

TELECONFERENCED MEETING

CITY COUNCIL REGULAR MEETING – 6:00 PM

JUNE 16, 2020

[Pursuant to Governor Executive Order N-29-20]

There Will Not Be a Physical Location for Attending the Meeting

The Public May Observe the Meeting and Offer Public Comment As Follows:

STEP 1

Install the Free Zoom App or Visit the Free Zoom Website at [<https://zoom.us/>](https://zoom.us/)

STEP 2

Get Meeting ID Number and Password by emailing zoom@moval.org or calling (951) 413-3001, no later than 5:00 p.m. on Tuesday, June 16, 2020

STEP 3

Select Audio Source

Computer Speakers/Microphone

or

Telephone

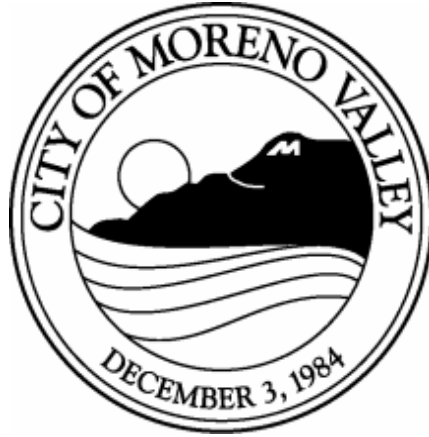
STEP 3

Public Comments May be Made Via Zoom

During the Meeting, the Mayor Will Explain the Process for Submitting Public Comments

ALTERNATIVE

If you do not wish to make public comments, you can view the meeting on Channel MVTV-3, the City's website at www.moval.org or YouTube



AGENDA
CITY COUNCIL OF THE CITY OF MORENO VALLEY
MORENO VALLEY COMMUNITY SERVICES DISTRICT
CITY AS SUCCESSOR AGENCY FOR THE
COMMUNITY REDEVELOPMENT AGENCY OF
THE CITY OF MORENO VALLEY
MORENO VALLEY HOUSING AUTHORITY
MORENO VALLEY PUBLIC FINANCING AUTHORITY
BOARD OF LIBRARY TRUSTEES

June 16, 2020

REGULAR MEETING – 6:00 PM

City Council Study Sessions

Second Tuesday of each month – 6:00 p.m.

City Council Meetings

Special Presentations – 5:30 P.M.

First & Third Tuesday of each month – 6:00 p.m.

City Council Closed Sessions

Will be scheduled as needed at 4:30 p.m.

City Hall Council Chamber – 14177 Frederick Street

Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities, in compliance with the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Guy Pegan, ADA Coordinator, at 951.413.3120 at least 72 hours before the meeting. The 72-hour notification will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

Dr. Yxstian A. Gutierrez, Mayor

Victoria Baca, Mayor Pro Tem
Ulises Cabrera, Council Member

David Marquez, Council Member
Dr. Carla J. Thornton, Council Member

AGENDA
CITY COUNCIL OF THE CITY OF MORENO VALLEY
June 16, 2020

CALL TO ORDER

SPECIAL PRESENTATIONS - NONE

**AGENDA
JOINT MEETING OF THE
CITY COUNCIL OF THE CITY OF MORENO VALLEY
MORENO VALLEY COMMUNITY SERVICES DISTRICT
CITY AS SUCCESSOR AGENCY FOR THE
COMMUNITY REDEVELOPMENT AGENCY OF THE
CITY OF MORENO VALLEY
MORENO VALLEY HOUSING AUTHORITY
MORENO VALLEY PUBLIC FINANCING AUTHORITY
AND THE BOARD OF LIBRARY TRUSTEES**

***THE CITY COUNCIL RECEIVES A SEPARATE STIPEND FOR CSD
MEETINGS***

**REGULAR MEETING – 6:00 PM
JUNE 16, 2020**

CALL TO ORDER

Joint Meeting of the City Council, Community Services District, City as Successor Agency for the Community Redevelopment Agency, Housing Authority and the Board of Library Trustees - actions taken at the Joint Meeting are those of the Agency indicated on each Agenda item.

ROLL CALL

INTRODUCTIONS

1. PUBLIC HEARINGS

Questions or comments from the public on a Public Hearing matter are limited to five minutes per individual and must pertain to the subject under consideration.

Those wishing to speak should follow the teleconference procedures.

IF YOU ARE ABSENT AT THE TIME YOUR NAME IS CALLED, YOU WILL FORFEIT THE OPPORTUNITY TO SPEAK ON THE ITEMS.

- 1.A. APPEAL OF TENTATIVE PARCEL MAP FOR FINANCE AND CONVEYANCE PURPOSES ONLY; APPEAL OF CERTIFICATION OF THE REVISED FINAL ENVIRONMENTAL IMPACT REPORT; AND CONSIDERATION OF WORLD LOGISTIC CENTER PROJECT DEVELOPMENT AGREEMENT (Report of: Community Development)

Recommendations:

1. ADOPT RESOLUTION 2020-____, DENYING APPEAL OF PLANNING COMMISSION'S CERTIFICATION OF THE REVISED FINAL EIR AND AFFIRMING PLANNING COMMISSION RESOLUTION NO. 2020-20:

- (A) APPROVING AND ADOPTING the Mitigation Monitoring and Reporting Program and the Findings Contained Therein, for the Revised Final EIR; and
 - (B) APPROVING AND ADOPTING the Statement of Overriding Considerations and the Findings Contained Therein, for the Final Revised EIR; and
 - (C) CERTIFYING that the Revised Final Environmental Impact Report PEN18-0050 for the World Logistics Center on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act and the CEQA Guidelines, and that the Planning Commission and City Council reviewed and considered the information in the Final EIR that reflects the City’s independent judgement and analysis; and
2. ADOPT RESOLUTION 2020-_____, DENYING APPEAL OF PLANNING COMMISSION’S APPROVAL OF THE TENTATIVE PARCEL MAP AND AFFIRMING PLANNING COMMISSION RESOLUTION NO. 2020-21:
- (A) APPROVING PEN20-0017 Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only, subject to the Tentative Parcel Map 36457 and Conditions of Approval; and,
3. INTRODUCE AND ADOPT ORDINANCE 2020-_____ :
- (A) APPROVING the Development Agreement by and between the City Of Moreno Valley and HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively “HF”) (PEN20-0018).
- 1.B. PUBLIC HEARING TO ADOPT THE FISCAL YEAR 2019/2020 CARES ACT AMENDMENT AND CITIZEN PARTICIPATION PLAN AMENDMENT AND AWARD CONSULTING CONTRACT TO WILLDAN FINANCIAL FOR CARES ACT GRANT ADMINISTRATION (Report of: Financial & Management Services)

Recommendations: That the City Council:

- 1. Conduct a Public Hearing to allow public comment on the proposed CARES Act Amendment to the 2019-2020 Annual Action Plan and proposed amendment to the Citizen Participation Plan reflecting CARES Act waivers.

2. Review and adopt the proposed CARES Act Amendment to the 2019-2020 Annual Action Plan
 3. Review and adopt the FY 2019-2020 Citizen's Participation Plan (as Amended for the CARES Act).
 4. Authorize a budget amendment as set forth in the fiscal impact section and authorize the Chief Financial Officer to allocate grant funds between HUD-approved grant activities.
 5. Award consulting agreement to Willdan Financial for CARES ACT Grant Administration Services.
1. C. PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR FISCAL YEAR 2020/21 (Report of: Financial & Management Services)

Recommendations: That the City Council and CSD:

1. Conduct a Public Hearing to receive public comments on the City of Moreno Valley General Fund appropriations limit for Fiscal Year 2020/21.
2. Adopt Resolution No. 2020-XX, a resolution of the City Council of the City of Moreno Valley, California, establishing the appropriations limit for Fiscal Year 2020/21.
3. Conduct a Public Hearing to receive public comments on the Moreno Valley Community Services District's appropriations limit for Fiscal Year 2020/21.
4. Adopt Resolution No. CSD 2020-XX, a resolution of the Moreno Valley Community Services District establishing the appropriations limit for Fiscal Year 2020/21.

PUBLIC COMMENTS ON ANY SUBJECT ON THE AGENDA AND NOT ON THE AGENDA UNDER THE JURISDICTION OF THE CITY COUNCIL

Any person wishing to address the Mayor and City Council on any matter, either under the Public Comments section of the Agenda or scheduled items or public hearings, must follow the procedures set forth above and wait to be identified to speak by the Mayor.

IF YOU ARE ABSENT AT THE TIME YOUR NAME IS CALLED, YOU WILL FORFEIT THE OPPORTUNITY TO SPEAK.

Members of the public may be limited to three minutes per person or the allowed time set by the Mayor, except for the applicant. The Mayor may establish an overall time limit for comments on a particular Agenda item. Members of the public must direct their questions to the Mayor and not to other members of the City Council, the applicant, the Staff, or the audience.

JOINT CONSENT CALENDARS (SECTIONS A-E)

All items listed under the Consent Calendars, Sections A, B, C, D, and E are considered to be routine and non-controversial, and may be enacted by one motion unless a member of the City Council, Community Services District, City as Successor Agency for the Community Redevelopment Agency, Housing Authority or the Board of Library Trustees requests that an item be removed for separate action. The motion to adopt the Consent Calendars is deemed to be a separate motion by each Agency and shall be so recorded by the City Clerk. Items withdrawn for report or discussion will be heard after public hearing items.

A. CONSENT CALENDAR-CITY COUNCIL

- A.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

- A.2. MINUTES - CITY COUNCIL - REGULAR MEETING - JUN 2, 2020 6:00 PM

Recommendation: Approve as submitted.

- A.3. MINUTES - CITY COUNCIL - STUDY SESSION - JUN 9, 2020 6:00 PM

Recommendation: Approve as submitted.

- A.4. 2020 CITY COUNCIL COMMISSION, BOARD, AND SUBCOMMITTEE APPOINTMENTS (Report of: City Clerk)

Recommendation: That the City Council:

1. Ratify the appointments to the various committees and subcommittees as noted on the 2020 Council Committee Participation List – terms end on December 31, 2020.

- A.5. PAYMENT REGISTER - APRIL 2020 (Report of: Financial & Management Services)

Recommendation:

1. Receive and file the Payment Register.

- A.6. AUTHORIZATION TO AWARD PROFESSIONAL CONSULTANT SERVICES TO WILLDAN ENGINEERING FOR PROJECT MANAGEMENT SERVICES OF THE COURTYARDS AT COTTONWOOD PROJECT AND NSP CLOSE OUT (Report of: Financial & Management Services)

Recommendations:

1. Award a professional consultant services agreement to Willdan Engineering to provide project management services for The Courtyards at Cottonwood Project, funded by HOME Investment Partnerships Program (HOME) and Neighborhood Stabilization Program (NSP), and closeout management of the NSP programs.
2. Authorize the City Manager to execute the Agreement, subject to approval as to form by the City Attorney, and subsequent amendments to the Agreement, including the authority to approve purchase orders in accordance with the terms of the Agreement, provided sufficient funding appropriations have been approved by the City Council.

- A.7. LIST OF PERSONNEL CHANGES (Report of: Financial & Management Services)

Recommendation:

1. Ratify the list of personnel changes as described.

- A.8. APPROVE BID AWARD TO ONE SOURCE DISTRIBUTORS FOR THE PURCHASE OF EMERGENCY STOCK FOR MORENO VALLEY UTILITY (MVU) (Report of: Financial & Management Services)

Recommendations:

1. Approve bid award to OneSource Distributors for the purchase of Emergency Stock for Moreno Valley Utility.
2. Authorize the purchase of emergency stock as needed in an amount not to exceed a total of \$1,325,000 for Fiscal Year 2020-2021 through Fiscal Year 2024/2025.
3. Authorize the Assistant City Manager/Chief Financial Officer to execute any subsequent related minor change orders up to his signature authority.

A.9. AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA CORPORATION FOR THE JUAN BAUTISTA DE ANZA MULTI-USE TRAIL ATP-4 PROJECT NO. 801 0086 (Report of: Public Works)

Recommendations:

1. Award an Agreement for Professional Consultant Services to KOA Corporation, 3190 Shelby Street, Bldg C, Ontario, CA 91764 to complete preliminary engineering, design, and right-of-way services for the Juan Bautista de Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue;
2. Authorize the issuance of a Purchase Order to KOA Corporation, in the amount of \$482,824 when the contract has been signed by all parties. The Project is fully funded by ATP Grant Cycle 4 (Fund 2301);
3. Authorize the City Manager to execute the contract with KOA Corporation, subject to the approval by the City Attorney; and
4. Authorize the Public Works Director to execute any subsequent related amendments to the Agreement for Professional Consultant Services with KOA Corporation, not to exceed the Purchase Order amount, subject to the approval by the City Attorney.

B. CONSENT CALENDAR-COMMUNITY SERVICES DISTRICT

- B.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

- B.2. MINUTES - CITY COUNCIL - REGULAR MEETING - JUN 2, 2020 6:00 PM (See A.2)

Recommendation: Approve as submitted.

- B.3. MINUTES - CITY COUNCIL - STUDY SESSION - JUN 9, 2020 6:00 PM

Recommendation: Approve as submitted.

C. CONSENT CALENDAR - HOUSING AUTHORITY

- C.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

C.2. MINUTES - CITY COUNCIL - REGULAR MEETING - JUN 2, 2020 6:00 PM
(See A.2)

Recommendation: Approve as submitted.

C.3. MINUTES - CITY COUNCIL - STUDY SESSION - JUN 9, 2020 6:00 PM

Recommendation: Approve as submitted.

D. CONSENT CALENDAR - BOARD OF LIBRARY TRUSTEES

D.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

D.2. MINUTES - CITY COUNCIL - REGULAR MEETING - JUN 2, 2020 6:00 PM
(See A.2)

Recommendation: Approve as submitted.

D.3. MINUTES - CITY COUNCIL - STUDY SESSION - JUN 9, 2020 6:00 PM

Recommendation: Approve as submitted.

E. CONSENT CALENDAR - PUBLIC FINANCING AUTHORITY

E.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

E.2. MINUTES - CITY COUNCIL - REGULAR MEETING - JUN 2, 2020 6:00 PM
(See A.2)

Recommendation: Approve as submitted.

E.3. MINUTES - CITY COUNCIL - STUDY SESSION - JUN 9, 2020 6:00 PM

Recommendation: Approve as submitted.

F. PUBLIC HEARINGS – ITEMS WERE MOVED TO THE BEGINNING OF THE AGENDA AS ITEMS 1A, 1B AND 1C

G. GENERAL BUSINESS

- G.1. CONSIDERATION OF A RESOLUTION CREATING THE MORENO VALLEY CITIZENS PUBLIC SAFETY COMMITTEE (Report of: Financial & Management Services)

Recommendations:

1. Approve Resolution No. 2020-_____, a Resolution of the City Council of the City of Moreno Valley, California, establishing the Moreno Valley Citizens Public Safety Committee
2. Ratify Mayor's appoint of Mayor Pro Tem Victoria Baca to serve as the Ad Hoc Committee Chairperson and Council Member Dr. Carla Thornton to serve as the Vice Chairperson. These positions shall be tasked with working with community stakeholders to guide the development of the Moreno Valley Citizens Public Safety Committee.
3. Direct the City Clerk to seek applications for the review and potential appointment by the Mayor to the Committee.

H. ITEMS REMOVED FROM CONSENT CALENDARS FOR DISCUSSION OR SEPARATE ACTION

I. REPORTS

I.1. CITY COUNCIL REPORTS

(Informational Oral Presentation - not for Council action)

March Joint Powers Commission (JPC)

Riverside County Habitat Conservation Agency (RCHCA)

Riverside County Transportation Commission (RCTC)

Riverside Transit Agency (RTA)

Western Riverside Council of Governments (WRCOG)

Western Riverside County Regional Conservation Authority (RCA)

School District/City Joint Task Force

I.2. CITY MANAGER'S REPORT

(Informational Oral Presentation - not for Council action)

I.3. CITY ATTORNEY'S REPORT

(Informational Oral Presentation - not for Council action)

CLOSING COMMENTS AND/OR REPORTS OF THE CITY COUNCIL, COMMUNITY SERVICES DISTRICT, CITY AS SUCCESSOR AGENCY FOR THE COMMUNITY REDEVELOPMENT AGENCY, HOUSING AUTHORITY, PUBLIC FINANCING AUTHORITY, AND THE BOARD OF LIBRARY TRUSTEES.

ADJOURNMENT

PUBLIC INSPECTION

The contents of the agenda packet are available for public inspection on the City's website at www.moval.org and in the City Clerk's office at 14177 Frederick Street during normal business hours.

Any written information related to an open session agenda item that is known by the City to have been distributed to all or a majority of the City Council less than 72 hours prior to this meeting will be made available for public inspection on the City's website at www.moval.org and in the City Clerk's office at 14177 Frederick Street during normal business hours.

CERTIFICATION

I, Pat Jacquez-Nares, City Clerk of the City of Moreno Valley, California, certify that 72 hours prior to this Regular Meeting, the City Council Agenda was posted on the City's website at: www.moval.org and in the following three public places pursuant to City of Moreno Valley Resolution No. 2007-40:

City Hall, City of Moreno Valley
14177 Frederick Street

Moreno Valley Library
25480 Alessandro Boulevard
Moreno Valley Senior/Community Center
25075 Fir Avenue

Pat Jacquez-Nares, CMC & CERA
City Clerk

Date Posted: June 11, 2020



Report to City Council

TO: Mayor and City Council

FROM: Manuel A. Mancha, Community Development Director

AGENDA DATE: June 16, 2020

TITLE: APPEAL OF TENTATIVE PARCEL MAP FOR FINANCE AND CONVEYANCE PURPOSES ONLY; APPEAL OF CERTIFICATION OF THE REVISED FINAL ENVIRONMENTAL IMPACT REPORT; AND CONSIDERATION OF WORLD LOGISTIC CENTER PROJECT DEVELOPMENT AGREEMENT

RECOMMENDED ACTION

Recommendations:

1. **ADOPT RESOLUTION 2020-____, DENYING APPEAL OF PLANNING COMMISSION'S CERTIFICATION OF THE REVISED FINAL EIR AND AFFIRMING PLANNING COMMISSION RESOLUTION NO. 2020-20:**
 - (A) **APPROVING AND ADOPTING** the Mitigation Monitoring and Reporting Program and the Findings Contained Therein, for the Revised Final EIR; and
 - (B) **APPROVING AND ADOPTING** the Statement of Overriding Considerations and the Findings Contained Therein, for the Final Revised EIR; and
 - (C) **CERTIFYING** that the Revised Final Environmental Impact Report PEN18-0050 for the World Logistics Center on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act and the CEQA Guidelines, and that the Planning Commission and City Council reviewed and considered the information in the Final EIR that reflects the City's independent judgement and analysis; and

2. **ADOPT RESOLUTION 2020-____, DENYING APPEAL OF PLANNING COMMISSION'S APPROVAL OF THE TENTATIVE PARCEL MAP AND AFFIRMING PLANNING COMMISSION RESOLUTION NO. 2020-21:**

- (A) **APPROVING** PEN20-0017 Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only, subject to the Tentative Parcel Map 36457 and Conditions of Approval; and,

3. **INTRODUCE AND ADOPT ORDINANCE 2020-_____ :**

- (A) **APPROVING** the Development Agreement by and between the City Of Moreno Valley and HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively “HF”) (PEN20-0018).

BACKGROUND

The WLC Project will include a mixture of industrial, logistics, warehouse and support uses on the land situated within the WLC Specific Plan, which was unanimously approved by the City Council on November 15, 2015, via the City Council’s adoption of the WLC Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs Initiative.” The other WLC Project entitlements approved in November 2015 under the Jobs Initiative include various amendments to the City’s General Plan and Zoning Map, and certain WLC Project Conditions of Development that incorporated the Mitigation Measures set forth in the WLC Project’s Program Environmental Impact Report previously certified by the City Council on August 19, 2015. The adoption of the Jobs Initiative also repealed the former Moreno Highlands Specific Plan.

In addition to the above, the City Council, acting in its capacity of Moreno Valley Community Services District Board of Directors, unanimously approved the “WLC Land Benefit Initiative” to request that the Riverside County Local Agency Formation Commission (“LAFCO”) initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, which is a part of the WLC Project. This also remains legally valid and in effect.

The aforementioned entitlements remain legally valid and in effect since they were neither vacated nor invalidated by any of the court proceedings, rulings or opinions issued as a result of the former litigation (described below). Further, as such, these specific entitlements cannot now be challenged in court since the applicable statutes of limitations have long expired. In light of the foregoing, the WLC Project’s Specific Plan, General Plan Amendment, Zoning Map Amendment and Conditions of Development, and proposed Annexation are not within the scope of review of this City Council Public Hearing.

WLC Project Community Benefits

The WLC Project is projected to generate millions of dollars annually for schools, police, fire, parks and other public and city services. The broader economic base will boost the local economy. Some benefits include:

- 20,000 permanent jobs in the community
- 13,000 construction jobs
- \$2.5 billion of annual economic benefit to the City and region
- \$3 billion in construction dollars, spent locally
- \$22 million for public education annually
- \$20 million paid to the local school districts
- \$7 million provided by the developer for education and workforce training
- \$5.7 million annually to the City's General Fund

WLC Project – Entitlements Approved in August 2015

Prior to the City Council's November 2015 unanimous approval of the Jobs Initiative that approved the WLC Project's Specific Plan, General Plan Amendment, Zoning Map Amendment and Conditions of Development, the City Council had approved the substantially same entitlements on August 19, 2015, at a duly noticed Public Hearing. At the conclusion of the August 2015 Public Hearing, the City Council approved General Plan Amendments for the WLC Project that changed the land use designations within the WLC Project's Specific Plan Area to Business Park/Light Industrial (BP) and Open Space (OS), and changed the land use designations of certain areas outside the boundaries of the WLC Project's Specific Plan to Open Space (OS). The City Council's August 2015 approvals also included amendments to the relevant Text and/or Maps contained in the General Plan's Goals and Objectives and the following General Plan Elements: (1) Community Development; (2) Circulation; (3) Parks, Recreation and Open Space; (4) Safety; and (5) Conservation.

In August 2015, the City Council also introduced an ordinance that: (1) approved and adopted the WLC Specific Plan; (2) approved a Change of Zone; (3) approved a Pre-Zoning/Annexation for the WLC Project; and (4) repealed the former Moreno Highlands Specific Plan. The Pre-Zoning/Annexation pertained to the proposed annexation of 85 acres at northwest corner of Gilman Springs Road and Alessandro Boulevard that was pre-zoned to Logistics Development (LD), Light Logistics (LL) and Open Space (OS) for areas within the WLC Specific Plan and Open Space (OS) for those areas situated southerly beyond WLC Project's Specific Plan boundaries. In connection with the proposed annexation, the City Council and the City Council acting in its capacity as the Moreno Valley Community Services District Board of Directors adopted resolutions requesting that the Riverside Local Agency Formation Commission ("LAFCO") initiate the necessary proceedings to annex the 85 acres into the City and the Community Services District, respectively.

A Tentative Parcel Map to establish twenty-six (26) parcels within the WLC Specific Plan was also approved by the City Council at the August 19, 2015, Public Hearing for Financing and Conveyance Purposes Only – not for development purposes.

Finally, at the August 19, 2015 Public Hearing, the City Council: (1) introduced an ordinance approving a Development Agreement for the WLC Project, that was consistent with all the aforementioned entitlements and approvals; (2) approved and adopted a Mitigation Monitoring and Reporting Program for the WLC Project; (3) approved and adopted Findings and a Statement of Overriding Considerations for the WLC Project; and (4) certified the 2015 Final Environmental Impact Report for WLC Project.

August 2015 WLC Project Entitlement Approvals – Legal Challenges

The August 2015 WLC Project Entitlement Approvals, as described above, were challenged by one individual and the following entities and organizations:

- Albert Thomas Paulk
- California Clean Energy Committee
- Center for Biological Diversity
- Center for Community Action and Environmental Justice
- Coalition for Clean Air
- Friends of the Northern San Jacinto Valley
- Laborers International Union of North America, Local Union No. 1184
- Residents for a Livable Moreno Valley
- Riverside County
- Riverside County Transportation Commission
- San Bernardino Valley Audubon Society
- Sierra Club
- SoCal Environmental Justice Alliance
- South Coast Air Quality Management District

Settlements were reached with some of the above petitioners, an agreement to pay approximately \$26,000,000 to the South Coast Air Quality Management District to be used to improve air quality with a priority for projects that will be especially beneficial to the areas surrounding the World Logistics Center most impacted by its construction and operation, i.e., the City, and an agreement to pay Riverside County and the Riverside County Transportation Commission several million dollars for road improvements in and near the City, the end result of the litigation was that the Judge vacated all of the August 2015 WLC Project Entitlement Approvals, except for the Development Agreement, which was set aside in separate litigation, discussed below, but found that despite the numerous legal challenges targeted at the 2015 Final Environmental Impact Report, there were **only five areas** that required further environmental analysis in order to bring the 2015 Final EIR into compliance under the California Environmental Quality Act (“CEQA”). Those five areas included:

- I. Energy Impacts: The FEIR must provide a comparison of feasible, cost-effective renewable energy technologies in the Energy Impacts analysis.
- II. Biological Impacts: The FEIR should remove all references to and consideration of the 910 acres of San Jacinto Wilderness Area (“SJWA”) and Multiple

Species Habitat Conservation Plan (“MSHCP”) lands as a “buffer zone” or California Department of Fish and Wildlife (“CDFW”) Conservation Buffer Area in the Biological Resources and Habitat Impact analysis.

- III. Noise Impacts: The FEIR must provide an analysis of construction noise over ambient levels; provide adequate analysis on construction noise impacts on nearby homes; address the inadequacy of mitigation measures, which fail to include performance standards or ways to reduce construction noise.
- IV. Agricultural Impacts: The FEIR and the resolution certifying the FEIR require clarification as to whether loss of locally important farmlands will have a significant direct or cumulative impact on agriculture and, if significant, the FEIR must either explain how proposed mitigation will reduce the impact or why other mitigation is not feasible.
- V. Cumulative Impacts: The FEIR should include consideration of recently constructed and proposed large warehouse WLC Projects in the summary-of-WLC Projections method, and should analyze whether individually insignificant impacts may be cumulatively significant.

WLC Project – Entitlements Approved in November 2015

On September 14 and 15, 2015, three Project-related initiative petitions were filed with the City Clerk on behalf of Robert D. Harris, the proponent of each initiative. The initiatives were known as follows:

- WLC Land Use and Zoning Entitlements Initiative, also known as the Moreno Valley Jobs Initiative;
- WLC Development Agreement Initiative; and
- WLC Land Benefit Initiative

The three initiatives sought to replace the August 2015 WLC Project Entitlement Approvals with a set of substantially identical WLC Project Entitlement Approvals through the initiative process.

As discussed above, the Jobs Initiative included: (1) the adoption of WLC Specific Plan; (2) approval of various amendments to the City’s General Plan and Zoning Map; (3) the adoption of certain WLC Project Conditions of Development, which mirrored the Mitigation Measures set forth in the 2015 Final EIR; and (4) the repeal of the former Moreno Highlands Specific Plan.

In addition to the above, the City Council, acting in its capacity of Moreno Valley Community Services District Board of Directors, unanimously approved the “WLC Land Benefit Initiative” to request that LAFCO initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, which is a part of the WLC Project.

Finally, the WLC Development Agreement Initiative included the approval of a statutory Development Agreement for the WLC Project, substantially identical to the WLC Development Agreement approved previously by the City Council in August 2015, and which included provisions consistent with the WLC Project's Entitlement Approvals as proposed in the Jobs Initiative and the WLC Land Benefit Initiative.

Pursuant to state law, once the City Clerk determined that the petitions, on their face ("prima facie review"), complied with all statutory (state law) requirements and contained the sufficient number of signatures, the City Clerk was required to present each of the initiative petitions to the City Council for its consideration. Under applicable law, the City Council had very limited alternatives. Basically, the City Council's options were either: (1) adopt the initiatives, or (2) place them on the ballot for the voters to decide whether to approve them. The City Council exercised the first option and unanimously approved the adoption all three initiatives.

November 2015 WLC Project Entitlement Approvals – Legal Challenges

After the City Council approved the three initiatives in November 2015, another set of lawsuits were filed against the City by the following entities and organizations:

- Center for Biological Diversity
- Center for Community Action and Environmental Justice
- Coalition for Clean Air
- Riverside County
- Riverside County Transportation Commission
- San Bernardino Valley Audubon Society
- Sierra Club
- SoCal Environmental Justice Alliance
- South Coast Air Quality Management District

At the conclusion of the above litigation, although the City Council's approval of the three initiatives were upheld as legally valid and effective by the Superior Court, the only action invalidated on appeal by the California Court of Appeal was the City Council's approval of the WLC Development Agreement Initiative, which included the following "Public Benefits":

- The WLC Project will result in 85 acres of land being annexed to the City and the Community Services District;
- Developer's payment of Development Impact Fees will cover costs associated with City Police Facilities, City Hall Facilities, the City's Corporate Yard Facilities and Maintenance Equipment;
- Developer's right to sell, transfer, or assign certain parts of the WLC Project will be subject to the City's prior written approval;
- Developer will be required to pay for all development services provided by the City once the City designates a WLC Coordinator;
- Any costs associated with using qualified private entities or persons will be the responsibility of Developer;

- Developer will be responsible for paying for or constructing all traffic circulation-related improvements, except for those that are paid by fees imposed on other developers for their fair share of the cost of particular improvements needed to accommodate their respective projects;
- Developer will be required, at its own cost, to provide a fully constructed, fully equipped fire station and fire station site, including fire trucks, as specified by the City's Fire Chief;
- Developer will establish a WLC Local Hiring Program, at Developer's cost to identify, align and facilitate educational interests and programs with workforce development programs that facilitate the hiring of Moreno Valley residents for job opportunities at the WLC Project, and associated jobs in industries that support the WLC Project;
- Developer will require its contractors, suppliers and tenants to be active participants in Moreno Valley Employment Resource Center ("ERC") programs including, but not limited to, utilizing the ERC's job opportunity announcements program;
- Developer will actively participate in the Hire MoVal Incentive Program;
- Developer will contribute up to \$6,993,000, to be used by the City to provide and enhance educational and workforce development training in the logistics industries; and
- Developer will contribute up to \$500,000 to develop freeway related landscaping, bridge architectural concepts, engineering and freeway signage regulations.

Unless the Development Agreement is resurrected through re-adoption by the City Council, in connection the certification of the Revised Final EIR, there is no guarantee that the above public benefits will materialize, if the WLC Project is developed solely on the basis of the currently valid WLC Project Entitlements that survived the litigation pertaining to the initiatives.

WLC Project Entitlement Approvals – Post Litigation Status

The following WLC Project Entitlement Approvals, as more particularly described in the WLC Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs Initiative" and "WLC Land Benefit Initiative," currently remain valid and effective:

1. Repeal of the former Moreno Highlands Specific Plan
2. Adoption of WLC Specific Plan
3. Amendments to the City's General Plan
4. Amendments to the City's Zoning Map
5. Approval of WLC Project Conditions of Development
6. Request that LAFCO commence proceeding to annex 85 acres into City and Community Services District

The only remaining entitlements that need to be approved for the WLC Project, other than Plot Plan approvals and subdivision maps, to permit the City to commence issuing necessary ministerial permits such as grading and building permits, so that construction and development of the WLC Project can finally begin, are the following:

1. Revised Final EIR
 - a. Mitigation Monitoring and Reporting Program
 - b. Statement of Overriding Considerations
2. Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only
3. Development Agreement

Planning Commission Public Hearing

At the May 14, 2020, regular meeting of the Planning Commission, after a noticed public hearing conducted by the Planning Commission, the Planning Commission on a 6-0-1 vote (with Commissioner Harris recusing himself due to the appearance of bias): (1) approved and certified the Revised Final Environmental Impact Report (“Revised Final EIR”) that included the approval and adoption of both a Mitigation Monitoring and Reporting Program and a Statement of Overriding Conditions; (2) approved Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only; and (3) recommended that the City Council approve the statutory Development Agreement. All of the above-referenced items are directly related/applicable to the World Logistics Center Project. (See attached Planning Commission Staff Report, dated February 14, 2020, which is incorporated by reference as though set forth at length herein.)

Appeals Filed

A total of three Appeal applications were filed by two appellants. Two of the Appeal applications (PAA20-0001 and PPA20-0002) challenge the Planning Commission’s May 14 decision to approve and certify the Revised Final EIR. One Appeal application PAA20-0003 challenges the Planning Commission’s May 14 decision to approve Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only.

Revised Final EIR - Appeals

On or about May 26, 2020, an appeal was filed by Adriano L. Martinez on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, challenging the Planning Commission’s May 14 decision to approve and certify the Revised Final EIR. (PAA20-0002)

On or about May 28, 2020, another appeal was filed by Angel Lopez-Ramirez challenging only the Planning Commission’s May 14 decision to approve and certify the Revised Final EIR. (PAA20-0001).

Tentative Parcel Map for Financing and Conveyance Purposes Only - Appeal

Adriano L. Martinez also filed an appeal on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, challenging the Planning

Commission's May 14 decision to approve Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only ("Tentative Parcel Map"). (PAA20-0003).

WLC Development Agreement - Review and Consideration

The final decision on the approval of the WLC Development Agreement vests with the City Council.

Pursuant to the Section 9.02.110 (Development Agreements) of Chapter 9.02 (Permits and Approvals), the WLC Development Agreement was reviewed by the Planning Commission in the context of the noticed May 14 Public Hearing. After the Planning Commission's Public Hearing, it adopted Resolution 2020-22 recommending that the City Council adopt the requisite ordinance to approve the WLC Development Agreement. The Planning Commission decision was based on, but not limited to, the following findings, as required by Section 9.02.110 (Development Agreements):

- (a) The WLC Development Agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the general plan and any applicable specific plan;
- (b) The WLC Development Agreement is compatible with the uses authorized in, and the regulations prescribed for, the land use district in which the real property is located;
- (c) The WLC Development Agreement is in conformity with public convenience, general welfare and good land use practice;
- (d) The WLC Development Agreement will not be detrimental to the public health, safety and general welfare; and
- (e) The WLC Development Agreement will not adversely affect the orderly development or the preservation of property values for the subject property or any other property.

After the Planning Commission Public Hearing, the City Council is required to conduct a noticed Public Hearing to consider the Planning Commission's recommendation. After the City Council completes the Public Hearing, it may accept, modify or disapprove the recommendation of the Planning Commission. The WLC Development Agreement, however, may only be approved by ordinance and it shall not be approved unless the City Council makes or approves the Planning Commission's findings as described above.

Administrative Record of the Proceedings

The Planning Commission's actions on the Revised Final EIR, Tentative Parcel Map and the WLC Development Agreement were based on various findings derived from the following body of evidence, which amounts to the Administrative Record of the Proceedings. This Administrative Record is vast, broad and very comprehensive and consists of the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein;
- (b) Title 9 (“Planning and Zoning”) of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Draft EIR, Recirculated Portions of the Final EIR (RSFEIR), Draft Recirculated RSFEIR and all studies, reports, public comments and responses thereto;
- (d) Final EIR and the Revised Final EIR and all studies, reports, public comments and responses thereto;
- (e) Draft Development Agreement by and between the City and Developer, its application and all documents, records and references contained therein;
- (f) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” that was unanimously approved by the City Council in November 24, 2015;
- (g) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (h) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (i) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (j) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (k) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (l) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015;
- (m) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto;
- (n) Planning Commission Staff Report and Staff Presentation and all documents, records and references related thereto;

- (o) Testimony and/or comments from Developer and its representatives during the Planning Commission Public Hearing;
- (p) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the Planning Commission Public Hearing;
- (q) Riverside County Superior Court's Ruling on Peremptory Writ of Mandate, filed February 8, 2018;
- (r) Riverside County Superior Court's Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018; and
- (s) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5th 689.

In addition to the above, the City Council has the benefit of considering the following additional evidence:

- (a) City Council Staff Report and Staff Presentation and all documents, records and references related thereto;
- (b) Testimony and/or comments from Developer and its representatives during the City Council Public Hearing;
- (c) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the City Council Public Hearing;
- (d) The findings set forth in Planning Commission Resolution 2020-20 Approving and Adopting a Mitigation Monitoring Reporting Program and Statement of Overriding Considerations and Certifying the Revised Final EIR;
- (e) The findings set forth in Planning Commission Resolution 2020-21 Approving Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes;
- (f) The findings set forth in Planning Commission Resolution 2020-22 Recommending that the City Council Adopt the Requisite Ordinance Approving the WLC Development Agreement;
- (g) Any and all written responses, prepared by staff, the applicant and/or applicant's representatives to comments submitted to the City prior to or at the Planning Commission Public Hearing and any and all responses to comments submitted to the City prior to or at the City Council Public Hearing; and
- (h) Tentative Court of Appeal Opinion, Albert Paulek, et al., v. City of Moreno Valley (May 2019), Case No. E071184.

Moreover, subsequent to the distribution of the Final Response to Comments and Revised Final EIR and prior to and during the Planning Commission hearing on May 14, 2020, comment letters on the Revised Final EIR were submitted to the City. Formal responses to those comments are not required pursuant to State CEQA Guidelines Section 15088. However, written responses have been prepared and are included herein by this reference as though set forth at length herein. HF's environmental and planning consultants, Environmental Science Associates ("ESA"), provided the responses for the benefit of the City Council and for completeness of the record. Staff

has reviewed and approved the responses. It is important to note that none of the responses provide any significant new information that would require recirculation of the Revised Final EIR.

Substantial Evidence

The general rule is that any findings made in regard to any of the three items be based on “substantial evidence” contained in the administrative record of the proceedings. Substantial evidence is not synonymous with any evidence. However, substantial evidence in some cases may include the testimony of a single witness provided that the conclusions and assumptions of the witness is supported by substantial evidence in light of the whole record.

“Substantial evidence” can be described as **enough relevant information and reasonable inferences from the information that a fair argument can be made to support a conclusion**, even though other conclusions might also be reached. Substantial evidence may include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts. Substantial evidence may also include relevant evidence that a reasonable mind might accept as adequate to support a conclusion. Substantial evidence may also include evidence of ponderable legal significance that is reasonable in nature, credible, and of solid value.

In light of the foregoing, it is important that all findings made in relation to the Revised Final EIR, the Tentative Parcel Map and even to some extent the WLC Development Agreement, be supported by substantial evidence in light of the whole record.

Revised Final EIR - Scope of Review

The Scope of Review of the Revised Final EIR should remain focused on the specific reasons for the appeal, as described in the two appeal letters. Since Section 9.02.240 (Appeals) requires the appellant to state the specific reasons for the appeal, it follows that the City Council is not conducting a de novo review of the Revised Final EIR, meaning the City Council for due process reasons should refrain from hearing the appeal as if the item on appeal (Revised Final EIR) is being heard for the first time.

If the City Council denies the appeal, the Resolution denying the appeal will reflect that it also formally repeals and sets aside Resolution No. 2015-56 which certified the previous Final EIR and adopted findings, the MMRP and the Statement of Overriding Considerations, which was vacated by Hon. Judge Waters in the Peremptory Writ of Mande issued June 7, 2018. (Case No: RIC 1510967 [MF])

Mandatory Recusals – Reason for Appeal

One of the appellants (Lopez) argues that that several members of the Planning Commission should have recused themselves and that even members of the City Council should recuse themselves, for a variety of reasons, none of which require mandatory recusals.

Common Law Bias

Appellant Lopez claims that four of the Planning Commissioners were “prejudiced” and “biased,” and should have recused themselves. This particular appellant bases his conclusions on statements such as: “perceived connections,” “leaning toward one side of a cause,” “turning her head directly toward Iddo Benzeevie of Highland Fairview,” “clear and convincing evidence for a ‘conflict of interest’ with prejudice and bias,” “prejudice and bias with grounds of a one-side partisan point of view,” “ex-parte,” “political influence” and “campaign contributions,” none of which are supported by any “clear and convincing evidence” as purported by this particular appellant.

The common law doctrine against conflicts of interest is the judicial expression of the public policy against public officials using their official positions for private benefit. See *Terry v Bender* (1956) 143 CA2d 198, 206. This doctrine has been primarily applied to require a public official to abstain from participation in cases when the public official's private financial interest may conflict with his or her official duties. 64 Ops Cal Atty Gen 795, 797 (1981). **However, a more recent court decision (cited by one of the appellants) actually indicates a reluctance to find a violation of the common law doctrine against conflicts of interest when statutory conflict of interest laws are not violated.** See *BreakZone Billiards v City of Torrance* (2000) 81 CA4th 1205, 1233.

Due process also requires in a quasi-judicial proceeding that the decision-maker be fair and impartial. A personal interest or involvement in the outcome of a matter, or with any participant, that is unrelated to the merits requires disqualification. See *City of Fairfield v Superior Court* (1975) 14 C3d 768. See also *Mennig v City Council* (1978) 86 CA3d 341. **This rule does not preclude holding opinions, philosophies, or strong feelings about issues or specific projects; it also does not proscribe expression of views about matters of importance in the community, particularly during an election campaign.** See *City of Fairfield v Superior Court* (1975) 14 C3d 768.

Moreover, **a council member who receives campaign contributions from an applicant** that seeks a quasi-judicial land use decision from the city or who is the appellant that brings the matter before the city council for review **is not automatically disqualified from participating due to bias or prejudgment of adjudicative facts.** See *BreakZone Billiards v City of Torrance* (2000) 81 CA4th 1205, 1235. See also *All Towing Servs. LLC v City of Orange* (2013) 220 CA4th 946, 955 (**under Political Reform Act, campaign contributions do not constitute gifts or income and thus do not create a conflict of interest**).

Legally Required Participation

Interestingly, even if four Planning Commissioners decided to recuse themselves from the proceedings, for whatever reasons, based on the vote of the Planning Commission, the outcome would have remained the same. This is because the Political Reform Act does not prevent any public official from making or participating in a governmental decision to the extent the official's participation is “legally required” for the action or

decision to be made. Govt C §87101. See also 2 Cal Code Regs §18705. The exception applies only if there is no reasonable alternative manner of decision-making, and the public official involved must act in order for a decision to be made. 2 Cal Code Regs §18705(a). See Brown v Fair Political Practices Comm'n (2000) 84 CA4th 137. A quorum for "legally required participation" is the minimum number of members needed to approve the item of business, and a random means of selection may be used to select the officials needed for the quorum. 2 Cal Code Regs §18705(c) (3), (d). Once selected, an official remains selected for the duration of the proceedings in all related matters until his or her participation is no longer legally required. 2 Cal Code Regs §18705(c)(3).

In light of the foregoing, if four members of the Planning Commission had recused themselves for any reason whatsoever, the Planning Commission would have been left without a quorum to act upon the Revised Final EIR, Tentative Parcel Map, and the WLC Development Agreement. Under such circumstances, the law would have required that at least one of the self-recused Planning Commissioners be selected by random draw to participate in the proceedings since a quorum is needed to take action on the three items. In other words, if recusals eliminate a quorum, this does not mean the item on the agenda automatically fails or is rejected by operation of law.

Letters from Attorney General Xavier Becerra and the California Air Resources Board and the State of California Department of Fish and Wildlife

Appellant Lopez attached copies of a joint letter submitted by Attorney General Xavier Becerra, in his independent capacity and the California Air Resources Board (CARB), dated May 14, 2020, and a letter from the State of California Department of Fish and Wildlife, dated May 13, 2020. Assuming the appellant is incorporating each issue raised in the above letters, separate supplemental information will be provided that responds to the issues raised in each of the above letters.

Mitigation Measures, Impacts Analysis, Recirculation, etc.

The other appellant attached several copies of correspondence from other members of the public, which he relies on for the reasons for his appeal. These appellants also raise issues over the adequacy of a multitude of mitigation measures, recirculation, impact analysis, etc. The responses to the reasons for both appeals are attached hereto.

Tentative Parcel Map – Scope of Review

The basis of the appeal of the Planning Commission's approval of the Tentative Parcel Map is the alleged inadequacy of the Revised Final EIR. This means that the review of the Tentative Parcel Map should not be focused on the nature the map nor the findings supporting its approval, other than those related to CEQA.

If the City Council denies the appeal, the Resolution denying the appeal will reflect that it also formally repeals and sets aside Resolution No. 2015-58 which approved the

former parcel map which was vacated by Hon. Judge Waters in the Peremptory Writ of Mandate issued June 7, 2018. (Case No: RIC 1510967 [MF])

WLC Development Agreement - Review and Consideration

The WLC Development Agreement approved by the City Council on August 19, 2015, was vacated by the Court Ruling and an identical version that was subsequently unanimously adopted by the City Council on November 14, 2015, was invalidated by the Court of Appeal, both for reasons unrelated to the content of the respective Development Agreements. The former was vacated based on an inadequate EIR and the latter based on a legal determination that the initiative process cannot be used as a mechanism to approve a statutory Development Agreement.

In light of the foregoing, since the WLC Project entitlements that the City Council had promised to process under the Development Agreement were not invalidated by the Court of Appeal, and which remain valid and in effect, this has provided the Developer with the benefit of the bargain under the Development Agreement, but leaving the City in jeopardy with respect to the “Public Benefits” that Developer was otherwise legally obligated to provide to the City had the Development Agreement remained in effect.

The numerous benefits that will be provided to the City if the Development Agreement is approved by the City Council are set forth in detail on pages 3 and 6-7 of this report.

Upon certification of the Revised Final EIR, which remedies the five deficiencies of the 2015 Final EIR, and the adoption of the 2020 Development Agreement through the City’s normal legislative process consistent with the State’s Development Agreement Law, as set forth in the California Government Code commencing with section 65864 (the “Development Agreement Law and the City’s “Development Agreement Ordinance” as set forth in Title 9, Section 9.02.110 of the Municipal Code), the City will be reassured that it will receive the “Public Benefits” from the development for the WLC Project set forth on pages 6 and 7 of this report.

Again, it is imperative to recognize that review of the scope of the Development Agreement must be focused on the “Public Benefits” specifically set forth in the Development Agreement, since all the underlying project entitlements have already been approved and remain valid and effective. In other words, the sole purpose of adopting the Development Agreement is to ensure that City retains its “benefit of the bargain” when the City Council unanimously approved the WLC Project Entitlements in August 2015 and subsequently by initiative in November 2015. Without the benefit of the Development Agreement, the City runs the risk that the Developer will be able to develop the WLC Project pursuant to the approved land use, planning and zoning entitlements without being obligated to provide the City and its residents with the Public Benefits set described herein and in the Development Agreement.

Since the underlying WLC Project Entitlements are in place, adoption of the Development Agreement will be consistent with the permitted uses, density and

intensity of the subject property, maximum height and size of proposed buildings permitted on the subject property, and the goals, objectives, policies, general land uses and programs specified in the City's General Plan and the already-approved WLC Specific Plan. In summary, the adoption of the Development Agreement will assure that subject property will be developed in an orderly manner that preserves and/or enhances property values while ensuring that the Public Benefits promised to the City and its residents by the Developer remain intact and enforceable.

In light of the foregoing, the Planning Commission recommended that the City Council approve and adopt the Development Agreement to preserve the Public Benefits that the Developer will be legally obligated and bound to provide to the City and its residents as part and parcel of the development of the WLC Project.

If the City Council approves the Development Agreement, the Ordinance approving the Development Agreement will also formally repeal and set aside Ordinance No. 901 which approved the former WLC Development Agreement in 2015, which was vacated by Hon. Judge Waters in the Peremptory Writ of Mandate issued June 7, 2018. (Case No: RIC 1510967 [MF])

SUMMARY AND CONCLUSION

Since the underlying land use, planning and zoning entitlements for the WLC Project have been approved unanimously by the City Council in November 2015, and remain valid and effective, despite the numerous lawsuits challenging the WLC project, it is imperative that the City Council approve the Development Agreement along with denying the appeals of the Revised Final EIR and affirming the Planning Commission's certification of the Revised Final EIR which includes the approval and adoption of the proposed MMRP and Statement of Overriding Considerations; and deny the appeal of the Tentative Parcel Map and affirm the Planning Commission's approval of the Tentative Parcel Map for Financing and Conveyance Purposes Only.

The recommended actions are critical for ensuring that the WLC Project is developed in a manner that is consistent with the approved entitlements, consistent with the City's approved amended General Plan Policies and Land Use Maps, consistent with the approved WLC Specific Plan, and safe for the environment. The recommended actions will also ensure that the specific economic and social benefits of the WLC Project which outweigh the unavoidable significant adverse impacts described in the Revised Final EIR come to fruition, which include, but are not limited to producing: (a) 20,000 permanent jobs in the community, (b) 13,000 construction jobs, (c) \$2.5 billion of annual economic benefit to the City and region, (d) \$3 billion in construction dollars, spent locally, (e) \$22 million for public education annually, (f) \$20 million paid to the local school districts, (g) \$7 million provided by Developer for education and workforce training, and (h) \$5.7 million annually to the City's General Fund.

ALTERNATIVES

1. Conduct a public hearing on this appeal and take an action to deny the Appeal of Planning Commission's Certification of the Revised Final EIR (PEN18-0050) and affirm Planning Commission Resolution No. 2020-20, deny the Appeal of Planning Commission's approval of the Tentative Parcel Map 3647 (PEN20-00017) and affirm Planning Commission Resolution No. 2020-21, and introduce an Ordinance to adopt the Development Agreement (PEN20-0018). Staff recommends this alternative.
2. Conduct a public hearing on this appeal and take an action to approve the appeal requests (PAA20-0001, PAA20-0002, and PAA20-0003) and deny the Certification of the Revised Final EIR (PEN18-0050), deny Tentative Parcel Map 36457 (PEN20-0017), and deny Development Agreement (PEN20-0018). This action requires directing staff to return with a proper resolution to deny the Certification of the Revised Final EIR (PEN18-0050), Tentative Parcel Map 36457 (PEN20-0017), and Development Agreement (PEN20-0018). Staff does not recommend this alternative.

CITY COUNCIL GOALS

Positive Environment. Create a positive environment for the development of Moreno Valley's future.

Community Image, Neighborhood Pride and Cleanliness. Promote a sense of community pride and foster an excellent image about our City by developing and executing programs which will result in quality development, enhanced neighborhood preservation efforts, including home rehabilitation and neighborhood restoration.

CITY COUNCIL STRATEGIC PRIORITIES

1. Economic Development
2. Public Safety
3. Library
4. Infrastructure
5. Beautification, Community Engagement, and Quality of Life
6. Youth Programs

Objective 1.1: Proactively attract high-quality businesses.

Objective 1.2: Market all the opportunities for quality industrial development in Moreno Valley by promoting all high-profile industrial and business projects that set the City apart from others.

Objective 1.3: Promote local hiring through the expansion of local, quality, high paying jobs, and workforce development efforts.

Objective 1.5: Showcase Moreno Valley’s unique assets.

Objective 1.6: Establish Moreno Valley as the worldwide model in logistics development.

Objective 2.5: Develop partnerships with local businesses and warehouse operators to reduce traffic related issues.

Objective 4.5: Explore green/renewable innovations and technologies for new developments such as the World Logistics Center.

Objective 4.7: Demonstrate innovative and industry leading transportation systems.

ATTACHMENTS

1. 2020-XX Resolution Revised FEIR Appeal
2. 2020-XX Resolution TPM 36457 Appeal
3. Ordinance No. XXX WLC Development Agreement with DA
4. WLC Errata_9JUNE2020
5. Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez
6. Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez
7. Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez
8. WLC Responses to Appeal_9JUNE2020_Part 1
9. WLC Responses to Appeal_9JUNE2020_Part 2
10. Notice of Public Hearing
11. WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1
12. WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2
13. WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020
14. Planning Commission 2020-20 RFEIR Resolution May 14, 2020
15. Planning Commission 2020-21 PC Resolution Tentative Parcel Map for Financing Purposes May 14, 2020
16. Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/11/20 12:40 PM
City Attorney Approval	<u>✓ Approved</u>	6/11/20 11:38 AM
City Manager Approval	<u>✓ Approved</u>	6/11/20 1:32 PM

RESOLUTION NO. 2020-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DENYING APPEALS (PAA20-0001 AND PAA20-0002) OF THE PLANNING COMMISSION'S CERTIFICATION OF THE REVISED FINAL EIR AND AFFIRMING PLANNING COMMISSION RESOLUTION 2020-20

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and;

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively "HF") have legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit "A-1" and as illustrated in the depiction set forth in Exhibit "A-2" (the "Subject Property") of the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs Initiative," which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support uses on the land subject to the World Logistics Center Specific Plan; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the "WLC Land Benefit Initiative" to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, which was approved by the City Council on August 19, 2015, after certification of the World Logistics Center Final Programmatic Environmental Impact Report ("FEIR"); and

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

WHEREAS, the certification of the FEIR and the approval of the Tentative Parcel Map were ordered set aside by a judgment of the Riverside Superior Court in June, 2018; and

WHEREAS, a Revised Final Environmental Impact Report (“Revised Final EIR”) has been prepared for the “Project,” as collectively described and depicted in the World Logistics Center Land Use and Zoning Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, the Revised Final EIR contains the information required by CEQA Guidelines Section 15132, including without limitation the FEIR and all revisions and additions thereto; comments and recommendations received on the Revised Sections of the FEIR (“RSFEIR”) and the Draft Recirculated RSFEIR; list of persons, organizations, and public agencies commenting on the RSFEIR and the Draft Recirculated RSFEIR; and the City’s responses to significant environmental points raised in the review and consultation process on RSEIR and the Draft Recirculated RSFEIR; and

WHEREAS, the Revised Final EIR finds and concludes that all potentially significant environmental impacts from implementation of the Project have been identified in the Revised Final EIR and, with the implementation of the mitigation measures defined and set forth in the Mitigation Monitoring and Reporting Program, will be mitigated to a less-than-significant level, except for those certain impacts identified in the Revised Final EIR as being significant and unavoidable; and

WHEREAS, the Revised Final EIR finds and concludes that the Project will have certain significant environmental effects which would remain significant even after implementation of all feasible mitigation measures identified in the Revised Final EIR, including the reasonable range of alternatives identified in the Revised Final EIR, as more particularly described in the Statement of Overriding Considerations; and

WHEREAS, CEQA Guidelines Section 15093 (Statement of Overriding Considerations) provides that CEQA requires the decision-making entity to balance the economic, legal, social, technological or other benefits, including region or state-wide environmental benefits (collectively, “Project Benefits”), of a proposed project against its unavoidable environmental risks when determining whether to approve the project, and if the Project Benefits of a proposed project outweigh the unavoidable and adverse environmental effects, the adverse environmental effects may be considered “acceptable;” and

WHEREAS, when the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the records and that a Statement of Overriding Considerations be supported by substantial evidence in the record; and

WHEREAS, the Planning Commission conducted a noticed Public Hearing on May 14-15, 2020, to consider the Revised Final EIR, the proposed 2020 World Logistics Center Development Agreement and Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only; and

WHEREAS, at the conclusion of the May 14-15, 2020 Public Hearing, the Planning Commission adopted Resolution 2020-20 approving and adopting the Mitigation Monitoring and Reporting Program (MMRP) and the findings contained therein for the Revised Final EIR; approving and adopting the Statement of Overriding Considerations and the findings contained therein for the Revised Final EIR; and certifying the Revised Final EIR (PEN18-0050) for the World Logistics Center on file with the Community Development Department; and

WHEREAS, the Planning Commission found and concluded that the Revised Final EIR was completed in compliance with the California Environmental Quality Act and the CEQA Guidelines, and that the Planning Commission reviewed and considered the information in the Revised Final EIR that reflects the City’s independent judgement and analysis; and

WHEREAS, on or about May 26, 2020, Adriano L. Martinez filed an appeal on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, challenging the Planning Commission’s May 14-15 decision to certify Revised Final EIR for the World Logistics Center (PEN18-0050) on file with the Community Development Department (PAA20-0002); and

WHEREAS, on or about May 28, 2020, an appeal was filed by Angel Lopez-Ramirez also challenging he Planning Commission’s May 14-15 decision to certify the Revised Final EIR for the World Logistics Center (PEN18-0050) on file with the Community Development Department (PAA20-0001); and

WHEREAS, on June 16, 2020, the City Council conducted a noticed Public Hearing to consider the appeals filed by Mr. Lopez-Ramirez and Mr. Martinez on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society and Sierra Club.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. RECITALS AND EXHIBITS

That the foregoing Recitals and attached Exhibits are true and correct and are hereby incorporated by this reference.

Section 2. EVIDENCE AND ADMINISTRATIVE RECORD

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

That the City Council has considered all of the evidence submitted into the administrative record related to the appeal of the Planning Commission's adoption of Resolution 2020-20 certifying the Revised Final Environmental Impact Report (PEN18-0050) for the World Logistics Center on file with the Community Development Department which includes a Mitigation Monitoring and Reporting Program (MMRP) and the findings contained therein and a Statement of Overriding Considerations and the findings contained therein, including, but not limited to, the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein;
- (b) Title 9 ("Planning and Zoning") of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Draft EIR, the Revised Sections of the FEIR (FSEIR), the Draft Recirculated FSEIR and all studies, reports, public comments and responses thereto;
- (d) Final EIR and the Revised Final EIR and all studies, reports, public comments and responses thereto;
- (e) Draft Development Agreement by and between the City and Developer, its application and all documents, records and references contained therein;
- (f) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs initiative," that was unanimously approved by the City Council in November 24, 2015;
- (g) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (h) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (i) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (j) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (k) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (l) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously

approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015;

(m) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto, including without limitation, the application and reports and written statements regarding the proposed method of control of storm water, including data as to amount of runoff, and the approximate grade and dimensions of the proposed facilities, unless waived;

(n) Written waiver requests submitted by Applicant and approval of said waivers;

(o) Planning Commission Staff Report and Staff Presentation and all documents, records and references related thereto;

(p) Testimony and/or comments from Developer and its representatives during the Planning Commission Public Hearing;

(q) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the Planning Commission Public Hearing;

(r) Riverside County Superior Court's Ruling on Peremptory Writ of Mandate, filed February 8, 2018, in Paulek v. City of Moreno Valley, Case No. RIC 1510967;

(s) Riverside County Superior Court's Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018, and Peremptory Writ of Mandate dated June 12, 2018; and

(t) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5th 689;

(u) City Council Staff Report and Staff Presentation and all documents, records and references related thereto;

(v) Testimony and/or comments from Developer and its representatives during the City Council Public Hearing;

(w) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the City Council Public Hearing;

(x) The findings set forth in Planning Commission Resolution 2020-20 approving and adopting a Mitigation Monitoring Reporting Program and Statement of Overriding Considerations and Certifying the Revised Final EIR;

(y) The findings set forth in Planning Commission Resolution 2020-21 Approving Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes;

(z) The findings set forth in Planning Commission Resolution 2020-22 Recommending that the City Council Adopt the Requisite Ordinance Approving the WLC Development Agreement;

(aa) Any and all written responses, prepared by staff, the applicant and/or applicant's representatives to comments submitted to the City after the Planning Commission Public Hearing and any and all responses to comments submitted to the City prior to or at the City Council Public Hearing and after the Planning Commission Public Hearing; and

(bb) Tentative Court of Appeal Opinion, Albert Paulek, et al., v. City of Moreno Valley (May 2019), Case No. E071184.

Section 3. Final Decision on Appeal

That based on the foregoing Recitals, Administrative Record and Findings, the City Council hereby denies the appeals filed by Adriano L. Martinez filed on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club (PAA20-0002), and Angel Lopez-Ramirez (PAA20-0001) challenging the Planning Commission’s May 14-15 decision to certify the Revised Final EIR for the World Logistics Center (PEN18-0050) on file with the Community Development Department and affirms Planning Commission Resolution 2020-20 approving and adopting the Mitigation Monitoring and Reporting Program and the findings contained therein for the Revised Final EIR; and approving and adopting the Statement of Overriding Considerations and the findings contained therein for the Final Revised EIR; and certifying that the Revised Final EIR (PEN18-0050) for the World Logistics Center on file with the Community Development Department and affirms Planning Commission Resolution 2020-20.

Section 4. CEQA COMPLIANCE

That the Revised Final EIR was prepared in compliance with CEQA and the CEQA Guidelines and that the Planning Commission has complied with CEQA’s procedural and substantive requirements.

Section 5. NO NEW INFORMATION

That no new significant information as defined by CEQA Guidelines Section 15088.5, has been received by the City Council after the circulation of the RSFEIR and the Draft Recirculated RSFEIR that would require further recirculation and that all of the information added to the Revised Final EIR and/or Mitigation Monitoring and Reporting Program merely clarifies, amplifies or makes insignificant modifications to an already adequate FEIR, RSFEIR and Draft Recirculated RSFEIR pursuant to CEQA Guidelines Section 15088.5(b).

Section 6. APPROVAL AND CERTIFICATION OF REVISED FINAL ENVIRONMENTAL IMPACT REPORT

That based on substantial evidence in the Recitals, Exhibits and Evidence contained in the Administrative Record, as set forth and described hereinabove, the Mitigation Monitoring and Reporting Program and findings set forth therein, and the Statement of Overriding Considerations and findings set forth therein, supporting evidence contained therein, the City Council hereby approves and certifies the Revised Final EIR as having been completed in compliance with CEQA and the CEQA Guidelines.

Section 7. INDEPENDENT JUDGMENT AND ANALYSIS

That the Revised Final EIR reflects the independent judgment and analysis of City of Moreno Valley as Lead Agency.

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

Section 8. NOTICE OF DETERMINATION

That a Notice of Determination shall be filed and posted, as required by CEQA.

Section 9. REPEAL OF RESOLUTION NO. 2015-56

That Resolution No. 2015-56 which certified the previous Final EIR and adopted findings, the MMRP and the Statement of Overriding Considerations, is hereby repealed and set aside as ordered by Hon. Judge Waters in the Peremptory Writ of Mandate dated June 12, 2018. (Case No: RIC 1510967 [MF])

Section 10. EFFECTIVE DATE

That this Resolution shall take effect immediately upon its adoption.

Section 11. SEVERABILITY

That if any provision, section, paragraph, sentence or word of Resolution be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words as hereby adopted shall remain in full force and effect.

Section 12. CERTIFICATION.

That the City Clerk shall certify to the passage of this Resolution.

Section 13. REPEAL OF CONFLICTING PROVISIONS.

That Resolution No. 2015-56 and all provisions of any other resolution in effect prior to the effective date of this Resolution as adopted by the City Council that are in conflict with the provisions of this Resolution, are hereby repealed.

PASSED AND ADOPTED THIS 16th day of June, 2020.

APPROVED AND ADOPTED this _____ day of _____, _____.

Dr. Yxstian A. Gutierrez
Mayor
City of Moreno Valley

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

ATTEST:

Pat Jacquez-Nares, City Clerk

APPROVED AS TO FORM:

Steven B. Quintanilla, Interim City Attorney

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

EXHIBIT A
MITIGATION MONITORING AND REPORTING PROGRAM

World Logistics Center – Mitigation Monitoring and Reporting Program

Note to Reader: This MMRP lists the mitigation measures to be implemented by the Revised Final EIR. Changes to the MMRP from that adopted by the City Council in 2015 are shown in Attachment A. Changes to the MMRP from that submitted to the Planning Commission for consideration at the May 14, 2020 Planning Commission hearing are shown in Attachment B.

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1 AESTHETICS						
4.1.6.1A Each Plot Plan application for development along the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing or planned residential zoned uses) shall include a minimum 250-foot setback measured from the City/County zoning boundary line and any building or truck parking/access area within the project. The setback area shall include landscaping, berms, and walls to provide visual screening between the new development and existing residential areas upon maturity of the landscaping materials. The existing olive trees along Redlands Blvd. shall remain in place as long as practical to help screen views of the project site. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before permitting	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1B Each Plot Plan application for development adjacent to Redlands Boulevard, Bay Avenue, or Merwin Street, shall include a plot plan, landscaping plan, and visual rendering(s) illustrating the appearance of the proposed development. The renderings shall demonstrate that views of proposed buildings and trucks can be reasonably screened from view from existing residents upon maturity of planned landscaping and to ensure consistency with the General Plan Objective 7.7. "Effective" screening shall mean that no more than the upper quarter (25%) of a building is visible from existing residences, which shall be achieved through a combination of landscaping, berms, fencing, etc. The location and number of view presentations shall be at the discretion of the Planning Division.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before issuance of certificate of occupancy	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1C Prior to the issuance of a certificate of occupancy for buildings adjacent to the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing residences at the time of application) the screening required in Mitigation Measure 4.1.6.1A shall be installed in substantial conformance	City Planning Division	Once before issuance of certificate of occupancy.	Prior to issuance of certificate of occupancy.	Review and Approval of Site Plans		Withhold Certificate of Occupancy

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
with the approved plans to the satisfaction of the Planning Official.						
4.1.6.1D Prior to the issuance of permits for any development activity adjacent to Planning Area 30 (74.3 acres in the southwest portion of the Specific plan), the entirety of Planning Area 30 shall be offered to the State of California for open space purposes. In the event that the State does not accept the dedication, the property shall be offered to Western Riverside County Regional Conservation Authority or an established non-profit land conservancy for open space purposes. In the event that none of these organizations accept the dedication, the property may be dedicated to a property owner’s association or may remain in private ownership and may be fenced and access prohibited.	City Planning Division	Once before permitting of any development activity adjacent to Planning Area 30.	Prior to issuance before of any discretionary permit.	Review and Approval of Site Plans.		Withhold Discretionary Permit
4.1.6.3A Each Plot Plan application for development shall include plans and visual rendering(s) illustrating any changes in views of Mount Russell and/or the Badlands, for travelers along SR-60, as determined necessary by the Planning Official. The plans and renderings shall illustrate typical views based on proposed project plans, with the location and number of view presentations to be determined by the Planning Official. These views shall be simulated from a height of six feet from the edge of the roadway travel lane closest to the visual resource. The renderings must demonstrate that the development will preserve at least the upper two thirds (67%) of the vertical view of Mt. Russell from SR-60.	City Planning Division	Once before plot plan review	Prior to issuance of building permit.	Review and Approval of Renderings		Withhold Plot Plan Approval

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1.6.4A Each Plot Plan application for development adjacent to residential development shall include a photometric plot of all proposed exterior lighting demonstrating that the project is consistent with the requirements of Section 9.08.100 of the City Municipal Code. The lighting study shall indicate the expected increase in light levels at the property lines of adjacent residential uses. The study shall demonstrate that the proposed lighting fixtures and/or visual screening meet or exceed City standards regarding light impacts.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Lighting Study		Withhold Building Permit Approval
4.1.6.4B Each Plot Plan application for development shall include an analysis of all proposed solar panels demonstrating that glare from panels will not negatively affect adjacent residential uses or negatively affect motorists along perimeter roadways. Design details to meet these requirements shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Plot Plan		Withhold Plot Plan Approval
4.2 AGRICULTURE						
6.2.1 (Cumulative Impacts) Prior to the issuance of any grading permit affecting land designated as “Farmland of Local importance” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Farmland of Local Significance” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.	City Planning Division	Once before issuance of grading permits on lands that contain farmland of local importance	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.3 Air Quality						
<p>4.3.6.2A Construction equipment maintenance records (including the emission control tier of the equipment) shall be kept on-site during construction and shall be available for inspection by the City of Moreno Valley.</p> <p>a) Off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 off-road emissions standards. A copy of each unit’s certified tier specification shall be available for inspection by the City at the time of mobilization of each applicable unit of equipment.</p> <p>b) During all construction activities, off-road diesel-powered equipment may be in the “on” position not more than 10 hours per day.</p> <p>c) Construction equipment shall be properly maintained according to manufacturer specifications.</p> <p>d) All diesel-powered construction equipment, delivery vehicles, and delivery trucks shall be turned off when not in use. On-site idling shall be limited to three minutes in any one hour.</p> <p>e) Electrical hook ups to the power grid shall be provided for electric construction tools including saws, drills and compressors, where feasible, to reduce the need for diesel-powered electric generators. Where feasible and available, electric tools shall be used.</p> <p>f) The project shall demonstrate compliance with South Coast Air Quality Management District Rule 403 concerning fugitive dust and provide appropriate documentation to the City of Moreno Valley.</p> <p>g) All construction contractors shall be provided information on the South Coast Air Quality Management District Surplus Off-road Opt-In “SOON” funds which provides funds to accelerate cleanup of off-road diesel vehicles.</p> <p>h) Construction on-road haul trucks shall be model year 2010 or newer if diesel-fueled.</p> <p>i) Information on ridesharing programs shall be made available to construction employees.</p>	Land Development Division and Building and Safety Division	As needed during construction	During construction	On-site Inspection of construction maintenance records and data sheets.		Issuance of Stop Work Order

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
j) During construction, lunch options shall be provided onsite. k) A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints per AQMD Standards. l) Off-site construction shall be limited to the hours between 6 a.m. to 8 p.m. on weekdays only. Construction during City holidays shall not be permitted.						
4.3.6.2B Prior to issuance of any grading permits, a traffic control plan shall be submitted to and approved by the City of Moreno Valley that describes in detail the location of equipment staging areas, stockpiling/storage areas, construction parking areas, safe detours around the project construction site, as well as provide temporary traffic control (e.g., flag person) during construction-related truck hauling activities. Construction trucks shall be rerouted away from sensitive receptor areas. Trucks shall use State Route 60 using World Logistics Center Parkway (formerly Theodore Street), Redlands Boulevard (north of Eucalyptus Avenue), and Gilman Springs Road. In addition to its traffic safety purpose, the Construction Staging Plan can minimize traffic congestion and delays that increase idling emissions. A copy of the approved Traffic Control Plan shall be retained on site in the construction trailer.	Transportation Division	Once prior to issuance of grading permits	Prior to issuance of any grading permits	Review and Approval of Traffic Control Plan.		Withhold Grading Permit
4.3.6.2C The following measures shall be applied during construction of the project to reduce volatile organic compounds (VOC): a) Non-VOC containing paints, sealants, adhesives, solvents, asphalt primer, and architectural coatings (where used), or pre-fabricated architectural panels shall be used in the construction of the project to the maximum extent practicable. If such products are not commercially available, products with a VOC content of 100 grams per Liter or lower for both interior and exterior surfaces shall be used. b) Leftover paint shall be taken to a designated hazardous waste center. c) Paint containers shall be closed when not in use. d) Low VOC cleaning solvents shall be used to clean paint application equipment.	Land Development, Building and Safety Division and Planning Division	Throughout construction	During Construction	On-site inspection		Issuance of a Stop Work Order

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
e) Paint and solvent-laden rags shall be kept in sealed containers.						
4.3.6.2D No grading shall occur on days with an Air Quality Index forecast greater than 150 for particulates or ozone as forecasted for the project area (Source Receptor Area 24).	City Land Development Division/Public Works	As needed during construction	During construction	Review of Construction Documentation and On-site Inspection		Issuance of a Stop Work Order
4.3.6.2E The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.3A Prior to issuance of occupancy permits for each warehouse building within the WLCSP, the developer shall demonstrate to the City that vehicles can access the building using paved roads and parking lots and that access on unpaved roads is prohibited.	City Planning Division	Once Before issuing Certificate of Occupancy	Prior to issuance or occupancy permits for each warehouse	Review and Approval of building plans.		Withhold Occupancy Permit
4.3.6.3B The following shall be implemented as indicated: Prior to Issuance of a Certificate of Occupancy a) Signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations and the prohibition of parking in residential areas. b) Signs shall be prominently displayed in all dock and delivery areas advising of the following: engines shall be turned off when not in use; trucks shall not idle for more than three consecutive minutes; telephone numbers of the building facilities manager and the California Air Resources Board to report air quality violations. c) Signs shall be installed at each exit driveway providing directional information to the City’s truck route. Text on the sign shall read “To Truck Route” with a directional arrow. Truck routes shall be clearly marked per the City Municipal Code. On an Ongoing Basis d) Tenants shall maintain records on fleet equipment and	City Planning Division and Building and Safety Public Works Inspector	Once before issuance of any certificate of Occupancy and ongoing basis On an ongoing basis	Prior to issuance of Certificate of Occupancy During on-site inspections	On-site inspections Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals, On-site Inspections Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-		Withhold Certificate of Occupancy Pursuant to City Municipal Code

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>vehicle engine maintenance to ensure that equipment and vehicles are maintained pursuant to manufacturer’s specifications. The records shall be maintained on site and be made available for inspection by the City.</p> <p>e) Tenant’s staff in charge of keeping vehicle records shall be trained/certified in diesel technologies, by attending California Air Resources Board approved courses (such as the free, one-day Course #512). Documentation of said training shall be maintained on-site and be available for inspection by the City.</p> <p>f) Tenants shall be encouraged to become a SmartWay Partner.</p> <p>g) Tenants shall be encouraged to utilize SmartWay 1.0 or greater carriers.</p> <p>h) Tenants’ fleets shall be in compliance with all current air quality regulations for on-road trucks including but not limited to California Air Resources Board’s Heavy-Duty Greenhouse Gas Regulation and Truck and Bus Regulation.</p> <p>i) Information shall be posted in a prominent location available to truck drivers regarding alternative fueling technologies and the availability of such fuels in the immediate area of the World Logistics Center.</p> <p>j) Tenants shall be encouraged to apply for incentive funding (such as the Voucher Incentive Program [VIP], Carl Moyer, etc.) to upgrade their fleet.</p> <p>k) All yard trucks (yard dogs/yard goats/yard jockeys/yard hostlers), landscaping equipment, and industrial sweepers shall be powered by electricity, natural gas, propane, or an equivalent non-diesel fuel. Any off-road engines in the yard trucks and landscaping equipment shall have emissions standards equal to Tier 4 Interim or greater. Any on-road engines in the yard trucks shall have emissions standards that meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025.</p> <p>l) All diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025</p>				specific approvals		

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time.</p> <p>m) All standby emergency generators shall be fueled by natural gas, propane, or any non-diesel fuel.</p> <p>n) Truck and vehicle idling shall be limited to three (3) minutes.</p> <p>o) For each building, the developer shall provide ten electrical outlets for the use of electric auxiliary power units (APUs) to be located at the dock doors near the shipping offices, or an alternate location with access to electrical outlets.</p> <p>p) All industrial sweepers shall be equipped with High-efficiency particulate air (HEPA) filters.</p>						
<p>4.3.6.3C Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a publicly-accessible fueling station shall be operational within the Specific Plan area offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public. Any fueling station shall be placed a minimum of 1000 feet from any off-site sensitive receptors or offsite zoned sensitive uses. This facility may be established in connection with the convenience store required in Mitigation Measure 4.3.6.3D.</p>	City Building and Safety	Once before issuance of building permits	Prior to issuance of building permits for more than 25 million total square feet of logistics warehousing within the WLC Specific Plan	Review and approval of building plans		Withhold building permit
<p>4.3.6.3D Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a site shall be operational within the Specific Plan area offering food and convenience items for purchase by the motoring public. This facility may be established in connection with the fueling station required in Mitigation Measure 4.3.6.3C.</p>	City Building and Safety	Before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold building permit
<p>4.3.6.3E Refrigerated warehouse space is prohibited unless it can be demonstrated that the environmental impacts resulting from the inclusion of refrigerated space and its associated facilities, including, but not limited to, refrigeration units in vehicles serving the logistics warehouse, do not exceed any environmental impact for the entire World Logistics Center identified in the program Environmental Impact Report. Such environmental analysis shall</p>	City Planning Division	Once before plot plan review for any building.	Prior to issuance of any building permit	Review and approval of building plans		Withhold building permit

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
be provided with any warehouse plot plan proposing refrigerated space. Any such proposal shall include electrical hookups at dock doors to provide power for vehicles equipped with Transportation Refrigeration Units (TRUs).						
4.3.6.3F The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.4A The following measures shall be incorporated as conditions to any Plot Plan approval within the Specific Plan: a) All tenants shall be required to participate in Riverside County’s Rideshare Program. b) Storage lockers shall be provided in each building for a minimum of three percent of the full-time equivalent employees based on a ratio of 0.50 employees per 1,000 square feet of building area. Lockers shall be located in proximity to required bicycle storage facilities. c) Class II bike lanes shall be incorporated into the design for all project streets. d) The project shall incorporate pedestrian pathways between on-site uses. e) Site design and building placement shall provide pedestrian connections between internal and external facilities. f) The project shall provide pedestrian connections to residential uses within 0.25 mile from the project site. g) A minimum of two electric vehicle-charging stations for automobiles or light-duty trucks shall be provided at each building. In addition, parking facilities with 200 parking spaces or more shall be designed and constructed so that at least six percent of the total parking spaces are capable of supporting future electric vehicle supply equipment (EVSE) charging locations. Sizing of conduit and service capacity at the time of construction shall be sufficient to install Level 2 Electric Vehicle Supply Equipment (EVSE) or greater.	City Building and Safety, City Planning Division, and Transportation Engineering Division/Public Works	Once before plot plan approval for any building.	Prior to plot plan approval	Review and approval of plot plans		Withhold plot plan approval

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<p>h) Each building shall provide indoor and/or outdoor - bicycle storage space consistent with the City Municipal Code and the California Green Building Standards Code. Each building shall provide a minimum of two shower and changing facilities for employees.</p> <p>i) Each building shall provide preferred and designated parking for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles equivalent to the number identified in California Green Building Standards Code Section 5.106.5.2 or the Moreno Valley Municipal Code whichever requires the higher number of carpool/vanpool stalls.</p> <p>j) The following information shall be provided to tenants: onsite electric vehicle charging locations and instructions, bicycle parking, shower facilities, transit availability and the schedules, telecommunicating benefits, alternative work schedule benefits, and energy efficiency.</p>						
<p>4.3.6.5A</p> <p>(a) The house at 30220 Dracaea Avenue shall be demolished prior to the issuance of the first grading permit for grading within the World Logistics Center.</p> <p>(b) An air filtration system meeting ASHRSE Standard 52.2 MERV-13 standards shall be offered to the owners of the houses located at 13100 World Logistics Center Parkway (formerly Theodore Street) and 12400 World Logistics Center Parkway (formerly Theodore Street). The developer shall offer to install the air filtration system to the owners of the two properties within two months of the certification of the Final Revised FEIR. Prior to the issuance of the first grading permit within the World Logistics Center, documentation shall be provided to the City confirming that an offer to install the air filtration system has been extended to the owners of each of the two properties. The owners of the two properties shall be under no obligation to accept the offer. Each property owner shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, the</p>	<p>City Building and Safety, City Planning Division</p> <p>City Building and Safety, City Planning Division</p>	<p>Once prior to issuance of first grading permit within the WLC.</p> <p>Prior to issuance of the first grading permit within the WLC.</p>	<p>Prior to issuance of the first grading permit.</p> <p>Initial offer within two months of certifying the Final RSFEIR.</p> <p>Documentation provided prior to issuance of the first grading permit.</p>	<p>Site inspection.</p> <p>Review of documentation.</p>		<p>Withhold grading permits.</p>

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developer shall work with each owner to ensure the air filtration system is properly installed within one year of acceptance.						
4.4 BIOLOGICAL RESOURCES						
4.4.5.2A (Previously included as 4.4.6.2A in the 2015 FEIR) Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter’s goldfields, smooth tarplant, Plummer’s mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review. They may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant’s discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once upon submittal of plot plan application	Prior to approval of Plot Plan	Review and Approval of biological assessment		Withhold Approval of Plot Plan
4.4.5.2B (Previously included as 4.4.6.2B in the 2015 FEIR) Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County Regional Conservation Authority (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the satisfaction of the City Planning Division and Riverside County Regional Conservation Authority (“RCA”).	City Planning Division, Riverside County RCA	Once upon submittal of tentative maps.	Prior to issuance of any tentative maps including or adjacent to MHSCP criteria cells.	Review JPR		Withhold approval of tentative maps
4.4.6.1A All Plot Plan applications within Planning Areas 10 and 12 (i.e., adjacent to the San Jacinto Wildlife Area as shown in Final EIR Volume 2 Figure 4.1.6B) shall provide a 250-foot setback from the southerly property line. Permitted uses within this setback area include landscaping, drainage and water quality facilities,	City Planning Division	Once before plot plan approval	Prior to plot plan approval	Plan check and review of setback area		Withhold Plot Plan approval.

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<p>fences and walls, utilities and utility structures, maintenance access drives, and similar related uses. No logistics buildings or truck access/parking/maneuvering facilities are permitted in this setback area.</p> <p>In addition, logistics buildings within Planning Areas 10 and 12 may not be located within 400 feet of the southerly property line. All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area. This fence/barrier shall have metal mesh installed below and above ground level to prevent animals from moving between the development area and the setback area.</p> <p>Within Planning Areas 10 and 12, all truck activity areas adjacent to the 250-foot setback area along the southern property line shall be enclosed by minimum 11-foot tall solid walls to reduce noise and lighting impacts on the adjacent property. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>A preliminary landscape plan for the 250-foot setback area shall be submitted with all Plot Plan applications for lots adjacent to the SJWA property. Precise landscape plans shall be submitted with any grading permit for said lots and must be approved prior to the issuance of any building permit on said lots. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the World Logistics Center Specific Plan. No plant species listed in Section 6.1.4 of the Western Riverside County Multiple Species Habitat Conservation Plan shall be installed within the setback area. Cottonwood trees shall be planted within the setback area consistent with the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division Manager.</p>	City Planning Division	Once before issuance of building permits and as needed during construction and operating	Prior to issuance of building permits	Plot plan/grading plan review.		Withhold grading permit and plot plan approval.
	City Land Development Division Manager	Once before issuance of grading permits for Plot Plans adjacent to the SJWA property.	Prior to issuance of grading permits.	Plot plan/grading plan review.		Withhold grading permit and plot plan approval.
	City Land Development Division Manager		Prior to issuance of grading permits.	Plot plan/grading plan review.		

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<p>4.4.6.1B Each Plot Plan application in Planning Areas 10 and 12 shall provide runoff management and water quality facilities adequate to minimize downstream erosion, maintain water quality standards and retain pre-development flows in a manner meeting the approval of the Moreno Valley and RWQCB requirements. All drainage improvements shall be designed to minimize runoff and erosional impacts on adjacent property. This measure shall be implemented to the satisfaction of the Land Development Division Manager of Public Works.</p>	<p>City Engineering Division and City Land Development Division Manager</p>	<p>Once upon submittal of plot plan application</p>	<p>Prior to approval of plot plan</p>	<p>Review and approval of plot plans within Planning Areas 10 and 12</p>		<p>Withhold approval of plot plan</p>
<p>4.4.6.2A (Previously included as 4.4.6.3A in the 2015 FEIR) Prior to the issuance of grading permits the applicant shall secure a jurisdictional determination from the United States Army Corps of Engineers (USACE) and confirm with the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) if drainage features mapped on the property to be developed are subject to jurisdictional authority. If the features are subject to regulatory protection, the applicant shall secure permit approvals with the appropriate agencies prior to initiation of construction. Compensatory riparian habitat mitigation shall be provided at a minimum ratio of 1: 1 (replacement riparian habitat to impacted riparian habitat) to ensure no net loss of riparian habitat or aquatic resources. It should be noted that this is a minimum recommended ratio but the actual permitting ratio may be higher. These detention basins shall be oversized to accommodate the provision of areas of riparian habitat. Maintenance of the basins shall be limited to that necessary to ensure their drainage and water quality functions while encouraging habitat growth. Riparian habitat mitigation shall be provided concurrent to or prior to impacts. A Compensatory Mitigation Plan shall be prepared for all unavoidable impacts and shall be consistent with the United States Army Corps of Engineers (USACE) / United States Environmental Protection Agency's Compensatory Mitigation for Losses of Aquatic Resources: Final Rule and the United States Army Corps of Engineers Standard Operating Procedure for Determination of Mitigation Ratios.</p> <p>The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife, and</p>	<p>City Planning Division and Land Development Division Manager</p>	<p>Once prior to issuance of grading permits</p>	<p>Prior to the issuance of grading permits</p>	<p>Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.</p>		<p>Withhold grading permit</p>

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<p>Regional Water Quality Control Board to establish the need for permits based on the results of a recent jurisdictional delineation and final design plans for each of the proposed facilities. Consultation with the three agencies shall take place and appropriate permits obtained for project-level development. Compensation for losses associated with the altering of drainages on site shall be in agreement with the permit conditions and in coordination with compensation outlined below.</p> <p>Mitigation shall consist of onsite creation, offsite creation, or purchase of mitigation credits from an approved mitigation bank. As outlined in the WLC programmatic DBESP report, onsite riparian habitat shall be created at a minimum 1: 1 ratio due to the poor quality of onsite habitat. New habitat shall be created within the onsite detention/infiltration basins to the extent allowed by the resource agencies to reduce storm flows, improve water quality, and reduce sediment transport. Habitat creation shall include the installation of mule fat scrub or similar riparian scrub habitat to promote higher quality riparian habitat, but still maintain the basins for their primary role as detention facilities. The use of these areas as conservation areas would require consent from CDFW and the City of Moreno Valley (MM BIO-2b and MM DBESP 1 through 3).</p>						
<p>4.4.6.2B (Previously included as 4.4.6.3B in the 2015 FEIR) As required by the Regional Conservation Authority (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the Regional Conservation Authority prior to project grading permit approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.</p> <p>If impacts to riparian habitat within the WLC site cannot be avoided at the time of specific development, then a separate project level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-</p>	City Planning Division	Once upon submittal of grading permit	Prior to the approval of any grading permit	Review and approval of site-specific DBESP and review and approval of plot plans.		Withhold grading permit approval.

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<p>specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.2A.</p> <p>A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations. Mitigation required for compensation for impacts to riparian/riverine areas shall require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.</p> <p>As outlined in the WLC programmatic DBESP, erosion control improvements shall be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat shall be enhanced within this drain following the installation of the erosion control improvements (MM DBESP 4 and 5).</p>						
<p>4.4.6.2C (Previously included as 4.4.6.3C in the 2015 FEIR) Prior to issuance of any grading permit for any offsite improvements that support development within the WLC site, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City. The Applicant shall consult with the Regional Water Quality Control Board (RWQCB) and California</p>	City Planning Division	Once before issuance of grading permit	Prior to issuance of grading permit	Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.		Withhold Grading Permit

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Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) and United States Army Corps of Engineers to establish the need for permits based on the results of the current stream mapping and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions, with a minimum 1:1 mitigation ratio. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the Regional Water Quality Control Board, U.S. Army Corps. of Engineers, and the California Department of Fish and Wildlife.						
<p>4.4.6.3A (Previously included as 4.4.6.4A in the 2015 FEIR) Pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC), site preparation activities (removal of trees and vegetation) shall be avoided during the nesting season of potentially occurring native and migratory bird species (generally February 1 to August 31). If site preparation activities must occur during the nesting season, a pre-activity field survey shall be conducted by a qualified biologist prior to issuance of grading permits for such development. The survey shall determine if active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code are present in the construction zone. If active nests of these species are found, the applicant shall establish an appropriate buffer zone with no grading or heavy equipment activity within of 500 feet from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed) 250 feet from passerine birds, or 100 feet for sensitive or protected songbird nests. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the setback area at the discretion of the biological monitor in consultation with CDFW. In</p>	City Planning Division	Once before issuance of grading permit	One week prior to issuance of grading permit	<p>If grading activities will take place within nesting season provide written evidence a qualified biologist has been retained by the applicant to conduct an onsite nesting survey prior to grading.</p> <p>If nesting birds are present, biologist will establish a construction buffer zone of a minimum from an active listed species or raptor nest, 300 feet from other sensitive or</p>		Withhold Grading Permit
	City Planning Division	Onsite Inspection	One week prior to issuance of grading permit			Issuance of a stop Work Order

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the event no special status avian species are identified within the limits of disturbance, no further mitigation is required. In the event such species are identified within the limits of ground disturbance, mitigation measure 4.4.6.3B shall also apply. This measure shall be implemented to the satisfaction of the City Planning Division.				protected bird bests (non-listed), or 100 feet for sensitive or protected songbird nests		
4.4.6.3B (Previously included as 4.4.6.4B in the 2015 FEIR) If it is determined that project-related grading or construction will affect nesting migratory bird species, no grading or heavy equipment activity shall take place within the limits established in Mitigation Measure 4.4.6.3A until it has been determined by a qualified biologist that the nest/burrow is no longer active, and all juveniles have fledged the nest/burrow. This measure shall be implemented to the satisfaction of the City Planning Division.	City Planning Division	Once Before Construction and onsite inspection	Prior to disturbance of site	Onsite inspection		Issuance of a Stop Work Order
4.4.6.3C (Previously included as 4.4.6.4C in the 2015 FEIR) The loss of foraging habitat for golden eagle and white-tailed kite will be mitigated by payment of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) fee and the creation of a landscaped setback area adjacent to the SJWA property. First, the payment of the Western Riverside County Multiple Species Habitat Conservation Plan fee shall be required on a project-by-project basis. Second, a 250-foot setback as described in Mitigation Measure 4.4.6.1A shall be established within the WLC site. This area will reduce impacts to raptor species foraging in the adjacent San Jacinto Wildlife Area open space areas.	City Planning Division	Once before issuance of grading permits	Prior to disturbance of site	Written verification of payment of MSHCP fees		Withhold Grading Permit
4.4.6.3D (Previously included as 4.4.6.4D in the 2015 FEIR) A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the WLC site. In the event no burrowing owls are observed within the limits of ground disturbance. no further mitigation is required. If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a	City Planning Division City Planning Division	Once 30-days prior to construction/grading Once 30-days prior to construction/grading	Prior to issuance of any grading permits Prior to issuance of any grading permits and during construction	Review of pre-construction survey for burrowing owls If construction takes place between Feb 1 – Aug 31 and nesting burrowing owl is present, a		Withhold Grading Permits Issuance of a Stop Work Order

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<p>500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged to the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.</p> <p>If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but Owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the Western Riverside County Regional Conservation Authority (RCA). A relocation plan will be required by CDFW, the USFWS, and the RCA if active and/or passive relocation is necessary. The relocation plan shall outline the basic process and provide options for avoidance and mitigation, identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.</p> <p>A relocation plan will be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated following consultation with the CDFW, the USFWS, and the RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include the SJWA, the 250-</p>	City Planning Division	Onsite inspection once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	<p>500 ft. construction buffer shall be maintained from the nest until all juveniles have fledged.</p> <p>If construction takes place between Sept 1- Jan 31 and burrowing owl outside the nesting season present, a passive relocation plan shall be prepared by a qualified biologist and approved by the City.</p>		Issuance of a Stop Work Order
	City Planning Division	Onsite inspection once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	Written verification a relocation plan has approved by the California Department of Fish and Wildfire.		Issuance of a Stop Work Order

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foot setback area or other suitable onsite or off-site areas). Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor, following consultation with CDFW, the USFWS, and RCA.						
4.4.6.3E (Previously included as 4.4.6.4E in the 2015 FEIR) Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to CDFW and the USFWS for review prior to submission to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the WLC site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas). All costs associated with the relocation, as well as short- and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division following coordination with CDFW and the USFWS.	City Planning Division	Once prior to plot plan approval for development of land including or adjacent to Drainage 9	Prior to plot plan approval	Submittal of a LAPM protocol survey report to the City.		Withhold Plot Plan Approval
4.4.6.3F (Previously included as 4.4.6.4F in the 2015 FEIR) Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan shall identify frequent and infrequent vegetation management requirements (i.e., removal	City Planning Official	Once before approval of any discretionary permits within Planning Areas 10 & 12	Prior to approval of any discretionary permits within planning Areas 10 & 12	Review and approval of a BRMP		Withhold Discretionary Permit

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<p>of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological Resource Management Plan shall also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.5.2A, 4.4.6.3D, and 4.4.6.3E.</p> <p>The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with California Department of Fish and Wildlife. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist to the satisfaction of the City Planning Division.</p>		Onsite inspection				
<p>4.4.6.3G (Previously included as 4.4.6.4G in the 2015 FEIR) Mitigation Measure 4.4.6.1A specifies that a landscape plan shall be submitted with any development proposal for lots adjacent to the San Jacinto Wildlife Area (SJWA) property prior to issuance of a precise grading permit. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the Specific Plan. No plant species listed in Section 6.1.4 or Table 6.2 of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) shall be installed within the setback area. In conjunction with development adjacent to the San Jacinto Wildlife Area (SJWA), cottonwood trees shall be planted within the 250-foot setback area, consistent with the World Logistics Center Specific Plan plant palette (per DBESP MM 8).</p> <p>During construction, the runoff leaving construction areas shall be directed to onsite detention basins and away from downstream drainage features located offsite. All projects within the WLC site shall be required to prepare a Storm Water Pollution Prevention Plan (as outlined in MM 4.9.6.2B). Regarding the 250-foot setback area, pedestrian and vehicular access to areas of riparian/riverine habitat shall be prohibited except for controlled maintenance access. Finally, no grading shall be permitted within conserved riparian/riverine habitat areas except for grading</p>	City Planning Division and Land Development Division Manager	Once before to issuance of a precise grading permit	Prior to issuance of a precise grading permit	Review and approval of landscape.		Withhold Grading Permit

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necessary to establish or enhance habitat areas (DBESP MM 6, 7, 9, and 10)						
4.4.6.3H (Previously included as 4.4.6.4H in the 2015 FEIR) As outlined in Mitigation Measure 4.4.6.1A, development adjacent to the 250-foot open space setback shall have a six-foot chain link fence or similar barrier to help separate human activity and the setback area. Any chain link fencing installed on any properties adjacent to the 250-foot setback area shall have metal mesh installed below and above ground level to prevent animals from accessing new development areas.	City Planning Division	Once before building permits	Prior to issuance of certificate of occupancy	Review and approval of fencing		Withhold plot plan approval Withhold grading permits
4.4.6.3I (Previously included as 4.4.6.4I in the 2015 FEIR) The individual property owner and/or Property Owners Association (POA) as appropriate shall be responsible for maintaining the various onsite landscaped areas, open improved or natural drainage channels, and detention or flood control basins in a manner that provide for fuel management and vector control pursuant to standards maintained by the City Fire Marshall and County Department of Environmental Health – Vector Control Group. This measure requires the individual owner or Property Owners Association (POA) to manage vegetation in and around these areas or improvements so as to not represent a fire hazard as defined by the City Fire Department through the substantial buildup of combustible materials. This measure also requires the individual owner or Property Owners Association to manage vegetation and standing water in drainage channels and basins such that they do not encourage or allow vectors to occur (primarily rats and mosquitoes). Runoff shall not be allowed to stand in channels or basins for more than 72hours without treatment or maintenance to prevent establishment of mosquitoes per published County vector control guidelines and “Best Management Practices for Mosquito Control on California State Properties” which is available from the California West Nile Virus website at http://www.westnile.ca.gov/resources . This measure shall be implemented by the Project Owners Association in consultation with City Fire Department and Riverside County Department of Environmental Health – Vector Control Group	City Fire Department; Land Development Division; and Stormwater Management Section of Public Works	As needed basis	Onsite Inspections during operations	Onsite Inspections		Issuance of Code Enforcement Citations

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>4.4.6.3J (Previously included as 4.4.6.4J in the 2015 FEIR) A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas and/or San Jacinto Wildlife Area (SJWA) lands. The Fuel Management Plan shall be prepared by the project applicant and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan and/or SJWA boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:</p> <ul style="list-style-type: none"> • A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area. • A list of non-native invasive plants that are prohibit from installation. • Maintenance activities and a maintenance schedule. <p>Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas and SJWA lands are adequately protected from expected fire risks.</p>	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan approval and Onsite Inspection		Withhold plot plan approval
<p>4.4.6.3K (Previously included as 4.4.6.4K in the 2015 FEIR) Prior to approval of any plot plans for development adjacent to the SJWA, the applicant shall demonstrate that direct light rays have been contained within the development area, per requirements of the MSHCP Section 6.0 which states, "Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting." This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan and Onsite Inspection		Withhold Plot Plan Approval

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4.5 CULTURAL RESOURCES						
<p>4.5.6.1A Prior to the approval of any grading permit for any of the "Light Logistics" parcels, the parcels shall be evaluated for significance by a qualified archaeologist. A Phase 1 Cultural Resources Assessment shall be conducted by the project archaeologist and an appropriate tribal representative(s) on each of the "Light Logistics" parcel to determine if significant archaeological or historical resources are present.</p> <p>A Phase 2 significance evaluation shall be completed for any of these sites in order to determine if they contain significant archaeological or historical resources. Cultural resources include but are not limited to stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. All resources determined to be prehistoric or historic shall be documented using DPR523 forms for archival research/storage in the Eastern Information Center (EIC). If the particular resource is determined to be not significant, no further documentation is required. If prehistoric resources are determined to be significant, they shall be considered for relocation or archival documentation. If any resource is determined to be significant, a Phase 3 recovery study shall be conducted to recover remaining significant cultural artifacts. If prehistoric archaeological/cultural resources are discovered during the Phase 1 survey and it is determined that they cannot be avoided through site design, they shall be subject to a Phase 2 testing program. The project archaeologist in consultation with appropriate tribal group(s) shall determine the significance of the resource(s) and determine the most appropriate disposition of the resource(s) in accordance with applicable laws, regulations and professional practices (per Cultural Report MM CR-1, MM CR-2, MM CR-7 Table 3, pg. 74).</p>	<p>Planning Division and Land Development Division/Public Works</p>	<p>Once Before Permitting</p>	<p>Prior to the approval of any grading permit for any of the "Light Logistics"</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p>		<p>Withhold grading permit approval</p> <p>Issue stop work order if cultural resources are found</p>

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<p>4.5.6.1B Prior to the issuance of any grading or ground-disturbing permit for construction of off-site improvements a qualified archaeologist shall be retained to prepare a Phase I cultural resource assessment (CRA) of the project site if an up to date Phase I cultural resource assessment is not available for the site at the time of development per Cultural Report MM CR-5, Table 3, pg. 74).</p> <p>Appropriate tribal representatives as identified by the City shall be invited by the Project Archeologist to participate in this assessment.</p> <p>If archaeological resources are discovered during construction activities, no further excavation or disturbance of the area where the resources were found shall occur until a qualified archaeologist evaluates the find. If the find is determined to be a unique archaeological resource, appropriate action shall be taken to (a) plan construction to avoid the archeological sites (the preferred alternative); (b) cap or cover archeological sites with a layer of soil before building on the affected project location; or (c) excavate the site to adequately recover the scientifically consequential information from and about the resource. At the discretion of the project archaeologist, work may continue on other parts of the project site while the unique archaeological resource mitigation takes place. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>If the project archaeologist, in consultation with the monitoring Tribe(s), determines that the find is a unique archaeological resource, the resource site shall be evaluated and recorded in accordance with requirements of the State Office of Historic Preservation (OHP). If the resource is determined to be significant, data shall be collected by the qualified archaeologist and the findings of the report shall be submitted to the City. If the find is determined to be not significant no mitigation is necessary.</p> <p>Should a future project-level analysis show that cultural resource site CA-RIV-3346 will be directly or partially impacted by project-level construction, an Addendum cultural resource report must be prepared and include an analysis of the alternatives associated with mitigation for impacts to this resource following CEQA Guidelines Section 15126.4(b)(3). This information must be</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits for off-site improvements and as Needed During Construction</p>	<p>Prior to the approval of any grading or ground-disturbing permit</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p> <p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit or Issuance of Stop Work Order</p>
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<p>included in any project-level CEQA compliance documentation. It should be noted that Phase 3 data recovery is an acceptable mitigation action under CEQA Guidelines Section 15126.4(b)(3)(C) (per Cultural Report MM CR-3, Table 3, pg. 74). Should it be determined through a future project-level EIR analysis that prehistoric cultural resource sites CA-RIV-2993 and/or CA-RIV-3347 shall be directly impacted by future construction, these sites must be Phase 2 tested for significance (per Cultural Report MM CR-4, Table 3, pg. 74).</p>						
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<p>4.5.6.1C Prior to the issuance of any grading permits a qualified archaeologist shall be retained to monitor all grading and shall invite tribal groups to participate in the monitoring. Project-related archaeological monitoring shall include the following requirements per Cultural Report MM CR-6, MM CR-8, Table 3, pg.74):</p> <ol style="list-style-type: none"> 1. All earthmoving shall be monitored to a depth of ten (10) feet below grade by the Project Archaeologist or his/her designated representative. Once all areas of the development project that have been cut to ten (10) feet below existing grade have been inspected by the monitor. the Project Archaeologist may, at his or her discretion, terminate monitoring if and only if no buried cultural resources have been detected; 2. If buried cultural resources are detected, monitoring shall continue until 100 percent of virgin earth within the specific project area has been disturbed and inspected by the Project Archaeologist or his/her designated representative. 3. Grading shall cease in the area of a cultural artifact or potential cultural artifact as delineated by the Project Archaeologist or his/her designated representative. A buffer of at a minimum 25 feet around the cultural item shall be established to allow for assessment of the resource. Grading may continue in other areas of the site while the particular find are investigated; and 4. If prehistoric cultural resources are uncovered during grading, they shall be Phase 2 tested by the Project Archaeologist, and evaluated for significance in accordance with §15064.5(f) of the CEQA Guidelines. Appropriate actions for significant resources as determined by the Phase 2 testing include but are not limited to avoidance or capping, incorporation of the site in green space. parks, or delineation into open space. If such measures are not feasible, Phase 3 data recovery of the significant resource will be required, and curation of recovered artifacts and/or reburial, shall be required. A report associated 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of grading permits</p>	<p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>	<p>Withhold Grading Permit</p>
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<p>with Phase 2 testing or Phase 3 data recovery must be delivered to the City and, if necessary, the museum where any recovered artifacts have been curated.</p> <p>5. No further grading shall occur in the area of the discovery until the City approves specific actions to protect identified resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p> <p>6. The developer shall make reasonable efforts to avoid, minimize, or mitigate significant adverse impacts on cultural resources. The State Historic Preservation Office (SHPO) and local Native American tribes will be consulted and the Advisory Council on Historic Preservation will be notified within 48 hours of the find in compliance with 36 CFR 800.13(b)(3). This measure shall be implemented to the satisfaction of the Planning Official.</p>						
<p>4.5.6.1D Prior to the issuance of any grading permit the project archaeologist shall invite interested Tribal Group(s) representatives to monitor grading activities. Qualified representatives of the Tribal Group(s) shall be granted access to the project site to monitor grading as long as they provide 48-hour notice to the developer of their desire to monitor, so the developer can make appropriate safety arrangements on the site. This measure shall be implemented to the satisfaction of the Planning Official.</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of any grading permit within 3,750 feet of the southwest corner</p>	<p>Evidence of invitation to Tribal Group Representatives</p>		<p>Withhold Grading Permit</p>
<p>4.5.6.1E It is possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources (archaeological or historical). In the event that buried cultural resources are discovered during grading and no Project Archaeologist or Historian is present, grading operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be retained to determine the most appropriate course of action regarding the resource. The Archeologist shall make recommendations to the City on the actions that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and</p>	<p>Grading Contractor, Land Development Division/Public Works, and Planning Division</p>	<p>As Needed During Construction</p>	<p>During Grading and/or ground disturbing activities</p>	<p>Verification to the City a qualified archaeologist been retained</p>		<p>Issuance a Stop Work Order</p>

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<p>evaluation of the finds in accordance with §15064.5 of the <i>CEQA Guidelines</i>. Cultural resources could consist of, but are not limited to, stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria. If the resources are determined to be unique historic resources as defined under §15064.5 of the <i>CEQA Guidelines</i>, appropriate protective actions for significant resources such as avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds shall be implemented by the project archaeologist and the City.</p> <p>No further grading shall occur in the area of the discovery until the City and Project Archaeologist approve the measures to address these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p>						
<p>4.5.6.2A If any historic resources are found during implementation of Mitigation Measure 4.5.6.1A, the Project Archaeologist or Historian (as appropriate) shall offer any artifacts or resources to the Moreno Valley Historical Society (MVHS) or the Eastern Information Center/County Museum or the Western Science Center in Hemet as appropriate for archival storage. From the time any artifacts are turned over to the Moreno Valley Historical Society or other appropriate historical group, the developer shall have no further responsibility for their management or maintenance.</p>	<p>City Planning Division</p>	<p>As Needed During Construction</p>	<p>During grading</p>	<p>A qualified archaeologist or historian(s) shall be retained by the applicant. A report of findings shall be submitted to the City after the finalization of construction</p>		<p>Issuance of a Stop Work Order</p>
<p>4.5.6.2B As part of construction of the trail segment connecting Redlands Boulevard to the California Department of Fish and Wildlife property, the developer shall contribute \$5,000 to the City for the installation of a historical marker acknowledging the passing of Juan Bautista de Anza through this area during his exploration of California. This measure shall be incorporated into trail plans for this segment which will be subject to review and approval by the City Park and Recreation Department in consultation with the Moreno Valley Historical Society.</p>	<p>City Park and Recreation Department</p>	<p>Once</p>	<p>Prior to approval of trail plans</p>	<p>Review and Approval of Trail Plans Written verification the \$5,000 has been paid</p>		<p>Withhold Approval of Trail Plans</p>

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<p>4.5.6.2C Streets C and E shall follow the historical alignment of Alessandro Boulevard and shall be named Alessandro Boulevard.</p>	<p>City Land Development/ Public Works City Park and Recreation Department</p>	<p>Once prior to issuance of plot plan</p>	<p>Prior to issuance of approval of plot plans for planning Areas along Alessandro boulevard</p>	<p>Review and Approval of Plot Plans</p>		<p>Withhold Plot Plan approval</p>
<p>4.5.6.3A Prior to the issuance of any grading permits, a City-approved Paleontologist shall be retained to conduct paleontological monitoring as needed for all grading related to development. Development monitoring shall include the following actions:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to exceed twenty (20) feet in depth, in areas where fossil-bearing formations are found during grading, and in all areas found to contain, or are suspected of containing, fossil-bearing formations. 2. To avoid construction delays, paleontological monitors shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates if they are unearthed. 3. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. This measure shall be implemented to the satisfaction of the Planning Official. The Project Paleontologist and the Project Archaeologist described in Mitigation Measure 4.5.6.1C may be the same person if he/she meets the qualifications of both positions per Cultural Report MM PR-1, Table 4, pg. 76. 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed during Construction</p>	<p>Prior to issuance of any grading permits for development within the WLCSP</p>	<p>A qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A report of findings shall be submitted to the City after the finalization of construction</p>		<p>Withhold Grading Permit or Issuance of a Stop Work Order</p>
<p>4.5.6.3B Prior to the issuance of any permits for the construction of off-site improvements, a qualified paleontologist shall conduct an assessment for paleontological resources on each off-site improvement location. If any site is determined to have a potential for exposing paleontological resources, the project paleontologist shall monitor off-site grading/excavation, subject</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to issuance of grading permits for construction of any off-site improvements</p>	<p>A Qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A Report</p>		<p>Withhold grading permit or issuance of a stop work order</p>

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<p>to coordination with the City. Development monitoring shall include the following mitigation measures:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to reach fossil-bearing formations during grading. This monitoring must be conducted by the Project Paleontologist in all areas found to or suspected of containing fossil-bearing formations. 2. To avoid construction delays, the Project Paleontologist shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates as they are unearthed. 3. The Project Paleontologist shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. 				<p>of findings shall be submitted to the City after the finalization of construction</p>		
<p>4.6 GEOLOGY AND SOILS</p>						
<p>4.6.6.1A Prior to approval of any projects for development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet, the City shall determine if a detailed fault study of the Casa Loma Fault Zone area is required based on available evidence.</p> <p>If necessary, any additional geotechnical investigations shall be prepared by a qualified geologist and determine if structural setbacks are needed, and shall identify specific remedial earthwork and/or foundation recommendations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site specific investigations, provide any additional necessary mitigation to meet California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that</p>	<p>City Engineer and Project Geologist and Land Development/ Public Works</p> <p>Building and Safety</p>	<p>Once before project approvals</p>	<p>Prior to approval of any projects for future development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the Western boundary along the Mount Russell toe of</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>all structural plans for the project meet current Building Code requirements.</p> <p>Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur. Structures intended for human occupancy shall not be located within any structural setback zone as determined by those studies. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>slope easterly into the site 1 , 500 feet.</p>			
<p>4.6.6.1B Prior to approval of any projects for development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone, the City shall review and approve a geotechnical fault study prepared by a qualified geologist to confirm the alignment and size of any required building setbacks related to the fault zone. If necessary, this study shall identify a “special foundation or grading remediation zone” for the areas supporting structures intended for human occupancy where coseismic deformation (fractures) is observed. This zone shall be determined after subsurface evaluation based on proposed building locations. Specific remedial earthwork and foundation recommendations shall be evaluated as necessary based on proposed building locations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a</p>	<p>City Engineer and Project Geologist; Land Development/ Public Works</p>	<p>Once before approval of any development permits and Prior to Plot Plan Approval</p>	<p>Prior to approval of any projects for future development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone.</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>This study may involve trenching to adequately identify the location of the Claremont segment of the San Jacinto Fault Zone that crosses the eastern portion of the World Logistics Center Specific Plan property. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>						
<p>4.6.6.1C Prior to the approval of grading permits, or permits for construction of off-site improvements, the City shall review and approve plans confirming that the project has been designed to withstand anticipated ground shaking and other geotechnical and soil constraints (e.g., settlement). The project proponent shall submit plans to the City as appropriate for review and approval prior to issuance of grading permits or issuance of permits for the construction of any offsite improvements. This measure shall be implemented to the satisfaction of the City Engineer.</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before issuance of grading permits</p>	<p>Prior to the approval of project grading permits, or permits for construction of off-site improvements</p>	<p>Review and approve grading and construction plans</p>		<p>Withhold Issuance of Grading or Construction Permits</p>
<p>4.6.6.2A Prior to issuance of building permits for any portion of the project site, a site-specific, design level geotechnical investigation for each parcel shall be submitted to the City, which would comply with all applicable state and local code requirements, and includes an analysis of the expected ground motions at the site from known active faults using accepted methodologies. The report shall determine structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. The report shall also determine final design parameters for walls, foundations,</p>	<p>City Engineer and Land Development/ Public Works Building and Safety Division</p>	<p>Once before issuance of building permits</p>	<p>Prior to the issuance of any building permits</p>	<p>Review and approval of a site-specific, design level geotechnical investigation for each parcel</p>		<p>Withhold Building Permits</p>

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<p>provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. These investigations shall identify any site-specific impacts from compressible and expansive soils based on the actual location of individual pads proposed in the future, so that differential movement can be further verified or evaluated in view of the actual foundation plan and imposed fill or structural loads. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>Compliance with this measure will ensure that future buildings are designed to protect the structure and occupants from on-site soil limitations, consistent with State Building Code requirements. This measure shall be implemented to the satisfaction of the City Engineer.</p>						
<p>4.6.6.3B Any cut slopes in excess of five (5) feet in vertical height shall be constructed as “replacement fill slopes” per the project geotechnical report, due to the variable nature of the onsite alluvial soils. This measure shall be implemented to the satisfaction of the City Land Development Division and the City Engineer in consultation with the Project Geologist.</p>	<p>City Land Development Division and City Engineer</p>	<p>Before and after issuance of any grading permit</p>	<p>Prior to issuance and following any grading permit for development within the Specific Plan</p>	<p>Review and approval of grading plans Review of grading prior to issuance of building permit</p>		<p>Withhold Grading Permit Withhold building permit</p>
<p>4.6.6.3C During all grading activities, a geotechnical engineer shall monitor site preparation, removal of unsuitable soils, mapping of all earthwork excavations, approval of imported earth materials, fill placement, foundation installation, and other geotechnical operations. Laboratory testing of subsurface</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before permitting</p>	<p>Prior to issuance of Any discretionary permit for development</p>	<p>Review of additional geotechnical and soils site investigations</p>		<p>Withhold Discretionary Permit</p>

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<p>materials to confirm compacted dry density and moisture content, consolidation potential, corrosion potential, expansion potential, and resistance value (R-value) shall be performed prior to and during grading as appropriate. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>within the Specific Plan</p>			<p>Issuance of a stop work order if necessary</p>
<p>4.7 GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE</p>						
<p>4.7.6.1A The World Logistic Center project shall implement the following requirements to reduce solid waste and greenhouse gas emissions from construction and operation of project development:</p> <p>a) After January 1, 2020, development shall divert a minimum of 75 percent of landfill waste. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>b) After January 1, 2020, recycle and/or salvage at least 75 percent of non-hazardous construction and demolition debris. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Calculations can be done by weight or volume but must be consistent throughout.</p> <p>c) The applicant shall submit a Recyclables Collection and Loading Area Plan for construction related materials prior to issuance of a building permit with the Building Division and for operational aspects of the project prior to the issuance of the occupancy permit to the Public Works Department. The plan shall conform to the Riverside County Waste Management Department’s Design Guidelines for Recyclable Collection and Loading Areas.</p>	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Provide verification sheet to the Recycling Coordinator/ Public Works Property Owners. Association or the property owner shall certify the percentage of land fill waste diverted on an annual basis Certification has been submitted to the City.</p>		<p>Pursuant to City Municipal Code</p>
	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Property Owners Association or the property owner shall certify the percentage of landfill waste diverted on an annual basis.</p>		<p>Pursuant to City Municipal Code</p>
	<p>City Planning Division</p>					<p>Pursuant to City Municipal Code</p> <p>Withhold Certificate of Occupancy</p>

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<p>d) Prior to issuance of certificate of occupancy, the recyclables collection and loading area shall be constructed in compliance with the Recyclables Collection and Loading Area plan.</p>		<p>Once before issuance of building permits</p>	<p>Prior to issuance of building permits</p>	<p>Review and approval of a Recyclables Collection and Loading Area plan</p>		<p>Withhold Certificate of Occupancy</p>
<p>e) Prior to issuance of certificate of occupancy, documentation shall be provided to the City confirming that recycling is available for each building.</p>	<p>City Planning Division</p>		<p>Prior to issuance of occupancy permit</p>	<p>Review and approval of building plans</p>		<p>Withhold Certificate of Occupancy</p>
<p>f) Within six months after occupancy of a building, the City shall confirm that all tenants have recycling procedures set in place to recycle all items that are recyclable, including but not limited to paper, cardboard, glass, plastics, and metals.</p>	<p>City Planning Division</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Building plan review.</p>		
<p>g) The property owner shall advise all tenants of the availability of community recycling and composting services.</p>	<p>Recycling Coordinator/ Public Work</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Compliance with Recyclables Collection and Loading Area Plan</p>		<p>Withhold Certificate of Occupancy</p>
	<p>Recycling Coordinator/ Public Work</p>	<p>Within six months of building occupancy</p>	<p>Within six months after occupancy of building</p>	<p>Review and approval of a Recyclables Collection and Loading Area Plan.</p>		
<p>h) Existing onsite street material shall be recycled for new project streets to the extent feasible.</p>	<p>City Engineer Land Development/ Public Works</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of a Certificate of Occupancy</p>	<p>Written verification will be submitted to the City that the property owner advised all tenants of the availability of community recycling and composting services.</p>		<p>Withhold grading permits</p>
		<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits.</p>	<p>Review and approval of documents including street plans</p>		

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<p>4.7.6.1B (Previously included as Utilities Mitigation Measure 4.16.4.6.1A in the 2015 FEIR for building energy). Each application for a building permit shall include energy calculations to demonstrate compliance with California Energy Efficiency Standards Plans shall follow the following:</p> <ul style="list-style-type: none"> • Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. • Cool pavement materials such as lighter-colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right-of-way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. • Energy-efficient appliances that achieve the 2016 California Appliance Energy Efficiency Standards (e.g., EnergyStar® Appliances) and use of sunlight-filtering window coatings or double-paned windows. 	<p>City Building and Safety, City Planning Division City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1C (Previously included as Utilities Mitigation Measure 4.16.4.6.1B building energy). Prior to the issuance of any building permits within the WLC site, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards, for each new structure. Plans may include but are not necessarily limited to implementing the following as appropriate:</p> <ul style="list-style-type: none"> • High-efficiency air-conditioning with electronic management system (computer) control. • Isolated High-efficiency air-conditioning zone control by floors/separate activity areas. • Use of Energy Star® exit lighting or exit signage. 	<p>City Building and Safety, City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1D (Previously included as Utilities Mitigation Measure 4.16.4.6.1C in the 2015 FEIR for building energy; now modified). Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p>	<p>City Planning Division, City Building and Safety Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>

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<ul style="list-style-type: none"> • Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building or up to the limit allowed by MVU’s restriction on distrusted solar PV connecting to their grid, whichever is greater; • Increase efficiency for buildings by implementing either 10 percent over the 2019 Title 24’s energy-saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict; • Require the equivalent of “Leadership in Energy and Environmental Design Certified” for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval; and • All project rooftops shall be constructed to be solar-ready and be designed to accommodate the additional loads from solar equipment that might be installed at a future date. <p>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</p>						
<p>4.7.7.1 The developer shall mitigate the WLC Project's remaining GHG emissions to net zero by purchasing and retiring offset carbon credits, based upon the amount of GHG emissions set forth in Table 4.7-16 of the Revised Final EIR. Upon the purchase and retirement of offsets carbon credits, no further analysis of GHG emissions will be required, and no further reduction of those emissions will be required.</p> <p>The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of offset carbon credits provided that the following conditions are satisfied:</p> <p>a) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), approved by the California Air Resources Board, such as, but not limited to, Climate Action Reserve, American Carbon Registry or Verra (formerly Verified Carbon Standard). In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and</p>	<p>City Planning Division</p>	<p>Prior to each phase as noted in Timing</p>	<p>Grading offsets shall be purchased and retired prior to issuance of a grading permit</p> <p>Construction offsets shall be purchased and retired prior to issuance of building permits</p> <p>Operational offsets shall be purchased and retired prior to issuance of</p>	<p>Review of written verification</p>		<p>Withhold applicable permit at each phase (grading, building and/or occupancy permit).</p>

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<p>enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City’s Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.</p> <p>b) Timing: The developer shall provide proof to the City that offset carbon credits equal to the amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent.</p>			<p>occupancy permits</p>			
<p>4.8 HAZARDS AND HAZARDOUS MATERIALS</p>						
<p>4.8.6.1A Prior to demolition of any existing structures on the project site, a qualified contractor shall be retained to determine if asbestos-containing materials (ACMs) and/or lead-based paint (LBP) are present. If asbestos-containing materials and/or lead-based paint are present, prior to commencement of demolition, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. In addition, onsite soils shall be tested for contamination by agricultural chemicals. If present, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. This measure</p>	<p>City Building Division</p>	<p>Once Before Permitting and as Needed During Construction</p>	<p>Prior to demolition of any existing rural residences or associated structures</p>	<p>Evidence of qualified contractor provided</p>		<p>Withhold Demolition Permits</p>

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shall be implemented to the satisfaction of the Building Division including written documentation of the disposal of any asbestos-containing materials, lead-based paint, or agricultural chemical residue in conformance with all applicable regulations.						
4.8.6.1B Prior to the issuance of any discretionary permits associated with the proposed fueling facility (“logistic support” site in the LD zone), a risk assessment or safety study that identifies the potential public health and safety risks from accidents at the facility (e.g., fire, tank rupture, boiling liquid, or expanding vapor explosion) shall be submitted to the City for review and approval. This study shall be prepared to industry standards and demonstrate that the facility will not create any significant public health or safety impacts or risks, to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Fire Prevention Bureau and Building and Safety Division Planning Division	Once Before Permitting	Prior to issuance of Any discretionary Permits associated with natural gas fueling facility	Review and Approval of Risk Assessment or Safety Study		Withhold Discretionary Permit
4.8.6.1C Prior to grading for any discretionary permits for development in Planning Areas 9-12 adjacent to the natural gas compressor plant, the applicant shall prepare a risk assessment report analyzing safety conditions relative to the existing compressor plant and planned development. The report must be based on appropriate industry standards and identify the potential hazards from the compressor plant (e.g., fire, explosion) and determine that the distance from the plant to the closest planned buildings in Planning Areas 9-12 is sufficient to protect the safety of workers from accidents that could occur (see Final EIR Volume 2 Figure 4.1.6B) at the compressor plant. This measure shall be implemented to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Building Official and Fire Marshal Planning Division	Once before issuance of discretionary permits for development within Planning Areas 9-12	Prior to issuance of Discretionary permits for Development within Planning Areas 9-12	Review and approval of a risk assessment		Withhold Discretionary Permit
4.8.6.1D Prior to the issuance of any grading permit, the developer shall inform the City of any existing solid waste materials within the development area. In conjunction with grading activities, all solid waste matter within the development area shall be removed by a licensed contractor and disposed of in an approved landfill. A record of the removal and disposal of any waste materials, in compliance with applicable laws and regulations, shall be submitted to the City prior to the issuance of any building permits.	Building and Safety Recycling Coordinator/ Public Works	Once before issuance of grading permits	Prior to issuance of grading permits	Applicant will inform the City in writing of any existing solid waste materials within the development area		Withold building permit until receipt of record of removal and disposal of waste materials Pursuant to City Municipal Code

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4.9 HYDROLOGY AND WATER QUALITY						
<p>4.9.6.1A Prior to issuance of any building permit within the Specific Plan area, the developer shall construct storm drain pipes and conveyances, as well as, combined detention and infiltration basin(s), bioretention area(s), and spreading area(s) within each proposed watershed, as outlined in the project hydrology plan, to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduce the time of concentration by storing and infiltrating increased runoff for a limited period of time and release the outflow at a rate that does not exceed the pre-development peak flows and velocities for the 2, 5, 10, 25, and 100-year storms and volumes as assessed in the water balance model for historical conditions. For the purpose of this mitigation measure, the term “construct” shall mean to substantially complete construction so as to function for its intended purpose during construction with complete construction prior to occupancy. Field investigations will be conducted to determine the infiltration rate of soils underlying the proposed locations of bioretention areas and detention basins. The infiltration rate of the underlying soils will be used to properly size the bioretention areas and detention basins/infiltration basins to ensure that adequate volumes of runoff, in cumulative total for all bioretention areas and detention basins, are captured and infiltrated. The water balance model will be updated and rerun for the site-specific conditions encountered to confirm the water balance. This measure shall be implemented to the satisfaction of the City Engineer. Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage weir structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow such that the flows exiting the project boundary will return to the sheet flow pattern similar to the existing condition. Detention basins and spreading areas shall be designed to account for the amount of the sediment transported through the project boundary so that the existing sediment carrying capacity is maintained.</p>	<p>Land Development/ Public Works</p>	<p>Prior to Occupancy</p>	<p>Prior to issuance of any development permit</p>	<p>Review and approval of construction documents Field Inspection</p>		<p>Withhold Building Permit</p>
<p>4.9.6.1B The bioretention areas and detention/infiltration basins shall be designed to assure infiltrations rates. The monitoring plan will follow the guidelines presented by the California Storm Water Quality Association (CASQA) in the California Storm Water Best</p>	<p>City Engineer</p>	<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits</p>	<p>Review and approval of a monitoring plan for the detention/ infiltration basins</p>		<p>Withhold Grading Permit</p>

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<p>Management Program (BMP) Handbook, Municipal, January 2003 Section 4, Treatment Control Best Management Programs Fact Sheets TC-11 Infiltration Basin and TC-30 Vegetated Swale)</p> <p>For the Bioretention areas, as needed maintenance activities shall be conducted to remove accumulated sediment that may obstruct flow through the swale. Bioretention areas shall be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. The maintenance activities should occur when sediment on channels and culverts builds up to more than 3 inches (CASQA 2003). The swales will need to be cultivated or rototilled if drawdown takes more than 72 hours.</p> <p>For the Detention/infiltration Basins, a 3-5 year maintenance program shall be implemented mainly to keep infiltration rates close to original values since sediment accumulation could reduce original infiltration rate by 25-50%. Infiltration rates in detention basins will be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. If cumulative infiltration rates of all detention basins drops below the minimum required rates, then the detention basins will be reconditioned to improve infiltration capacity by scraping the bottom of the detention basin, seed or sod to restore groundcover, aerate bottom and dethatch basin bottom (CASQA 2003).</p>	<p>Land development/Public Works</p>	<p>Ongoing during occupancy</p>	<p>Ongoing during occupancy</p>	<p>On-site Inspection</p>		<p>Citation, City Maintenance, Lien and Foreclosure Pursuant to City Municipal Code</p>
<p>4.9.6.2A Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall file a Notice of Intent (NOI) with the Santa Ana Regional Water Quality Control Board to be covered under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit for discharge of storm water associated with construction activities. The project developer shall submit to the City the Waste Discharge Identification Number issued by the State Water Quality Control Board (SWQCB) as proof that the project's Notice of Intent is to be covered by the General Construction Permit has been filed with the State Water Quality Control Board. This measure shall be implemented to the satisfaction of the City Engineer</p>	<p>City Engineer. Land Development/Public Works, and Stormwater Management</p>	<p>Once before issuance of any grading permit</p>	<p>Prior to issuance of any grading permit</p>	<p>Proof of NOI submittal</p>		<p>Withhold Grading Permit</p>
<p>4.9.6.2B Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall submit to the State Water Quality Control Board (SWQCB) a</p>	<p>City of Moreno Valley and the Regional Water</p>	<p>Once before issuance of</p>	<p>Prior to issuance of any grading permit</p>	<p>Written verification of filing a SWPPP by the RWQCB</p>		<p>Withhold Grading Permit</p>

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<p>project-specific Storm Water Pollution Prevention Plan (SWPPP). The Storm Water Pollution Prevention Plan shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the Storm Water Pollution Prevention Plan shall emphasize structural and nonstructural best management practices (BMPs) to control sediment and non-visible discharges from the site. Best Management Practices to be implemented may include (but shall not be limited to) the following:</p> <ul style="list-style-type: none"> • Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary debris basins (if deemed necessary), and other discharge control devices. The construction and condition of the Best Management Practices are to be periodically inspected by the Regional Water Quality Control Board during construction, and repairs would be made as required. • Materials that have the potential to contribute non-visible pollutants to storm water must not be placed in drainage ways and must be placed in temporary storage containment areas. • All loose soil, silt, clay, sand, debris, and other earthen material shall be controlled to eliminate discharge from the site. Temporary soil stabilization measures to be considered include: covering disturbed areas with mulch, temporary seeding, soil stabilizing binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. Stockpiles shall be surrounded by silt fences and covered with plastic tarps. • The Storm Water Pollution Prevention Plan shall include inspection forms for routine monitoring of the site during the construction phase. • Additional required Best Management Practices and erosion control measures shall be documented in the Storm Water Pollution Prevention Plan. • The Storm Water Pollution Prevention Plan would be kept on-site for the duration of project construction and shall be available to the local Regional Water Quality Control Board for inspection at any time. 	<p>Quality Control Board and Land Development/ Public Works</p>	<p>any grading permit And Ongoing as part of routine site inspections</p>	<p>Ongoing</p>	<p>Site inspection</p>		<p>Pursuant to City Municipal Code</p>
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<p>The developer and/or construction contractor for each development area shall be responsible for performing and documenting the application of Best Management Practices identified in the project-specific Storm Water Pollution Prevention Plan. Regular inspections shall be performed on sediment control measures called for in the Storm Water Pollution Prevention Plan. Monthly reports shall be maintained and available for City inspection. An inspection log shall be maintained for the project and shall be available at the site for review by the City of Moreno Valley and the Regional Water Quality Control Board.</p>					
<p>4.9.6.3A Prior to discretionary permit approval for individual plot plans, a site-specific Water Quality Management Plan (WQMP) shall be submitted to the City Land Development Division for review and approval. The Water Quality Management Plan shall specifically identify site design, source control, and treatment control Best Management Practices that shall be used on-site to control pollutant runoff and to reduce impacts to water quality to the maximum extent practicable. The Water Quality Management Plan shall be consistent with the Water Quality Management Plan approved for the overall World Logistics Center Specific Plan project. At a minimum, the site developer shall implement the following site design, source control, and treatment control Best Management Practices as appropriate:</p> <p>Site Design Best Management Practices</p> <ul style="list-style-type: none"> a) Minimize urban runoff. b) Maximize the permeable area. c) Incorporate landscaped buffer areas between sidewalks and streets. d) Maximize canopy interception and water conservation by planting native or drought-tolerant trees and large shrubs. e) Use natural drainage systems. f) Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration. g) Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives. 	<p>City Land Development Division</p>	<p>Once before issuance of any grading or building permits</p> <p>And</p> <p>Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permit approval for individual plot plans</p> <p>Ongoing</p>	<p>Review and Approval of WQMP</p> <p>Site inspection</p>	<p>Withhold Grading or Building Permit</p> <p>Pursuant to City Municipal Code</p>

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<p>h) Minimize impervious footprint.</p> <p>i) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.</p> <p>j) Reduce widths of street where off-street parking is available.</p> <p>k) Minimize the use of impervious surfaces such as decorative concrete, in the landscape design.</p> <p>l) Conserve natural areas.</p> <p>m) Minimize Directly Connected Impervious Areas (DCIAs).</p> <p>n) Runoff from impervious areas will sheet flow or be directed to treatment control Best Management Practices.</p> <p>o) Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas that are planted with native or drought-tolerant trees and large shrubs.</p> <p>Source Control Best Management Practices</p> <p>Source control Best Management Practices are implemented to eliminate the presence of pollutants through prevention. Such measures can be both nonstructural and structural.</p> <p>Non-structural source control Best Management Practices include:</p> <p>a) Education for property owners, operator, tenants, occupants, or employees;</p> <p>b) Activity restrictions;</p> <p>c) Irrigation system and landscape maintenance;</p> <p>d) Common area litter control;</p> <p>e) Street sweeping private streets and parking lots; and</p> <p>f) Drainage facility inspection and maintenance.</p> <p>Structural source control Best Management Practices include:</p> <p>g) MS4 stenciling and signage;</p> <p>h) Landscape and irrigation system design;</p> <p>i) Protect slopes and channels; and</p> <p>j) Properly design fueling areas, trash storage areas, loading docks, and outdoor material storage areas.</p> <p>Treatment Control Best Management Practices</p>						
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<p>Treatment control Best Management Practices supplement the pollution prevention and source control measures by treating the water to remove pollutants before it is released from the project site. The treatment control Best Management Practice strategy for the project is to select Low Impact Development (LID) Best Management Practices that promote infiltration and evapotranspiration, including the construction of infiltration basins, bioretention facilities, and extended detention basins. Where infiltration Best Management Practices are not appropriate, bioretention and/or biotreatment Best Management Practices (including extended detention basins, bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration may be utilized. Harvest and Reuse Best Management Practice will be used to store runoff for later non-potable uses.</p> <p>Site-specific Water Quality Management Plans have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the project are developed, Best Management Practices will be implemented consistent with the goals contained in the Master Water Quality Management Plan. All development within the project will be required to incorporate on-site water quality features to meet or exceed the approved Master Water Quality Management Plan's water quality requirements identified previously.</p>						
<p>4.9.6.3B The Property Owners Association (POA) and all property owners shall be responsible to maintain all onsite water quality basins according to requirements in the guidance Water Quality Management Plan and/or subsequent site-specific Water Quality Management Plans, and established guidelines of the Regional Water Quality Control Board. Failure to properly maintain such basins shall be grounds for suspension or revocation of discretionary operating permits, and/or referral to the Regional Water Quality Control Board for review and possible action. This measure shall be implemented to the satisfaction of the City Land Development Division, in consultation with the City Engineer, and Regional Water Quality Control Board.</p>	<p>City Land Development Division</p>	<p>As Needed</p>	<p>Ongoing</p>	<p>Onsite inspections</p>		<p>Revocation of Discretionary or Operating Permits</p>

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<p>4.9.6.3C Prior to issuance of future discretionary permits for any development along the southern boundary of the World Logistics Center Specific Plan (WLCSP), the project developer of such sites, in cooperation with the Property Owners Association (POA), shall establish and annually fund a Water Quality Mitigation Monitoring Plan (WQMMP) to confirm that project runoff will not have deleterious effects on the adjacent San Jacinto Wildlife Area (SJWA). This program shall include at least quarterly sampling along the southern boundary of the site (i.e., at the identified outlet structures of the project detention basins) during wet season flows and/or when water is present, as well as sampling of any dry-season flows that are observed entering the San Jacinto Wildlife Area property from the project property, including Drainage 9, which is planned to convey only clean off-site flows from north of the World Logistics Center Specific Plan site across Gilman Springs Road. The program shall also include at least twice yearly sampling after completion of construction, and a pre-construction survey must be completed to determine general water quality baseline conditions prior to and during development of the southern portion of the World Logistics Center Specific Plan. This sampling shall be consistent with and/or comply with the requirements of applicable Storm Water Pollution Prevention Plans (SWPPPs) for the development site.</p> <p>The project developer of sites along the southern border of the World Logistics Center Specific Plan shall be responsible for preventing or eliminating any toxic pollutant (not including sediment) found to exceed applicable established public health standards. In addition, the discharge from the project shall not cause or contribute to an exceedance of Receiving Water Quality Objectives for the potential pollutants associated with the project as identified in Table 4.9.J. Once development is complete, the developer shall retain qualified personnel to conduct regular (i.e., at least quarterly) water sampling/testing of any basins and their outfalls to ensure the San Jacinto Wildlife Area will not be affected by water pollution from the project site. This measure shall be implemented to the satisfaction of the City Land Development Division Manager based on consultation with the project developer, Eastern Municipal Water District, the Regional</p>	<p>Land Development Division</p>	<p>Annually And Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permits for any development along the southern boundary of the WLCSP Ongoing</p>	<p>Evidence of Annual Water Quality Monitoring Plan fund Site inspection</p>		<p>Withhold Discretionary Permit Pursuant to City Municipal Code</p>
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Water Quality Control Board-Santa Ana Region, and the Mystic Lake Manager.						
4.10 LAND USE AND PLANNING						
NOT APPLICABLE						
4.11 MINERAL RESOURCES						
NOT APPLICABLE						
4.12 NOISE						
<p>4.12.6.1A Prior to issuance of any discretionary project approvals that allow construction activity, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City’s daytime (except for sensitive receptors located within 500 feet of active construction areas) and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures:</p> <ul style="list-style-type: none"> • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers’ standards. • Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project. • No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends. • A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity. The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may 	City Planning Division	Once And Ongoing as part of routine site inspections	Prior to issuance of any discretionary approvals. Ongoing	Review and Approval of a Noise Reduction Compliance Plan Site inspection		Withhold approvals. Pursuant to City Municipal Code

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<p>be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.</p> <ul style="list-style-type: none"> • Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a “hotline” telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request. • Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51). 						
<p>4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City’s approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development:</p> <p>Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the the Revised Sections of the FEIR remain valid. These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the Revised Sections of the FEIR and shall be used to impose building-specific mitigation on the individually proposed buildings.</p>	<p>City Planning Division</p>	<p>Once before issuance of a certificate of occupancy</p>	<p>Prior to issuance of Discretionary permits for Action 1. Prior to issuance of certificate of occupancy for actions 2 and 3</p>	<p>Review and approval of a noise study</p>		<p>Withhold discretionary approvals</p>

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<p>Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the World Logistics Center site, the Applicant shall implement the mitigation identified in the Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels reaching residential uses at 60 dBA during the daytime hours (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.). Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants.</p> <p>If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a <i>no</i> vote.</p> <p>At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.</p> <p>Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited</p>						
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receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement.						
4.12.6.2B Prior to issuance/approval of any building permits, the centerline of Cactus Avenue Extension will be located no closer than 11449 feet to the residential property lines along Merwin Street. An alternative is to locate the roadway closer to the residences and provide a soundwall along Cactus Avenue Extension. The soundwall location and height should be determined by a Registered Engineer, and the soundwall shall be designed to reduce noise levels to less than 65 CNEL at the residences. The Engineer shall provide calculations and supporting information in a report that will be required to be submitted to and approved by the City prior to issuing permits to construct the road.	City Planning Division	Prior to the approval of a Building permit	Prior to the issuance of building permits	Review and Approval of Building permits		Withhold Building Permits
4.12.6.2C Prior to the approval of any discretionary permits, cumulative impact areas shown in the WLC EIR Noise Study shall be included in the soundwall mitigation program outlined in Mitigation Measures 4.12.6.2A and 4.12.6.2D.	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of soundwall mitigation program		Withhold discretionary permits
4.12.6.2D Prior to issuance of a building permit, the applicant shall demonstrate that the development maintains a buffer with soundwall for noise attenuation at residential/warehousing interface (i.e., western and southwestern boundaries of the project site). To keep the noise levels at nearby residential areas less than typical ambient conditions, the warehousing property line shall be located a minimum of 250 feet from the residential zone boundary, and a 12-foot noise barrier shall be located along the perimeter of the property that faces any residential areas. The 12 foot noise barrier may be a soundwall, berm, or combination of the two. The height shall be measured relative to the pad of the warehouse. This requirement shall be implemented anytime residential areas are within 600 feet of the warehousing property line to insure that a noise level of 45 dBA (Leq) will not be exceeded at the residential zone. This requirement is consistent with Item 10 of Municipal Code Section 9.16.160 Business park/industrial that states, "All manufacturing and industrial uses adjacent to residential land uses shall include a buffer zone and/or noise attenuation wall to reduce outside noise levels".	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold Building Permit

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<p>4.12.6.4A Prior to the issuance of building permits for projects within 1,300 feet of the Southern California Gas Company (SCGC) and San Diego Gas and Electric (SDG&E) blowdown facilities, documentation shall be submitted to the City confirming that sound attenuation devices and/or improvements for the blow-down facilities providing at least a 40 dB reduction in noise levels during blow-down events are available and will be installed for all planned blow-down events. It shall be the responsibility of the developer to fund all sound attenuation improvements to the blow-down facilities required by this measure. It shall also be the responsibility of the developer to coordinate with San Diego Gas and Electric and/or Southern California Gas Company regarding the installation of any sound attenuation devices or improvements on the blow-down facilities at either the San Diego Gas and Electric compressor station or the Southern California Gas Company pipelines. This measure shall be implemented to the satisfaction of the City Land Management Division</p>	<p>City Land Development Division City Planning Division</p>	<p>Once before Permitting</p>	<p>Prior to the issuance of Building permits for projects within 1,300 feet of the SCGC and SDG&E facilities</p>	<p>Review and Approval of Documentation confirming sound attenuation device</p>		<p>Withhold Building Permits</p>
<p>4.13 POPULATION, HOUSING, AND EMPLOYMENT</p>						
<p>NOT APPLICABLE</p>						
<p>4.14 PUBLIC SERVICES AND FACILITIES</p>						
<p>NOT APPLICABLE</p>						
<p>4.15 TRAFFIC AND CIRCULATION</p>						
<p>4.15.7.4A A traffic impact analysis (“TIA”) conforming to the guidelines for TIAs adopted by the City shall be submitted in conjunction with each Plot Plan application within the WLCSP. Prior to the approval of the Plot Plans, the City shall review the Revised TIA to determine if any of the traffic improvements listed in the above tables need to be implemented as part of the plot plan. The TIA prepared for the Revised Sections of the FEIR are required to be completed prior to the issuance of a certificate of occupancy for each building. If the City determines that any of the improvements within Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated into insignificance, then the completion of construction of the improvements prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval</p>	<p>City Engineer</p>	<p>Once before plot plan approval Once prior to Certificate of Occupancy</p>	<p>Prior to plot plan approval Prior to Certificate of Occupancy</p>	<p>Review and Approval of site-specific TIAs Review and Approval of site-specific TIAs</p>		<p>Withhold Plot Plan approval Withhold Certificate of Occupancy</p>

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<p>of the Plot Plan. Construction of improvements within the City shall be subject to reimbursement agreement for those costs that exceed the fair share contribution determined for the specific Plot Plan application. If the City determines that any of the improvements outside Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated to a less than significant level, then the payment of any necessary fair share contribution as prescribed in Mitigation Measure 4.15.7.4E prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. If the City determines that the traffic impacts which will result from the construction or operation of a building will be significantly more adverse than those shown in the Revised TIA, further environmental review shall be conducted prior to the approval of the Plot Plan pursuant to Public Resources Code § 21166 and CEQA Guidelines §15162 to determine what additional mitigation measures, if any, will be required in order to maintain the appropriate levels of service.</p>						
<p>4.15.7.4B As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the dedication of appropriate right-of-way, where feasible, consistent with the Subdivision Map Act for frontage street improvements contained within the World Logistics Center Specific Plan Circulation Map. Required dedications shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Evidence of dedication of right of- way in compliance with Subdivision Map Act</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4C As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the Applicant to construct or to fully fund the transportation measures identified in the development’s TIA (see MM4.15.7.4A) as needed to mitigate the transportation impacts within the city of the Plot Plan development. The payment or construction shall be made prior to the issuance of occupancy permits for the requested development. This condition shall apply only to mitigation measures where a mechanism has been established to collect funds from the project and any other funds to needed to complete the improvements.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>

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<p>4.15.7.4D As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require each project to pay the requisite Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44. Required TUMF payments shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer City Planning Division</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment of TUMF</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4E In order to ensure that all of the Project’s traffic impacts are mitigated to the greatest extent feasible, the Applicant shall contribute its fair share of the cost of the needed traffic improvements that are not within the City as identified in the Revised Traffic Impact Analysis (i.e., under the jurisdiction of other cities, the County of Riverside or Caltrans, pursuant to Mitigation Measure 4.15.7.4F). As used in this mitigation measure, the Applicant’s “fair share” has been determined in compliance with the requirements of the Fee Mitigation Act, Government Code § 66000 et seq., and, pursuant to § 66001(g), does not require that the Applicant be responsible for making up for any existing deficiencies. The fair share mitigation is summarized in Tables 72 through 77 of the TIA located in Appendix F of the RSFEIR.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4F The Applicant shall pay its portion of the fair share of the cost of traffic improvements identified in the Transportation Impact Analysis for those significantly impacted road segments and intersections for each warehouse building within the World Logistics Center if the impacted jurisdiction has established a fair share contribution program prior to the approval of a building-specific plot plan. The City shall determine whether a fair share program exists in the impacted jurisdiction and, if one does exist, require that the appropriate fees are paid by the Applicant, consistent with the requirements below, prior to the issuance of a certificate of occupancy for the building in question. If no fair share program exists or if the existing programs are not consistent with the requirements below, then no payment of fees shall be required. The impacts are to be determined on a road segment or intersection basis. Nothing in this condition requires the payment of a traffic impact fee imposed by another jurisdiction which covers improvement to facilities where the Project does not have a significant impact. Fair-share</p>	<p>City Engineer</p>	<p>Once prior to issuance of building permits for individual buildings.</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair-share programs</p>		<p>Withhold Occupancy Permits</p>

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contributions will be determined on a building-by-building basis as a share of the impact of the Project as a whole (for each segment or intersection where the WLC project as a whole has a significant impact identified in the Revised Sections of the FEIR) as determined by the Revised Traffic Impact Analysis and will be due as each certificate of occupancy is issued. The fair share payments for the significantly impacted road segments and intersections identified in the Revised Sections of the FEIR will be required even though the impact resulting from a specific building does not, by itself, cause a significant impact.

For example, the intersection of Martin Luther King Blvd. and the I-215 northbound ramps (Intersection 85) in the City of Riverside was identified as a place where the World Logistic Center contributes to cumulatively significant impacts, and where the fair share contribution of the World Logistic Center project as a whole was computed to be 6.2%. If the City of Riverside establishes a fair share contribution program consistent with this Mitigation Measure 4.15.7.4F to improve that intersection, then when a certificate of occupancy is to be issued for a 2-million square feet high-cube warehouse in the World Logistic Center (approximately 5% of the entire World Logistic Center project) the amount of the fair share payment due from the Applicant to the City of Riverside would be computed as follows:

Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	% Attributable to the building that is subject to the certificate of occupancy (5%)
A x B x C = D						
A = % attributable to the building that is subject to the certificate of occupancy (%5)						
B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis						
C = Total cost of Improvement						
D = Amount Due						

A similar calculation would be done for each subsequent building, with payments for each due at the time of issuance of the

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<p>certificate of occupancy. As a result, while each building individually would not produce a significant impact, and therefore would not be required to pay any mitigation fees if considered by itself, the total amount of the payments for all of the buildings would be equal to the fair share payment for the entire World Logistic Center to the extent that the responsible jurisdiction has chosen to adopt a fair share contribution funding program consistent with Mitigation Measure 4.15.7.4F.</p>						
<p>4.15.7.4G City shall work directly with WRCOG to request that TUMF funding priorities be shifted to align with the needs of the City, including improvements identified in the TIA. Toward this end, City shall meet regularly with WRCOG.</p>	<p>City Engineer</p>	<p>On-going</p>	<p>Yearly starting with project up and ending with project buildout.</p>	<p>City Engineer provides quarterly updates to the City Council regarding TUMF funding priorities as it relates to the improvements identified in the traffic impact analysis.</p>		<p>None</p>
4.16 UTILITIES AND SERVICE SYSTEMS						
<p>4.16.1.6.1A Prior to approval of a precise grading permit for each plot plan for development within the World Logistics Center Specific Plan (WLCSF), the developer shall submit landscape plans that demonstrate compliance with the World Logistics Center Specific Plan, the State of California Model Water Efficient Landscape Ordinance (AB 1881), and Conservation in Landscaping Act (AB 325). This measure shall be implemented to the satisfaction of the Planning Division. Said landscape plans shall incorporate the following:</p> <ul style="list-style-type: none"> • Use of xeriscape, drought-tolerant, and water-conserving landscape plant materials wherever feasible and as outlined in Section 6.0 of the World Logistics Center Specific Plan; • Use of vacuums, sweepers, and other “dry” cleaning equipment to reduce the use of water for wash down of exterior areas; • Weather-based automatic irrigation controllers for outdoor irrigation (i.e., use moisture sensors); • Use of irrigation systems primarily at night or early morning, when evaporation rates are lowest; 	<p>City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of precise grading permit for each plot plan.</p>	<p>Review and Approval of landscape plans</p>		<p>Withhold precise grading permit.</p>

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<ul style="list-style-type: none"> • Use of recirculation systems in any outdoor water features, fountains, etc.; • Use of low-flow sprinkler heads in irrigation system; • Provide information to the public in conspicuous places regarding outdoor water conservation; and • Use of reclaimed water for irrigation if it becomes available. 					
<p>4.16.1.6.1B All buildings shall include water-efficient design features outlined in Section 4.0 of the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division/Public Works. These design features shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> • Instantaneous (flash) or solar water heaters; • Automatic on and off water faucets; • Water-efficient appliances; • Low-flow fittings, fixtures and equipment; • Use of high-efficiency toilets (1.28 gallons per flush [gpf] or less); • Use of waterless or very low water use urinals (0.0 gpf to 0.25 gpf); • Use of self-closing valves for drinking fountains; • Infrared sensors on drinking fountains, sinks, toilets and urinals; • Low-flow showerheads; • Water-efficient ice machines, dishwashers, clothes washers, and other water-using appliances; • Cooling tower recirculating system where applicable; • Provide information to the public in conspicuous places regarding indoor water conservation; and • Use of reclaimed water for wash down if it becomes available. 	<p>Building and Safety Division Planning Division</p>	<p>Once</p>	<p>Prior to issuance of any building permits.</p>	<p>Review and Approval building plans</p>	<p>Withhold building permit.</p>
<p>4.16.1.6.1C Prior to approval of a precise grading permit for each plot plan, irrigation plans shall be submitted to and approved by the City demonstrating that the development will have separate irrigation lines for recycled water. All irrigation systems shall be designed so that they will function properly with recycled water if it becomes available. This measure shall be implemented to the satisfaction of the City Planning Division and Land Development Division/Public Works.</p>	<p>City Planning Division, Land Development Division/Public Works</p>	<p>Once</p>	<p>Prior to issuance of precise grading permits.</p>	<p>Review irrigation plans</p>	<p>Withhold precise grading permit.</p>

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<p>4.16.1.6.2A Each Plot Plan application for development shall include a concept grading and drainage plan, with supporting engineering calculations. The plans shall be designed such that the existing sediment carrying capacity of the drainage courses exiting the project area is similar to the existing condition. The runoff leaving the project site shall be comparable to the sheet flow of the existing condition to maintain the sediment carrying capacity and amount of available sediment for transport so that no increased erosion will occur downstream. This measure shall be implemented to the satisfaction of the City Land Development Division/Public Works.</p>	<p>Land Development Division/Public Works</p>	<p>Once Concurrent with Plot Plan review and approval.</p>	<p>Prior to issuance of grading permit.</p>	<p>Review and Approval of Grading and Drainage Plans</p>		<p>Withhold Plot Plan Approval</p>
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4.17 Energy (New Section)
 Refer to mitigation measures in Air Quality and GHG.

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EXHIBIT B
STATEMENT OF OVERRIDING CONSIDERATIONS

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Facts, Findings and Statement of Overriding Considerations
Regarding the Environmental Effects of the
World Logistics Center
(State Clearinghouse No. 2012021045)

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I. INTRODUCTION

The City Council of the City of Moreno Valley (this “Council”), in certifying the Revised Final Environmental Report (“Revised Final EIR”) for the World Logistics Center (WLC) Project (the “Project”) for the construction of up to approximately 40.4 million square feet of warehouse distribution uses classified as Logistics Development (LD) and 200,000 square feet of warehousing-related uses classified as “Light Logistics” (LL) on 2,535 acres within the WLC Specific Plan area, makes the Findings described below and adopts the Statement of Overriding Considerations presented at the end of the Findings. The Revised Final EIR was prepared by the City of Moreno Valley (“City”) acting as lead agency pursuant to the California Environmental Quality Act (“CEQA”). Hereafter, unless specifically identified, the Notice of Preparation (“NOP”), Notice of Availability & Completion (“NOA/NOC”), Draft EIR (“DEIR”), Technical Studies, Final EIR containing Responses to Comments and textual revisions to the Draft EIR (“FEIR”), the Revised Sections of the Final EIR (“RSFEIR”), the Draft Recirculated Sections of the RSFEIR (“Recirculated Sections”), the Revised Final EIR which contains Responses to Comments, and Errata will be referred to collectively herein as the “EIR” These Findings are based on the entire record before this Council, including the above-referenced documents, in addition to Resolution Exhibit B, Mitigation Monitoring and Reporting Program (MMRP), Section VI, Statement of Overriding Considerations, and other information presented to the Council and part of the administrative record. This Council adopts the facts and analyses in the Revised Final EIR, which are summarized below for convenience. The omission of some detail or aspect of the Revised Final EIR does not mean that it has been rejected by this Council.

II. PROJECT SUMMARY

A. PROJECT DESCRIPTION

1. Site Location

The Project is located in the eastern portion of the City of Moreno Valley (also referred to as the “Rancho Belago” portion of the City), in northwestern Riverside County, within the World Logistics Center (WLC) Specific Plan area. The Project site is immediately south of State Route 60 (SR-60), between Redlands Boulevard and Gilman Springs Road (the easterly City limit), extending to the northern boundary of the San Jacinto Wildlife Area. The major roads that currently provide access to the Project site are Redlands Boulevard, World Logistics Center Parkway, Alessandro Boulevard, and Gilman Springs Road.

The WLC Project area is located in portions of Sections 1, 12, and 13 of Township 3 South, Range 3 West; and portions of Sections 6, 7, 8, 9, 16, 17, 18, 19, 20, and 21 of Township 3 South, Range 2 West, as depicted on the U.S. Geological Survey (USGS) 7.5-minute series Sunnymead and El Casco, California quadrangles.

2. Project Description

The World Logistics Center (WLC) project is located on 2,610 acres in the Rancho Belago area at the eastern end of Moreno Valley, south of SR-60, east of Redlands Boulevard, west of Gilman Springs Road and north of the San Jacinto Wildlife Area. The site currently has a General Plan designation of Business

Park/Light Industrial and zoning designations of WLCSP-LD (World Logistics Center Specific Plan – Logistics Development) and WLCSP-LL (World Logistics Center Specific Plan – Light Logistics). The site is subject to the adopted World Logistics Center Specific Plan (WLC Specific Plan) which authorizes the construction and operation of 40,600,000 square feet of logistics facilities and associated infrastructure and 74.3 acres of open space.

The land use entitlements for the WLC project that are in place include the General Plan and zoning designations, the WLC Specific Plan, and a request for annexation of 85 acres of unincorporated land in Riverside County into the City – the annexation pre-zoning having been adopted in November 2015, through the initiative process. The discretionary approvals that will be considered by the City as part of the current approval process consist of a development agreement and Parcel Map 36457.

3. Actions Covered by the EIR

The Revised Final EIR provides information to allow a reasoned decision concerning the following discretionary and non-discretionary approvals:

- Implementation of the World Logistics Center Specific Plan.
- Approval of the Development Agreement between the Project applicants, collectively Highland Fairview, and the City of Moreno Valley, in order to provide certainty for the future development of the Project for those parcels owned by Highland Fairview.
- Approval of a Tentative Parcel Map, subdividing a portion of the Project site into large parcels. This map is for financing purposes only and does not create any development rights for the subdivided properties. Subsequent subdivision applications will be required prior to the development of any buildings on the site.
- Approval of grading plans, plot plans, building plans, infrastructure plans and related approvals for construction and operation of individual buildings within each development area.

Approvals and permits required by other agencies include:

a. County of Riverside

- Local Agency Formation Commission (LAFCO): Annexation of 85-acre parcel.
- Flood Control and Water Conservation District: Amend Storm Drain Master Plan.

b. Other Affected Agencies

- Western Riverside Council of Governments: Transportation Uniform Mitigation Fee (TUMF) Contributions.
- Eastern Municipal Water District: Water Service Agreements.
- Developer will make “fair share” contributions to development impact fee programs if established by the cities of Riverside, Perris, and Redlands for local road and intersection improvements identified in the programmatic Traffic Impact Assessment (TIA) included with the RSFEIR (Revised Final EIR Part 3, Appendix F). This item is subject to review and approval by the City Transportation Division.

c. State of California

- Regional Water Quality Control Board: Water Quality Permitting.
- Department of Transportation (Caltrans): Encroachment Permits for SR-60. Developer will make “fair share” contributions to a development impact free program if established by Caltrans for future development of improvements to State Route 60 as identified in the programmatic Traffic Impact Assessment (TIA) included with the RSFEIR (Revised Final EIR Part 3, Appendix F).
- California Department of Fish and Wildlife: Streambed Alteration Agreements.

d. Federal Agencies

- U.S. Army Corps of Engineers: Clean Water Act Permitting and associated federal agency consultation.

B. PROJECT OBJECTIVES

The Project Objectives include the following:

- Create substantial employment opportunities for the citizens of Moreno Valley and surrounding communities.
- Provide the infrastructure plan necessary to meet current market demands and to support the City’s Economic Development Action Plan.
- Create a major logistics center with good regional and freeway access.
- Implement design standards and development guidelines to ensure a consistent and attractive appearance throughout the entire Project.
- Implement a master plan for the entire Project area to ensure that the Project is efficient and business-friendly to accommodate the next-generation of logistics buildings.
- Provide a major logistics center to accommodate a portion of the ever-expanding trade volumes at the Ports of Los Angeles and Long Beach
- Create a Project that will provide a balanced approach to the City’s fiscal viability, economic expansion, and environmental integrity.
- Provide the infrastructure improvements required to meet Project needs in an efficient and cost-effective manner.
- Encourage new development consistent with regional and municipal service capabilities.
- Significantly improve the City’s jobs/housing balance and help reduce unemployment within the City.
- Provide thousands of construction job opportunities during the Project’s buildout phase.
- Provide appropriate transitions between on-site and off-site uses.

III. ENVIRONMENTAL REVIEW AND PUBLIC PARTICIPATION

The City has conducted an extensive review of this Project which included the DEIR, FEIR, RSFEIR, Recirculated Sections and supporting technical studies, along with public review and comment period first during the circulation of the Notice of Preparation, then through the circulation of the DEIR, circulation of the FEIR, and circulation of the RSFEIR and Recirculated Sections for public review and comment. The following is a summary of the environmental review of this Project:

- On February 25, 2012, the City circulated a Notice of Preparation (“NOP”) that identified the environmental issues that the City anticipated would be analyzed in the Project’s DEIR to the State Clearinghouse, responsible agencies, and other interested parties.
- On March 12, 2012, the City conducted a public scoping meeting to allow members of the public to provide comments and input regarding the scope and content of the DEIR.
- The NOP public review period ran for 30 days, from February 25, 2012 to March 26, 2012. Written comments on the NOP were received from 27 different agencies, organizations, and individuals. The scope of the issues identified in the comments expressing concern included potential impacts associated with:
 - Aesthetics
 - Air Quality
 - Alternatives
 - Biological Resources
 - Cultural Resources
 - Greenhouse Gases
 - Geology & Soils
 - Hazards
 - Hydrology
 - Land Use
 - Noise
 - Population & Housing
 - Public Services
 - Traffic
 - Utilities

Based on the comments received pursuant to the NOP, it was determined that all environmental issues needed to be addressed in depth in the DEIR.

- As required by the California Environmental Quality Act (CEQA) Guidelines Section 15087, a Notice of Completion (NOC) of the DEIR State Clearinghouse No. 2012021045 for the WLC Project was filed with the State Clearinghouse on July 17, 2012, and the Notice of Availability (NOA) of the DEIR was filed with the Riverside County Clerk on July 18, 2012.
- The DEIR was circulated for public review for a period of 63 days, from February 4, 2013 to April 8, 2013. Copies of the DEIR were distributed to all Responsible Agencies and to the State Clearinghouse in addition to various public agencies, citizen groups, and interested individuals. Copies of the DEIR were also made available for public review at the City Planning Department, at one area library, and on the internet. A total of one-hundred and forty-four (144) comment letters were received during the public review period commenting on the DEIR and WLC Project. Twenty-three (23) of the comment letters received were from Federal, State, regional, or local agencies. Fifteen (15) comment letters were received from private organizations or conservation groups, and one-hundred and six (106) letters were received from individuals. In addition, several letters/emails from individuals and one letter from the City of Redlands were received well after the close of the public review period. The

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City prepared specific responses to all comments. The responses to comments are included in FEIR, Revised Final EIR Part 4 Volume 1.

- On May 1, 2015 in accordance with *Public Resources Code* Section 21092.5, the City provided written responses to public agencies that commented on the DEIR.
- On August 2015, the City Council held a public hearing to consider the Project and staff recommendations. The Council, after considering written comments and oral testimony on the FEIR, determined that no new information was presented that would require recirculation of the FEIR. Following public testimony, submission of additional written comments, and staff recommendations, the Council certified the FEIR as having been completed in compliance with CEQA, adopted Facts, Findings and the Statement of Overriding Considerations, and the further recommendations in the Staff Report, and approved the Project.
- In September 2015, a number of lawsuits were filed challenging the City Council certification of the FEIR and the approvals granted for the construction and operation of the WLC.
- In November 2015, the City Council, in response to initiative petitions submitted to it for the GPA, Zone Change, the WLC Specific Plan and the Development Agreement, adopted ordinances which vacated approvals for those entitlements granted in August, and then reapproved the GPA, the Zone Change, the WLC Specific Plan and the Development Agreement. *The WLC, through the WLC Specific Plan, is entitled for 40.6 million square feet of logistics and associated land uses and infrastructure on the 2,610-acre Project site.*
- In February 2016, lawsuits were filed challenging the use of the initiative process to adopt the Development Agreement. The trial judgement rejected the challenges (later overturned on appeal).
- On February 8, 2018, the Honorable Sharon Waters, Judge of the Riverside Superior Court, found five deficiencies in the FEIR. The key findings from Judge Waters' ruling are quoted below:

Energy Impacts: “The FEIR must provide a comparison of feasible, cost-effective renewable energy technologies in the Energy Impacts analysis”.

Biological Impacts: “The FEIR should remove all references to and consideration of the 910 acres of SJWA and MSHCP lands as “buffer zone” or “CDFW Conservation Buffer Area” in the Biological Resources and Habitat Impacts analysis”.

Noise Impacts: “The FEIR must provide an analysis of construction noise over ambient levels; provide adequate analysis on construction noise impacts on nearby homes; address the inadequacy of mitigation measures, which fail to include performance standards or ways to reduce construction noise”.

Agricultural Impacts: “The FEIR and the resolution certifying the FEIR require clarification as to whether loss of locally important farmland will have a significant direct or cumulative impact on agriculture and, if significant, the FEIR must either explain how proposed mitigation will reduce the impact or why other mitigation is not feasible”.

Cumulative Impacts: “The FEIR should include consideration of recently constructed and proposed large warehouse projects in the summary of projections method and should analyze

whether individually significant impacts may be cumulative considerable”.

- In June 2018, a judgement was entered, and a writ issued which ordered the City to set aside the certification of the FEIR. The Revised Sections of the FEIR (RSFEIR), was prepared to correct the deficiencies identified in the February 2018 ruling.
- In July 2018, the RSFEIR was circulated to the public for review and comment.
- In August 2018, the Court of Appeal, Fourth Appellate District, Division One, reversed the trial court judgment in the lawsuits attacking the use of the initiative process to approve the Development Agreement, holding that the initiative process could not be used to approve the Development Agreement, and directed the trial court to issue a writ of mandate ordering the City to vacate its November 2015 approval of the Development Agreement. The Court of Appeal’s decision did not affect the validity of the WLC Specific Plan, the GPA, the rezoning or the request for annexation adopted through the initiative process, all of which are still in effect.
- On August 15, 2019, the U.S. Environmental Protection Agency’s approval of the use of the California EMFAC2017 air quality analysis model resulted in requiring revisions to portions of the RSFEIR. Because the RSFEIR utilized EMFAC2014 for the Project and cumulative analyses for air quality, greenhouse gas, and energy evaluations, these portions of the RSFEIR using EMFAC2014 were addressed in Draft Recirculated Sections of the RSFEIR (“Recirculated Sections”) using EMFAC2017.
- In December 2019, the Recirculated Sections were circulated to the public for review and comment (Revised Final EIR Part 2).
- On April 30, 2020 in accordance with *Public Resources Code* Section 21092.5, the City provided written responses to public agencies that commented on the Recirculated Sections (Revised Final EIR Part 2) and RSFEIR (Revised Final EIR Part 3).
- On May 2, 2020, the Final Responses to Comments and Errata was published, providing written responses to all comments received on the RSFEIR and the Recirculated Sections (Revised Final EIR Part 1a).
- On May 14, 2020, the Planning Commission held a public hearing to consider the Project and staff recommendations. The Commission, after considering written comments and oral testimony on the Revised Final EIR, determined that no new information was presented that would require recirculation of the Revised Final EIR. Following public testimony, submission of additional written comments, and staff recommendations, the Commission certified the Revised Final EIR as having been completed in compliance with CEQA, adopted Facts, Findings and the Statement of Overriding Considerations, and the further recommendations in the Staff Report, and approved the Parcel Map and recommended that the City Council approve the Development Agreement.
- On May 26, 2020, the Planning Commission’s Project approval and Revised Final EIR certification was appealed to the City Council hearing of June 16, 2020.

- On June 16, 2020, the City Council held a public hearing to consider the Development Agreement, as well as the appeal of the Planning Commission’s May 14 certification of the Revised Final EIR and approval of the Tentative Parcel Map. The Council, after considering written comments and oral testimony on the Revised Final EIR, determined that no new information was presented that would require recirculation of the Revised Final EIR. Following public testimony, submission of additional written comments, and staff recommendations, the Council certified the Revised Final EIR as having been completed in compliance with CEQA, adopted Facts, Findings and the Statement of Overriding Considerations, and the further recommendations in the Staff Report, and approved the Parcel Map and the Development Agreement.
- The Revised Final EIR serves to evaluate the environmental effects of the construction and operation of the World Logistics Center project.

IV. INDEPENDENT JUDGMENT FINDING

The Applicant originally retained the independent consulting firm of LSA Associates, Inc. (“LSA”) to prepare the FEIR for the Project. LSA prepared the FEIR under the supervision, direction and review of the City with the assistance of an independent peer review by Dr. Timothy Krantz, University of Redlands, and Fehr & Peers for the Traffic Impact Analysis. Environmental Science Associates (ESA) was later retained to prepare the RSFEIR and Recirculated Sections. The Applicant retained Kimley-Horn and Associates to assist in reviewing the RSFEIR, Recirculated Sections, and Responses to Comments. The City of Moreno Valley is the Lead Agency for the preparation of the Revised Final EIR, as defined by CEQA, Public Resources Code Section 21067. This Council has received and reviewed the Revised Final EIR prior to certifying the Revised Final EIR and prior to making any decision to approve or disapprove the Parcel Map.

Finding: Consistent with Public resources Code Section 21082.1 CEQA and Section 15084 of the CEQA Guidelines, the City has conducted its own independent review and analyses of the Revised Final EIR, and circulated draft and proposed final documents, including the responses to comments and the Errata. The Revised Final EIR reflects the City’s independent judgment.

A. GENERAL FINDING ON MITIGATION MEASURES

In preparing for the consideration of the Parcel Map, part of the Project, City staff incorporated the mitigation measures set forth in the Revised Final EIR as applicable to that approval for the Project. In the event that the approvals do not use the exact wording of the mitigation measures recommended in the Revised Final EIR, in each such instance, the adopted mitigation measures incorporated into approvals are intended to be identical or substantially similar to the mitigation measure set forth in the MMRP (Exhibit B to the Resolution). Any minor revisions were made for the purpose of improving clarity or to better define the intended purpose.

Finding: Sections 4.8 and 4.9 of the Development Agreement require the developer of the Project to construct or pay for all necessary traffic improvements and a fire station, all as needed, as a result of the development of the Project. In return, section 1.5, 4.8, and 4.9 of the Development Agreement exempts the Project from the payment of development impact fees ordinarily imposed under Municipal Code sections 3.42.030, 040, and 060. These exemptions shall remain in effect only as long as the Development Agreement, is in effect. If the Development Agreement is approved but does not become effective or if it is approved and does become effective and is terminated for any reason, the requirements that the Project pay development impact fees under Municipal Code sections 3.42.030, .040, .050, and .060 shall become effective.

Unless specifically stated to the contrary in these findings, it is this Council’s intent to adopt all mitigation measures recommended in the Revised Final EIR which are applicable to the Project. If a measure has, through error, been omitted from the Approvals or from these Findings, and that measure is not specifically reflected in these Findings, that measure shall be deemed to be adopted pursuant to this paragraph. In addition, unless specifically stated to the contrary in these Findings, all Approvals repeating, or rewording mitigation measures recommended in the Revised Final EIR are intended to be substantially similar to the

mitigation measures identified in the Revised Final EIR and as shown in the MMRP (Resolution Exhibit B) and are found to be equally effective in avoiding or lessening the identified environmental impact. In each instance, the Approvals contain the final wording for the mitigation measures.

V. ENVIRONMENTAL IMPACTS AND FINDINGS

City staff reports, the Revised Final EIR, written and oral testimony at public meetings or hearings, these facts, findings, and statement of overriding considerations, and other information in the administrative record, serve as the basis for the City's environmental determination.

The detailed analysis of environmental impacts defined as potentially significant by CEQA and mitigation measures for the Project is presented in the Revised Final EIR Parts 2, 3 and 4. Responses to comments on the DEIR, along with copies of the comments, are provided in the Revised Final EIR Part 4 Volume 1 (regarding comments on the 2015 DEIR) and Revised Final EIR Part 1 (regarding comments on the 2018 RSFEIR and the 2019 Recirculated Sections).

The DEIR evaluated fourteen major environmental categories for potential impacts including Aesthetics, Agricultural Resources, Air Quality, Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use, Noise, Population and Housing, Public Services and Facilities (including Recreation), Transportation, Utilities and Service Systems, and Greenhouse Gases and Global Climate Change. Both Project-specific and cumulative impacts were evaluated. In addition, the analysis of potentially significant environmental impacts and mitigation measures were further evaluated and/or updated within the RSFEIR and Recirculated Sections, and associated Responses to Comments and Errata, in response to the February 2018 court ruling noted above, and described in detail within the Revised Final EIR Part 1, Topical Response C.

Of these fourteen major environmental categories, the Council concurred with the conclusions in the Revised Final EIR that the issues and sub issues discussed in Sections V.A and V.B below were either less-than-significant without mitigation or could be mitigated below a level of significance. For the remaining potential environmental impacts that could not feasibly be mitigated below a level of significance discussed in Section V.C, the authority to impose a feasible mitigation measure is vested in another jurisdiction and overriding considerations exist which made these potential impacts acceptable to the Council. Based on the entire record and having considered the unavoidable adverse impacts of the Project, the City hereby determines that all feasible mitigation has been adopted to reduce or avoid the potentially significant impacts identified in the Revised Final EIR and that no additional feasible mitigation is available to further reduce significant impacts.

A. LESS-THAN-SIGNIFICANT ENVIRONMENTAL IMPACTS NOT REQUIRING MITIGATION

The Moreno Valley City Council hereby finds that the following potential environmental impacts of the Project are less-than-significant and therefore do not require the imposition of mitigation measures.

1. Agricultural and Forestry Resources

a. Forest Land Zoning

Potential Significant Impact: Whether the Project would conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)).

Findings: Potential impacts of the Project related to forest land zoning were analyzed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to forest land and timberland; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3 and the California Department of Forestry and Fire Protection, there are no areas designated as forest land or timberland on the Project site. Therefore, no significant impacts would occur from the implementation of the Project. (Revised Final EIR Part 3 pg. 4.2-8).

b. Loss or Conversion of Forest Land

Potential Significant Impact: Whether the Project would result in the loss of forest land or conversion of forest land to non-forest use.

Findings: Potential impacts of the Project related to the loss or conversion of forest land are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to the loss or conversion of forest land; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3 and the California Department of Forestry and Fire Protection, there are no areas of forest land on the Project site. Therefore, no significant impacts would occur from the implementation of the Project (Revised Final EIR Part 3, pg. 4.2-8).

c. Existing Zoning and Williamson Act

Potential Significant Impact: Whether the Project would conflict with existing zoning for agricultural use or a Williamson Act contract.

Findings: Potential impacts of the Project related to conflicts with existing zoning for agricultural uses or Williamson Act properties are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the

entire record before us, this Council finds that development of the Project will not result in conflicts with existing agricultural zoning or an existing Williamson Act contract; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3, while some portions of the 2,610-acre Project site are currently used for agriculture, there were no Williamson Act contracts on either the Project site or any adjacent properties. According to Section 4.2 of the Revised Final EIR Part 3, agriculture is allowed in most areas of the City as an interim land use until it is replaced by development (Revised Final EIR Part 3, pg. 4.2-9). Currently, the City's updated 2019 General Plan Land Use Map shows that there are no agricultural zones identified on the Project site or on any of the surrounding properties. In addition, the Moreno Valley Map Viewer¹ that provides geographic and parcel information via Geographic Information System (GIS) data does not identify the Project site's zoning for agricultural uses. Because the Project would not conflict with any Williamson Act contracts and is consistent with the General Plan's land use and zoning designations, the impacts related to this issue would be less than significant and no mitigation is required. (Revised Final EIR Part 3, pg. 4.2-9).

d. Farmland Conversion

Potential Significant Impact: Whether the Project would result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural land use.

Findings: Potential loss of Farmland (Prime Farmland, Unique Farmland or Farmland of Statewide Importance) is discussed in the Revised Final EIR Part 3, Section 4.2. Based on the entire record before us, this Council finds that development of the Project will not result in the loss of any Farmland; therefore, no mitigation is required.

Facts in Support of the Finding: According to Section 4.2 of the Revised Final EIR Part 3, while portions of the Project site are currently used for agriculture, there is no land currently designated as Farmland, on the 2,610-acre Project site or in the 104-acre off-site improvement area. Because the Project would not convert any on-site or off-site land designated as Farmland the Project's impacts related to this issue would be less than significant, and no mitigation is required (Revised Final EIR, Part 3, pgs. 4.2-9 and 4.2-10).

¹ Accessed February 2, 2020. Retrieved from: https://moval.geocortex.com/Html5Viewer/index.html?viewer=comv_hv

e. **Conversion of Farmland to Non-Agricultural Uses**

Potential Significant Impact: Whether the Project would involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use, or conversion of forest land to non-forest use.

Finding: The current agricultural status of the Project site and potential impacts of the Project related to conversion of the Project site to non-agricultural uses are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. The 25 acres of Unique Farmland identified in the FEIR were determined to be Farmland of Local Importance in 2017. The Project would convert approximately 2,361 acres that are designated as Farmland of Local Importance, approximately 2,200 acres of which are being farmed, to nonagricultural uses (Revised Final EIR, Part 3 pg. 4.2-10). However, results of the California Land Evaluation and Site Assessment (LESA) Model indicated a less than significant impact and therefore the conversion of the currently farmed land does not require mitigation. Based on the entire record before us, this Council finds that potentially significant impacts related to conversion of farmland to non-agricultural use would be a less than significant level without implementation of mitigation.

Facts in Support of the Finding: In addition to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) designations, Riverside County has established a program through which it classifies various land within the County as Locally Important Farmland. The state uses the County's determination to identify Farmland of Local Importance for its FMMP designations. The factors used by Riverside County to define Locally Important Farmland are provided in Section 4.2.1.1 of the Revised Final EIR, Part 3.

The LESA Model. The California LESA Model was developed to provide lead agencies with an optional methodology to ensure that potentially significant effects on the environment from agricultural land conversions are quantitatively and consistently considered in the environmental review process (Public Resources Code Section 21095), including in CEQA reviews. The California LESA Model evaluates measures of soil resource quality, a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, the factors are rated, weighted, and combined, resulting in a single numeric score. The project score becomes the basis for making a determination of a project's potential significance.

To assess potential agricultural resource impacts that may result from development of the World Logistics Center site, the LESA model was run by WSP for the 2,610-acre project area. The total LESA score for the Project is 60.4, which is considered significant unless either the Land Evaluation (LE) sub-score or the Site Assessment (SA) sub-score is less than 20. The LE sub-score is 40.9 and the SA sub-score is 19.5, indicating a less than significant impact and therefore does not require mitigation (Revised Final EIR Part 3, pg. 4.2-11).

An independent analysis was conducted on the potential agricultural resource impacts that may result from development of the World Logistics Center site. The LESA model was run by the Agribusiness, Natural Resources & Energy Practice Group of Cushman & Wakefield Western, Inc. (C&WW) for the 2,610-acre Project area. The total LESA score for the project is 58.9, which is considered significant only if the LE and

SA sub-scores are each greater than 20. The LE sub-score is 40.9 and the SA sub-score is 18.0, indicating a less than significant impact and therefore does not require mitigation (Revised Final EIR Part 3, pg. 4.2-11).

The majority of the World Logistics Center Project site is currently designated as Farmland of Local Importance by the state's FMMP as determined by the County. The County's maps do not reflect the City's General Plan Land Use Map, which shows no agricultural designations in the City (Revised Final EIR Part 3, pg. 4.2-12).

Implementation of the Project would result in the permanent conversion of approximately 2,200 acres currently used for dry farming to non-agricultural uses and would result in the permanent conversion of approximately 2,361 acres of land designated as Farmland of Local Importance. While this could have an effect on accelerating the loss of other existing agricultural land, portions of the state-owned lands to the south likely will continue in agricultural production. Likewise, there is no other agricultural use in the Zone of Influence (term used in the State LESA Model) and a majority of the land in that zone is vacant (i.e., in the Badlands to the east and portions of the San Jacinto Wildlife Area and the Lake Perris State Recreation Area to the south). The conversion of agricultural lands to urban uses is supported by the City's General Plan policies, as discussed in Section 4.2 of the Revised Final EIR Part 3. The entire Project site and adjacent lands have been designated for urban uses for nearly 20 years by the City, and the area designated Farmland of Local Importance within the Specific Plan area has been permanently converted to nonagricultural urban uses. Therefore, Project implementation will result in less than significant impacts to conversion of Farmland of Local Importance. No mitigation is required.

2. Air Quality

a. Odors

Potential Significant Impact: Whether the Project would create objectionable odors affecting a substantial number of people.

Findings: Potential impacts of the Project related to odors are discussed in detail in Section 4.3 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to objectionable odors; therefore, no mitigation is required.

Facts in Support of the Findings: As stated in Section 4.3.5.1 of the Revised Final EIR Part 4 Volume 3, diesel exhaust and volatile organic compounds (VOCs) would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from the Project site and therefore should not reach an objectionable level at the nearest sensitive receptors. Diesel exhaust would also be emitted during operation of the Project from the long-haul trucks that would visit the Project site. However, the concentrations would not be at a level to result in a negative odor response at nearby sensitive or worker receptors. In addition, modern emission control systems on diesel vehicles since 2007 virtually eliminate diesel's characteristic odor. Further, Project mitigation requires that 2010 or newer diesel vehicles be used during construction.

During blow-down maintenance activities, natural gas odors will be present around the SDG&E Compressor Plant located adjacent to the Project site. When the southernmost portion of the WLC Specific Plan area is

developed, these odors will occasionally be detectable from the industrial warehouse properties adjacent to the SDG&E facility. These odors will be infrequent and odorized natural gas will not be present in high concentrations. Therefore, potential odor impacts from the adjacent natural gas operations are considered to be less than significant and do not require mitigation.

South Coast Air Quality Management District (SCAQMD) Rule 402 dictates that air pollutants discharged from any source shall not cause injury, nuisance, or annoyance to the health, safety, or comfort of the public. While the application of architectural coatings and installation of asphalt may generate odors, these odors are temporary and not likely to be noticeable beyond the Project boundaries. SCAQMD Rules 1108 and 1113 identify standards regarding the application of asphalt and architectural coatings, respectively.

SCAQMD Rule 1108 sets limitations on ROG (reactive organic gases), which are similar to and interchangeable with VOCs content in asphalt. This rule is applicable to any person who supplies, sells, offers for sale, or manufactures any asphalt materials for use in the South Coast Air Basin. Rule 1113 of the SCAQMD deals with the selling and application of architectural coatings. Rule 1113 is applicable to any person who supplies, sells, offers for sale, or manufactures any architectural coating for use in the Basin that is intended to be applied to buildings, pavements, or curbs. This rule is also applicable to any person who applies or solicits the application of any architectural coating within the Basin. Rule 1113 sets limits on the amount of VOC emissions allowed for all types of architectural coatings, along with a time table for tightening the emissions standards in the future. Compliance with Rule 1113 means that architectural coatings used during construction would have VOC emissions that comply with these limits.

Adherence to applicable provisions of these rules is standard for all development within the Basin. In addition, conditions for the design of waste storage areas on the site would be established through the permit process to ensure enclosures are appropriately designed and maintained to prevent the proliferation of odors. Solid waste generated by the on-site uses will be collected by a contracted waste hauler, ensuring that any odors resulting from on-site uses would be adequately managed.

b. Long-Term Microscale (CO Hot Spot) Emissions

Potential Significant Impact: Whether the Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

For carbon monoxide (CO), the applicable thresholds are:

- California State one-hour CO standard of 20.0 ppm; and
- California State eight-hour CO standard of 9.0 ppm.²

Findings: Potential impacts of the Project related to long-term microscale (CO Hot Spot) emissions are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to long-term microscale (CO Hot Spot) emissions; therefore, no mitigation is required.

² The California standards for CO are equal to, or more stringent than, federal standards.

Facts in Support of the Findings: According to Section 4.3 of the Revised Final EIR Part 2, vehicular trips associated with the development of the World Logistics Center Project could contribute to congestion at intersections and along roadway segments in the Project vicinity resulting in potential local CO “hot spot” impacts. The primary mobile source pollutant of local concern is CO, which is a direct function of vehicle travel speeds and idling time and, thus, traffic flow conditions. CO transport is extremely limited; it disperses rapidly with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthful levels affecting local sensitive receptors (residents, schoolchildren, etc.). High CO concentrations are typically associated with roadways or intersections operating at unacceptable levels of service or with very high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project’s effect on local CO levels.

For this Project analysis, the intersections with the highest traffic volumes and the LOS E or F before mitigation were identified for 2025 using information from the table in the Traffic Impact Assessment (TIA) “Intersection LOS under 2025 Plus Project Phase 1 Conditions.” The intersections with the greatest LOS before mitigation were also identified for buildout using information from the table in the TIA “Intersection LOS under 2040 Plus Build-out Conditions.”

The CO concentrations were estimated using the CALINE4 model using 2025 and 2035 emission factors. The emission factors are for “all” vehicle classes and are not adjusted for a project-specific fleet to provide a worst-case scenario. In addition, the emission factors do not take into account the Project mitigation reductions from requiring that all diesel trucks are model year 2010 or newer (Revised Final EIR Part 2, pg. 4.3-35).

As shown in Revised Final EIR Part 2 Table 4.3-6: *Carbon Monoxide Concentrations at Intersections, 2025* and Table 4.3-7: *Carbon Monoxide Concentrations at Intersections, 2035*, the estimated 1-hour and 8-hour average CO concentrations from Project-generated and cumulative traffic plus the background concentrations are below the State and Federal standards (Revised Final EIR Part 2, pgs. 4.3-35 to 4.3-36). No CO hot spots are anticipated because of traffic-generated emissions by the Project in combination with other anticipated development in the area. Therefore, the mobile emissions of CO from the Project are not anticipated to contribute substantially to an existing or projected air quality violation of CO. Therefore, according to this criterion, air pollutant emissions during operation would result in a less than significant impact. No mitigation is required (Revised Final EIR Part 2, pgs. 4.3-34 to 4.3-35).

c. Acute and Chronic Non-Cancer Health Risk Emission Impacts

Potential Significant Impact: Whether the Project would have the potential to result in impacts to sensitive receptors with regards to acute and chronic non-cancer health risk impacts. For non-cancer health risk hazard index (HI); the applicable threshold is a cumulative increase for any target organ system exceeding 1.0 at any receptor location.

Findings: Potential impacts of the Project related to acute and chronic non-cancer health risk emission impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to acute and chronic non-cancer health risks related to Project emissions; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.3 of the Revised Final EIR Part 2, the construction and operation of the Project would not emit any toxic chemicals in any significant quantity other than vehicle exhaust. While there may be other toxic substances in use on-site, risk would be negligible due to intermittent use (i.e., chemicals from periodic maintenance), dispersion of chemicals throughout the Project site, and compliance with State and Federal handling regulations.

Exposure to diesel exhaust can have immediate (acute) health effects, such as irritation of the eyes, nose, throat, and lungs, and can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. However, according to the rulemaking on *Identifying Particulate Emissions from Diesel-Fueled Engines as a Toxic Air Contaminant* (California Air Resources Board (CARB) 1998), the available data from studies of humans exposed to diesel exhaust are not sufficient for deriving an acute non-cancer Reference Exposure Level (REL).

The analysis, however, does derive an estimate of acute non-cancer risks by examining the acute health effects of the various toxic components that comprise diesel and gasoline emissions. There is specific guidance for estimating the acute non-cancer hazards from these toxic components based on chemical profiles established by the CARB which was used in the revised analysis to determine the Project's acute non-cancer hazards.

To determine the Project's *chronic* non-cancer hazard impact, the highest annual emissions concentrations were determined covering the years 2020 (the commencement of Project construction) to 2035 (the full build-out of the Project). In this regard, the highest annual average concentrations prior to mitigation determined through air dispersion modeling occurred at an existing residence located within the Project boundaries. This concentration was due to the impacts of emissions from the off-road construction equipment and operation equipment. This level of impact results in a chronic non-cancer HI of 0.14. This HI is less than the SCAQMD's significance level of 1.0, and is, therefore, less than significant. The estimation of the *acute* non-cancer HI requires the estimation of the maximum 1-hour impacts of toxic air contaminants (TAC) components in organic gases and particulate matters (PM) emissions. For Project construction, estimates of the maximum 1-hour reactive organic gases (ROG) and PM exhaust emissions were derived from the Project's peak daily construction equipment emissions; for Project operation, estimates of the Project's maximum 1-hour ROG and PM emissions were derived from the Project's peak hour traffic data along the nearly 230 roadway segments contained within the study area and then speciated or broken down into the various TAC components by fuel type, gasoline and diesel, and emission type (i.e., exhaust, evaporative, brake wear and tire wear). The acute non-cancer HI was determined by using the highest annual emissions concentrations assuming that the project would be constructed between 2020 and 2034 and full operation starts in 2035. Based on this information, the maximum acute non-cancer HI found at any receptor within the model domain prior to mitigation was 0.07 during any year of project construction and operation, which is less than the SCAQMD's non-cancer HI of 1.0, and, therefore, is less than significant without mitigation. Therefore, the potential for short-term acute and chronic exposure from TAC emissions are considered to be less than significant and no mitigation is required. (Revised Final EIR Part 2, pgs. 4.3-64 to 4.3-65).

d. Odors - Cumulative

Potential Significant Impact: Whether the Project’s contribution to cumulative objectionable odors would be cumulatively considerable.

Findings: Potential cumulative impacts related to odors are discussed in detail in Section 6.3 of the Revised Final EIR Part 2, pg. 6.3-34 to 6.3-35. Based on the entire record before us, this Council finds that there will be no cumulative impacts related to objectionable odors; therefore, no mitigation is required.

Facts in Support of the Findings: Section 6.3 of the Revised Final EIR Part 2 examined the environmental documents of cumulative projects to determine whether respective projects would result in excessive nuisance odors, as defined under the California Code of Regulations and Section 41700 of the California Health and Safety Code. Of the 173 environmental documents that were evaluated (173 environmental documents were available for the 359 cumulative projects), all found that the respective projects would not create objectionable odors that will affect a substantial number of people and many projects were found to have a less than significant impact or no impact at all. None of the projects were of the type described by the SCAQMD as being associated with substantial odors such as agricultural uses, wastewater treatment plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. Furthermore, Project-specific impacts would be less than significant and would not exceed the AQMD’s significance threshold for odors. Therefore, impacts associated with this issue would be considered cumulatively less than significant and no mitigation is required. (Revised Final EIR Part 2 pgs. 6.3-34 to 6.3-35)

e. Cumulative CO Hot Spot Impacts

Potential Significant Impact: Whether the Project’s contribution to cumulative impacts associated with the violation of any air quality standard would be cumulatively considerable.

Findings: Potential impacts of the Project related to cumulative CO hot spot impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that no significant cumulative impacts related to CO hot spot impacts will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: As identified in Section 4.3.5.2 of the Revised Final EIR Part 2, no significant CO hot spot impacts would occur as a result of the Project. The SCAQMD anticipates that CO emissions in the future will decrease with advances in technology. As previously identified, background concentrations in future years are anticipated to continue to decrease as the concerted effort to improve regional air quality progresses. Therefore, ambient CO concentrations, from cumulative projects, in the future years would generally be lower than existing conditions.

Of the 173 environmental documents (173 environmental documents were available for the 359 cumulative projects) that were reviewed, all projects found that no hot spot impacts would occur with their respective projects. Similar to the Project, intersections within the highest traffic volumes and worst LOS were identified and evaluated. No exceedances of significance thresholds were estimated. The traffic volumes utilized in the analysis include other past, present, and reasonably foreseeable projects expected to be constructed by the time Project Phase 1 and buildout is to occur (Revised Final EIR Part 3, Appendix F, pg. 1). Furthermore, Project-

specific impacts would be less than significant and would not exceed the AQMD’s significance threshold for CO hot spot emissions. Based on the analysis and SCAQMD methodology, it is reasonable to assume that a less than significant cumulative CO impact would occur. No mitigation is required. (Revised Final EIR Part 2 pgs. 6.3-35 and 6.3-36).

f. Cumulative Non-Cancer Hazard Index

Potential Significant Impact: Whether the Project’s contribution to the cumulative exposure of substantial pollutant concentrations on sensitive receptors would be cumulatively considerable with regard to non-cancer hazard index (HI)..

Findings: Potential impacts of the Project related to cumulative non-cancer hazard index are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that no significant cumulative impacts related to non-cancer acute and chronic hazard impacts will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: The SCAQMD uses the same significance thresholds for project-specific and cumulative health risk impacts. The only case where the significance thresholds for project-specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. The project-specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. Because the cumulative HRA included emissions from both the Project and the 359 cumulative projects, the cancer risks and chronic HIs calculated are the cumulative health risk values that will be compared to the selected cumulative HRA threshold. In terms of non-cancer thresholds, the non-cancer HI value at each of the modeled receptor locations is less than SCAQMD cumulative threshold of 3.0. Therefore, the Project is expected to have a less than significant cumulative impact (Revised Final EIR Part 2, pg. 6.3-48 through pg. 6.3-49).

3. Biological Resources

a. Adopted Policies and Ordinances

Potential Significant Impact: Whether the Project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Findings: Potential impacts of the Project related to adopted policies and ordinances are discussed in detail in Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in conflict with local policies or ordinances and, therefore, no mitigation is required.

Facts in Support of the Findings: As detailed in Section 4.4 of the Revised Final EIR Part 3, City policies or ordinances identified in the General Plan protecting biological resources are summarized in Table 4.4-5: General Plan and Municipal Code Biological Resource Policies (Revised Final EIR Part 3, pg. 4.4-59 to 4.4-60) As detailed in Table 4.4-5, the Project is consistent with local policies and ordinances protecting biological resources that apply to the Project area. Compliance with State and Federal regulations to ensure protection and preservation of significant biological resources, and the implementation of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) are the applicable policies/ programs that the Project

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must implement. As there are no other local policies or ordinances regarding the protection of biological resources identified by the City or other local jurisdiction applicable to the Project site, no impact would occur, and no mitigation is required. (Revised Final EIR Part 3, pgs. 4.4-59 to 4.4-60).

b. Habitat Fragmentation/Wildlife Movement

Potential Significant Impact: Whether the Project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Findings: Potential impacts of the Project related to habitat fragmentation/wildlife movement are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in habitat fragmentation or interfere with wildlife movement; therefore, no mitigation is required.

Facts in Support of the Findings: Habitat fragmentation occurs when a single, contiguous habitat area is divided into two or more areas, or where an action isolates two or more new areas from each other. Isolation of habitat occurs when wildlife cannot move freely from one portion of the habitat to another or to/from one habitat type to another. Habitat fragmentation may occur when a portion of one or more habitats is converted into another habitat, as when scrub habitats are converted into annual grassland habitat because of frequent burning. Wildlife movement includes seasonal migration along corridors, as well as daily movements for foraging. Examples of migration corridors may include areas of unobstructed movement for deer, riparian corridors providing cover for migrating birds, routes between breeding waters and upland habitat for amphibians, and between roosting and feeding areas for birds (Revised Final EIR Part 3, pg. 4.4-64).

According to Section 4.4 of the Revised Final EIR Part 3, the Project area contains no significant cover of native plant communities and currently experiences heavy disturbance associated with agricultural activities. Additionally, the Project area is adjacent to State Route 60 (SR-60) and Gilman Springs Road on the north and east and is bordered by urban development on the west. The nearest linkage area as identified under the MSHCP is Proposed Linkage 5 and is located approximately 3 miles north of the Project. Proposed Constrained Link 20 is approximately 3.6 miles south of the Project. . The development of the Project area will not impede the movement of any wildlife; therefore, the Project will not affect any wildlife movement corridor.

The San Jacinto Wildlife Area (SJWA) currently provides foraging habitat for various resident and migratory wildlife species. The southern portion of the Project site adjacent to the SJWA lands has been actively farmed for decades and is regularly disked. The northern portion of the SJWA is designated as open space and no development is proposed for this area.

Although the Project area does not contain any designated wildlife movement corridors or MSHCP linkages (i.e., MSHCP, City General Plan, etc.) it is likely that wildlife moves through adjacent properties such as the SJWA and the Mystic Lake area to the south, the Badlands area to the east and the Lake Perris State Recreation Area to the southwest. The MBA original Project biological report concluded, updated in 2018 by ESA's surveys, that development of the Project as proposed would not directly have any significant impact on wildlife movement in the area and would not fragment habitat or adversely affect wildlife movement through the

surrounding areas because the Project site contains limited vegetation cover and minimal resource value for wildlife moving between habitat blocks (Revised Final EIR Part 4, Appendix E).

The biological report also determined that the WLC site would not impede or minimize any significant wildlife corridor for the target species associated within the Reche Canyon/Badlands Area plan, which include Bell's sage sparrow (*Amphispiza belli belli*), cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), bobcat (*Lynx rufus*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), mountain lion (*Puma concolor*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), Stephens' kangaroo rat (*Dipodomys stephensi*), and Nevin's barberry (*Berberis nevinii*). In addition, although not required, Drainage 9, comprising the most suitable habitat in the eastern portion of the Project site, is being retained to allow for wildlife movement between the Badlands and the SJWA (e.g., relatively natural channel conditions with 50-foot setbacks on either side of the channel through the Project site property). Therefore, impacts related to wildlife movement are less than significant, and no mitigation is needed. (Revised Final EIR Part 3, pg. 4.4-64).

4. Cultural Resources

a. Human Remains

Potential Significant Impact: Whether the Project would disturb any human remains, including those interred outside of formal cemeteries.

Findings: Potential impacts of the Project related to human remains are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts to human remains; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site is currently undeveloped. No evidence suggesting the Project site has been utilized in the past for human burials has been identified. In the unlikely event that human remains are discovered during grading or construction activities within the Project site, compliance with State law (Health and Safety Code §7050.5) (HSC §7050.5) would be required. State law requires that no further disturbance shall occur until the County Coroner has made determination of the origin and disposition pursuant to Public Resources Code §5097.98. Because adherence to provisions of HSC §7050.5 is required of all development projects, and because adherence to the requirements in State law sufficiently mitigates for potential impacts to human remains, no significant impact related to this issue will occur. Because potential impacts associated with this issue are less than significant, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.5-16 to 4.5-17).

b. Cumulative Cultural Resources Impacts – Human Remains

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would disturb any human remains, including those interred outside of formal cemeteries.

Findings: Potential cumulative impacts to Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development

of the Project will not result in significant cumulative impacts related to human remains; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative ground disturbance in Western Riverside County could disturb human burials. Potentially cumulative projects would be subject to the State laws that protect human remains such as Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Because these State laws have been adopted to protect human remains, compliance with them would assure that cumulative impacts related to the disturbance of human remains would be less than significant. Because there is no evidence of human burials on the Project site and ground disturbing activities on the Project site would be subject to the State laws cited above, the Project's less-than-significant incremental contribution to potential cumulative impacts on human burials would not cause or contribute to a significant cumulative effect. (Revised Final EIR Part 3, pg. 6.5-2 to 6.5-21).

5. Geology and Soils

a. Landslides and Rockfalls

Potential Significant Impact: Whether the Project would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Findings: Potential impacts of the Project related to landslides and rockslides are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to landslides and rockslides that may result in loss, injury or death; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, a large older landslide has been mapped primarily off-site on the northeasterly flanks of Mount Russell, near the southwest portion of the Project site. The landslide appears to have originated on the higher slopes off-site, and moved northeast, partially onto the Project site. The Specific Plan designates 74.3 acres in the southwestern portion of the Project site as open space. This 74.3 acres includes the steepest slopes on-site (i.e., the Mount Russell foothills), which will reduce the potential for significant landslide or rockfall impacts on the Project site to less than significant levels; therefore, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-12).

b. Soil Erosion or Loss of Top Soil

Potential Significant Impact: Whether the Project would result in substantial soil erosion or the loss of topsoil.

Findings: Potential impacts of the Project related to soil erosion or loss of topsoil are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts due to soil erosion or loss of topsoil; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, development of the Project site would require the movement of on-site soils. Portions of the site have been and

are being used for dry farming, and several rural residences are present. Prior to the issuance of grading permits, the Project proponent will be required to prepare and submit detailed grading plans as each phase is developed. These plans will be prepared in conformance with applicable standards of the City's Grading Ordinance. Construction of off-site utility and roadway improvements will also result in the movement of soil. Plans are not available at this time for off-site improvements, but that construction will be subject to the same permitting and plan checking processes.

Development of the Project site and related off-site improvements would involve the disturbance of more than one acre; therefore, the Project is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. A Storm Water Pollution Prevention Plan (SWPPP) will also be required to address erosion and discharge impacts associated with the proposed on-site grading. Compliance with storm water regulations include minimizing storm water contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

Additionally, a preliminary Water Quality Management Plan (WQMP) was prepared for the WLC Specific Plan and contains the post-construction measures, which will help reduce potential impacts to soil erosion to less than significant levels and identifies measures to treat and/or limit the entry of contaminants into the storm drain system. The WQMP is incorporated by reference and/or attached to the Project's SWPPP as the Post-Construction Management Plan.

As soils covering the Project site have a slight-to-high erosion hazard potential and because the Project would be required to adhere to the City's Grading Ordinance, obtain an NPDES Permit, and prepare an SWPPP and a WQMP, construction and operational impacts associated with soil erosion hazards are considered to be less than significant, and no mitigation is required.

Grading for off-site improvements would require subsequent grading permits or related approvals from both the City and County of Riverside, depending on the improvement and its location. Most roadway and intersection improvements will occur within existing rights-of-way or on land that has been previously disturbed. The SWPPP and the WQMP establish performance standards for future development, and implementation the identified measures in those plans will reduce potential erosion impacts to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.6-13 to 4.6-15).

c. Septic Tanks

Potential Significant Impact: Whether the Project would have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Findings: Potential impacts of the Project related to septic tanks are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to soils that may be incapable of supporting septic tanks or alternative wastewater disposal systems; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, all buildings within the Project will be connected to existing wastewater facilities (sewers) owned and operated by the Eastern Municipal Water District. Septic tanks will not be used anywhere within the Project; therefore, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-15).

d. Seismic-Related Ground Failure

Potential Significant Impact: Whether the Project would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground failure.

Findings: Potential impacts of the Project related to seismic-related ground failure are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to seismic-related ground failure; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, the Project site is located within Seismic Zone 4 as defined by the Uniform Building Code (UBC). Exhibit S4 of the Safety Element of the City's General Plan indicates that the Project site is not located in an area susceptible to landslides or slope instability. The Project site lies on relatively flat terrain ($\pm 2\%$ grade) and no landslide areas or mass movement were observed on-site. The only steep topographical features are located in the southwest corner of the Project area. This area is designated for Open Space uses and is not proposed for development.

The Project does not propose any activity known to cause damage by subsidence (e.g., oil, gas, or groundwater extraction). Settlement generally occurs within areas of loose, granular soils with relatively low density. The Project site is underlain by relatively dense alluvial and dense sedimentary bedrock materials at depth and the potential for settlement is considered low. Because the Project site does not exhibit characteristics of a high potential for subsidence or settlement, impacts are considered less than significant. No mitigation is required.

The potential for liquefaction generally occurs during strong ground shaking within relatively cohesionless loose sediments where the groundwater is typically less than 50 feet below the surface. Because the Project site does not exhibit characteristics of a high potential for liquefaction induced settlement (i.e., relatively dense soils with groundwater levels in excess of 100 feet), impacts are considered less than significant. No mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-16).

e. Cumulative Geology Impacts – Landslides and Rockfalls

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant cumulative impacts related to landslides or rockfalls; therefore, no mitigation is required.

Facts in Support of the Findings: The Project site includes one area that encompasses the lower slopes of Mount Russell. The Project designates these slope areas as Open Space, which would reduce the potential for landslide or rockfalls to less than significant.

Because projects in the cumulative scenario would not expose people or structures to landslides or rockfall impacts, the Project's incremental less-than-significant contribution to potential cumulative effects would not alone cause or create a significant cumulative effect relating to the exposure of people and structures to landslide or rockfall impacts. As a result, the cumulative projects in conjunction with the World Logistics Center project do not constitute a cumulatively considerable effect on exposure of persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides (Revised Final EIR Part 3, pg. 6.6-13 through pg. 6.6-14).

c. Cumulative Geology Impacts – Soil Erosion or Loss of Topsoil

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a cumulative significant impact on substantial soil erosion or the loss of topsoil.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant cumulative impacts with respect to soil erosion or loss of topsoil; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario have the potential to result in short-term erosion of surface soils; however, as appropriate, the cumulative projects include the implementation of erosion control features that comply with National Pollutant Discharge Elimination System (NPDES) and SCAQMD Rule 403 (fugitive dust) requirements and would reduce erosion to less than significant. In addition, those projects include improvements that would not increase long-term erosion of on-site soils and therefore, would result in less than significant impacts.

The implementation of the proposed Project includes specific components to reduce potential impacts of soil erosion or loss of topsoil during construction activities. These components are identified in Section 4.6.5.2 of the Revised Final EIR Part 4 Volume 3. With the implementation of these construction measures/ components, the Project would result in a less than significant soil erosion or loss of topsoil impact. In assessing the cumulative projects in conjunction with the Project, the implementation of erosion control features that would be required to obtain grading permits would reduce the cumulative soil erosion or loss of topsoil impact to less than significant. Further, the Project's incremental less-than-significant contribution to potential cumulative impacts associated with soil erosion or the loss of topsoil alone would not cause a significant cumulative impact. Thus, cumulative erosion and topsoil impacts would not be cumulatively considerable during construction.

Long-term operations of projects in the cumulative scenario have the potential to cause soil erosion or loss of topsoil if soil stabilization measures are not incorporated into ongoing operations. However, based on review of the environmental documentation for the cumulative related projects, each project identifies that the implementation of the urban uses on the project site would result in less than significant soil erosion impacts,

or each project would incorporate soil stabilization measures to reduce soil erosion impacts to less than significant. In assessing the cumulative related projects in conjunction with the Project, the implementation of soil stabilization measures for those projects that require those measures such as the WLC Project, the potential cumulative long-term soil erosion impact would be less than significant. Because the Project includes various detention/retention, treatment and soil stabilization measures to reduce potential long-term soil erosion or the loss of topsoil with the measures identified in Section 4.6.5.2 of the Revised Final EIR Part 4 Volume 3, the Project would not cause a significant cumulative impact. Thus, cumulative erosion and topsoil impacts would not be cumulatively considerable during operation (Revised Final EIR Part 3, pg. 6.6-13 through pg. 6.4-14).

d. Cumulative Geology Impacts – Seismic-Related Ground Failure

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground failure.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant cumulative impacts related to seismic ground failure; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, persons or structures associated with projects in the cumulative scenario could be exposed to geologic conditions that cause ground failure during seismic events. These potential geologic conditions include landslides, settlement, subsidence, or liquefaction, and potential ground failure that could expose people or structures to these effects. The exposure to these impacts could result in significant impacts; however, each of the cumulative projects would be subject to the City of Moreno Valley’s grading requirements and building codes. Compliance with these requirements would reduce potential effects to less than significant.

The Project site is located in an area of the City that is not subject to settlement, subsidence or liquefaction. In addition, the majority of the Project site lies on relatively flat terrain. There is one portion of the site that includes steep topographic features that could be subject to landslides; however, the Project designates this area for Open Space (Planning Area 30). In considering the implementation of the Project in combination with the cumulative related projects, no significant cumulative effect of exposing persons and structures to potential seismic ground failure would result. Therefore, impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-15).

6. Hazards and Hazardous Materials

a. Within Two Miles of a Public Airport or Within an Airport Land Use Plan or Within Two Miles of a Private Airport

Potential Significant Impact: Whether the Project would result in a safety hazard for people residing or working in the Project area or be located within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area.

Findings: Potential impacts of the Project related to safety hazards associated with proximity to public and private airports are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the nearest airport to the Project area is March Air Reserve Base (MARB), approximately 5.5 miles to the southwest. The airfield is operated by two entities, MARB (military) and March Inland Port Airport Authority (quasi- governmental/private). In addition, Perris Valley Airport is located approximate 15 miles southwest of the Project area. Perris Valley Airport is a private airport that is open to the public and is utilized for skydiving and ballooning activities. The WLC Project area is not located within the Airport Influence Area for either airport. Given the distance of the WLC Project area to both airports in the vicinity, the development of the WLC Project area as proposed would not result in private airport safety hazards for people residing or working in the WLC Project area. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-15).

e. Existing or Proposed Schools

Potential Significant Impact: Whether the Project would emit hazardous emissions or handle acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Findings: Potential impacts of the Project related to existing or proposed schools are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant hazardous materials impacts related to existing or proposed schools; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, there are no existing school facilities within one-quarter of a mile of the Project area. The nearest existing school is Calvary Chapel Christian School which is located approximately 1.17 miles northwest of the Project. There is one proposed elementary school site that is located within one-quarter mile of the WLC Project area. The site for proposed Wilmot Elementary School is located on Bay Avenue at Wilmot Street, approximately 0.25-mile west of the Project area.

The amount and type of materials that would be used during Project construction (building and infrastructure) or stored in the high-cube logistics distribution center after construction is unknown at this time. While the warehouse facilities themselves are not expected to utilize acutely hazardous materials, the possibility exists that such materials could be stored or transported to and from the Project site. For the purposes of this analysis, it is assumed that the Project will handle substances that may be acutely hazardous. The handling of hazardous materials or emission of hazardous substances in accordance with the Hazardous Materials Business Emergency Plan (HMBEP) as required by applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials or emissions of hazardous substance near existing or proposed schools are less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.8-15 through 4.8-16).

f. Routine Transport, Use, or Disposal of Hazardous Materials, Reasonably Foreseeable Upset and Accident Conditions

Potential Significant Impact: Whether the Project would create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials, or create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Findings: Potential impacts of the Project related to the routine transport, use, or disposal of hazardous materials and reasonably foreseeable upset and accident conditions are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to the routine transport, use, or disposal of hazardous materials and reasonably foreseeable upset and accident conditions; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, exposure to hazardous materials during the operation of the on-site uses may result from (1) the improper handling or use of hazardous substances; (2) transportation accidents; or (3) an unforeseen event (e.g., fire, flood, or earthquake). The severity of any such exposure is dependent upon the type and amount of the hazardous material involved; the timing, location, and nature of the event; and the sensitivity of the individual or environment affected.

Truck-Related Risks. The regulation of the transport of hazardous materials on State highways is governed by the United States Department of Transportation (USDOT), as described in Title 49 of the Code of Federal Regulations and by Title 13 of the California Code of Regulations. Appropriate documentation for all hazardous waste that is transported in connection with Project site activities would be provided as required by hazardous materials regulations. Hazardous waste produced on-site is subject to requirements associated with accumulation time limits, proper storage locations and containers, and proper labeling. Additionally, for removal of hazardous waste from the site, hazardous waste generators are required to use a certified hazardous waste transportation company, which must ship hazardous waste to a permitted facility for treatment, storage, recycling, or disposal. Compliance with applicable regulations would reduce impacts associated with the use, transport, storage, and sale of hazardous materials. The enforcement of applicable local, State, and Federal standards, ordinances, and regulations will ensure that potential impacts associated with environmental and health hazards related to an accidental release of hazardous materials are less than significant and no mitigation is required.

Freeway Accident Risks. According to the California Department of Transportation's Traffic Accident Surveillance and Analysis System (TASAS) report, there are approximately 105 accidents per year along a 3.75-mile stretch of SR-60 between Nason Street and Gilman Springs Road in the general vicinity of the Project area. The data were derived for the three-year span of January 1, 2008, to December 31, 2010.³ During this period, there were 316 accidents (average of 105 per year) along SR-60 (both westbound and eastbound). Of the 316 accidents, approximately 15.8 percent involved trucks (tractor/trailer). There were 127 eastbound accidents (19 or 15% involving trucks) and 189 westbound accidents (31 or 16.4% involving trucks). It is

³ California Department of Transportation, TSAR – Accident Summary 1/1/08-12/31/10

possible that congestion on the freeway might result in some WLC - related trucks exiting the freeway at off-ramps other than World Logistics Center Parkway or attempting to enter the freeway at on-ramps if the drivers see or hear on their radios that the freeway is congested. In most instances, drivers will use the shortest route indicated on GPS system maps or the route(s) they have used previously, regardless of traffic conditions at the time. In addition, due to the type of uses planned within the WLC Specific Plan area, much of the Project-related traffic will be accessing the WLC site during off-peak times, so the chances of congestion or accidents occurring during the time they are accessing the site would be reduced. The accident database contains no information on whether the truck was the cause of a particular accident or the time of day, the vehicles involved, if hazmat spills occurred, if trucks or other vehicles detoured off the freeway, etc. Without these data, it is overly speculative to extrapolate any particular conclusions. Despite the lack of specific evidence regarding freeway accidents, it is reasonable to conclude that potential environmental impacts in this regard will be less than significant given the regulation of truck traffic on freeways according to State and Federal laws, and truck restrictions on local streets according to the City's Municipal Code (i.e., truck route enforcement) and no mitigation is necessary.

Land Use-Related Hazmat Risks. Both the Federal Government and the State of California require all businesses that handle more than a specified amount of hazardous materials or extremely hazardous materials, to submit a Hazardous Materials Business Emergency Plan (HMBEP) to the local Certified Unified Program Agency (CUPA). The CUPA with responsibility for the City of Moreno Valley is the County of Riverside Community Health Agency, Department of Environmental Health. The HMBEP must include an inventory of the hazardous materials used in the facility, and emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. The HMBEP must also include the Material Safety Data Sheet for each hazardous and potentially hazardous substance used. The Material Safety Data Sheets summarize the physical and chemical properties of the substances and their health impacts. The plan also requires immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information of all company emergency coordinators of the business, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel.

HMBEPs are designed to be used by responding agencies, such as the Moreno Valley Fire Department, to allow for a quick and accurate evaluation of each situation for an appropriate response. HMBEPs are also used during a fire to quickly assess the types of chemical hazards that firefighting personnel may have to deal with, and to make decisions as to whether or not the surrounding areas need to be evacuated. Compliance with existing law will ensure that no significant impacts pertaining to the creation of hazards affecting the public will occur. The handling of hazardous materials in accordance with the HMBEP as required by applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials are less than significant and no mitigation is required.

Though the uses in the Project area are not expected to utilize acutely hazardous materials in their daily operation, a potential for an accidental release of hazardous materials into the environment is present at the Project site as it is at any commercial, retail, or industrial site. Compliance with the identified State and Federal

transportation safety standards will govern the handling of hazardous materials during truck and freight transfer operations. These standards include procedures to contain, report, and remediate any accidental spill or release of hazardous materials. The handling of hazardous materials in accordance with all applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials at the Project site will be less than significant and no mitigation is required.

Hazardous On-site Facilities. The Project site is adjacent to a regional natural gas compressor station operated by San Diego Gas & Electric (SDG&E). At present, the plant occupies a 19-acre site, surrounded by 174 acres of SDG&E-owned open space. There is additional open space around the plant, consisting of land owned by the California Department of Fish and Wildlife (CDFW) as part of the SJWA. There are no plans to expand or otherwise modify the plant and/or its open space zone, which is considered adequate at this time to protect public health and safety, including users of the SJWA and new employees and users of the new warehouses associated with the WLC.

There will be sufficient setback from the plant to future warehouse uses (e.g., 1,000 feet). No development or change in operation has been announced for the property within the SJWA. Existing safety conditions will continue relative to the gas facility as it relates to the SJWA. Compliance with established safety laws and regulations regarding the natural gas facilities will reduce the potential impact to a less than significant level and no mitigation is required.

The Southern California Gas Company (SCGC) operates a natural gas metering station on a one-acre site located one-quarter mile north of the SDG&E Compressor Plant. Future warehouses will be set back at least 1,000 feet from the SCGC station. These setbacks appear sufficient to protect future uses/users within the WLC Specific Plan area if upset conditions were to occur at this station. Compliance with established safety laws and regulations regarding natural gas plants is expected to reduce this potential impact to a less than significant level and no mitigation is required. The Project site also contains two natural gas lines that cross the central and southern portions of the site in an east-west direction. They range in size from 16 to 36 inches in diameter and carry natural gas under medium and high pressure. As development occurs in areas with buried natural gas lines, the Project proponent will be required to negotiate with the involved utility provider as to whether these pipelines can be relocated or need to be protected in place. Future development is required to maintain clearance for pipelines depending on their contents and size, in consultation with the serving utility provider. As long as these design restrictions are implemented during the site design and construction process, no significant impacts are expected. However, if a catastrophic accident were to occur involving one or more natural gas lines on-site, there could be property damage and loss of life. While the chance of occurrence is low, there are potential safety risks, mainly to Project employees, if such an accident were to occur. Compliance with established safety laws and regulations regarding pipelines is expected to reduce this potential impact to a less than significant level and no mitigation is required.

Off-site Improvements. A number of off-site improvements will be needed to serve the Project, including three reservoirs, various water, sewer, and drainage improvements within existing rights-of-way, and the SR-60/World Logistics Center Parkway interchange. None of these facilities is expected to create significant hazards or risks to public health or safety. These facilities will require standard improvement plan approvals

through the City of Moreno Valley and/or County of Riverside. Based on these plan reviews, no significant hazard-related impacts are expected, and no mitigation is required.

Hunting Accidents. Immediately south of the Project area is the SJWA, where limited hunting is permitted. Hunting in these areas requires a hunting license issued by the State. The Fish and Game Code provides strict regulations on hunting, including limits on hours, time of year, quantity, and firearms.

Hunting on State lands, such as the SJWA, can only be done with shotguns that are smaller in size (higher in gauge) than 10-gauge shotguns. In addition, Federal law allows no more than three shells in the chamber of the shotgun at any given time during hunting. The SJWA is patrolled by CDFW wardens to ensure that all hunting rules and regulations are followed. The private hunt clubs are also governed by similar rules and regulations to ensure the safety of their members and the general public.

Given the proximity of the Project area to the nearby hunting areas, it is appropriate to consider the possibility of stray gunfire as a possible risk to future employees, visitors, and facilities on the Project site. Accident conditions that could arise from the nearby hunting activities are expected to be less than significant for the following reasons: the most intensive operations at the high-cube logistics center would be during off-peak hours when there is no hunting; the hunting on the adjacent areas to the south of the WLC Project area is in accordance with all applicable local, State, and Federal standards and regulations; and the range for the allowed firearms (shotguns smaller than 10-gauge) would be 60 yards or less providing a safe distance for development to occur in the WLC Project area, which would be a safe distance from the actual hunting areas. It should also be noted that the Specific Plan provides for a minimum 250-foot setback along the southern boundary of the Specific Plan property, which is greater than the minimum safe distance described above. Impacts are less than significant, and no mitigation is required.

Valley Fever. During processing of the Highland Fairview Corporate Park EIR, a local resident expressed concern regarding Valley Fever (*Coccidiomycosis*), a disease caused by fungus spores (*Coccidioides immitis*). The WLC Specific Plan site is adjacent to the Highland Fairview Corporate Park site. These fungal spores most typically lie dormant in relatively undisturbed soil with native vegetation cover in the Central Valley of California.

The likelihood of these spores to occur at this site is remote. The soil at the Project site is not undisturbed and has little, if any, native vegetation cover. The site consists primarily of disturbed agricultural soils (i.e., regularly tilled and occasionally irrigated) and had virtually no native vegetative cover. The local soils will be extensively disturbed during grading and would be regularly watered to control dust. Erosion control measures will be implemented immediately following grading. Under these conditions, it is unlikely that *Coccidioides immitis* spores would survive in the soil. This potential impact appears minimal and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.8-16 to 4.8-20).

g. Located on a List of Hazardous Materials Sites

Potential Significant Impact: Whether the Project would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Findings: Potential impacts of the Project related to being located on a hazardous materials site is discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to development occurring on a hazardous materials site; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the Project area is not listed in any of the searched regulatory databases provided by Environmental Data Resources (EDR). This included a review of Federal, State, and local environmental databases for information pertaining to documented and/or suspected contaminated sites, known handlers or generators of hazardous waste, waste disposal facilities, releases of regulated hazardous substances and/or petroleum products within specified search distances. Analysis of soil samples obtained during the limited site characterizations conducted as part of the Phase I Environmental Site Assessments (ESAs) indicated there were trace concentrations of pesticides present in near surface soils at some of the sample locations. However, the pesticide concentrations were below the EPA’s Preliminary Remediation Goals, for residential properties. No further sampling was deemed necessary and unrestricted use of the property is warranted. Since neither the Project site nor areas in the vicinity of the Project site are listed on any of the hazardous materials sites as defined by Government Code Section 65962.5, there would be a less than significant impact and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-20).

e. Conflict with Emergency Response Plans

Potential Significant Impact: Whether the Project would impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation

Findings: Potential impacts of the Project related to emergency response plan conflicts are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to emergency response plan conflicts; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley adopted its Local Hazard Mitigation Plan (LHMP) on October 4, 2011. This document identifies known hazards throughout the community and identifies strategies for which to prepare for and respond to these hazards if and when it is necessary. Figure 12-2 of the LHMP maps primary and alternative evacuations routes out of Moreno Valley. There are three (3) routes that either run through or along the Project area that are identified as primary evacuation routes: Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard. The Project will be designed, constructed, and maintained in accordance with applicable standards associated with vehicular access, ensuring that adequate emergency access and evacuation will be provided. Construction activities that may temporarily restrict vehicular traffic would be required to implement appropriate measures to facilitate the passage of persons and vehicles through/around any required road closures. Compliance with existing regulations for emergency access and evacuation will ensure that impacts related to this issue are less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-20).

f. Wildland Fire Risk

Potential Significant Impact: Whether the Project would expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Findings: Potential impacts of the Project related to wildland fire risk are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to wildland fire risk; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley is subject to both wildland and urban fires. Wildfires in particular pose a threat to the northern and eastern portions of the City, near the WLC Project area. Moreno Valley's LHMP documents that three wildland fires have occurred within the WLC Project area since 2003. Although the Project area is not within a mapped fire hazard area, the Badlands directly east of the Project area are considered a High Fire Hazard Area. Development of the eastern portion of the Project could expose persons or property to wildland fire risks given the proximity of the Project area adjacent to a High Fire Hazard Area. Regardless of this proximity, all new structures in the Project area must be constructed in compliance with Title 24 of the California Code of Regulations to safeguard life and property from fire hazards, including the installation of automated fire suppression systems. Compliance with these standards would be enforced during building permit review and the construction inspection period. In addition, no development will be allowed within the San Jacinto Fault Zone, which runs parallel and just west of Gilman Springs Road; this area of limited development will provide a fuel or fire break to help protect future occupied uses within the WLC Specific Plan.

Six fire stations presently serve the City of Moreno Valley and a seventh will be built on the Project site. Station No. 58, the Moreno Beach station, is the closest station to the Project area (approximately a quarter of a mile directly west). Given the proximity of Station No. 58, the construction of the on-site fire station and with all new structures constructed in compliance with Fire and Building Code regulations, the susceptibility and exposure of the Project to wildland fires would be limited and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-21).

g. Cumulative Hazards and Hazardous Materials Impacts

1. Within Two Miles of a Public Airport or Within an Airport Land Use Plan or Within Two Miles of a Private Airport

Potential Significant Impact: Whether the Project would result in a significant cumulative impacts related to safety hazards for people residing or working in the Project area or be located within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area.

Findings: Potential cumulative impacts of the Project related to safety hazards associated with proximity to public and private airports are discussed in detail in Section 4.8 of the Revised Final EIR Part 4, Volume 3.

Based on the entire record before us, this City Council finds that development of the Project will not result in significant cumulative impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: The WLC Project area is not located within the Airport Influence Area for either airport. Given the distance of the WLC Project area to both airports in the vicinity, the development of the WLC Project area as proposed would not result in private airport safety hazards for people residing or working in the WLC Project area. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-15).

2. **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school**

Potential Significant Impact: Whether the Project would create a significant cumulative impact related to emitting hazardous emissions or handle acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Findings: Potential impacts of the Project related to safety hazards associated with the emission or handling of hazardous materials are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project will not result in cumulative significant impacts related to hazardous materials within an existing or proposed school; therefore, no mitigation is required.

Facts in Support of the Findings: The handling of hazardous materials or emission of hazardous substances in accordance with the Hazardous Materials Business Emergency Plan (HMBEP) as required by applicable local, State, and Federal standards, ordinances, and regulations would ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials or emissions of hazardous substance near existing or proposed schools would be less than significant. The project would not contribute to cumulative safety hazards for school-age children within ¼-mile of the project because the nearest existing school is 1.17 miles from the Project site, and the nearest proposed school site is the Wilmot Elementary School, located on Bay Avenue at Wilmot Street, approximately 0.25 mile west of the Project area. Therefore, the Project would not cause or contribute to any potential significant cumulative impacts to existing or proposed schools located within 0.25 miles from the Project.

Many of the cumulative projects would use, handle, store, and/or transport hazardous materials or require demolition of structures containing such materials within ¼-mile of a proposed school. Some of the cumulative projects may be on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5. However, each cumulative project would be required to comply with existing Federal, State, and local regulations related to hazardous material sites, including cleanup sites, and hazardous materials generators. As such, cumulative development would account for clean-up of many existing hazardous conditions and would not result in significant cumulative impacts related to the exposure of students to hazardous emissions within 0.25-mile of a proposed school (Revised Final EIR Part 3, pg. 6.8-14).

3. **Create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials, Reasonably Foreseeable Upset and Accident Conditions**

Potential Significant Impact: Whether the Project would create a significant cumulative hazard to the public through the routine transport, use, or disposal of hazardous materials? Would the project create a significant cumulative hazard to the public or the environment through reasonably foreseeable upset and accident?

Findings: Potential impacts of the Project related to safety hazards associated with routine transport, use, or disposal of hazardous materials are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project will not result in significant cumulative impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.8 of the Revised Final EIR Part 3, the Project's incremental less than significant contribution, in combination with the impacts of other cumulative projects, could create a significant impact related to this issue. For example, the substantial increase in trucks in and around the WLC site would incrementally increase the risks of accidents involving truck-related fuels (e.g., fire or explosion). However, the number of trucks containing hazardous materials on the road in a given area at any given time would be difficult if not impossible to calculate, and it would be likewise difficult to estimate the number and/or location of accidental spills and leaks, which, by their nature, are accidental or unplanned occurrences, it would be impossible to predict the specific occurrence of such events on the project site. Despite these uncertainties, it is reasonable to assume that with an increase in vehicles transporting hazardous materials would incrementally increase the potential for accidents on a regional basis. However, the enforcement of applicable local, State, and Federal standards, ordinances, and regulations will ensure that potential cumulative impacts associated with environmental and health hazards related to an accidental release of hazardous materials would be less than significant (Revised Final EIR Part 3, pg. 6.8-15)

4. **Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;**

Potential Significant Impact: Whether the Project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant cumulative hazard to the public or the environment?

Findings: Potential impacts of the Project related to sites included on a hazardous materials sites are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds the Project is not located on a site compiled pursuant to Government Code Section 65962.5, therefore, no mitigation is required.

Facts in Support of the Findings: Several cumulative projects could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment. However, these projects would be required to comply with existing Federal, State, and local regulations related to hazardous material sites, including

cleanup sites, and hazardous materials generators. As such, cumulative development would account for clean-up of many existing hazardous conditions and would not result in cumulatively significant impacts.

The Project site is not located on a site compiled pursuant to Government Code Section 65962.5. As a result, the Project's contribution to potential cumulative impacts related to development on a hazardous materials site would not cause or contribute to a significant cumulative effect (Revised Final EIR Part 3, pg. 6.8-16).

5. **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation;**

Potential Significant Impact: Whether the Project would cumulatively impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation.

Findings: Potential impacts of the Project cumulatively-related impairment of an adopted emergency response plan are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not contribute a significant impact to an adopted emergency response plan or emergency evacuation and would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: It is anticipated that cumulative projects would request the appropriate approvals and be in conformance with applicable codes and regulations. Therefore, cumulative development would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Cumulative impacts involving wildfires consists of future development adjacent to a High Fire Hazard Area. The risk to each future project is based on the location and interface between urbanized area and wildland areas. The risks associated with development in these areas can only be reduced through conformance with Fire and Building Code regulations, it is anticipated that cumulative development would not create a significant and cumulative impact associated with wildland fire hazards. As a result, the Project's incremental impact is less than significant and its contribution to any potential impacts related to emergency response and evacuation would not cause or contribute to a significant cumulative impact.

6. **Expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

Potential Significant Impact: Whether the Project would expose people or structures to a significant cumulative risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Findings: Potential impacts of the Project related to wildland fire risks are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not create significant contribution to cumulative human and structural risks associated with wildland fires; therefore, no mitigation is required.

Facts in Support of the Findings: Development of the eastern portion of the Project site could expose persons or property to wildland fire risks given the proximity of the Project area adjacent to a High Fire Hazard Area.

Regardless of this proximity, all new structures in the Project area must be constructed in compliance with Title 24 of the California Code of Regulations to safeguard life and property from fire hazards, including the installation of automated fire suppression systems. Compliance with these standards would be enforced during building permit review and the construction inspection period. In addition, no development would be allowed within the San Jacinto Fault Zone, which runs parallel to, and west of Gilman Springs Road; this area of limited development would serve as a fuel or fire break to help protect future occupied uses within the Project area. Compliance with existing standards, codes and regulations for fire safety would ensure that cumulative impacts related to this issue would be less than significant. The Project's incremental less-than-significant contribution, in combination with the impacts of other cumulative projects, would not cause or contribute to significant cumulative impacts related to risks from wildland fires (Revised Final EIR Part 3, pg. 6.8-17).

7. Hydrology, Drainage, and Water Quality

a. Seismic Flooding-Related Impacts

Potential Significant Impact: Whether the Project would expose people or structure to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Findings: Potential impacts of the Project related to seismic flooding-related impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to seismic flooding-related impacts; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, because neither the Project site nor the Project's off-site improvement areas are not identified as being located within the City's mapped dam inundation area; therefore, the Project would not result in the exposure of people or structures to risk of loss, injury, or death involving flooding as a result of failure of either the Poorman Reservoir (Pigeon Pass Dam) or Lake Perris Dam. Impacts related to this issue would be less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4. 9-26 to 4.9-28)

h. Seismic-Related Impacts

Potential Significant Impact: Whether the Project would expose people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Findings: Potential impacts of the Project related to seismic-related impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to loss, injury, or death involving inundation by seiche, tsunami, or mudflow; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, the Project area is not at risk of inundation by a tsunami as it is located approximately 56 miles from the Pacific Ocean. The Project area is located approximately 2.5 miles northeast of Lake Perris. Lake Perris is an enclosed body of water and could be subject to a seiche during a seismic event. However, a seiche event would not affect the Project area because water levels in the lake are not high enough to overtop the Perris Dam in the

event of a seiche.¹ The Perris Dam has been designed to prevent seiche phenomena due to the region's high seismicity. In addition, the topography between the Specific Plan area and Lake Perris has multiple hills and valleys. Given these factors, impacts associated with seiche events are less than significant for the WLC Project.

Except for the far southwest corner, the Project site is located in a gently sloping area where landslides and mudslides would not occur. No development is proposed on the steep slopes of Mount Russell in the southwesterly portion of the property, which is included in the 74.3 acres of open space designated within the WLC Specific Plan. Therefore, a less than significant impact associated with exposure of people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow would occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-27).

c. Groundwater

Potential Significant Impact: Whether the Project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin and there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Findings: Potential impacts of the Project related to groundwater impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to interference with groundwater recharge such that the Project may impede sustainable groundwater management of the basin; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, based on the Water Supply Assessment (WSA) prepared for the Project by the Eastern Municipal Water District (EMWD), water demand for the proposed on-site uses would total approximately 1,991.25 acre-feet per year (AFY).⁴ The EMWD considers this a worst-case estimate based on the total acres and amount of square footage of logistics uses proposed by the Project. This estimate does not take into account the Project landscaping design with xeriscape drought-tolerant landscaping and on-site collection of runoff and channeling it to landscaped areas to minimize irrigation on the interior of the Project site. The Project will obtain water service from the EMWD. It is anticipated that the Project would primarily utilize imported water purchased from Metropolitan Water District of Southern California (MWDSC). In the event that the supply of imported water is reduced, it would be supplemented with new local supply projects during multiple dry years, if needed. The WSA prepared for the Project indicates that development of the Project will not include groundwater for water supply. Rather, this Project, as well as other new developments in the EMWD's service area, will be supplied exclusively with imported water provided by MWDSC. The imported water may be treated by MWDSC as untreated water and subsequently treated by the EMWD or recharged into the basin for later withdrawal.

The Project will not substantially interfere with groundwater recharge due to the Project implementation of bioretention areas and detention basins with infiltration capacity that mitigates the impact of reduced pervious

⁴ *Water Supply Assessment Report for the World Logistics Center Specific Plan in Moreno Valley*, Eastern Municipal Water District, March 21, 2012.

areas. Bioretention areas and detention basins will be implemented in addition to the remaining impervious areas. The only use of groundwater may be to support continued agriculture on portions of the WLC Specific Plan property that have not yet been developed. The EMWD developed the West San Jacinto Groundwater Basin Management Plan (Plan) to help ensure that local groundwater resources are conserved, and groundwater overdraft does not occur, based on projections of future growth and expected water supply conditions. The Plan projects the water consumption demands of existing and future development based on rates of growth assumed by regional planning organizations (i.e., Southern California Association of Governments (SCAG) and Western Riverside County Council of Governments (WRCOG0) and estimates water demand versus available supply under different water supply scenarios (e.g., multiple dry years).

Based on the State Water Supply analysis provided in the Revised Final EIR, the WLC Project is not expected to interfere with groundwater recharge activities or groundwater supplies. Impacts associated with this issue are less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.9-28 to 4.9-30).

d. 100-Year Flooding Impacts

Potential Significant Impact: Whether the Project would place within a 100-year flood hazard area structures that would impede or redirect flood flows or place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Findings: Potential impacts of the Project related to 100-year flood events are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts related to 100-year flooding events; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) identify areas subject to flooding during the 100-year storm.⁵ Based on these FIRM maps, the Project site does not fall within a 100-year flood zone.⁶ Because the Project site does not lie within a 100-year floodplain impacts related to this issue are less than significant. No mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.9-30 to 4.9-32).

e. Hydrology and Water Quality Cumulative Impacts

1. **Would the Project expose people or structure to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?**

⁵ The term “100-year” is a measure of the size of the flood, not how often it occurs. The “100-year flood” is a flooding event that has a one percent chance of occurring in any given year.

⁶ FEMA DFIRM Data, 2008.

Potential Significant Impact: Whether the Project would expose people or structure to a significant cumulative risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Findings: Potential cumulative impacts of the Project related to flooding, including flooding as a result of the failure of a levee or dam are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not cause or contribute to a significant cumulative effect associated with the exposure of people or structures to potential flooding from the failure of a levee or dam; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the Project site and off-site improvement areas could be subject to potential flooding due to a failure of the nearest dam. The nearest dams to the Project site are Pigeon Pass Dam at Poorman’s Reservoir located approximately five miles northwest of the Project site and Lake Perris Dam located approximately four miles southwest of the Project site. Although cumulative development could be exposed to inundation flooding, the Project is not within anticipated inundation areas of either dam or any other dam as mapped within the City of Moreno Valley General Plan Final Program EIR. Therefore, the implementation of the Project would not contribute to the exposure of people or structures to risk of loss, injury, or death involving flooding as a result of failure of either the Poorman Reservoir (Pigeon Pass Dam) or Lake Perris Dam. Therefore, the Project would not cause or contribute to any cumulative effect associated with the exposure of people or structures to flooding (Revised Final EIR Part 3, pg. 6.9-25 through 6.9-26).

2. **Would the Project expose people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?**

Potential Significant Impact: Whether the project would expose people or structure to a significant cumulative risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Findings: Potential cumulative impacts of the Project related to safety hazards associated with significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not cause or contribute to a significant cumulative impact relating to the exposure of people or structures to potential significant cumulative inundation impacts from seiche, tsunami, or mudflow; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the Project site and off-site improvement areas would not be subject to potential inundation by seiche or tsunami. As described in Section 4.9.5.2, the nearest enclosed body of water that could be subjected to seiche conditions is Lake Perris, but the Perris Dam has been designed to prevent seiche phenomena. The watershed is not located near the Pacific Ocean which is where tsunami risks occur. Therefore, cumulative development would not expose people or structures to inundation flooding due to seiche or tsunamis. As a result, the Project would not cause or contribute to any significant cumulative seiche or tsunami inundation impacts. Cumulative development within the watershed could expose people and structures to mudflow inundation due to the presence of steep slopes within the watershed. This exposure could result in significant cumulative impacts.

However, because the Project site as well as off-site improvement areas do not have steep slopes, the Project's contribution to potential cumulative mudflow inundation impacts would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.9-26).

3. **Would the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to the depletion of groundwater supplies or interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Findings: Potential cumulative impacts of the Project related to the depletion of groundwater supplies or interference with of groundwater recharge are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not cause or contribute to a significant cumulative depletion of groundwater supplies or the interference with groundwater recharge; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the Eastern Municipal Water District (EMWD) service area is planned to be supplied exclusively with imported water provided by the Metropolitan Water District. Therefore, cumulative development would not deplete groundwater supplies from use of groundwater. As a result, the Project would not contribute to cumulative impacts to groundwater supplies. Cumulative development would reduce the amount of pervious surfaces within the EMWD service area. This reduction of potential groundwater infiltration areas could cause a significant impact on groundwater recharge. However, because the Project includes the implementation of bioretention areas and detention basins that would provide for infiltration opportunities, the Project's contribution to potential significant cumulative groundwater infiltration impacts would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.9-26 through 6.9-27).

4. **Would the Project place within a 100-year flood hazard area structures that would impede or redirect flood flows?**

Would the Project place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to the placement of structures within a 100-year flood hazard area that would impede or redirect flood flows or the placement of housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Findings: Potential cumulative impacts of the Project related to the placement of structures on 100-year flood hazard areas are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record

before us, this City Council finds that development of the Project would not cause or contribute to significant cumulative impacts relating to the placement of structures within a 100-year flood hazard area that would impede or redirect flood flows; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the project site and off-site improvement areas include areas subject to 100-year storms according to the FEMA FIRM maps. Therefore, cumulative development could expose structures or housing to flood hazards and result in significant cumulative flood hazard impacts. However, because the Project site and off-site improvements are not located in any areas subject to flooding during a 100-year storm, the implementation of the Project would not cause or contribute to any potential significant cumulative flood hazard to structures or housing (Revised Final EIR Part 3, pg. 6.9-27).

5. **Would the Project substantially alter the existing local drainage patterns of the site and substantially increase the rate or amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on-site or off-site?**

Would the Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to existing local drainage patterns of the site and substantially increasing the rate or amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on-site or off-site or create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Findings: Potential impacts of the Project related to the alteration of existing local drainage patterns and creation of runoff water are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not cause or contribute to significant cumulative impacts to erosion, siltation, or flooding due to alterations of existing drainages or exceedance of drainage capacities or the addition of pollutant runoff; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed will result in an increase in impervious surfaces in addition to changes in land use and associated pollutant runoff characteristics. Increased impervious surfaces are likely to alter existing hydrology by potentially increasing surface water runoff and increase potential pollutant loads. Following are the evaluations of cumulative hydrology and cumulative erosion, siltation and flooding impacts.

Hydrology

The proposed Project is located in the San Jacinto River watershed and is tributary to two separate sub-watershed areas, the Perris Valley Storm Drain (PVSD) Watershed and the SJWA watershed, prior to flows reaching the San Jacinto River. For the area to the west, the PVSD is the most downstream drainage facility that the WLC Project is tributary to before flows reach the San Jacinto River. It is necessary to consider the

downstream drainage areas and their facilities when evaluating cumulative impacts for hydrology. The PVSD is a major drainage facility draining a large area including the City of Moreno Valley and any flow impacts to the facility would be important to analyze the effects. For this reason, on the west side, the area tributary to the PVSD was selected as the geographic area for the cumulative impacts analysis. On the east side, flows drain to the SJWA before reaching the San Jacinto River. The SJWA is an important habitat and water feature within the watershed and it is necessary to analyze any potential flow impacts to the area. For this reason, for flows draining to the east, the area tributary to the SJWA was chosen as the geographic area for considering potential cumulative effects. This area includes the upstream portion of the San Jacinto Watershed as the SJWA extends to the south side of the San Jacinto River.

As discussed in Section 4.9 of the Revised Final EIR, runoff from the western portion of the Project site flows west toward the Perris Valley Storm Drain (PVSD), while runoff from the eastern portion of the Project site flows south into Mystic Lake, and (during times of high storm flow), reaches the San Jacinto River south of the San Jacinto Wildlife Area. Table 6.9-1 identifies the cumulative projects that are located in each watershed (Revised Final EIR Part 3, pg. 6.9-28).

PVSD Watershed Area

The volume of runoff after the Project is constructed would be less than the existing volume of runoff and the amount of infiltration and groundwater recharge would increase by a small amount, which would provide a net benefit to groundwater recharge. The proposed Project's drainage improvements would be designed to have sufficient capacity to accommodate and convey storm water runoff flows generated by the Project as well as expected future storm water runoff flows associated with buildout of the Moreno Master Drainage Plan (MDP) area. All of the cumulative projects in the Moreno MDP and Sunnymead MDP areas would be required to mitigate flows to equal to or less than existing and/or demonstrate that storm drain capacity is available to service their anticipated flows and that their project is consistent with the MDPs. The Project's compliance with the Moreno MDP meets this requirement. In addition, there would be zero hydrologic impact on downstream drainage facilities due to the Project; therefore, the Project would not contribute to any cumulative impacts. As such, cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.9-28 through 6.9-29).

SJWA Watershed Area

The portion of the Project site located east of the topographic divide drains to the SJWA. In addition to the Project, one current and one potential project are tributary to the SJWA. They are the Badlands Landfill Improvements Project located north of the Project site and the Quail Ranch Specific Plan project located southeast of the Project site. Runoff from the Badlands Landfill flows through the Project site. The hydrologic study for the Project considered flows from the Badlands Landfill. The Badlands Landfill Improvement project does not change the pervious cover of the site. As such, flows from the Landfill Improvements Project would not increase above existing and would be consistent with the existing flows north of the Project.

Downstream of the Project site, the Quail Ranch Specific Plan Project is proposed. This cumulative Project consists of a planned residential community. Currently, there are no specific details on this cumulative project. Stormwater flows generated by the cumulative project site could increase. However, the developer would be

required to alleviate any increase in flows leaving the site and demonstrate that the cumulative Project does not increase storm flows such as peak flow, velocities, and volume for each of the 2, 5, 10, 25, and 100-year storms. The cumulative Project would be required to demonstrate that storm drain capacity is available to service the anticipated flows and that the Project is consistent with the MDPs. As such, cumulative downstream capacity impacts within the SJWA watershed area would be less than significant. Because the Project would reduce storm flows leaving the Project site so that they do not exceed existing flows, the Project's contribution to potential cumulative erosion and siltation impacts within the SJWA watershed area would be less than significant (Revised Final EIR Part 3, pg. 6.9-29).

8. Land Use and Planning

a. Conflict with Any Applicable Habitat or Natural Community Conservation Plan

Potential Significant Impact: Whether the Project would conflict with any applicable habitat conservation plan or natural community conservation plan.

Findings: Potential impacts of the Project related to the conflict with any applicable habitat conservation plan are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts due to a conflict with any applicable habitat or natural community conservation plan; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.10 in the Revised Final EIR Part 4 Volume 3, the Project site is located within the MSHCP area, Mead Valley and Reche Canyon/Badlands Plan Area. Portions of the Project area occur in 14 criteria cells of the MSHCP. The Project site is not located within any special linkage areas identified by the MSHCP. The Project applicant, the City, and the County are required to use the Joint Project Review (JPR) process established in the MSHCP to identify and acquire habitat as part of the development review process. The JPR process involves negotiations between a landowner and the Western Riverside County Regional Conservation Authority (RCA) so the County can acquire land with important habitat or other biological resources while providing fair compensation and/or reasonable development opportunities on the remaining land for the landowner.

The Project site is located within areas requiring burrowing owl surveys, within the MSHCP Criteria Area Species Survey Area (CASSA), and Narrow Endemic Plant Species Survey Area (NEPSSA). Because the Project site is within an MSHCP CASSA and is considered to be a covered activity, the Project is subject to provisions of the MSHCP. In particular, the Project proponent will be required to provide payment of mitigation fees and adhere to the BMPs found in Appendix C of the MSHCP. Pursuant to agreements with the U.S. Fish and Wildlife Service (USFWS) and the CDFW, the payment of the mitigation fees and compliance provisions of the MSHCP provides full mitigation under CEQA, the Federal Endangered Species Act (FESA), and the California Endangered Species Act (CESA) for impacts to the species and habitats covered by the MSHCP. Since the City has adopted the MSHCP and its requirements and provisions, and since the Project is within Moreno Valley, the WLC Project would be required to adhere to applicable MSHCP requirements and fees. Therefore, the WLC Project was determined to be consistent with the MSHCP. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-11 to 4.10-12).

b. Conflict with Land Use Plans, Policies, or Regulations (Regional)

Potential Significant Impact: Whether the Project would conflict with any applicable regional land use plan, policy, or regulation of any agency with jurisdiction over the Project (including but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential impacts of the Project related to the conflict with any applicable land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts due to a conflict with any applicable regional land use plan, policies, or regulations; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.10 in the Revised Final EIR Part 4 Volume 3, pursuant to *CEQA Guidelines* Section 15125 (d), the Project’s Revised Final EIR includes an evaluation of the consistency of the WLC Project with pertinent goals and policies of relevant adopted local and regional plans. The analysis evaluates the Project against all the applicable regional planning documents and processes which include: airport regulations associated with MARB and Riverside County Airports; Southern California Council of Governments’ (SCAG) 2008 Regional Comprehensive Plan (RCP), Regional Transportation Plan (RTP), and Compass Growth Vision; SCAG’s 2012 RTP and Sustainable Communities Plan, Santa Ana Water Quality Control Plan (Basin Plan); Riverside County Drainage Area Management Plan (DAMP); and EMWD’s Urban Water Management Plan (UWMP).

The analysis in the Revised Final EIR demonstrates that the Project is generally consistent with the goals of SCAG’s Regional Comprehensive Plan, Compass Plan and Regional Transportation Plan in that it seeks to add employment in an area that has historically been “jobs poor,” which will help reduce worker commute trips from Moreno Valley over the long term. The Project is generally consistent with these plans because the Project will generate fewer emissions than the previously approved Moreno Highland Specific Plan, and it will provide for a better balance of jobs versus housing in Moreno Valley, which will incrementally improve regional commuting directions and distances by providing almost 24,000 new jobs (direct, indirect and induced) in an area previously planned for housing. No other conflicts with the applicable plans were identified. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-12 to 4.10-26).

c. Conflict with Applicable Land Use Plans, Policies, or Regulations (Local)

Potential Significant Impact: Whether the Project would conflict with any applicable local land use plan, policy, or regulation of any agency with jurisdiction over the Project (including but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential impacts of the Project related to the conflict with any applicable land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant impacts due to a conflict with any applicable local land use plan, policies, or regulations; therefore, no mitigation is required.

NOTE: As discussed in Section I, Introduction, the Project's Specific Plan has been adopted and therefore, the Project is consistent with the General Plan and zoning which currently show the site as the World Logistics Center.

Potential impacts of the Project related to the conflict with any applicable local land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Parts 3 and 4 Volume 3. The Project is consistent with the City's General Plan, which shows the site as World Logistics Center Specific Plan, and its goals and policies. It will add significant employment opportunities, facilitate significant economic growth, establish well-planned attractive new development, establish a broader and more stable tax base for the City, expand recreational trail systems, increase permanent open space, provide for alternative forms of transportation, implement extensive sustainable design features and advance the progress of the City's annexation program. These are specifically identified and discussed in Section VI of this document including statements about how the Project helps the City to achieve these goals, objectives and policies.

Facts in Support of the Findings: The Project is consistent with the goals, objectives, and policies of the City of Moreno Valley General Plan. According to the Figure 2-2, *Land Use Map*⁷ updated in October 2019, the land is currently planned for Business Park (BP), and zoning land use designations of WLCSP-LD (World Logistics Center Specific Plan – Logistics Development) and WLCSP – LL (World Logistics Center Specific Plan – Light Logistics). This would allow the development of the WLC Project which will introduce 40.6 million square feet of logistics warehousing onto existing agricultural land that is adjacent to existing residential uses to the west and the San Jacinto Wildlife Area to the south.

Housing Element. During the NOP period, several group representatives expressed concern that the WLC Specific Plan would eliminate 7,700 housing units in the Moreno Highlands Specific Plan that would have to be replaced elsewhere in the City. The City adopted an updated Housing Element in February 2011 identifying the Moreno Highlands area as a potential location for future jobs-producing land uses rather than housing (affordable or otherwise).

The 2011 Housing Element update indicated the Moreno Highlands area would likely be rezoned to support employment-generating uses rather than housing. It also stated that “pursuing any land use changes with the Moreno Highlands Specific Plan area will not hinder the City's ability to meet its Regional Housing Needs Allocation (RHNA) obligations.” The term RHNA refers to the Regional Housing Needs Allocation (affordable housing allocations) from the SCAG. The State Department of Housing and Community Development (HCD) certified the City's Housing Element on May 31, 2011.

In April 2011 and April 2013, the City adopted its Economic Development Action Plan, which also identified the eastern part of the City as a potential area for major job-producing land uses. The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (“Study”) prepared by David Taussig & Associates, Inc., in 2014 concluded that the WLC Project would generate 24,000 jobs/ employees to the area,

⁷ City of Moreno Valley. (2019). *Moreno Valley General Plan; Figure 2-2: Land Use Map*. Figure accessed from: http://www.moreno-valley.ca.us/city_hall/general-plan/landuse-map.pdf

which includes the creation of direct, indirect, and induced jobs/employees to the City. (Revised Final EIR Part 4 Volume 3, Appendix O)

The City's 2006 Housing Element identified the Moreno Highlands Specific Plan as a potential source of vacant land that could accommodate possible future residential growth in the City. However, in 2011 the City updated its Housing Element and (i) anticipated possible land use changes from mixed-use and residential to jobs producing warehouses in the eastern part of the City, and (ii) concluded that redesignating the entire land east of Redlands Boulevard to the eastern City border for warehouse uses would not impede the City's Housing Element Objectives. The HCD certified the City's Housing Element as compliant with State law on May 31, 2011. In February 2014, the Housing Element was updated again, however this update did not include any changes relating to the Moreno Highlands property.

Therefore, because the land use and zoning designations for the Project site are in full compliance with all applicable plans, policies, and regulations and would not impede the City's housing goals as set forth in its Housing Element, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.10-26-34).

d. Cumulative Land Use Impacts

1. Would the proposed WLC Project conflict with any applicable habitat conservation plan or natural community conservation plan?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to conflicts with any applicable habitat conservation plan or natural community conservation plan.

Findings: Potential cumulative impacts of the Project related to the conflict with any applicable habitat conservation plan or natural community conservation plan are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not contribute to a significant cumulative effect relating to conflicts with a habitat or natural community conservation plan; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative projects are located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP) areas. Based on a review of each of the potentially cumulative projects, each that would be subject to the MSHCP and/or SKR HCP would be required to pay a fee to sustain the plant and wildlife populations within the MSHCP and the species population in the SKR HCP areas.

Projects subject to the MSHCP are required to pay a fee that will eventually result in an MSHCP Conservation Area in excess of 500,000 acres and focuses on conservation of 146 species including amphibians, reptiles, birds, mammals, invertebrates, and plants. Certain species require additional measures to ensure that the population of the species is sustained. Because each of the cumulative projects within the MSHCP area is required to comply with the provisions of the MSHCP, no significant cumulative impact would result. In addition, since the Project also would be required to comply with the MSHCP, the Project's incremental impact on the species within the MSHCP would not combine with the incremental impacts of the other cumulative projects to cause or contribute to a significant cumulative impact.

Projects subject to the SKR HCP are required to pay a fee so that the funds can be used to acquire and permanently conserve, maintain and fund the conservation, preservation, restoration and enhancement of SKR occupied habitat. The implementation of the HCP has demonstrated the acquisition of habitat and sustaining the population of the SKR. Therefore, implementation of the cumulative projects would not result in a significant cumulative impact. In addition, because the Project also would be subject to the SKR HCP, including the requirement to pay a conservation fee, the Project’s incremental impact on the SKR program would not combine with the incremental impacts of the other cumulative projects to cause or contribute to a significant cumulative impact (Revised Final EIR Part 3, pg. 6.10-14).

2. **Would the Project conflict with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Regional)**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to conflicts with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential cumulative impacts of the Project related to the conflict with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not contribute to potential significant cumulative impacts related to conflicts with regional plans or policies; therefore, no mitigation is required.

Facts in Support of the Findings: The Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) includes policies that provide a strong commitment to reduce emissions from traffic and transportation. The RTP/SCS provides a blueprint for improving quality of life for residents by providing more choices for where they will live, work, play, and how they will move around. Many of the cumulative projects include the development of residential uses within the City of Moreno Valley. These projects are expected to be consistent with some of the policies identified in the RTP/SCS; however, cumulatively, the cumulative projects are not assisting in reducing potential commute traffic emissions. Therefore, development of the cumulative projects could result in significant cumulative impacts. With the implementation of the Project, approximately 25,000 new jobs would be eventually created, which would nearly double the number of jobs within the City. This increase in jobs would positively affect commute patterns for residents within the City as well as within the region by reducing commuter trips. The Project is consistent with the applicable policies of the RTP/SCS. Because the Project would be consistent with the applicable RTP/SCS policies, the project would not contribute to any adverse cumulative conflicts associated with the RTP/SCS.

SCAGs Regional Comprehensive Plan’s (RCP) overall goal is to reinvigorate the region’s economy, avoid social and economic inequities and the geographical dislocation of communities, and to maintain the region’s quality of life. Because the applicability of the RCP is to projects of “regional significance,” the cumulative

projects that include warehousing would be applicable. These warehousing projects would result in the creation of employment opportunities that would assist the City in balancing the current housing rich condition. These cumulative projects could modify commuting patterns to reduce overall vehicle miles travelled. These projects of “regional significance” would be consistent with the RCP and therefore would be less than cumulatively significant. The Project is also considered a project of “regional significance.” The Project’s anticipated increase of approximately 25,000 new employment opportunities would also modify commuting patterns so that overall vehicle miles travelled could be reduced. Because the Project would be consistent with the policies of the RCP, the Project would not contribute to potential adverse cumulative impacts to the implementation of the RCP.

Overall, the Project would not contribute to potential adverse cumulative impacts related to the implementation of the policies of the applicable regional plans (Revised FEIR Part 3, pg. 6.10-15).

3. **Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Local)**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential cumulative impacts of the Project related to the conflict of any applicable land use plan, policy, or regulation of an agency with jurisdiction are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that development of the Project would not contribute to potential significant cumulative conflicts with the City of Moreno Valley General Plan; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative projects (including MV 4 and MV 24, for example) were consistent with the City’s General Plan as they were proposed; others required amendments to the City’s General Plan to become compliant. Based on a review of the available environmental documents for the cumulative projects that included an amendment, the amended land uses were still consistent with the goals, policies and objectives of the City’s General Plan. The cumulative projects resulted in less than significant environmental effects related to the City’s General Plan land use goals, policies and objectives.

As stated in Section 4.10.5.3 of the Final EIR, the Project originally sought amendments to the General Plan; however, in November 2015, the City Council approved the proposed amendments through the initiative process. Even prior to the adoption, the FEIR identified that the Project was consistent with the goals, policies and objectives of the General Plan. Therefore, the Project would not contribute to any potential cumulative impacts relating to consistency with the City of Moreno Valley General Plan (Revised Final EIR Part 3, pg. 6.10-16).

9. Mineral Resources

a. Loss of Statewide, Regional, or Locally Important Mineral Resources

Potential Significant Impacts: Whether the Project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plans.

Findings: Potential impacts of the Project relating to mineral resources are discussed in detail in Section 4.11 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to mineral resources will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.11 of the Revised Final EIR Part 4, Volume 3, lands within the City of Moreno Valley and its Sphere of Influence are designated Mineral Resources Zone-3 (MRZ-3) and MRZ-4, which are not defined as significant mineral resource areas. No sites have been designated as locally-important mineral resource recovery sites on any local plan.⁷ In addition, Figure OS-5 of the Riverside County General Plan shows that the Project area is also located within MRZ-3. The development of the Project site would not result in the loss of identified regional or local mineral resources, conversion of an identified mineral resource use, or conflict with existing mineral resource extraction activities. Therefore, the development of the Project site would not result in a loss of statewide, regional, or locally important mineral resources. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3 pg. 4.11-3).

b. Cumulative Mineral Resource Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and foreseeable future projects would have significant cumulative impacts related to mineral resources.

Findings: Potential cumulative impacts of the Project related to mineral resource are discussed in detail in Section 4.11 of the Revised Final EIR Part 4 Volume 3 and Section 6.11 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that development of the Project will not result in significant cumulative impacts related to mineral resources; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.11 of the Revised Final EIR Part 4 Volume 3, the cumulative area for mineral resources is the City of Moreno Valley and part of western Riverside County. As population levels increase in the region, greater demand for aggregate and other mineral materials will be placed on mineral resources, especially sand and gravel. Similarly, development pressures in areas where these materials are known or expected to occur would result in the loss of availability of these mineral resources. However, because the Project site is not identified as a significant source of sand/gravel deposits and development subsequent to the adoption of the land use actions on any of the sites would not decrease the local or regional availability of mineral resources, potential future development of any of the sites would have no significant cumulative mineral resources impact. (Revised Final EIR Part 4 Volume 3, pg. 4.11-3 and 4.11-4). Further, because the Project would result in no impact related to the loss of availability of a known mineral

resource that would be of valued to the region and the residents of the state or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan, it could not cause or contribute to any potential cumulative impact. (Revised FEIR Part 3, pg. 6.11-1.)

10. Noise

a. Groundborne Vibration or Groundborne Noise Impacts

Potentially Significant Impact: Whether the Project would result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.⁸

Findings: Potential impacts of the Project relating to groundborne vibration and groundborne noise is discussed in detail in Section 4.12 of Revised Final EIR Part 4, Volume 3. Based on the entire record before use, this Council finds that no significant impacts related to groundborne vibration and groundborne noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.12 of the Revised Final EIR Part 4, Volume 3, roadways in the vicinity of the Project area are either paved or would be paved as the area develops and would not result in Project traffic driving over rough or dirt roads. Well maintained roads typically do not result in substantial vibration levels. Even roads with irregularities typically only generate substantial levels of vibration very near, less than 50 feet from the irregularity. Construction activities that would occur within the WLC Specific Plan area are not anticipated to require blasting or pile driving. Roadway vibrations are typically not perceptible more than 50 feet from the roadway except in very unusual circumstances. Generally, the interface between the soft tire of a truck or automobile will not generate significant vibration unless the road is in poor shape (e.g., potholes or pavement joints). Therefore, impacts associated with this issue are anticipated to be less than significant, and no mitigation is required (Revised Final EIR Part 4, Volume 3, pg. 4.12-34).

b. Airport Noise

Potentially Significant Impact: Whether a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would result in exposure of people residing or working in the Project area to excessive noise levels or if a Project within the vicinity of a private airstrip, would expose people residing or working in the Project area to excessive noise levels.

Findings: Potential impacts of the Project relating to airport noise are discussed in detail in Section 4.12 of Revised FEIR Part 4, Volume 3. Based on the entire record before use, this Council finds that no significant impacts related to airport noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.12 of the Revised FEIR Part 4, Volume 3, the Project area is located approximately 5.5 miles northeast of the March Airfield (MAF) and is not located within two miles of a private airstrip. The MAF is a joint-use airport, used for both military and civilian purposes. The March Air Reserve Base (MARB) is the military operator of the MAF and March Inland Port (MIP) is the

⁸ “Groundbourne noise” is the noise radiating from structures as a result of groundbourne vibrations. It is absent when groundbourne vibrations are small.

civilian operator of the airport. This facility is anticipated to play an increasingly important role in the transportation of goods and cargo for the Southern California region. Existing flight patterns affect a large portion of the City of Moreno Valley, along a path that affects the western portion of the City in a northwest/southeast alignment. Aircraft operations from the airport currently contribute intermittent single-event noise.

There is potential for single-event noise exposure levels from MAF activity to affect the Project. The exposure levels will vary dependent upon the type of aircraft and flight track flown for each operation at MAF. However, the Project is not identified as being within the noise or safety contours delineated for the MAF. In addition, the Project is not considered to contain sensitive receptors and, therefore, the impacts from these single-event noise levels are considered to be below the level of significance. The City's exterior noise standard for industrial uses is 70 dBA CNEL. MAF noise levels are less than 60 dB CNEL within the Project area. Therefore, the Project would not have the potential to expose people to excessive noise levels from airport operations. Therefore, no significant noise impacts would occur regarding these issues from implementation of the Project, and no mitigation is required (Revised Final EIR Part 4, Volume 3, pg. 4.12-35).

c. Cumulative Groundborne Vibration

Potentially Significant Impact: Whether the Project's contribution to the cumulative exposure of persons to or generation of excessive groundborne vibration levels would be cumulatively considerable.

Findings: Potential impacts of the Project relating to groundborne vibration is discussed in detail in Section 4.12 of Revised Final EIR Part 4 and potential cumulative impacts are discussed in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before use, this Council finds that there is no potential for cumulative impacts with respect to groundborne vibration; therefore, no mitigation is required.

Facts in Support of the Findings: As discussed in Section 6.12 of the Revised Final EIR Part 3, two cumulative projects are located at distances that could undergo construction activities during the project's construction period: P06-158/Gascon and MV-6: Highland Fairview Corporate Park, and MV-126: TTM 33222. Due to the rapid attenuation characteristics of ground-borne vibration and distance from each of the Related Projects to the Project site, there is no potential for cumulative construction impacts with respect to ground-borne vibration. Therefore, cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.12-23).

The Project's operations would include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce vibration. In addition, the primary sources of transient vibration would include truck circulation within the proposed parking areas and internal drive aisles. Ground-borne vibration generated by each of the above-mentioned activities would generate up to approximately 0.005 in/sec at 50 feet from the source. The potential vibration levels from all Project operational sources at the closest existing sensitive receptor locations would be less than the significance threshold of 0.5 in/sec peak particle velocity (PPV) significance threshold for potential residential building damage and 0.1 in/sec PPV significance threshold for human annoyance. As such, vibration impacts associated with operation of the Project would be below the significance threshold and would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.12-23).

d. Cumulative Airport Noise

Potentially Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to exposure of people to excessive airport noise levels.

Findings: Potential cumulative impacts of the Project relating to airport noise are discussed in detail in Section 6.12 of Revised Final EIR Part 3. Based on the entire record before use, this Council finds that no significant cumulative impacts related to airport noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.12 of the Revised Final EIR Part 3, the Project area is located approximately 5.5 miles northeast of the March Airfield (MAF) and is not located within two miles of a private airstrip. The MAF is a joint-use airport, used for both military and civilian purposes. The March Air Reserve Base (MARB) is the military operator of the MAF and March Inland Port (MIP) is the civilian operator of the airport. This facility is anticipated to play an increasingly important role in the transportation of goods and cargo for the Southern California region. Existing flight patterns affect a large portion of the City of Moreno Valley, along a path that affects the western portion of the City in a northwest/southeast alignment. Aircraft operations from the airport currently contribute intermittent single-event noise.

There is potential for single-event noise exposure levels from MAF activity to affect the Project. The exposure levels will vary dependent upon the type of aircraft and flight track flown for each operation at MAF. However, the Project is not identified as being within the noise or safety contours delineated for the MAF. In addition, the Project is not considered to contain sensitive receptors and, therefore, the impacts from these single-event noise levels are considered to be below the level of significance. The City's exterior noise standard for industrial uses is 70 dBA CNEL. MAF noise levels are less than 60 dB CNEL within the Project area. Therefore, the Project would not have the potential to expose people to excessive noise levels from airport operations in the cumulative setting. Therefore, no cumulative significant noise impacts would occur regarding these issues from implementation of the Project, and no mitigation is required (Revised Final EIR Part 3, pg. 6.12-24).

e. Cumulative Long-Term Utility Noise

Potential Significant Impact: Whether the Project's contribution to long-term utility noise impacts in excess of City standards is less than cumulatively considerable.

Findings: Potential cumulative impacts related to long-term utility noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before use, this Council finds that there is no potential for cumulative impacts with respect to long-term utility noise; therefore, no mitigation is required.

Facts in Support of the Findings: There is one existing SDG&E compressor station and two existing SCGC facilities located adjacent to the WLC Specific Plan area.

The L_{eq} noise level generated by the compressor station does not exceed 60 dBA L_{eq} beyond the property lines of the facility. For SCGC blow-down events, noise generated could reach as high as 130 dBA just outside the fence line of the southern facility and in excess of 135 dB just outside the fence line of the northern facility. People within approximately 250 feet of the blow-down points would be exposed to noise levels greater than 115 dBA. No sensitive receptors are located such that noise levels from the compressor station and on-site project activity would result in cumulatively considerable impacts. Therefore, noise impacts associated with the operation of the compressor station in conjunction with Project operations would not be cumulative considerable and would be less than significant. (Revised Final EIR Part 3 pg. 6.12-31)

SCGC blow-down events also have the potential to produce groundborne vibration. However, the effect of the blow-down groundborne vibration would be limited to within 100 feet of the equipment and would not be perceived beyond the facility fence line, resulting in a less than significant impact and no mitigation is required. (Revised Final EIR Part 3 pg. 6.12-31)

11. Population and Housing

a. Population Growth

Potential Significant Impact: Whether the Project would induce substantial unplanned population growth in an area, either directly (e.g., new homes and businesses) or indirectly (e.g., extension of roads and infrastructure).

Findings: Potential impacts of the Project related to population growth are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to population growth will occur as a result of development of the Project and, therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.13 of the Revised Final EIR Part 4 Volume 3, population projections developed by SCAG estimate the City's population will reach approximately 213,700 persons by the year 2020 and approximately 255,200 persons by the year 2035. The extent to which the new jobs created by a Project are filled by existing residents is a factor that tends to reduce the growth-inducing effect of a Project. Construction of the WLC Project will create short-term construction jobs. These short-term positions are anticipated to be filled by workers who, for the most part, reside in the Project area; therefore, construction of the WLC Project will not generate a permanent increase in population within the Project area.

An economic study of the Project prepared by DTA concluded that the WLC Project could generate up to 20,307 new direct on-site jobs within the City.⁹ In addition to the projected on-site job creation, the DTA study estimates the WLC Project could generate new off-site jobs (i.e., indirect/induced employment) in all industries of the economy. The DTA study also estimated that an additional 7,386 indirect/induced jobs could be created in the County, of which 3,693 jobs were projected to be within the City as a result of Project implementation. While the specific location of the potential additional indirect/induced jobs created within the County cannot be specifically determined, it is reasonable to assume that some percentage of these jobs will be support service jobs and are likely to be located in the WLC Project vicinity, and therefore the City.

The WLC Project does not include a residential component. The WLC Project is located within an area that is currently largely vacant and previously planned for a mix of residential, commercial, business park, and open space land uses.

The WLC Specific Plan supplanted the approved Moreno Highlands Specific Plan (MHSP) Project that did have a residential component. The EIR for that project indicated it would have increased the City's population by 17,019 persons over 15 years (7,736 units × 2.2 persons/unit). However, because the City is considered housing rich (and jobs poor) by SCAG, the loss of that projected population growth is not considered a significant impact and, in fact, a number of State policies (e.g., SB 375) encourage the creation and development of jobs-producing development in areas with poor jobs/housing numbers such as that which exists in the City.

Currently, there are six occupied single-family homes in various locations on the Property along with associated ranch/farm buildings. Streets, water and sewer utilities, and municipal services would be extended to serve the WLC Project. The WLC Project may benefit other development projects in the Project area by the installation of infrastructure (e.g., roads and utilities), but is not expected to induce substantial population growth into the area since there would be no large areas of vacant land left in the east end of the City (south of SR-60) that could be developed with residential uses.

It should be understood that the actual eventual number of employees generated by the Project will vary depending on a variety of economic factors (e.g., actual companies that relocate and current hiring conditions). The projected employment estimate also does not take into account relocation of existing employees from other jurisdictions as a result of existing businesses relocating into the WLC Project. However, these would be counted as "new" employees for the City of Moreno Valley. For the purposes of this analysis, the Revised Final EIR used 20,307 direct employees working at the WLC or one employee per 2,000 square feet as a conservative estimate (in terms of environmental impacts) for future employment growth from the Project's development.

The new employment opportunities resulting from development of the high-cube logistics warehouse and general warehouse uses will raise the City's current jobs-to-housing ratio by providing additional jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, due to the City's projected jobs/housing ratio, it is reasonable to assume and therefore expect that some percentage of these jobs would be filled by persons already living within the City or near the Project area. Therefore, no significant increase in population of the City would result from the development or operation of the WLC Project, resulting in a less than significant impact associated with growth inducement and no mitigation is required.

Indirect City Population Impacts Related to Fiscal and Economic Changes. If the WLC Project is not built, it could be argued that the City may experience a financial impact from the loss of higher property tax, sales tax, and other revenues related to growth and development.

Potential economic impacts that may occur with Project implementation include permanent employment (direct on-site and indirect/induced), permanent output (gross receipts; total direct output plus output produced by suppliers and employee spending), and construction jobs over 15 years.

The DTA study indicates that the creation of new jobs will lead to more consumer spending by employees in existing retail establishments within the City, as well as new retail development that will be attracted to the City as a result of this spending. Job creation also results in increased tax revenues to the City through increased property taxes and sales taxes associated with development of the WLC Project. However, it is important to note that because of the difference in timing of the development of the various phases of the WLC Project, the number of employees summarized above will not be realized all at once.

Development of the WLC Project is projected to create approximately 16,521 construction-related full-time equivalent (FTE) jobs within the City. Similar to recurring employment (i.e., permanent), it is likely that some percentage of these jobs will be associated with support services and are likely to be located in the vicinity of the WLC Project and therefore within the City.

The WLC Project does not include a residential component, so it would not directly generate additional new housing. Employees of the Project that choose to live in the City would likely utilize the existing supply of housing within the City.

Based on the potential increase in jobs (additional 20,307 direct jobs) within the City and no substantial increase in population as a result of the Project, the City's jobs-to-housing ratio would improve from the 2011 ratio of 0.47 to 0.91, thus achieving a greater jobs-to-housing balance within the City. Similarly, the potential new County employees that may be generated by the WLC Project would increase the total County employment to 571,799 from 551,492 resulting in an increase of the ratio to 0.74 from 0.69.

As development of the WLC Project is expected to occur over the course of many years, the jobs-to-housing ratio will not significantly change immediately. The City's current jobs-to-housing ratio is exceptionally low when compared to SCAG standards; therefore, the need for employment is immediate. A balance between jobs and housing within the City would have a positive impact by decreasing costs associated with commuting and traffic congestion. It also provides savings to consumers in the operation and maintenance of automobiles and saving to local public agencies in terms of the need to construct and maintain new road improvements.

Based on the foregoing discussion, implementation of the WLC Project would not result in a deficit in the City's General Fund even after City costs to provide public services to the development are considered. The estimated surplus is approximately \$5.7 million annually, which is about two times the projected annual City General Fund costs. Additionally, the WLC Project is expected to generate sizeable, substantial, and lasting employment, wages, output, and revenues for the City and region. Therefore, potential fiscal and economic changes that could affect the City's population or housing are considered to be less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.13-11 to 4.13-17).

b. Displace Substantial Housing/People

Potential Significant Impact: Whether the Project would displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere.

Findings: Potential impacts of the Project related to displacement of housing or people are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council

finds that no significant impacts related to displacement of housing or people will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.13 of the Revised Final EIR Part 4 Volume 3, the WLC Project site currently contains six occupied rural residences. At the Planning Commission meeting on May 22, 2012, some of the existing residents stated that they did not want to be included in the Specific Plan. After deliberation, the Commission decided to include the rural properties in the Specific Plan in the interest of comprehensive land planning for the WLC property. These properties continue as non-conforming uses, and the WLC Specific Plan designates these properties as “Light Logistics” (LL), which allows for future industrial-related uses (vehicle storage, light assembly, etc.). In this way, the WLC Specific Plan does not remove or displace any of the existing residents or residences from the Project site. As large warehouse buildings are developed near or adjacent to these residences, it may become less desirable to reside within the WLC Specific Plan area; however, the Project itself does not cause housing displacement.

Therefore, impacts to the six occupied on-site residences would not be considered a significant housing impact. For these reasons, the WLC Specific Plan will not have significant population or housing impacts related to displacing substantial numbers of people or existing housing.

The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (“Study”) prepared by DTA in 2014 concluded that the WLC Project would generate 20,307 direct jobs/employees to the City. Section 4.13.5.3 of the 2015 FEIR determined that the WLC Project is consistent with the 2011 Housing Element, and it will not displace substantial numbers of existing housing or necessitate the construction of replacement housing elsewhere. Therefore, no significant displacement impacts relative to people or housing are expected to occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.13-18 to 4.13-19).

c. Cumulative Population and Housing Impacts

Potential Significant Impact: Whether the Project could cause an increase in population and housing that is substantial in relation to the past, current, and probable future projects.

Findings: Potential impacts of the Project related to cumulative impacts of the Project on housing or population are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3 and Section 6.13 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that no significant impacts related to cumulative impacts on housing or population will occur as a result of development of the Project and, therefore, no mitigation is required.

Fact Supporting the Findings: The cumulative area for the discussion of population and housing impacts is the City of Moreno Valley. The development of the WLC Project site is governed by the existing WLC Specific Plan. The Project would not contribute to substantial population growth and therefore would not result in an increased demand on the current or future housing in the region. In addition, the Moreno Valley area is considered housing rich and jobs poor by the Southern California Association of Governments, so the loss of population (and planned housing) would actually be a regional benefit according to its Regional Transportation Plan. The Project may result in an influx of new workers who would need to locate temporarily or permanently

in the area, but the City has an overabundance of existing housing stock due to current market conditions. Implementation of the WLC Project would actually benefit population and housing conditions relative to employment and jobs/housing ratio and, therefore, not result in cumulatively adverse impacts to population or housing. The WLC Project would also not significantly induce growth into areas where growth was not previously anticipated since the WLC Project area represents the last largest remaining vacant land in the City of Moreno Valley. (Revised Final EIR Part 4 Volume 3, pg. 6.13-1 to 6.13-10).

12. Public Services and Facilities

a. Law Enforcement Services and Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered law enforcement facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential impacts of the Project related to law enforcement services and facilities are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to law enforcement services or facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the WLC Specific Plan requires building and site design characteristics that specifically support police services by encouraging buildings that are safe and can be secured by design, fencing, security services, etc. The WLC Specific Plan design guidelines are consistent with the goals of the General Plan relative to police protection and site design. In addition, future development within the WLC Specific Plan will be required to comply with the City's Development Impact Fee (DIF) requirements as new development is constructed. It is anticipated that DIF revenues will help fund additional equipment needs and increased property taxes would help fund increased service or staffing needs. Therefore, the Project will have less than significant impacts relative to police service, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-4 to 4.14-7).

b. Fire Protection Services and Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered fire-fighting facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential impacts of the Project related to fire-fighting services and facilities are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to fire protection or facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the WLC Specific Plan will dedicate a new 1.5-acre urban fire station site within its boundaries to allow for expansion of fire protection services as the Project develops (see WLC Specific Plan Section 2.2.6). The WLC

Specific Plan indicates the new fire station will be at the north end of Planning Area 11. The WLC Specific Plan also requires building and site design characteristics that specifically support fire services by encouraging buildings that are safe and can be secured by design, fencing, security services, etc. The WLC Specific Plan design guidelines are consistent with the goals of the General Plan relative to fire protection and site design. Finally, future development within the WLC Specific Plan area will be required to comply with the City's DIF requirements as new development is constructed. Therefore, the Project will have less than significant impacts relative to fire protection service, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-10 to 4.14-13).

c. School Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities, the construction of which could cause significant environmental impacts.

Findings: Potential impacts of the Project related to school facilities are discussed in detail in Section of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to school facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the Project contains no residential development, so it would not cause a significant increase in the local population that would increase the number of students attending local schools. Since payment of the school impact fees is required of all projects within Moreno Valley Unified School District and San Jacinto Unified School District boundaries, impacts to school services and facilities would not occur. The WLC Project is also consistent with the applicable General Plan policies as it will assist in the provision of adequate school facilities by providing legally required development impact fees. Accordingly, impacts to the environment resulting from new or expanded school facilities would not occur, resulting in a less than significant impact and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.14-15 to 4.14-17).

d. Parks, Recreation, and Trails

Potential Significant Impact: Whether the Project would result in increased use of existing neighborhood and regional parks or other recreational facilities (e.g., trails) where substantial physical deterioration would occur or be accelerated or result in construction or expansion of recreational facilities that would have an adverse physical effect on the environment.

Findings: Potential impacts of the Project related to parks, recreation, and trails are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to parks, recreation, or trails will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, there is a potential for the Project to indirectly generate new residents in the City, although predicting the exact

number would be too speculative. Increases in the City’s population from future residential development will help fund new parks and trails through dedications of land and the payment of Development Impact Fees.

In November 2015, the City Council approved a General Plan Amendment to the Master Plan of Trails to reduce the extent of trail systems in the area to reflect the change from a residential neighborhood (Moreno Highlands) to a non-residential neighborhood (World Logistics Center). Trail linkages are provided in the WLC Project to extend existing trail routes from the western edge of the Project to the east, providing for future linkages to Gilman Springs Road, to the Lake Perris State Recreation Area, and to the San Jacinto Wildlife Area.

Implementation of these new trails and the General Plan Amendment (i.e., revised Master Plan of Trails) will allow the Project to be consistent with the General Plan policies relative to trails. The Project is consistent with the City General Plan policies relative to parks, recreation, and trails.

The WLC Specific Plan provides connections to existing trails to the west and southwest, and a connection to and trailhead for a future planned trail in the San Jacinto Wildlife Area south of the site, as outlined in Section 3.4.2, *Multi-Use Trails*, and as shown on Figure 3-17 of the Specific Plan. In addition, future development within the WLC Specific Plan area will pay applicable DIFs to offset any potential impacts to parks or recreational services. Based on this, the Project will not create significant impacts on parks, recreation, or trails.

The Project does not include the construction or expansion of a recreational facility since it would not create any substantial demands on recreational facilities. The Project would have a less than significant impact on population or housing; therefore, no new demand on existing park facilities would occur, and no expansion of existing parks or the construction of new parks would be required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-17 to 4.14.25).

e. **Cumulative Public Services and Facilities and Parks, Recreation, and Trails Impacts**

Law Enforcement Services and Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered law enforcement facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential cumulative impacts of the Project related to law enforcement services and facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that the Project contribution to significant environmental effects from new or altered law enforcement facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for police protection services is the City of Moreno Valley. Police protection services for the City, including the project and cumulative

development, is provided by the City of Moreno Valley Police Department (MVPD), which contracts police services from the Riverside County Sheriff's Department (RCSD).

In general, impacts to the MVPD services and facilities during the construction of cumulative development would be addressed as part of each cumulative project's development review process conducted by the City. During construction of cumulative development, equipment and building materials could be temporarily stored on the cumulative project sites, which could result in theft, graffiti, and vandalism. Many cumulative project sites are located in areas of moderate to high vehicular activity from nearby streets. In addition, the construction sites of the cumulative projects would be fenced along the perimeters, when applicable, with the height and fence materials subject to review and approval by the City. Temporary lane closures may be required for right-of-way frontage improvements and utility construction. However, these closures would be temporary in nature and in the event of partial lane closures, both directions of travel on area roadways and access to the cumulative project sites would be maintained. Due to their proximity to the Project site, should project construction occur concurrently with the construction of cumulative projects MV-4, MV-5, MV-6, and MV-126, coordination with these construction sites would be implemented through each cumulative project's respective construction traffic management plan, if applicable, which would ensure emergency access and traffic flow are maintained on adjacent right-of-ways. In addition, construction-related traffic generated by the cumulative development would not significantly impact the MVPD responses within the vicinities of the cumulative projects as emergency vehicles normally have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic.

According to the MVPD, there are no planned improvements for the MVPD facilities. If expanded police facilities were determined warranted by the MVPD, and were foreseeable, the impacts of the construction and operation of such a station would be analyzed at that time under CEQA as a project independent of the cumulative development. Moreover, the expansion of any police station would likely be on an infill lot potentially less than an acre in size. Generally, development associated with typical police stations is unlikely to result in significant unavoidable impacts, and projects involving the construction or expansion of a police station are typically anticipated to be addressed pursuant to CEQA through the use of a Class 32 categorical infill exemptions (CEQA Guidelines Section 15332) or (mitigated) negative declarations since they are likely relatively small structures on infill parcels. Accordingly, the need for additional police protection services as part of an unplanned or expanded police station at this time is not an environmental impact of a project or one that a project is required to be mitigated.

It is expected that the cumulative projects (particularly those of a larger nature) would be subject to discretionary review by the MVPD on a project-by-project basis to ensure that sufficient security measures are implemented to reduce potential impacts to police protection services. Many of the cumulative projects would also be expected, when applicable, to provide on-site security, personnel and/or design features for their residents and patrons per standard development practices for the given uses. Further, the City would collect development impact fees from the cumulative projects that would be used to fund the MVPD expenditures as necessary to offset any cumulative incremental impact from each cumulative project on police protection services. The protection of public safety is the first responsibility of local government, and local officials have

an obligation to give priority to the provision of adequate public safety services, which are typically financed through the City general funds.

With regard to emergency response times, cumulative projects would introduce new uses which would generate additional traffic in the vicinity of the cumulative development. Traffic from the cumulative development could have the potential to affect emergency vehicle response times to the cumulative project sites and surrounding properties due to travel time delays caused by the additional traffic. Emergency vehicles would access the cumulative project sites directly from the surrounding roadways. The drivers of emergency vehicles have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. As such, emergency access to the vicinity of cumulative development would be maintained at all times, and the increase in cumulative traffic generated by cumulative development would not significantly impact emergency vehicle response times. Further, consistent with the *City of Hayward v. Trustees of California State University*, 242 Cal.App.4th 833 (2015), potential impacts on emergency response times are not an environmental impact that CEQA requires a project to mitigate.

The Project is located in an area of high vehicular activity and would provide construction fencing and private security during construction. As such, the Project would not cause a significant impact to police protection services during construction. Therefore, the Project's contribution to cumulative impacts during construction on the MVPD's emergency response would not be cumulatively considerable.

The Project would be designed and operated per applicable standards required by the City for new development in regard to public safety. The Project would be required to pay the applicable development impact fees to the City. Similar to cumulative development, the drivers of emergency vehicles would have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. Therefore, the Project's contribution to cumulative impacts to MVPD facilities would not be cumulatively considerable. Therefore, the Project would result in a less than cumulatively considerable contribution to the need for the construction of new, or expanded police facilities and, as such, cumulative impacts on police protection services would be less than significant. (Revised Final EIR Part 3, pg. 6.14-19 through 6.14-20).

Fire Protection

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection.

Findings: Potential cumulative impacts of the Project related to fire protection services and facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that no significant cumulative impacts related to fire protection services or facilities will occur as a result of development of the project; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for fire protection is the City of Moreno Valley. Fire protection for the City, including the Project and cumulative development, is provided by

the City of Moreno Valley Fire Department (MVFD), which contracts with the Riverside County Fire Department (RCFD).

In general, impacts to the MVFD services and facilities during the construction of cumulative development would be addressed as part of each cumulative project's development review process conducted by the City. Construction activities associated with cumulative development may temporarily increase the demand for fire protection and emergency medical services, and may cause the occasional exposure of combustible materials, such as wood, plastics, sawdust, covering and coatings, to heat sources including machinery and equipment sparking, exposed electrical lines, welding activities, and chemical reactions in combustible materials and coatings. However, in compliance with the requirements of the California Occupational Safety and Health Administration (OSHA), all construction managers and personnel of cumulative development would be trained in fire prevention and emergency response. Further, fire suppression equipment specific to construction of the cumulative development would be maintained on the cumulative project sites. As applicable, all cumulative construction activities would be required to comply with the 2013 California Building Code (CBC); the 2013 California Fire Code (CFD); and the City's Fire Code.

Construction activities may involve temporary lane closures of right-of-way frontage improvements and utility construction. However, these closures would be temporary in nature and in the event of partial lane closures, both directions of travel on area roadways and access to the cumulative project sites would be maintained. Due to their proximity to the Project site, should project construction occur concurrently with the construction of cumulative projects MV-4, MV-5, MV-6, and MV-126, coordination with these construction sites would be implemented through each cumulative project's respective construction traffic management plan, if applicable, which would ensure emergency access and traffic flow are maintained on adjacent right-of-ways. In addition, construction-related traffic generated by the cumulative development would not significantly impact MVFD response within the vicinities of the cumulative projects as emergency vehicles normally have a variety of options for avoiding traffic, such using sirens to clear a path of travel or driving in the lanes of opposing traffic.

During operation, although the cumulative demand on MVFD services would increase, cumulative impacts on fire protection and emergency medical services would be reduced through each cumulative project's regulatory compliance and site-specific design and safety features. Each cumulative project would be subject to the required review by the MVFD for compliance with Fire Code and Building Code regulations related to emergency response, emergency access, fire flow, and fire safety that would reduce potential cumulative impacts to fire protection and emergency services. Further, the City would collect development impact fees from cumulative projects that would be used to fund MVFD expenditures as necessary to offset any cumulative incremental impact from each cumulative project on fire protection services. The protection of public safety is the first responsibility of local government, and local officials have an obligation to give priority to the provision of adequate public safety services, which are typically financed through the City general funds.

Cumulative project sites which are located in Very High Fire Severity Zone (VHFSZ) and susceptible to wildland fire hazards would adhere to the special construction features set forth in Chapter 7A of the CBC. Further, any significant risk of loss, injury, or death involving wildland fires, would be minimized to the maximum extent feasible through implementation of cumulative project-specific fuel modification plans, if applicable, that would be subject to review and approval by the MVFD.

The Project would be subject to the required review of the MVFD for compliance with the Fire Code and Building Code regulations related to emergency response, emergency access, fire flow, and fire safety that would reduce potential impacts to fire protection and emergency services. The Project includes a future 1.5-acre urban fire station within its boundaries to be dedicated to the City to help offset increased fire service needs. The new fire station will be located at the north end of Planning Area 11 and is required to be built during Phase I. Placement of the new fire station is subject to review and approval by the Fire Chief. As portions of the Project site are located within a State-designated VHFSZ, the Project would comply with Chapter 7A of the CBC. Further, the Project would be required to pay the applicable development impact fees to the City. Compliance with payment of fees could further offset the cumulative impact from the cumulative projects on the Project's proposed fire station. Therefore, the Project would result in a less than cumulatively considerable contribution to the need for the construction of new, or expanded fire facilities and, as such, cumulative impacts on fire protection services would be less than significant (Revised Final EIR Part 3, 6.14-21 through 6.14-22).

Schools

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for schools.

Findings: Potential cumulative impacts of the Project related to school facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project's contribution to significant environmental effects from new or altered school facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: Construction of the cumulative development would require the participation of construction employees who would be hired from a mobile regional construction work force that moves from project to project. Typically, construction workers pass through various development projects on an intermittent basis as their particular trades are required. Given the mobility and short durations of work at a particular site, and a large construction labor pool that can be drawn upon in the region, construction employees would not be expected to relocate their residences within this region or move from other regions as a result of their work on the cumulative development. Accordingly, construction of cumulative development is not anticipated to generate new students needing to attend local schools within the MVUSD or SJUSD.

The MVUSD and SJUSD monitors enrollment numbers at all schools within their districts. Seating shortages can be addressed through changes in attendance boundaries and new/expanded school facilities. Nonetheless, cumulative development is expected to generate students that would attend local schools within the MVUSD and SJUSD. As such, this cumulative development could require new or expanded school facilities. The cumulative projects would be required to pay development fees for schools to the MVUSD or SJUSD prior to the issuance of grading permits pursuant to SB 50. Pursuant to Government Code Section 65995, the payment of developer fees would be considered full and complete mitigation of schools impacts by cumulative development.

Construction of the Project is not anticipated to generate new students needing to attend local school within the MVUSD or SJUSD. The project does not include residential uses but is expected to generate approximately 15,000 to 25,000 new jobs in the City. According to Section 4.14.3.5 of the Revised Final EIR Part 4 Volume 3, it is speculative to estimate how many workers would actually live within the City and how many would commute from the surrounding area. Although the exact number is speculative, any increase is not expected to be substantial and would not generate significant new demands related to the need for new or altered schools. Further, the Project would be required to pay development fees pursuant to SB 50. Therefore, the Project's contribution to cumulative impacts to school facilities would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.14-23).

Parks, Recreation, and Trails.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for parks, recreation, and trails.

Findings: Potential cumulative impacts of the Project related to parks, recreation, and trails are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project's contribution to the deterioration of existing park, recreation and trail facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: Most park visits originate from residential uses. Typically, employees are engaged in their work during the day and do not contribute substantial demand for parks. If employees use the parks, such usage would occur during the week rather the weekend. Construction workers may visit a park to eat lunch or for recreation after a day of work. Cumulative development would increase the residential and visitor population which could create new demand on parks and recreation space in the vicinities of the cumulative projects. Some cumulative projects could include recreational facilities and open space features that would serve cumulative project residents and guests and would thereby reduce cumulative demand on public parks. Pursuant to the Quimby Act, the City would require the dedication of land, or the payment of fees for park and/or recreational facilities from the cumulative projects to offset any cumulative incremental impact from each cumulative project on parks, recreation, and trails. Therefore, with the dedication of land, or the payment of development fees, cumulative development would not substantially deteriorate or accelerate the deterioration of recreational facilities or resources.

The Project includes the development of a master-planned logistics center; no residential development is proposed. There is a potential for the Project to indirectly generate new residents in the City, although predicting the exact number would be too speculative. Trail linkages are provided as part of the Project for future linkages to Gilman Springs Road, to the Lake Perris State Recreation Area, and to the San Jacinto Wildlife Area. Future development within the Project site will pay the applicable development impact fees for parks or recreational services. Therefore, the Project's contribution to cumulative impacts to parks, recreation, and trails would be less than cumulatively considerable.

The Project would result in less than cumulatively considerable contribution to increased use of existing neighborhood and regional parks or other recreational facilities where substantial physical deterioration would occur or be accelerated. As such, cumulative impacts on parks, recreation, and trails would be less than significant (Revised Final EIR Part 3, pg. 6.14-24).

13. Transportation

Introduction

As discussed in Section 1, Introduction, the Revised Final EIR reflects information found in the 2015 FEIR, the July 2018 RSFEIR and the responses to comments on both. The Revised Final EIR Part 3 found the discussion of transportation impacts to be in compliance with CEQA. The FEIR and the RSFEIR relied upon the then governing CEQA Guidelines, including Appendix G for applicable thresholds of significance, using the Level of Service (LOS), a measure of delay,

In 2013 (effective January 1, 2014), the Legislature adopted SB 743, a new CEQA provision with respect to the criteria for determining the significance of transportation impacts of projects, mandating the preparation of revisions to the CEQA Guidelines, including the potential use of “vehicles miles traveled” (VMT) or other metrics to evaluate transportation impacts. (Cal. Publ. Res. Code § 21099.) In response to Section 21099, the 2018 revisions to the CEQA Guidelines included Section 15064.3, entitled “Determining the Significance of Transportation Impacts” which defines VMT as “the amount and distance of automobile travel attributable to a project. (Section 15064.3(a).) Importantly, under Section 21099, with the certification of the new Guidelines, “automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment” under CEQA. Thus, as of December 2018, “automobile delay” is not to be considered a significant impact on the environment under CEQA. (See *Citizens for Positive Growth & Preservation v. City of Sacramento*, 43 Cal.App.5th 609, 626 (2019) (court applied Section 21099 or “existing law,” holding that impacts on LOS or “automobile delay” cannot constitute a significant environmental impact under CEQA.)

CEQA Guidelines. Section 15007(b) states:

“Amendments to the Guidelines apply prospectively only. New requirements in amendments will apply to steps in the CEQA process not yet undertaken by the date when agencies must comply with the amendments.”

Section 15007(c) clarifies the timing for implementing Guideline amendments with respect to documents sent out for public review prior to the effective date of the amendments, but proposed for certification after the effective date of the amendments:

“If a document meets the content requirements in effect when the document is sent out for public review, the document shall not need to be revised to conform to any new content requirements in Guideline amendments taking effect before the document is finally approved.”

On April 23, 2020, the City of Moreno Valley Planning Commission adopted Resolution No. 2020-18 and recommended that specified VMT thresholds be adopted by the City Council, pursuant to SB743. However, the City’s new VMT thresholds are not yet in effect, until such time as they are adopted by the City Council.

These Findings consider Section 21099 and the proposed City’s new VMT thresholds. When the FEIR, Revised Final EIR Part 4 Volume 3 was certified in 2015 and when the RSFEIR, Revised Final EIR Part 3 was circulated for public review in July 2018, the use of “Level of Service” criteria was an accepted threshold of significance for the evaluation of transportation impacts and LOS criteria were relied upon in those documents. In addition, although the transportation section was updated in the July 2018 RSFEIR, the transportation section of the 2015 FEIR, Revised Final EIR Part 4, Volume 3 was upheld by the Superior Court (see Topical Response C to the December 2019 Recirculated Draft RSFEIR). Accordingly, for consistency with those prior CEQA documents and in conformance with the Superior Court’s decision, these Findings consider “Level of Service” criteria for purposes of evaluating the significance of transportation impacts. In addition, however, these Findings also consider transportation impacts based on the City’s proposed VMT thresholds. However, because the RSFEIR and the Draft Recirculated RSFEIR were sent out for public review before the effective date of CEQA Guidelines Section 15064.3, VMT is not considered to be a significant impact under CEQA. Therefore, the analysis of the Project’s VMT impact is provided for information purposes only.

Qualitative Considerations Regarding VMT

Internal Trip Capture. The 2018 TIA does not assume any internal trip capture, as a conservative estimate of total daily trips, and therefore provides a conservative estimate of VMT. The Project is a master-planned logistics campus with forward-thinking provisions to take advantage of modern technology, logistics and telecommunications. Based on other similar logistics campuses in the United States and globally, it is anticipated that a number of its larger tenants will seek to minimize external truck traffic (and therefore reducing VMT) by collaborating on tenant to tenant supply needs, some of which will be met through transferring supplies between tenants within WLC, without leaving the campus. In addition, it is WLC anticipated that industry clusters will form, where several similar industries would co-locate to provide added efficiencies in logistics, including allowing for internal fulfillment of material shipping needs, again avoiding external trips and associated VMT. The net effect of this VMT reduction through internal trip capture is difficult to estimate and was therefore not factored into the VMT analysis. However, there is reasonably foreseeable certainty that some level of internal trip capture will occur.

Efficiencies in Logistics Operations. In addition to internal trip capture, it is reasonably foreseeable that some WLC tenants will coordinate inbound and outbound truck shipments to combine loads, minimize empty inbound and outbound trucks, and collaborate in other ways to maximize logistics efficiencies and minimize shipping costs, in part by minimizing the frequency of truck shipments, thereby reducing truck trips and associated VMT. As with internal trip capture, although this is difficult to estimate and therefore was not factored into the EIR, it is reasonable to expect some level of truck trip and VMT reduction due to efficiencies in logistics operations with a large master-planned campus such as WLC.

Employee commute trips. Most often an important strategy for reducing VMT in a community is to improve the local jobs/housing balance by increasing the number of employment opportunities. As such, it is reasonable to expect that increasing local employment opportunities will reduce the average commuter trip lengths of residents, resulting in a net decrease to regional net VMT. This is discussed at length within the Revised Final EIR Part 3 (pages 4.15-50 through page 4.15-51), as well as in Response to Comment 2-F1-15 and Response to Comment 2-F1-46 (addressing The Sustainable Freight Action Plan) of the Responses to Comments to the

2019 Recirculated Sections, Revised Final EIR Part 2, and the supplemental VMT memo provided as Attachment A to these Findings.

Truck trips related to shipping activities. Page 4 of the Office of Planning and Research (OPR) concerning VMT analysis guidance indicates that, although heavy vehicle traffic can be included for analysis convenience, the provided analysis requirements are specific to passenger-vehicles and light duty trucks.⁹ While it may be appropriate to consider heavy vehicle traffic if directed by the lead agency, it is generally understood that Interstate commerce and related heavy vehicle traffic are regulated by the federal government as it relates to commerce. Irrespective of this and considering that the end-users are unknown at this time (so the nature of the business enterprise and its probable origins and destinations are unknown), it is reasonable to assume that the ultimate end users will select this location, at least in part, as to how it affects their transportation costs. Most often businesses which have shipping as a significant part of their operations are sensitive to transportation costs and their relative proximity to customers and suppliers. Accordingly, it is reasonable to assume that warehouses are often located in a manner to reduce VMT given that it is the interest of the business.

Discussion of Transportation Findings

a. Air Traffic Patterns

Potential Significant Impact: Whether the Project would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Findings: Potential impacts of the Project related to air traffic patterns are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the information contained in the Revised Final EIR, the Project is allowed to occur within Airport Influence III of the March Inland Port (MIP) and this City Council finds that no significant impacts related to air traffic patterns will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, airport facilities within the vicinity of the Project site include the March Air Field (MAF), which is part of the March Air Reserve Base (MARB). The MARB Redevelopment Project Area includes the entire 6,500-acre former active duty base area, and approximately 450 acres adjacent to the base in the industrial area of the City of Moreno Valley. To implement the MARB Redevelopment Project Area and to facilitate the transition of a portion of the MARB from military to civilian uses, the March Joint Powers Authority, (March JPA) consisting of the County of Riverside and the Cities of Moreno Valley, Perris, and Riverside, was formed. The March JPA along with the U.S. Air Force pursued the establishment of March Air Field as a joint use airport.

The Department of the Defense (Air Force) completed an Air Installation Compatible Use Zone (AICUZ) study for MARB in 1998 (updated in 2005). The AICUZ study was designed and is intended to aid in the development of compatible land uses in non-government areas surrounding military airfields to protect public safety and health. The study established three zones based on potential crash patterns: a Clear Zone and two Accident Potential Zones (APZs). The Clear Zone reaches from along the extended runway centerline to a distance of 3,000 feet, APZ 1 extends from 3,000 feet to 8,000 feet, and APZ II extends from 8,000 feet to

⁹ http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf (accessed March 31, 2020).

15,000 feet. According to the AICUZ, outside of the Clear Zone and APZs “the risk of aircraft accidents is not significant enough to warrant special consideration in land use planning.” The Project site is not located within a Clear Zone, APZ 1, or APZ 2 for MAF as designated by the Air Force 2005 AICUZ Study. In addition to the AICUZ, Airport Influence Area boundaries around MAF have been adopted by County of Riverside Airport Land Use Commission (ALUC) in its Airport Land Use Plan (ALUP). Portions of the Project within the foothills are located within the High Terrain Area of Influence.

The Project site is approximately 5.5 miles east of MAF. A portion of the Project is in the foothills to the south of where Brodiaea Avenue ends, over to World Logistics Center Parkway, and is located within the High Terrain Influence Area. As part of the standard process for development within High Terrain Influence Areas for MAF, Projects are required to be reviewed by the ALUC for consistency with the ALUP when objects are higher than 35 feet. As a standard condition imposed during ALUC reviews, development located within the boundaries of the High Terrain Influence Area are required to provide navigation easements. Development that is allowed to occur within the High Terrain Airport Influence Area would not include any features that would alter air traffic patterns or the level of air traffic; therefore, a less than significant air safety impact would occur, and no mitigation is required. (Revised Final EIR Part 3, pp. 4.15-47 to 4.15-48).

b. Design Features or Incompatible Uses

Potential Significant Impact: Whether the Project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Findings: Potential impacts of the Project related to design features or incompatible uses are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that no significant impacts related to design features or incompatible uses will occur as a result of development of the Project and, therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, the design of roadways must provide adequate sight distance and traffic control measures. This provision is normally realized through roadway design to facilitate roadway traffic flows. Roadway improvements in and around the Project site would be designed and constructed to satisfy all City and Caltrans requirements for street widths, corner radii, intersection control as well as incorporate design standards tailored specifically to Project access requirements. Adherence to applicable City requirements would ensure the Project would not include any sharp curves or dangerous intersections.

Temporary impacts associated with the construction of infrastructure improvements included as a part this Project may temporarily restrict vehicular traffic or cause temporary hazards. The construction of infrastructure would coincide with roadway improvements, which would include road or lane closures as well as the presence of construction workers and equipment on public roads. Construction operations would be required to implement adequate measures to facilitate the passage of people and vehicles through/around any required road or lane closures. Site-specific activities, such as temporary construction activities, are finalized on a project-by-project basis by the City and are required to ensure adequate traffic flow. At the time of approval of any site-specific plans required for the construction of infrastructure as a part of typical conditions of

approval, the Project would be required to implement measures that would maintain traffic flow and access. In the absence of a roadway design hazard, no impact would occur; therefore, no mitigation is required.

As identified in the Project TIA, the Project would not produce a significant safety risk and appropriate safety features are already present on roads near local schools. Other than Perris Boulevard, which would experience a small number of Project trucks (22 and 25 medium and heavy-duty trucks in the a.m. and p.m. peak hours, respectively), none of the other truck routes would result in Project trucks traveling near local schools. The safety impact of Project-related passenger cars along streets near local schools was also evaluated by reviewing existing pedestrian facilities and collecting pedestrian counts at the intersections along Project truck routes. All pedestrian crossings at signalized intersections near schools are protected. Crosswalks near schools are striped in yellow (per the California Manual on Traffic Control Devices page 1,282). In most cases, sidewalks exist along roadways and lead to the striped, protected crosswalks at the intersections. Intersection and roadway features along Project truck routes were reviewed and it was determined that adequate pedestrian amenities already exist in the form of protected crossings, crosswalks, curb ramps, and pedestrian signals. For these reasons, Project passenger cars and trucks would not create unsafe conflicts with pedestrians. (Revised Final EIR Part 3 pgs. 4.15-48 to 4.15-49). Therefore, project implementation would cause a less than significant impact due to design hazard features.

c. Inadequate Emergency Access

Potential Significant Impact: Whether the Project would result in inadequate emergency access.

Findings: Potential impacts of the Project related to emergency access are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that no significant impacts related to emergency access will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, construction activities that may temporarily restrict vehicular traffic would be required to implement adequate measures to facilitate the passage of people and vehicles through/around any required road closures. Site- specific activities such as temporary construction activities are finalized on a project-by-project basis by the City and are required to ensure adequate emergency access.

The roadway improvements that will take place as a part of this Project will improve the traffic circulation in the area. For example, emergency vehicles that currently pass through the site using either World Logistics Parkway or Alessandro Boulevard would continue to have those routes available to them, and these roads will be upgraded to arterial standards within the Project limits. Access to Alessandro Boulevard would be provided by a connection to Redlands Boulevard at Cactus Avenue instead of a direct extension to Alessandro Boulevard. The change would not lengthen the distance between Gilman Springs Road and the Riverside Community Regional Medical Center on Cactus Avenue or the route to and from the Kaiser Moreno Valley Community Hospital on Iris Avenue. The extension of Eucalyptus Avenue through the Project area would improve access between the Project site and the nearest existing fire station (the Moreno Beach fire station). As a condition of approval, the Project will also be required to construct a fire station on site.

These roadway improvements of the Project would enhance the ability of emergency vehicles to access the Project as well as the surrounding properties. Access to the Project site is designed to accommodate large trucks with trailers used for the distribution of goods to and from the warehouses. This would provide ample vehicular access for emergency vehicles. During the operational phase of the Project, on-site access would be required to comply with standards established by the City Public Works Department. The size and location of fire suppression facilities (e.g., hydrants) and fire access routes would be required to conform to Fire Department standards. As required of all development in the City, the operation of the Project would conform to applicable Uniform Fire Code standards. The submittal of such plans would be considered a condition of approval, which would be part of the permitting process initiated by the applicant and approved by the City in accordance with City standards. As with any development, access to and through the Project would be required to comply with the required street widths, as determined in the California Building Code (CBC), Master Plan of Streets, and the Uniform Fire Code. Therefore, implementation of the Project would not significantly impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; therefore, no mitigation is required. (Revised Final EIR Part 3 pp. 4.15-49)

d. Alternative Transportation

Potential Significant Impact: Whether the Project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Findings: Potential impacts of the Project related to alternative transportation are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that no significant impacts related to alternative transportation will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, the Project would result in the development of employment opportunities and would therefore reduce vehicle miles traveled for the region. The provision of additional employment options in proximity to existing residential development in the City will help reduce local vehicle miles traveled as the employment generated by the Project slowly improves the City's job/housing ratio, and more local jobs are created for City residents.

Although there is currently no transit service in the Project area, the proposed Project would be designed to accommodate bus access on all Project streets. Bus turnouts and shelters would be provided at all active bus stops. It is expected that transit service would be provided once the Project reaches a transit-supportable level of operations. Candidate streets for future bus routes within the project limits are Eucalyptus Avenue, Street C, Street E, and Street F as shown in WLC Specific Plan Figure 3-14 of the Revised Final EIR Part 3. Therefore, the proposed project is consistent with City policies encouraging alternative transportation.

The WLC Specific Plan provides for connections to existing trails to the west along Redlands Boulevard, and to the southwest along Cactus Avenue. In addition, the WLC Specific Plan provides for a new trail connection from the southwest corner of the site around the land designated as open space under the WLC Specific Plan, to connect to a future planned "trailhead" at the northwest corner of the state-owned property to the south. The WLC Specific Plan also includes a "loop" trail segment through the WLC Specific Plan along Street F to

Eucalyptus Avenue and back to Redlands Boulevard (see Revised Final EIR Part 4 Volume 3 Figure 3-12, Non-Vehicular Circulation). In addition, the Project will be conditioned to provide sidewalks and landscaping treatments to allow for pedestrian access throughout the site. With these planned improvements, the Project will have less than significant impacts regarding non-vehicular circulation and no mitigation is required. Refer to discussion above for additional discussion regarding VMT and the Project's relationship to SB743.

e. Freeway Impacts from Truck Trips to the Ports of Los Angeles and Long Beach.

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the freeway system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project would result in a less than significant impact for freeways segments from truck trips to the Ports of Los Angeles and Long Beach and no mitigation is required.

Facts in Support of the Findings: The potential for traffic impacts along the SR-60 and SR-91 corridors was assessed by manually adding the forecasts for WLC trucks under 2040 buildout conditions to and from the port to the No-Project condition from the SCAG model. Because the ports and the freeways leading to them are in Los Angeles County, the threshold of significance for the analysis was taken from the Los Angeles County Congestion Management Program (CMP). The CMP states that a significant impact would be deemed to occur if the project increased demand on a highway by at least 2 percent causing LOS F or, if the highway facility already operates at LOS F, then a significant impact would be deemed to occur if the project increases traffic demand by 2 percent or more of capacity.

The Revised Final EIR Section 4.15.6.5 included an analysis of the Project's impacts to each section of the SR-60 and SR-91 corridors and in each direction, for both the a.m. and p.m. peak periods, for the 2018, 2025, and 2040 scenarios. The addition of the WLC traffic would increase freeway traffic volume ranging from 0.03 percent to 0.48 percent of non-project traffic, and therefore would not cause a significant impact on any segment of these freeways.

14. Utilities and Service Systems

a. Construction or Expansion of Water Treatment Facility

Potential Significant Impact: Whether the Project would require the construction of new water treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

Findings: Potential impacts of the Project related to construction or expansion of water treatment facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts that would cause the construction or expansion of water treatment facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the Metropolitan Water District has analyzed the reliability of water delivery through the State Water Project

(SWP) and the Colorado River Aqueduct. Metropolitan’s Integrated Resources Plan and 2010 and 2015 Regional Urban Water Management Plan conclude that, with the storage and transfer programs developed by Metropolitan, there will be a reliable source of water to serve its member agencies’ needs through 2040. ¹⁰

All necessary water distribution facilities would be installed simultaneously with required roadway frontage improvements for each phase of development of the WLC Project. Therefore, the connection to the existing water delivery system would not result in substantial disturbance of existing roadways or water facilities. As previously identified, the potable water demand that would be required for the WLC Project would total 1,991.25 acre-feet per year (AFY). The amount of water demand would be within the existing available supply even with a reduction in deliveries from the State Water Project (SWP). Imported sources of water will be supplemented by an increase in desalination of brackish groundwater, recycled water use, and water use efficiency, and implementation of aggressive conservation measures by the EMWD. The WLC Project would not require the construction of new water treatment facilities or expansion of existing facilities, which could cause significant environmental effects. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-13 to 4.16-15).

b. Wastewater Treatment Requirements

Potential Significant Impact: Whether the Project would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB).

Findings: Potential impacts of the Project related to construction or expansion of water treatment facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts that would exceed wastewater treatment requirements of the applicable RWQCB as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, The WLC Project would result in a connection to the sewer line underlying Redlands Boulevard in the vicinity of the intersection of Redlands Boulevard and Brodiaea Avenue. It is anticipated that all wastewater generated by the WLC Project would be routed to and treated by the Moreno Valley Regional Water Reclamation Facility (MVRWRF). The MVRWRF is a publicly owned treatment works (POTW), so operational discharge flows treated at the MVRWRF would be required to comply with waste discharge requirements contained within the waste discharge requirements for that facility. Compliance with condition or permit requirements established by the City, and waste discharge requirements at the MVRWRF would ensure that discharges into the wastewater treatment facility system from the operation of the WLC Project would not exceed applicable Santa Ana RWQCB wastewater treatment requirements. Expected wastewater flows from the WLC Project will not exceed the capabilities of the serving treatment plant, so no significant impact related to this issue would occur and no mitigation would be required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-28).

c. Wastewater Treatment Capacity and/or New or Expanded Wastewater Treatment Facilities

¹⁰ Metropolitan Water District of Southern California. 2015 Urban Water Management Plan. Available online: https://wuedata.water.ca.gov/public/uwmp_attachments/9284070670/Metropolitan%20Water%20District%20of%20Southern%20California%202015%20UWMP.pdf. [Accessed April 2020]

Potential Significant Impact: Whether the Project would result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it lacks adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments or require the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to adequate water supply are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to wastewater treatment capacity or need for new or expanded wastewater treatment facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project would connect to the existing sewer pipeline underlying Redlands Boulevard in the vicinity of the intersection of Redlands Boulevard and Brodiaea Avenue. Wastewater flows from the WLC Project site would be handled by the EMWD and would be conveyed to the MVRWRF located in the southwestern portion of the City, southwest of the WLC Project site. Current capacity at this facility is 16 million gallons per day (mgd)¹¹ with an existing average inflow of approximately 11.2 mgd.¹² Under current conditions, the average daily surplus treatment capacity is approximately 4.5 mgd. Generally, water use, and wastewater flows are related in that wastewater is generated from indoor water uses.

Based on a square footage of 40.6 million, the wastewater generated from the logistics uses on the site is 812,000 gallons per day (gpd). An additional 5,100 gpd of flow was added to account for the in-Project fueling station. Thus, the total wastewater generated from the site is 817,100 (0.82 mgd). The additional wastewater treatment demand of 0.82 mgd resulting from development of the WLC Project totals approximately 18.2 percent of current surplus treatment capacity. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd (Revised Final EIR Part 3, pg. 6.16-45). Impacts associated with wastewater facilities would be less than significant because the amount of wastewater generated by the Project would be within the existing surplus treatment capacity at the MVRWRF. The WLC Project would not require the construction of new wastewater treatment facilities or expansion of existing facilities, which could cause significant environmental effects. Therefore, impacts associated with wastewater facilities would be less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-29).

d. Solid Waste Facilities

Potential Significant Impact: Whether the Project would be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs.

¹¹ 5.13 *Public Services and Utilities*, City of Moreno Valley General Plan Final EIR, July 2006.

¹² Eastern Municipal Water District Moreno Valley Regional Water Reclamation Facility, <http://www.emwd.org/modules/showdocument.aspx?documentid=1423>, website accessed April May 4, 2020. .

Findings: Potential impacts of the Project related to solid waste facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to solid waste facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project is anticipated to generate approximately 104.6 tons of solid waste per day (38,164 tons/year).¹³ Solid waste from the WLC Project would be hauled by Waste Management of Inland Valley and transferred to the Badlands Sanitary Landfill, located in Moreno Valley. The Badlands Sanitary Landfill has a daily permitted throughput of 4,800 tons per day, a remaining capacity of 15,748,799 cubic yards, and an estimated closure date of 2022.¹⁴

The volume of solid waste generated by the WLC Project per day represents 2.6 percent of the current permitted throughput and 4.5 percent of the current surplus capacity at the Badlands Sanitary Landfill. As adequate daily surplus capacity exists at the receiving landfill, development of the WLC Project would not significantly affect current operations or the expected lifetime of the landfill serving the Project area. No significant solid waste disposal impact would occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-32 to 4.16-33).

e. Solid Waste Reduction

Potential Significant Impact: Whether the Project would fail to comply with applicable Federal, State, and local statutes and regulations related to solid waste.

Findings: Potential impacts of the Project related to solid waste reduction are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that no significant impacts related to solid waste reduction will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley is responsible for meeting the requirements of AB 939 and SB 1016, which includes a 50 percent reduction in disposal by the start of 2000 and preparation of a solid waste reduction plan to help reduce the amount of solid waste disposed of at the landfills. Various programs are implemented by the City of Moreno Valley to satisfy the mandated reduction in solid waste.

The WLC Project would be required to coordinate with the waste hauler to develop collection of recyclable materials for the Project on a common schedule as set forth in applicable local, regional, and State programs. Recyclable materials that would be recycled by the Project include paper products, glass, aluminum, and plastic. Additionally, the Project would be required to comply with applicable elements of AB 1327, Chapter

¹³ South Coast Air Quality Management District. CalEEMod Manual, Appendix D, Table 10.1, Solid Waste Disposal Rate for Unrefrigerated Warehouse. <http://www.aqmd.gov/calmod/user's-guide>. Calculation: 0.94 tons/thousand square feet/year × 40,600 thousand square feet = 38,164 tons per year.

¹⁴ *Badlands Sanitary Landfill Facility/Site Summary Details*, CalRecycle website, <https://www2.calrecycle.ca.gov/swfacilities/Directory/33-AA-0006>, website accessed April 2020.

18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, State, and Federal solid waste disposal standards, thereby ensuring that the solid waste stream to the Badlands Sanitary Landfill is reduced in accordance with existing regulations. Impacts are considered less than significant and require no mitigation. (Revised Final EIR Part 4 Volume 3, pg. 4.16-33 to 4.16-34).

f. Cumulative Impacts – Public Services

Water Supply

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the construction of new water treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

Findings: Potential cumulative impacts related to new or expanded water treatment facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that the Project's incremental contribution to environmental effects associated with the construction of new water treatment facilities or expansion of existing facilities would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: According to Revised Final EIR Part 4 Volume 3 Section 4.16, the Project would require the construction of new water reservoirs to serve each of three water pressure zones (1967, 1860, and 1764). All three reservoir sites are located outside of the Specific Plan boundary. As development proceeds within the Project area, new waterlines, ranging in size from 12 to 24 inches, will be constructed in the existing and future street rights-of-way to connect the future water tanks to the development area. The water system will require a new pump station at the 1764 reservoir and an upgrade to the existing EMWD pump station near Cottonwood Avenue and Redlands Boulevard. All water facilities for the Project would be constructed to EMWD standards and would be subject to a Plan of Service approval by EMWD (Specific Plan Section 3.5.1). Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts and were analyzed in Chapters 4.0, 5.0 and 6.0 of the Revised Final EIR Part 3. None of those sections identified construction or operation of the Project's new or expanded water facilities as resulting in significant impacts

Annually, a 5-year Capital Improvement Plan (CIP) is prepared by the EMWD. The EMWD's CIP outlines specific projects and their funding sources. Each project is also submitted individually to the Board for authorization and approval. This allows the EMWD to match needed facilities with development trends accurately. Funding for the EMWD's microfiltration plants, distribution pipes, and the recharge and recovery program is listed in the most recent EMWD CIP. Development and construction of the cumulative scenario would be included in the most recent EMWD CIP. Each applicant also would have to fund the costs of the water-related infrastructure needed to serve a particular site. All new facilities proposed or necessitated by projects in the cumulative scenario would be subject to applicable CEQA review and would be required to comply with all applicable laws and regulations protecting environmental resources. Cumulative project CEQA documents within the district boundary have been reviewed and the findings have been incorporated into this analysis.

Overall, the impacts of the Project would not combine with other projects in the cumulative scenario to cause or contribute to a significant cumulative impact to water treatment facilities (Revised Final EIR Part 3, pg. 6.16-33).

Adequate Water Supply

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to sufficient water supplies from existing entitlements and resources or are new or expanded entitlements needed.

Findings: Potential cumulative impacts of the Project related to sufficient water supplies are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project’s incremental contribution to cumulative demand on water supplies requiring the need for new or expanded entitlements would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The WSA prepared for the project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY. The EMWD considers this a “worst-case” estimate based on the total acres and amount of square footage of warehousing proposed by the Project. Taking into account the proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan would be substantially less than the worst-case EMWD estimate. As identified in Table 4.16.A of the Revised Final EIR Part 4 Volume 3, anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for the proposed Project would total 0.93 and 0.66 percent of the EMWD’s 2015 and 2035 supplies under worst-case conditions. The demand estimated for this Project is substantially less and therefore still within the limit of growth projected in the 2015 UWMP.

Existing and future development within the EMWD’s service area would demand additional quantities of water. The Project, along with any projects in the cumulative scenario, would be required to provide availability and commitment letters demonstrating sufficient water resources and access to available water facilities prior to building permit issuance. The 2015 UWMP addresses the water supply sources, projected demand, and supply reliability for Eastern EMWD service area. The 2015 UWMP estimates population within the EMWD service area to increase to 1,111,729 persons by the year 2035. Increases in population, square footage, and intensity of uses would contribute to increases in the overall regional water demand. The anticipated conversion of water-intensive uses (e.g., agriculture) and the implementation of existing water conservation measures and recycling programs would reduce the need for increased water supply. Demand projections for EMWD were developed using information about planned development and land use (UWMP 2015) and would include the water demand for the cumulative projects listed in Table 6.16-1. CEQA documents for projects in the cumulative scenario have been reviewed and the findings have been incorporated into the cumulative impact analysis.

Based on the information provided in the 2015 UWMP, EMWD has the ability to meet current and projected water demand through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from MWD with existing supply resources. Planned local supplies will supplement imported

supplies and improve reliability for EMWD and the region. In addition, adherence to regulations would ensure that cumulative projects would not result in a demand for water that exceeds existing entitlements and resources, or any new or expanded water-related infrastructure would be funded by the respective applicant. Therefore, projects in the cumulative scenario, together with the Project, would not cause significant cumulative impacts associated with adequate water service and supplies (Revised Final EIR Part 3, pg. 6.16-33 through 6.16.-34).

Storm Water Drainage Requirements

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts from the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related storm water drainage requirements are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the City Council finds that the Project's incremental contribution to environmental effects from the construction of new storm water drainage facilities or expansion of existing facilities would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for storm water drainage facilities is the watershed the project site is located in. The Revised Final EIR Part 4 Volume 3, Section 4.16, analyzes the storm water drainage facilities necessary to serve the Project site. To reduce flows to below or equal to pre-development conditions, the on-site storm water flows would be routed to a series of on-site detention and infiltration basins by phase before flows are routed off site. While the increase in impervious surfaces attributable to the proposed WLC project would contribute to a greater volume and higher velocity of storm water flows, the proposed WLC project's detention and infiltration basins would accept and accommodate runoff that would result from Project construction at pre-project conditions.

Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts as identified were analyzed in Chapters 4.0, 5.0 and 6.0 of the Revised Final EIR Part 4 Volume 3. None of those sections identified construction or operation of the Project's new storm water drainage facilities as resulting in significant impacts. All new storm water drainage facilities proposed or necessitated by cumulative projects would be subject to applicable CEQA review and would be required to comply with all applicable laws and regulations protecting environmental resources. CEQA documents prepared for projects in the cumulative scenario have been reviewed and the findings have been incorporated into this analysis.

The impacts of the Project would not combine with the impacts of other projects in the cumulative scenario to cause or contribute to significant cumulative impacts resulting from construction of storm water drainage facilities. As such, cumulative impacts to stormwater drainage facilities would be less than significant.

Wastewater Treatment Requirements

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts resulting from exceedances of wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Findings: Potential cumulative impacts of the Project related wastewater treatment requirements are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project's incremental contribution would not cause or contribute to any significant cumulative impact resulting from exceedance of wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative area for wastewater-related issues is the MVRWRF service area. Cumulative population increases and development within the area serviced by the MVRWRF would increase the overall regional demand for wastewater treatment service. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd. The MVRWRF is expected to have adequate capacity to service the City's wastewater needs through 2030. Any proposed changes to capacity of the MVRWRF or any facility maintained by EMWD are reviewed throughout the year. EMWD has a funding and construction mechanism in place that ensures improvements to EMWD facilities occurs in a timely manner. This funding mechanism is referred to as EMWD's Sewer Financial Participation Charge Program. For all new development within the EMWD service area, the Sewer Financial Participation Charge is allocated to assist in the financing of any future collection and disposal facilities and any future sewer treatment plant facilities. Cumulative development would not exceed the capacity of the wastewater treatment system because the MVRWRF would expand as growth occurred. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been incorporated into this analysis.

The proposed Project would not require the expansion of existing wastewater infrastructure: only connections to existing infrastructure would be required by the Project. By adhering to the wastewater treatment requirements established by the Santa Ana RWQCB through the NPDES permit, wastewater from the Project site that is processed through the MVRWRF would meet established standards. As the wastewater from all development within the service area of the MVRWRF would be similarly treated under the NPDES, no cumulatively significant exceedance of wastewater treatment requirements would occur (Revised Final EIR Part 3, pg. 6.16-36).

Wastewater Treatment Capacity and/or New or Expanded Wastewater Treatment Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts based on a determination by the wastewater treatment provider, which serves or may serve the cumulative projects, that it lacks adequate capacity to serve the cumulative demand in addition to the provider's existing commitments; or

Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related wastewater treatment capacity and/or new or expanded wastewater treatment facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project’s incremental contribution to impacts on wastewater treatment capacity would not cause or contribute to a significant cumulative effect. Additionally, the project’s contribution to environmental effects from the construction of new wastewater treatment facilities or expansion of existing facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative area for wastewater-related issues is the MVRWRF service area. Cumulative population increases and development within the area serviced by the MVRWRF would increase the overall regional demand for wastewater treatment service. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd. The MVRWRF is expected to have adequate capacity to service the City’s wastewater needs through 2030. Any proposed changes to capacity of the MVRWRF or any facility maintained by EMWD are reviewed throughout the year. EMWD has a funding and construction mechanism in place that ensures improvements to EMWD facilities occurs in a timely manner. This funding mechanism is referred to as EMWD’s Sewer Financial Participation Charge Program. For all new development within the EMWD service area, the Sewer Financial Participation Charge is allocated to assist in the financing of any future collection and disposal facilities and any future sewer treatment plant facilities. Cumulative development would not exceed the capacity of the wastewater treatment system because the MVRWRF would expand as growth occurred.

The proposed Project would not cause or contribute to a cumulatively significant impact on wastewater infrastructure because the proposed Project would not combine with the demands of other projects in the cumulative scenario to require the expansion of existing infrastructure. The Project would require only connections to existing infrastructure. Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts as identified were analyzed in Chapters 4.0 and 6.0 of the Revised Final EIR Part 4 Volume 3. None of those sections identified construction or operation of the Project’s new or expanded wastewater infrastructure as resulting in significant impacts. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis.

By adhering to the wastewater treatment requirements established by the Santa Ana RWQCB through the NPDES permit, wastewater from the Project site that is processed through the MVRWRF would meet established standards. As the wastewater from all development within the service area of the MVRWRF would be similarly treated under the NPDES, no cumulatively significant exceedance of Santa Ana RWQCB wastewater treatment requirements would occur. As such, cumulative impacts to wastewater treatment facilities would be less than significant (Revised Final EIR Part 3, pg. 6.16-37).

g. Solid Waste Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to insufficient permitted landfill capacity to accommodate the project's solid waste disposal needs.

Findings: Potential cumulative impacts of the Project related to solid waste facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project's incremental contribution to landfill impacts would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for solid waste services is the City of Moreno Valley. Solid waste disposal and recycling services for the proposed project site would be provided by Waste Management of the Inland Empire. Waste Management of the Inland Empire separates and markets recyclable materials collected within its service area. The project, in combination with other cumulative projects, would increase the amount of solid waste being transferred to landfills within the City. The volume of solid waste generated by the proposed WLC project per day represents 2.6 percent of the current permitted throughput and 4.5 percent of the current surplus capacity at the Badlands Sanitary Landfill. As adequate daily surplus capacity exists at the receiving landfill, development of the proposed project would not significantly affect current operations or the expected lifetime of the landfill serving the project area. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis.

AB 939 mandates the reduction of solid waste disposal in landfills. While the Badlands Sanitary Landfill has an estimated closure date of 2022, as previously identified, the City's waste hauler will also use other County landfills in the area (e.g., Lamb Canyon Landfill and El Sobrante Landfill). The estimated closure date of the Lamb Canyon Landfill is 2023 and the estimated closure date of the El Sobrante Landfill is 2030. With planned expansion activities of landfills in the Project vicinity and projected growth rates contained in the City's General Plan EIR, sufficient landfill capacity would exist to accommodate future disposal needs through City buildout in 2030. Buildout of the City General Plan would not create demands for solid waste services that would exceed the capabilities of the County's waste management system. Therefore, although the Project and cumulative projects would result in an increase in the amount of solid waste sent to landfills, compliance with state and local waste diversion requirements would contribute to the longevity of existing and proposed landfills that would serve the projects and ensure that cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.16-37 through 6.16-38).

h. Solid Waste Reduction

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to compliance with applicable federal, state, and local statutes and regulations related to solid waste.

Findings: Potential cumulative impacts of the Project related to solid waste reductions are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project’s incremental contribution to cumulative solid waste regulation impacts would not cause or contribute to a significant cumulative impact; therefore, no mitigation is required.

Facts in Support of the Findings: The Project, in combination with other cumulative projects, would increase the amount of solid waste being transferred to landfills within the City. Federal, State and local governments have enacted a variety of laws and established programs to deal with the transport, use, storage, and disposal of hazardous materials to reduce the risks to public health and the environment. AB 939 and SB 1016 mandates the reduction of solid waste disposal in landfills. While the Badlands Sanitary Landfill has an estimated closure date of 2022, as previously identified, the City’s waste hauler will also use other County landfills in the area (e.g., Lamb Canyon Landfill and El Sobrante Landfill). Additionally, the proposed project would be required to comply with applicable elements of AB 1327, Chapter 18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, State, and Federal solid waste disposal standards. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis. The estimated closure date of the Lamb Canyon Landfill is 2023 and the estimated closure date of the El Sobrante Landfill is 2030. With planned expansion activities of landfills in the project vicinity and projected growth rates contained in the City’s General Plan EIR, sufficient landfill capacity would exist to accommodate future disposal needs through City buildout in 2030. Buildout of the City General Plan would not create demands for solid waste services that would exceed the capabilities of the County’s waste management system. Therefore, although the Project and cumulative projects would result in an increase in the amount of solid waste sent to landfills, compliance with state and local waste diversion requirements would contribute to the longevity of existing and proposed landfills that would serve the projects and ensure that cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.16-38).

i. Cumulative Impacts to Water Supply Services

Potential Significant Impact: Whether the Project could result in cumulative impacts to the water supply.

Findings: Potential impacts of the Project related to cumulative impacts to water supply impacts are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that no significant impacts related to cumulative water supply services will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.16 of the Revised Final EIR Part 3, the cumulative impact geographic area for water supply is the EMWD service area. Cumulative projects also could result in potential water supply impacts, and incrementally increase the long-term demand for water service.

The WSA prepared for the Project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY. The EMWD considers this a “worst-case” estimate based on the total acres and amount of square footage of warehousing proposed by the Project. Taking into account the proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan would be substantially less than the worst-case EMWD estimate. Anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for

the proposed Project would total 0.93 and 0.66 percent of the EMWD's 2015 and 2035 supplies under worst-case conditions. The demand estimated for this Project is substantially less and therefore still within the limit of growth projected in the 2015 UWMP.

Existing and future development within the EMWD's service area would demand additional quantities of water. The 2015 UWMP addresses the water supply sources, projected demand, and supply reliability for Eastern EMWD service area. The 2015 UWMP estimates population within the EMWD service area to increase to 1,111,729 persons by the year 2035. Increases in population, square footage, and intensity of uses would contribute to increases in the overall regional water demand. The anticipated conversion of water-intensive uses (e.g., agriculture) and the implementation of existing water conservation measures and recycling programs would reduce the need for increased water supply. Demand projections for EMWD were developed using information about planned development and land use (UWMP 2015) and would include the water demand for the cumulative projects. CEQA documents for projects in the cumulative scenario have been reviewed and the findings have been incorporated into the cumulative impact analysis.

Based on the information provided in the 2015 UWMP, EMWD has the ability to meet current and projected water demand through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from MWD with existing supply resources. Planned local supplies will supplement imported supplies and improve reliability for EMWD and the region. In addition, adherence to regulations would ensure that cumulative projects would not result in a demand for water that exceeds existing entitlements and resources, or any new or expanded water-related infrastructure would be funded by the respective applicant. Therefore, projects in the cumulative scenario, together with the Project, would not cause significant cumulative impacts associated with adequate water service and supplies. No mitigation measures are required.

15. Cumulative Energy

a. Cumulative Energy Consumption – Electricity

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to electricity consumption, supply, energy standards and expansion of facilities.

Findings: Potential cumulative impacts of the Project regarding energy consumption are discussed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that no significant cumulative impacts to electricity consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: The geographic context for the cumulative analysis of electricity is Moreno Valley Utility's (MVU) service area. Electricity demand for all cumulative projects located within the MVU's service area has been estimated. Growth within this geography is anticipated to increase the demand for electricity and the need for infrastructure, such as new or expanded facilities.

The cumulative projects would require electricity for water conveyance during ground-moving activities which would require a relatively large amount of water to cover the affected construction areas. Electrical consumption due to the conveyance of water used for dust control is presented in Table 6.17-2 (Revised Final EIR Part 2, as revised by Section 4, Errata, of the Revised Final EIR Part 1, pg. 821 to 823).

Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City would increase electricity consumption during Project construction and operation and may cumulatively increase the need for electricity supplies. Estimated electrical use for the cumulative projects do not take into account electricity use from electric vehicle (EV) charging stations as the specifics of EV stations are not known for the cumulative projects.

Water use related to dust control is regulated under SCAQMD's Rule 402 and 403 and is required to limit fugitive particulate matter generated by construction activities. The Project would be in compliance with Rules 402 and 403 and would require a relatively large amount of water to cover the entire acreage of the Project site. The expected electricity consumption associated with water use during construction equates to only 0.43 percent of MVU's forecasted sales for 2020 (expected starting year of construction).

MVU forecasts that its peak demand in 2037, the latest available forecast from the Integrated Resource Plan (IRP), would be approximately 231,555 MWh/year. The Project's estimated net new electrical consumption would account for between 74 to 113 percent of MVU's projected electricity sales in 2024 depending on the electric vehicle (EV) penetration scenario. Total energy consumption from all cumulative projects is estimated at 565,690 MWh annually and is 161 percent of MVU's forecasted sales in 2037 (Section 4, Errata, of the Revised Final EIR Part 1, pg. 819). Nonetheless, as the utility provider for the Project and cumulative projects, MVU has determined that the increased electricity demand would be minor compared to existing supply and infrastructure within its service area and would be consistent with growth expectations for its service area. MVU's 2018 IRP predicts an increase in electricity demand over a 10-year period that is planned to be met by increasing solar, wind, and geothermal power, and supplementing with natural gas as needed. MVU's IRP specifically mentions the World Logistics Center and states that, "a portion of the anticipated demand [of the Project] is incorporated in MVU's load forecast. MVU will monitor development progress at the World Logistics Center and other local projects to determine potential impacts to customer energy requirements".¹⁵ MVU forecasts projected growth in the region and with its 2018 IRP already has plans in place that account for future development including the Project and cumulative projects.

Furthermore, like the Project, other future development projects would be expected to incorporate energy conservation features, comply with applicable regulations including CALGreen and State energy standards under Title 24, and incorporate mitigation measures, as necessary. As discussed above and based on evidence from MVU, the Project would not have a cumulatively considerable impact on existing energy resources either individually or incrementally when considering the anticipated growth in the service area. Accordingly, the impacts related to electricity consumption would not be cumulatively considerable, and thus would be less than significant and no mitigation is required.

b. Cumulative Energy Consumption – Natural Gas

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to natural gas consumption, supply, energy standards and expansion of facilities.

¹⁵ Moreno Valley Utility, Integrated Resource Plan (2015).

Findings: Potential cumulative impacts of energy consumption are discussed in detail in Section 6.17 of the Revised FEIR Part 2. Based on the entire record before us, this Council finds that no significant cumulative impacts to natural gas consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: The geographic context for the cumulative analysis of natural gas is Southern California Gas’s (So Cal Gas) service area. All of the cumulative projects identified by the traffic impact analysis (TIA) are in So Cal Gas’ service area. Growth within this geography is not anticipated to increase the demand for natural gas and the need for infrastructure, such as new or expanded facilities.

Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City could increase natural gas consumption during Project construction and operation and may cumulatively increase the need for natural gas supplies.

Though electricity usage is predicted to rise, natural gas demand is expected to decline overall from 2016-2035 accounting for population and economic growth as well as efficiency improvements and the State’s transition away from fossil fuel-generated electricity to increased renewable energy. SoCalGas predicts a decline in every sector (residential, industrial, commercial, electricity generation, and vehicular), with the exception of wholesale and international gas sales to Mexico. The 2016 California Gas Report states, “SoCalGas projects total gas demand to decline at an annual rate of 0.6% from 2016 to 2035. The decline in throughput demand is due to modest economic growth, CPUC-mandated energy efficiency (EE) standards and programs, renewable electricity goals, the decline in commercial and industrial demand, and conservation savings linked to Advanced Metering Infrastructure (AMI).”¹⁶ Buildout of the Project and cumulative projects in the Statewide service area is not expected to increase natural gas consumption and the need for natural gas supplies from building energy.

Natural gas consumption from the Project was compared to Statewide natural gas fuel consumption since natural gas as a fuel can be procured from anywhere and is not limited to the service provider’s resources. The Project would not generate any natural gas use for building operations, as shown in Table 6.17-3 (in Section 6.17 of the Revised Final EIR Part 2, as revised by Section 4, Errata, of the Revised Final EIR Part 1, pg. 827 to 830). Natural gas consumption would primarily be from operation of on-site equipment and the planned CNG/LNG fueling station which will be publicly accessible and are included as transportation fuels. From a cumulative standpoint, natural gas consumption from all cumulative projects (including the Project) would be 3,239,659 MMBtu or 0.37 percent of the SoCalGas’s total natural gas use (Section 4, Errata, of the Revised Final EIR Part 1, pg. 830).

Although future development projects would result in use of nonrenewable natural gas resources which could limit future availability, the use of such resources would be on a relatively small scale and would be consistent with regional and local growth expectations for SoCal Gas’s service area and would not strain Statewide natural gas resources. Further, like the Project, other future development projects would be expected to incorporate energy conservation features, comply with applicable regulations including CALGreen and State

¹⁶ California Gas and Electric Utilities, *2016 California Gas Report*.
<https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf>. Accessed May 2018.

energy standards in Title 24, and incorporate mitigation measures, as necessary. While initially the Project and cumulative projects could result in increased natural gas demand compared to existing uses on each specific project site, the overall demand for natural gas over time is expected to decline due to increases in regional natural gas efficiencies and the transition to renewable energy on a statewide basis displacing fossil fuels including natural gas. Therefore, the Project would not have a cumulatively considerable impact related to natural gas consumption, and impacts would be less than significant, and no mitigation is required.

c. Cumulative Energy Consumption – Transportation Energy

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to transportation energy consumption, supply, energy standards and expansion of facilities.

Findings: Potential cumulative impacts of energy consumption are discussed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that no significant cumulative impacts to transportation energy consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City could increase gasoline, diesel, and natural gas consumption during Project construction and operation, and may cumulatively increase the need for supplies.

As stated in the traffic impact analysis (TIA) (Revised Final EIR Part 3, Appendix F, pg. 93), approximately 80 percent of the vehicles entering or leaving warehouse sites are passenger cars, mostly used for commute trips by employees of the warehouses. The WLC would create much needed local jobs, which would affect commute patterns in the area by reducing VMT because people would work closer to where they live. Thus, the TIA demonstrates that regional VMT is reduced due to the net effect the Project has on regional automobile travel. Nonetheless, buildout of the Project and cumulative projects in the region would be expected to increase overall VMT; however, the effect on transportation fuel demand would be minimized by future improvements to vehicle fuel economy pursuant to federal and state regulations. By 2025, vehicles are required to achieve 54.5 mpg (based on USEPA measurements), which is a 54 percent increase from the 2012-2016 standard of 35.5 mpg. As discussed in detail in Section 4.07, *Greenhouse Gas Emissions*, the Project would be consistent with the 2016 RTP/SCS for the region. Cumulative projects would need to demonstrate consistency with the goals in the 2016 RTP/SCS and incorporate project design features or mitigation measures as required under CEQA, which would also ensure cumulative projects contribute to transportation energy efficiency.

According to the USEIA's International Energy Outlook 2016, the global supply of crude oil, other liquid hydrocarbons, and biofuels is expected to be adequate to meet the world's demand for liquid fuels through 2040.¹⁷ CARB's analyses and the State's 2017 Climate Change Scoping Plan show a 45 percent decrease in fossil fuel demand by 2030.¹⁸ The State's Mobile Source Strategy aims to displace fossil fuel reliant vehicles

¹⁷ EIA, International Energy Outlook 2016, [https://www.eia.gov/outlooks/ieo/pdf/0484\(2016\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2016).pdf); Accessed April 2018.

¹⁸ CARB, *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*, November, 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf; Accessed May 2018.

with 1.5 million zero emission vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2030.¹⁹ Considering the State’s goals of displacing transportation fuels, overall fossil fuel use will decrease and the current refining capacity would be sufficient to support the demand of the Project and cumulative projects (Revised FEIR Part 2, Section 6.17, pg. 6.17-22).

The Project’s annual gas and diesel consumption from construction would represent approximately 0.57 percent of County diesel sales and 0.005 percent of County gasoline sales in 2018.²⁰ Cumulative construction consumption for diesel and gasoline would result in 25 million gallons of diesel and 15 million gallons of gasoline representing approximately 9 percent of County diesel and 1 percent of County gasoline respectively (Section 6.17, Revised Final EIR Part 2, pg. 6.17-22). The Project’s annual gas and diesel consumption from operational activities would represent approximately 0.02 percent of County diesel sales and 0.003 percent of County gasoline sales in 2018.²¹ Cumulative construction and operational consumption for diesel and gasoline would result in 80 million gallons of diesel and 147 million gallons of gasoline representing approximately 29 percent of County diesel and 14 percent of County gasoline respectively (Section 4, Errata, of the Revised Final EIR Part 1, pg. 853). The Project’s transportation fuel consumption from construction and operations consists of 7 percent of the total overall cumulative consumption of projects (total consumption of cumulative projects plus the proposed Project). Therefore, as the Project would incorporate land use characteristics consistent with state goals for reducing VMT and would represent a small fraction of transportation sales, the Project would not have a cumulatively considerable impact related to transportation energy, and impacts would be less than significant.

B. ENVIRONMENTAL IMPACTS MITIGATED TO A LEVEL OF LESS-THAN-SIGNIFICANT

Public Resources Code Section 21081 states that no public agency shall approve or carry out a project for which an EIR has been completed which identifies one or more significant effects unless the public agency makes one or more of the following findings:

- I. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1).
- II. Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency. (Finding 2).
- III. Specific economic, legal, social, technological, or other considerations make infeasible the mitigation measures or alternatives identified in the EIR, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment. (Finding 3).

¹⁹ CARB, *California’s 2017 Climate Change Scoping Plan: The strategy for achieving California’s 2030 greenhouse gas target*, November, 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf; Accessed May 2018.

²⁰ California Energy Commission, *California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018*. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed September 2019. Diesel is adjusted to account for retail (52%) and non-retail (48%) diesel sales.

²¹ California Energy Commission, *California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018*. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed September 2019. Diesel is adjusted to account for retail (52%) and non-retail (48%) diesel sales.

Certain of the following issues from the environmental categories analyzed in the Revised Final EIR, including aesthetics, air quality (cancer risk), biological resources, cultural and paleontological resources, hazards and hazardous materials, hydrology, drainage, water quality, noise (short-term construction during the night), transportation (local intersections), utilities, and global climate change (individually and cumulatively) were found to be potentially significant, but can be mitigated to a less-than-significant level with the imposition of mitigation measures. This City Council hereby finds pursuant to *Public Resources Code* Section 21081 that all potentially significant impacts listed below can and will be mitigated to below a level of significance by imposition of the mitigation measures in the Revised Final EIR; and that these mitigation measures are included as Conditions of Approval and set forth in the Mitigation Monitoring and Reporting Program (MMRP) adopted by this City Council. Specific findings of the Council for each category of such impacts are set forth in detail below.

1. Cumulative Agricultural Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use, or conversion of forest land to non-forest use.

Findings: Potential impacts of the Project related to cumulative agricultural impacts are discussed in detail in Section 6.2.3 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to the cumulative loss of farmland would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the City Council and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.2 of the Revised Final EIR Part 3, implementation of the Project would result in the permanent conversion of approximately 2,200 acres currently used for dry farming to non-agricultural uses and would result in the permanent loss of approximately 2,361 acres of land designated as Farmland of Local Importance.

Implementation of the cumulative related projects includes farmlands that are proposed to be converted to a non-agricultural use with two resulting in potential impacts that would remain significant and unavoidable subsequent to mitigation. Many of the remaining cumulative projects within the cumulative geographic area for agriculture include residential or commercial type projects, and the associated environmental documents found the impacts to be less than significant. Because there are cumulative related projects that would result in significant farmland conversion impacts, the cumulative related projects would result in significant cumulative impacts due to the conversion of an agricultural use to a non-agricultural use.

The implementation of **Mitigation Measure 6.2.1** however would conserve agricultural land that is as productive as the onsite designated Farmland of Local Importance. This measure would conserve land located off-site that has equivalent or better agricultural economic productivity compared to the agricultural economic productivity of the Project site. Although cumulative related projects would cause a significant and unavoidable impact, the implementation of this measure would reduce the Project's contribution to the

cumulative impact on land designated as Farmland of Local Importance to less than cumulatively considerable.

2. Aesthetics

a. Light and Glare

Potentially Significant Impact: Whether the Project has the potential to introduce a significant new source of light and glare into the Project area.

Finding: Potential impacts of the Project related to light and glare impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this City Council finds that potentially significant impacts related to light and glare would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, development of the Project site would introduce numerous new sources of light and glare into the area in the form of street lighting, parking lots, and security lighting for the buildings and nighttime traffic.

The WLC Specific Plan requires that all site lighting be oriented downward so as to not project direct light rays upward into the sky or onto adjacent properties. The development of the Project will cause a significant increase in light and glare in the area. This new lighting will incrementally affect nighttime conditions in the area.

Exterior surfaces of the concrete tilt-up structure would be finished with a combination of architectural coatings, trim, and/or other building materials such as concrete and brushed metal. The Project will incrementally increase the amount of daytime glare in the Project area by introducing windows and metal fixtures into the area. All development in the City, which includes light generated from warehouse buildings and parking lots, is required to adhere to lighting requirements contained in the City's Municipal Code (Section 9.08.100 Lighting), which states that any outdoor lighting associated with nonresidential uses shall be shielded and directed away from the surrounding residential uses. Such lighting shall not exceed one-quarter (0.25) foot-candle at property lines and shall not blink, flash, oscillate, or be of unusually high intensity or brightness. Lighting in parking areas and drive aisles must be at least 1.0-foot candle and cannot exceed a maximum of 8.0-foot candles.

Adherence to the City's Zoning Code would help reduce potential building or parking lighting impacts, but the location of industrial uses adjacent to residential uses would not reduce potential lighting impacts on adjacent residential uses to less than significant levels prior to the implementation of mitigation measures.

The WLC Specific Plan also requires the installation of roof-mounted solar panels on future warehouse buildings and these panels may produce unintended glare to the southeast, south, and southwest of the site, depending on the angle of the sun, the number and location of panels, and the degree to which the building

parapet blocks views of the panels from surrounding land uses. Without additional information, this impact is determined to be potentially significant and requires mitigation.

Light and glare impacts of the Project can be reduced to less than significant levels by compliance with the lighting requirements of the City Municipal Code and implementation of **Mitigation Measures 4.1.6.4A** and **4.1.6.4B**. (Revised Final EIR Part 4 Volume 3 pgs. 4.1-80 to 4.1-82).

b. Cumulative Aesthetics – Light and Glare

Potential Significant Impact: Whether the Project could result in cumulative impacts in connection with past, present, and probable future projects create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Findings: Potential cumulative impacts of the Project-related aesthetics are discussed in detail in Section 6.1 Revised Final EIR Part 2. Based on the entire record before us, this Council finds that potentially significant impacts related to cumulative aesthetics would be reduced to a less than significant level, with implementation of Mitigation Measures Mitigation Measures 4.1.6.1A, 4.1.6.1B, 4.1.6.4A, and 4.1.6.4B. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Fact Supporting the Findings: The Project in conjunction with the cumulative development of other projects could significantly degrade the existing visual character (including light and glare) of the area, including both daytime glare and nighttime lighting. Development of cumulative projects within the eastern Moreno Valley area would result in the conversion of open space/vacant land to urbanized land uses. The environmental document for MV-3 identified existing visual character/light and glare, and surroundings as being a significant and unavoidable impact. Because MV-3 identified significant and unavoidable impacts to the existing visual character, cumulative development within the cumulative geographic areas for aesthetics would result in a significant cumulative impact associated with visual character.

Development of the Project would substantially alter the existing character and create light and glare impacts from conversions of the Project site from open space to an urbanized setting with many large logistics buildings. Because the Project would result in a significant impact on the visual character and light and glare from development of the area and cumulative development will also result in a significant impact on visual character, the Project's contribution to cumulative impacts to/ the existing visual character and surroundings would be cumulatively considerable, prior to the application of mitigation.

The Project will be required to comply with the City's General Plan, the City's Municipal Code (Section 9.08.100, Lighting) and the WLC Specific Plan's development guidelines for lighting and building materials. Mitigation Measures 4.1.6.1A and 4.1.6.1B would help reduce related visual impacts. Mitigation Measures 4.1.6.4A and 4.1.6.4B will help reduce light and glare associated with the new buildings near the San Jacinto Wildlife Area to the south. Mitigation Measure 4.1.6.4A requires a photometric plot of all proposed exterior lighting demonstrating that the Project is consistent with the requirements of Section 9.08.100 of the Municipal Code. The lighting study will be required to indicate the expected increase in light levels at the property lines

of the adjacent residential uses. Mitigation Measure 4.1.6.4B requires an analysis of proposed solar panels demonstrating the glare from the panels will not negatively affect adjacent residential uses or motorists along perimeter roadways. Therefore, with compliance with the City's General Plan, the City's Municipal Code, and implementation of the mitigation measures, the Project's contribution to cumulative light and glare impacts would be less than cumulatively considerable. (Revised Final EIR Part 2, pg. 6.1-9 to pg. 6.1-10)

3. Air Quality

a. Cancer Risk and Cancer Burden

Potential Significant Impact Whether the Project would expose residential receptors to substantial pollutant concentrations resulting in cancer risk impacts.

Finding: Potential impacts of the Project related to cancer risk and cancer burden impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that potentially significant impacts related to cancer risk impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: As set forth in Section 4.3 of the Revised Final EIR Part 2, adverse health effects related to cancer would exist, in the absence of mitigation, as a result of the construction and operation of the Project.

As noted in Section 4.3.3, Methodology, the Project Health Risk Assessment (HRA) examined the following condition for impacts to both sensitive/residential and worker receptors: Project Development condition which evaluates the impacts of Project-related construction and operational traffic diesel PM emissions as if the Project were built out in accordance with its proposed phased construction and operational buildout schedule commencing with the construction of Phase 1 in 2020 and the full build-out in 2035. This HRA has been provided to allow decision-makers to see the cancer-related impacts of the World Logistics Center project based on in the assumption that new technology diesel exhaust causes cancer, contrary to what was found by the HEI study. The mitigation conditions require that all diesel-fueled haul trucks during construction be 2010 or newer, that diesel trucks accessing the Project during operation be model year 2010 or newer, and that all on-site equipment greater than 50 horsepower be Tier 4 (see MM 4.3.6.2A[h] and MM 4.3.6.2A[a], respectively), and that the installation of air filtration system meeting ASHRAE Standard 52.2 MERV-13 standards are installed for specified residential units (MM 4.3.6.5A) (Revised Final EIR Part 2,pg. 4.3-72).

For reference, a risk level of 1 in a million implies a likelihood that up to one person, out of one million equally exposed people would contract cancer if exposed continuously (24 hours per day) to the specific concentration of TAC emissions over the duration of the exposure. This risk would be an excess cancer risk that is in addition to any cancer risk borne by a person not exposed to these air toxics (USEPA, 2017).

Table 4.3-26 presents the estimated unmitigated cancer risks for the 30-year exposure scenario that starts from the beginning of Project construction (Construction + Operation HRA), which uses updated construction and operational emissions values. The results are provided separately for Project construction emissions,

operational emissions, and the total project emissions prior to the application of emission mitigation. Table 4.3-27 shows the estimated unmitigated cancer risk for the 30-year residential exposure scenario that starts from the beginning of Project full operation in 2035 (Operational HRA), which used the 2035 emission levels to represent the emissions for 2035 to 2064.

On the basis of the results shown in Table 4.3-26, the overlap of Project construction and operation would exceed the SCAQMD's cancer risk significance threshold of an incremental increase of 10 in a million prior to the application of mitigation and would represent a significant impact. Table 4.3-27 shows that during full Project operation, the estimated maximum cancer risk would exceed the 10 in a million threshold within and outside of the Project boundary and would represent a significant impact. Overall, without mitigation, the Project is expected to have a significant impact mainly due to diesel PM emissions from construction and heavy-duty diesel truck activities. Figures 4.4-3 and 4.3-4 show the incremental cancer risks for the Project location. The figures show the results prior to the application of mitigation (Revised Final EIR Part 2, pg. 4-3-65 to 4.3-68).

The mitigation measures previously identified under other impact sections are required (**Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E**) to reduce construction and operational emissions of criteria pollutants and would reduce the estimated cancer risks associated with the Project. Additionally, Mitigation Measure 4.3.6.5A is required to ensure that a significant health risk does not occur at on-site residential receptors during 30 years of full Project operations. Therefore, with mitigation measures implemented, impacts regarding cancer risks and cancer burdens will be mitigated to less to significant (Revised Final EIR Part 2, pg. 4.3-72 to 4.3-79).

b. Cancer Risks – On-site and Off-site Workers (25-year)

Potential Significant Impact: Whether the Project would expose on-site and off-site workers including school staff to substantial pollutant concentrations resulting in cancer risk impacts.

Findings: Potential impacts of the Project related to cancer risk impacts on on-site and off-site workers are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that potentially significant impacts related to cancer risk to on-site and off-site workers would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: As described in Section 4.3.3, Methodology, a multi-pollutant Health Risk Assessment (HRA) was conducted for the Project. The HRA examined the following condition for impacts to both sensitive/residential and worker receptors:

Project Development condition which evaluates the impacts of Project-related construction and operational traffic emissions as if the Project were built out in accordance with its proposed phased construction and operational buildout schedule commencing with the construction of Phase 1 in 2020 and the full build-out in 2035 (Revised Final EIR Part 2, pg 4.3-23).

The HRA has been provided to allow decision makers and the public to see the cancer-related impacts of the World Logistics Center project based on the assumption that new technology diesel exhaust causes cancer, contrary to what was found by the HEI study. The mitigation conditions require that all diesel-fueled haul trucks during construction be 2010 or newer, diesel trucks accessing the Project during operation be model year 2010 or newer, and that all on-site equipment greater than 50 horsepower be Tier 4 (see MM 4.3.6.2A[h] and MM 4.3.6.2A[a], respectively).

To be conservative, the HRA relied on EMFAC2017 to determine the breakdown of vehicle types and fuel types and did not consider the potential reductions in TACs emissions and health risks from increased penetration of zero-emission vehicles (ZEVs). The increased penetration of ZEVs is speculative, but likely given rapid technology advancement and more stringent legislation. For example, the HRA assumed that the 2035 heavy-duty truck fleet would be made up of 89 percent diesel, 9 percent gasoline, 3 percent natural gas, and 0 percent electric. According to the WLC Transportation Energy Technical Report (Revised Final EIR Part 2, Appendix E pg. 11 to 14)), a Medium electric vehicle (EV) Penetration scenario projects that the heavy-duty truck fleet could consist of 22 percent electric and a High EV Penetration scenario projects that the heavy-duty truck fleet could consist of 30 percent electric by 2035. Therefore, accounting for the High EV Penetration scenario would result in a greatly reduced health risk impact than what has been calculated in this analysis set forth in the Revised Final EIR.

Estimates of worker exposures were prepared based on the assumption of a 25-year exposure duration for 250 days per year and 8 hours per day. Note that the Office of Environmental Health Hazards Assessment (OEHHA) early-in-life age factors do not apply to worker receptors. The highest worker cancer risk estimates prior to the application of mitigation is approximately 10.9 in one million for the construction + operational scenario and 3.8 in one million for the full operational scenario, both at one on-site location. Therefore, cancer risk for worker receptors anywhere in the HRA's study area is greater than the 10 in one million significance thresholds. Projected impacts are potentially significant without mitigation.

The mitigation measures identified under other air quality impact sections are required (Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E) in addition to Mitigation Measure 4.3.6.5A to reduce construction and operational emissions of criteria pollutants and reduce the estimated cancer risks associated with the Project.

Table 4.3-28 and Figure 4.3-5 of the Revised Final EIR Part 2 show the estimated cancer risks for workers for the construction and operation HRA, with mitigation, and Tables 4.3-29 and 4.3-30, and Figure 4.3-6 show the cancer risks for the full operation HRA after application of mitigation. As noted, the cancer risks are substantially lower after mitigation, and the SCAQMD cancer risk significance threshold would not be exceeded at any of the on-site or off-site receptors within the study area. The highest worker cancer risk estimates after the application of mitigation is approximately 1.8 in one million for the construction + operational scenario and 1.6 in one million for the full operational scenario. Therefore, cancer risk for worker receptors anywhere in the HRA's study area is less than the 10 in one million significance threshold with the implementation of mitigation and are less than significant. (Revised Final EIR Part 2, pgs. 4.3-66 to 4.3-78).

c. Cancer Risks – Schools

Potential Significant Impact: Whether the Project would expose schools (students) to substantial pollutant concentrations resulting in cancer risk impacts.

Findings: Potential impacts of the Project related to cancer risk impacts on school children are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that potentially significant impacts related to cancer risk to schools would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Refer to “Facts in Support of Findings” for “Cancer Risks – On-site and Off-site Workers” for a background discussion in regard to the HRA. Cancer risk estimates at school sites in the area were prepared assuming a 9-year exposure during construction and operation as well as operation at full buildout. Prior to the application of the mitigation, the maximum cancer risk is at Ridgecrest Elementary School for the construction + operational scenario and would be approximately 12.6 in a million. Similarly, the maximum cancer risk for the full operational scenario is 3.54 in one million is at Bear Valley Elementary School. Therefore, maximum impacts at schools are greater than the 10 in one million significance threshold prior to mitigation and are potentially significant without mitigation.

With the implementation of the mitigation measures previously identified above (**Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E**) the maximum cancer risk would be approximately 3.0 in one million at the Ridgecrest Elementary School for both the construction + operational scenario and the full operational scenario and maximum cancer risk would be reduced to 1.8 in one million for the construction + operational scenario and 0.54 in one million for the full operational scenario at the Bear Valley Elementary School. Therefore, maximum impacts at schools are less than the 10 in one million significance threshold with the implementation of mitigation and are less than significant (Revised Final EIR Part 2, pgs. 4.3- 66 to 4.3-78).

4. Biological Resources

a. Endangered and Threatened Species

Potential Significant Impact: Whether the Project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as endangered or threatened in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to endangered and threatened species are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to endangered and threatened species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the City Council and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, of the special-status plant and animal species that have the potential to occur within the general vicinity of the Project area,

17 plant and animal species are designated as endangered or threatened by State and/or Federal authorities (Table 4.4-6 of Revised Final EIR Part 3, pg. 4.4-65). The Coastal California gnatcatcher was observed but no other species are believed to be present on the Project site. However, it is possible the listed birds may utilize the SJWA on a seasonal basis.

Coastal California gnatcatcher is a Covered Species in the MSHCP and is considered Adequately Conserved. Consistent with the MSHCP requirements, **Mitigation Measure 4.4.6.3A** prevents suitable habitat from disturbance during the breeding season. Active bird nests are protected by both the Migratory Bird Treaty Act (MBTA) and sections of the California Fish and Game Code.

The potential for occurrence determination was based on the results of focused biological resource surveys, and/or the lack of suitable habitat within the Project site for the referenced species. No Federal or State endangered/threatened species besides the Coastal California gnatcatcher were detected on the Project site during the focused biological resource surveys. However, to err on the side of caution, it is reasonable to conclude that, at a minimum, indirect impacts to listed species may be significant, and mitigation is required. The 250-foot setback identified in **Mitigation Measure 4.4.6.1A** with an additional 400-foot building setback from the southerly property line, for logistics buildings within Planning Areas 10 and 12 will effectively mitigate potential indirect impacts of air pollutants, including diesel particulate matter, on wildlife within the SJWA. Furthermore, according to the Revised Final EIR Part 3 Section 4.4, pgs. 4.4-66 to 4.4-68, operational and construction noise would not require additional mitigation due to the increased setback and would not exceed 60 dB within the SJWA.

In terms of invasive species, the WLC Specific Plan landscaping palette does not include any of the invasive plant species listed in Section 6.1.4 of the MSHCP (Table 6-2), and **Mitigation Measure 4.4.6.3G** will ensure that no on-site landscaping along the southern boundary of the Project site conflicts with MSHCP invasive plant guidelines.

Future development within the WLC site will have to comply with the off-site lighting restrictions outlined in Section 4.3 of the WLC Specific Plan, including the requirement that direct light rays from all lighting fixtures be directed downward, illuminate only the building or space intended, and do not spill onto adjacent properties (Section 9.08.100 Lighting 5.5.2.1). This will also apply to Project-related development in Planning Areas 10 and 12, which will help minimize lighting impacts on biological species in the adjacent SJWA land. All on-site lighting will also have to comply with the new night lighting guidelines in Section 9.08.100 of the City's Municipal Code, which limits off-site impacts to 0.25 foot-candles. As development occurs within the Project, adherence to these design guidelines and restrictions will help ensure that night lighting increases will not result in significant indirect lighting impacts on native wildlife within the SJWA.

For example, the Specific Plan requires that streetlights, parking lot lighting, and other project-related illumination sources be positioned, directed, and shielded to avoid "direct light spill" into MSHCP conservation areas including those contained within Existing Core H to the south of the WLC site, and Proposed Core 3 (Section 6.1.1, Proposed Core 3) to the east of the WLC site. Lighting installed according to the WLC Specific Plan will be consistent with MSHCP guidelines. The Project will also have to comply with

the City's new Dark Sky Lighting Ordinance, which reduces spillover light to 0.25 foot-candles at five feet from the adjacent property lines.

In addition to night lighting issues associated with construction and operation, the proposed facilities are to include roof-mounted photovoltaic panels to provide electricity for the facilities and aid in the sustainability of the Project and reduce additional GHG emissions. There is a potential for glare from these panels to confuse migratory birds into attempting to land in the area of the panels. However, the Project design calls for the use of low glare and high solar transmission films to increase solar capacity and prevent unnecessary glare, so this impact would be less than significant (Revised Final EIR Part 3, pgs. 4.4-68 to 4.4-69). Deteriorated water quality can result in impacts to endangered and threatened species. The implementation of water quality BMPs summarized here and detailed in Sections 4.9.6.1 and 4.9.6.2 (Revised Final EIR Part 4) will reduce impacts to biological resources. Toxics Water Quality Development plans for the WLC project will include Water Quality Best Management Practices (BMPs) such as vegetated earthen channels, storm drain stenciling, street sweeping, and education, and Detention basins will be designed to filter potential toxics from storm water. Section 4.9.6.2, Operational Water Quality Impacts (Revised Final EIR Part 4), also requires the regular removal of any contaminated materials from the detention basins to protect downstream water quality. These BMPs will be implemented as part of the storm water pollution prevention measures for the Project, in accordance with all appropriate NPDES requirements. Development of the WLC project will result in the additional use of hazardous materials in limited quantities associated with normal logistics use such as janitorial and cleaning products, solvents, herbicides, and insecticides. However, compliance with regulations, standards, and guidelines established by the Environmental Protection Agency (EPA), State, County, and local agencies relating to the storage, use, and disposal of hazardous waste will reduce the potential risk of hazardous materials exposure to downstream water and reduce the potential risk to endangered and threatened species (Revised Final EIR Part 3, pgs. 4.4-69 to 4.4-70).

Local wildlife (i.e., within the SJWA) may be exposed to vehicular exhaust and diesel particulates and toxic air contaminants from truck exhaust as the WLC project builds out. New development will produce significant amounts of diesel-related air pollutants that will be released into the atmosphere, including gases and particles of various sizes. Diesel emissions contain thousands of pollutant species, and the composition depends on the fuel, vehicle, and driving conditions. The main public health concerns are from fine and ultrafine particulate matter, black or elemental carbon, polycyclic aromatic hydrocarbons (PAHs) like phenanthrene, metallic ashes, gases like nitrogen dioxide, aldehydes like acetaldehyde, acrolein, and crotonaldehyde, volatile organic compounds like benzene and 1,3-butadiene, etc. One of the research limitations is that some health effects from these pollutants take a long time, in some cases even a lifetime, to exhibit themselves.

These pollutant species can also be emitted from other sources, so in complex urban environments, it can be difficult to trace individual sources of air pollution. In this case, air quality is relatively good, and the only major activity is agriculture, so the increase in most of these pollutant species would predominantly be the result of new warehouse uses within the Project. Research suggests that wildlife may be more susceptible to air pollutant impacts than humans, due to their smaller size, higher respiration rates, smaller lung capacities, ingestion of local plant materials that have also been exposed, higher metabolic rates, etc., although some factors like shorter lifespans would reduce the length of exposure over time. For these reasons and for the

purposes of the analysis in the Revised Final EIR, it was assumed that animals within the SJWA would be at least as susceptible to health effects from air pollution, including diesel exhaust, as humans.

In 2002, the EPA compiled a wide range of scientific studies on the health effects of diesel exhaust, including non-carcinogenic effects of diesel exhaust on laboratory animals. Studies found that diesel particulate matter (diesel PM) had a limited effect on the survival and growth of rats and mice when exposed to diesel PM for short periods of time. However, rats, mice and hamsters all experienced increased lung to body-weight ratios when exposed to 1.5 mg/m³ diesel PM concentrations for extended periods of time. Several studies looked at behavior effects in animals and found that juvenile rats exposed to diesel emissions (DE) exhibited a decreased ability to move around on their own, and negatively affected their learning in adulthood.

Extended exposure to diesel emissions caused negative effects on the pulmonary functions of rats, hamsters, cats and monkeys. Depending on the species, DE levels of 1.5–11.7 mg/m³ affected lung mechanical properties, diffusing capacity, lung volumes, and ventilator performance of the subject animal. The ability of rats to clear their airways was also severely impaired by diesel PM concentrations of 1 mg/m³ or greater. Data on the effect of diesel PM on airway clearance in other animals were limited, but the pathological effects of diesel PM seemed to be dependent on the relative rates of pulmonary deposition and clearance (rate of breathing) of the subject animal. The studies also showed that diesel PM can reduce an animal's resistance to respiratory infections. Diesel PM can begin to impair an animal's immune system in as little as 2–6 hours with exposures of 5–8 mg/m³ of diesel PM. The testing data also suggested that diesel PM may be a factor in increased allergic reactions in animals.

When comparing filtered versus non-filtered DE, studies found that diesel particulates are the main cause of noncancerous health effects. However, they could not determine if diesel PM acts additively with the gas, or whether it combines with the gases to create different effects. The studies also found that other airborne contaminants (e.g., criteria pollutants) can be altered by diesel PM when absorbed by the diesel particles and increase the physical health effects caused by the diesel PM and other contaminants. These increased health risks were only found in laboratory settings. There was no evidence for DE interacting with other contaminants in normal urban atmospheric settings except for the impaired ability of animals to resist respiratory tract infections. No other noncancerous effects were found in any of the studies.

Chapter 7 of the EPA document includes studies that concluded diesel emissions also have carcinogenic effects on animals. Studies indicated that DE and/or diesel PM did result in increased cases of cancer in laboratory animals as well as humans. Rats experienced a trend of increased tumor growth when exposed to concentrations of DE exceeding 1×10^4 mg \times hr/m³. Because tumors were induced at high concentrations it is believed that they are caused by the lungs experiencing particle overload. The studies also examined the effect of filtered exhaust and discovered that it did not cause tumors. They concluded that filtered exhaust either was not a carcinogenic or had low cancer potency (Revised Final EIR Part 3, pgs. 4.4-70 to 4.4-72).

As a result of the advances in emission control technology, USEPA, CARB, and other government and industry stakeholders commissioned a series of studies called the Advanced Collaborative Emissions Study (ACES). Phase 3 of ACES evaluated whether emissions from new technology diesel engines cause cancer or other health effects. Specifically, it evaluated the health impacts of a 2007-compliant engine equipped with a diesel

particulate filter. HEI found chronic exposure to NTDE did not induce tumors or pre-cancerous changes in the lung and did not increase tumors that were considered to be related to NTDE in any other tissue in laboratory rats. The study also confirmed that the concentrations of particulate matter and toxic air pollutants emitted from NTDE are more than 90 percent lower than emissions from traditional older diesel engine. Rats are the most sensitive laboratory animal species for evaluation of older technology diesel engines (pre-model year 2007), because of their sensitivity to high concentrations of particles (present in older technology diesel engines), compared with other species (including humans) (Revised Final EIR Part 2, pg. 4.3-18 to 4.3-19).

Based upon the previously described information, the 250-foot setback identified in **Mitigation Measure 4.4.6.1A**, will effectively mitigate potential indirect impacts of air pollutants, including diesel particulate matter, on wildlife within the SJWA. Compliance with the off-site lighting guidelines of the Specific Plan, compliance with the night lighting standards in Section 9.08.100 of the City Municipal Code, and implementation of Aesthetics **Mitigation Measure 4.1.6.4A** will help reduce lighting impacts on the SJWA to less than significant levels. In addition, **Mitigation Measure 4.4.5.2A** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]), **4.4.6.1B** and **4.4.6.3G** will help assure that potential impacts to listed or sensitive plant species remain at less than significant levels.

b. Adopted Habitat Conservation Plans

Potential Significant Impact: Whether the proposed Project would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Finding: Potential impacts of the Project related to compliance with the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) and the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts with the species protected by these Plans would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, the Project site is within the SKR HCP Fee Area. The SKR is relatively widespread throughout the SKR HCP Fee Area, but the main blocks of occupied habitat are concentrated in several Core Areas that must be conserved. The Project site is not within an SKR Core Area. The long-term SKR HCP provides Take Authorization for the SKR within its boundaries. The core reserves established by the SKR HCP will be managed as part of the MSHCP Conservation Area consistent with the provisions of the SKR HCP. Focused surveys for SKR will not be required for this Project because the Project lies within the SKR Fee Area; therefore, no requirements under the SKR HCP other than payment of a local mitigation fee are required.

The Project area is located within the Reche Canyon/Badlands Area of the MSHCP. Development of the Project area would not conflict with the conservation goals established by the MSHCP for Cell Group X or

Cell Group E. In addition, no conflict from development would occur in relation to the Reche Canyon/Badlands Area Plan, the Area Plan Subunit 4, the Area Plan Subunit 3, Proposed Core 3, or Existing Core H.

The WLC site is adjacent to Cell Group D and Proposed Core 3, however, it is not near any Linkages identified in the MSHCP. It is adjacent to the SJWA and, therefore, is subject to the Project guidelines provided in MSHCP Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface). The Project is also required to adhere to the Best Management Practices (BMPs) found in Appendix C of the MSHCP.

The WLC project does not propose to alter land use in any way that would adversely affect Cores, Linkages, or Reserve Assembly within the Reche Canyon/Badlands Area Plan. The WLC project is not located within any Amphibian, Mammalian, or Special Linkage Areas identified by the MSHCP. The Project is in an area requiring burrowing owl surveys, is within the MSHCP Criteria Area Species Survey Area (CASSA) and is within the Narrow Endemic Plant Species Survey Area (NEPSSA).

The MSHCP and its Implementation Agreement contain a fee mitigation program pursuant to which local agencies collect development impact fees and remit such fees to the Western Riverside County Regional Conservation Authority (RCA). These fees are in turn used to acquire lands that are suitable for habitat preservation for species covered by the MSHCP. Payment of the local MSHCP mitigation fee will be required of the Project prior to the issuance of building permits. The MSHCP provides that payment of the fee completely mitigates a project's environmental impacts.

From available information, potential indirect impacts to avian and other biological resources within the SJWA will be reduced to less than significant levels by the creation of a 250-foot on-site setback in **Mitigation Measure 4.4.6.1A**. Project design features and associated setbacks previously described will reduce Project impacts to adjacent biological resources to less than significant levels. As required by the October 17, 2014 Joint Project Review with the RCA, the WLC Project must implement the guidelines contained in MSHCP Section 6.1.4 related to controlling adverse effects for development adjacent to the MSHCP Conservation Area, of which there are seven specific conditions. Therefore, the WLC project would have a less than significant impact in regard to the MSHCP.

Participation in the MSHCP and payment of the MSHCP fee provides compensation for the loss of raptor foraging habitat due to approved projects. A project proponent is required to participate as outlined in the MSHCP, so that loss of raptor foraging habitat is considered to be less than significant and no mitigation is required.

Narrow Endemic Plant Species. No Narrow Endemic plant species are anticipated to occur in the WLC site, but compliance with **Mitigation Measure 4.4.5.2A**, as revised (Additional Errata to the Revised Final EIR dated May 14, 2020) will assure there will be no significant impacts to these plant species.

Criteria Area Plant Species. No Criteria Area plant species are anticipated to occur on the WLC site, but compliance with **Mitigation Measure 4.4.5.2A**, as revised (Additional Errata to the Revised Final EIR dated May 14, 2020) will assure there will be no significant impacts to these plant species.

Riparian/Riverine Areas and Vernal Pools. Drainage Features 7, 8, 9, 12, and 15 contain riparian/riverine areas, as designated by the MSHCP. The Project area does not contain habitat suitable for covered riparian species, such as least Bell’s vireo, southwestern willow flycatcher, and western yellow-billed cuckoo. No vernal pools or ephemeral ponds were observed on the Project site area and no suitable habitat for any fairy shrimp species was identified on-site. No additional mitigation regarding vernal pools or vernal pool species is required. A programmatic-level Determination of Biologically Equivalent or Superior Preservation (DBESP) was prepared by MBA in 2013 to outline specific requirements for Project-related impacts to these features in the future. A building-specific DBESP will be required in connection with the development of each building within the WLC.

Specific Plan Design Features. The Project is consistent with the major MSHCP requirements relative to core areas, criteria cells, threatened and endangered species. In addition, the Project complies with the MSHCP guidelines for urban/wildland interface, riparian/riverine areas, or related setback (with implementation of **Mitigation Measure 4.4.6.1A**). In addition, future development will be required to demonstrate that it is also consistent with all MSHCP requirements, including indirect impacts such as lighting, noise, and air pollution effects.

Regulatory Compliance. Stephens’ kangaroo rats have a low potential to occur within the study area. While the study area is not within the SKR Core Reserve Area, the SKR HCP Implementing Agreement requires payment for loss of habitat within defined areas. The entire Project site lies within the fee area. An assessment of individual actions for development within the WLC Specific Plan area would be required prior to any implementation. The number of acres of disturbance associated with the development and any off-site improvements shall require payment to comply with the SKR HCP. In addition, prior to issuance of a grading permit for the development of each building within the WLC, the applicants will be required to pay the mandatory MSHCP mitigation fee. The mitigation fee is a per-acre fee for commercial or industrial development. **Mitigation Measures 4.4.6.1A** and **4.4.6.1B** will also help reduce potential direct and indirect impacts to biological resources covered by the MSHCP.

With implementation of **Mitigation Measures 4.4.6.1A, 4.4.6.1B, 4.4.6.2B, 4.4.5.2A** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]), and **4.4.5.2B** (as revised [Additional Errata to the Revised Final EIR dated June 9, 2020]), potential impacts related to the species protected by the MSHCP will be reduced to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-60 to 4.4-63).

c. Jurisdictional Delineation, Riparian Habitat or Other Sensitive Natural Communities

Potential Significant Impact: Whether a Project would have a substantial adverse effect on federally protected waters or wetlands as defined by Section 404 of the Clean Water Act (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Whether the proposed Project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CSFW) or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to jurisdictional land, riparian habitat, and sensitive natural communities’ impacts are discussed in detail in Section 4.4 of the Revised Final EIR Parts 3. Based on the

entire record before us, this Council finds that potentially significant impacts related to jurisdictional land, riparian habitat, and sensitive natural communities' impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.4 of the Revised Final EIR Part 3, drainages in the WLC site were investigated and delineated by MBA in March 2012 and updated in 2013. A total of 15 primary drainage features, sub-drainages or tributaries were identified and evaluated for jurisdiction under Section 404 and 401 of the CWA as administered by the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB), respectively; Porter Colonne as administered by the RWQCB; and Section 1600 of the Fish and Game Code as administered by the CDFW.

The MBA 2013 report concludes that two of the drainages on the Project site are under the jurisdiction of the USACE (Drainages 12 and 15), and several additional drainages are under the jurisdiction of the CDFW and RWQCB (Drainages 7, 8, 9, 12, and 15).

Drainage Feature 12 and 15 are likely subject to USACE jurisdiction. However, if any portion of Drainage Features 12 and 15 are affected by WLC Project construction activities or flood control improvements in the future, then regulatory permitting may be required (Revised Final EIR Part 3, pgs. 4.4-74 to 4.4-75).

Drainage Feature 7, 8, 9, 12, and 15 within the WLC Project are considered riparian/riverine areas, as defined by MSHCP. If impacts to any of these areas cannot be avoided, a DBESP report and relevant mitigation will be required by the RCA.

The Project area does not contain habitat suitable for sensitive riparian species, such as least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo. Additionally, no vernal pools or ephemeral ponds were observed on the Project area and no suitable habitat for any fairy shrimp species was identified on-site.

Raptor Foraging Habitat. The WLC Specific Plan area and off-site facilities contain flat, open areas with sparse vegetation, which could be considered foraging habitat for some raptor species. Due to the regular, heavy disturbance associated with the various agricultural activities in the WLC Specific Plan area and off-site facilities resulting in a rather limited prey base, and the limited size of the site in relation to the expansive foraging habitat in the near vicinity including both the CDFW Conservation Area and the SJWA, Lake Perris State Recreational Area and the extensive Badlands to the east, the foraging habitat on-site is considered marginally suitable and an adverse but not significant impact to raptor foraging habitat is anticipated.

Several drainages on the Project site are under the jurisdiction of the USACE, CDFW, or RWQCB. Therefore, **Mitigation Measures 4.4.6.2A through 4.4.6.2C** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]) will help ensure there will be no significant impacts to riparian areas associated with Waters of the U.S. or Waters of the State as a result of future development within the Project.

With implementation of **Mitigation Measures 4.4.6.1A, 4.4.6.1B and 4.4.6.2A** through **4.4.6.2C** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]), potential impacts to riparian habitat or other sensitive natural communities, including on-site drainages, will be reduced to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-75 to 4.4-77).

d. Candidate, Non-listed Sensitive, or Other Special Status Species

Potential Significant Impact: Whether the Project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to candidate, non-listed sensitive, or other special status species impacts are discussed in detail in Section 4.4 of the Revised Final EIR Parts 3. Based on the entire record before us, this Council finds that potentially significant impacts related to candidate, non-listed sensitive, or other special status species impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, no USFWS designated Critical Habitat for any species is located within the Project area; therefore, no further action with regard to Critical Habitat is necessary.

Los Angeles Pocket Mouse. Focused surveys for the Los Angeles Pocket Mouse (LAPM) were conducted in August 2005, June 2010, June 2012, July 2013, and May 2018. Suitable habitat was found within Drainage Feature 9, one of the main drainage features located in the eastern end of the WLC site. In its MSHCP Consistency Report, MBA concluded that LAPM is absent from the WLC site, which is substantiated by the ESA May 2018 surveys (Revised Final EIR Part 3, Appendix B). However, the WLC Specific Plan indicates this drainage will remain in its present natural condition, except for the southern end as it becomes the Street H channel and outlets to the SJWA land to the south. Extensive surveys were completed in 2005, 2010, 2012, 2013, and 2018, which concluded that the LAPM was not present. In addition, there is no suitable habitat between the known occurrence of the LAPM and the WLC SITE. The known populations of the LAPM are located within the southern portion of the SJWA, which is more than 2 miles from the southern WLC site boundary. The area between the known recorded occurrences of the LAPM and the WLC site have been actively disked farmland in the past and a 500-foot wide area along the southern WLC site boundary continues to be actively disked. Therefore, there is no habitat connectivity between the known occurrences of the LAPM and the WLC site. However, to ensure that no impacts occur, **Mitigation Measure 4.4.6.3E** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]) is included in the MMRP.

Migratory or Nesting Birds. The 2013 MBA report found the extensive agriculture plant communities in the WLC Specific Plan area and off-site facilities provide suitable nesting habitat for ground-nesting avian species such as western meadowlark (*Sturnella neglecta*) and burrowing owl. Suitable habitat for shrub and tree nesting species such as red-tailed hawk, black phoebe (*Sayornis nigricans*), and house finch occur along the

edges of existing development surrounding the WLC Specific Plan area and off-site facilities as well as isolated, remnant patches of vegetation in undisturbed portions of the WLC Specific Plan area and off-site facilities. Therefore, portions of the WLC Specific Plan area and off-site facilities and immediately adjacent to the WLC Specific Plan area and off-site facilities provide suitable nesting habitat for migratory birds protected under the MBTA and California Fish and Game Code.

The Project area contains suitable nesting habitat for several tree-, shrub-, and ground-nesting avian species. Therefore, MBA recommended construction activities avoid the avian nesting season, from February to August, if possible. If construction activity must take place during the nesting season, a pre-construction nesting bird survey will be conducted prior to any ground disturbance activities. The survey can be conducted in conjunction with the pre-construction survey for burrowing owl.

If passerine birds are found to be nesting or if there is evidence of nesting behavior within 250 feet of the impact area, a 250-foot setback will be required around the nest where no vegetation disturbance will be permitted. For raptor species such as hawks and owls, this setback should be expanded to 500 feet. A qualified biologist will be required to closely monitor nests until it is determined that they are no longer active, at which time construction activity in the vicinity of nests could continue. Construction activity may proceed within the buffer area at the discretion of the biological monitor. **Mitigation Measures 4.4.6.3A through 4.4.6.3C** will ensure that impacts are less than significant.

Burrowing Owl. For those species that are not covered by the take and incidental take provisions of the MSHCP (e.g., burrowing owl), the MSHCP requirements dictate that further protective action be taken. While no burrowing owls were identified within the Project's area of disturbance, because suitable habitat is present within the Project area for the burrowing owl and because the species is highly mobile, a potential exists that, at some future date prior to Project development, this species may occupy the development sites. This is a potentially significant impact requiring mitigation. **Mitigation Measure 4.4.6.3D**, as revised (Additional Errata to the Revised Final EIR dated May 14, 2020), will ensure that impacts are less than significant.

All burrowing owl observations within the Project site prior to 2018 are associated with artificially created berms. The recorded sightings have been within a bank of an existing drainage feature, a berm within the recently constructed detention basin associated with the Skechers Building (Drainage 3), and a roadside berm just south of Alessandro Boulevard. Burrowing owl was observed in 2018 in the eastern drainage within the proposed 250-foot setback area. The proposed detention basins will be constructed with similar manufactured berms. Based on historic observations of burrowing owl within the WLC site, it is reasonable to assume that construction of similar berms will continue to provide optimum burrow habitat for resident burrowing owls.

In addition, since there have been no recorded occurrences of burrowing owl in the northern portion of the SJWA there is no concern for competition with other burrowing owls. It is reasonable to assume that the created detention basins will provide more than a sufficient amount of foraging habitat to support a single pair of burrowing owls. The southern 250-feet of the WLC site will not contain any building development and construction activities will be restricted to detention basins and associated access roads. Mitigation Measure 4.4.6.1A discusses the 250-foot setback required for areas developed adjacent to the San Jacinto Wildlife Area. (Revised Final EIR Part 3 pgs. 4.4-78 to 4.4-79).

Plant Survey Areas. The Project limits are within MSHCP Survey Area 10 of the Narrow Endemic Plant Species' Survey Areas (NEPSSA) and MSHCP Survey Area 9 of the Criteria Area Sensitive Plant Species' Survey Areas (CASSA) for plant species. The MSHCP requires that a habitat site assessment (HSA) be conducted for all proposed developments within NEPSSAs and CASSAs. The HSA for most NEPSSA and CASSA plants must be done during a normal rainfall year and/rainy season. If it is determined during the HSA that suitable soils and/or growing conditions are present on-site to support identified NEPSSA species, a focused plant survey is required during the plant species blooming period.

Habitat suitability of the site for NEPSSA and CASSA species is detailed in the General Biological Resources and MSHCP Compliance Report (Final EIR, Volume 3 Appendix E). None of the species analyzed in the NEPSSA or CASSA is anticipated to occur on the WLC Project site. The implementation of the WLC Project would not affect the habitat or result in a direct impact for any special status plant species. **Mitigation Measure 4.4.5.2A**, as revised (Additional Errata to the Revised Final EIR dated May 14, 2020), will ensure that impacts are less than significant.

WLC Specific Plan design features: The WLC Specific Plan does not contain any design features relative to sensitive species or birds, other than the landscape palette that contains all native and/or drought-tolerant plants that may be utilized by birds tolerant of human activity.

In summary, implementation of **Mitigation Measures 4.4.5.2A** (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]), **4.4.6.1A**, and **4.4.6.4A** through **4.4.6.4K** would reduce impacts to burrowing owl, migratory bird species, and Los Angeles pocket mouse to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-77 to 4.4-79).

e. Cumulative Biological Impact – Adversely Affect Endangered or Threatened Species.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect, either directly or indirectly or through habitat modifications, on any species identified as endangered or threatened in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to threatened or endangered species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: There are 17 plant and animal species that are designated as endangered or threatened by State and/or Federal authorities that have the potential to occur within the general vicinity of the Project area (Table 4.4-6) and the MSHCP area. Only the coastal California gnatcatcher has been observed within the Project site. Coastal California gnatcatcher is a Covered Species in the MSHCP and is considered Adequately Conserved. Consistent with the MSHCP requirements, **Mitigation Measure 4.4.6.4A** prevents suitable habitat from disturbance during the breeding season.

Consistency with the MSHCP would provide assurance that the Project would be in compliance with the provisions of the federal Endangered Species Act, the California Endangered Species Act, and the Natural Community Conservation Planning Act; and would adequately provide for the conservation and protection of the covered species adequately conserved and their habitats in the MSHCP Plan Area.

The Project site and off-site facilities are located within the fee area of the SKR HCP. The SKR HCP is managed as part of the MSHCP Conservation Area and significant cumulative impacts to SKR are addressed through adherence to the Stephens' kangaroo rat HCP's Implementing Agreement and payment of the County's per-acre mitigation fee.

Cumulative projects that would occur on previously undeveloped land supporting endangered or threatened species would be required to identify and mitigate any potentially significant impacts to those biological resources. Cumulative projects within the MSHCP Plan Area would be subject to consistency with the MSHCP as well as subject to consistency for any relevant HCPs. The combined construction of projects within the vicinity of the Project could deprive some species of a significant amount of habitable space. Related projects that would potentially affect threatened or endangered species would also be subject to the same regulatory requirements as the Project. These determinations would be made on a case-by-case basis, and the effects of cumulative development on sensitive species would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, cumulative adverse effects on threatened and endangered species would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.4A, 4.4.6.1A and 4.4.6.1B** would reduce potential impacts to listed endangered and threatened species. Mitigation Measures 4.4.6.1A and 4.4.6.1B includes development setbacks from the SJWA northern boundary and water quality and erosion control facilities to minimize downstream impacts. Mitigation Measures 4.4.6.4A requires avoidance of impacts to nesting birds, including the Federally Threatened coastal California gnatcatcher. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-34 through pg. 6.4-36).

f. Cumulative Biological Impact – Adversely Affect Candidate, Non-listed Sensitive, or Special-Status Species.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect, either directly or indirectly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to a candidate, sensitive, or special status species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The WLC Specific Plan area overlaps with the MSHCP Survey Areas for Narrow Endemic Plant Species as well as Criteria Area Sensitive Plant Species. Focused surveys for these species did not produce positive findings within the Project site and these species are not anticipated to occur. The implementation of the WLC Project would not affect the habitat or result in a direct impact for any special status plant species.

Focused surveys for Los Angeles pocket mouse did not find this species within the Project site and the closest known location for the species is in the southern portion of the SJWA for which there is no suitable habitat connection. However, **Mitigation Measure 4.4.6.4E** is recommended to prevent impacts to the species from occurring with the implementation of the Specific Plan as suitable habitat was identified within Drainage Feature 9 on the Project site.

Burrowing owl has been observed within the WLC site on several occasions, most recently in 2018. The MSHCP requires specific protective action for this species; as such, **Mitigation Measure 4.4.6.4D** provides for pre-construction surveys and the preparation of a relocation plan if burrowing owl is found. In addition, the construction of berms around detention basins where burrowing owls have been observed to use will provide nesting opportunities and the conservation of 74.3 acres within the Specific Plan area will provide the potential to construct artificial burrows for use in the relocation plan.

Migratory and nesting birds are known from the Project site because suitable nesting habitat is available for several bird species. **Mitigation measure 4.4.6.4A** is recommended to minimize potential impacts to nesting birds.

Raptor foraging habitat will be lost through the construction of the WLC and cumulative projects. The MSHCP incorporates suitable raptor foraging habitat within the MSHCP conservation areas. As a result of conservation planning within the MSHCP area enabled through the contribution of fees required for approved development, cumulative impacts to raptor foraging habitat will not be considerable.

The combined construction of projects within the vicinity of the Project could deprive some species of a significant amount of habitable space. Related projects that would potentially affect local or regional candidate, sensitive, or special status species subject to the same regulatory requirements as the Project. Therefore, cumulative adverse effects on local or regional candidate, sensitive, or special status species would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on

biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.4A through 4.4.6.4K** would reduce potential impacts to candidate, non-listed sensitive, or special-status species. **Mitigation Measures 4.4.6.4A through 4.4.6.4K** includes protection for nesting birds, including burrowing owl, development of a resource management plan, landscape buffer adjacent to the SJWA, and payment of impact fee to the MSHCP. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-36 through pg. 6.4-38).

g. Cumulative Biological Impact – Adversely Affect Riparian Habitat or Other Sensitive Natural Communities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant cumulative impacts related to riparian habitat or other sensitive natural community would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Riparian or riverine areas are lands that contain habitat dominated by trees, shrubs, and persistent emergent plants, which occur close to or depend upon soil moisture from a nearby water source; or areas with fresh water flowing during all or a portion of the year. Drainage Feature 7, 8, 9, 12, and 15 within the WLC Project are considered riparian/riverine areas, as defined by MSHCP. If impacts to any of these areas cannot be avoided, a Determination of Biologically Equivalent or Superior Preservation (DBESP) report and relevant mitigation will be required.

Mitigation Measure 4.4.6.3A will help ensure there will be no significant impacts to riparian areas associated with Waters of the State as a result of future development within the Project. In addition, **Mitigation Measure 4.4.6.3B** will provide mitigation in the form of on-site preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at off-site or on-site locations. The intent of the regulatory permitting for Waters of State is a no net loss of these resources and cumulative impacts would be less than considerable.

Cumulative projects that would potentially affect habitat would also be subject to the same requirements of CEQA as the Project. These determinations would be made on a case-by-case basis, and the effects of

cumulative development on riparian habitat or other sensitive natural communities would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. With the implementation of the MSHCP Conservation Areas, sustainable populations for covered species within conserved habitats would result and cumulative impacts would be less than considerable. Therefore, for the reasons described above, cumulative adverse effects on sensitive habitat would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.3A through 4.4.6.3C** would reduce potential impacts to riparian habitat or other sensitive natural communities. **Mitigation Measures 4.4.6.3A through 4.4.6.3C** includes the requirement to obtain regulatory jurisdictional permits, creation or enhancement of riparian resources, development of a resource management plan, and demonstration that the mitigation resources are equivalent or better than the jurisdictional resources impacted. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-38 through pg. 6.4-39).

h. Cumulative Biological Impact – Adversely Affect Federally Protected Wetlands or Waters of the U.S.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect on federally protected wetlands or waters of the U.S. as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to federally protected wetlands or waters of the U.S. would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: A total of 15 primary drainage features were identified during this survey and a number of sub-drainages or tributaries were also identified. Jurisdiction for each drainage and/or sub-drainage or tributary was evaluated for jurisdiction under Section 404 and 401 of the Clean Water Act (CWA) as administered by USACE and RWQCB, respectively. Two of the 15 features are subject to the jurisdiction of the USACE and/or RWQCB. In addition, no jurisdictional wetlands or isolated wetlands were identified within the Project site. **Mitigation Measure 4.4.6.3A** will help ensure there will be no significant impacts to

riparian areas associated with Waters of the U.S. as a result of future development within the Project. In addition, there would be no net loss of riparian resources.

Related projects that would potentially affect wetlands would also be subject to the same requirements of the Project with respect to the MSHCP. These determinations would be made on a case-by-case basis, and the effects of cumulative development on wetlands would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, cumulative adverse effects on wetlands would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on Federally protected wetlands or Waters of the United States.

Implementation of **Mitigation Measures 4.4.6.3A through 4.4.6.3C** would reduce impacts to federally protected wetlands or waters of the U.S. **Mitigation Measures 4.4.6.3A through 4.4.6.3C** includes the requirement to obtain regulatory jurisdictional permits, creation or enhancement of riparian resources, development of a resource management plan, and demonstration that the mitigation resources are equivalent or better than the jurisdictional resources impacted. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-39 through pg. 6.4-40).

i. Cumulative Biological Impact – Interfere with Wildlife Movement.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native or resident migratory wildlife corridors or impede the use of native wildlife nursery sites.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to wildlife movement would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project area contains no significant cover of native plant communities and currently experiences heavy disturbance associated with agricultural activities. Additionally, the Project area is adjacent to SR-60 and Gilman Springs Road on the north and east and is bordered by urban development on the west. The nearest linkage area as identified under the MSHCP is Proposed Linkage 5 and is located approximately 3 miles north of the Project. The Proposed Constrained Link 20 is approximately 3.6 miles

south of the Project. . Development of the Project would not directly have any significant impact on wildlife movement in the area and would not fragment habitat or adversely affect wildlife movement through the surrounding areas. It is determined that the Project would not impede or minimize any significant wildlife corridor for the target species associated within the Reche Canyon/Badlands Area plan. None of the cumulative projects would interfere with wildlife movement in the region.

Direct and indirect impacts of the Project on the MSHCP and SJWA would be less than significant with mitigation, and the regional (cumulative) implications of the Project can be addressed through the fee payment program of the MSHCP because it provides a regional and comprehensive approach to conservation planning. Through the implementation of the stated mitigation for Project-specific impacts, and the payment of required MSHCP mitigation fees, no significant cumulative effect on biological resources would result from the development of the proposed uses with implementation of the identified program mitigation measures.

Related projects that would potentially affect wildlife movement would be subject to the same requirements of CEQA as the Project. These determinations would be made on a case-by-case basis, and the effects of cumulative development on wildlife movement would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, for the reasons described above, cumulative adverse effects on wildlife movement would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources.

Implementation of Mitigation Measures 4.4.6.1A, 4.4.6.1B, 4.4.6.2A through 4.4.6.2C (as revised [Additional Errata to the Revised Final EIR dated May 14, 2020]), and 4.4.6.3A through 4.4.6.3K would reduce conflicts with adopted habitat conservation plans and impacts to biological resources. Through the implementation of the above mitigation measures, the Project contribution to potential cumulative impacts would be less than cumulatively considerable. (Revised Final EIR Part 3, pg. 6.4-40 through pg. 6.4-41).

j. Cumulative Biological Impact – Conflict with Adopted Policies, Ordinances or Habitat Conservation Plans

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to consistency with adopted policies, ordinances or habitat conservation plans would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1).

Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project site is located within the Reche Canyon/Badlands Area of the MSHCP. Development of the Project site would not conflict with the conservation goals established by the MSHCP for Cell Group X or Cell Group E. In addition, no conflict from development would occur in relation to the Reche Canyon/Badlands Area Plan, the Area Plan Subunit 4, the Area Plan Subunit 3, Proposed Core 3, or Existing Core H.

No development is proposed within the portion of the Project site that lies adjacent to Cell Group D and the SJWA. Development that will be adjacent to the SJWA property may cause significant indirect impacts to species within the SJWA. The Project site is not adjacent to any Cores or Linkages identified in the MSHCP. However, it is adjacent to the SJWA and is subject to the project guidelines provided in MSHCP Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface). The Project is also required to adhere to the Best Management Practices (BMPs) found in Appendix C of the MSHCP.

The Project is not located within any Amphibian, Mammalian, or Special Linkage Areas identified by the MSHCP. The Project is in an area requiring burrowing owl surveys, is within the MSHCP Criteria Area Species Survey Area (CASSA) and is within the Narrow Endemic Plant Species Survey Area (NEPSSA). Surveys the CASSA and NEPSSA resulted in the lack of observation of these species. Burrowing owl has been observed within the Project site.

The WLC Project site is located within the Stephen's Kangaroo Rat (SKR) Habitat Conservation Plan (HCP). Core Areas have been designated for the conservation of this species; however, the Project site is not located within an SKR Core Area.

The effects of the Project, in combination with other cumulative projects in the geographic area, could combine to cause or contribute to significant cumulative effects to biological resources. In particular, identified cumulative projects that are located within or near the northern portion of the San Jacinto Wildlife Area could have significant effects on special status species, sensitive vegetation communities, and wildlife movement documented in the MSHCP and the San Jacinto Wildlife Area Management Plan. It should be noted that cumulative projects are required to adhere to and be consistent with the goals and objectives established in the MSHCP, including the payment of MSHCP fees. Therefore, cumulative adverse effects on resource protection policies would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on adopted policies, ordinances or habitat conservation plans.

Implementation of **Mitigation Measures 4.4.6.2A and 4.4.6.2B** (as revised [Additional Errata to the Revised Final EIR dated June 9, 2020]) would reduce conflicts with adopted habitat conservation plans that the Project is subject to. **Mitigation Measures 4.4.6.2A and 4.4.6.2B** includes the requirement to conduct a focused plant survey, and demonstration to the Western Riverside County Regional Conservation Authority compliance with the provisions of the MSHCP. Through the implementation of the above mitigation measures, the Project's contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-41 through pg. 6.4-42).

5. Cultural Resources

a. Prehistoric Cultural Resources

Potential Significant Impact: Whether the Project could have an adverse effect on significant archaeological resource pursuant to CEQA Guidelines Section 15064.5.

Finding: Potential impacts of the Project related to archaeological resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to archaeological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: Based on Section 4.5 of the Revised Final EIR Part 4 Volume 3, a reconnaissance pedestrian-survey for the Project site was conducted in November 2007. Although the Project site is located within the Moreno Hills Complex, no archaeological resources were identified on the Project site during the field survey, and the cultural resource assessment concluded the Project would have no significant impacts; however, there is a potential for Project grading to disturb previously undiscovered cultural resources. While there is no recorded or surface evidence that archaeological resources are present on-site, the Project is located in an area with a high potential of containing prehistoric archaeological resources. Therefore, a potential exists that excavation and construction activities may uncover previously undetected prehistoric or historic cultural resources. Adherence to **Mitigation Measures 4.5.6.1A through 4.5.6.1E** would reduce potential impacts to archaeological resources to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.5-17 to 4.5-21)

b. Historic Resources

Potential Significant Impact: Whether the Project could have a significant adverse effect on historic resources.

Findings: Potential impacts of the Project related to historic resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to historic resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site contains two previously identified historic sites: CA-RIV-4201H and CA-RIV-4210H. Both of these are historic-era homesteads and previously contained farm buildings and related out-buildings. They were located in the eastern portion of the Specific Plan area, but MBA could find no remains of these facilities or related artifacts. The MBA report concludes the buildings were demolished and/or their materials removed for disposal or reuse at some point in the past.

There are six occupied rural residential structures and associated out-buildings currently present on the project site, and one (APN 478-220-009) near Redlands Boulevard contains a farm building that was built around 1900 and may be one of the oldest surviving buildings of the historic Moreno community.²² No other evidence of past structures or unique features was identified; however, access to the six occupied rural residential properties was not available at the time of survey, and it appears from general observations, historical aerial photographs, and historical records that one or more of these buildings may be older than 40 years. Without more information, there is a possibility that removal of these buildings could represent a significant impact to historic structures, features, or resources, and mitigation is required.

In addition, historical evidence indicates Juan Bautista de Anza traveled through the project area (i.e., along the base of Mt. Russell from south to northwest), which should be acknowledged as part of the trail proposed within the Specific Plan.

Alessandro Boulevard was designated as a City Landmark in 1988 (Resolution CPAB 88-2). Resolution CPAB 88-2 was designed to assure the maintenance, enhancement, or protection of a street of historical significance. Over the years various portions of Alessandro Boulevard have been modernized to enhance traffic flow throughout the City, but the original routing has remained unchanged. Alessandro Boulevard within the WLC Specific Plan area would retain its original alignment but the roadway would be enhanced to serve modern traffic needs. This has been done in multiple areas along Alessandro Boulevard in the past to better serve the needs of the community. These changes have not impacted the integrity of the landmark status, as the significance of the Landmark status is associated with the original location of the boulevard since 1890 and the retention of the original name of the boulevard across the City. These aspects would remain, and the impacts would not be considered significant since the California Register requires that a resource possess integrity, which is defined as “the authenticity of a historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance” (California Office of Historic Preservation 1999). To retain integrity, a resource should have its original location, design, setting, materials, workmanship, feeling, and association. Which of these factors is most important depends on the particular criterion under which the resource is considered eligible for listing (California Office of Historic Preservation 1999). Alessandro Boulevard integrity is retained in the original location, however, design, setting, materials feeling have changed over time through modifications to the road throughout the City and thus the impacts are not significant.

²² ¹⁸ *Cultural Resources Assessment*, Michael Brandman Associates, Inc., September 2014.

Approximately 1,350 feet of Alessandro Boulevard east of Merwin Street would be closed to through traffic to keep trucks from using Alessandro Boulevard through the residential neighborhood between Merwin Street and Wilmot Street. The loss of this portion of Alessandro Boulevard would not have a significant impact on the landmark status of the road, as the name would continue to be employed and the original routing would be retained throughout. These are the two key characters of the landmark status. This portion of road would be open to hikers and bikers and the closure will be designed to keep access open to non-vehicular users. Both the original route and name would be retained in keeping with the main aspects of the landmark designation.

Implementation of **Mitigation Measures 4.5.6.1A, 4.5.6.2A, and 4.5.6.2B**, will help reduce potential impacts to historical resources to less than significant levels. (Revised Final EIR Part 4 Volume 3 pgs. 4.5-21 to 4.5-26).

c. Paleontological Resources

Potential Significant Impact: Whether the Project could have an adverse effect on significant paleontological resource or site or unique geologic feature.

Findings: Potential impacts of the Project related to paleontological resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to paleontological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. Implementation of **Mitigation Measures 4.5.6.3A and 4.5.6.3B** will reduce the impact to unique paleontological resource or unique geologic feature to less than significant.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site is located within an area that has a high potential to contain near-surface Pleistocene fossils.²³ The paleontological literature search indicated that there is potential for significant, nonrenewable resources that to encountered during on-site construction activities. Therefore, a paleontological resources impact mitigation program (PRIMP), including excavation monitoring by a qualified paleontologist, is required for earthmoving activities in Pleistocene sediments on the Project site with potential to contain significant, nonrenewable paleontological resources. Although no paleontological resources were identified on-site during the field survey, because of the location of the Project site and associated sensitivity for paleontological resources, the potential exists that paleontological resources maybe uncovered during construction. Adherence to the **Mitigation Measures 4.5.6.3A and 4.5.6.3B** will reduce potential impacts to paleontological resources to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.5- 26 to 4.5-27).

d. Cumulative Cultural Resources Impacts – Archaeological Resources

²³ *Ibid.*

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to archaeological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative projects within Western Riverside County would involve ground disturbance that could result in a significant impact to archaeological resources. Some of the cumulative projects have incorporated design features to avoid potential effects to known archaeological resources; however, potential significant cumulative impacts could occur to unknown archaeological resources. Although no known resources are located within the Project area, ground disturbing activities could result in a significant impact to unknown archaeological resources. Therefore, the Project's contribution to potential significant cumulative impacts would be cumulatively considerable.

Typical mitigation measures implemented by the cumulative projects to reduce potential impacts to unknown archaeological resources include archeological monitoring, Native American tribal representation during monitoring, and protocols for treatment of discovered resources. These measures typically reduce potential impacts to unknown archaeological resources to less than significant.

Implementation of the recommended mitigation measures reduces potential impacts to archaeological resources. Mitigation Measures 4.5.6.1A and 4.5.6.1B includes Phase 1 cultural resources assessments of parcels that have not been assessed, significance evaluation of any resources encountered, and development of appropriate treatment or mitigation. Mitigation measures 4.5.6.1C and 4.5.6.1D include the retention of an archaeological monitor to observe all grading activities, with invitation of a Native American tribal representative to participate in monitoring. Mitigation measure 4.5.6.1E includes protocols to be followed should resources be discovered, including resource evaluation and appropriate treatment for significant resources. Through the implementation of the above mitigation measures, the Project's incremental contribution to potential significant cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-21 to 6.5-22).

e. Cumulative Cultural Resources Impacts – Historic Resources

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that

potentially significant impacts related to historic resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative related projects within Western Riverside County would involve ground disturbance that could impact above-ground structures that are of historic-age and meet the criteria of historic resources. Ground disturbance could also result in impacts to unknown historic resources that are located below ground. The construction activities associated with cumulative development could result in a potential significant cumulative impact. Typical mitigation measures implemented by projects in the cumulative scenario to reduce potential impacts to historical resources include proper curation and recordation of the recovered historic resources. These measures typically reduce potential impacts to historical resources to less than significant.

The implementation of the Project would contribute to potential cumulative impacts to historic resources. Because the Project includes the removal of six occupied rural residential structures and associated out-buildings that may be of historic-age, impacts on these structures, features or resources could be significant. In addition, the Project also includes effects on other structures of historic-age such as two previously identified historic sites containing farm buildings and related out-buildings as well as Alessandro Boulevard which was constructed across the site in the 1890s. The Project's incremental contribution to cumulative historic impacts would be cumulatively considerable.

Implementation of the recommended mitigation measures reduces the Project's contribution to historic cumulative impacts. The implementation of **Mitigation Measure 4.5.6.2A** would include the proper curation of recovered historic resources. The implementation of **Mitigation Measure 4.5.6.2B** would include the installation of a historical marker along a historic trail. **Mitigation Measure 4.5.6.2C** includes an alignment of an on-site road along the historical alignment of Alessandro Boulevard. With the implementation of these mitigation measures, the Project's contribution to potentially significant cumulative historic impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-22 to 6.5-23).

f. Cumulative Cultural Resources Impacts – Paleontological Resources

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to paleontological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative projects within Western Riverside County would involve ground disturbance that could cause adverse impacts to paleontological resources. Potential impacts from projects in the cumulative scenario that could impact the same fossil-bearing geologic units as the Project would be considered significant. These units include older Pleistocene alluvium and the San Timoteo formation, both of which have been assigned a moderate paleontological sensitivity because they have yielded paleontological resources in the past. Potential impacts from the implementation of projects in the cumulative scenario could result in significant cumulative impacts. The typical mitigation measures implemented by the cumulative related projects to reduce potential impacts to paleontological resources are paleontological monitoring and properly curating resources that are found. These measures typically reduce potential impacts to paleontological resources to less than significant.

Because the Project would result in ground disturbance that could affect paleontological resources within the Pleistocene alluvium and the San Timoteo formation, the Project's contribution to cumulative paleontological resources impacts would be cumulatively considerable.

Implementation of mitigation measures would reduce the Project's contribution to potential cumulative impacts to paleontological resources. The implementation of **Mitigation Measure 4.5.6.3A** includes the presence of a City-approved paleontologist to monitor excavation activities and salvage/collect fossils. **Mitigation Measure 4.5.6.3B** provides for the paleontological assessment of off-site improvements area and the implementation of monitoring protocols, where appropriate. Through the implementation of these mitigation measures, the Project's contribution to potential significant cumulative impacts to paleontological resources would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-23).

6. Geology and Soils

a. Fault Rupture

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to fault rupture.

Findings: Potential impacts of the Project related to fault rupture impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to fault rupture would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, the western portion of the site is crossed by the City of Moreno Valley Seismic Zone, a postulated trace of the Casa Loma Fault and the Farm Road Strand. A detailed fault investigation was performed by Leighton for these projected faults. Although no active faulting was observed, some local discontinuous fracturing was observed and documented. Because of the potential for ground movements in this area, mitigation is required.

State law prohibits the construction and placement of habitable structures²⁴ over the trace of an active fault pursuant to the Alquist-Priolo Act. The A-P Earthquake Fault Zone is located on the eastern border of the project site. Trenching conducted by Leighton across the Claremont Segment of the San Jacinto Fault in the eastern area of the project site identified the location of a portion of the fault; however, the entire length of the fault through the Project site was not trenched. Although no habitable structure can be located on an active fault per State law, fault rupture hazard represents a potential significant seismic hazard on-site that would require mitigation.

Implementation of **Mitigation Measures 4.6.6.1A** through **4.6.6.1C** will ensure fault rupture hazards are reduced to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.6-17 to 4.6-20).

b. Ground Shaking

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to ground shaking.

Findings: Potential impacts of the Project related to ground shaking impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to ground shaking would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4, Volume 3, Southern California is a seismically active area and, therefore, will continue to be subject to ground shaking resulting from seismic activity on regional faults. Ground shaking from earthquakes associated with nearby and more distant faults is expected to occur during the lifetime of the Project. The level of potential ground motion is considered moderate to high in the City of Moreno Valley and, therefore, in the project area.

In accordance with the City’s General Plan Safety Element (Objective 6.1),²⁵ Project development will require geological and geotechnical investigations by State-licensed professionals. The geotechnical investigations will provide design considerations and earthwork recommendations to ensure that ground shaking impacts are appropriately mitigated. In addition, California Code of Regulations (CCR), Title 24, also known as the California Building Standards Code (CBC), contains building design and construction requirements relating to fire and life safety, and structural safety. The CBC also includes standards designed to ensure that structures within California are built to withstand expected levels of seismic activity for each earthquake region throughout the State. Specifically, Part 2 of Title 24, including Chapters 4, 16-18, and Appendix J provide guidance regarding grading, soils, and construction techniques related to seismic protection. These codes are

²⁴ ²⁰ California Code of Regulations, Section 3601 states, “A structure for human occupancy is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year.”

²⁵ Moreno Valley General Plan, Chapter 9 Goals and Objectives, pg. 9-30.

provided to protect public safety and ensure that all structures built in the State can withstand anticipated seismic ground shaking and other related geotechnical and soils constraints. Implementation of **Mitigation Measure 4.6.6.2A** will ensure ground shaking impacts caused by earthquakes are reduced to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.6-20 to 4.6-21).

c. Unstable Soils

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to unstable soils.

Findings: Potential impacts of the Project related to unstable soil impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to unstable soils would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4, Volume 3, expansive soils generally have a substantial amount of clay particles, which can give up water (shrink) or absorb water (swell). The change in the volume exerts stress on buildings and other loads placed on these soils. The extent or range of the shrink/swell is influenced by the amount and kind of clay present in the soil. Expansive soils can be widely dispersed, and they can occur in hillside areas as well as low-lying alluvial basins. On-site soils (Dv and Wb soils) are identified as having a moderate to low shrink-swell potential. Because the potential exists to locate development on moderately expansive soils, impacts are considered significant and mitigation is required. In accordance with the City's General Plan Safety Element (Implementation Measure I.E.1) and as indicated previously, development of the Project will require geological and geotechnical investigations by State-licensed professionals. To ensure impacts from expansive soils are addressed for specific development sites, adherence to **Mitigation Measures 4.6.6.3A** through **4.6.6.3C** is required to reduce impacts from unstable soils to less than significant. (Revised Final EIR Part 4, Volume 3 pg. 4.6-21 to 4.6-23)

d. Cumulative Geology Impacts – Fault Rupture

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zone Maps issued by the State Geologist for the area or based on other substantial evidence of a known fault.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant cumulative impacts related to fault rupture would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, the San Jacinto Fault Zone and its associated fault segments are located within the eastern portion of the City of Moreno Valley. According to the City of Moreno Valley General Plan EIR, no other active fault zone is located within the City. Based on a review of projects in the cumulative scenario, San Jacinto Wildlife Area Land Management Plan is the only related project that is located in the immediate vicinity of the San Jacinto Fault Zone. A portion of the Land Management Plan encompasses the area immediately south of the Project site and is located within the City of Moreno Valley. This portion of the Land Management Plan includes a potential for a water storage project that would involve construction of enclosed berms to hold water and an on-site pipeline. However, based on information from the San Jacinto Wildlife Area Land Management Plan EIR, the water storage project would not be located on any of the mapped earthquake fault zones and would thus be unlikely subject to fault rupture. Therefore, no significant cumulative effect would result relating to surface rupture impacts exposing persons and structures to significant effects and the Project's impacts would be less than cumulatively considerable.

Implementation of **Mitigation Measures 4.6.6.1A through 4.6.6.1C** will require subsurface evaluations to determine the implementation of structural setbacks, remedial earthwork and/or foundation recommendations if site-specific geotechnical investigations confirm the locations of the fault alignments in the areas of proposed land uses. The implementation of these mitigation measures would reduce the Project's potential fault rupture impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-15 through pg. 6.6-16).

e. Cumulative Geology Impacts – Ground Shaking

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant cumulative impacts related to ground shaking would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario could be subject to ground shaking resulting from seismic activity on regional and local faults. The level of potential ground motion from faults is considered moderate to high in the City of Moreno Valley. Based on a review of the environmental documents prepared for the cumulative projects, the structures proposed by each project would be required to be designed in accordance with the California Building Code and the City of Moreno Valley Building Code to preclude adverse effects to the structures and persons associated with strong seismic ground-shaking. The amount of ground shaking would be dependent on the earthquake size, location and distance. Ground shaking would be greater with larger and closer earthquakes. Cumulative projects could expose persons and structures to significant cumulative seismic ground shaking impacts.

The implementation of the Project could also subject persons and structures to ground shaking from seismic activity on regional and local faults. Section 4.6.6.2 of Revised Final EIR Part 4 Volume 3 identifies that the exposure of the proposed structures and persons to seismic activity would be potentially significant. Therefore, the combination of impacts of the Project and other projects in the cumulative scenario would result in a cumulative significant impact. Given the size of the Project and the number of people and scope of structures it would include, the Project's contribution to the significant cumulative impact associated with exposing persons and structures to strong seismic ground shaking impacts could be cumulatively considerable.

Implementation of **Mitigation Measure 4.6.6.2A** requires structural design parameters for the proposed improvements in accordance with the California Building Code, including applicable City amendments as indicated based on site-specific geotechnical investigations. The implementation of this measure would reduce the Project's contribution to the potential significant cumulative exposure of persons and structures to seismic ground shaking impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-16 through pg. 6.6-17).

f. Cumulative Geology Impacts – Unstable Soils

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would be located on expansive soil, creating substantial risks to life or property.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant cumulative impacts related to unstable soils would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario would include structural development on soils that have a low to moderate shrink/swell potential that could result in unstable soils. Areas where soils have a moderate shrink/swell potential could result in expansive soil impacts that would be significant. However, based on a review of the cumulative projects, the implementation of special construction techniques and compliance with the California Building Code would reduce expansive soil impacts to less than significant.

The implementation of the Project could include structures on soils with moderate shrink/swell and cause potential significant impacts to persons and structures. Therefore, the combination of the Project's incremental impacts together with the impacts of other projects in the cumulative scenario would result in a cumulative significant expansive soil impact. Given the size of the Project and the number of people it would include, the Project's contribution to exposing persons and structures to expansive soil impacts would be cumulatively considerable.

Implementation of **Mitigation Measures 4.6.6.3A through 4.6.6.3C** require structural design parameters for the proposed improvements in accordance with the California Building Code, including applicable City amendments. These design parameters would be implemented based on site-specific geotechnical

investigations. The implementation of these measures would reduce the Project's contribution to the potential significant cumulative exposure of persons and structures to expansive soil impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-17).

7. Greenhouse Gas Emissions, Climate Change, and Sustainability

a. Greenhouse Gas Emissions

Potential Significant Impact: Whether the Project could have a significant adverse effect due to the generation of greenhouse gas emissions (GHGs).

Findings: Potential impacts of the Project related to Greenhouse Gas Emissions impacts are discussed in detail in Section 4.7 of the Revised Final EIR Parts 2 and 3. Based on the entire record before us, this Council finds that potentially significant impacts related to Greenhouse Gas Emissions impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program

Facts in Support of the Findings: According to the Revised Final EIR Part 2 Section 4.7, future development that could occur on the Project site could generate GHG emissions during construction and operation activities. Based on a comparison of the Project to the South Coast Air Quality Management District tiered interim GHG significance criteria, the most applicable South Coast Air Quality Management District thresholds for the uncapped GHG emissions is the Industrial at 10,000 metric tons of carbon dioxide equivalents (MT CO₂e) per year.

As shown in Table 4.7-4 of the Revised Final EIR Part 2, GHG emissions at Buildout (2035) for the Project is 258,700 MT CO₂e per year and exceeds the SCAQMD threshold; therefore, the Project's GHG emissions are significant before mitigation. With implementation of mitigation measures, the Project's GHG emissions would be reduced to 230,792 MT CO₂e which is significant. In order to ensure that the Project complies with and would not conflict with or impede the implementation of reduction goals identifies in AB 32, the Governor's EO S-3-05 and other strategies to help reduce GHGs to the level proposed by the Governor, Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, 4.7.6.1D, 4.16.1.6.1A, 4.16.1.6.1B, and 4.16.1.6.1C shall be implemented. (Revised Final EIR Part 2, pgs. 4.7-34-20 to 4.7-40)

In addition to the above Mitigations Measures, new Mitigation Measure 4.7.7.1, as revised, would mitigate "Project Emissions" from new Table 4.7-16 (Additional Errata to the Revised Final EIR dated June 9, 2020). With this new Mitigation Measure 4.7.7.1, as revised, the WLC Project's GHG emissions will be reduced to net zero without consideration of the cap-and-trade program on the analysis of GHG emissions for the construction and operation of the WLC Project. Therefore, Project emissions would not exceed the SCAQMD's significance threshold of 10,000 MT CO₂e per year and would not contribute to a significant cumulative impact. (Revised Final EIR Part 1, pg. 35).

b. Greenhouse Gas Plan, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project could be inconsistent with greenhouse gas plans, policies and regulations.

Findings: Potential impacts of the Project related to greenhouse gas plan, policy, regulation consistency impacts are discussed in detail in Section 4.7 of the Revised Final EIR Parts 2 and 3. Based on the entire record before us, this Council finds that potentially significant impacts related to Greenhouse Gas Emissions impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to the Revised Final EIR Part 2 Section 4.7, implementation of the Project could result in the development of an approximately 40.6 million square feet of logistics distribution facilities. The Project includes a variety of physical attributes and operational programs that would help reduce operational-source pollutant emissions from worker commuting, including GHG emissions. Similar to the discussion of cumulative air quality impacts, the Project may employ workers locally from the City. This has the benefit of improving the local jobs/housing balance leading to air quality benefits in terms of shorter trip lengths, which lead to lower GHG emissions than if the workforce was derived from distant locations.

Future development that would occur under the Project would be consistent with greenhouse gas emission reduction strategies and policies, including the City's Climate Change Strategy. The Project would implement the Mitigation Measures listed above to reduce its contribution to GHG emissions and to ensure it does not conflict with or impede implementation of reduction goals identified in AB 32, Governor's Executive Order S-3-05, and other strategies to help reduce GHGs to the level proposed by the Governor. In addition, the Project would also be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. Since the Project is consistent with these policies, including being required to mitigate its GHG emissions to net zero, the Project is consistent with greenhouse gas plans, policies, and regulations and impacts are less than significant after mitigation. (Revised Final EIR Part 2, pgs. 4.7-41 to 4.7-47)

c. Cumulative Greenhouse Gas Emissions Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a cumulative significant impact from greenhouse gas emissions.

Findings: Potential cumulative impacts of the Project-related greenhouse gas emissions (GHG) are discussed in detail in Section 6.7 Revised Final EIR Part 2. Based on the entire record before us, this Council finds that potentially significant impacts related to cumulative greenhouse gas emissions would be reduced to a less than significant level, with implementation of **Mitigation Measures 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, 4.7.6.1D, 4.7.6.1E.1 or 4.7.6.1E.2, and 4.7.7.1**. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Cumulative effects to greenhouse gas (GHG) emissions, climate change and sustainability are described in Section 6.7 of the Revised Final EIR Part 2. As part of the GHG cumulative analysis a review of available environmental documents for projects within the Project vicinity was conducted. Approximately 359 projects were identified in the vicinity of the Project and are listed in Table 6.7-1. Out of those 359 projects, approximately 173 environmental documents were available. All 173 were reviewed to

identify quantitative emissions for construction and operation of the respective projects; however, not all environmental documents contained emissions for construction and operation. Emissions from all of the identified cumulative projects were calculated based on available information and methodologies. Cumulative construction and operational emissions are provided in Table 6.7-2 in Section 6.7 of the Revised Final EIR Part 2.

During construction, the Project would emit GHGs mainly from direct sources such as combustion of fuels from worker, vendor and haul vehicles and construction equipment. Section 4.7.6.1 Greenhouse Gas Emissions of the Revised Final EIR Part 2 found that construction of the Project would contribute approximately 18,770 MT CO₂e in its first year of construction and up to approximately 23,511 mt CO₂e per year of construction during the 15-year construction period. Over the 15-year construction period the Project would emit a total of 221,727 MT CO₂e. The SCAQMD recommends that construction emissions be averaged over a 30-year period, so that GHG reduction measures will address construction GHG emissions as part of a project's overall GHG reduction strategies. In accordance with this methodology, the estimated construction GHG emissions have been amortized over a 30-year period and are included in the annualized operational GHG emissions. Averaged over a 30-year period results in approximately 7,391 MT CO₂e per year. In addition, out of the 359 cumulative projects that were evaluated during preparation of the Recirculated Sections, Revised Final EIR Part 2, 68 were found to be completed or currently undergoing construction as of November 2019. Therefore, 291 potentially cumulative projects could undergo construction activities during the Project's 15-year construction period.

Operational or long-term emissions occur over the life of the Project. CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32 and SB 32. The program began on January 1, 2012, placing GHG emissions limits on capped sectors (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 MT CO₂e per year), and enforcing compliance obligations beginning with 2013 emissions. Vehicle fuels were placed under the cap in 2015, and, with the passage of AB 398, the program was extended through 2030. The cap-and-trade program allocates emissions permits across covered entities in each sector. Without consideration of the cap-and-trade program on Project emissions, the Project's unmitigated emissions at full buildout in 2035 are approximately 258,700 MT CO₂e per year which are over the SCAQMD's significance threshold of 10,000 MT CO₂e per year (Section 4.7.6.1 Greenhouse Gas Emissions of the Revised Final EIR Part 2).

The quantitative analysis of operation and construction emissions utilized the SCAQMD's Interim CEQA GHG Significance Thresholds to determine the respective project's level of significance. Significance thresholds for each project were determined based on land use. The projects that were identified as either residential or commercial projects are considered part of the SCAQMD's draft threshold for residential/commercial projects and 3,000 MT CO₂e per year was used in each of the greenhouse assessments. The projects that were identified as industrial/warehouses were compared against a threshold of 10,000 MT CO₂e for industrial projects. Of the 359 projects analyzed, 94 projects exceeded their given threshold and 261 projects were below threshold. Given that the unmitigated Project and 94 of the cumulative projects are over threshold, impacts would be potentially significant and cumulatively considerable. (Revised Final EIR Part 2, pgs. 6.7-13 to 6.7-14)

In addition to the above Mitigations Measures, new Mitigation Measure 4.7.7.1, as revised, would mitigate “Project Emissions” from new Table 4.7-16 (Additional Errata to the Revised Final EIR date June 9, 2020). With this new Mitigation Measure 4.7.7.1, as revised, the WLC Project’s GHG emissions will be reduced to net zero without consideration of the cap-and-trade program for the construction and operation of the WLC Project. Therefore, Project emissions would not exceed the SCAQMD’s significance threshold of 10,000 MT CO₂e per year and would not contribute to a significant cumulative impact. (Revised Final EIR Part 1, pg. 35 of the Response to Comments document)

d. Cumulative Aesthetics – Light and Glare

Potential Significant Impact: Whether the Project could result in cumulative impacts in connection with past, present, and probable future projects to create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Findings: Potential cumulative impacts of the Project with respect to light and glare aesthetics are discussed in detail in Section 6.1 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that the Project’s potentially significant cumulative impacts related to light and glare aesthetics would be reduced to a less than significant level, with implementation of Mitigation Measures 4.1.6.1A, 4.1.6.1B, 4.1.6.4A, and 4.1.6.4B. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Fact Supporting the Findings: The Project in conjunction with the cumulative development could significantly degrade the existing visual character (including light and glare) of the area, including both daytime glare and nighttime lighting. Development of cumulative projects within the eastern Moreno Valley area would result in the conversion of open space/vacant land to urbanized land uses, including projects identified as MV-3 and MV-4, both large warehouse projects, both of which could contribute to cumulative aesthetic impacts. (Revised Final EIR Part 3, Table 6.1-1, pg. 6.1-4.). The environmental document for MV-3 identified existing visual character/light and glare, and surroundings as being a significant and unavoidable impact, and the visual change introduced by MV-4’s warehouse could contribute to cumulative aesthetic impacts. Accordingly, cumulative development within the cumulative geographic areas for aesthetics would result in a significant cumulative impact associated with visual character.

Development of the Project would substantially alter the existing character and create light and glare impacts from conversions of the Project site from open space to an urbanized setting with many large logistics buildings. Because the Project would result in a significant impact on the visual character and light and glare from development of the area and cumulative development will also result in a significant impact on visual character, the Project’s contribution to cumulative impacts to the existing visual character and surroundings would be cumulatively considerable, prior to the application of mitigation.

The Project will be required to comply with the City’s General Plan, the City’s Municipal Code (Section 9.08.100, Lighting) and the WLC Specific Plan’s development guidelines for lighting and building materials. Mitigation Measures 4.1.6.1A and 4.1.6.1B would help reduce related visual impacts. Mitigation Measures 4.1.6.4A and 4.1.6.4B will help reduce light and glare associated with the new buildings near the San Jacinto

Wildlife Area to the south. Mitigation Measure 4.1.6.4A requires a photometric plot of all proposed exterior lighting demonstrating that the Project is consistent with the requirements of Section 9.08.100 of the Municipal Code. The lighting study will be required to indicate the expected increase in light levels at the property lines of the adjacent residential uses. Mitigation Measure 4.1.6.4B requires an analysis of proposed solar panels demonstrating the glare from the panels will not negatively affect adjacent residential uses or motorists along perimeter roadways. Therefore, with compliance with the City's General Plan, the City's Municipal Code, and implementation of the mitigation measures, the Project's contribution to cumulative light and glare impacts would be less than cumulatively considerable and less than significant. (Revised Final EIR Part 2, pg. 6.1-9 to pg. 6.1-10)

8. Hazards and Hazardous Materials

a. On-site Conditions Involving Hazardous Materials

Potential Significant Impact: Whether the Project could through the demolition of the existing on-site rural residential structures involve hazardous materials (ACM and LBP) and possibly soil contamination from past agricultural chemical use and may involve hazardous materials (LNG/CNG).

Findings: Potential impacts of the Project related to on-site conditions involving hazardous materials are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to on-site conditions involving hazardous materials would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4, Volume 3, due to the suspected age of the rural residential structures on the site, it is possible that demolition of these structures may involve asbestos-containing materials (ACMs) and/or lead-based paint (LBP). Demolition of these structures may need to be supervised or conducted by contractors certified to remove and dispose of ACMs and/or LBP.

Also, because the site was previously farmed the on-site soils may contain pesticides. Prior to grading, soil testing shall be performed to determine if in fact these areas contain any significant levels of agricultural chemicals in the soil, and, if so, they will be remediated by a licensed contractor.

In addition, the Specific Plan proposes a liquefied natural gas/compressed natural gas (LNG/CNG) fueling station to be constructed on approximately 3,000 square feet somewhere in the eastern portion of the Logistics Development (LD) land use area in the Specific Plan. This LNG/CNG facility is referred to as "logistics support" in the Specific Plan. It would provide natural gas to fuel heavy and light-duty trucks serving the Project. Since this facility would store natural gas under liquefied and compressed conditions, there is a potential for fire and/or explosion involving natural gas.

Implementation of **Mitigation Measures 4.8.6.1A** through **4.8.6.1D**, impacts associated with potential hazardous materials in existing rural residential structures or from the proposed natural gas fueling facility will be reduced to less than significant levels. (Revised Final EIR Part 4 Volume 3 pg. 4.8-22 to 4.8-23).

9. Hydrology, Drainage, and Water Quality

a. Drainage Pattern and Capacity-Related Impacts

Potential Significant Impact: Whether the Project may significantly increase off-site runoff.

Findings: Potential impacts of the Project related to off-site runoff impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to off-site runoff would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, Due to the construction of impervious surfaces on the Project site, post-development flows will be higher than the pre-development flows. To avoid a significant impact to the existing drainage capacity, the post-development flows, volumes, and velocities coming from the Project site must be managed to be equal to or less than pre-development flows volumes, and velocities.²⁶ As required by **Mitigation Measure 4.9.6.1A**, flows will be reduced to below or equal to pre-development conditions by routing the on-site stormwater flows through a series of on-site detention and infiltration basins before flows are released off-site. The existing stormwater runoff discharge rate for the undeveloped project site is 7,720 cubic feet per second (cfs). With the installation of the on-site detention basins, culverts, and energy dissipaters included in the project, expected discharges would be at a rate of 6,835 cfs, which is less than the existing condition. With the installation of the storm drain system facilities outlined in CH2M Hill's hydrology reports (Appendix J, Revised Final EIR Part 4, Volume 3) and implementation of the **Mitigation Measure 4.9.6.1A**, the buildout of the project will convey storm flows safely through the region in accordance with Riverside County Flood Control requirements and will not result in flooding or additional erosion within the project area or any downstream areas, including the Perris Valley Storm Drain Channel. (Revised Final EIR Part 4, Volume 3, pg. 4.9-49)

Development of the WLC Project site will increase impervious surfaces on the Project site due to the construction of the Project's buildings, roadways, and associated improvements. While the resultant increase in impervious surfaces would contribute to a greater volume and higher velocities of storm flow, **Mitigation Measure 4.9.6.1A** requires the WLC Project site's drainage system be designed to accept and accommodate runoff that would result from the Project construction at or better than historic, or pre-development, conditions, as outlined in the Project's Master Plan of Drainage. **Mitigation Measure 4.9.6.1B** provides for the operation

²⁶ As part of the MS4 Permit issuance requirements, projects must identify any Hydrologic Conditions of Concern and demonstrate that changes to hydrology are minimized to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion, sedimentation or stream habitat.

and maintenance of these facilities to ensure that they will be maintained. (Revised Final EIR Part 4, Volume 3, pg. 4.9-32 to 4.9-51).

b. Construction-Related Water Quality Impacts

Potential Significant Impact: Whether the Project could violate water quality standards or waste discharge requirements during construction phases of the Project in form of increased soil erosion, sedimentation, or storm water discharges.

Findings: Potential impacts of the Project related to the violation of water quality standards or waste discharge requirements are discussed in detail in Section 4.9 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts to construction-related water quality would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4, Volume 3, the construction and grading phases of the Project site would require the disturbance of surface soils and removal of existing orange groves and vegetative cover. During the construction period, grading and excavation activities would result in exposure of soil to storm runoff, potentially causing erosion and sediment in runoff. If not managed through Best Management Practices (BMPs), the runoff could cause erosion and increased sedimentation in local drainage ways such as the Quincy Channel. The potential for chemical releases is present at most construction sites in the form of fuels, solvents, glues, paints, and other building construction materials. However, implementation of construction practices and adherence to existing water quality regulations and **Mitigation Measures 4.9.6.2A** and **4.9.6.2B** would reduce these impacts to a less than significant level. (Revised Final EIR Part 4, Volume 3 pgs. 4.9-52 to 4.9-54).

c. Operational-Related Water Quality Impacts

Potential Significant Impact: Whether the Project could violate water quality standards or waste discharge requirements during the operational phases of the Project in the form of increased soil erosion, sedimentation, or urban runoff.

Findings: Potential impacts of the Project related to the violation of water quality standards or waste discharge requirements are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts to operational-related water quality would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, during the operational phase of any urban use, the major source of pollution in stormwater runoff will be contaminants that have accumulated on the land surface over which runoff passes. Storm runoff from the roadways, parking

lots, and commercial and industrial buildings can carry a variety of pollutants such as sediment, petroleum products, commonly utilized construction materials, landscaping chemicals, and (to a lesser extent) trace metals such as zinc, copper, lead, cadmium, and iron, which may lead to the degradation of storm water in downstream channels. Runoff from landscaped areas may contain elevated levels of phosphorus, nitrogen, and suspended solids. Oil and other hydrocarbons from vehicles are also expected in storm water runoff.

Pollutant concentrations in urban runoff are variable depending on storm intensity, land use, elapsed time since previous storms, and the volume of runoff generated in a given area that reaches receiving waters. Pollutant concentrations are typically highest during the first major rainfall event after the dry season, known as the “first-flush.” The Master Water Quality Management Plan (WQMP) prepared for the project identifies pollutants and hydrologic conditions of concern that may be associated with the implementation of the project.

Site-specific WQMPs have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the Project are developed, BMPs will be implemented consistent with the goals contained in the Master WQMP. All development within the Project will be required to incorporate on-site water quality features to meet or exceed the approved Master WQMP’s water quality requirements identified previously. This would include the design based on the appropriate pollutant loads for the project from all sources including climate change.

The Project will comply with the *Water Quality Management Plan for the Santa Ana Region of Riverside County* (approved by the Santa Ana Regional Water Quality Control Board October 22, 2012), which requires the use of Low Impact Development (LID) BMPs that maximize infiltration, harvest and use, evapotranspiration and/or bio-treatment. Flows from the Project will be treated first by LID BMPs where the flow will be infiltrated, evapotranspired, or treated. As required by **Mitigation Measure 4.9.6.1A**, the treated flows will then be reduced to below or equal to pre-development conditions by routing the on-site storm water flows through a series of on-site detention and infiltration basins before flows are released off-site. These basins will provide incidental infiltration and secondary treatment downstream of the LID BMPs. All runoff from the site will be treated by LID BMPs and then routed through the detention and infiltration basins before it leaves the Project area and into Mystic Lake and the San Jacinto Wildlife Area.

The Project will comply with the Nutrient Total Maximum Daily Load (TMDL) for Lake Elsinore and Canyon Lake by implementing LID-based BMPs. According to the *Comprehensive Nutrient Reduction Plan for Lake Elsinore and Canyon Lake* (prepared for Riverside County Flood Control and Water Conservation District by CDM Smith, January 28, 2013 in compliance with Order No. R8-2010-0033, NPDES Permit No. CAS618033), “Post construction LID based BMPs required for new development and significant redevelopment projects are the only structural watershed based BMPs currently included in the Comprehensive Nutrient Reduction Plan (CNRP). The newly developed WQMP requirements ensure that a portion of the wet weather runoff will be contained on-site for all future development projects subject to WQMP requirements. Implementation of WQMP requirements over time coupled with the in-lake remediation projects are expected to provide sufficient mitigation of nutrients.”

The proposed Project incorporates on-site drainage control structures and programs sufficient to meet the applicable Federal, State, and local water quality requirements. Through the use of site design BMPs, source

control BMPs (e.g., street and parking lot sweeping and vacuuming), and treatment control BMPs (e.g., infiltration basins and pervious pavement), the resulting pollutant loads coming from the Project will be reduced, thereby reducing pollutants discharged from urban storm water runoff to surface water bodies. Compliance with the requirements of the NPDES permit, which include implementation of the BMPs outlined in the WQMP, will be enforced by the City during the ongoing operation of the Project. Implementation of **Mitigation Measures 4.9.6.3A** through **4.9.6.3C** will help to reduce potential water quality impacts resulting from storm water and urban runoff to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-55 to 4.9-64)

10. Noise

a. Short-Term Construction Noise – Nighttime Construction

Potential Significant Impact: Whether noise levels from grading and other construction activities for the Project may range up to 93 dBA at the closest residences southeast of the Project site for very limited times when construction occurs near the Project's boundary and whether construction-related noise impacts from the Project would be potentially significant.

Finding: Potential impacts of the Project related to short-term construction noise impacts are discussed in detail in Section 4.12 of the Revised Final EIR Part 3, pgs. 4.12-16 to 4.12-26. Based on the entire record before us, this Council finds that potentially significant impacts related to nighttime short-term construction noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: On-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical work day, the equipment would be operating at different locations within the various plots of the project site and would not likely be operating concurrently. However, for a more conservative approximation of construction noise levels to which the nearest sensitive receptor would be exposed, it is assumed that two of the loudest pieces of construction equipment would be operating at the same time and located within the Project Plots nearest to a sensitive receptor. The nearest sensitive receptors are the existing on-site residences, which would be located approximately 25 feet from construction activity of various Plots. As a worst-case scenario, it has been assumed that all existing on-site residences will remain on-site throughout construction.

Based on the list of the construction equipment that would be used at each of the Plots, it was assumed that the two loudest pieces of off-road equipment (a paver and scraper) would have a combined noise level of 85 dBA Leq from a distance of 50 feet (FHWA, 2006a). Using this reference noise level and a 7.5 dB per doubling of distance attenuation rate, the noise exposure level at representative locations around the Project site were calculated. In some cases, construction of various Plots occurring concurrently would expose sensitive receptors to noise levels that would exceed the City's 55 dBA Leq nighttime exterior noise standard.

Specifically, impacts would occur at existing residences located within and to the west of the project area. Affected receptors are all located within City of Moreno Valley boundaries.

Based on these projections, anticipated worst-case construction noise levels would regularly be exceeded at residences within and near the Project area. Based on an Leq noise level of 85 dBA Leq at 50 feet and an attenuation rate of 7.5 dB per doubling of distance, an observer would need to be at a distance of 500 feet from an active Project construction area to experience a noise level of 60 dBA Leq, or 800 feet for a noise level of 55 dBA Leq. Therefore, the on-site construction of the Project would result in the exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley Noise Ordinance and would result in a significant impact.

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a Noise Reduction Compliance Plan (NRCP), which is expected to attenuate construction noise levels by a minimum of 10 dB. Table 4.12-8 shows mitigated construction noise levels at sensitive receptors in the vicinity of on-site construction areas. In addition, Mitigation Measure 4.12.6.1A prohibits construction activity within 800 feet of any sensitive receptor outside of the allowable hours of 7:00 a.m. to 8:00 p.m. As shown in table 4.12-8, at distances greater than 800 feet, construction noise would not exceed the City's nighttime exterior noise standard of 55 dBA Leq. Therefore, impacts would be less than significant with mitigation incorporated for nighttime construction.

b. Long-term Operational Noise

Potential Significant Impact: Whether the Project would cause exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley General Plan, Moreno Valley Municipal Code, or applicable standards of other agencies and whether long-term operational noise impacts from the Project would be potentially significant.

Finding: Potential impacts of the Project related to long-term operational noise impacts are discussed in detail in Section 4.12 of the Revised Final EIR Part 4, pg. 4.12-56 to 4.12-57. Based on the entire record before us, this Council finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The City of Moreno Valley Noise Ordinance requires that noise levels remain below 55 dBA (Leq) during nighttime hours. To achieve this noise level, the warehouse property line would only need to be 100 feet from the nearest residential property and no soundwall would need to be present.

Another consideration is whether the proposed activity levels will be substantially higher than current ambient conditions. No matter what is developed in the Specific Plan area, ambient conditions would be higher in future years due to higher levels of traffic and activity. Ambient noise levels were measured at seven sites that could border the World Logistics Center (i.e., Measurement Sites 3 through 9). The nighttime ambient noise levels

(Leq) ranged from 35.8 to 61.8 dBA with an average for the sites of 46.6 dBA. To keep the noise levels at nearby residential areas less than typical ambient conditions, the logistics property line will be located a minimum distance of 250 feet and a 12-foot soundwall will be located along the perimeter of the Property that faces any residential areas. This would keep the logistic use noise to less than 45 dBA (Leq) at the residences. The implementation of this setback between logistics uses and noise sensitive uses has been included as **Mitigation Measure 4.12.6.1A**. (Revised Final EIR, Part 4 pgs. 4.12-56 to 4.12-57).

c. Long-Term Utility Noise

Potential Significant Impact: Whether the Project would cause exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley General Plan, Moreno Valley Municipal Code, or applicable standards of other agencies.

Finding: Potential impacts of the Project related to long-term utility noise impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 4. Based on the entire record before us, this Council finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which would lessen the significant effects on the environment (Finding 1). Each mitigation measure is adopted by this Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: There are no utility facilities located within the WLC Specific Plan area. There is one existing SDG&E compressor station and two existing SCGC facilities located adjacent to the WLC Specific Plan area.

The worst-case compressor station operational characteristics will result in a maximum noise level just above 65 CNEL within the Project area proposed for development (i.e., not open space). Typical commercial construction results in buildings that achieve at least a 20-dB reduction of outdoor noise levels. Therefore, an office use exposed to the highest noise level from the compressor station will be just above 45 CNEL and below the 50 CNEL limit prescribed by the City's General Plan, resulting in a less than significant impact and no mitigation is required. (Figure 4.12.3, Revised Final EIR Part 4, pg. 4.12-17).

The Leq noise level generated by the compressor station does not exceed 60 dBA Leq beyond the property lines of the facility. Therefore, the compressor station is not considered a noise disturbance based on City criteria. Operation of the compressor station would not result in any interior noise levels exceeding the limits established by the City in the General Plan. Therefore, noise impacts associated with the operation of the compressor station would be less than significant and no mitigation is required (Figure 4.12-4, Revised Final EIR Part 4, pg. 4.12-19).

The maximum noise level from a blow-down at the SDG&E compressor station within the WLC Specific Plan area proposed for development (i.e., the Logistics Development land use) is 100 dBA. A person would need to be exposed to this level for more than two hours in a day before permanent hearing loss would be expected. As discussed above, blow-down events at the SDG&E compressor station typically do not last longer than 90 seconds. Therefore, the SDG&E blow-down events will not result in a significant impact to the uses proposed

within the WLC Specific Plan area, and no mitigation is required (Figure 4.12-5, Revised Final EIR Part 4, pg 4.12-21).

For SCGC blow-down events, noise generated could reach as high as 130 dBA just outside the fence line of the southern facility and in excess of 135 dB just outside the fence line of the northern facility. People within approximately 250 feet of the blow-down points would be exposed to noise levels greater than 115 dBA, which would likely cause permanent hearing damage regardless of the exposure time. The SCGC blow-downs could last as long as 90 minutes. It is anticipated that people exposed to noise levels greater than 102 dBA, within approximately 1,300 feet from the blow-down point could experience permanent hearing loss based on this event duration. Noise generated by SCGC blow-down events has the potential to cause permanent hearing loss in persons in the developed area of the Project. This is a significant impact and mitigation is required (Revised Final EIR Part 4, pg. 4.12-57). Mitigation Measure 4.12.6.4A (Revised Final EIR Part 4, Volume 3, pg. 4.12-58) requires that a minimum 40 dB reduction in noise levels during blow-down events are available and will be installed prior to the issuance of building permits for projects within 1,300 feet of the SCGC and SDG&E blow-down facilities. With implementation of mitigation, SCGC blow-down events would not result in noise levels that could cause permanent hearing loss and people within the Project site would not be significantly affected by noise from the SCGC facilities, resulting in a less than significant impact.

SCGC blow-down events also have the potential to produce groundborne vibration. However, the effect of the blow-down groundborne vibration would be limited to within 100 feet of the equipment and would not be perceived beyond the facility fence line, resulting in a less than significant impact and no mitigation is required (Revised Final EIR Part 4, pg 4.12-57 to 4.12-59).

d. Cumulative Long-Term Operational Noise

Potential Significant Impact: Whether the Project's contribution to the cumulative exposure of persons to long-term operational noise would be cumulatively considerable.

Finding: The Project's cumulative contribution to long-term operational noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before us, this Council finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: On-site operational noises are individual noise occurrences and are not typically additive in nature. It is extremely unlikely that adjacent properties will generate noises that would be additive in nature because of two important reasons. First, the noise sources would have to be adjacent or in close proximity to one another in order for the noises to intermingle. Second, the sensitive receptor or receptors would also have to be adjacent to or in close proximity to the noise generators. Because the Project assumes 24-hour operations, it is conservatively assumed that the geographic limit for cumulative on-site operational noise would include the three cumulative projects located adjacent to the Project site. Cumulative project MV-126 consists of residential uses and would therefore not generate noise levels equivalent to the Project. Assuming that the remaining two cumulative projects (MV-5 and MV-6) would generate noise at the same

time as the Project and at distances and levels that would be additive in nature, a significant cumulative noise impact at sensitive receptors could occur.

As discussed in Section 4.12.6.3 of the Revised Final EIR Part 4 Volume 3 (pg. 4.12-56 to 4.12-57), on-site operational activity would include noise from truck delivery, loading/unloading activities at the loading areas, heating, ventilation, and air-conditioning equipment and other noise-producing activities within the parking lot. On-site activity would generate noise levels of up to 56.9 dBA L_{eq} at a distance of 50 feet. Related Projects MV-5 and MV-6 do not have CEQA documents in which on-site operational noise has been analyzed. Therefore, assuming that operation of Related Projects MV-5 and MV-6 would consist of similar on-site activity as the Project, Table 6.12-6 summarizes the potential cumulative noise level increases at this receptor (referred to as R5 in Section 4.12). As discussed in Section 6.12 of the Revised Final EIR Part 3 (pg. 6.12-30), cumulative on-site noise levels would not result in perceptible increases in ambient noise (3 dBA). Therefore, on-site Project operations would not result in cumulatively considerable on-site operational noise impacts.

With regard to on-site residential uses, the Project would result in significant impacts at on-site residential uses. However, the nearest on-site residence to cumulative projects MV-5 and MV-6 is located at a distance greater than 2,400 feet. At this distance on-site, operational noise at MV-5 and MV-6 would be negligible. Therefore, cumulative impacts would not occur. In addition, Section 4.12.6.3 of the Revised Final EIR Part 4, Volume 3 (pg. 4.12-56 to 4.12-57) determined that impacts to on-site residential uses would be less than significant with implementation of Mitigation Measure 4.12.6.2D.

Implementation of Mitigation Measure 4.12.6.2D would eliminate any noise impacts on off-site residential areas due to the operation of logistic activities. Through the provision of a 250-foot setback, berms, and/or soundwalls, noise levels at the nearest residences would be reduced to below the City's thresholds. Therefore, with adherence to the identified mitigation measure, off-site impacts associated with this issue would be less than significant and would be less than cumulatively considerable.

11. Transportation

These Findings consider Public Resources Code Section 21099 and the City's proposed new VMT thresholds. When the FEIR (Revised Final EIR Part 4, Volume 3), was certified in 2015 and when the RSFEIR (Revised Final EIR Part 3) was circulated for public review in 2018, the use of "Level of Service" (LOS) criteria was an accepted CEQA threshold of significance for the evaluation of transportation impacts and LOS criteria were relied upon in those documents. In addition, although the transportation section was updated in the RSFEIR, the transportation section of the FEIR was upheld by the Superior Court (see Topical Response C in the Revised Final EIR Part 1a). Accordingly, for consistency with those prior CEQA documents and in conformance with the Superior Court's decision, these Findings consider "Level of Service" criteria for purposes of evaluating the significance of transportation impacts. In addition, however, these revised Findings also consider transportation impacts based on the VMT thresholds as proposed by City staff for adoption of the City Council. As of this date, the City Council has not adopted VMT thresholds and such threshold are only required for consideration in CEQA analysis for draft environmental documents released after July 1, 2020.

a. Intersection and Roadway Level of Service (Within the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that many of the Project’s potentially significant impacts under existing traffic conditions would be reduced to a less than significant level for roadway segments and intersections located within the City of Moreno Valley. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Traffic Impact Analysis (TIA, Revised Final EIR Part 3, Appendix F) discusses Project-related impacts to the intersection and roadway level of service (LOS) under the following development scenarios:

- 1) Existing baseline conditions (2018) plus Phase 1 of the Project
- 2) Existing baseline conditions (2018) plus Buildout of the Project
- 3) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2025 plus Phase 1 of the Project
- 4) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2040 plus Buildout of the Project

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if an impact is potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. As discussed further below, all direct Project impacts to locations within the City of Moreno Valley are mitigated to less than significant levels.

Intersection LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for the study area intersections are summarized in Table 26 of the Revised Final EIR Part 3, Appendix F (pg. 123), showing that 19 intersections would operate at unacceptable LOS. Table 27 (pg. 129) shows there are 15 study intersections where Phase 1 of the Project would have a significant impact. Of those 15 study intersections, 3 are located within the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for the study area intersections are summarized in Table 35 of the Revised Final EIR Part 3, Appendix F (pg. 161), showing that 25 intersections would operate at unacceptable LOS. Table 36 (pg. 167) shows there are 17 study intersections where buildout of the Project would have a significant impact. Of those 17 intersections, 5 are located within the City of Moreno Valley.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for the study area intersections are summarized in Table 49 of the Revised Final EIR Part 3, Appendix F (pg. 229), showing that 26

intersections would operate at unacceptable LOS. Table 50 (pg. 235) shows there are 13 study intersections where Phase 1 of the Project would have a significant impact. Of those 13 intersections, 3 are located within the City of Moreno Valley.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 63 of the Revised Final EIR Part 3, Appendix F (pg. 300), showing that 72 intersections would operate at unacceptable LOS. Table 64 (pg. 306) shows there are 30 study intersections where buildout of the Project would have a significant impact. Of those 30 intersections, 17 are located within the City of Moreno Valley.

Roadway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in Table 25 of the Revised Final EIR Part 3, Appendix F (pg. 104). Table 25 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, one is located within the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 34 of the Revised Final EIR Part 3, Appendix F (pg. 142). Table 34 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, one is located within the City of Moreno Valley.

2025 Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in table 48 of the Revised Final EIR Part 3, Appendix F (pg. 210). Table 48 shows that all study segments would operate at acceptable LOS, and no Project impacts would occur.

2040 Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 62 of the Revised Final EIR Part 3, Appendix F (pg. 280). Table 62 shows that one roadway segment would operate at unacceptable LOS and that the Project would worsen conditions, resulting in a significant impact. This segment is not within the jurisdiction of the City of Moreno Valley.

Project- related and cumulative impacts to locations outside the City of Moreno Valley are discussed in the Unavoidable Significant Impacts section of these Findings.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.C** require the applicant to construct or fund all required improvements to mitigate Project impacts to roadways and intersections within the City of Moreno Valley. With implementation of these mitigation measures, direct impacts on study area roadway segments and intersections located within the City of Moreno Valley would be reduced to less than significant.

b. Cumulative Transportation Impacts - Intersection Level of Service (Within the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause a cumulatively considerable increase in traffic on the street system within the City of Moreno Valley that is substantial in relation to the without Project (i.e., No-Project) scenario.

Findings: Potential cumulative impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 6.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this City Council finds that the Project’s potentially significant cumulative impacts on the street system would be reduced to a less than significant level for intersections located within the City of Moreno Valley (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Section 6.15 of the Revised Final EIR Part 3 and the Traffic Impact Analysis (TIA) in Appendix F discuss cumulative impacts of the Project to the intersection level of service (LOS). The cumulative impacts of the Project were determined by comparing the LOS of the study facilities under the 2040 No-Project and 2040 Plus Project Build-out Scenarios.

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if impacts are potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands.

Intersection LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 6.15-3 in the Revised Final EIR Part 3 and in Table 76 on page 343 within the TIA, showing that 26 intersections would have unacceptable LOS and one roadway segment would have unacceptable LOS and resulting in significant cumulative impacts. Of the 26 intersections, 16 are located within the City of Moreno Valley.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.C** requires the applicant to construct or fund all required mitigation for the Project’s cumulative impacts on intersections and roadways within the City of Moreno Valley as identified in Section 6.15 and Appendix F of the Revised Final EIR Part 3. With implementation of these mitigation measures, the Project’s cumulative impacts on intersections located within the City of Moreno Valley would be reduced to less than significant.

12. Utilities and Service Systems

a. Adequate Water Supply

Potential Significant Impact: Whether the Project could result in the lack of sufficient water supplies available to serve the Project from existing entitlements.

Findings: Potential impacts of the Project related to water supply are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to adequate water supply would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4, Volume 3, the Eastern Municipal Water District (EMWD) has determined that it will be able to provide adequate water supply to meet the potable water demand for the Project in addition to existing and future users. The WSA prepared for the Project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY.²⁷ The EMWD considers this a “worst-case” estimate based on the total acres and amount of square footage of warehousing proposed by the Project. This estimate does not take into account the Project landscaping design with xeriscape (drought-tolerant plants) and on-site collection of runoff and channeling it to landscaped areas to minimize irrigation on the interior of the project site. For example, the “Water Budget Technical Memorandum” prepared by CH2MHill (see EIR Appendix N) in September 2011 for the WLC Project indicates that actual water usage of on-site buildings, based on the specific development characteristics of the WLC Specific Plan, would be on the order of 450 AFY which is less than a quarter of the amount estimated by EMWD; however, this estimate does not include on-site irrigation of landscaping and could only be achieved if all on-site landscaping was irrigated by collection and distribution of on-site runoff from roofs and hardscape areas.

Taking into account the Project’s proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan will be substantially less than the worst-case EMWD estimate. Therefore, for the purposes of analysis in this EIR, both the CH2MHill figure of 450 AFY and the EMWD’s worst-case estimate of 1,991 AFY figure were used relative to water consumption. Under either scenario, the anticipated water demand for the WLC Project is substantially less than what is identified above for the General Plan land uses and what was used in the formulation of the 2010 and 2015 UWMPs. Anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for the WLC Project would total 0.93 and 0.66 percent of the EMWD’s 2015 and 2035 supplies under worst-case conditions. The demand estimated for this project is substantially less and therefore still within the limit of growth projected in the 2010 and 2015 UWMPs.

Implementation of the **Mitigation Measures 4.16.1.6.1A** through **4.16.1.6.1C** will reduce impacts to water supply over the long term to less than significant levels. (Revised Final EIR Part 4, Volume 3, pgs. 4.16-15 through 4.16-22).

b. Storm Water Drainage Requirements

²⁷ *Water Supply Assessment Report for the World Logistics Center Specific Plan in Moreno Valley*, Eastern Municipal Water District, March 21, 2012.

Potential Significant Impact: Whether the Project could result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to new storm water drainage facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Council finds that potentially significant impacts related to the construction of storm water drainage systems would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the Project would route storm water flows from the Project site into existing storm drains to the west and the San Jacinto Wildlife Area to the south after flows are routed through a combination of water quality basins and sand filters. Due to the installation of impervious surfaces on the Project site, the post-development flows would be higher than the pre-development flows. To avoid a significant impact to the existing drainage capacity, the post-development flows coming from the Project site are required to be equal to or less than pre-development flows. To reduce flows to below or equal to pre-development conditions, the on-site storm water flows would be routed to the on-site detention basins²⁶ before flows are routed off-site. While the increase in impervious surfaces attributable to the Project would contribute to a greater volume and higher velocity of storm water flows, the Project's water quality basins would accept and accommodate runoff that would result from Project construction at pre-Project conditions.

As identified in the Preliminary Hydrology Calculations prepared for the Project, to adequately contain and store the greatest volume that would be generated, the Project site would require a minimum storage volume of 13.6 acre-feet. The proposed amount of storage area (20.3 acre-feet) is greater than the required amount of storage area. Based on this, it appears there is excess capacity of 6.7 acre-feet (20.3 acre-feet – 13.6 acre-feet = 6.7 acre-feet) of storage area available from the on-site detention basins; therefore, the Project appears to have adequate drainage capacity that would result in post-development flows being reduced to pre-development flows before leaving the Project site. However, to ensure that impacts associated with on-site drainage capacity are reduced to a less significant level, the **Mitigation Measures 4.9.6.1A and 4.9.6.1B and 4.16.1.6.2A** has been identified to reduce potential impacts to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-22 to 4.9-25).

13. Energy

a. Energy Consumption and Generation

Potential Significant Impact: Whether the Project would result in energy use and consumption that would cause wasteful, inefficient, and unnecessary consumption of energy.

Findings: Potential impacts of the Project related to energy consumption are discussed in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that the Project's potentially significant cumulative impacts related to energy consumption would be reduced to a less than significant level.

Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: During construction, electrical power would be consumed to construct the Project. Electricity would be supplied by the Moreno Valley Utility (MVU), with electrical service extended to specific construction sites from existing infrastructure throughout the WLC site area, as warranted. Specifically, construction offices and security lighting are expected to be powered by MVU-provided electricity. However, diesel-powered generators are expected to be used to power tools in remote portions of the construction sites (diesel use discussed below). The City’s Noise Ordinance generally restricts construction during nighttime hours (See Section 4.12.3, the City of Moreno Valley Noise Ordinance as well as Section 4.12, Noise, in the Revised Final EIR Part 3), which would minimize the need for nighttime lighting.

However, on-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical workday, the equipment would be operating at different locations within the various plots of the Project site and would be largely intermittent. Should 24-hour concrete pouring occur, the Project would use light carts powered by diesel to illuminate pouring areas. The light carts used for continuous pouring are included in the construction transportation energy analysis on Revised Final EIR Part 2, pg. 4.17-26.

The Project would require electricity for water conveyance during ground-moving activities. The Project site spans 2,600+ acres and would require a relatively large amount of water to cover the affected construction areas. Water use related to dust control is regulated under SCAQMD’s Rules 402 and 403 and is required to limit fugitive particulate matter generated by construction activities. The Project would be in compliance with Rules 402 and 403 and would require a relatively large amount of water to cover the entire acreage of the project site. However, the expected electricity consumption associated with water use equates to only 0.74 percent of MVU’s forecasted sales for 2020 (expected starting year of construction). The electrical demand would vary throughout the construction period based on the construction activities being conducted. Additionally, when not in use, electrical equipment would be powered off to avoid unnecessary energy consumption.

Therefore, since electricity from water conveyance represents a relatively negligible percentage of total electricity use, and night construction activities would be intermittent and would not require electricity, construction activities would not result in the wasteful, inefficient, and unnecessary consumption of electricity, and impacts would be less than significant. In addition, Natural gas is not expected to be consumed in any substantial quantities during construction of the WLC project. Therefore, related to the consumption of natural gas during construction, the Project would have no impact.

In terms of transportation energy, compliance with the anti-idling regulation and the use of cleaner, more energy efficiency construction equipment would reduce the project’s annual average diesel fuel usage. As discussed previously, construction of the Project would utilize fuel-efficient equipment consistent with state

and federal regulations and would comply with State measures to reduce the inefficient, wasteful, and unnecessary consumption of energy. While these regulations are intended to reduce construction emissions, compliance with them would also result in energy savings. In addition, the Project would implement a construction waste management plan to divert 50 percent of mixed construction and demolition debris to City certified construction and demolition waste processors, consistent with the AB 341. Implementation of the construction waste management plan will likely reduce truck trips to landfills and/or material recovery facilities and increase the amount recycling and reuse of materials.

Based on the available data, construction would utilize energy for necessary on-site activities and to transport construction materials and demolition debris to and from the Project site. As discussed above, idling restrictions and the use of cleaner, energy-efficient equipment would result in less fuel combustion and energy consumption and thus result in the efficient use of the Project's construction-related energy. Construction of the WLC project would benefit from California's Pavley/Advanced Clean Car (ACC) standards that are designed to result in more efficient use of transportation fuels, because they would affect the vehicles used by workers and any light-duty trucks used by vendors or haulers. These vehicle efficiency standards are the most stringent in the nation and among the most stringent in the world. In addition, the Project would reduce fuel use by requiring that construction equipment greater than 50 horsepower be USEPA Tier 4 emissions compliant and by limiting on-site idling of all diesel-powered construction equipment, delivery vehicles, and delivery trucks to three minutes in any one hour, as specified in **Mitigation Measure 4.3.6.2A**.

Transportation fuel usage during construction represents approximately 0.0051 percent of annual gasoline usage and 0.57 percent of annual diesel usage within Riverside County, respectively, representing a small fraction of the County's total fuel demand. In conjunction with California's stringent vehicle efficiency standards, the Project would not result in the wasteful, inefficient, and unnecessary consumption of energy.

During operations, the Project will implement commitments and strategies to lower electricity consumption needed for buildings (e.g., lighting, cooling, power equipment, and water conveyance). In 2025, electrical demand will be lowered with implementation of sustainability measures such as high-efficiency lighting and appliances, skylights, and motion sensors, etc. As discussed above, the Project would comply with and exceed the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 sf (representing more than 99 percent of total project square footage at buildout) will be LEED certified. Reliance on grid-supplied power is further offset by the generation of 12 MW of power through on-site rooftop solar photovoltaic (PV) panels. As discussed in the Revised Final EIR Part 1, pg. 48 through 52 (Topical Response E), current MVU rules impose limitations on solar PV capacity. Thus, the Project + Low Electric Vehicle (EV) Penetration (Scenario A) uses approximately 14 percent less electricity than the baseline demand scenario. In 2035, the Project + Low EV Penetration Scenario would use approximately 16 percent less electricity than the 2035 Baseline Scenario.

Although the Project + Medium EV Penetration Scenario would require more power than the Project + Low EV Penetration Scenario, the net electrical demand on MVU would still be 11 percent less than the Baseline Scenario for 2025 due to the energy conservation measures and on-site solar PV generation. For 2035, electricity use would be 12 percent more than the Baseline Scenario due to the much higher EV penetration rates for light-duty passenger cars and medium-duty vehicles consistent with the 2016 Mobile Source Strategy.

The feasibility of using medium and heavy-duty EVs for delivery of goods to or from the WLC is, to a great extent, dependent on the nature of the warehousing operations. For example, many warehouses implement the “drop and drag” procedure, where a truck will bring goods to the facility, and the trailer (or sea-going cargo container) will be disconnected and left on-site for the lengthy process of unloading. An empty trailer may be connected, and the truck quickly departs to return to its point of origin. Conversely, an out-bound truck is usually scheduled to retrieve a delivery load only once the container/trailer is full. Thus, trucks are not on-site or idle for long enough times to obtain a meaningful battery charge. Medium-duty and heavy-duty zero-emission trucks are in the very early stages of commercially market deployment and currently cost substantially more than conventionally fueled trucks, and current funding assistance programs do not fully offset that cost difference (ESA and CALSTART, 2018). Given that the future tenants of the WLC are not known and cannot be identified at this time, it would be speculative to assume the High EV Penetration Scenario would be practicable or feasible by 2025 or by 2035.

In regard to forecasting, such as done with EV penetration rates to generate the scenarios evaluated, the California Supreme Court commented that an agency is required to forecast only to the extent that an activity could be reasonably expected under the circumstances. The Court recognized that an agency cannot be expected to predict the future course of governmental regulation or exactly what information scientific advances may ultimately reveal. *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal. 3d 376. Therefore, in light of the changes to market and regulatory drivers that would have to occur to make medium and heavy-duty EVs widely implemented and feasible by 2025 or 2035 to the now unknown future tenants of the WLC, the potential for the electrical demand projected under the Project + High EV Penetration Scenario to materialize is highly speculative. CEQA Guidelines Section 15145 states “If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact.” Therefore, any effects to energy resources from achieving the Project + High EV Penetration Scenario would be highly speculative, and associated analyses are presented in the Revised Final EIR for informational purposes only.

MVU forecasts that its peak demand in 2025, would be approximately 231,555 MWh per year. This is approximately 25 percent higher than the 185,000 MWh that MVU sold to all customers in its area for the 2015-2016 fiscal year. As shown in Table 4.17-4, the WLC project’s estimated electrical consumption would account for between 74 and 113 percent of MVU’s projected electricity sales depending on the EV penetration scenario for Phase 1 (2025). However, MVU’s 2018 Integrated Resources Plan (IRP) anticipates growth in the region and specifically considers the electrical demand generated by energy-intensive account focused in the logistics industry. The IRP states that large energy-intensive projects like the WLC project are included in the projected growth. Therefore, it is reasonable to assume that MVU’s existing and planned electricity supplies could support the project’s electricity demand calculated for the Project + Low EV Penetration (Scenario A) and the Project + Medium EV Penetration (Scenario B) by 2025. Any determination of MVU’s need for additional capacity beyond what is planned would be speculative and depend on the cumulative demand within MVU’s service area.

MVU’s electrical generation is derived from a mix of non-renewable and renewable sources such as coal, natural gas, solar, geothermal, wind, and hydropower. MVU’s 2018 Power Integrated Resources Plan identifies

adequate resources to support future generation capacity, and a new 115 kV substation is proposed to be constructed within the WLC site. With regard to renewable energy sources, the Project would use electricity provided by MVU, which MVU is required to meet the 2050 Renewable Portfolio Standard. MVU's current source of renewable resources include wind, solar, and hydroelectric and account for 17 percent of MVU's overall energy mix for 2017 (the most current year data is available for). The Project itself is incorporating renewable energy sources with a minimum of 14.1 MW of rooftop solar at buildout to achieve a net-zero energy use for the estimated office demands. At full buildout WLC will feature the equivalent of twenty-seven 60,000 square-foot net-zero office buildings. To put this in context, the entire State of California has about 190 net-zero commercial buildings that are currently verified or designed as of 2017 (CPUC, 2017). This solar commitment would be within the solar PV limitations set by MVU.

In addition to the solar commitment the WLC project would implement energy performance improvement measures to exceed the current minimum Title 24 requirements after Phase 1 and full buildout. Although the Project would result in moderate increases in annual electrical demand compared to MVU's current supply, for the low and medium EV penetration scenarios, MVU is committed to meeting the Project's electricity demand through a future IRP update and planning process. Therefore, with the incorporation of these features, operation of the Project would not result in the wasteful, inefficient, or unnecessary consumption of electricity, would not cause a need for additional capacity regionally or locally, and would not affect electricity resources to the extent that electricity demand can reasonably be projected and assessed.

EMFAC2017 assumes that by 2025, natural gas-powered large trucks (Heavy Heavy Duty Trucks and Medium Heavy Duty Trucks) would represent 2.2 percent of all large trucks in the South Coast Air Basin region. By 2035, the natural gas-powered large truck population slightly increases to 2.5 percent. The natural gas vehicle population at the Project would remain constant for each EV penetration scenario. The WLC project (all scenarios) would also include regularly operating propane-powered yard trucks and CNG-powered forklifts that are typical of large warehouse facilities. Additionally, the Project would include a Compressed Natural Gas/Liquid Natural Gas (CNG/LNG) fueling station on-site that would be publicly available for refueling. As presented in Table 4.17-11, the natural gas use from operational vehicles and the CNG/LNG fueling station would represent approximately 0.037 percent of the statewide natural gas consumption. The analysis assumes a conservative estimate of 204 trucks completely refueling per day based on trip rates presented in the WLC project's traffic study. The traffic study bases trip rates on Institute of Transportation Engineer's code for a gas station with convenience store that has a relatively high trip rate. CNG fueling stations would likely have less daily visits than a traditional gas station, making the analysis even more conservative. The operational vehicles are also based on conservative assumptions of maximum operating hours of 7 hours for propane-powered yard trucks and 4 hours for CNG forklifts. Realistically, all of the yard trucks would not be operating simultaneously or continuously for 7 hours and forklifts would be used intermittently for the unloading and loading of warehousing goods. Furthermore, the analysis above represents additional natural gas use from vehicles and does not account for CNG/LNG trucks displacing diesel- or gasoline-powered vehicles. In actuality, the CNG/LNG trucks may displace fossil-fueled trucks on the Project site. Even with the conservative assumptions for trip rates, volumes, non-displacement, and operating hours, and without considering the potential benefit of offsetting other vehicle fuels, the natural gas use from operational vehicles and the CNG/LNG fueling station represent a negligible percent of the State's total natural gas use.

According to SoCal Gas data, natural gas sales have been relatively stable over the past three years with a slight increase from 287 billion cubic feet in 2014 to 294 billion cubic feet in 2016. Southern California’s natural gas supply is predominantly sourced from out of state with a small portion originating in California. Sources of natural gas are obtained from locations throughout the western United States as well as Canada. According to the US Energy Information Administration (EIA), the United States has approximately 85 years of natural gas reserves based on consumption in 2015. Statewide compliance with energy efficiency standards is expected to result in more efficient use of natural gas and therefore reduced consumption in future years. It is anticipated that SoCal Gas’ existing and planned natural gas supplies would be sufficient to support the project’s natural gas use and that the CNG/LNG fueling station would have a negligible effect on the natural gas supply.

Operation of the WLC project would benefit from California’s Pavley/ACC standards that are designed to result in more efficient use of transportation fuels. These vehicle efficiency standards are the most stringent in the nation and among the most stringent in the world. Operation of the Project would require very small amounts of natural gas to be consumed by vehicles at the site, and in conjunction with California’s stringent vehicle efficiency standards, would not result in the wasteful, inefficient, and unnecessary consumption of natural gas. Overall, construction and operations of the Project would not cause a significant waste, inefficient, nor unnecessary consumption of energy, therefore, impacts would be less than significant (Revised Final EIR Part 2, pp. 4.17-25 to pg. 4.17-37).

b. Construction or Expansion of Electrical and Natural Gas Facilities

Potential Significant Impact: Whether the Project could result in the construction or expansion of electrical and natural gas facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to construction or expansion of natural gas facilities impacts are discussed in detail in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that the Project’s potentially significant cumulative impacts related construction or expansion of electrical and natural gas facilities would be reduced to a less than significant level, with implementation of Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.16.1.6.1A, 4.16.1.6.1C, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, and 4.7.6.1D. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project would consume approximately 376,426 megawatt-hours (MWh) of electricity and almost 14.6 million cubic feet of natural gas per year. The estimated electrical demand assumes no on-site electrical generation by photovoltaic panels.

The WLC Specific Plan requires future installation of solar photovoltaic panels on the roof of each warehouse building to offset the energy demands of the office portion of the building. Utility improvements are based on a “worst-case” assumption that on-site solar electrical generation is not available and electrical service would have to be provided by Moreno Valley Utility (MVU). In addition, partial or complete connection to the existing electrical grid may be necessary even with roof-mounted solar photovoltaic panels so there is

redundancy (backup) in case of an emergency or during nighttime when no on-site power is being generated (i.e., some warehouses may operate 24/7). At this time, it is not anticipated that any uses will install sufficient on-site power generation and storage to be totally independent of the existing electrical grid.

A number of Southern California Edison (SCE) facilities would still require relocation and expansion of MVU facilities in order to provide network backup (i.e., if the solar generation equipment were to fail) and accommodate the potential increase in electrical demand no matter the contribution of project alternative energy generated. Power poles, guy poles, and guy anchors for the existing overhead 115 kV line along World Logistics Center Parkway and Gilman Springs Road will need to be relocated at the time these roadways are widened. The portion of the existing 115 kV line along Eucalyptus Avenue may also need to be relocated into the new Eucalyptus Avenue alignment between World Logistics Center Parkway and Gilman Springs Road at the time the roadway is constructed. The existing 115 kV line along Brodiaea Avenue may be able to be protected in place except for a few hundred feet where the transmission line intersects with the new Merwin Street, which will need to be relocated to accommodate street and storm drain channel improvements.

The existing 12 kV overhead power distribution lines along Redlands Boulevard will need to be undergrounded when the roadway is developed to its ultimate width. The existing 12 kV overhead power feeder lines located along World Logistics center Parkway and Alessandro Boulevard will need to be relocated and undergrounded as these roadway improvements take place during the development of the WLC project. The existing 12 kV overhead power feeder line running south along Virginia Street to the Moreno Compressor Station (planned as Open Space) will be protected in place. The existing overhead service lines from the World Logistics Center parkway 12 kV line along Dracaea Avenue to the east and along Cottonwood Avenue to the west can be abandoned when existing on-site residences served by these facilities are abandoned. Per SCE requirements, SCE 12 kV undergrounded lines cannot be in a common trench with MVU facilities and require a separate underground facility with a minimum 6 feet from other utility lines.

Based on the *Technical Memorandum – Dry Utilities World Logistics Center, Moreno Valley, CA*, (Revised Final EIR Appendix N Utility Specialists, September 2014) prepared for the WLC project, construction of the first three logistics buildings that would occur during the initial phase of construction can be served by the existing MVU substation at Cottonwood Avenue and Moreno Beach Drive, as long as capacity is still available at that station. Subsequent construction of buildings in Phase 1 will require the expansion of this substation. The expansion that would occur to meet this demand would be the addition of two new 28 MW transformer units which can be accommodated within the existing substation property. New 12 kV underground feeder circuits, including trenching, conduit, electrical vaults, and conductors will need to be installed from the substation to the WLC Project site. These improvements will occur along Cottonwood Avenue, along Moreno Beach Drive, and along Alessandro Boulevard, Brodiaea Avenue, and Cactus Avenue. These improvements are expected to take place concurrently with roadway construction.

To meet the WLC Project’s ultimate annual demand of 376,426 MW, a new 112 MW substation will be constructed within the Project site at a central location near one of SCE’s 115 kV transmission lines that will feed power to the substation. The *Dry Utilities* memo for the Project indicates two potential locations; the first adjacent to the SCE transmission lines along Gilman Springs Road, and the other adjacent to the SCE transmission lines along Brodiaea Avenue. Impacts of constructing the new station at either of these on-site

locations will be the same. All MVU primary distribution conductors within the Project will be installed within underground conduits and vaults within the public roadway rights-of-way or within easements as a joint trench with telephone, cable television, and natural gas. Since the installation or relocation of electrical facilities would take place concurrently with roadway construction and/or within dedicated easements, or protected in place, the construction of these facilities would not result in any additional significant environmental effects.

Relocation of natural gas transmission lines within the WLC site into public street rights-of-way and easements will be necessary to support site development and grading. These include 11,100 feet of the 30-inch gas pipeline in Cottonwood Avenue from Redlands Boulevard to World Logistics Center Parkway and then southeast to the Virginia Street and Alessandro Boulevard intersection; 1,900 feet of 30-inch gas line from Gilman Springs Road at Lisa Lane southwest to Alessandro Boulevard; 1,000 feet of 16-inch gas line owned by Questar from Gilman Springs Road southwest to Alessandro Boulevard and 4,000 feet of 16-inch gas line owned by Questar on the Maltby Avenue alignment from Merwin Street to World Logistics Center Parkway. The remaining transmission gas lines are anticipated to be protected in place within the proposed streets or easements between buildings. The regulator station located at the southeast corner of Gilman Springs Road and Laurene Lane east of the WLC project area will need to be relocated as part of the widening of this road. The gas facility on Alessandro Boulevard and Virginia Street will remain in place as the Project develops in this area. The SDG&E natural gas compression station on Virginia Street south of the Project site, known as the Moreno Compressor Station, along with a smaller facility on Virginia Street at Boadicea Avenue will be protected in place. Since the installation or relocation of natural gas facilities would take place concurrently with roadway construction and or within dedicated easements, or protected in place, the construction of these facilities would not result in any additional significant environmental effects (Revised Final EIR Part 2, pg. 4.17-37 to pg. 4.17-39).

c. Energy Standards, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project would conflict with any applicable energy standards, policies, or regulations which may cause significant environmental effects.

Findings: Potential impacts of the Project related to energy regulations were analyzed in detail in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Council finds that the Project's potentially significant cumulative impacts related to energy standards, policy and regulation consistency would be reduced to a less than significant level, with implementation of Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.16.1.6.1A, 4.16.1.6.1C, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, and 4.7.6.1D. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project would comply with applicable CARB regulations restricting the idling of heavy-duty diesel motor vehicles and governing the accelerated retrofitting, repowering, or replacement of heavy-duty diesel on- and off-road equipment. As discussed in Section 4.7, Greenhouse Gas Emissions, CARB has adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. The

measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than five minutes at any given time. While intended to reduce construction emissions, compliance with the above anti-idling and emissions regulations would also result in energy savings from the use of more fuel-efficient engines. According to the CARB staff report that was prepared at the time the anti-idling Airborne Toxic Control Measure was being proposed for adoption in late 2004/early 2005, the regulation was estimated to reduce non-essential idling and associated emissions of diesel particulate matter and nitrogen oxide (NOX) emissions by 64 and 78 percent respectively in analysis year 2009. These reductions in emissions are directly attributable to overall reduced idling times and the resultant reduced fuel consumption. Mitigation Measure 4.3.6.2A includes a stricter provision that would limit idling to no more than three minutes in any one hour. Therefore, fuel savings have the potential to be even more than those estimated from the Airborne Toxic Control Measure.

CARB has also adopted emission standards for off-road diesel construction equipment of greater than 25 hp. The emissions standards are referred to as “tiers,” with Tier 4 being the most stringent (i.e., least polluting). The requirements are phased in, with full implementation for large and medium fleets by 2023 and for small fleets by 2028. The Project would accelerate the use of cleaner construction equipment by using mobile off-road construction equipment greater than 50 horsepower (wheeled or tracked) that meets, at a minimum, the Tier 4 off-road emissions standards as specified in Mitigation Measure 4.3.6.2A. Field testing by construction equipment manufacturers has shown that higher tier equipment results in lower fuel consumption. For example, Tier 4 interim engines have shown a 5 percent reduced fuel consumption compared to a Tier 3 engine. Similar reductions in fuel consumption have been shown for Tier 3 engines compared to a Tier 2 engine.

The Project would comply with and exceed (through its project design features [PDFs] and mitigation measures) the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 square feet will be designed to be LEED-certified. According to the California Energy Commissions (CEC), buildings compliant with the Title 24 (2019) standards should use 5 percent less energy for lighting, heating, cooling, ventilation, and water heating than the prior Title 24 (2013) standards for nonresidential uses. As specified in the Project Design Features, the Project would include numerous energy and waste reduction features that would allow the project to comply with or exceed the Title 24 standards and achieve energy savings equal to or greater than what is required by state regulations.

With respect to operational transportation-related energy, the WLC project would support statewide efforts to improve transportation energy efficiency and reduce transportation fuel consumption with respect to private automobiles. In particular, the Project would provide the infrastructure for supporting a higher population of electric vehicles, in direct support of the state’s targets of 1.5 million Zero Emission Vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2040. WLC will accommodate ZEV technologies by planning for appropriate on-site charging infrastructure. To that end, the Project will construct the WLC parking areas with cable raceways for installing future EV charging stations, which will enable WLC to more readily and cost effectively provide this service to future tenants if and when demand dictates. The Project would also include the installation of electric vehicle supply equipment pursuant to Title 24, part 6 of the CALGreen Code. Thus, the Project would comply with existing energy standards (Revised Final EIR Part 2, pg. 4.17-38 to pg. 4.17-39).

14. Cumulative Energy

a. Energy Standards, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project in connection with past, present, and probable future projects would conflict with any applicable standards, policies, or regulations which may cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related to energy regulations were analyzed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this City Council finds that potentially significant cumulative impacts related to consistency with energy standards, policy and regulations would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project would comply with applicable CARB regulations restricting the idling of heavy-duty diesel motor vehicles and governing the accelerated retrofitting, repowering, or replacement of heavy-duty diesel on- and off-road equipment. As discussed in Section 4.7, Greenhouse Gas Emissions, CARB has adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. The measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than five minutes at any given time. While intended to reduce construction emissions, compliance with the above anti-idling and emissions regulations would also result in energy savings from the use of more fuel-efficient engines. According to the CARB staff report that was prepared at the time the anti-idling Airborne Toxic Control Measure was being proposed for adoption in late 2004/early 2005, the regulation was estimated to reduce non-essential idling and associated emissions of diesel particulate matter and nitrogen oxide (NOX) emissions by 64 and 78 percent respectively in analysis year 2009. These reductions in emissions are directly attributable to overall reduced idling times and the resultant reduced fuel consumption. Mitigation Measure 4.3.6.2A includes a stricter provision that would limit idling to no more than three minutes in any one hour. Therefore, fuel savings have the potential to be even more than those estimated from the Airborne Toxic Control Measure.

CARB has also adopted emission standards for off-road diesel construction equipment of greater than 25 hp. The emissions standards are referred to as “tiers,” with Tier 4 being the most stringent (i.e., least polluting). The requirements are phased in, with full implementation for large and medium fleets by 2023 and for small fleets by 2028. The Project would accelerate the use of cleaner construction equipment by using mobile off-road construction equipment greater than 50 horsepower (wheeled or tracked) that meets, at a minimum, the Tier 4 off-road emissions standards as specified in Mitigation Measure 4.3.6.2A. Field testing by construction equipment manufacturers has shown that higher tier equipment results in lower fuel consumption. For example, Tier 4 interim engines have shown a 5 percent reduced fuel consumption compared to a Tier 3 engine. Similar reductions in fuel consumption have been shown for Tier 3 engines compared to a Tier 2 engine.

The Project would comply with and exceed (through its project design features and mitigation measures) the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 square feet will be designed to be LEED-certified. According to the California Energy

Commission, buildings compliant with the Title 24 (2019) standards should use 5 percent less energy for lighting, heating, cooling, ventilation, and water heating than the prior Title 24 (2016) standards for nonresidential uses. As specified in the Project's Design Features, the Project would include numerous energy and waste reduction features that would allow the project to comply with or exceed the Title 24 standards and achieve energy savings equal to or greater than what is required by state regulations.

With respect to operational transportation-related energy, the WLC project would support statewide efforts to improve transportation energy efficiency and reduce transportation fuel consumption with respect to private automobiles. In particular, the Project would provide the infrastructure for supporting a higher population of electric vehicles, in direct support of the state's targets of 1.5 million Zero Emission Vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2040. WLC will accommodate ZEV technologies by planning for appropriate onsite charging infrastructure. To that end, the Project will construct the WLC parking areas with cable raceways for installing future EV charging stations, which will enable WLC to more readily and cost effectively provide this service to future tenants if and when demand dictates. The Project would also include the installation of electric vehicle supply equipment pursuant to Title 24, part 6 of the CALGreen Code. Thus, the project would comply with existing energy standards (Revised Final EIR Part 2, pg. 4.17-38 to pg. 4.17-39).

C. ENVIRONMENTAL IMPACTS NOT FULLY MITIGATED TO A LEVEL OF LESS-THAN-SIGNIFICANT

The Moreno Valley City Council finds the following environmental impacts identified in the Revised Final EIR remain significant and unavoidable even after application of all feasible mitigation measures: aesthetics (individually and cumulative), air quality (individually and cumulative), land use and planning, noise, and transportation. In accordance with CEQA Guidelines Section 15092(b)(2), the City Council of the City of Moreno Valley cannot approve the Project unless it first finds (1) under *Public Resources Code* Section 21081(a)(3), and CEQA Guidelines Section 15091(a)(3), that specific economic, legal, social technological, or other considerations, including provisions of employment opportunities to highly trained workers, make infeasible the mitigation measures or Project alternatives identified in the Revised Final EIR; and (2) under CEQA Guidelines section 15092(b), that the remaining significant effects are acceptable due to overriding concerns described in the CEQA Guidelines Section 15093 and, therefore, a Statement of Overriding Considerations is included herein (refer to Section VI of these findings); or (3) that under Public Resources Code Section 21081(a)(2) and CEQA Guidelines Section 15091(a)(2) changes or alterations are within the responsibility and jurisdiction of other public agencies and not the City. Such changes can and should be adopted by other agencies.

1. Aesthetics (Individual and Cumulative Impacts)

a. Scenic Vistas

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could have adverse effects on one or more scenic vistas, notably views of the Badlands, Mount Russell Range, and Mystic Lake/San Jacinto Wildlife Area.

Finding: Potential impacts of the Project related to light and glare impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated

into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on scenic vistas and therefore impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, the nearest sensitive permanent visual receptors would be the existing single-family residences to the west and southwest along Redlands Boulevard. In addition, the views of the motoring public along SR-60, Gilman Springs Road, Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard would be significantly affected as well. At present, the Skechers building blocks views of the site for travelers on SR-60 who are immediately north of the Skechers building.

One of the development requirements of the Specific Plan is to have the heights of the buildings along the north, west and south perimeter of the Project site, including SR-60, be approximately the same height as the existing Skechers building (i.e., approximately 55 feet above a ground elevation of 1,740 feet above mean sea level (amsl)). This means, as the site elevation decreases to the south, taller buildings theoretically could be built as long as they do not exceed 1,795 feet elevation (i.e., height above sea level, not building height above ground). This would result in seeing only the buildings adjacent to the freeway for eastbound travelers on SR-60, but it would adversely affect views from other locations around the WLC Specific Plan site regardless of the height comparison to the Skechers building. The motoring public heading westbound on SR-60 would experience impacts to their views of Mount Russell.

Many of the views of the motoring public while on local roadways will fundamentally change instead of views of open agricultural land, these residents and motorists will view new logistics buildings and the associated parking areas, roadways, infrastructure, and landscaping. Therefore, the Project will have a significant visual impact. The degree to which these buildings may block views of major scenic resources (i.e., Mount Russell, the Badlands, and Mystic Lake) will depend on the location and heights of buildings.

This impact requires mitigation; however, this change in views, while substantial, is anticipated in the City's General Plan, which allows development within the Project area. The WLC Specific Plan would develop the site with logistics warehouse buildings (maximum height 60–80 feet), so this change in itself would represent a significant visual impact. In addition, the eventual change in views from existing (baseline) conditions is substantial and is considered a significant visual impact on scenic vistas. After implementation of the **Mitigation Measures 4.1.6.1A** through **4.1.6.1C**, adverse effects on scenic vistas would remain significant and unavoidable due to the fundamental change in public views for residents within and surrounding the Project site, for travelers on SR-60, Gilman Springs Road, Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard, and for users of the San Jacinto Wildlife Area. (Revised Final EIR Part 4 Volume 3, pgs. 4.1-61 to 4.1-73 and 4.1-82 to 4.1-83).

b. Scenic Resources and Scenic Highways

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could have a significant impact on the views of scenic resources for motorists traveling on SR-60 and Gilman Springs Road.

Finding: Potential impacts of the Project related to scenic resources and scenic highways impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project-related impacts to scenic vistas and scenic highways will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley identifies SR-60 and Gilman Springs Road as local scenic roads. According to the City's General Plan EIR, major scenic resources within the Moreno Valley study area are visible from SR-60, and Gilman Springs Road, both of which are City-designated local scenic roadways. Development of the Project would significantly alter the existing view by introducing large industrial buildings adjacent to the freeway. Existing eastbound and westbound views on SR-60 and Gilman Springs Road would be fundamentally altered with the future development of the Project.

The perimeter portions of the site will have buildings with heights up to 60 feet, and some of the buildings south of Street C (southeastern portion of the site but not adjacent to the San Jacinto Wildlife Area), would have heights of up to 80 feet. Since the Skechers building (roof height approximately 1,790 feet amsl) is already visible throughout the Project site and from off-site areas to the east, south, and southwest, it is likely that most new buildings will be visible from these areas or possibly even farther away, depending on building heights and locations. The use of light colors and reflective surfaces such as glass and polished metal near office entrances and building corners, such as required in the WLC Specific Plan design guidelines, will enhance the visibility of these buildings.

The proposed sound walls and ornamental landscaping would soften the visual impacts of future buildings, but the Project would likely result in at least a partial obstruction of a portion of the Mount Russell Range for motorists traveling on SR-60, so the proposed buildings may obstruct the view of a major scenic feature from a City-designated scenic route. The Project meets criteria in both the moderate and major visual intrusion categories. Therefore, it is anticipated that the WLC Specific Plan design guidelines may create a major visual intrusion (i.e., significant impact) for motorists traveling on SR-60 and Gilman Springs Road.

The WLC Specific Plan can preserve significant visual features, significant views, and vistas if the size and location of buildings developed under the WLC Specific Plan can be controlled so as to not substantially block views of Mount Russell, the Badlands, and Mystic Lake. The views from SR-60 and Gilman Springs Road

will fundamentally change, but their views of major scenic resources (i.e., Mount Russell, the Badlands, and Mystic Lake) may be preserved through careful limitations on the height and location of future buildings. The WLC Specific Plan outlines how future development along SR-60 and Gilman Springs Road will be made visually attractive and can maintain some view corridors of the surrounding mountains and Mystic Lake through careful limitations on the height and location of future buildings. These are considered significant visual impacts on local scenic roads that will require mitigation.

Construction of future logistics warehousing according to the development standards and design guidelines of the WLC Specific Plan will help soften building façades, and the installation of ornamental landscaping will help screen the visual appearance of the buildings from SR-60, but the obstruction of local views will still be significant. Implementation of **Mitigation Measures 4.1.6.1A through 4.1.6.1D, 4.1.6.3A, 4.1.6.4A, and 4.1.6.4B** will help reduce these impacts, but not to less than significant levels. (Revised Final EIR Part 4, Volume 3, pgs. 4.1-73 to 4.1-76).

c. Existing Visual Character and Surroundings

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could significantly degrade the existing visual character of the Project site from open space to an urbanized setting by introducing large logistics warehouse buildings.

Finding: Potential impacts of the Project related to visual impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4- Volume 3. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that even with application of this mitigation measure, the Project will have significant Project-related impacts to the existing visual character of the site and will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Visual impacts associated with changes to the general character of the Project site (e.g., loss of open space), the components of the visual settings (e.g., landscaping and architectural elements), and the visual compatibility between proposed site uses and adjacent land uses would occur. The significance of visual impacts is inherently subjective as individuals respond differently to changes in the visual characteristics of an area. According to Section 1.4 of the Revised Final EIR Part 4 Volume 3, the Project site is currently undeveloped with existing agricultural fields throughout the site. Development of the proposed industrial uses on the Project site would include approximately 40.6 million square feet of warehouse distribution uses with associated parking areas, ornamental landscaping, and roadway and infrastructure on approximately 2,535 acres. Maximum building heights will range from 60 to 80 feet depending on location within the Project and will substantially change the views of both nearby residents and motorists on adjacent roadways.

The Project would also change views for travelers on the adjacent portion of SR-60 and Gilman Springs Road by introducing large industrial buildings in place of vacant agricultural land. The proposed buildings closest to the freeway would most likely have an average height of approximately 55 to 60 feet, although the maximum height may be increased by 10 feet, which would exceed the existing height of the adjacent freeway by approximately 30 feet.

Development of the Project would substantially and fundamentally change the existing character of the Project site from open space to an urbanized setting with many large logistics buildings. The change in the character of the site would constitute a significant alteration of the existing visual character of the WLC Project site, regardless of the architectural treatment and landscaping of the site. These impacts would be especially significant for residents of the existing residences on the Project site, depending on the timing, location, and size of development in the future.

The WLC Specific Plan includes a variety of architectural elements including façade accents such as corner treatments and roof trim. The Specific Plan also provides variation in wall planes that serve to avoid an institutional appearance and break up the bulk of the buildings. This variation would create shadow lines at various times of the day.

The proposed setbacks, landscaping, berms, and walls outlined in the Specific Plan appear sufficient to provide adequate visual screening between proposed warehouse buildings and the existing residential uses. However, mitigation is required to ensure the actual design and appearance of setback areas will effectively screen new development from existing residences and neighboring roadways.

However, even with implementation of **Mitigation Measures 4.1.6.1A through 4.1.6.1D, 4.1.6.3A, 4.1.6.4A, and 4.1.6.4B** the substantial change in visual character of the Project site and surrounding area from development of the Project will cause aesthetic impacts to remain significant and unavoidable. (Revised Final EIR Part 4 Volume 3, pgs. 4.1-76 to 4.1-80).

d. Cumulative Aesthetics – Scenic Vistas, Scenic Resources, and Existing Visual Character

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would in connection with past, present, and probable future projects result in cumulative impacts by adversely affecting one or more scenic vistas; scenic resources; and existing visual character.

Finding: Potential impacts of the Project related to cumulative aesthetics impacts are discussed in detail in Section 6.1 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant cumulative effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on scenic vistas, scenic resources, and on existing visual character. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic,

legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The Project, in combination with other projects in the eastern portion of the City and along SR-60 and Gilman Springs Road, would have a cumulatively significant and unavoidable impact related to views, scenic resources, and existing character in this portion of the City.

The development of the Project would partially obstruct views of surrounding mountain vistas from various vantage points in and around the Project area. Scenic vistas adversely impacted by the project include views of Mount Russell and the foothills surrounding the Lake Perris State Recreation Area, the Badlands, the San Jacinto Wildlife Area and the valley floor. Views from Gilman Springs Road, and other local roadways could be altered by the development of the project in combination with some or all of the cumulative projects. Environmental documents for MV-3 and MV-4 both identified scenic vistas as being significant and unavoidable impacts and that both projects would have cumulative impacts. Both MV-3 or MV-4 identified that there were no feasible measures to reduce impacts on the scenic vistas. MV-3 and MV-4 are considered large warehouse projects with structures and uses that would be similar in character to the structures and uses of the project. Because there are cumulative projects that would result in significant and unavoidable impacts to scenic vistas, the cumulative development within the cumulative geographic areas for aesthetics would result in significant cumulative impacts associated with scenic vistas prior to mitigation.

The size, height, and location of buildings within the Project site are limited by the standards and guidelines contained in the WLC Specific Plan. Mitigation Measures 4.1.6.1A through 4.1.6.1D are recommended to reduce impacts related to the loss of public and private views. After implementation of the proposed mitigation measures, adverse effects on scenic vistas would remain significant and unavoidable due to the change in views for residents within and surrounding the project site, for travelers on SR-60, Gilman Springs Road, Theodore Street, and Redlands Boulevard. Therefore, the Project's contribution to cumulative impacts to scenic vistas would be considered cumulatively significant and unavoidable. (Revised Final EIR Part 2, pgs. 6.1-5 to 6.1-9)

2. Air Quality

a. Air Quality Management Plan Consistency

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project has the potential to conflict with implementation of the SCAQMD 2012 Air Quality Management Plan (AQMP).

Finding: Potential impacts of the Project related to Air Quality Management Plan Consistency impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to inconsistencies with the SCAQMD 2012 Air Quality Management Plan and, therefore, impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations

make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the Project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to the 1993 SCAQMD Handbook, there are two key indicators of consistency with the Air Quality Management Plan (AQMP):

1. Indicator: Whether the Project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
2. Indicator: The Project would conflict with the AQMP if it would exceed the assumptions in the AQMP in 2012 or increments based on the year of project buildout and phase. The Handbook indicates that key assumptions to use in this analysis are population number and location and a regional housing needs assessment. The parcel-based land use and growth assumptions and inputs used in the Regional Transportation Model run by the Southern California Association of Governments that generated the mobile inventory used by the SCAQMD for AQMP are not available and assumed not to include the Project; therefore, the SCAQMD's significance thresholds are used to determine if the Project exceeds the assumptions in the AQMP.

Considering the recommended criteria in the SCAQMD's 1993 Handbook, the analysis in the Revised Final EIR utilizes the following criteria to address this potential impact:

- Project's contribution to air quality violations (SCAQMD's first indicator, 1 as listed above);
- Assumptions in AQMP (SCAQMD's second indicator, 2, as listed above); and
- Compliance with applicable emission control measures in the AQMPs (2012 and 2016)

Project's Contribution to Air Quality Violations and Assumptions in AQMP. According to the SCAQMD, the Project is consistent with the AQMP if the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (SCAQMD, 1993, page 12-3). As shown in analyses in Impacts 4.3.6.2, 4.3.6.3, and 4.3.6.4 of the Revised Final EIR Part 2, the Project could violate an air quality standard and therefore, could contribute substantially to an existing or projected air quality violation.

If a project's emissions exceed the SCAQMD regional thresholds for NOX, VOC, PM10, or PM2.5, it follows that the emissions could cumulatively contribute to an exceedance of a pollutant for which the Basin is in nonattainment (ozone, PM10, and PM2.5) at a monitoring station in the Basin. The thresholds are criteria for determining environmental significance and are discussed in the SCAQMD's 1993 Handbook for Air Quality Analysis. An exceedance of a nonattainment pollutant at a monitoring station would not be consistent with the goals of the AQMP—to achieve attainment of pollutants. The Project would exceed the regional emission significance thresholds for VOC, NOX, CO, PM10, and/or PM2.5 prior to mitigation. This means that Project emissions could combine with other sources and could result in an ozone, PM10, or PM2.5 exceedance at a

nearby monitoring station. The Basin in which the project is located is in nonattainment for these pollutants; therefore, according to this criterion, the Project would not be consistent with the AQMP. The regional emissions assume a zero baseline for existing emissions on the Project site and therefore assumes that the AQMP had no emissions for the Project site. The regional significance thresholds can be interpreted to mean that if Project emissions exceed the thresholds, then the Project would also not be consistent with the assumptions in the AQMP. Therefore, based on this criterion, the Project could contribute to air quality violations and would not be consistent with the AQMP (Revised Final EIR Part 2, pg. 4.3-37).

Compliance with Emission Control Measures. The second indicator of whether the Project could conflict with or obstruct implementation of the AQMP is by assessing the Project's compliance with the control measures in the AQMPs and the State Implementation Plan (SIP).

2012 AQMP: The Project would comply with all applicable rules and regulations enacted as part of the AQMP. In addition, the AQMP relies upon the SCAG regional transportation strategy, which is in its adopted 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and 2011 Federal Transportation Improvement Plan (FTIP). Included in the RTP/SCS are transportation control measures including active transportation (non-motorized transportation, e.g., biking and walking); transportation demand management; transportation system management; transit; passenger and highspeed rail; goods movement; aviation and airport ground access; highways; arterials; and operations and maintenance.

2016 AQMP: The SCAQMD approved on March 3, 2017 the Final 2016 AQMP. Currently, the 2016 AQMP is being reviewed by the U.S. EPA and CARB. Until the approval of the EPA and CARB, the current regional air quality plan is the Final 2012 AQMP adopted by the SCAQMD on December 7, 2012. Therefore, consistency analysis with the 2016 AQMP has not been included. Nonetheless, the Project would comply with all applicable rules and regulations enacted as part of the 2016 AQMP, including transportation control measures from the 2016 RTP/SCS.

State Implementation Plans. Geographical areas in the State that exceed the Federal air quality standards are called nonattainment areas. The Project area is in nonattainment for ozone, PM10, and PM2.5. SIPs show how each area will attain the Federal standards. To do this, the SIPs identify the amount of pollutant emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions. On September 27, 2007, CARB adopted its State Strategy for the 2007 SIP. In 2009, the SIP was revised to account for emissions reductions from regulations adopted in 2007 and 2008 and clarifies CARB's legal commitment. Additional recent revisions to the SIP are as follows:

- In 2008, the EPA revised the lead national ambient air quality standard by reducing it to 0.15 µg/m³. On December 31, 2010, the Los Angeles County portion of the Basin was designated as nonattainment for the 2008 lead national standard as a result of exceedances measured near a large lead-acid battery recycling facility. The 2012 Lead SIP for Los Angeles County was prepared by the SCAQMD and addresses the recent revision to the lead national standard and outlines the strategy and pollution control activities that demonstrate attainment of the lead national standard before December 31, 2015. The 2012 Lead SIP was approved May 4, 2012.

- A SIP revision for the deferral nitrogen dioxide standard was prepared in 2012, to address the new 1-hour federal ambient air quality standard for nitrogen dioxide.
- The proposed California Infrastructure SIP revision was considered by CARB on January 23, 2014. The proposed infrastructure SIP revision is administrative in nature and covers the National Ambient Air Quality Standards (federal standards) for ozone (1997 and 2008), fine particulate matter (PM_{2.5}; 1997, 2006, and 2012), lead (2008), nitrogen dioxide (2010), and sulfur dioxide (2010). The proposed revision describes the infrastructure (authorities, resources, and programs) California has in place to implement, maintain, and enforce these federal standards. It does not contain any proposals for emission control measures.

The SIP takes into account CARB rules and regulations. The Project will comply with applicable rules and regulations as identified in the AQMPs and SIPs and therefore, complies with this criterion.

Although the Project would be consistent with the policies, rules, and regulations in the AQMPs and SIP, the Project must meet all the criteria listed above to be consistent with the AQMPs. The Project could impede AQMP attainment because its construction and operation emissions exceed the SCAQMD regional significance thresholds, and therefore, the Project is considered to be inconsistent with the AQMP.

Applicable SCAQMD regulatory requirements are restated in the mitigation measures identified in Sections 4.3.6.2 and 4.3.6.3 of the Revised Final EIR Part 2. These measures shall be incorporated in all Project plans, specifications, and contract documents. **Mitigation Measures 4.3.6.2A, 4.3.6.2B, 4.3.6.2C, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.4A** are required.

Overall, implementation of the World Logistics Center project would exceed applicable thresholds for all criteria pollutants, with the exception of SOX, as noted below. Despite the implementation of mitigation measures, emissions associated with the Project cannot be reduced below the applicable thresholds. Construction and operational emissions would be reduced to the extent feasible through implementation of mitigation measures listed above and described below. Construction emissions would be reduced through implementation of mitigation measures that require the use of Tier 4 construction equipment, reduced idling time, use of non-diesel equipment where feasible, low-VOC paints and cleaning solvents, and dust suppression measures. Operational emissions would be reduced through implementation of mitigation measures that require reduced vehicle idling, use of non-diesel on-site equipment, meeting or exceeding 2010 engine emission standards for all diesel trucks entering the site, electric vehicle charging stations, and prohibition of refrigerated warehouses. In the absence of further feasible mitigation to reduce the Project's emission of criteria pollutants to below SCAQMD thresholds, potential air quality impacts resulting from exhaust from construction equipment will remain significant and unavoidable (Revised Final EIR Part 2, pgs. 4.3-35 to 4.3-38).

b. Construction Emissions

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would to exceed applicable daily thresholds that may affect sensitive receptors. For construction operations, the applicable daily thresholds are:

- 75 pounds per day of ROC/VOC;

- 100 pounds per day of NO_x;
- 550 pounds per day of CO;
- 150 pounds per day of PM₁₀;
- 150 pounds per day of SO_x; and
- 55 pounds per day of PM_{2.5}.

Finding: Potential impacts of the Project related to construction emission impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on construction emission impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Grading and other construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. The use of construction equipment on-site would result in localized exhaust emissions. Activity during peak grading days typically generates a greater amount of air pollutants than other Project construction activities.

While the actual details of the future construction schedule are not known, it is expected that Project construction would occur in two phases with the construction of Phase 1 occurring over five years and the construction of Phase 2 occurring over ten years. Appendix A.1 of the Revised Final EIR Part 2 includes details of the emission factors and other assumptions.

Table 4.3-8 (Revised Final EIR Part 2 pg. 4.3-40) identifies projected emissions resulting from grading and construction activities for the World Logistics Center project and shows the estimated maximum daily construction emissions over the course of Project construction prior to the application of mitigation.

The construction emissions estimates summarized in Table 4.3-8 are based on the assumed construction scenario described in Appendix A.1, of this Revised Final EIR Part 2. Using emission factors from the CalEEMod model for off-road sources and EMFAC2017 emission factors for on-road sources, Table 4.3-8 indicates that construction emissions of criteria pollutants would exceed the SCAQMD daily emission thresholds for all criteria pollutants (VOC, NO_x, CO, PM₁₀, and PM_{2.5}), with the exception of SO_x. This is a significant impact requiring mitigation.

Fugitive dust emissions are generally associated with land clearing and exposure of soils to the air and wind and cut-and-fill grading operations. Dust generated during construction varies substantially by project,

depending on the level of activity, the specific operations and equipment, local soils, and weather conditions at the time of construction. The World Logistics Center project will be required to comply with SCAQMD Rules 402 and 403 to control fugitive dust. There are a number of feasible control measures that can be reasonably implemented to significantly reduce PM10 emissions from construction.

As identified in Table 4.3-8, fugitive dust and exhaust emissions during the anticipated peak construction day for the World Logistics Center project would exceed SCAQMD daily construction thresholds. The percentage of dust and exhaust varies by year but for PM10 is an average of 85 percent dust and 15 percent exhaust. PM2.5 has an average of 54 percent dust and 46 percent exhaust.

Concrete pouring would likely occur during nighttime hours due to limitations high temperatures pose for concrete work during the day. On-site equipment used during concrete pouring would involve daytime preparation with actual concrete pouring occurring during the nighttime hours. On average, the total hours of operation for each piece of equipment during the concrete phase would be approximately 10 hours. Therefore, maximum daily emissions presented in Table 4.3-8 represent the average concrete pour day. However, under rare occurrences, extended concrete pour days may be required. Table 4.3-9 (Revised Final EIR Part 2, pg. 4.3-41) summarizes daily maximum emissions for each year of construction associated with 24-hour operation of on-site building concrete equipment. As shown in Table 4.3-9, maximum 24-hour concrete pour days would exceed SCAQMD thresholds for NOX. However, all maximum daily emissions are less than those for the worst-case construction day as summarized in Table 4.3-8. Therefore, rare 24-hour concrete pour days would be within the estimated worst-case construction day assumptions. No further analysis of 24-hour concrete pour days is required.

Similar to extended concrete pouring days, other phases of construction such as utility installation and building construction may require an occasional extended construction day based on the task at hand and schedule goals. Occasional extended construction hours would occur for specific tasks within specific planning areas as needed (determined on a day-to-day basis) and would not occur site-wide throughout the 15-year construction period. Therefore, it is anticipated that estimated yearly maximum construction day emissions, as summarized in table 4.3-8, represent the realistic worst-case regional construction emissions for the 15-year construction duration.

The World Logistics Center project is required to comply with regional rules that assist in reducing short-term air pollutant emissions. SCAQMD Rule 402 requires implementation of dust-suppression techniques to prevent fugitive dust from creating a nuisance off-site. SCAQMD Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Applicable dust suppression techniques from Rule 403 are summarized below. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM10 component). Compliance with these rules would reduce impacts on nearby sensitive receptors. The applicable Rule 403 measures are as follows:

- All clearing, grading, earthmoving, or excavation activities shall cease when winds exceed 25 miles per hour per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the

project are watered at least three times daily during dry weather. Watering, with complete coverage of disturbed areas, shall occur at least three times a day, preferably in the mid-morning, afternoon, and after work is done for the day.

- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 0.6 meter (2 feet) of freeboard (vertical space between the top of the load and top of the trailer) in accordance with the requirements of California Vehicular Code Section 23114.
- The contractor shall ensure that traffic speeds on unpaved roads and project site areas are 15 miles per hour or less to reduce fugitive dust haul road emissions.

SCAQMD Rule 1113 regulates the sale and application of architectural coatings. Rule 1113 is applicable to any person who applies or solicits the application of any architectural coating within the Basin. Rule 1113 sets limits on the amount of ROG or VOC emissions allowed for all types of architectural coatings. Compliance with Rule 1113 means that architectural coatings used during construction would have ROG or VOC emissions that comply with these limits.

Overall, as shown in Table 4.3-10 (Revised Final EIR Part 2, pg. 4.3-44), construction emissions are still significant after mitigation, with the exception of PM2.5 and SO2. The reduction in PM2.5 emissions is by a reduction in exhaust from the application of Tier 4 off-road equipment. PM10 emissions are still significant because emissions in 2022, 2023, 2024, and 2028 exceed the threshold; however, emissions of PM10 during all other years of construction are less than significant. Although mitigation reduces emissions of all pollutants (with the exception of CO due to how CalEEMod calculates Tier 4 emissions) during construction, potential air quality impacts resulting from exhaust from construction equipment and fugitive dust will remain significant and unavoidable.

c. Localized Construction and Operational Air Quality Impacts

Significant Unavoidable Impact. The Revised Final EIR evaluated and concluded that construction and operation of the Project would to exceed localized significance daily thresholds that may affect sensitive receptors.

Finding: Potential impacts of the Project related to localized construction and operational air quality impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on localized construction and operational air quality impacts and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: The localized significance threshold (LST) analysis evaluated four conditions:

- Project Build Out (2020): this condition assumes that Phase 1 and Phase 2 of the Project are fully built out in 2020 as a worst-case scenario.
- 2022, the year when the Project emissions from both Project construction and operation are at their highest combined levels for several pollutants; and when construction activities would occur near the existing residences west of the Project boundary along Merwin Street;
- 2025, the earliest year Phase 1 is assumed to be fully operational. When the projected construction schedule would result in construction activities in the southern portion of the Project adjacent to Alessandro Boulevard and east of the existing residential areas along Merwin Street, and when all of Phase I operations would occur (approximately 57 percent of entire Project floor space); and
- 2035 when Phase 1 and Phase 2 of the Project are fully operational.

Project Full Build Out under 2020 conditions represents hypothetical worst-case conditions in that the Project physically could not be built-out in 2020 or, in fact, in any single year due to the size of the Project. These conditions have been included in this assessment to correspond to the analysis scenarios examined in the Project TIA. These conditions also do not account for the fact that vehicle emissions are expected to decline over time as vehicle emission control technologies improve. Thus, consideration of these conditions will significantly overestimate the Project's potential air quality impacts. The 2022, 2025, and 2035 conditions represent the logical and realistic development of the Project over a period of 15 years as represented by the Project applicant. The LST analysis is presented for each condition below.

Pursuant to the SCAQMD's LST methodology, only emissions generated from emission sources located within and along the Project boundaries are included in the LST assessment. These emission sources include vehicle travel on the roadway network within and along the borders of the Project and emissions from support equipment including forklifts, yard/hostler trucks, and emergency standby electric generators.

The Project Full Build Out (2020) LST Assessment

The localized assessment results for the Project Phase 1 and Phase 2 Full Build Out (2020) condition are provided in Table 4.3-11 (Revised Final EIR Part 2, pg. 4.3-46) for receptors located within the Project boundaries and in Table 4.3-12 (Revised Final EIR Part 2, pg. 4.3-47) for receptors located outside the Project's boundaries along with a comparison to the SCAQMD's localized significance thresholds. The significance thresholds for CO and nitrogen dioxide are derived from the measured ambient air quality data from the SCAQMD Riverside air monitoring station and serve as the measure of existing air quality.

As noted from Table 4.3-11, the Project would exceed the SCAQMD's significance thresholds for the annual PM10 threshold for receptors located within the Project's boundaries. As shown in Table 4.3-12, the significance thresholds would not be exceeded at any sensitive receptor located outside of the Project boundaries (Revised Final EIR Part 2, Pg. 4.3-46).

It is important to note the Project Phase 1 and Phase 2 Full Build Out (2020) condition assumes that the Project's emissions are at the levels that would occur in 2020. The majority of the Project's operational emissions are from on-road mobile sources, more particularly, heavy-duty trucks that contribute a disproportionate amount of emissions compared to passenger vehicles. Emissions from on-road mobile sources are regulated at the State and Federal levels and, therefore, are outside of the control of local agencies such as the City and the SCAQMD. For example, CARB is working closely with the USEPA, engine and vehicle manufacturers, and other interested parties to identify programs that will reduce emissions from heavy-duty diesel vehicles in California. Emission reductions arise from a combination of measures including the use of ultra-low sulfur diesel fuel, new emission standards for large diesel engines, restrictions on diesel engine idling, addition of post-combustion filter and catalyst equipment, and retrofits for business and government diesel truck fleets. The implementation of these emission reductions will also result in reductions of other pollutants such as NOX, VOC, and CO. As these emission reduction programs are implemented and there is a turnover in the use of older vehicles with newer and cleaner vehicles, the Project's operational emissions are expected to decline significantly in the future. Emission controls on mobile source vehicles already adopted by the CARB particularly dealing with NOX and PM10 controls on heavy-duty trucks will reduce truck emissions significantly over time. Thus, Project (2020) conditions represent highly conservative estimates, in terms of overestimating of the Project's operational impacts.

Project Development Schedule LST Assessment

The final localized threshold assessment condition examined potential local Project impacts considering the proposed construction and build-out schedule of the Project over a time period of 15 years from the commencement of construction in 2020 to the final build-out and occupation in 2035. This condition examined three specific time periods:

- The Project's on-site maximum daily and annual construction emissions were estimated using the CalEEMod land use emission model and the construction equipment inventory and activities provided by the applicant. The Project's on-site operational emissions, principally from the Project's mobile sources, were derived from detailed traffic volume data provided by the project's TIA that reflects a completely operational Phase 1. The TIA applied a comprehensive regional transportation model to develop daily and peak hour traffic volumes for 2025 and buildout from the Project's mobile sources.

Peak hour and daily Project traffic volumes were developed for each year from 2020 to buildout for roadway segments within and along the boundaries of the Project using the following assumptions:

- Project operational traffic volumes were assumed to be zero in 2020, the year that Project construction would commence.
- Traffic volumes for the years 2021 to 2024 (the completion year for Phase 1 operations) were interpolated from 2025 volumes provided in the TIA by applying the annual Project occupancy schedule to the 2025 traffic volumes.
- Traffic volumes for the years 2026 to 2034 were interpolated from the provided traffic volumes at buildout by applying the annual Project occupancy schedule.

Localized Impact Analysis, 2025. The localized impacts for the short-term construction and operational activities were analyzed using an air dispersion model (EPA AERMOD Model) to simulate the transport and dispersion of Project-related emissions through the air. These impacts were then compared to the applicable SCAQMD localized concentration thresholds.

The estimated maximum localized air quality impacts from the construction and operation of the Project at Phase 1 buildout are summarized in Table 4.3-13 for locations within the Project’s boundaries. These maximum impacts were found at the locations of the existing residences within the Project boundaries. Table 4.3-14 summarizes the highest air quality impacts for sensitive receptors located outside of the Project boundaries. These maximum impacts were found at the locations of the existing residences outside of the Project boundary located west of the Project boundary along Merwin Street. As noted from these two tables, Project impacts would exceed the significance thresholds for PM10 for locations within and outside the Project boundaries, thus represents a significant impact without mitigation (Revised Final EIR Part 2, pg. 4.3-48).

Localized Air Quality Impact Analysis, 2022. The year 2022 was selected for the LST Analysis for two principal reasons: 1) the year 2022 corresponds to the year with the highest combined total on-site construction and operational emissions for NOX and PM2.5, the second-highest on-site emissions for CO, and the fourth-highest on-site emissions of PM10; and 2) the location of the building construction in 2022 places the construction emissions nearest to the existing residences located west of the Project boundary along Merwin Street.

The Project’s maximum combined impacts from construction and operations during 2022 are shown in Table 4.3-15 for the existing sensitive receptors located within the Project boundaries along with the SCAQMD-recommended significance thresholds. Table 4.3-16 shows the maximum combined impacts for sensitive receptors located outside of the Project boundaries. Maximum impacts outside of the Project boundary were found within the residential areas located to the west of the Project boundary. As shown in these tables, the Project would exceed the SCAQMD’s significance thresholds for PM10 at locations within the Project boundary and outside of the Project boundary and NOX within the Project boundary (Revised Final EIR Part 2, pg. 4.3-49 to 4.3-51).

Localized Air Quality Impact Analysis, 2035. The year 2035 represents a long-term planning year when both phases of the Project would be fully in operation. Operational emissions during 2035 were estimated based on the Project’s trip generation and project-related travel along the local roadway network within and along the Project boundaries. Table 4.3-17 shows the maximum localized air quality impacts for 2035 relative to the background air quality levels at the existing sensitive receptors located within the Project boundaries. Table 4.3-18 identifies the highest localized impacts for sensitive receptors located outside of the Project boundaries. As shown in Table 4.3-17 and Table 4.3-18, the Project would exceed PM10 LSTs for receptors within and outside the Project boundary, and would, therefore, represent a significant impact without mitigation.

Overall the localized significance analysis demonstrates that without mitigation, the Project would exceed the localized significance thresholds for NOX and PM10 for one or more of the LST assessment years (2022, 2025, or 2035) analyzed. Therefore, according to this criterion, the air pollutant emissions would result in a

significant impact and could exceed or contribute to an exceedance of the national 1- hour NO₂ annual, as well as the 24-hour and annual PM₁₀ ambient air quality standards.

Mitigation measures identified under Impact 4.3.6.2 (**Mitigation Measures 4.3.6.2A, 4.3.6.2B, 4.3.6.2D and 4.3.6.2E**) to reduce construction emissions of criteria pollutants are required. The Project will also be required to comply with SCAQMD Rules 402 and 403. Additionally, mitigation measures 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, 4.3.6.3E, and 4.3.6.3F are required to reduce emissions of criteria pollutants during Project operations. After application of mitigation, the Project would continue to exceed the localized significance thresholds at one or more of the existing residences located within and outside the Project boundaries for PM₁₀ (24-hour and/or annual) (Revised Final EIR Part 2, pgs. 4.3-45 to 4.3-55).

d. Long-Term Operational Emissions

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that implementation of the Project would have the potential to exceed applicable daily thresholds for operational activities.

Finding: Potential impacts of the Project related to long-term operational emissions are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects of long-term operational emissions and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Long-term air pollutant emission impacts that would result from the Project are those associated with stationary sources (generators, forklifts, etc.), area sources (landscaping and maintenance activities), and mobile sources (e.g., emissions from the use of motor vehicles by Project generated traffic). As discussed in Section 4.3.3.2 of the Revised Final EIR Part 2, the TIA provides Vehicle Miles Traveled (VMT) attributable to the project based on the net effect the Project would have on regional travel as well as Project VMT without consideration of a net effect. The emissions from the net effect on VMT, in conjunction with the proposed stationary and area sources, are shown in the Revised Final EIR Part 2 for determination of significance even though VMT does not represent a CEQA impact for the Project.

Worst-Case Scenario. Projected emissions resulting from operational activities of the Project under the worst-case scenario are identified in Table 4.3-20 on page 4.3-56 of the Revised Final EIR Part 2. As identified in Table 4.3-20, operational emissions for the Project would exceed SCAQMD daily operational thresholds for all criteria pollutants with the exception of SOX for the “worst-case” 2020 scenario.

There may be minor emissions of VOC from the fueling station, depending on what type of fuel is used. However, details regarding the fueling station are currently unknown so the emission source is not estimated. This is a worst-case analysis because it assumes that the entire Project would be built-out in 2020. The motor vehicle and truck emission factors are from 2020, which assumes a “dirtier” fleet than would be the case in later years. In addition, no reductions are taken for mitigation measures.

Operational Regional Emissions. Table 4.3-21 shows the detailed operational emission sources generated both on-site and off-site for Phase 1 and buildout. The table shows particulate matter (PM10 and PM2.5) divided into dust (roadway and tire and brake wear) and exhaust sources. As shown in the table, emissions of VOC, NOX, CO, PM10, and PM2.5 are significant after completion of Phase 1 and after full buildout.

Table 4.3-22 shows the operational emissions year by year using emission factors interpolated from 2025 and 2035 emission factors. The VOC, NOX, CO, PM10, and PM2.5 emissions would be over the SCAQMD’s significance thresholds for most years. The emissions demonstrate that although the number of vehicles and trucks would increase year by year, the emissions do not increase dramatically because the per vehicle emission factors decrease over time as cleaner vehicles enter the fleet.

Combined Construction and Operation. There would be overlapping of construction and operational emissions with Project implementation. The maximum daily operational emissions were added to the maximum daily construction emissions and are shown in Table 4.3-23, which shows all pollutants for all years exceed the SCAQMD thresholds, with the exception of SOX emissions. As identified in Section 4.3 of Revised Final EIR Part 2, Project-related air quality impacts for all criteria pollutants, with the exception of SOX, would be significant and mitigation measures are required.

Health Effects. Section 4.3.6.6 Summary of Health Effects of Air Quality Emissions, starting on page 4.3-79 of the Revised Final EIR Part 2, discusses the health effects from ozone and PM2.5 resulting from the Project. Tables 4.3-32 through 4.3-35 show the annual percent of background health incidence for PM2.5 and ozone health effects associated with the unmitigated and mitigated Project, respectively. The “background health incidence” is the actual incidence of health effects (based on available data) as estimated in the local population in the absence of additional emissions from the Project.²⁸ When taken in context, the small increase in incidences and the very small percent of the number of background incidences indicate that these health effects are minimal in a developed, urban environment. There are no relevant significance thresholds for health effects from criteria pollutants adopted by state, federal, or local agencies; thus, this information is provided for background understanding regarding the air quality emissions. Table 4.3-32 and Table 4.3-33 show the health effects, morbidity and mortality, of the unmitigated Project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Table 4.3-34 and Table 4.3-35 show the health effects, morbidity and mortality, of the mitigated Project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Potential PM2.5 Mitigated Project related health effects show an increase in asthma-related emergency room visits (0.0047%),

²⁸ Background health statistics were obtained from data included in the BenMAP model, and the sources are referenced in the BenMAP manual (USEPA, 2018). For example, EPA obtained mortality rates from the Centers for Disease Control (CDC) WONDER database, and hospital admissions rates from the Healthcare Cost and Utilization Project (HCUP).

asthma-related hospital admissions (0.0028%), all cardiovascular-related hospital admissions (not including myocardial infarctions (heart attacks)) (0.00059%), all respiratory-related hospital admissions (0.0015%), mortality (0.0044%), and nonfatal acute myocardial infarction (less 0.0020% for all age groups). Potential Project Mitigated Ozone-related health effects increased respiratory-related hospital admissions (0.00062%), mortality (0.00027%), and asthma-related emergency room visits for any age range (lower than 0.011% for all age groups). Because the health effects from ozone and PM2.5 are minimal, in light of background incidences, and health effects from other criteria pollutants would be even smaller, the health effects of those other criteria pollutants were not quantified. Because there are no established thresholds, this data was provided for informational purposes.

Mitigation Measures. The mitigation measures identified under Impact 4.3.6.3 (Mitigation Measures 4.3.6.3A through 4.3.6.3E) with the additional implementation of Mitigation Measure 4.3.6.4A would reduce operational emissions of criteria pollutants associated with the Project. It is important to note that, in addition to the operational activity mitigation measures identified previously, future development would need to incorporate physical attributes and operational programs that will act to generally reduce operational-source pollutant emissions including GHG emissions. These Project characteristics are identified in Section 4.7, Climate Change and Greenhouse Gas Emissions, and Section 4.17, Energy, of the Revised Final EIR Part 2 (pg. 4.3-61).

On October 21, 2016, the Project’s developers entered into a settlement agreement with the SCAQMD which requires the payment to the SCAQMD of an Air Quality Improvement Fee of 64 cents per square foot for each building as the Project is constructed (Revised Final EIR Part 1, pg. 29 to 30). The settlement agreement states:

“[T]he payment of the Air Quality Improvement Fee will adequately mitigate heavy-duty truck-related air quality impacts that may result from the construction and operation of the World Logistics Center as described in the EIR and that no additional charges will be imposed on the World Logistics Center to mitigate emissions, including NOX, described in the EIR from heavy-duty trucks.”

Funds may be used by SCAQMD for any purpose to improve air quality in the South Coast Air Basin although the SCAQMD has indicated that the funds will be used “to develop mitigation efforts focused on reducing emissions in the areas affected by the warehouse project.”²⁹ One possible use might be that individual or fleet truck owners servicing the Project could be offered a financial incentive to purchase a near-zero or zero-emission truck model, similar to the Carl Moyer Program. This type of program has been an effective tool for more than 19 years in speeding the transition of heavy-duty trucks and other equipment to cleaner models. In the 2017 Reporting Cycle for the Carl Moyer Program (Funding Years 8-19), \$87,373,480 was funded for “On-Road” vehicles by the SCAQMD for a reduction of 6,265 tons of NOX and ROG emissions, and a reduction of 145.3 tons of PM emissions, with an average cost-effectiveness of \$11,612.³⁰ Using those costs and resulting reductions in emissions, the \$26,000,000 Air Quality Improvement Fee could result in a reduction

²⁹ SCAQMD press release October 21, 2016, announcing the settlement.

³⁰ California Air Resources Board. Carl Moyer Program Status Reports. 2017 Reporting Cycle. Available online: <https://ww3.arb.ca.gov/msprog/moyer/status/status.htm>

of 1,864 tons of NOX and ROG emissions, and a PM reduction of 43 tons of PM emissions. Therefore, with the payment of the Air Quality Improvement Fee through the 2016 settlement, the Project’s net contribution to regional air quality would be further reduced. Because the use of the funds will be determined by the SCAQMD’s Governing Board and because it is not yet known how the SCAQMD will allocate the funds, no credit for emission reductions has been taken by the Project (Revised Final EIR Part 2, pg. 4.3-62).

Although implementation of **Mitigation Measures 4.3.6.3B** through **4.3.6.3F**, **4.3.6.4A**, and the payment of funds to SCAQMD may reduce impacts and vehicular trips associated with the Project, it is not possible to quantify the reduction in the amount of emissions that may occur. Considering the volume of emissions generated and current commuter habits, it is unlikely the implementation of vehicular management plans will result in a reduction of operational Project emissions to below existing SCAQMD thresholds. Application of Leadership in Energy and Environmental Design (LEED) standards and green building design principles could reduce emissions from building operations such as heating and cooling; however, such standards and principles would not reduce emissions of CO, ROG, NO_x, PM₁₀, and PM_{2.5} to below SCAQMD thresholds. No other feasible mitigation measures have been identified to reduce the operational emissions of CO, ROG, NO_x, PM₁₀, and PM_{2.5} to a less than significant level. Because the Project site is located in a nonattainment air basin for criteria pollutants, the addition of air pollutants resulting from operation of the Project would contribute to the continuation of nonattainment status in the Basin. In the absence of mitigation to reduce the Project’s emission of contribution of ozone, PM₁₀, and PM_{2.5} to below SCAQMD thresholds, long-term air quality impacts resulting from the operation of the Project would remain significant and unavoidable. (Revised Final EIR Part 2, pgs. 4.3-56 to 4.3-63).

e. Cumulative Air Quality Impacts - Construction

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project’s contribution to the cumulative exceedance of applicable daily thresholds that may affect sensitive receptors would be cumulatively considerable.

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, there will be a significant cumulative impact due to adverse effects from cumulative air quality impacts and the Project’s contribution would be cumulatively considerable; therefore, cumulative impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the

Project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, out of the 359 cumulative projects that were evaluated, 67 were found to be completed or currently undergoing construction as of November 2019. Therefore, 289 potential cumulative projects could undergo construction activities during the Project's 15-year construction period. Construction emissions gathered from the environmental documents and modeling show that out of the 289 cumulative projects, 95 cumulative projects were identified as exceeding VOC significance thresholds, 22 projects were identified as exceeding NO_x thresholds, and 2 projects would exceed CO, PM_{2.5} and PM₁₀ thresholds. However, even if none of the 289 potential cumulative projects undergo construction while the Project is under construction, a cumulatively considerable impact will occur because projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. The Project-specific construction emissions presented in Section 4.3.6.2 exceed the applicable SCAQMD significance thresholds for VOC, NO_x, CO, PM₁₀, and PM_{2.5}; therefore, a cumulatively considerable impact will occur, despite any potential construction activity associated with another project.

f. Cumulative Air Quality Impacts – Localized Construction and Operational Air Quality Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to the cumulative exceedance of localized thresholds that may affect sensitive receptors would be cumulatively considerable

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, there will be a significant cumulative impact due to adverse effects to cumulative air quality impacts and the Project's contribution will be cumulatively considerable; therefore, cumulative impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, out of the 359 cumulative projects that were identified, three cumulative projects (MV-5, MV-6, and MV-126) are located within 1,000 feet of the proposed Project boundary. The cumulative analysis focused on two cumulative scenarios: Construction start year (2020) and Full Build Out (2035).

The cumulative localized significance analysis demonstrates that without mitigation, the cumulative projects would exceed the localized significance thresholds for national 1-hour NO₂, annual PM₁₀, 24-hour PM₁₀, and 24-hour PM_{2.5} for one or more of the LST assessment years (2020 or 2035) analyzed. Therefore, according to this criterion, the air pollutant emissions would result in a significant impact and could exceed or contribute to an exceedance of the national 1-hour NO₂, annual PM₁₀, 24-hour PM₁₀, and 24-hour PM_{2.5} ambient air quality standards. Due to the findings of the Project's localized threshold analysis the air pollutant emissions from the Project would result in a significant cumulative impact and could exceed or contribute to an exceedance of the ambient air quality standards for NO₂, PM₁₀, and PM_{2.5}. Construction and operation of the cumulative projects along with the Project would result in cumulatively considerable significant and unavoidable localized impacts.

g. Cumulative Air Quality Impacts - Operations

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to the exceedance of cumulative operational thresholds would be cumulatively considerable.

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects to cumulative air quality impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, operational emissions gathered from the environmental documents and modeling show that out of the 359 cumulative projects, 25 cumulative projects were identified as exceeding VOC significance thresholds, 59 projects were identified as exceeding NO_x thresholds, and 16 projects were identified as exceeding CO thresholds. None of the 359 projects would exceed the PM_{2.5} and PM₁₀ significance thresholds. However, because the Project-specific emissions exceed the SCAQMD significance thresholds, this Project is considered by the SCAQMD to be cumulatively considerable, despite the potential operation of any of the identified cumulative projects.

h. Cumulative Health Risk Impacts

Potentially Significant Impact. The Revised Final EIR evaluated and concluded that construction and operation of the Project would have a cumulatively considerable contribution cumulative significant cancer risk.

Finding: Potential impacts of the Project related to cumulative cancer risk and cancer burden impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required

in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that, even with application of these mitigation measures, the cancer risk to sensitive receptors and the cancer burden to the general population will be cumulatively significant and unavoidable, and that the Project's contribution will be cumulatively considerable. The Project will have a significant impact due to adverse effects on long-term operational emissions impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of Revised Final EIR Part 2, the cumulative HRA uses the same air dispersion modeling and health risk calculation methodologies used in the Project-level HRA; however, the operational AERMOD model was updated to include emissions sources from the 359 cumulative projects and an expanded receptor grid that covers most of the South Coast Air Basin.

Two sets of 30-year cancer risk calculations were performed for the identified cumulative projects, one includes the cancer risks from exposure to construction plus operation (Cumulative Construction & Operation HRA), and the other includes 30-year exposure to the full operation of the 359 cumulative projects in addition to the Project (Cumulative Operation HRA).

Thirty-year exposure to cumulative construction and operations results in a cancer risk of 139.8 in one million at the maximum exposed receptor and 30-year cumulative operations would result in a cancer risk of 171.5 in one million at the maximum exposed receptor. These impacts at the maximum exposed receptor are above the cumulative cancer threshold of 10 in one million. Therefore, the construction and operation of cumulative projects in addition to the Project is expected to have a significant and unavoidable cumulative impact. (Revised Final EIR Part 2 pg. 6.3-28). As discussed in Section 4.3 of Revised Final EIR Part 2, the Project impacts would be reduced to less-than-significant levels after implementation of mitigation. However, because the Project would result in an increase in cancer risk of 9.1 under construction + operations and 7.1 under 30-year operations, the Project would be cumulatively considerable.

3. Land Use and Planning

a. Physically Divide an Established Community

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would physically divide an established community.

Finding: Potential impacts of the Project related to the existing rural residences on the Project site are discussed in detail in Section 4.10 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated into, the project which will mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached

Mitigation Monitoring and Reporting Program. However, the Council finds that even with installation of solid block walls around the warehouse building or the existing residences, the Project will have a significant impact due to adverse effects to existing residences and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.10 of the Revised Final EIR Part 4, Volume 3, the adjacent properties surrounding the WLC Project are residential, light industrial, open space and undeveloped. Essentially, the Project site is located along the eastern urban boundary of the City of Moreno Valley with development only adjacent to the western boundary and northwest corner of the site. At present, there are six occupied residences on the Project site. These properties vary in size from 0.5 to 10 acres and are located on the east side of Redlands Boulevard and World Logistics Center Parkway. These properties represent less than 1.5% of entire WLC Specific Plan area. The WLC Specific Plan designates these properties as “Light Logistics” and allows various logistics-related uses. It is believed these properties are currently occupied. It is possible that, as development of the Project site occurs according to the WLC Specific Plan, large warehouse buildings may eventually be located in close proximity to the existing residences. It would be ineffective and inefficient to try to incorporate these residences into the WLC Specific Plan land plan of large logistics warehouses to accommodate these residences. In addition, logistics operations would cause significant air pollutant, noise, and lighting, impacts on residents living in these units if they were adjacent to operating warehouses.

The WLC Specific Plan currently shows a 250-foot setback along the western boundary of the site to separate existing residences neighboring the Project site from the proposed warehouse buildings. However, it would be ineffective and inefficient to try to incorporate similar setbacks, for the existing residences on the Project site, into the WLC Specific Plan land plan. Under CEQA, the question is whether a project will affect the environment or persons in general, not whether a project will affect particular persons. For instance, CEQA addresses how view sheds are impacted by a proposed project but would not address the specific view that an individual resident sees. Therefore, the effect on the estimated 13 people (six homes x 2.2 persons average occupancy) who live in the six houses does not constitute an impact and is insignificant. The Council has erred on the side of caution treating the impact as if it were significant.

Installation of solid block walls around the warehouse buildings or the existing residence would help reduce noise and lighting impacts, but they would not help reduce air pollutant impacts. Therefore, there is no effective mitigation available to protect or separate these existing residences from future warehousing buildings and operations. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-36).

4. Noise

a. Off-Site Short-term Construction Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that construction activities would adversely affect residences located adjacent to off-site construction projects because they would still be exposed to noise levels greater than 60 dBA (Leq).

Finding: Potential impacts of the Project related to off-site short-term construction impacts of the Project are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would lessen the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the Council and set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences adjacent to a construction area from significant noise levels, Project-related noise impacts during off-site construction on existing residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Off-site construction activities would occur within the allowed construction hours identified in the City's Noise Ordinance and would be consistent with the City's code. The nearest receptors are located approximately 25 feet from off-site construction areas. Based on the operation of the two loudest pieces of equipment simultaneously at 25 feet, off-site construction could expose sensitive receptors to a noise level of 93 dBA Leq, which would exceed the City's allowable daytime exterior noise level of 60 dBA Leq. Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a NRCP, which is expected to attenuate construction noise levels by a minimum of 10 dB. However, even with implementation of this mitigation measure, noise levels experienced at residences adjacent to off-site construction activity would be above the City's threshold. Therefore, impacts would remain significant and unavoidable. (Revised Final EIR Part 4 Volume 3, pgs. 4.12-17 to 4.12-26).

b. Substantial Temporary and/or Periodic Increase in Ambient Noise Levels – Construction

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would elevate the existing ambient noise level above the applicable 10 dB substantial temporary increase threshold.

Finding: Potential impacts of the Project related to an increase in ambient noise levels are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to reduce construction noise so that ambient levels would not be elevated above the applicable 10 dB substantial temporary increase threshold, impacts will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the

significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The Project has the potential of exposing sensitive receptors within the vicinity of on- and off-site construction areas to noise levels that could temporarily exceed the existing ambient noise level by more than the applicable 10 dB substantial temporary increase threshold. As discussed in Section 4.12.3 of the Revised Final EIR Part 3, the City of Moreno Valley Noise Ordinance and General Plan do not contain an incremental increase threshold for construction. Therefore, for purposes of analysis, it was considered a significant impact in cases where sensitive receptors are exposed to construction noise levels that increase ambient noise levels by 10 dB.

Construction activities within the Project area (i.e., Plots 1 through 22) would exceed existing ambient noise levels by as much as 50 dB. The existing sensitive receptors that would be most affected by on-site construction activities are located within, to the west, and to the southwest of the Project area. The Project-related construction activities could also have the potential to expose wildlife located within the undeveloped land located south of the Project area to construction noise levels that would exceed the existing ambient by more than the applicable 10 dB substantial temporary increase threshold. Transient construction noise consisting of worker trips and construction equipment and materials delivery would not occur along the southern boundary of the site, adjacent to the wildlife area. Therefore, noise generated during on-site construction activities would not result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project with regard to the adjacent wildlife area. However, noise generated during on-site construction activities would result in a substantial temporary or periodic increase in ambient noise levels at residences within, to the west, and to the southwest of the Project areas and would result in a significant impact (Revised Final EIR, Part 3, pg. 4.12-26 and Revised Final EIR, Part 1, pg. 744). As shown in Table 4.12-10 (Revised Final EIR pg. 4.12-29 to 4.12-35), off-site construction (e.g., roadway improvements, drainage improvements, etc.) in some areas, would exceed existing ambient noise levels by as much as 45 dB. The existing sensitive receptors located adjacent to Redlands Boulevard, Cactus Avenue and near the intersections of World Logistics Center Parkway, South of SR 60/Highway 60 and Redlands Boulevard/Highway 60 would be most affected by off-site construction activities. Therefore, noise generated during off-site construction activities would result in a substantial temporary or periodic increase over ambient noise levels in the Project in the absence of Project and would result in a significant impact.

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a NRCP, which is expected to attenuate construction noise levels by 10 dB and which will prohibit construction activities within 800 feet of residences during nighttime hours. As shown in Table 4.12-8 and Table 4.12-10, even with implementation of Mitigation Measure 4.12.6.1A, sensitive receptors located near on-site and off-site construction areas would be exposed to construction noise levels that would exceed the existing ambient noise levels by more than the applicable 10 dB substantial temporary increase threshold. Therefore, this would result in a significant and unavoidable impact with mitigation.

c. On-Site Short-term Construction Impacts - Daytime

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that on-site Project construction activities would adversely affect residences located within 500 feet of a construction area as the residences would be exposed to noise levels greater than 60 dBA (Leq).

Finding: Potential impacts of the Project related to on-site short-term construction impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences within 500 feet of a construction area from significant Project-related daytime noise impacts during construction, impacts on existing residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Construction noise levels in and around the Project area would fluctuate depending on the type, number, and duration of use of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving or blasting), which can be particularly disruptive. Pile driving and blasting, however, is not proposed during Project construction. Table 4.12-7 shows typical noise levels produced by the types of construction equipment that would likely be used during Project construction.

The City of Moreno Valley Noise Ordinance prohibits construction from occurring outside of the hours of 8:00 p.m. to 7:00 a.m. that creates a noise disturbance. Construction occurring within the allowable hours of 7:00 a.m. and 8:00 p.m. would not result in the violation of the City's Noise Ordinance. Exposing residences to noise levels exceeding those identified in Table 4.12-5 during daytime or nighttime project construction would result in violation of the City's Noise Ordinance (Revised Final EIR Part 3, pg. 4.12-16)

Construction operations would occur in two general areas; on-site and off-site. The on-site construction activities will be more intense. Some phases of the on-site construction are expected to occur for 24- hours a day, 7-days per week. For the purpose of this analysis, construction is anticipated to begin in 2020, periodically, for a total of 15-years.

On-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical work day, the equipment would be operating at different locations within the various Plots of the Project site and would not likely be operating concurrently. However, for a more conservative approximation of construction noise levels to which the nearest sensitive receptor would be exposed, it is assumed that two of the loudest pieces of construction equipment would be operating at the same time and located within the Project Plots nearest to a sensitive receptor. The nearest

sensitive receptors are the existing on-site residences, which would be located approximately 25 feet from construction activity of various Plots. As a worst-case scenario, it has been assumed that all existing on-site residences will remain onsite throughout construction (Revised Final EIR Part 3, pg. 4.12-17).

Based on the list of the construction equipment that would be used at each of the Plots, it was assumed that the two loudest pieces of off-road equipment (a paver and scraper) would have a combined noise level of 85 dBA Leq from a distance of 50 feet (FHWA, 2006a). Using this reference noise level and a 7.5 dB per doubling of distance attenuation rate, the noise exposure level at representative locations around the Project site were calculated and presented in Table 4.12-8. The location of the modeled receptor locations is presented in Figure 4.12-3. As shown in Figure 4.12-3 and Table 4.12-8 of the Revised Final EIR Part 3, noise generated during construction on the Plots, in some cases construction of various Plots occurring concurrently, would expose sensitive receptors to noise levels that would exceed the City's 60 dBA Leq daytime exterior noise standard. Specifically, impacts would occur at existing residences located within and to the west of the Project area. Affected receptors are all located within City of Moreno Valley boundaries.

Based on these projections, anticipated worst-case construction noise levels would regularly be exceeded at residences within and near the Project area. Based on an Leq noise level of 85 dBA Leq at 50 feet and an attenuation rate of 7.5 dB per doubling of distance, an observer would need to be at a distance of 500 feet from an active Project construction area to experience a noise level of 60 dBA Leq, or 800 feet for a noise level of 55 dBA Leq. Therefore, the on-site construction of the Project would result in the exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley Noise Ordinance and would result in a significant impact.

Implementation of **Mitigation Measure 4.12.6.1A** (as revised [Additional Errata to the Revised Final EIR dated June 9, 2020]) would reduce construction noise levels at nearby sensitive receptors, except for those located within 500 feet from active construction areas, through implementation of a NRCPP, which is expected to attenuate construction noise levels by a minimum of 10 dB. Table 4.12-8 shows mitigated construction noise levels at sensitive receptors in the vicinity of on-site construction areas. With regard to daytime construction, sensitive receptors located within and to the west of the Project (within 500 feet of active construction areas) would continue to be exposed to construction noise levels that would exceed the City's daytime exterior noise standard of 60 dBA Leq even with implementation of mitigation. Additionally, with a 10-dB reduction, off-site construction activity would continue to expose the sensitive receptors at 25 feet to noise levels up to 83 dBA Leq. Therefore, this would result in a significant and unavoidable impact even with the implementation of mitigation.

d. Long-Term Traffic Noise Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's long-term traffic would result in a substantial permanent increase in ambient noise levels in the vicinity of the WLC Specific Plan area exceeding the maximum noise level allowed under the City's Municipal Code.

Finding: Potential impacts of the Project related to long-term traffic noise impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment.

(Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects to long-term traffic noise impacts and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The noise analysis for the World Logistics Center project is based on the traffic volume data contained in the revised Traffic Impact Analysis (TIA) prepared for the Project (contained in its entirety as Revised Final EIR Part 3 Appendix D). The TIA addressed the intersections of surface streets in Moreno Valley of a collector or higher classification street with another collector or higher classification street, at which the Project will add 50 or more peak hour trips. The study area also included the main travel routes between the Project and the nearby cities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. The study area extended west to the nearest ramps on SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes radiating from the Project site to the north, south, east, and west. The study area extended west to the nearest ramps on SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes radiating from the project site to the north, south, east, and west. The traffic analysis covered SR-60 from I-10 in the east to SR-71 in the west, SR-91/I-215 from I-210 in the east to I-15 in the west, I-215 from Redlands Avenue in the north to the Scott Road interchange in the south, and I- 10 from SR-62 in the east to SR-60 in the west.

Three hundred and thirty-nine (339) roadway links and eighty-nine (89) freeway segments were analyzed in the noise analysis. The change in noise level was calculated for all 428 roadway and freeway links with and without the World Logistics Center project for the (2018)³¹, 2025, and 2040 buildout scenarios.³² Segments with noise increases less than 1.5 dB would not have a substantial noise increase and were not presented in the main body of the noise report (i.e., the tables). Similarly, any segments that do not have sensitive receptors (e.g., residential uses or schools) were also not presented in the main body of the noise report. Based on this filtering process, of the 428 segments analyzed, 21 segments have sensitive receptors and an increase of 1.5

³¹ The Project’s contribution to traffic noise in 2020 would represent a slightly smaller percentage given the increase in ambient traffic of roughly 2% per year. Using a 2018 buildout year therefore slightly overstates the increase in traffic noise attributable to the Project.

³² The traffic impact analysis (TIA) (Revised FEIR Part 3, Appendix F) analyzes full project buildout under existing conditions (year 2018) and full project buildout in 2040, which is the worst case for traffic analysis purposes as it accounts for greater regional growth in non-project traffic. For purposes of conservative air quality and greenhouse gas analyses in the Revised FEIR Part 2, it is assumed that full project operations would occur as early as 2035, resulting in the use of higher mobile emissions factors (dirtier engines). In addition, the public project buildout scenario under existing conditions assumed the year 2020 to align with the date of Part 2 of the Revised FEIR. The traffic utilized in the traffic noise analysis remain unchanged and references to the 2018 and 2040 build out years has been retained to maintain consistency with the TIA.

dB for at least one buildout scenario and were therefore addressed in the analysis (Revised Final EIR Part 3, pgs. 4.12-36 to 4.12-37).

The projected future traffic volumes (WSP USA, June 2018) for roadway segments in the World Logistics Center project vicinity found in the TIA were used in the traffic noise analysis. Modeled noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. As previously identified, long-term impacts from the Project's traffic noise that affect existing sensitive land uses are considered to be substantial and, therefore, constitute a significant noise impact if the Project would:

- Increase noise levels by 5dB or more where the no Project noise level is less than 60 CNEL;
- Increase noise levels by 3dB or more where the no Project noise level is 60 CNEL to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the no Project noise level is greater than 65 CNEL.

Operation of development that could occur within the World Logistics Center Project area would generate traffic along roadways in the project vicinity. Table 4.12-11 of the Revised Final EIR Part 3 (pg. 4.12-37) identifies existing with Project roadway traffic noise levels. Build out of the proposed WLC project under 2018 conditions would result in substantial increases in traffic noise levels in the Existing plus Project Build Out scenario case. The largest Project-related increase in traffic noise would be along Cactus Avenue Extension and Street F where increases of greater than 65 dBA are predicted. However, the increases associated with these roadway segments are attributable to Cactus Avenue Extension and Street F being new roads that will be constructed by the Project. A total of 13 road or freeway segments would result in a substantial noise increase attributable to the Project, resulting in a significant impact requiring mitigation.

Year 2025 (Phase I) With and Without World Logistics Center project scenarios projected traffic volumes on roadway segments in the Project vicinity were used to conduct the traffic noise modeling. The projected traffic volumes in the area were taken from the TIA prepared for the Project. Table 4.12-12 of the Revised Final EIR Part 3 (pg. 4.12-38) identifies year 2025 Without Project and With Project traffic noise levels.

Increases in noise levels associated with Buildout Year (2040) traffic conditions on area roadways range up to 68.3 dBA. As identified in Table 4.12-13, the greatest increase in noise levels would be along Cactus Avenue Extension and Street F (east of World Logistics Center Parkway), where increases of 66.8 dBA and 68.3 dBA, respectively, are predicted for the Buildout Year 2040 With Project scenario over the Buildout Year 2040 Without Project scenario. However, the increases associated with these roadway segments are attributable to Cactus Avenue Extension and Street F being new roads that will be constructed by the Project. A total of eight road and freeway segments would result in a substantial noise increase attributable to the Project, resulting in a significant impact requiring mitigation (Revised Final EIR Part 3, pg. 4.12-39).

Areas within the World Logistics Center Site. Six occupied noise-sensitive uses within the World Logistics Center site include residences that may remain with the implementation of the Project. The land is currently zoned as WLC SP-LD with Industrial/Business Park general land uses, but it is anticipated that the residences

may remain for some time. The existing residences, as long as they remain, must be considered sensitive land uses.

- *Street A/ World Logistics Center Parkway, South of SR 60 (Street B/Eucalyptus Avenue to Street F)*. Three residences are located along Street A (World Logistics Center Parkway, South of SR 60) between the future Street B and Street F. These residences are anticipated to experience noise increases up to 18.5 dB due to the implementation of the Project. As a result, existing noise levels at these residences will be changed significantly. Therefore, this would be a significant impact requiring mitigation. The exact alignment of the roadway is to be determined, but the homes may be roughly 100 feet from the centerline on the roadway. Two residences front onto Street A (World Logistics Center Parkway), and the driveway access would make a soundwall ineffective. The other residence is on Street A (World Logistics Center Parkway) and it is difficult to determine where an outdoor living area is for this residence. However, since it is a single residence, a soundwall would have a limited effectiveness. Since mitigation is not feasible, impacts remain significant and unavoidable.
- *Street F/Dracaea Avenue (east of Street A/ World Logistics Center Parkway, South of SR 60)*. A single residence is located east of World Logistics Center Parkway, South of SR 60 along what is currently Dracaea Avenue (future Street F). Existing conditions identify low levels of traffic noise on Dracaea Avenue. With build out of the Project in year 2040, this residence would experience noise increases up to 69.2 CNEL during the 2018 buildout year. Therefore, this would be a significant impact requiring mitigation. Installation of a soundwall would not be effective in reducing noise levels due to the opening for the driveway. Since mitigation is not feasible, impacts remain significant and unavoidable.
- *Street E/Dracaea Avenue (east of Redlands Boulevard)*. Two residences are located along Dracaea Avenue east of Redlands Boulevard. These residences would be most affected by traffic along Redlands Boulevard between Eucalyptus Avenue and Cottonwood Avenue, where no significant noise increase has been identified. Additionally, although the alignment of future Street E is not yet known, it is not anticipated that the future Street E centerline would be located less than 100 feet from these residences. Therefore, impacts would be less than significant, and no mitigation is required.

Off-Site Areas Adjacent to the World Logistics Center Site. For areas adjacent to the World Logistics Center site, 13 segments would experience a noise increase that would be greater than significance criteria specified previously. These areas are described below.

- *Street D/Cactus Avenue Extension (Alessandro Boulevard to Cactus Avenue)*. Cactus Avenue Extension, as shown in the Specific Plan, will come down the western side of the World Logistics Center project parallel to Merwin Street. It then merges with Cactus Avenue traveling to the west until Redlands Boulevard. A specific alignment has not been determined for this roadway. There are approximately 14 homes that side-on to Merwin Street that could be affected by traffic on Cactus Avenue Extension. There are no soundwalls along these homes. These homes would experience noise level increases of up to 66.8 dB during the 2040 buildout year. Therefore, this would be a significant impact requiring mitigation.
- *Redlands Boulevard (from Eucalyptus Avenue to State Route 60)*. There are homes located at the northwestern corner of Redlands Boulevard and Eucalyptus Avenue. The 2018 buildout

scenario results in a significant noise increase of 2.8 dB. Therefore, this would be a significant impact requiring mitigation.

- *Cactus Avenue (west of Redlands Boulevard)*. Existing residences are located along Cactus Avenue with rear yards facing Cactus Avenue with soundwalls located along the rear yards of the residences. The 2018 and 2040 buildout scenarios result in significant noise increases of 2.1 dB and 3.9 dB, respectively. Therefore, this would be a significant impact requiring mitigation.
- *Ironwood Avenue (between Redlands Boulevard and Highland Boulevard)*. There are two single-family homes that front onto Ironwood Avenue. There are also two churches along this roadway. A significant noise increase of 5.5 dB is projected for 2018 with full Project build-out. Therefore, this would be a significant impact requiring mitigation.
- *Cactus Avenue (Redlands Boulevard to Cactus Avenue Extension)*. This area is occupied by a small group of single-family homes along Cactus Avenue between the future Street D/Cactus Avenue Extension and Redlands Boulevard. A significant noise increase is projected for all buildout scenarios. Currently, there is no soundwall along these homes. Therefore, this would be a significant impact requiring mitigation.
- *Locust Avenue (between Moreno Beach Drive and Smiley Boulevard)*. There are three single-family homes along this roadway and the front onto the roadway. The 2018 buildout scenario results in a significant noise increase for this area. In 2018, the project will increase noise levels by 5.1 dB. Therefore, this would be a significant impact requiring mitigation.
- *Locust Avenue (between Moreno Beach Drive and Redlands Boulevard)*. There are single-family homes along this roadway with front, rear, and side yards facing Locust Avenue. With Project buildout in 2018, the project will increase noise levels by 5.7 dB. Therefore, this would be a significant impact requiring mitigation.
- *Kitching Street (between Krameria Avenue and Lurin Avenue)*. There are single-family homes along this roadway with rear yards facing Kitching Street. Existing 6-foot high soundwalls are located along the residences and rear yard areas. Under the 2018 buildout scenario, the noise level is projected to increase by 3.2 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 60 eastbound ramps (between SR-60 and Central Avenue)*. Single-family homes are located south of SR-60 eastbound ramps. Under the Project buildout scenario in year 2018, a noise level increase of 7.6 dB is anticipated. Therefore, this would be a significant impact requiring mitigation.
- *State Route 60 (from Perris Boulevard to Nason Street)*. All residential areas along this stretch of freeway have soundwalls in place. The 2018 buildout scenario results in a significant noise increase of 1.5 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 60 (from Moreno Beach Drive to Redlands Boulevard)*. There are soundwalls in place for all residences in this area. The existing 2018 buildout scenario results in a significant noise increase of 2.4 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 215 (from Mill Street to 2nd Street)*. There are four residential uses located to the west of SR-215 south of 2nd Street with no soundwalls. The residential uses are set back from the freeway and are located at a lower grade than the freeway. The 2040 buildout scenario

results in a significant noise increase of 1.9 dB. Therefore, this would be a significant impact requiring mitigation.

- *State Route 215 (from Baseline Road to Highland Avenue/SR-210)*. There are residential uses on the west and east sides of SR-215. There are soundwalls in place along this segment of the SR-215 alignment. The 2040 buildout scenario results in a significant noise increase of 1.7 dB. Therefore, this would be a significant impact requiring mitigation.

Specific Plan Design Features. The WLCSP indicates there will be a 250-foot setback from existing housing along Redlands Boulevard. No additional design features to attenuate noise impacts are planned as part of the WLCSP.

With the implementation of **Mitigation Measures 4.12.6.2A** through **4.12.6.2D**, two areas would experience noise increases that would be mitigated to a less than significant level. Those areas are as follows:

- Cactus Avenue from Redlands Boulevard to Cactus Avenue Extension; and
- Cactus Avenue Extension from Alessandro Boulevard to Cactus Avenue.

For the remaining noise impact locations adjacent to the World Logistics Center site for which significant noise impacts have been identified, mitigation measures are not feasible or will not fully reduce the impact to less than significant levels; therefore, aside from the two areas listed above, impacts would remain significant and unavoidable (Refer to Revised Final EIR Part 3, pgs. 4.12-44 to 4.12-45).

e. Cumulative Short-Term Construction Noise

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to cumulative short-term construction noise levels in the project vicinity is cumulatively considerable.

Finding: Potential impacts of the Project related to short-term construction noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences within 500 feet of a construction area from significant noise levels, Project-related noise cumulative impacts during construction on existing rural residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As discussed in Section 6.12 of the Revised Final EIR Part 3, construction crew commutes and the transport of construction equipment, and materials to the WLCSP area would incrementally increase noise levels on access roads leading to the site. Secondary sources of noise would include noise generated during excavation, grading, and building erection on the Project site. The net increase

in Project site noise levels generated by these activities and other sources has been quantitatively estimated and compared to the applicable noise standards and thresholds of significance. Three cumulative projects are located at distances that could undergo construction activities during the Project's 16-year construction period: MV-5: P06-158/Gascon, MV-6: Highland Fairview Corporate Park, and MV-126: TTM 33222. Construction of the western portion of the Project would result in significant and unavoidable impacts. Should any of these three cumulative projects undergo construction while the western portion of the Project is under construction, cumulative construction noise impacts would occur, potentially exposing sensitive receptors to cumulative construction noise greater than that experienced from Project construction alone. Therefore, Project construction would result in cumulatively considerable and potentially significant cumulative noise impacts.

The three cumulative construction projects do not have CEQA documents in which construction noise has been analyzed. Therefore, assuming that construction of Related Projects would consist of similar construction activity and equipment as the project, receptors located nearest both the Project and each of the related projects could potentially be exposed to noise level increase of 10.1 dBA Leq and 44.4 dBA Leq (Revised Final EIR Part 3 pg. 6.12-25).

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a Noise Reduction Compliance Plan (NRCP), which is expected to attenuate construction noise levels by 10 dB and prohibit construction activities within 800 feet of residences during nighttime hours. As shown in Section 4.12, Table 4.12-8 and Table 4.12-9, even with implementation of Mitigation Measure 4.12.6.1A, sensitive receptors located near on-site and off-site construction areas would be exposed to construction noise levels that would exceed the existing ambient noise levels by more than the applicable 10 dB substantial temporary increase threshold. As shown in Table 6.12-3 (Revised Final EIR Part 3 pg. 6.12-26), with implementation of mitigation measures to Project construction noise levels, cumulative construction noise at sensitive receptors nearest Related Project MV-126 is expected to remain significant and unavoidable. Therefore, this would result in a significant and unavoidable cumulative impact with mitigation.

f. Cumulative Long-Term Traffic Noise Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to cumulative long-term traffic noise levels in the project vicinity is cumulatively considerable.

Finding: Potential cumulative impacts of the Project related to cumulative long-term traffic noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the City Council and set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that even with application of these mitigation measures, the Project will have significant cumulative impacts due to adverse effects to long-term traffic noise impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The noise analysis for the World Logistics Center project is based on the traffic volume data contained in the revised Traffic Impact Analysis (TIA) prepared for the Project (contained in its entirety as Revised Sections of the Final EIR Appendix D). Cumulative traffic volumes contained in the TIA were developed for the Future Year 2025 and Buildout 2040 analysis time horizons. Traffic volumes for each time horizon were developed utilizing a combination of various future traffic growth methods as follows. For Future Year 2025, traffic volumes were developed by interpolating year 2040 traffic volume projections from the Riverside County Transportation and Analysis Model (RivTAM) to year 2025 plus traffic from a list of past, present, and reasonably foreseeable projects (see Table 6.12B). For Buildout Year 2040, traffic volumes were developed by utilizing the year 2040 traffic volume projections from the RivTAM plus traffic from a list of past, present, and reasonably foreseeable projects.

Three hundred and thirty-nine (339) roadway links and eighty-nine (89) freeway segments were analyzed in the noise analysis. The change in noise level was calculated for all 428 roadway and freeway links with and without the World Logistics Center project for the existing case (2018), 2025, and 2040 buildout scenarios. Segments with noise increases less than 1.5 dB would not have a substantial noise increase and were not presented in the main body of the noise report (i.e., the tables). Similarly, any segments that do not have sensitive receptors (e.g., residential uses or schools) were also not presented in the main body of the noise report. Based on this filtering process, of the 428 segments analyzed, 21 segments have sensitive receptors and an increase of 1.5 dB for at least one buildout scenario and were therefore addressed in the analysis (Revised Final EIR Part 3, pgs. 6.12-26).

Cumulative noise impacts associated with roadway noise have been addressed based on the cumulative traffic volumes, analyzing the difference between future plus project traffic noise and existing without Project traffic noise to account for cumulative projects as well as ambient growth as a worst-case scenario. As identified in Table 6.12-4 (Revised Final EIR Part 3 pg. 6.12-27), implementation of the proposed WLC project would contribute to cumulative changes in traffic noise levels in Year 2025 (Phase I). The largest Project-related increase in traffic noise would be along Street D/Cactus Avenue Extension (Alessandro Avenue to Cactus Avenue) and along Street F (east of World Logistics Center Parkway), where increases of 63.9 dBA and 58.1 dBA, respectively, are predicted for the 2025 With Project Phase 1 scenario over the 2018 Existing Conditions scenario. However, the increases associated with these roadway segments is attributable to Street D/Cactus Avenue Extension and Street F being new roads that will be constructed by the Project through open space areas that are currently vacant and don't contribute to the overall ambient noise environment. A total of eleven road segments would result in a substantial noise increase attributable to the Project, resulting in a significant cumulative impact requiring mitigation.

Increases in noise levels associated with Buildout Year traffic conditions on area roadways range up to 68.3 dBA. As identified in the Table 6.12-5 (Revised Final EIR Part 3, pg. 6.12-28), the greatest increase in noise levels would be along Street D/Cactus Avenue Extension (Alessandro Boulevard to Cactus Avenue) and along Street F (east of World Logistics Center Parkway), where increases of 66.8 dBA and 68.3 dBA, respectively, are predicted for the Buildout Year With Project scenario over the Existing Conditions scenario. However, the increases associated with these roadway segments is attributable to Cactus Avenue Extension and Street F, being new roads that will be constructed by the Project through open space areas that are currently vacant and

don't contribute to the overall ambient noise environment. A total of twenty-one road and freeway segments would result in a substantial noise increase attributable to the Project, resulting in a significant impact requiring mitigation.

The Project calls for improvements to several of the roadways around the project area in order to accommodate the projected increase in Project traffic volumes. The presence of residential uses occurs within the Project and nearby area. These roadway segments are analyzed against the thresholds for determining significant impacts defined previously in Section 4.12.6.2 (Revised Final

EIR Part 3 pg. 4.12-36 to 4.12-45). As described previously in Section 4.12.4 (Revised Final EIR Part 3, pg. 4.12-15 to 4.12-16), the Project's incremental contribution to a cumulative noise increase would be considered cumulatively considerable and significant when ambient noise levels affect noise-sensitive land uses and when the Project increases noise levels by 1 dB or more over pre-Project conditions and the predicted future cumulative with Project noise levels cause the following cumulative increases:

- Increase noise levels by 5 dB or more where the existing noise level is less than 60 CNEL;
- Increase noise levels by 3 dB or more where the existing noise level is 60 to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the existing noise level is greater than 65 CNEL.

Cumulative noise impacts associated with roadway noise have been addressed based on the 2025 and 2040-time horizons analyses for the roadway segments identified for analysis in Section 4.12 of the Revised Final EIR Part 3. Table 6.12-4 (Revised Final EIR Part 3, pg. 6.12-27) and Table 6.12-5 (Revised Final EIR Part 3, pg. 6.12-28) show the Future Year 2025 and Buildout 2040, respectively, CNEL values with the Project and if a substantial increase would be produced based on the cumulatively significant significance criteria identified above. Traffic noise level increases from the existing baseline condition and the future (2025 and 2040) time horizons are attributable to the intermingled effects of both the cumulative (i.e., past, present, and reasonably foreseeable projects) development projects in the Project vicinity and region as well as the Project.

As discussed in Section 4.12.6.2 (Revised Final EIR Part 3, pg. 4.12-36 to 4.12-45), there are numerous instances in which there is no feasible means to reduce roadway noise impacts because of the existing developed nature of the affected roadway segment and/or the scattered nature of the sensitive receptors (i.e., residences), which prohibits the effectiveness of a soundwall. For those segments at which there is a cumulatively considerable impact and there is no feasible means to provide mitigation, the significant cumulative impact will remain significant and unavoidable (Revised Final EIR Part 3, pg. 6.12-29).

5. Transportation

a. Intersection and Roadway Level of Service (Outside the Jurisdiction of the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that even with mitigation measures, the Project will have significant impacts due to inability to control the mitigation, funding and timing for improvements located outside the City of Moreno Valley, and therefore are considered significant and unavoidable. Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: The Traffic Impact Analysis (TIA, Revised Final EIR Part 3, Appendix F) discusses Project-related impacts to the intersection and roadway level of service (LOS) under the following development scenarios:

- 5) Existing baseline conditions (2018) plus Phase 1 of the Project
- 6) Existing baseline conditions (2018) plus Buildout of the Project
- 7) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2025 plus Phase 1 of the Project
- 8) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2040 plus Buildout of the Project

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if an impact is potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. The study area also extended west to the nearest ramps to SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes extended from the Project site to the north, south, east, and west. The analysis covered SR-60 from I-10 in the east to SR-71 in the west, SR-91/I-215 from I-210 in the east to I-15 in the west, I-215 from Redlands Avenue in the north to the Scott interchange in the south, and I-10 from SR-62 in the east to SR-60 in the west. In addition, any freeway ramp where the Project added 100 or more peak-hour trips was also studied.

Intersection LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for the study area intersections are summarized in Table 26 of the Revised Final EIR Part 3, Appendix F (pg. 123), showing that 19 intersections would operate at unacceptable LOS. Table 27 (pg. 129)

shows there are 15 study intersections where Phase 1 of the Project would have a significant impact. Of those 15 study intersections, 12 are located outside of the jurisdiction of the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for the study area intersections are summarized in Table 35 of the Revised Final EIR Part 3, Appendix F (pg. 161), showing that 25 intersections would operate at unacceptable LOS. Table 36 (pg. 167) shows there are 17 study intersections where buildout of the Project would have a significant impact. Of those 17 study intersections, 12 are located outside of the jurisdiction of the City of Moreno Valley.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for the study area intersections are summarized in Table 49 of the Revised Final EIR Part 3, Appendix F (pg. 229), showing that 26 intersections would operate at unacceptable LOS. Table 50 (pg. 235) shows there are 13 study intersections where Phase 1 of the Project would have a significant impact. Of those 13 study intersections, 10 are located outside of the jurisdiction of the City of Moreno Valley.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 63 of the Revised Final EIR Part 3, Appendix F (pg. 300), showing that 72 intersections would operate at unacceptable LOS. Table 64 (pg. 306) shows there are 30 study intersections where buildout of the Project would have a significant impact. Of those 30 study intersections, 13 are located outside of the jurisdiction of the City of Moreno Valley.

Roadway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in Table 25 of the Revised Final EIR Part 3, Appendix F (pg. 104). Table 25 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, 2 are located outside of the jurisdiction of the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 34 of the Revised Final EIR Part 3, Appendix F (pg. 142). Table 34 shows that three roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all three roadway segments. Of those 3 segments, 2 are located outside of the jurisdiction of the City of Moreno Valley.

2025 Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in table 48 of the Revised Final EIR Part 3, Appendix F (pg. 210). Table 48 shows that all study segments would operate at acceptable LOS, and no Project impacts would occur.

2040 Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 62 of the Revised Final EIR Part 3, Appendix F (pg. 280). Table 62 shows that one roadway segment, located outside of the jurisdiction of the City of Moreno Valley, would operate at unacceptable LOS and that the Project would worsen conditions, resulting in a significant impact.

Freeway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway segments are summarized in Table 28 of the Revised Final EIR Part 3, Appendix F (pg. 130), showing that 33 freeway segments would operate at unacceptable LOS. Table 29 (pg. 135) shows there are 24 freeway segments where Phase 1 of the Project would have a significant impact.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for freeway segments are summarized in Table 37 of the Revised Final EIR Part 3, Appendix F (pg. 169), showing that 23 freeway segments would operate at unacceptable LOS. Table 38 (pg. 173) shows there are 24 freeway segments where buildout of the Project would have a significant impact.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway segments are summarized in Table 51 of the Revised Final EIR Part 3, Appendix F (pg. 237), showing that 40 freeway segments would operate at unacceptable LOS. Table 52 (pg. 241) shows there are 34 freeway segments where Phase 1 of the Project would have a significant impact.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for freeway segments are summarized in Table 65 of the Revised Final EIR Part 3, Appendix F (pg. 310), showing that 58 freeway segments would operate at unacceptable LOS. Table 66 (pg. 314) shows there are 42 freeway segments where buildout of the Project would have a significant impact.

Freeway Weaving LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway weaving sections are summarized in Table 30 of the Revised Final EIR Part 3, Appendix F (pg. 137), showing that 5 freeway weaving sections would operate at unacceptable LOS. Table 31 (pg. 139) shows that Phase 1 of the Project would have a significant impact at all 5 freeway weaving sections.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project buildout levels of service for freeway weaving sections are summarized in Table 39 of the Revised Final EIR Part 3, Appendix F (pg. 175), showing that 5 freeway weaving sections would operate at unacceptable LOS. Table 40 (pg. 177) shows that buildout of the Project would have a significant impact at all 5 freeway weaving sections.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway weaving sections are summarized in Table 54 of the Revised Final EIR Part 3, Appendix F (pg. 245), showing that 9 freeway weaving sections would operate at unacceptable LOS and that Phase 1 of the Project would have a significant impact at all 9 freeway weaving sections.

2040 Plus Project Buildout. Year 2040 plus Project buildout levels of service for freeway weaving sections are summarized in Table 68 of the Revised Final EIR Part 3, Appendix F (pg. 318), showing that 14 freeway weaving sections would operate at unacceptable LOS and that buildout of the Project would have a significant impact at all 14 freeway weaving sections.

Freeway Ramp LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway ramps are summarized in Table 33 of the Revised Final EIR Part 3, Appendix F (pg. 140), showing that 1 freeway ramp would operate at unacceptable LOS and that Phase 1 of the Project would have a significant impact at that freeway ramp.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project buildout levels of service for freeway ramps are summarized in Table 42 of the Revised Final EIR Part 3, Appendix F (pg. 279), showing that 1 freeway ramp would operate at unacceptable LOS and that buildout of the Project would have a significant impact at that freeway ramp.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway ramps are summarized in Table 47 of the Revised Final EIR Part 3, Appendix F (pg. 208), showing that 1 freeway ramp would operate at unacceptable LOS. Table 56 (pg. 247) shows that Phase 1 of the Project would have a significant impact at that freeway ramp.

2040 Plus Project Buildout. Year 2040 plus Project buildout levels of service for freeway ramps are summarized in Table 61 of the Revised Final EIR Part 3, Appendix F (pg. 278), showing that 3 freeway ramps would operate at unacceptable LOS. Table 70 (pg. 320) shows that buildout of the Project would have a significant impact at one of those freeway ramps.

Offsite Improvements to TUMF Facilities

As indicated in Section 4.15 of the Revised Final EIR Part 3, there are improvements and changes to the road system that are part of the TUMF Regional System of Highways and Arterials, some of which are under the jurisdiction of Moreno Valley and others of which are located in other jurisdictions. Mitigation Measure 4.15.7.4D requires the developer to pay TUMF fees applicable to a particular building prior to receiving a certificate of occupancy for the building. These payments shall constitute the developer's mitigation of Project impacts to this category of roads. Mitigation Measure 4.15.7.4G requires the City to work with the other member agencies of the Western Riverside Council of Governments, the agency overseeing the TUMF program, to program TUMF funds to implement the mitigation measures identified in the Revised Final EIR Part 3 (pg. 4.15-131) pertaining to TUMF facilities outside the jurisdiction of the City of Moreno Valley. To the extent that TUMF fees provided by the developer are used to implement the recommended improvements, the Project's impacts would be less-than-significant. However, because the City does not have direct control over TUMF funding, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's impacts on these facilities must be considered significant and unavoidable (Revised Final EIR, Part 3, pp. 4.15-132).

Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

At this time, the City does not have cooperative agreements with nearby jurisdictions that would serve as a fair share contribution program for collecting and distributing developer funds to cover the cost of cross jurisdictions mitigation measures, other than the TUMF program. The City will work with the Cities of Beaumont, Perris, Redlands and Riverside, and with Riverside County to collect fair share funds from the

developer and to implement the mitigations measures identified in the Revised Final EIR Part 3 (Tables. 4.15-40, 4.15-41 and 4.15-42) that are in these jurisdictions if fair share contribution programs have been established with the jurisdictions. To the extent that the City is able to establish such a program (as described in Mitigation Measures 4.15.7.4E and 4.15.7.4F) and the other jurisdiction constructs the recommended improvement, the Project’s impacts would be less-than-significant. However, because the City cannot guarantee that such a program will be established and does not have direct control over facilities outside of its jurisdiction, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project’s impacts on these facilities must be considered significant and unavoidable.

Similarly, the City has not entered into an agreement with Caltrans for the collection of developer fair share payments for improvements to the state highway system other than freeway interchange improvements funded through the TUMF program. Nor has Caltrans established a fair share contribution program to collect fair-share contributions to freeway improvements such as those identified in Revised Final EIR Part 3 Tables 4.15-40 and 4.15-41. Instead, Caltrans has traditionally relied on other means to fund freeway improvements; means involving multiple stages of review and input from other agencies, with priorities and constraints applied at each stage, that preclude a direct connection between developer-provided fair-share funds and specific highway improvements.

The key feature of this system pertaining to the recommended freeway mitigation measures is that this system is outside the control of the City of Moreno Valley. The City shall work with Caltrans to establish a fair share contribution program for collecting fair share funds from developers for use in funding needed freeway improvements. However, since at the present time no such program exists that would ensure that WLC funds contributed to Caltrans or any other state agency would be used to implement specific improvements that mitigate WLC impacts, and because there is no mechanism by which the City can construct or guarantee the construction of any improvements to the freeway system by itself, the Project’s impacts on the state highway system must be considered significant and unavoidable (Revised Final EIR Part 3, pp. 4.15-131 to 4.15-135).

b. Cumulative Transportation Impacts

Potential Significant Impact: Whether the Project could cause a cumulatively considerable increase in traffic on the intersection, street and freeway system outside the jurisdiction of the City of Moreno Valley that is substantial in relation to the without Project (i.e., No-Project) scenario.

Findings: Potential cumulative impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 6.15 and Appendix F of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the City Council is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Council finds that even with mitigation measures, the Project will have significant impacts due to inability to control the mitigation, funding and timing for improvements located outside the City of Moreno Valley, and therefore are considered significant and unavoidable. Those changes or alterations that are within the responsibility and jurisdiction of other public agencies and have been, or can and should be, adopted by those other agencies (Finding 2). Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR

and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: Section 6.15 of the Revised Final EIR Part 3 and the Traffic Impact Analysis (TIA) in Appendix F discuss cumulative impacts of the Project to the intersection level of service (LOS). The cumulative impacts of the Project were determined by comparing the LOS of the study facilities under the 2040 No-Project and 2040 Plus Project Build-out Scenarios.

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands.

Intersection LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 6.15-3 in the Revised Final EIR Part 3 and in Table 76 on page 343 within the TIA, showing that 26 intersections would have unacceptable LOS and resulting in significant cumulative impacts. Of the 26 intersections, 10 are located outside of the City of Moreno Valley.

Roadway Segment LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area roadway segments are summarized in Table 6.15-2 in the Revised Final EIR Part 3 and in Table 75 on page 341 within the TIA, showing that one roadway segment would have unacceptable LOS and result in significant cumulative impacts. The roadway segment is located outside of the City of Moreno Valley.

Freeway LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area freeway facilities (mainline and weaving facilities) are summarized on pages 6.15-38 and 6.15-41 through 6.15-44 in the Revised Final EIR Part 3 as well as Table 77 and pages 346 through 354 of the TIA located in Appendix F of the Revised Final EIR Part 3. The Project would result in significant cumulative impacts to 21 mainline facilities and 11 freeway weaving sections as shown in Table 77 of the TIA.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.G** requires the applicant to construct or fund all required mitigation for the Project's cumulative impacts for intersections and roadways within the City of Moreno Valley, and includes the payment of a Transportation Uniform Mitigation Fee (TUMF) as set forth in Moreno Valley Municipal Code Chapter 3.44 and paying a fair share contribution to jurisdictions that

have established such programs toward mitigating Project-related cumulative impacts in jurisdictions other than the City of Moreno Valley, as identified in Section 6.15 and Appendix F of the Revised Final EIR Part 3. With implementation of these mitigation measures, the Project's cumulative impacts on intersections located within the City of Moreno Valley could be reduced to less than significant. However, because the City cannot guarantee that such programs will be established and does not have direct control over the funding or construction of needed improvements outside of its jurisdiction, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's cumulative impacts on these facilities must be considered significant and unavoidable. A discussion of the two categories of improvements that would result in significant and unavoidable impacts is discussed below.

Offsite Improvements to TUMF Facilities

As indicated in Section 6.15 of the Revised Final EIR Part 3, there are improvements and changes to the road system that are part of the TUMF Regional System of Highways and Arterials, some of which are under the jurisdiction of Moreno Valley and others of which are located in other jurisdictions. Mitigation Measure 4.15.7.4D requires the developer to pay TUMF fees applicable to a particular building prior to receiving a certificate of occupancy for the building. These payments shall constitute the developer's mitigation of Project impacts to this category of roads. Mitigation Measure 4.15.7.4G requires the City to work with the other member agencies of the Western Riverside Council of Governments, the agency overseeing the TUMF program, to program TUMF funds to implement the mitigation measures identified in the Revised Final EIR Part 3 (pp. 6.15-39 to 6.15-40) pertaining to TUMF facilities outside the jurisdiction of the City of Moreno Valley. To the extent that TUMF fees provided by the developer are used to implement the recommended improvements, the Project's impacts would be less-than-significant. However, because the City does not have direct control over TUMF funding, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's cumulative impacts on these facilities must be considered significant and unavoidable (Revised Final EIR, Part 3, p. 6.15-41).

Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

At this time, the City does not have cooperative agreements with nearby jurisdictions that would serve as a fair share contribution program for collecting and distributing developer funds to cover the cost of cross jurisdictions mitigation measures, other than the TUMF program. The City will work with the Cities of Beaumont, Perris, Redlands and Riverside, and with Riverside County to collect fair share funds from the developer and to implement the signalization of the San Timoteo Road/Alessandro Road intersection and the San Timoteo Road and Live Oak Canyon intersection (respectively) if fair share contribution programs have been established with the jurisdictions. The City will work with the City of Riverside to collect a fair-share contribution from the developer to signalize the Martin Luther King Boulevard/I-215 northbound ramp intersection if fair share contribution program has been established with the City of Riverside. To the extent that the City is able to establish such programs (as described in Mitigation Measure 4.15.7.4F) and the other jurisdiction constructs the recommended improvement, the Project's impact would be less than significant. However, because the City cannot guarantee that such programs will be established and does not have direct control over facilities outside of its jurisdiction, the City cannot ensure that the identified improvements would

be made. Thus, at this point the Project's impacts on these facilities must be considered significant and unavoidable.

Similarly, the City has not entered into an agreement with Caltrans for the collection of developer fair share payments for improvements to the state highway system other than freeway interchange improvements funded through the TUMF program. Nor has Caltrans established a fair share contribution program to collect fair-share contributions to freeway improvements such as those identified in Table 77 of the TIA in the Revised Final EIR Part 3. Instead, Caltrans has traditionally relied on other means to fund freeway improvements; means involving multiple stages of review and input from other agencies, with priorities and constraints applied at each stage, that preclude a direct connection between developer-provided fair-share funds and specific highway improvements.

The key feature of this system pertaining to the recommended freeway mitigation measures is that this system is outside the control of the City of Moreno Valley. The City shall work with Caltrans to establish a fair share contribution program for collecting fair share funds from developers for use in funding needed freeway improvements. However, since at the present time no such program exists that would ensure that WLC funds contributed to Caltrans or any other state agency would be used to implement specific improvements that mitigate WLC impacts, and because there is no mechanism by which the City can construct or guarantee the construction of any improvements to the freeway system by itself, the Project's impacts on the state highway system must be considered significant and unavoidable (Revised Final EIR Part 3, pp. 4.15-41 to 4.15-43).

D. ADEQUACY OF THE RANGE OF PROJECT ALTERNATIVES

The Revised Final EIR Part 4 analyzed four alternatives to the Project as proposed, and also evaluated these alternatives for their ability to meet the Project's objectives as described in Section II.B above. CEQA requires the evaluation of a "No Project Alternative" to assess the maximum net change in the environment as a result of implementation of the Project. The No Project Alternative, referred to as the No Project/No Build, assumes no ground-disturbing activities would take place, nor would any form of structure or facility be erected. No Project/Existing General Plan Alternative, a Reduced Density Alternative, and two Mixed Use Alternatives were also selected for analysis. CEQA requires the evaluation of alternatives that can reduce the significance of identified impacts and "feasibly attain most of the basic objectives of the Project." Thus, in order to develop a range of reasonable alternatives, the Project Objectives must be considered when this Council is evaluating the alternatives.

1. No Project/No-Build Alternative

Description: Under the No-Build Alternative, no development would take place within the Project site. . No ground-disturbing activities would take place, nor would any form of structure or facility be erected. This alternative provides a baseline comparison to the Project. (Revised Final EIR Part 4, Volume 3, pg. 6-14 to 6-15).

Impacts: The No Project/No-Build Alternative, as referenced in Section 6.0 of the Revised Final EIR Part 4, Volume 3, would not result in any new physical environmental effects.

Objectives: Under the No Project/No Build Alternative, the Project site would not be developed and none of the twelve of the Project Objectives would be achieved.

Finding: Under the No-Build Alternative, no ground-disturbing activities would take place, nor would any form of structure or facility be erected. This Alternative would not result in the same significant and unavoidable impacts associated with agricultural resources, air quality, and traffic that have been identified within the Revised Final EIR Part 4, Volume 3 for the Project. In the absence of development, no impacts would occur, and this alternative would be the environmentally superior alternative. However, prohibiting development of the site, as suggested by this alternative, would not fulfill any of the primary objectives of the Project. Retention of the project site in its current condition would not create a logistics facility consisting of approximately 2,525 acres of warehouse uses and it would not expand employment opportunities within the City and surrounding area. This Alternative provides a baseline comparison to the Project. Because the No-Build Alternative does not meet any the Project objectives, the Council hereby rejects the No-Build Alternative.

2. No Project/Existing General Plan Alternative

Note: This alternative is moot, as the Project is now consistent with the City's General Plan and zoning, which reflects the site as World Logistics Center Specific Plan, in accordance with the City's November 2015 approvals and as remains in effect following the various court actions noted above.

3. Alternative 1 - Reduced Density Alternative

Description: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, the Reduced Density Alternative has been considered with the intent of avoiding or substantially reducing significant impacts, and in particular the significant impacts that cannot be reduced to a less than significant level through implementation of mitigation measures created by the Project's traffic, air quality, and noise impacts. This Alternative includes development of the project site with approximately 28 million square feet of logistics warehousing, a reduction of 12.6 million square feet, including 74.3 acres for open space. Under this alternative, the proposed logistics uses would represent a net decrease of approximately 31 percent as compared with the Project.

Because of the large area, approximately 2,535 acres, of the Project that is proposed for development, public facilities, or off-site improvements, a variety of reduced density alternatives could be considered that might substantially reduce or eliminate one or more of the significant and unavoidable impacts of the Project. For example, warehousing development on the site would have to be reduced to approximately one percent of the Project's 40,600,000 sq.ft, or 400,000 square feet, of the WLC Project's proposed logistics warehouse building area to eliminate significant and unavoidable impacts associated with air quality to less than applicable SCAQMD thresholds. The only way this could logically occur would be to develop a small portion of the site (i.e., less than one percent) and leave the rest of the site vacant. In addition, even this substantial reduction in the proposed logistics warehouse building area and/or developable area would not eliminate the Project's other significant and unavoidable impacts associated with aesthetics, air quality, noise, and transportation. Any of the viable alternatives that are examined in the Revised Final EIR would entail some

type of development on all or most of the Project site, rather than development of an illogically small portion of the site (i.e., one percent). (Revised Final EIR Part 4, Volume 3, pg. 6-23 to 6-24).

Impacts: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, the Reduced Density Alternative would result in similar impacts for the following nine environmental issues: Aesthetics; Agriculture and Forestry Resources; Biological Resources; Cultural Resources; Geology and Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Mineral Resources; Recreation. Under the Reduced Density Alternative, development of the same logistics land uses, building heights and mass, but at a floor area level approximately 70 percent of the Project, would be constructed resulting in significant and unavoidable impacts associated with scenic vistas, local scenic roads, character of the site and surroundings, and on a cumulatively considerable basis in the same exact manner as the Project. Impacts related to short-term construction-related air quality would be the same as the Project, because the same amount of land would be disturbed and the same mix of equipment would be utilized. The Reduced Density Alternative would result in significant and unavoidable air quality impacts from CO, VOC, NO_x, and PM₁₀ emissions during project construction, in the same exact manner as the Project. Long-term operational-related air quality impacts would be incrementally reduced when compared to the Project, but the emissions cannot be mitigated to below SCAQMD thresholds and would remain significant and unavoidable. Similarly, impacts related to short-term construction-related noise cannot be mitigated to a less than significant level and would be significant and unavoidable. Although traffic-related noise would be reduced when compared to the Project, impacts would have a similar effect on local roadway segments and would remain significant and unavoidable as there are no feasible mitigation measures that would be able to reduce impacts to a less than significant level. Under this alternative, the volume of water required and the amount of wastewater and solid waste generated would be reduced in comparison to the Project and the decrease in the amount of logistics uses would result in a reduction of permanent jobs that would be created. Consequently, this Alternative would have incrementally reduced demand on public services, recreation, and water use. Similar to the Project, increased property tax revenues, the payment of fees, and adherence to City development and utility requirements would reduce these impacts to less than significant levels.

Because of the decrease in vehicle trips achieved under this alternative, impacts to the operation of local roadways and intersections would be proportionally reduced from those identified for the Project. However, under this Alternative, the future increases in traffic volumes would have a similar effect on freeways and interchanges, resulting in significant impacts similar to those identified for the Project. Since the City does not have control over when freeway improvements would occur, traffic impacts to freeways and interchanges would remain significant and unavoidable for impacts associated with freeway segments.

In summary, the Reduced Density Alternative would incrementally reduce almost all of the Project impacts by reducing the total square footage of development. However, all of the impacts identified as significant and unavoidable under the Project, including aesthetics, air quality, greenhouse gas emissions, noise, and traffic would still be significant and unavoidable under this alternative. (Revised Final EIR Part 4, Volume 3, pg. 6-24 to 6-29).

Objectives: Under this Alternative, some of the Project objectives are met, but not nearly to the same degree as the Project which includes creating substantial employment opportunities for the City's citizens; providing

the land use designations and infrastructure plans necessary to meet current market demands and to support the City's Economic Development Action Plan; creating a major logistics center with good regional and freeway access; providing a major logistics center to accommodate to some degree the ever- expanding volumes at the Ports of Los Angeles and Long Beach; creating a project that will provide a balanced approach to the City's fiscal viability, economic expansion, and environmental integrity; providing the infrastructure improvements required to meet project needs in an efficient and cost-effective manner; encouraging new development consistent with regional and municipal service capabilities; creating employment opportunities within the City to improve the City's jobs/housing balance and help reduce systemic unemployment within the City; providing thousands of construction job opportunities during the Project's buildout phase to improve the jobs/housing balance and help reduce systemic unemployment; and providing appropriate transitions or setbacks between on-site and off-site uses. (Revised Final EIR Part 4, Volume 3, Table 6.M: Comparison of Reduced Density Alternative to the Project Objectives, pg. 6-29).

Findings: Under the Reduced Density Alternative, development of the Project site with approximately 28 million square feet of logistics warehousing, including 74.3 acres for open space, would occur. This Alternative would have similar impacts that have been identified within the Revised Final EIR Part 4, Volume 3. However, the Reduced Density Alternative would result in a decrease in trip generation in comparison to the Project and would result in a decrease in the severity of the significant and unavoidable impacts to construction and operational air pollution emissions, and traffic. The Council finds that the Reduced Density Alternative would fulfill three of the 12 Project Objectives by establishing design standards and development guidelines to ensure a consistent and attractive appearance throughout the entire project; establishing a master plan for the entire project area to ensure that the Project is efficient and business-friendly, accommodating the next-generation of logistics buildings; and providing appropriate transitions or setbacks between on-site and off-site uses. Moreno Valley residents would also have more opportunities for employment. Because the Reduced Density Alternative will not fulfill nine of the twelve objectives of the Project and the severity of significant and unavoidable impacts would be not be reduced, this Council hereby rejects the Reduced Density Alternative.

4. Alternative 2 - Mixed Use A

Description: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, with the intent of avoiding or substantially reducing significant impacts created by the Project's traffic, air quality, and noise impacts, the City considered Mixed Use A Alternative. This alternative includes development of the Project site with approximately 1,410 acres of logistics warehousing (22 million square feet), 1,000 acres of light industrial uses (2,120 million square feet), 50 acres of retail commercial uses (500,000 square feet), 100 acres of professional or medical office uses (1.0 million square feet), and 150 acres of open space. (Revised Final EIR Part 4, Volume 3, pg. 6-29 to 6-30).

Impacts: Section 6.0 of the Revised Final EIR Part 4, Volume 3, identifies nine environmental issues that would have similar impacts as the Project. These issues are: Aesthetics, Agricultural and Forestry Resources, Cultural Resources, Biological Resources, Geology and Soils, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, and Recreation. Under this alternative, impacts related to short-term construction-related air quality and noise impacts would remain significant and unavoidable, similar to the Project. Long-term air quality operational impacts under this alternative would be increased in magnitude,

remain significant and unavoidable, and would result in similar conditions as identified for the Project. The Mixed Use A Alternative would decrease the amount of logistics warehousing and would add light industrial, commercial, and office uses that would generate more permanent and more varied jobs than the Project, but some uses may require skilled workers and it is not known if or to what degree these workers already reside in the City. In addition, the developer will be supporting a local employment center to help City residents find positions within the WLC before the positions are advertised on a regional basis. The office uses proposed under this alternative may incrementally increase the total number of people that would be added to the City’s population and could have greater demands on public services and recreation. However, the increased property tax revenues, payment of fees, and dedication of parkland would reduce these impacts to a less than significant level. This alternative would increase the amount of wastewater generated, increase the amount of potable water required, and increase the amount of solid waste produced on-site. Similar to the Project, adherence to utility requirements would reduce these impacts to less than significant levels. Because of the increase in vehicle trips resulting from this alternative, impacts to noise and air quality would be proportionally increased from the Project and remain significant and unavoidable.

Long-term traffic impacts would remain significant and unavoidable for impacts associated with freeway segments as the City does not have control of when such freeway improvements would occur. Similarly, traffic- related noise would be increased in magnitude and cannot be mitigated to a less than significant level in a manner similar to the Project.

In summary, the Mixed Use A Alternative would increase employment opportunities but would substantially increase traffic, noise, and air quality impacts. All the impacts identified as significant under the Project, including air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-29 through 6-34).

Objectives: Under this alternative, nearly all of the Project objectives are met, with the exception of the following: creating a major logistics center with good regional and freeway access; providing a major logistics center to accommodate to some degree the ever-expanding volumes at the Ports of Los Angeles and Long Beach; creating a project that will provide a balanced approach to the City’s fiscal viability, economic expansion, and environmental integrity; and providing the infrastructure improvements required to meet Project needs in an efficient and cost-effective manner; and encouraging new development consistent with regional and municipal service capabilities. (Revised Final EIR Part 4, Volume 3, Table 6.O: Comparison of the Mixed Use A Alternative to the Project Objectives, pg. 6-34).

Finding: Under the Mixed Use A Alternative, the Project site would be developed with approximately 1,410 acres of logistics warehousing (22 million square feet), 1,000 acres of light industrial uses (2,120 million square feet), 50 acres of retail commercial uses (500,000 square feet), 100 acres of professional or medical office uses (1.0 million square feet), and 150 acres of open space. The Mixed Use A Alternative would increase employment opportunities but would substantially increase traffic, noise, and air quality impacts. All the impacts identified as significant under the Project, including air quality health risks, would still be significant under this alternative.

Most of the objectives of the Project would be met; however, the Mixed Use A Alternative would not meet the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system. This Council finds that the Mixed Use A Alternative would have similar impacts to all environmental issues. Because the Mixed Use A Alternative will not substantially reduce the environmental impact of the Project and it would not meet the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system, this Council hereby rejects the Mixed Use A Alternative.

Finally, because the WLC Specific Plan, which was adopted through the initiative process, does not allow commercial or professional uses without a vote of the electorate, the alternative is not legally available.

5. Alternative 3 - Mixed Use B

Description: As identified in Section 6.0 of the FEIR, Volume 3, the Mixed Use B Alternative would develop the project site similar to the land use plan of the Moreno Highlands Specific Plan (MHSP) but with 10 million square feet of logistics warehousing on the 603 acres proposed for business, retail, institutional, and other uses under the MHSP. (Revised Final EIR Part 4 Volume 3, pg. 6-34 to 6-35).

Impacts: Section 6.0 of the Revised Final EIR Part 4, Volume 3, Under Alternative 3, impacts related to short-term construction-related air quality would be similar to the Project as the same amount of land would be disturbed, and the same mix of equipment would be utilized. Long-term operational-related air pollutant emissions would be higher than the Project and would remain significant and unavoidable, with the exception of PM_{2.5} and SO_x. Like the Project, long-term air quality relative to criteria pollutants would still be significant, with the exception of SO_x. Assuming the same level of mitigation as the proposed Project, there would be no cancer risks associated with this alternative since the use of new technology diesel engines do not contribute to cancer risk as described in Revised Final EIR Volume 3 Section 4.3. The development of the Mixed Use B Alternative would have increased demands on public services and recreation facilities to serve future residential uses. However, increased property tax revenues, payment of development impact fees, and adherence to development requirements would reduce these impacts to a less than significant level. Water supply availability is expected to be available as water demand is expected to be the same. Water demand was determined to be available for the Project. There would be an increase in vehicle trips under this alternative, resulting in greater noise and air quality impacts compared to that identified for the Project; therefore, long-term traffic impacts would remain significant and unavoidable. Development of the Mixed-Use B Alternative would provide new employment opportunities and homes for residents of Moreno Valley, but new employment opportunities would be significantly reduced compared to the Project.

In summary, the Mixed-Use B Alternative would incrementally increase traffic and not improve the City's jobs/housing balance over the long-term. However, this is the only alternative that would reduce a significant impact of the Project (aesthetics – views) by substantially reducing the amount of warehousing on the site and replacing it with residential uses. Views of the area would still transition from vacant agricultural land to suburban development, but it would have a residential appearance compared to the Project. All the other

impacts identified as significant under the Project, including likely air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-34 through 6-38).

Objectives: Under this alternative, some of the Project objectives are met, with the exception of the following: providing the land use designation and infrastructure plans necessary to meet current market demands and to support the City’s Economic Development Action Plan; creating a major logistics with good regional and freeway access; establishing a master plan for the entire project area to ensure that the project is efficient and business-friendly, accommodating the next-generation of logistics buildings; providing a major logistics center to accommodate to some degree the ever-expanding trade volumes at the Ports of Los Angeles and Long Beach; creating a project that will provide a balanced approach to the City’s fiscal viability, economic expansion, and environmental integrity; providing the infrastructure improvements required to meet Project needs in an efficient and cost-effective manner; encouraging new development consistent with regional and municipal service capabilities; and providing thousands of construction job opportunities during the Project’s buildout. (Revised Final EIR Part 4, Volume 3, Table 6.Q: Comparison of the Mixed-Use B Alternative to the Project Objectives, pg. 6-38).

Finding: Under the Mixed Use B Alternative, development of the Project site similar to the land use plan of the Moreno Highlands Specific Plan (MHSP) but with 10 million square feet of logistics warehousing on the 603 acres proposed for business, retail, institutional, and other uses under the MHSP. The Mixed-Use B Alternative would incrementally increase traffic and not improve the City’s jobs/housing balance over the long-term. However, this is the only alternative that would reduce a significant impact of the Project (aesthetics – views) by substantially reducing the amount of warehousing on the site and replacing it with residential uses. Views of the area would still transition from vacant agricultural land to suburban development, but it would have a residential appearance compared to the Project. All the other impacts identified as significant under the Project, including likely air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-37).

Some of the objectives of the Project would be met; however, the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system would not be met. This Council finds that the Mixed-Use B Alternative would have similar impacts to all environmental issues except for aesthetic because this Alternative would eliminate the significant and unavoidable impacts to aesthetics. Because the Mixed Use B Alternative will not substantially reduce the environmental impact of the Project and it would not meet the Project objectives of locating major distribution services near transportation corridors and clustering such uses near the state highway system, provide land use designations and infrastructure plans necessary to meet current market demands and to support the City’s Economic Development Action Plan, and create a project that will provide a balanced approach to the City’s fiscal viability, economic expansion, and environmental integrity this Council hereby rejects the Mixed Use B Alternative.

Finally, because the WLC Specific Plan, which was adopted through the initiative process, does not allow commercial or residential uses without a vote of the electorate, the alternative is not legally available.

6. Alternatives Considered and Rejected

A variety of additional alternatives were considered as part of the Revised Final EIR Part 4, Volume 3's Alternatives Analysis. (Revised Final EIR Part 4, Volume 3, pgs. 6-3 through 6-5) Two possible alternatives were considered and rejected because they could not accomplish the basic objectives of the Project or they were considered infeasible. Per the *CEQA Guidelines* (Section 15126.6(c)), factors that may be considered when addressing the feasibility of alternatives include failure to meet most of the stated Project objectives, infeasibility, or inability to avoid significant environmental effects. The purpose of the Project is to provide for and expand employment and revenue opportunities within the City of Moreno Valley. The Project would expand employment options in a location that is convenient to existing transportation corridors, convenient to existing and future City residents and would augment the City's economic base. The following provides a discussion of the three development scenarios that were considered and rejected as potential alternatives to implementation of the Project based on Section 15126.6 of the *CEQA Guidelines* because they did not feasibly attain most of the basic objectives of the Project while reducing or avoiding any of the significant effects of the Project:

- **All Residential Alternative:** A number of residential uses, including very low density (2-acre or 5-acre lots) were considered prior to deciding on all warehousing uses, but it was concluded that any residential alternatives, or alternatives that emphasized residential uses, would further exacerbate the City's jobs/housing imbalance and did not meet any of the Project goals. In addition, the City's Economic Strategy Plan excludes additional residential development in this area. For these reasons, all Residential Use Alternatives were rejected for further analysis. However, an evaluation of the largely residential Moreno Highlands Specific Plan (MHSP) was provided under the No Project/Existing General Plan alternative. (Revised Final EIR Part 4, Volume 3, pg. 6-4).
- **Mixed Use Alternative:** The EIR examines two Mixed Use Alternatives with varying amounts of residential and non-residential uses. The No Project-Existing General Plan Alternative is based on the approved mixed-use Moreno Highlands Specific Plan (MHSP). In addition, Alternative 3 (Mixed Use B) evaluates the impacts of substituting logistics warehouse uses for the non-residential uses currently included in the MHSP. After extensive evaluation, it was concluded that any reasonable combination of residential and non-residential uses (i.e., light industrial, business park, office, commercial) would result in impacts similar to those of the MHSP, Alternative 2 (mixed non-residential uses but no residential uses), or Alternative 3 (Moreno Highlands Specific Plan with logistics warehousing as the main non-residential use). For this reason, no other Mixed Use Alternatives were considered further in this analysis. (Revised Final EIR Part 4, Volume 3, pg. 6-4).
- **Alternative Sites.** Section 6.0 of the Revised Final EIR Part 4, Volume 3 examines different sites in the surrounding region to determine if an alternative location would reduce or eliminate one or more significant impacts of the Project. This analysis must be based on feasible sites that could realistically support the Project (i.e., a contiguous 2,610-acre site for 40.6 million square feet of high-cube and light logistics warehouse uses as envisioned by the WLC Specific Plan). The surrounding jurisdictions, including Cities of Riverside, Perris, San Jacinto, Menifee, Calimesa, Banning, and Beaumont and the County of Riverside, along with Moreno Valley were contacted

to identify potential alternative sites for the Project. Revised Final EIR Part 4, Volume 3, Figure 6.1 pg. 44 shows the locations of the various jurisdictions that were contacted and/or analyzed in this evaluation and Revised Final EIR Part 4, Volume 3, Table 6.R pg. 45 presents the results of that analysis. Table 6.R indicates that there are no feasible alternative sites in the surrounding or nearby jurisdictions that could support the Project (i.e., that have enough vacant land zoned or available for logistics warehousing with good freeway and/or rail access). For these reasons, Alternative Sites were not considered further in this analysis. (Revised Final EIR Part 4, Volume 3, pgs. 6-38 through 6-41).

7. Environmentally Superior Alternative

As identified in the Revised Final EIR Part 4, Volume 3, the No Project/Existing General Plan Alternative has mixed impacts relative to the Project; it reduces aesthetic impacts to less than significant levels but worsens the jobs/housing ratio by introducing more housing than employment-generating uses. The Mixed Use A Alternative substantially increases traffic and related impacts compared to the Project impacts, but it does not create any additional significant impacts. The Mixed Use B Alternative would incrementally increase traffic and would not improve the jobs/housing balance. It would incrementally reduce health risks to existing residents along Redlands Boulevard (i.e., approximately 30 percent less warehousing), but could create health risks for new residents depending on the ultimate location of warehouses and new residences. In addition, this alternative would also worsen the jobs/housing ratio of the City by allowing the construction of many more homes than job-creating land uses. Regarding air quality impacts, development of any land uses would likely exceed SCAQMD thresholds mainly due to the size of the Project site. (Revised Final EIR Part 4, Volume 3, pg. 6-45 to 6-47).

The *CEQA Guidelines* (Section 15126.6 (e[2])) requires that an environmentally superior alternative be identified in the EIR. Based on the analysis in Revised Final EIR Part 4 Section 6 and the summary contained in Revised Final EIR Part 4 Table 6.S, Alternative 1 – Reduced Density – is the only alternative that reduces traffic, air quality, and related impacts by reducing the total square footage of warehousing by approximately 30 percent. Alternative 3—Mixed Use B—is the only alternative that would reduce a significant impact of the proposed project (i.e., aesthetics – views). However, it could create health risks for future residents of the Project and would worsen the jobs/housing balance of the City over the long term. For these reasons, the Revised Final EIR Part 4 concluded that Alternative 1 – Reduced Density — was environmentally superior to the proposed project.

Revised Final EIR Part 4 Table 6.T compared Alternative 1 to the project objectives and determined Alternative 1 does not meet 9 of the 12 major goals of the proposed project mainly because reducing the total square footage by 30 percent also reduces the amount of new employment and property tax revenues. Therefore, Alternative 1 - Reduced Density, was rejected in favor of the proposed project.

E. GROWTH-INDUCING IMPACTS

CEQA requires a discussion of ways in which the Project could be growth-inducing. Specifically, CEQA Guidelines Section 1512602(d) states that an EIR must describe the ways in which the Project could foster

economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

The Project area is largely vacant undeveloped land, although there are six existing single-family homes in various locations on the WLC Project site along with associated ranch/farm buildings. The site has been farmed since the early 1900s and has supported dry (non-irrigated) farming, livestock grazing, and limited citrus groves. Much of the site continues to be used for dry farming.

The City's population has grown steadily over the past decades. Population projections developed by SCAG estimate the City's population will reach approximately 213,700 persons by the year 2020 and approximately 255,200 persons by the year 2035. The extent to which the new jobs created by a Project are filled by existing residents is a factor that tends to reduce the growth-inducing effect of a Project. Construction of the WLC Project will create short-term construction jobs. These short-term positions are anticipated to be filled by workers who, for the most part, reside in the Project area; therefore, construction of the WLC Project will not generate a permanent increase in population within the Project area. Development envisioned under the Specific Plan consists of approximately 40.6 million square feet of logistics warehouse and general warehouse facilities.

Development of the high-cube logistics warehouse and general warehouse facilities will create jobs in the local economy. It is estimated that the WLC Project would result in approximately 25,000 new on-site job opportunities in addition to 7,583 indirect jobs of which 3,792 are projected to be within the City as a result of Project implementation (Revised Final EIR Part 1, Response 1-G-170-4).

The new employment opportunities resulting from development of the proposed high-cube logistics warehouse and general warehouse uses will raise the City's current jobs-to-housing ratio by providing additional jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, due to the City's projected jobs/housing ratio, it is reasonable to assume that a large percentage of these jobs would be filled by persons already living within the City or Project area. The Project does not include a residential component. The WLC Project is located within an area that is currently largely vacant and previously planned for a mix of residential, commercial, business park, and open space land uses in accordance with the General Plan Community Development Element. The WLC Project is consistent with the City's General Plan and zoning, which allows a mix of land use designations including Logistics Development and Light Logistics. Therefore, no significant increase in population of the City would result from the development or operation of the WLC Project.

The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (Revised Final EIR Part 4 Appendix O "Study," DTA 2014) estimates that approximately 7,386 indirect/induced jobs will be created in the County, of which 3,693 jobs are projected to be within the City as a result of Project implementation (updated as approximately 25,000 new on-site job opportunities in addition to 7,583 indirect jobs of which 3,792 are projected to be within the City as a result of Project implementation, as noted in Revised Final EIR Part 1, Response 1-G-170-4). While the specific location of the potential additional indirect/induced jobs created within the County cannot be specifically determined, it is reasonable to assume that a large percentage of these jobs will support service jobs and are likely to be located in the WLC Project

vicinity, and therefore the City. As detailed in the Study, total recurring revenues available to the City are estimated at approximately \$11,257,466 per year. The greatest percentage of revenue is attributed to the Property Tax In-Lieu of Vehicle License Fee (40.2%), followed by Secured Property Tax (29.1%), and Business Receipts Tax and Licenses (10.8%). Total recurring costs to the City are estimated at approximately \$5,557,674 per year. The greatest percentage of cost is attributed to the Police Services (35.8%), followed by Infrastructure and Parks Maintenance Costs (34.1%), and Fire Services (13.3%).

Project recurring annual fiscal surplus that would be available to the City is estimated at approximately 7 million dollars which is twice the Project annual City General Fund costs.

The Project would add 40.6 million square feet of logistics facilities and associated infrastructure in the eastern portion of the City. Since the City currently has a jobs-to-housing ratio substantially lower than the region (i.e., SCAG region), it is likely that much of the employment that would be generated by this Project can be accommodated by the existing workforce in the City and surrounding area. In that way, the Project is growth-inducing in terms of employment. Due to relatively high vacancy rates in the City, it is also likely that the housing needs of new employees that do not already live in the City (i.e., own or rent) could largely be accommodated by the City's existing housing stock. Therefore, the WLC Project would only produce modest (i.e., not significant) growth inducement within Moreno Valley.

As previously noted, the specific location of the additional indirect jobs created within the County cannot be specifically determined; however, it is likely that a large percentage of these jobs will be support service jobs and are likely to be located in the Project vicinity. The Study assumes that one-half of these indirect jobs will be located within the City. The Study indicates that the creation of new jobs to the City will lead to more consumer spending by employees in existing retail establishments within the City, as well as new retail development that will be attracted to the City as a result of this spending. Job creation also results in increased tax revenues to the City through increased property taxes and sales taxes associated with development of the WLC Project. However, it is important to note that because of the difference in timing of the development of the various phases of the WLC Project, the number of employees summarized above will not be realized at the same time.

Development of the WLC Project is projected to create approximately 16,521 construction-related jobs within the City. Similar to recurring employment (i.e., permanent), it is likely that a large percentage of these jobs will be located in the general vicinity of the WLC Project and therefore within the City.

The WLC Project does not include a residential component; therefore, the jobs generated by the WLC Project would not need to support new households as a result of direct employment or indirect employment. Based on the potential increase in jobs (additional 25,000 direct jobs) within the City and no substantial increase in population as a result of the project, the City's jobs-to-housing ratio would improve from the (2011) ratio of 0.47 to 0.91, thus achieving a greater jobs-to-housing balance within the City. As development of the WLC Project is expected to occur over the course of many years, the jobs-to-housing ratio will not be significantly changed immediately. The City's current jobs-to-housing ratio is exceptionally low when compared to SCAG standards; therefore, the need for employment is immediate. A balance between jobs and housing within the City would have a positive impact by decreasing costs associated with commuting, traffic congestion, air

pollution, and improves the standard of living. It also provides savings and a better quality of life to consumers in operation and maintenance of automobiles, lessening commute times and saving to local public agencies in terms of the need to construct and maintain new road improvements.

Streets, water and sewer utilities, and municipal services would be extended to serve the WLC Project. The WLC Project will benefit other development projects in the Project area, and therefore, could potentially induce additional business and job growth by removing an impediment to growth, such as a lack of basic infrastructure or services. However, the WLC Project is located proximate to other existing warehouse, commercial, and residential uses. Therefore, the Project will necessitate extension of major infrastructure; however, the Project will not result in substantial population growth that has not already been planned for in the City's General Plan. As discussed in the Statement of Overriding Considerations in Section VI, the Project is consistent with the General Plan and would further the overall goals of the General Plan, and because the improvements necessary for development of the site would not facilitate growth that has not been anticipated in the project area, no significant growth-inducing effect would occur, and no mitigation is required. (Section 5.0 of the Revised Final EIR Part 4, Volume 3, pgs. 5-4 through 5-6)

F. SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126(c) of the CEQA Guidelines mandates that an EIR must address any significant irreversible environmental changes which would be involved in the proposed action should it be implemented. An impact would fall into this category if it resulted in any of the following:

- A. The Project would involve a large commitment of non-renewable resources;
- B. The primary and secondary impacts of the Project would generally commit future generations of people to similar uses;
- C. The Project involves uses in which irreversible damage could result from any potential environmental incidents associated with the Project; and/or
- D. The Project will consume large amounts of energy that are produced from non-renewable fossil fuels, although the WLC Specific Plan indicates the proposed uses will efficiently consume energy and water resources.

Determining whether the WLC Project may result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed in such a way that there would be little possibility of restoring them. Because no significant mineral resources were identified within the Project site, no significant impacts related to this issue would result from development of the Project. Natural resources in the form of construction materials would be utilized in the construction of the WLC Project and energy resources in the form of electricity and natural gas would be used during the long-term operation of the Project; however, their use is not expected to result in a negative impact related to the availability of these resources. Existing scenic vistas were identified as being visible from outside the Project limits. Implementation of the WLC Project would result in the obstruction of views of the Badlands, Mt. Russell and Mystic Lake/San Jacinto Wildlife Preserve from the nearest sensitive visual receptors and those traveling along roadways in the Project vicinity. This is a significant and irreversible environmental change that would occur as a result of Project

implementation. Cumulatively, future development along SR-60 would also result in the obstruction of the existing views of surrounding mountains and visual features.

In addition, this logistics warehouse project, in concert with the other built or approved industrial warehouse projects to the north and west, will fundamentally change the character and land use pattern of this portion of the City. Many of the Project-specific impacts are addressed, as outlined above, but the land use change represented by this and other industrial projects represents a substantial irreversible change in community character for this area. (Revised Final EIR Part 4, Volume 3 pgs. 5-4).

VI. STATEMENT OF OVERRIDING CONSIDERATIONS

Pursuant to Section 15093 of the CEQA Guidelines, this Council must balance the benefits of the proposed Project against unavoidable environmental risks in determining whether to approve the proposed Parcel Map and the proposed Development Agreement, and CEQA Guidelines Section 15093(b) provides that when a public agency approves a project that will result in significant impacts that are identified in the Final EIR but are not avoided or substantially lessened, the agency must state in writing the specific reasons to support its decision based on the Final EIR and/or other information in the whole administrative record. If the specific economic, legal, social, technological or other benefits of a proposed project outweigh its unavoidable adverse environmental impacts, the adverse effects may be considered “acceptable.”

As set forth in sections V.A and V.B above, many of the World Logistics Center’s impacts on the environment will either be insignificant or, through the imposition of mitigation measures as conditions of approval of the Project, can be reduced to less than significant.

Some impacts of the World Logistics Center will remain significant and unavoidable even after the imposition of all feasible mitigation measures which include impacts to aesthetics, air quality, land use, noise, transportation and circulation. There are no feasible alternatives to the Project which would mitigate or avoid those environmental impacts as indicated in Section V.D above.

In consideration of the above and as set forth below, this Council has determined that the benefits which will accrue from the development of the Project outweigh the significant and unavoidable impacts which the Project will produce.

Finding: Notwithstanding the significant unavoidable impacts to aesthetics (individually and cumulative), air quality (individually and cumulative), land use and planning, noise, and transportation discussed in subsection V.C above, the development of otherwise underused land, the creation of jobs by the Project, both during construction and after the Project is in operation, the multiplier effect which will create secondary jobs to support the Project and those who work in it, the substantial economic benefits which will be generated, directly and indirectly, by the Project, the reduction in commute times and the reduction of trips on the County’s highways during peak morning and evening hours in the peak travel direction, the reduction of water consumption over previously planned uses, the achievement of the City’s goal of attracting new business opportunities, the improvement of the City’s jobs/housing balance and the generation of revenues which will go into the City’s general fund constitute benefits which outweigh the unavoidable adverse environmental impacts to aesthetics, air quality, land use, noise and transportation and circulation. Each of the benefits, individually, constitutes a sufficient basis for approving the Project notwithstanding the significant and unavoidable impact on aesthetics, air quality, land use, noise and transportation and circulation which will result.

Factual Basis for the Finding:

Approval of the Project Will Create Jobs and Increase Economic Activity. At full build-out, the Project is estimated to generate over 25,000 ongoing direct jobs in the City. An economic study of the Project

concluded that the proposed WLC project could generate approximately 25,000 new on-site jobs within the City (Revised Final EIR Part 1, Response 1-G-170-4). In addition to the projected on-site job creation, the study estimates the proposed WLC Project could generate new off-site jobs (i.e., indirect/induced employment) in all industries of the economy. The study also estimated that an additional 7,583 indirect/induced jobs could be created in the County, of which 3,792 jobs were projected to be within the City as a result of project implementation. In constant 2012 dollars, these jobs will result in estimated annual wages of approximately \$830,000,000 for direct jobs and approximately \$300,000,000 in wages resulting from indirect and induced jobs. Of the estimated \$300,000,000 indirect and induced jobs approximately \$150,000,000 in wages will occur within the City. (Revised Final EIR Part 4 Appendix O, Table 4B.). This translates into an overall annual estimated economic output of approximately \$2,370,000,000, approximately \$1,940,000,000 of which will occur within the City (Revised Final EIR Part 4 Appendix O, Table 4C.). The Project also is estimated to generate in aggregate, almost 13,000 direct construction jobs over the 15-year build-out period, equivalent to approximately 850 full-time equivalent jobs every year for the duration of the 15-year construction period. These jobs will result in estimated wages, in constant 2012 dollars, of approximately \$625,000,000. (Revised Final EIR Part 4 Appendix O, Table 4D.) Added to this will be approximately 7,400 estimated indirect and induced jobs, with approximately 3,700 of them within the City, with wages, in constant 2012 dollars, of approximately \$300,000,000 half of which, approximately \$150,000,000 will be for jobs within the City. (Revised Final EIR Part 4 Appendix O, Table 4D.) Construction is estimated to result in approximately \$2,600,000,000 in total economic output, which includes in wages and sales income of which approximately \$2,140,000,000 will occur within the City. (Revised Final EIR Part 4 Appendix O, Table 4D.)

Furthermore, with the recent dramatic economic impact of the COVID-19 restrictions and associated substantial job loss, unemployment claims and direct impact to local businesses, the Project provides extraordinary economic value in construction jobs, City revenues, infrastructure improvements and permanent jobs at a time when such economic considerations are critical to a City's immediate and long-term success.

Approval of the Project Will Increase the City's Tax Revenues and Generate a Substantial Annual tax Surplus. At full build-out, the Project is estimated to generate approximately \$11,300,000 in annual revenues (in constant 2012 dollars) for the City (Revised Final EIR Part 4 Appendix O, Table 3A) with approximately \$5,500,000 in costs (Revised Final EIR Part 4 Appendix O, Table 3B) resulting in an estimated annual surplus of almost \$5,700,000 (Revised Final EIR Part 4 Appendix O, Table 3C). In addition, the City will receive an estimated additional \$1,800,000 in Moreno Valley Fire property taxes over the cost of the fire protection services which will be provided to the Project, money that can be spent on fire services in other parts of the City (Revised Final EIR Part 4 Appendix O, page 18).

Approval of the Project Will Provide Money for Schools. The Project is estimated to provide approximately \$47,502,000 in school impact mitigation fees (calculated based on a total 40,600,000 sq. ft. times the 2019 Moreno Valley School District and San Jacinto Unified School District's respective development fees) that can be used to improve educational opportunities for students within both the Moreno Valley Unified School District and the San Jacinto Unified School District. (Revised Final EIR Part 4, Table 4.14.D.) The Project is estimated to also generate approximately \$22,000,000 in additional State education revenue annually as a result of the 1% ad valorem property taxes assessed against the developed Project property. Further, the Project

is estimated to contribute \$6,993,000 to be used by the City to provide and enhance educational and workforce development training in the supply chain and logistics industries. Finally, the Project will also benefit education as a result of income taxes paid to the State on jobs created by the Project, which will be used to fund elementary and high schools, both locally and throughout the State. (Education Code § 14002.).

Approval of the Project Will Improve the City’s Jobs/Housing Balance. As shown in Section 4.13.1.3 of the Revised Final EIR Part 4, the City’s current jobs/housing balance of 0.47 is one of the lowest in Southern California and is almost 60% below the Southern California Association of Government’s 1.14 average, resulting in long commutes for many of the City’s residents. At full build-out, the jobs within the City associated with the Project, direct, indirect and induced, are projected to increase the jobs/housing balance to 0.91 (Revised Final EIR Part 4 Appendix O, Table 4F).

Approval of the Project Will Further the State of California’s Goals of Improving the Urban Jobs/Housing Balance. California Government Code 65890.1 declares the following:

- State land use patterns should be encouraged that balance the location of employment-generating uses with residential uses so that employment-related commuting is minimized.
- Balance in employment and residential land use patterns reduces traffic congestion and may contribute to improvement of air quality in urban areas.
- Balancing of employment-generating land uses and residential land uses improves economic and housing opportunities and reduces loss of economic productivity caused by transportation delay.
- The attainment of a more balanced land use pattern requires the cooperation of government agencies with the private sector to assure that public and private decisions affecting land use take into consideration the need to seek balance in the location of employment-generating land uses and residential land uses.
- Local agencies and state agencies should cooperate to facilitate the balancing of employment-generating land uses and residential land uses and provisions of transportation to serve these uses.
- Local governments have the primary responsibility to plan for local land use patterns, within the parameters established by state law to achieve statewide needs.
- It is the intent of the Legislature to move toward the goal that every California worker have available the opportunity to reside close to his or her jobsite.

By creating an estimated 25,000 direct jobs and more indirect and induced jobs in Moreno Valley, the Project improves the City’s jobs/housing balance and helps the City meet this State-mandated goal.

Approval of the Project Will Further the General Plan’s Goal to Create an Orderly and Balanced Land Use Pattern that Accommodates a Range of Residential, Cultural, Recreational, Business and Employment Opportunities (Goal 9.1, I). The Project adds a major jobs-rich, high- demand land use which is projected to provide a substantial number of both construction and permanent job opportunities to significantly improve the City’s low jobs-housing balance and establish a long-term stable tax base to fund City services. The Project includes a Specific Plan which incorporates extensive project design standards and

project review processes to ensure that all project development occurs in an orderly and balanced manner.

Approval of the Project Will Further the General Plan’s Goal of Creating Clean, Attractive Conditions, Free of Blight and Deteriorated Conditions (Goal 9.1, II). The Project will convert more than 2,600 acres of unused, unproductive marginal farmland into a comprehensively designed logistics campus incorporating Project-wide guidelines for site planning, architecture, and landscaping. The WLC project will advance many of the City’s General Plan goals, objectives and policies. The Project includes a Specific Plan which requires compliance with these guidelines for all development within the WLC, all of which will be subject to a discretionary plan review process including provisions for public review.

Approval of the Project Will Further the General Plan’s Goal of Creating a Community that Enjoys a Healthy Economic Climate that Benefits Both Residents and Businesses (Goal 9.1, IV). The Project will create substantial long-term economic growth and stability for the City as a whole through the creation of tens of thousands of short-term and long-term employment opportunities, increased property values, substantial on-going revenue sources from property taxes and retail sales, low cost of municipal services for logistics uses and payment of substantial development fees. Based on the projections from three separate economic analyses contained in the EIR, the Project will provide substantial annual tax surpluses that will generate funds for use by the City to address city-wide needs.

Approval of the Project Will Further the General Plan’s Goal of Creating Recreational Amenities, Recreational Services and Open Space, Including but not Limited to Parks, Multi-Use Trails, Community Centers and Open Space (Goal 9.1, V). The Project includes the offer of dedication of 74.3 acres of significant open space in the Mt. Russell area. This area is immediately adjacent to the State of California’s 8,800-acre Lake Perris State Recreation Area and the 9,000-acre San Jacinto Wildlife Area. The 74.3 acres will be offered for dedication to the state and to the City for open space use. In addition, the WLC Specific Plan includes the provision for more than five miles of new mixed-use trails to be developed through the Project extending the existing trail system to provide public access opportunities to the Lake Perris Recreation Area and the San Jacinto Wildlife Area.

Approval of the Project Will Further the General Plan’s Goal to Create a Pattern of Land Uses Which Organizes Future Growth, Minimizes Conflicts Between Land Uses and Which Promotes the Rational Utilization of Presently Underdeveloped and Undeveloped Parcels (Goal 2.1). The Project will develop a major undeveloped section of the City into a self-contained, master-planned logistics park featuring major setback areas between the Project and adjacent land uses. Development of the Project will occur in an organized rational manner subject to the review and approval by the City of all development proposals.

Approval of the Project Will Further the General Plan’s Goal to Create an Organized, Well-Designed, High Quality, and Functional Balance of Urban and Rural Land Uses that Will Meet the Needs of a Diverse Population and Promote the Optimum Degree of Health, Safety, Well-being and Beauty for All Areas of the Community While Maintaining a Sound Economic Base (Goal 2.2). The Project will convert more than 2,600 acres of unused, unproductive marginal farmland into a comprehensively designed logistics campus incorporating Project-wide guidelines for site planning, architecture, and landscaping. The WLC project will advance many of the City’s General Plan goals, objectives and policies. This Project replaces the

previously approved 20-year old Moreno Highlands Specific Plan west of Gilman Springs Road which proved to be unmarketable. The Project is projected to create thousands of job opportunities in the City of Moreno Valley within a master-planned logistics campus that will feature unified building design concepts, on-site and off-site landscaping, architecture, street design and a project-wide drainage and water quality system that emphasizes the creation of a sustainable business environment, a safe working environment for thousands of employees, in an attractive comfortable setting while creating a source of major economic benefits and stability to the City and its residents.

Approval of the Project Will Further the General Plan’s Goal of Achieving an Overall Design Statement that Will Establish a Visually Unique Image Throughout the City (Goal 2.3). The Project will be subject to extensive design guidelines which guide all elements of the development of the Project including grading, streets, buildings, lighting, landscaping, architecture, screening, parking, and signage all focused on creating a unified, aesthetically pleasing, functional design across the entire project area. The Project’s proximity to SR60 and Gilman Springs Road will provide a comprehensively planned, architecturally-significant entry statement for the City. Every element of the Project will be subject to City review and approval to ensure that all applicable standards and these City goals are met.

Approval of the Project Will Further the General Plan’s Goal of Providing Systems for Water Supply and Distribution; Wastewater Collection, Treatment and Disposal; and Energy Distribution Which are Capable of Meeting the Present and Future Needs of All Residential, Commercial and Industrial Customers Within the City of Moreno Valley (Goal 2.5). The Project will provide necessary infrastructure systems to accommodate the future water, wastewater and utility needs of all users within the WLC. Such infrastructure systems will be constructed to keep pace with demand and will be monitored by the City and the Eastern Municipal Water District in connection with the review of each individual building application. Infrastructure improvements will be required to be operational at such time as buildings are occupied.

Approval of the Project Will Further the General Plan’s Goal of Balancing the Provision of Urban and Rural Lands Within Moreno Valley by Providing Adequate Land for Present and Future Urban and Economic Development Needs, While Retaining the Significant Natural Features and the Rural Character and Lifestyle of the Northeastern Portion of the Community (Objective 2.1). The Project will establish a major center of jobs-rich land uses to provide thousands of job opportunities for residents of the City and the region and will generate substantial long-term tax revenues to the City, the County and the State to assist in the funding of public services throughout the region. The development of the Project will be accomplished without impact on the rural character and lifestyle of the northeastern portion of the community. The SR60 corridor will provide a significant visual and functional separation between the WLC project and the northeastern portion of the community.

Approval of the Project Will Further the General Plan’s Goal of Providing a Mix of Industrial Uses Which Will Provide a Sound and Diversified Economic Base and Ample Employment Opportunities for the Citizens of Moreno Valley with the Establishment of Industrial Activities that Have Good Access to the Regional Transportation System, Accommodate the Personal Needs of Workers and Business Visitors; and which Meets the Service Needs of Local Businesses (Objective 2.5). The Project will provide

a large-scale, master-planned logistics center specifically designed for the unique goods movement needs of the national and international business community relating to access, circulation, security and technology, all in an attractive, secure and sustainable environment. The Project will create thousands of job opportunities for the citizens of Moreno Valley and the region and will provide a substantial long-term source of tax revenues to help provide a stable and diversified economic base for the City. The circulation plan for the Project is oriented toward the SR60 freeway and to Gilman Springs Road so that traffic, particularly truck traffic, can move to and from the freeway system without interacting with drivers from residential areas in the vicinity. Heavy trucks are prohibited on streets adjacent to residential areas in the vicinity of the Project.

Approval of the Project Will Further the General Plan’s Goal of Designating Business Park/Industrial Areas to Provide for Manufacturing, Research and Development, Warehousing and Distribution as Well as Office and Support Commercial Activities (Policy 2.5.1). The Project will create a 2,600-acre master-planned logistics park which can provide up to 40,600,000 square feet of logistics uses (warehouse and distribution) and ancillary office uses in addition to associated infrastructure. Development of the Project will create thousands of job opportunities responding to the strong demand of the logistics industry and adding to the depth and variety of employment opportunities in the City. Development of the Project will provide a substantial long-term revenue benefits to the City allowing for the funding of City services across a broader and more stable economic base.

Approval of the Project Will Further the General Plan’s Goal of Locating Industrial Uses to Avoid Adverse Impacts on Surrounding Land Uses (Policy 2.5.2). The Project site is located at the most easterly end of the City and is buffered by SR60 on the north, Gilman Springs Road and the Badlands on the east, and the permanent open space of the San Jacinto Wildlife Area on the south. The Project includes several design features specifically to address the interface with the residential areas to the west of the Project. An extensive landscaped setback runs the full length of the Project along Redlands Boulevard, Bay Avenue and Merwin Street. This setback includes an earthen berm and a landscape design oriented to the adjacent residential neighborhoods. Special building height restrictions are applicable to the Project along its western edge to reduce the visibility of WLC buildings from the properties to the west. Other design features include: substantial development setbacks along all edges of the Project, extensive landscape treatments within these setbacks, a circulation system designed to direct trucks toward the freeways and away from residential areas, revisions to city-enforced Truck Routes to prohibit large trucks in residential areas, lighting restrictions, noise restrictions, building height limitations and architectural and landscape guidelines. These design features will be implemented by the City in connection with its review and approval of all development proposals within the WLC area.

Approval of the Project Will Further the General Plan’s Goal of Screening Manufacturing and Industrial Uses When Necessary to Reduce Glare, Noise, Dust, Vibrations and Unsightly Views (Policy 2.5.3). The Project provides extensive design guidelines in the Specific Plan to provide appropriate screening of WLC uses. The Specific Plan contains provisions for extensive landscape areas in setbacks around the WLC project, including an earthen berm along the western project edge. In addition, guidelines addressing building height limitations, on-site and off-site landscape requirements, equipment screening, light-shielding and noise restrictions are contained in the Specific Plan. Implementation of these design features will ensure that adjacent

properties are not adversely affected by the development of the WLC project. The City will implement these guidelines in connection with its Plot Plan review of all development proposals in the WLC as required in the Specific Plan.

Approval of the Project Will Further the General Plan’s Goal of Designing Industrial Developments to Discourage Access Through Residential Areas (Policy 2.5.4). The Project provides for a circulation system that directs traffic toward the freeways and away from local residential areas. The circulation plan provides no vehicular access to Redlands Blvd. between the existing intersections with Eucalyptus Ave. on the north and Cactus Ave. on the south. The City’s Truck Routes will be amended such that heavy truck traffic will be prohibited on Redlands Blvd. south of Eucalyptus Ave. and on Cactus Ave. west of the WLC project.

Approval of the Project Will Further the General Plan’s Goal of Encouraging Open Space Preservation through Policies that Recognize Valuable Natural Resources and Areas Required for Protection of Public Safety that Exist in the City (Objective 2.7). The Project includes 74.3 acres of land on the slopes of Mt. Russell will be offered for dedication to the State of California or to the City of Moreno Valley as permanent open space

Approval of the Project Will Further the General Plan’s Goal of Supporting and Encouraging the Annexation of Unincorporated Areas within the General Plan Study Area for which: a) Long-term Benefits Will be Derived by the City, b) Adequate Infrastructure and Services Have Been or Can Be Economically Provided in Accordance with Current City Standards, and c) the Proposed Annexation Will Generate Sufficient Revenues to Adequately Pay for the Provision of City Services Within a Reasonable Period of Time (Policy 2.9.1). The Project includes the annexation of an 85-acre parcel at the intersection of Gilman Springs Road and Alessandro Blvd., the development of which is incorporated into the WLC Specific Plan. The site’s location west of Gilman Springs Road makes its inclusion in the Specific Plan both practical and logical from a Project design perspective as well as for the delivery of public services.

Approval of the Project Will Further the General Plan’s Goal of Ensuring that All Development within the City of Moreno Valley Is of High Quality, Yields a Pleasant Living and Working Environment for Existing and Future Residents and Attracts Business as the Result of:

Consistent Exemplary Design (Objective 2.10). The Project establishes extensive design guidelines in the Specific Plan and establishes project review procedures by the City to ensure that all development is of high quality, compatible design, and incorporates features to enhance its environmental sustainability. The City will conduct a discretionary review of all development proposals to ensure that the overall WLC and each building within it will result in a pleasant environment for employees and visitors. Through the provisions of the Specific Plan, the Project will have a consistent design theme (Policy 2.10.1), will contain regulations regarding screening of outdoor storage and trash facilities (Policy 2.10.2), will require architecturally attractive building elevations (Policy 2.10.3), will require landscaping as an integral part of the Project design (Policy 2.10.4), requires a landscaped area as setback along the freeway right-of-way (Policy 2.10.5), will require a comprehensive sign program for the entire Project area (Policy 2.10.6), provides regulations for the control of on-site lighting (Policy 2.10.7 and 8), provides design standards for fences and walls (Policy 2.10.9), provides design standards for street frontages (Policy 2.10.10), provides design features (setbacks, berms, landscaping,

height restrictions, etc.) to screen the Project from residential properties (Policy 2.10.11), provides screening requirements for on-site parking areas (Policy 2.10.12) and requires compliance with the Municipal Code for landscaping in parking areas (Policy 2.10.13).

Approval of the Project Will Further the General Plan’s Goal of Maintaining a Water System Capable of Meeting Daily and Peak Demands of Moreno Valley Residents and Businesses Including the Provision of Adequate Fire Flows (Objective 2.11). The Project will be designed to minimize water consumption to the greatest degree possible. In addition to incorporating water-saving design features in all buildings, the Project will feature a landscape design that will minimize the use of mechanical irrigation to the greatest degree possible. The Project is required to confirm the availability of infrastructure to provide adequate water service (including fire flows) to serve development prior to the occupancy of each building in the WLC. Improvement plans will be reviewed and approved by the City and by Eastern Municipal Water District for all development within the WLC.

Approval of the Project Will Further the General Plan’s Goal of Maintaining a Wastewater Collection, Treatment and Disposal System Capable of Meeting the Daily and Peak Demands of Moreno Valley Residents and Businesses (Objective 2.12). The Project’s commitment to reducing water consumption throughout the Project will significantly reduce the amount of wastewater that will be generated. The Project is required to confirm the availability of infrastructure to provide adequate wastewater services to serve development prior to the occupancy of each building in the WLC. Improvement plans will be reviewed and approved by the City and by Eastern Municipal Water District for all development within the Project.

Approval of the Project Will Further the General Plan’s Goal of Coordinating Development Activity With the Provision of Public Infrastructure and Services (Objective 2.13). The Project is subject to state-mandated subdivision procedures as well as discretionary project review procedures both carried out by the City prior to the development of any property within the Project area. These procedures establish the nature and extent of infrastructure improvements needed to serve any proposed development. All development plans will be reviewed and approved by the service provider and such development will be limited to that which can be adequately served (Policy 2.13.1). Backbone facilities will be constructed with the initial phases of the development served (Policy 2.13.2). Such improvements are required to be operational prior to the occupancy of any new buildings (Policy 2.13.3). The Project will include advanced technology infrastructure, including high-speed internet access and solar energy. (Policy 2.13.4).

Approval of the Project Will Further the General Plan’s Goal of Developing a System of Trails Which Contribute to Environmental Quality and Energy Conservation by Providing Alternatives to Motorized Vehicular Travel and Opportunities for Recreational Equestrian Riding, Bicycle Riding and Hiking and that Connects With Major Regional Trail Systems (Objective 4.3). The Project includes the extension of the City’s multi-use trail system with five miles of trails to be constructed within the WLC. These trails will provide linkages between the residential area west of the Project to the Lake Perris Recreation Area and the San Jacinto Wildlife Area to the south of the Project and to the Badlands area east of the Project. The trails will extend along Eucalyptus Ave. providing a nearby linkage to the future trails on the north side of SR60 (Policy 4.3.1). In addition, a public Trail Head will be constructed along Alessandro Boulevard (Policy 4.3.5).

All such multi-use trails will be constructed along with adjacent development (Policy 4.3.3).

Approval of the Project Will Further the General Plan’s Goal of a Safe, Efficient, Environmentally and Fiscally Sound Integrated Vehicular Circulation System which Provides Access to Development and Supports Mobility Requirements of the System’s Users (Goal 5.1). The Project incorporates a circulation system that fully meets the needs of the WLC project through the provision of enhanced freeway interchanges, new and expanded arterial highways, and collector streets within the WLC (Objective 5.1). The design of this system of roadways will be evaluated with each proposed building to ensure that adequate access and circulation is provided for planned vehicles (autos and trucks) as well as emergency vehicles, trash trucks, pedestrians and bicycles (Policy 5.1.1). Class II bikeways will be constructed on all streets in the WLC to reduce conflicts between vehicular, pedestrian and bicycle traffic (Policy 5.1.2). Off-street parking is required to meet Municipal Code requirements (Policy 5.1.3) and additional truck pull-out parking bays along collector streets will be installed to offer additional truck parking without obstructing traffic flow. The circulation system is designed to preclude project truck traffic from traveling through residential areas by interrupting through traffic on Alessandro Blvd. and by not designating Redlands Blvd. south of Eucalyptus Ave. and Cactus Avenue west of the WLC project as Truck Routes.

Approval of the Project Will Further the General Plan’s Goal of Maintaining Level Of Service (LOS) “D” in the Vicinity of SR60 and High Employment Centers (Objective 5.3). The Project has been designed to meet the LOS “D” standard throughout the Project and each building project will be required to prepare and process a focused traffic impact analysis to confirm that this standard is met. Road improvements to maintain this standard will be constructed prior to occupancy of each building (Policy 5.3.1). Other traffic improvements will be funded through the collection of TUMF fees in connection with the construction of each building (Policy 5.3.5). Mitigation Measures imposed on the development of the Project will ensure that surrounding streets will not be exposed to additional traffic or traffic delays.

Approval of the Project Will Further the General Plan’s Goal of Maximizing the Efficiency of the Local Circulation System (Objective 5.5). The Project’s circulation system includes a system of roadways to provide safe and efficient access to all development parcels within the WLC. Each individual project will be reviewed and approved by the City to ensure that roadway spacing is appropriate (Policy 5.5.1), turn lanes are provided where necessary (Policy 5.5.2) and points of access are coordinated to ensure adequate capacity, efficiency and safety (Policy 5.5.3 and 5.5.4).

Approval of the Project Will Further the General Plan’s Goal of Encouraging Development of an Efficient Public Transportation System for the Entire Community (Objective 5.8). The Project has been designed to accommodate public transit vehicles on all Project streets, including future bus turnouts and bus shelters at such time as bus routes are established to serve the WLC (Policy 5.8.4).

Approval of the Project Will Further the General Plan’s Goal of Encouraging Development of Safe, Efficient and Aesthetic Pedestrian Facilities (Objective 5.9). The Project includes a system of pedestrian walkways that will link all Project sites to one another as well as to transit facilities, trails, bikeways, and off-Project locations (Policies 5.9.1 and .2). Such pedestrian walks will be designed into adjacent Project plans to enhance the aesthetics of the pedestrian experience while encouraging non-vehicular transportation. (Policies

5.9.3 and .4).

Approval of the Project Will Further the General Plan's Goal of Encouraging Bicycling as an Alternative to Single Occupant Vehicle Travel for the Purpose of Reducing Fuel Consumption.

Traffic Congestion and Air Pollution (Objective 5.10). The Project provides a comprehensive network of bikeways along all Project streets to link all Project sites as well as links to off-Project bicycle facilities and circulation facilities (Policy 5.10.1). Plot Plans for each building will ensure that facilities are incorporated (storage lockers, showers, etc.) to encourage the use of bicycles.

Approval of the Project Will Make Major Progress Toward Fulfilling Goals of the Moreno Valley Economic Development Action Plan. The Moreno Valley Economic Development Action Plan approved by the City Council, first as a two-year plan in April 2011, and again as a three-year plan in April 2013, specifically identified logistics development in eastern Moreno Valley as a primary economic opportunity for the City. The logistics industry has been a leader in job creation in the Inland Empire and is expected to remain a strong business sector for the region (Inland Empire Quarterly Economic Report, January, 2014). Accordingly, the Project will create jobs well-suited for the local population in a community with an unemployment rate of 9.7% (April, 2014), which is well above the State average of 7.3% (April, 2014). (City Manager's Report, pages 13-14 (June, 2014).

Approval of the Project Will Provide Quality Jobs. As set forth in Revised Final EIR Part 1 Response to Comment 1-F8-17, development of the Project is projected to create over 25,000 jobs with an estimated average annual income of \$40,926 (David Taussig & Associates, Fiscal and Economic Impact Study, 2014). This average income, taken from the U.S. Census Bureau for Riverside County and the Inland Empire, is slightly higher than the \$40,124 average income of current Moreno Valley residents according to the U.S. Bureau of Labor Statistics.

Approval of the Project Will Create Jobs in the Industry Where Demand Exists. For twenty years, the Moreno Highlands Specific Plan allowed for the development of a mix of residential, commercial, and small business park uses. However, due to a lack of demand, the uses allowed by the Specific Plan were never realized. Throughout Moreno Valley, there remains undeveloped residentially and commercially zoned property that sits underutilized due to a lack of demand resulting in a lack of job creation. Recognition of the lack of job creation was one of the driving elements of the City's Economic Development Action Plan (April, 2011 and April, 2013), which sought to increase investment in the City and create job opportunities within the City. The Economic Development Action Plan identified healthcare and the logistics industries as the two major areas of economic opportunity for the City, where job creation is directly linked to market demand. The City has lost job creation opportunities due to the mismatch between zoning and market demand for those land uses. By selectively aligning some of the City's land uses with market demands, the City will create job opportunities within the City that would not be achievable based on current zoning and market demand.

Approval of the Project Will Increase Employment, Furthering the City's Goal of Improving Quality of Life and Creating a Healthy Economic Climate by Reducing Poverty and Its Impacts. The Project will create jobs improving the economic vitality of the City and help reduce its 10.7% unemployment rate as of

August 2014, according to the City Manager’s October, 2014, Update. Increased employment in the City is one of many actions that will raise the quality of life and help improve the economic environment for the 1 in 6 residents, including 1 in 4 children, that live below the poverty line. By approving the Project, thereby creating an estimated 25,000 jobs, the City will help reduce poverty and its resulting impacts, which will result in an improved quality of life and economic climate (Ultimate General Plan Goals II and IV).

Approval of the Project Will Improve Public Health. One method of improving public health in Moreno Valley is to improve economic opportunities in the City because poverty is strongly correlated with many negative outcomes, particularly health. Public health research groups like the Robert Wood Johnson Foundation find that socioeconomic difficulties, not environmental issues, are the principal causes of public health risks (<http://www.dailynews.com/opinion/20131025/californias-poor-kept-in-poverty-by-job-killing-elite-john-husing>). And according to “IS POVERTY A DEATH SENTENCE? The Human Cost of Socioeconomic Disparities” by Senator Bernie Sanders (<http://www.sanders.senate.gov/>), almost as many people die from poverty as from lung cancer. Therefore, one of the best ways to improve public health in Moreno Valley is to increase the number of employment opportunities in the City. By approving the Project, thereby creating an estimated 25,000 direct jobs, the City will help reduce poverty and its resulting public health impacts.

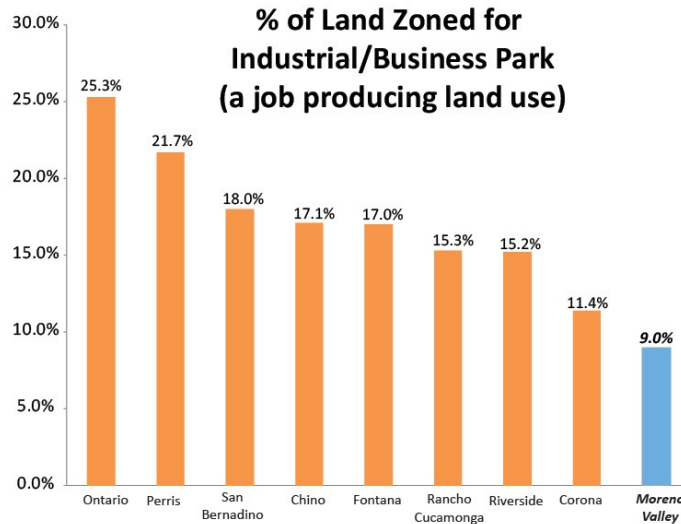
Approval of the Project Will Allow for the Economic Use of Currently Underused Land. As set forth in Appendices C-1 and C-4 of the Revised Final EIR Part 4 , the Project site is currently suitable only for dry farming as the high cost and uncertain availability of irrigation water make irrigated farming economically infeasible. Further, as stated in section 3.3.1 of the Revised Final EIR Part 4 , there were numerous uses permitted by the previous zoning on the site (the Moreno Highlands Specific Plan), but, because there had been no market for the planned and permitted uses, the Project site has remained undeveloped for over 20 years. As set forth in the Project Objectives in Section 3.6 of the Revised Final EIR Part 4 and in the Fiscal and Economic Impact Study dated May 21, 2014 (Revised Final EIR Part 4 Appendix O), the approval of the Project will allow the conversion of vacant, marginally productive agricultural land into a jobs- and revenue-producing facility.

Approval of the Project Will Ensure the Availability of Industrially-Zoned Land in Moreno Valley to Meet Demand. With the exception of the Project site, the City of Moreno Valley has less than 150 acres, remaining for industrial development that does not already have an application for development pending. Over 14 million square feet of industrial development has been constructed in Moreno Valley with only one building currently vacant (City of Moreno Valley Economic Development Summary, July 10, 2014). As noted, inclusive of the 14 million square feet of industrial buildings already developed in the city, the City will still suffer from a substantial deficit of jobs compared to housing and the remaining 150 acres of industrial land in the City is insufficient to create the jobs needed to reduce poverty in the City and to meet the City’s employment goals set forth in the Economic Development Action Plan. Land for logistics development is in high demand and is one of the fastest-growing sectors in the Inland Empire (Inland Empire Quarterly Economic Report, January, 2014). Without additional industrially zoned land, the City will not be able to meet the regional demand for logistics facilities which the city has identified as a prime area of economic opportunity in the City. Approval of the Project will provide more than 2,400 acres of land for logistics use, responding to

the demand for those uses.

Approval of the Project Will Allow Moreno Valley to be More Competitive for Industrial Projects.

Moreno Valley substantially lags other cities in the Inland Empire in the percentage of land zoned for industrial/business park uses (see chart below):



City of Moreno Valley’s Economic Development Action Plan, Survey of Inland Region - Industrial/Business Park Zoning (April, 2011)

With hardly any other available land remaining in the City for industrial development, the City cannot effectively compete and gain its fair share of industry in the region. With an insufficient amount of industrially zoned land, Moreno Valley is unable to attract the jobs necessary to provide economic opportunities for its residents.

Approval of the Project Will Make Major Progress Toward Fulfilling the Regional Need for Logistics Development.

The Southern California Association of Governments, of which the City is a member, came to the following conclusions in its June, 2010, report, Industrial Space in Southern California: Future Supply and Demand for Warehousing and Intermodal Facilities, at pages ES- 1-2:

“According to assumed growth rates, the region will run out of suitably zoned vacant land in about the year 2028. At that time, forecasts show that the demand for warehousing space will be approximately 1,023 million square feet.

“During the year 2035, there will be a projected shortfall of space of about 228 million square feet, unless other land not currently zoned for warehousing becomes available.”

The Project will be developed over the time period that the region needs additional appropriately zoned land for warehousing and intermodal facilities. As a result, the Project will help meet the forecasted demand for such facilities and will allow the City to be well placed to reap the benefits from serving the demand for

logistics services.

Approval of the Project Will Implement Aggressive Air Quality Strategies. The Project will implement the most stringent air quality requirements. All trucks serving the facility will be required to meet U.S. Environmental Protection Agency's (USEPA) and California Air Resources Board's (CARB) most stringent engine emissions standards that apply to new heavy-duty vehicles (Mitigation Measure 4.3.6.2A). By prohibiting trucks that do not meet 2010 emissions standards, the Project will exceed the operational requirements of USEPA and CARB and other agencies. In addition, the Project will: 1) construct an alternative fueling station to encourage the use of alternatively-fueled vehicles (Mitigation Measure 4.3.6.3C); 2) prohibit the use of diesel in onsite facility equipment (Mitigation Measure 4.3.6.3B); and 3) restrict idling (Mitigation Measure 4.3.6.3B), and 4) prohibit the use of diesel backup generators (Mitigation Measure 4.3.6.3B).

Approval of the Project Will Ensure that the Health of Residents, School Children and Workers, both Within and Outside of the Project Area, Will Not Be Adversely Affected by the Construction and Operation of the Project. The development of a logistics facility necessarily involves the use of large numbers of diesel trucks. Numerous studies have found that the exhaust from the older diesel trucks can cause cancer and other adverse health effects. As set forth in Revised Final EIR Part 4 Section 4.3, the recent study conducted by the Health Effects Institute demonstrates that diesel trucks which comply with stringent USEPA and CARB standards do not cause cancer or adverse health effects. Project conditions of approval prohibit diesel trucks which do not comply with the 2010 standards from accessing the Project. The Revised Final EIR Part 2 utilized current OEHHA guidelines and the new EMFAC2017 emission factors, demonstrating that the Project would not result in significant health risk impacts (Revised Final EIR Part 2, Page 4.3-78). As a result, the City will enjoy the numerous benefits which will flow from the construction and operation of the Project without subjecting anyone to the risk of cancer and other adverse health effects which result from the use of older diesel trucks.

Approval of the Project Will Reduce Commuting Time and Decrease Traffic on the County's Highways during Peak Hours. As shown in Section 4.15.3.2 of the Revised Final EIR Part 4, the jobs created by the Project will result in shorter commutes for the City's residents, shorter commutes for those who do not reside in the City but who have been forced to seek jobs closer to Los Angeles and will allow workers from outside of the City to travel to and from the Project on the County's freeways in the off peak directions which will reduce commute times. (Revised Final EIR Part 4 Appendix L, section 4.D.)

Approval of the Project Will Result in Substantially Fewer Vehicle Trips Compared to the Previous Zoning (prior to adoption of the WLC Specific Plan). The traffic study for the Moreno Highlands Specific Plan (the previous zoning) forecasted a total of 178,608 average vehicle trips per day (ADT) resulting from the development of the Moreno Highlands plan. Deducting the land in the Moreno Highlands plan purchased by the California Department of Fish and Wildlife, San Diego Gas and Electric Company and Southern California Gas Company, none of which will be developed further, reduces the Average Daily Trips to 119,668. (Revised Final EIR Part 4, Volume 3, Table 6.G.) The development of the Moreno Highlands plan (zoning in place prior to November 2015 adoption of the WLC Specific Plan) would result in more than a 70% increase in Average Daily Trips as compared to the development of the World Logistics Center project (69,542

ADT). (Revised Final EIR Part 4, Volume 3, Table 6.G.) It is important to note that the approved Moreno Highlands traffic studies did not provide separate counts for car and truck traffic and did not provide a forecast in terms of passenger care equivalents (PCEs) therefore the Average Daily Trips for the Moreno Highlands plan may understate total traffic as compared to the World Logistics Center Average Daily Trips. However, even if the Moreno Highlands plan were to generate no truck trips at all (only passenger car trips), it would still generate substantially more PCE trips than the proposed Project. Further, the operation of the WLC will result in a substantial net decrease in vehicle miles currently traveled because of the substantial decrease in the commuting distances of the workers who will have jobs at the WLC (Attachment B).

Approval of the Project Will Result in the Consumption of Substantially Less Water Compared to Previous Zoning. When compared to the previously in place Moreno Highland Specific Plan, there will be a 64% decrease in projected water demand, 1,761,260 gallons per day, compared to 4,888,456 gallons per day after accounting for the land within the Specific Plan area which will never be developed. (Revised Final EIR Part 4, Table 6.I.) As a result, the Project's water usage consumption will be substantially below that anticipated in the City's General Plan and the 2010 Eastern Municipal Water District's Urban Water Management Plan. (Revised Final EIR Part 4, Volume 3, pg. 4.16-20.). As the Project is currently consistent with the General Plan and zoning, Project implementation will be consistent with General Plan and Urban Water Management Plan projections.

Approval of the Project Will Create a Master-Planned, Sustainable Development. The development of the Project will be governed by the World Logistics Center Specific Plan which will result in a master-planned industrial development that will create a jobs center in eastern Moreno Valley that is separated from residential communities. By governing the development of the Project through the use of the Specific Plan, the City has ensured that all development at the Project site will meet the highest environmental standards while limiting impacts on the community. The Project achieves these standards through requirements such as LEED certification for buildings, minimal irrigation landscaping, solar power which ensures sustainable design and the smallest environmental footprint. In addition, the use of a master-planned development ensures that the Project will meet the highest aesthetic standards, creating a world-class facility, subject to rigorous design standards.

VII. CERTIFICATION OF THE FINAL ENVIRONMENTAL IMPACT REPORT

A. FINDINGS

1. CEQA Compliance

The Moreno Valley City Council certifies that the Revised Final EIR was prepared in compliance with CEQA and the CEQA Guidelines and that the City Council has complied with CEQA's procedural and substantive requirements.

The Moreno Valley City Council further declares that it has reviewed and considered the EIR in evaluating the Project and that the Revised Final EIR reflects the independent judgment and analysis of the City Council. The City Council further finds that no new significant information as defined by CEQA Guidelines Section 15088.5, has been received by the City Council after the circulation of the RSFEIR and Recirculated Sections that would require further recirculation. All of the information added to the Revised Final EIR merely clarifies, amplifies or makes insignificant modifications to an already adequate DEIR, RSFEIR and Recirculated Sections pursuant to CEQA Guidelines Section 15088.5(b).

Accordingly, the City Council certifies the Revised Final EIR for the WLC Project.

As the decision-making body for approval of the Parcel Map, the City Council has reviewed and considered the information contained in the Findings and supporting documentation. The City Council determines that the Findings contain a complete and accurate reporting of the environmental impacts and mitigation measures associated with the Project, as well as complete and accurate reporting of the unavoidable impacts and benefits of the Project as detailed in the Statement of Overriding Considerations.

B. Significant Unavoidable Impacts/Statement of Overriding Considerations

The Project will have significant adverse impacts even following adoption of all feasible mitigation measures which are required by the Council. The following significant environmental impacts have been identified in the Revised Final EIR and will require mitigation but cannot be mitigated to a level of insignificance as set forth in Section V(C) of these Findings:

- Aesthetics - Scenic Vistas
- Aesthetics - Scenic Resources and Scenic Highways
- Aesthetics - Substantial degradation of the existing visual character or quality of the site and its surroundings
- Aesthetics - Cumulative Aesthetic Impacts
- Air Quality - Construction Air Pollutant Emissions
- Air Quality - Operational Air Pollutant Emissions
- Air Quality - Consistency with Air Quality Management Plan (AQMP)
- Air Quality - Cumulative Air Pollutant Emissions
- Air Quality - Sensitive Receptors

- Land Use and Planning - Physically divide an established neighborhood (impacts on existing residences)
- Noise - Short-Term Construction Noise
- Noise - Long-Term Traffic Noise
- Noise – Long Term Noise
- Noise - Cumulative Noise Levels
- Transportation - Off-Site Impacts to TUMF Facilities
- Transportation Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

The City Council has eliminated or substantially reduced environmental impacts where feasible as described in the Findings, and the City Council determines that the remaining unavoidable significant adverse impacts are acceptable due to the reasons set forth in the preceding Statement of Overriding Considerations.

C. Conclusions

All potentially significant environmental impacts from implementation of the Project have been identified in the Revised Final EIR and, with the implementation of the mitigation measures defined herein and set forth in the MMRP, will be mitigated to a less-than-significant level, except for the impacts identified in Section VII.A.2 above. All reasonable and feasible mitigation measures have been adopted in the MMRP and the City finds that economic, social, and environmental considerations of the proposed Project outweigh the unavoidable significant adverse impacts described in Section VII.A.2 above. Further, the City finds that each of the separate benefits of the proposed Project is hereby determined to be, independent of the other proposed Project benefits, a basis for overriding all unavoidable environmental impacts identified in the Revised Final EIR and in these Findings. The reasons for accepting these remaining significant impacts are described above. In making these findings, the City has balanced the benefits of the proposed Project against its unavoidable environmental impacts and finds that the benefits outweigh and override the significant unavoidable impacts for the reasons stated below.

VIII. ADOPTION OF MITIGATION MONITORING AND REPORTING PROGRAM

Pursuant to *Public Resources Code* Section 21081.6, the City Council hereby adopts, as conditions of approval of the Project, the Mitigation Monitoring and Reporting Plan (MMRP) provided as Resolution Exhibit B. In the event of any inconsistencies between the mitigation measures as set forth herein and the attached MMRP, the MMRP shall control, except to the extent that a mitigation measure contained herein is inadvertently omitted from the MMRP, in which case such mitigation measure shall be deemed as if it were included in the MMRP.

EXHIBIT C

REVISED FINAL ENVIRONMENTAL IMPACT REPORT BY REFERENCE

Attachment: 2020-XX Resolution Revised FEIR Appeal [Revision 1] (4074 : World Logistics Center)

RESOLUTION NUMBER 2020-_____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DENYING THE APPEAL (PAA20-0003) OF THE PLANNING COMMISSION'S APPROVAL OF TENTATIVE PARCEL MAP NO. 36457 FOR FINANCE AND CONVEYANCE PURPOSES AND AFFIRMING PLANNING COMMISSION RESOLUTION 2020-21 APPROVING TENTATIVE PARCEL MAP NO. 36457

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and;

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively "HF" or "Applicant") have a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit "A-1" and as illustrated in the depiction set forth in Exhibit "A-2" (the "Subject Property") of the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs initiative," which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support uses on the land subject to the World Logistics Center Specific Plan; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the "WLC Land Benefit Initiative," to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only ("Parcel Map"), attached to Resolution 2020-21 as Exhibit 1, subject to subsequent processing and recordation of a future map for development purposes; and

Resolution No. 2020-XX
Date Adopted: June 16, 2020

WHEREAS, a Revised Final Environmental Impact Report was prepared for the “Project,” as collectively described and depicted in the World Logistics Center Land Use and Zoning Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, Section 9.14.065 (“Finance and Conveyance Maps”) of the Moreno Valley Municipal Code set forth the criteria governing the filing and processing of tentative maps for finance and/or conveyance purposes; and

WHEREAS, pursuant to 9.14.065 C (“Submittal Requirements”), the Director of Community Development waived the following requirements as requested in advance by Applicant:

1. Identification of existing structures, both above and below ground, which are too small to show on the Parcel Map, such as but not limited to, power poles and fire hydrants;
2. Identification of widths, approximate grades of proposed streets and approximate street centerline radii of curves;
3. Identification of specific areas of existing subsurface sewage disposal systems and disposal areas;
4. Identification of proposed facilities for control of storm waters;
5. Identification of common areas and open spaces since there are none to show currently;
6. Identification of adjoining residential property and lot lines due to the size of the Parcel Map;
7. Identification of existing use and zoning of property immediately surrounding the Parcel Map;
8. Identification of existing zoning and proposed land use of property within the Parcel Map;
9. Inclusion of a detailed Site Grading Plan.
10. Identification of dimensions and location of sidewalks and common areas;
11. Inclusion of a soils and geology report; and
12. Inclusion of a regional housing needs statement; and

WHEREAS, the Planning Commission conducted a noticed Public Hearing on May 14-15, 2020, to consider the Revised Final Environmental Impact Report, the proposed 2020 World Logistics Center Development Agreement and Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only; and

WHEREAS, at the conclusion of the May 14-15, 2020 Public Hearing, the Planning Commission adopted Resolution 2020-21 approving Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only subject to certification of the World Logistics Center Revised Final Environmental Impact Report and approval of the 2020 World Logistics Center Development Agreement; and

Resolution No. 2020-XX
Date Adopted: June 16, 2020

WHEREAS, on or about May 26, 2020, Adriano L. Martinez filed an appeal on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, challenging the Planning Commission's May 14-15 decision to approve Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only (PAA20-0002); and

WHEREAS, on June 16, 2020, the City Council conducted a noticed Public Hearing to consider the appeal filed by Mr. Martinez.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. Recitals and Exhibits

That the foregoing Recitals and attached Exhibits are true and correct and are hereby incorporated by this reference.

Section 2. Evidence

That the City Council has considered all of the evidence submitted into the administrative record related to the appeal of the Planning Commission's approval Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, including, but not limited to, the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein;
- (b) Title 9 ("Planning and Zoning") of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Draft EIR and all studies, reports, public comments and responses thereto;
- (d) Final EIR and all studies, reports, public comments and responses thereto;
- (e) Draft Development Agreement by and between the City and Developer, its application and all documents, records and references contained therein;
- (f) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs initiative," that was unanimously approved by the City Council in November 24, 2015;
- (g) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (h) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;

Resolution No. 2020-XX
Date Adopted: June 16, 2020

(i) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;

(j) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;

(k) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;

(l) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015;

(m) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto, including without limitation, the application and reports and written statements regarding the proposed method of control of storm water, including data as to amount of runoff, and the approximate grade and dimensions of the proposed facilities, unless waived;

(n) Written waiver requests submitted by Applicant and approval of said waivers by the Community Development Director;

(o) Planning Commission Staff Report and Staff Presentation and all documents, records and references related thereto;

(p) Testimony and/or comments from Developer and its representatives during the Planning Commission Public Hearing;

(q) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the Planning Commission Public Hearing;

(r) Riverside County Superior Court's Ruling on Peremptory Writ of Mandate, filed February 8, 2018;

(s) Riverside County Superior Court's Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018; and

(t) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5t 689.

(u) City Council Staff Report and Staff Presentation and all documents, records and references related thereto;

(v) Testimony and/or comments from Developer and its representatives during the City Council Public Hearing;

(w) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the City Council Public Hearing;

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(x) The findings set forth in Planning Commission Resolution 2020-20 approving and adopting a Mitigation Monitoring Reporting Program and Statement of Overriding Considerations and Certifying the Revised Final EIR;

(y) The findings set forth in Planning Commission Resolution 2020-21 Approving Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes;

(z) The findings set forth in Planning Commission Resolution 2020-22 Recommending that the City Council Adopt the Requisite Ordinance Approving the WLC Development Agreement; and all written responses, prepared by staff, the applicant and/or applicant’s representatives to comments submitted to the City after the Planning Commission Public Hearing and any and all responses to comments submitted to the City prior to or at the City Council Public Hearing and after the Planning Commission Public Hearing; and

(aa) Tentative Court of Appeal Opinion, Albert Paulek, et al., v. City of Moreno Valley (May 2019), Case No. E071184.

Section 3. Findings

That based on the content of the foregoing Recitals and the Evidence contained in the Administrative Record as set forth above, the City Council affirms the findings set forth in Resolution _____ in addition to the findings set forth below:

- (a) The Tentative Parcel Map is for finance and conveyance purposes only;
- (b) The Tentative Parcel Map does not create a legal building site and that a future map for development purposes must be processed and recorded in order for any development on the site to occur;
- (c) No development approvals are included in this Tentative Parcel Map;
- (d) The Tentative Parcel Map includes parcel map identification number, assessor’s parcel number, title of map, and legal description of property;
- (e) The Tentative Parcel Map includes the name and address of the owner and subdivider and name and address of person preparing map;
- (f) The Tentative Parcel Map includes the approximate total acreage of property and lot size net and gross for a typical lot and for each irregular lot, overall dimensions, north arrow, scale and date;
- (g) The Tentative Parcel Map identifies the land division boundary line and vicinity map showing its relationship to the surrounding community;
- (h) The Tentative Parcel Map references the assessor’s map book and page numbers of adjoining land divisions;
- (i) The Tentative Parcel Map identifies the names, locations, right-of-way, width and improvements of existing adjacent streets, alleys, railroads and existing structures, both above and below ground, unless waived by the Community Development Director at the request of Applicant;
- (j) The Tentative Parcel Map identifies the names, location, widths of rights-of-way or proposed streets, alleys and easements, and the approximate grades of proposed streets and approximate street centerline radii of curves, unless waived by the Community Development Director at the request of Applicant;

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Attachment: 2020-XX Resolution TPM 36457 Appeal (4074 : World Logistics Center)

(k) The Tentative Parcel Map identifies the streets, alleys and right-of-way providing legal access to the property, unless waived by the Community Development Director at the request of Applicant;

(l) The Tentative Parcel Map identifies all the proposed private streets, unless waived by the Community Development Director at the request of Applicant;

(m) The Tentative Parcel Map includes the names of utility purveyors, location and width of existing and proposed known public utility easements;

(n) The Tentative Parcel Map identifies the location and width of the areas for required subsurface sewage disposal systems, unless waived by the Community Development Director at the request of Applicant;

(o) The Tentative Parcel Map identifies all known existing wells on the property or within two hundred (200) feet of the subdivision boundary;

(p) The Tentative Parcel Map identifies all water courses, channels, existing culverts and drain pipes, including existing and proposed facilities for control of storm waters, unless waived by the Community Development Director at the request of Applicant;

(q) The Tentative Parcel Map identifies the land areas subject to overflow, inundation or flood hazard;

(r) The Tentative Parcel Map identifies the land or right-of-way to be dedicated for public use and right-of-way for railroads and other uses unless waived by the Community Development Director at the request of Applicant;

(s) The Tentative Parcel Map identifies all common areas and open spaces, unless waived by the Community Development Director at the request of Applicant;

(t) The Tentative Parcel Map identifies the proposed lot lines and approximate dimensions, unless waived by the Community Development Director at the request of Applicant;

(u) The Tentative Parcel Map identifies all adjoining property and lot lines, unless waived by the Community Development Director at the request of Applicant;

(v) The Tentative Parcel Map includes the maximum contour interval required by the City Engineer and the contour lines extend three hundred (300) feet beyond the exterior boundaries of the property since the adjacent property is unimproved and vacant;

(w) The Tentative Parcel Map identifies the existing use and zoning of property immediately surrounding tentative map;

(x) The Tentative Parcel Map identifies the existing zoning and proposed land use of the property, unless waived by the Community Development Director at the request of Applicant;

(y) The Tentative Parcel Map includes a statement as to whether the tentative map includes the entire contiguous ownership of the land divider or only a portion thereof;

(z) The parcel (or parcels) of land covered by the Tentative Parcel Map meet the minimum size requirements to ensure that future development can meet all applicable site development standards imposed by Title 9 of the Municipal Code;

(aa) The parcel (or parcels) of land have access from a public road, or access is both feasible and required by a condition of approval for the proposed map;

(bb) The parcel lines do not conflict with any public easements;

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(cc) There are not physical constraints or other issues which may affect the feasibility of future development on the site (e.g., vehicular access, utility service extensions);

(dd) The Tentative Parcel Map provides sufficient information on future uses and feasibility of future uses to ensure consistency with the general plan and zoning designations for the site;

(ee) The site is suitable for the future permitted or proposed uses;

(ff) The Tentative Parcel Map provides sufficient information on the subdivision design and future improvements to evaluate its potential impact on the environment in compliance with the California Environmental Quality Act;

(gg) There is sufficient information on the subdivision design and future improvements to enable the city to determine whether the map complies with applicable water quality standards, particularly with respect to future discharge of waste into the sewer system.

(hh) The Tentative Parcel Map contains or is accompanied by all the necessary site grading information such as, but not limited to, the proposed cuts and fills in the subdivision related to slope stability, erosion control and landscaping of the proposed grading, subsurface sewage disposal unless waived by the Community Development Director at the request of Applicant; and

(ii) The Tentative Parcel Map includes the elevations of all individual building pads in the subdivision; the elevations at the perimeter of the subdivision; and the relationship of the subdivision to adjoining land and development unless waived by the Community Development Director at the request of Applicant.

(jj) The parcel (or parcels) of land covered by the map meet the minimum size requirements to ensure that future development can meet all applicable site development standards imposed by Title 9 of the Municipal Code.

(kk) The parcel (or parcels) of land have access from a public road, or access is both feasible and required by a condition of approval for the proposed map.

(ll) The parcel lines do not conflict with any public easements.

(mm) There are not physical constraints or other issues, which may affect the feasibility of future development on the site (e.g., vehicular access, utility service extensions). If necessary in order to adequately evaluate the map, additional technical studies (e.g., access study) should be required prior to finding the application complete;

(nn) The Tentative Parcel Map provides sufficient information on future uses and feasibility of future uses to ensure consistency with the general plan and zoning designations for the site;

(oo) The site is suitable for the future permitted or proposed uses;

(pp) The Tentative Parcel Map provides sufficient information on the subdivision design and future improvements to evaluate its potential impact on the environment in compliance with the California Environmental Quality Act;

(qq) The Tentative Parcel Map is consistent with applicable general and specific plans and the zoning ordinance;

(rr) That the design or improvement of the proposed subdivision is consistent with applicable general and specific plans;

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Date Adopted: June 16, 2020

- (ss) That the site is physically suitable for the type of development;
- (tt) That the site is physically suitable for the proposed density of development.
- (uu) That the design of the subdivision or the proposed improvements are not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat;
- (vv) That the design of the subdivision or type of improvements is not likely to cause serious public health problems;
- (ww) That the design of the subdivision or the type of improvements will not conflict with easements, acquired by the public at large, for access through or use of, property within the proposed subdivision; and
- (xx) That despite the waivers requested by Applicant and approved by the Community Development Director, the proposed map continues to comply with the spirit and intent of the Subdivision Map Act and Section 9.14.065 ("Finance and Conveyance Maps") of the Moreno Valley Municipal Code.

Section 4. Final Decision on Appeal

That based on the foregoing Recitals, Administrative Record and Findings, and the City Council's denial of the appeals (PAA20-0001 and PAA20-0002) challenging the Planning Commission's certification of the Revised Final EIR and affirmation of Planning Commission Resolution No. 2020-20 approving and adopting the Mitigation Monitoring and Reporting Program and the findings contained therein, for the Revised Final EIR; and approving and adopting the Statement of Overriding Considerations and the findings contained therein, for the Final Revised EIR; and certifying that the Revised Final Environmental Impact Report PEN18-0050 for the World Logistics Center, the City Council hereby denies the appeal filed by Adriano L. Martinez on behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, challenging the Planning Commission's May 14 decision to approve Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only (PAA20-0002), and affirms the Planning Commission adoption of Resolution 2020-21 approving Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, as attached to Resolution 2020-21 as Exhibit A.

Section 5. Repeal of Resolution No. 2015-58

That Resolution No. 2015-58 which approved the former parcel map is hereby repealed and set aside as ordered by Hon. Judge Waters in the Peremptory Writ of Mandate dated June 12, 2018. (Case No: RIC 1510967 [MF])

Section 6. Repeal of Conflicting Provisions

That all the provisions as heretofore adopted by the City Council that are in conflict with the provisions of this Resolution are hereby repealed.

Resolution No. 2020-XX
Date Adopted: June 16, 2020

Section 7. Severability

That the City Council declares that, should any provision, section, paragraph, sentence or word of this Resolution be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words of this Resolution as hereby adopted shall remain in full force and effect.

Section 8. Effective Date

That this Resolution shall take effect immediately upon adoption.

Section 9. Certification

That the City Clerk shall certify to the passage of this Resolution.

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Resolution No. 2020-XX
Date Adopted: June 16, 2020

PASSED AND ADOPTED THIS 16th day of June, 2020.

APPROVED AND ADOPTED this _____ day of _____, _____.

Dr. Yxstian A. Gutierrez
Mayor
City of Moreno Valley

ATTEST:

Pat Jacquez-Nares, City Clerk

APPROVED AS TO FORM:

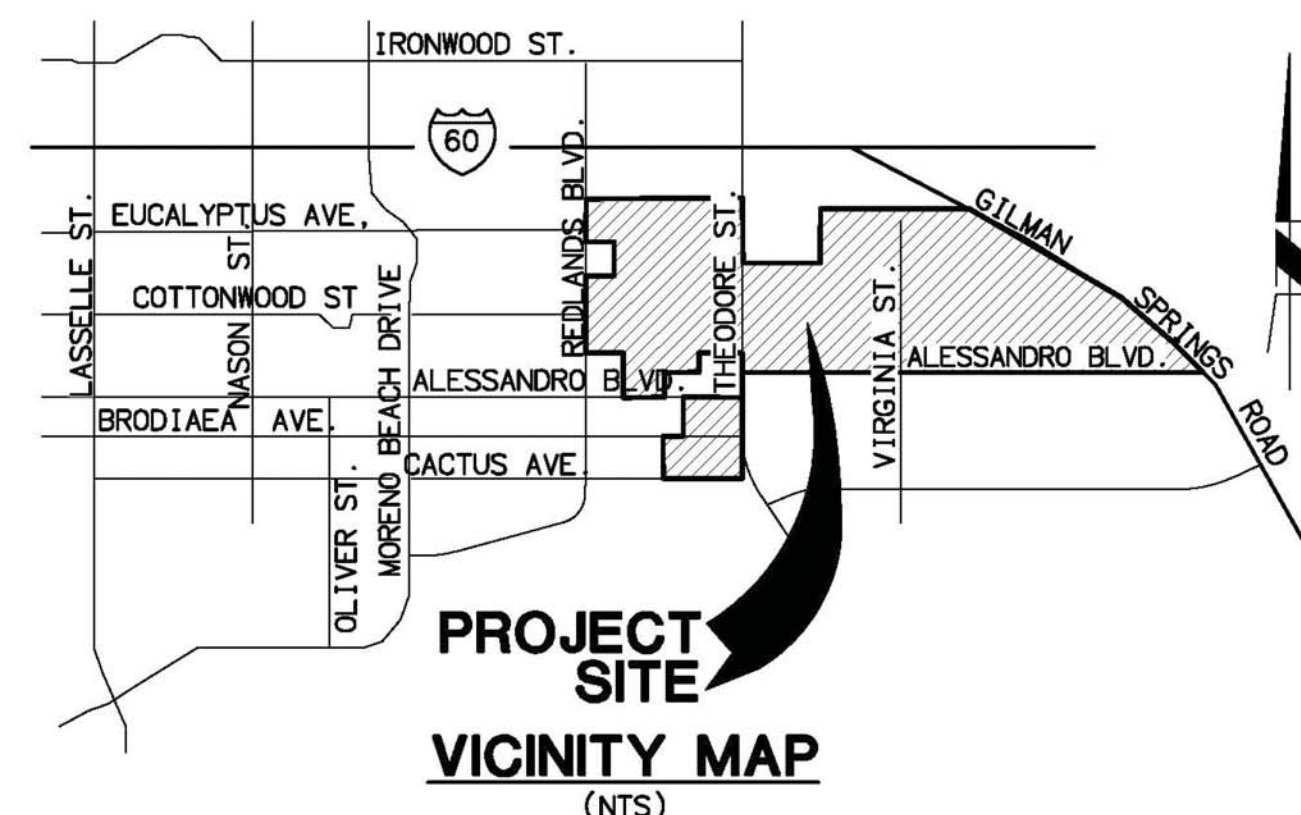
Steven B. Quintanilla, Interim City Attorney

Attachment: 2020-XX Resolution TPM 36457 Appeal (4074 : World Logistics Center)

Resolution No. 2020-XX
Date Adopted: June 16, 2020

PARCEL SUMMARY

Table with 3 columns: PARCEL #, GROSS AC., NET AC. Rows 1-26 showing parcel details.



LEGEND

- Legend items: PARCEL MAP PROJECT BOUNDARY, PROPOSED LOT LINE, EXISTING LOT LINE, etc.

DATA TABLE with columns: BEARING/Delta, RADIUS, LENGTH. Lists 30 survey points.

TENTATIVE PARCEL MAP NO. 36457

TOTAL ACRES: 1,539.2
PREPARED: APRIL 2015
FOR FINANCE AND CONVEYANCE PURPOSES ONLY

ASSESSOR PARCEL NUMBERS: 422-070-005, 010, 017, 018, 019, 020, 021, 022

EASEMENT NOTES:

- Notes 13-30 detailing easements for pipelines, utilities, and other infrastructure.

EASEMENT NOTES:

- Notes 31-50 detailing easements for pipelines, utilities, and other infrastructure.

LEGAL DESCRIPTION

ALL OF BLOCKS 55, 56, 57, 81, 82, 83, 84, 85, 86, 87, 88, 109, 111, 112 and 136 AS SHOWN BY MAP NO. 1 BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY...

GENERAL NOTES:

- Notes 1-17 providing general information about the map, including zoning and survey details.

THIS MAP DOES NOT CREATE LEGAL BUILDING SITES. FURTHER APPLICATIONS ARE NECESSARY TO DEVELOP THIS PROPERTY.

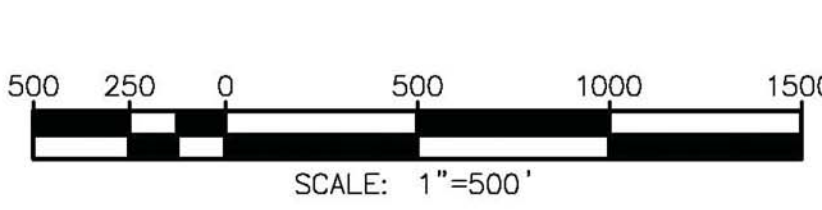
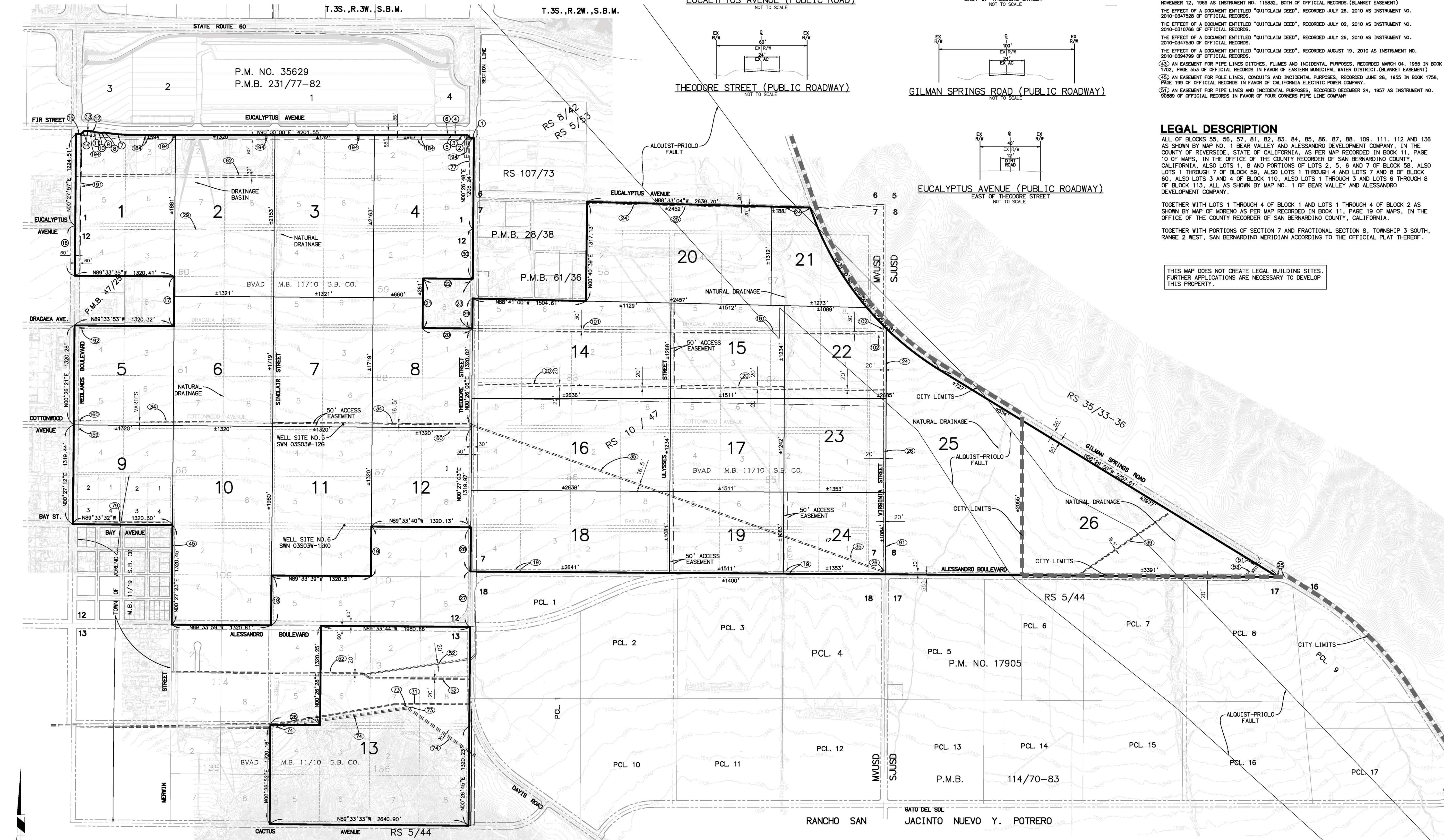


Table with columns: JOB NO., SCALE, DATE, DESIGNED BY, REVISIONS, APP'D, DATE.

RBF CONSULTING logo and contact information: 14725 ALTON PARKWAY, IRVINE, CALIFORNIA 92618-2027.

WORLD LOGISTICS CENTER TENTATIVE PARCEL MAP NO. 36457 FOR FINANCE PURPOSES CITY OF MORENO VALLEY

ORDINANCE NUMBER 2020-_____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, APPROVING THE WORLD LOGISTICS CENTER DEVELOPMENT AGREEMENT

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively "HF") has a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit "A-1" and as illustrated in the depiction set forth in Exhibit "A-2" ("Subject Property"); and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support use on the land subject to the World Logistics Center Specific Plan ("Project"); and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the "Moreno Valley Jobs initiative," which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the "WLC Land Benefit Initiative" to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes; and

WHEREAS, a Revised Final Environmental Impact Report was prepared for the "Project," as described and depicted in the World Logistics Center Land Use and Zoning Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 and this Development Agreement; and

Ordinance No. XXX
Date Adopted: June 16, 2020

WHEREAS, to strengthen the public planning process, encourage private participation in comprehensive planning and reduce the economic risk of development, the California State Legislature adopted Sections 65864 et seq. of the California Government Code, "Development Agreement Statute" which authorizes cities to enter into property development agreements with any person(s) or entity(ies) having a legal or equitable interest in real property for the development of such real property in order to establish certain development rights in the real property; and

WHEREAS, Title 9, Section 9.02.110 ("Development Agreements") of the Moreno Valley Municipal Code acknowledges that the Development Agreement Statute permits local agencies and property owners to enter into development agreements as to matters such as the density, intensity, timing and conditions of development of real properties and that development agreements provide an enhanced degree of certainty in the development process for both the property owner/developer and the public agency; and

WHEREAS, the Agreement will eliminate uncertainty in planning for and secure orderly development of the Subject Property, assure progressive installation of necessary improvements, and ensure attainment of the maximum effective utilization of resources within City at the least economic cost to its citizens; and

WHEREAS, based on the foregoing recitals, City has determined that this Agreement is appropriate under the Development Agreement Statute and the City's "Development Agreement" provisions set forth in Title 9, Section 9.02.110 of the Municipal Code; and

WHEREAS, the Agreement is voluntarily entered into in consideration of the benefits to and the rights created in favor of each of the parties hereto and in reliance upon the various representations and warranties contained herein; and

WHEREAS, the City is authorized to enter into development agreements with persons having legal or equitable interests in real property for the development of such property pursuant to California State general laws: Article 2.5 of Chapter 4 of Division I of Title 7 of the California Government Code commencing with section 65864 (the "Development Agreement Law"), and Article XI, Section 7, of the California Constitution, together with City ordinances; and

WHEREAS, the development of the Subject Property will generate a variety of public benefits to the City, its residents, property owners, taxpayers and surrounding communities; and

WHEREAS, the Project is believed to substantially advance the goals of the City's adopted Economic Development Action Plan, expand and improve the City's property and sales tax base, invest significant private capital into the local

Ordinance No. XXX
Date Adopted: June 16, 2020

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

economy, generate extensive construction employment and new permanent employment opportunities for Moreno Valley and the region, and will improve the severe jobs to housing imbalance that currently exists in the City; and

WHEREAS, among the public benefits, the development of the Project pursuant to the WLCSP will implement goals, objectives and policies of the City's General Plan, and the WLCSP, which will provide logistics development, public utility and open space uses for the Subject Property and for the City; and

WHEREAS, in exchange for the duties and obligations imposed by this Agreement, HF will receive the vested right to develop the Subject Property in accordance with the terms of the Agreement; and

WHEREAS, on May 14, 2020, the Planning Commission, at a duly noticed public hearing adopted Resolution 2020-20, approving and certifying the Revised Final Environmental Impact Report (SCH # 2012021045) and approved and adopted the related Mitigation Monitoring and Reporting Program and a Statement of Overriding Considerations and the findings contained therein; and

WHEREAS, on May 14, 2020, the Planning Commission, at a duly noticed public hearing adopted in Resolution 2020- 21, approving Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only (PEN20-0017); and

WHEREAS, on May 14, 2020, the Planning Commission, at a duly noticed public hearing held pursuant to the Development Agreement Statute and the "Development Agreement" provisions set forth in Title 9, Section 9.02.110 of the Municipal Code, adopted Resolution 2020-22 recommending That the City Council adopt the requisite ordinance approving the 2020 World Logistics Center Development Agreement as attached hereto; and

WHEREAS, the City Council find and determine that the Agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the City General Plan, as amended by the Project Approvals; is compatible with the uses authorized in and the land use regulations prescribed by the City in its Zoning Code; and will promote and encourage the development of the Subject Property by providing a greater degree of certainty with respect thereto, while also providing specified public benefits to the City; and

WHEREAS, on June 16, 2020, after a duly noticed public hearing held pursuant to the Development Agreement Law and the "Development Agreement" provisions set forth in Title 9, Section 9.02.110 of the Municipal Code, the City Council approved the introduction of Ordinance No. ____ (the "Enacting Ordinance") that approves and adopts the Agreement and authorize its execution on behalf of the City.

Ordinance No. XXX
Date Adopted: June 16, 2020

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF MORENO VALLEY DOES ORDAIN AS FOLLOWS:

SECTION 1. RECITALS

That the above Recitals are true and correct and are incorporated as though fully set forth herein.

SECTION 2. APPROVAL OF DEVELOPMENT AGREEMENT

That the City Council hereby approves the Development Agreement by and between the City of Moreno Valley and HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively "HF") and authorizes the Mayor to execute the Development Agreement on behalf of the City of Moreno Valley.

SECTION 3. REPEAL OF ORDINANCE NO. 901

That Ordinance No. 901 which approved the former WLC the Development Agreement in August 2015 is hereby repealed and set aside, which, although not ordered set aside by Hon. Judge Waters in the Peremptory Writ of Mandate dated June 12, 2018. (Case No: RIC 1510967 [MF]), had been approved in reliance on the previous Final EIR because the Development Agreement adopted through the initiative process in November, 2015, found to have been valid at the time the Writ of Mandate was issued, was set aside by the Court of Appeal in August, 2018.

SECTION 4. SEVERABILITY

That the City Council declares that, should any provision, section, paragraph, sentence or word of this Ordinance be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words of this Ordinance as hereby adopted shall remain in full force and effect.

SECTION 5. EFFECTIVE DATE OF ORDINANCE

That this Ordinance shall take effect thirty (30) days after its second reading by the City Council.

SECTION 6. CERTIFICATION

That the City Clerk shall certify to the passage of this Ordinance and shall cause the same to be published according to law.

Ordinance No. XXX
Date Adopted: June 16, 2020

APPROVED AND ADOPTED this _____ day of _____, _____.

Dr. Yxstian A. Gutierrez
Mayor
City of Moreno Valley

ATTEST:

Pat Jacquez-Nares, City Clerk

APPROVED AS TO FORM:

Steven B. Quintanilla, Interim City Attorney

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

Ordinance No. XXX
Date Adopted: June 16, 2020

ATTACHMENT "A"
WLC DEVELOPMENT AGREEMENT
SEE ATTACHED

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

Ordinance No. XXX
Date Adopted: June 16, 2020

Recording Requested by And
When Recorded Return to:

City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552
Attn: City Clerk

[Exempt From Recording Fee Per Gov. Code § 27383]

DEVELOPMENT AGREEMENT
(World Logistics Center)

This DEVELOPMENT AGREEMENT (“Agreement”) is entered into as of this ____ day of _____, 2020, by and between the CITY OF MORENO VALLEY, a California general law municipal corporation (“City”), and HF PROPERTIES, a California general partnership, SUNNYMEAD PROPERTIES, a Delaware general partnership, THEODORE PROPERTIES PARTNERS, a Delaware general partnership, 13451 THEODORE, LLC, a California limited liability company, and HL PROPERTY PARTNERS, a Delaware general partnership (collectively “HF”). The City and HF hereafter are referred to collectively as the “Parties” and individually as a “Party.”

RECITALS

A. Consistent with the City’s economic development and general plan, the City and HF have agreed to enter into this Agreement because the World Logistics Center will be a master planned business park specifically designed to support large global companies and their business and logistics operations which will be a significant revenue generating, job creating and training/education project as further detailed in Exhibit A-3.

B. The City is authorized to enter into development agreements with persons having legal or equitable interests in real property for the development of such property pursuant to California State general laws: Article 2.5 of Chapter 4 of Division I of Title 7 of the California Government Code commencing with section 65864 (the “Development Agreement Law”), and Article XI, Section 7, of the California Constitution, together with City ordinances.

C. The City has enacted an ordinance, codified and set forth in the Moreno Valley Municipal Code as Title 9, Section 9.02.110 (the “Development Agreement Ordinance”) that establishes the procedures and requirements for its consideration of such development agreements upon application by, or on behalf of, persons having legal or equitable interests in real property pursuant to the Development Agreement Law.

D. HF represents and hereby warrants that it has a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City, as described in the legal

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Ordinance No. XXX
Date Adopted: June 16, 2020

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

description set forth in Exhibit "A-1" and as illustrated in the depiction set forth in Exhibit "A-2" (the "Subject Property"). The City has been provided proof of the records HF relies upon for the representation and warranty by HF. City is relying upon this evidence and considers it to be an element of HF's consideration for this Agreement.

E. In clarification of the foregoing the Subject Property includes approximately 85 acres, as described on Exhibit "A-1" and depicted in Exhibit "A-2" that is currently located in an unincorporated area of Riverside County but is proposed by HF to be annexed to the City within five years, subject to the process and approval of the Riverside County Local Agency Formation Commission ("LAFCO") (the "Annexation").

F. The World Logistics Center Specific Plan ("WLCSP") allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support use on the land subject to the WLCSP. The WLCSP, a General Plan Amendment and a Zone Change of the Subject Property and the Annexation, were unanimously approved by the City Council of the City on November 24, 2015, in response to initiative petitions submitted to it. The Development, as hereinafter defined, includes both HF improvements to the Subject Property and City entitlements, including but not limited to, Tentative Parcel Map 36457 and annexation of an 85-acre parcel along Gilman Springs Road. The Development, including the Project, as defined herein, will also include subdivision maps and other approvals needed to construct the facilities proposed for the Subject Property. The permitted uses of the Subject Property, including a plan of development, the density and intensity of use, the maximum height and size of proposed buildings are set forth in the WLCSP, as it may be amended from time to time, and are hereby incorporated by reference. The City's certification of the Environmental Impact Report and approval of the Tentative Parcel map are conditions precedent to this Agreement.

G. The development of the Subject Property will generate a variety of public benefits to the City, its residents, property owners, taxpayers and surrounding communities. The Project is believed to substantially advance the goals of the City's adopted Economic Development Action Plan, expand and improve the City's property and sales tax base, invest significant private capital into the local economy, generate extensive construction employment and new permanent employment opportunities for Moreno Valley and the region, and will improve the severe jobs to housing imbalance that currently exists in the City. Among the public benefits, the development of this Project pursuant to the WLCSP will implement goals, objectives and policies of the City's General Plan, and the WLCSP, which will provide logistics development, public utility and open space uses for the Subject Property and for the City. In exchange for the duties and obligations imposed by this Agreement, HF will receive the vested right to develop the Subject Property for the Term in accordance with the terms of this Agreement.

H. The City has previously adopted the Economic Development Action Plan ("EDAP"). The WLCSP responds to a portion of the EDAP. The eastern portion of Moreno Valley lacks the infrastructure necessary to support and implement the City's EDAP. To allow for the development of the World Logistics Center and the WLCSP, HF is willing to provide and assist the City in the development of infrastructure in support of the City's economic plan which may be in excess of HF's fair share and therefore may provide broader benefits. The City and HF desire to ensure that all beneficiaries of the Infrastructure Improvements will pay their fair

share per the Municipal Code. Therefore this Agreement includes reference to the City’s usual method for reimbursement to an owner for the amount of the costs of such Infrastructure Improvements which exceeds the fair share of those costs and accrues to the benefit of other owners.

I. On _____, 2020, the Planning Commission of the City, at a duly noticed public hearing certified, in Resolution 2020-___, the Revised Final Environmental Impact Report (SCH # 2012021045) (the “EIR”) and approved the related Mitigation Monitoring and Reporting Program and, in Resolution 2020- ___, Tentative Parcel Map 36457, PEN20-0017.

J. On _____, 2020, the Planning Commission of the City, at a duly noticed public hearing held pursuant to the Development Agreement Law and the Development Agreement Ordinance, recommended, in Resolution 2020-___ that the City Council find and determine that this Agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the City General Plan, as amended by the Project Approvals; is compatible with the uses authorized in and the land use regulations prescribed by the City in its Zoning Code; and will promote and encourage the development of the Subject Property by providing a greater degree of certainty with respect thereto, while also providing specified public benefits to the City.

K. On _____, 2020, after a duly noticed public hearing held pursuant to the Development Agreement Law and the Development Agreement Ordinance, the City Council of the City approved the introduction of Ordinance No. ____ (the “Enacting Ordinance”) that would approve and adopt this Agreement and authorize its execution on behalf of the City. On _____, 2020, the City Council of the City adopted the Enacting Ordinance.

L. The Parties intend that HF will proceed with the Development upon the Subject Property pursuant to this Agreement within the Term.

AGREEMENT

NOW, THEREFORE, in consideration of the above recitals which are incorporated herein and intended to assist with the interpretation of this Agreement, and of the mutual covenants hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and HF agree as follows:

ARTICLE 1 DEFINITIONS.

The following terms when used in this Agreement shall, unless defined elsewhere in this Agreement, have the meanings set forth below:

1.1 “Agreement” shall mean this Development Agreement by and between the City and HF and any subsequent amendments.

1.2 “City” shall mean the City of Moreno Valley, a municipal corporation, organized and existing under the general laws of the State of California.

1.3 “City Council” shall mean the governing body of the City.

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

1.4 “Development” shall mean the improvement of the Subject Property for the purposes of completing the structures, improvements and facilities composing the Project, including but not limited to: grading; the construction of infrastructure related to the Project whether located within or outside the Subject Property; the construction of buildings and structures; construction of post-development storm drain related improvements and the installation of landscaping and public facilities and improvements. “Development” also includes the maintenance, repair, reconstruction, modification, or redevelopment of any building, structure, improvement, landscaping, or facility after the construction and completion thereof on the Subject Property. The Development shall at all times conform to the Agreement.

1.5 “Development Impact Fee,” “Development Impact Fees” or “DIF” means for purposes of this Agreement only those fees imposed pursuant to Moreno Valley Municipal Code Sections 3.42.070 (police facilities), 3.42.080 (City hall facilities), 3.42.090 (corporate yard facilities) and 3.42.100 (maintenance equipment). The term “Development Impact Fees” (or “DIF”) does not include those fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals), 3.42.050 (interchange improvements) and 3.42.060 (fire facilities).

1.6 “Development Plan” shall mean the plan for Development of the Subject Property pursuant to the Existing Regulations and including the Infrastructure Improvements.

1.7 “Development Requirement(s)” shall mean any fees or requirement(s) of the City imposed in connection with or pursuant to the Project Approvals such as the construction or improvement of public facilities or the payment of fees or assessments in order to lessen, offset, mitigate or compensate for the impacts of the Development.

1.8 “Effective Date” shall mean the date that is ninety (90) days after the date the City Council adopts the Enacting Ordinance unless litigation is commenced in which case the Effective Date shall mean the date on which the litigation is finally terminated, whether by dismissal which leaves all of the Project Approvals in place or by the entry of a final judgment, free from further appellate review, which upholds the Project Approvals. Notwithstanding the forgoing, Article 7 shall be immediately effective thirty one (31) days after the date the City Council adopts the enacting ordinance.

1.9 “Enacting Ordinance” shall mean the City Council adopted ordinance described in Recital K of this Agreement.

1.10 “Existing Regulations” shall mean the Project Approvals, Development Requirements, and all ordinances, resolutions, codes, rules, regulations and official policies of City, adopted and effective on the date of the adoption of the Enacting Ordinance governing Development and use of the Subject Property, including but not limited to the permitted use of land, the density or intensity of use, the maximum height and size of proposed building, and the architectural design, improvement and construction standards and specifications applicable to the Development of the Subject Property, all as set forth in the General Plan, WLCSP and Zone Change adopted by the City Council of the City on November 24, 2015. The City shall compile two sets of the Existing Regulations. Once that compilation has been completed by the City, one

set will be stored with the Agreement by the City Clerk for future use and certainty of requirements and the other set will be given to HF.

1.11 "HF" shall mean HF PROPERTIES, SUNNYMEAD PROPERTIES, THEODORE PROPERTIES PARTNERS, 13451 THEODORE, LLC and HL PROPERTY PARTNERS, and/or its successors or assigns to all or any portion of the Subject Property.

1.12 "Infrastructure Improvements" shall mean all public infrastructure improvements on and off the Subject Property.

1.13 "Judgment(s)" shall mean one or more final or interim judgment(s) of a court of competent jurisdiction affecting the rights of the Parties hereunder.

1.14 "Moreno Valley Municipal Code" shall mean the City's Municipal Code in effect on the date of the adoption of the Enacting Ordinance.

1.15 "Mortgagee" shall mean a mortgagee of a mortgage, a beneficiary under a deed of trust or any other security device, a lender, or each of their respective successors and assigns.

1.16 "Parcel" shall mean any lot created by a recorded subdivision or parcel map.

1.17 "Project" shall mean the Development and operation of the Subject Property pursuant to and consistent with the Development Plan and the provisions of this Agreement.

1.18 "Project Approvals" shall mean, collectively, the General Plan Amendment, the WLCSP, the Zone Change, the Annexation, all approved through the initiative process on November 24, 2015, and Tentative Parcel Map 36457.

1.19 "Subject Property" shall mean that certain real property consisting of the property more particularly described in Exhibit "A-1" attached hereto and depicted on Exhibit "A-2" attached hereto, any real property subject to the WLCSP acquired by HF after the date on which the Enacting Ordinance is adopted and all real property intended to be included by the Annexation. Until the Annexation is finally accomplished by HF at its sole cost and expense, nothing in this Agreement shall apply to the property to be annexed.

1.20 "Subsequent Development Approvals" shall mean any and all ministerial and/or discretionary permits, licenses, consents, rights and privileges, and other ministerial and/or discretionary actions approved or issued by City in connection with Development of the Subject Property after the date of the adoption of the Enacting Ordinance, including all associated environmental documentation and mitigation measures pursuant to the California Environmental Quality Act.

1.21 "Subsequent Regulations" shall mean any ordinances, resolutions, codes, rules, regulations and official policies of the City adopted and effective after the date of the adoption of the Enacting Ordinance.

1.22 "Term" shall mean the period of time during which this Agreement shall be in effect, enforceable and bind the Parties, as set forth below in Section 3.5 of this Agreement.

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Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

Ordinance No. XXX
Date Adopted: June 16, 2020

ARTICLE 2 EXHIBITS.

The following documents are attached to, and by this reference made a part of, this Agreement:

- Exhibit “A-1” Legal Description of the Subject Property
- Exhibit “A-2” Depiction of the Subject Property
- Exhibit “A-3” Public Benefits

ARTICLE 3 GENERAL PROVISIONS.

3.1 Binding Effect of Agreement. From and following the Effective Date of this Agreement and throughout the Term, Development of the Subject Property and the City’s actions on applications for Subsequent Development Approvals affecting the Subject Property and the Development of the Subject Property shall be governed by the terms and conditions of this Agreement, all Project Approvals and all Subsequent Development Approvals. Any matter not addressed in the foregoing documents shall be regulated pursuant to then applied routine City practices and ordinances.

3.2 Ownership of Subject Property. HF represents and warrants that it is the holder of legal and equitable interests to all of the property described and shown in Exhibits “A-1” and “A-2” and thus is qualified to enter into and to be a party to this Agreement in accordance with Government Code section 65865(b), as set forth in documentation HF provided to City and upon which City relies as part of the consideration for this Agreement.

3.3 Addition of Parcels to This Agreement. The terms of this Agreement shall apply to the 85 acre Parcel described in Recital E upon its annexation into the City which process is intended to be completed within five years by HF at HF’s sole cost and to any real property subject to the WLCSP acquired by HF after the date on which the Enacting Ordinance is adopted.

3.4 Assignment Rights. From time to time HF may sell or otherwise transfer title to buildings or property in the WLC. HF shall have the right subject to City’s prior written approval to sell, transfer, or assign the Subject Property, in whole or in part (provided that no such parcel transfer shall violate the Subdivision Map Act, Government Code Section 66410, et seq.) to any person, partnership, joint venture, firm or corporation at any time during the Term of this Agreement; provided, however, that any such sale, transfer or assignment (collectively, “Assignment”) shall include the assignment and assumption of the rights, duties and obligations arising under or from this Agreement be made in strict compliance with the following conditions:

- (a) No assignment of any right or interest under this Agreement shall be made unless made together with the assignment of all or the concomitant part of the Subject Property.
- (b) Prior to any such Assignment, HF shall provide City with an executed agreement, in a form reasonably acceptable to City, by the purchaser, transferee or assignee (collectively, “Assignee”) and providing therein that the Assignee expressly and unconditionally

assumes all the duties and obligations of HF under this Agreement with respect to the portion of the Subject Property being transferred. City shall have the sole power to allocate, prorate, or otherwise apportion any term, provision, fee, contribution, or similar duty or obligation of HF, so that City, HF, and assignee have a specific agreement as to the duties and obligations, of all Parties after the Transfer.

(c) Any Assignment of this Agreement will require the prior written consent of the City, which will not be unreasonably withheld or delayed. The City's approval will be based upon the City's reasonable determination, in accordance with the standard set forth in Section 3.4.1(d) as to whether or not such Assignee has the requisite ability to complete the portion of the Subject Property being transferred. Within thirty (30) days following receipt by the City of written notice regarding Assignment (such notice must include development experience information regarding the Assignee sufficient to allow the City to make the above determination) the City will notify HF regarding its approval or disapproval of such Assignment. Failure of the City to respond in writing within thirty (30) days of receipt of the notice of the Assignment shall constitute approval of the assignment.

Any Assignment not made in compliance with the foregoing conditions shall result in HF continuing to be responsible for all obligations under this Agreement. Notwithstanding the failure of any Assignee to receive City approval and/or execute the Agreement required by subparagraph (c) above, the burdens of this Agreement shall be binding upon such Assignee, but the benefits of this Agreement including but not limited to DIF, shall not inure to such Assignee until and unless such Assignment is approved by the City and executed.

3.4.1 Release of HF. Notwithstanding any Assignment, HF shall continue to be obligated under this Agreement unless HF is given a release in writing by City, which release shall be provided by City upon the full satisfaction by HF of the following conditions:

(a) HF no longer has a legal or equitable interest in the portion of the Subject Property being transferred other than a lien on the portion of the Subject Property being transferred to secure the payment of the purchase price to HF. HF shall provide the City written notice to the City of the party to which the lien is to be transferred, upon transfer of the lien, pursuant to this Article 3.

(b) HF is not then in default under this Agreement in City's sole reasonable determination, subject to procedure set forth in Section 5.2 of this Agreement.

(c) HF has provided City with the notice and executed agreement and other information required under subparagraphs (b) and (c) of Subsection 3.4 above.

(d) The City has reviewed and approved the Assignee and the Assignment, such approval to include a determination by the City that the Assignee has the requisite ability to complete the portion of the Subject Property being transferred.

(e) The Assignee provides City with security equivalent to any security previously provided by HF to secure performance of its obligations hereunder with respect to the portion of the Subject Property being transferred. The City shall cooperate with HF to effectuate

the substitution of security provided by HF to that to be provided by the Assignee with respect to the portion of the Subject Property being transferred.

(i) HF has paid City all monies then due and owing to City under this Agreement.

3.4.2 Subsequent Assignment. Any subsequent Assignment after an initial Assignment shall be made only in accordance with and subject to the terms and conditions of this Article. All subsequent Assignors must deliver written acknowledgement of this Agreement, and the Assignees duties under the Agreement or the City may, in its sole discretion, terminate this Agreement as to that owner's parcel(s).

3.4.3 Termination of Agreement With Respect to Individual Parcels upon Sale and Completion of Construction. Notwithstanding any other provisions of this Agreement, this Agreement shall terminate with respect to any Parcel and such Parcel shall be released and no longer be subject to this Agreement without the execution or recordation of any further document upon satisfaction of the following conditions:

(a) The Parcel has been finally subdivided and sold or leased for a period longer than one year to a member of the public or other ultimate user; and,

(b) A Certificate of Occupancy has been issued for each new structure on the Parcel shown on the plot plan required by Section 11.3.2 of the WLCSP, and the fees set forth under this Agreement have been paid.

(c) The Parcel has no duty to contribute monies or render performance under this Agreement.

3.5 Term. Unless earlier terminated as provided in this Agreement, this Agreement shall continue in full force and effect until the earlier of (i) the date of completion of the last portion of the Development, or (ii) the date that is fifteen (15) years from and after the Effective Date of this Agreement unless new Certificates of Occupancy have been granted by the City for new buildings on the Subject Property consistent with the Development Plan for not less than twelve-million (12,000,000) square feet (gross floor area as defined by Moreno Valley Municipal Code 9.15.030) in which event the Term shall be extended for an additional ten (10) years, subject to extension pursuant to Section 11.9 below (the "Term"). Alternatively, if HF is, for any reason, unable to obtain new Certificates of Occupancy for not less than eight (8) million square feet, and up to twelve million (12,000,000) square feet within the original fifteen (15) year Term, it shall be entitled to have this Agreement extended for an additional ten (10) years, subject to extension pursuant to Section 11.9 below, upon the payment to the City of one million dollars (\$1,000,000) prior to the expiration of the original fifteen (15) year term.

3.6 City Cooperation.

(a) In anticipation of the effort necessary to facilitate the timely processing and permitting of project improvements, HF may request the City to designate a mutually agreeable individual (the "City's WLC Coordinator") who shall have the authority to facilitate and coordinate development services within the City and with HF for all actions to be taken by

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the City which are needed for the development of the Project, including, but not limited to, discretionary approvals, entitlements, site plans, grading, building and occupancy permit applications and inspections through the City's review and approval processes, all at the full cost of HF, which HF shall pay in advance and replenish upon City's request, from time to time. If any payments are not received by City when requested, the WLC coordinator shall cease acting until the funds are received and normal City protocols shall govern. All applications submitted to the City shall be evaluated for completeness within twelve (12) working days of receipt by the City. If not complete, the City shall immediately ensure that HF is notified of what additional information is required.

(b) Upon receipt of an application deemed complete pursuant to subsection 3.6(a) above for a site, grading, building, occupancy, or similar permit, the City shall process, review and approve or disapprove the application within ten (10) working days for the first submittal and within ten (10) working days of any subsequent submittals.

(c) It shall be the City's WLC Coordinator's responsibility to ensure that all of the time limits set forth above are met.

(d) The Project shall, pursuant to ordinary procedures, participate in the City's "Time and Materials Fee Program" which is designed to ensure that the City is reimbursed by HF for its actual costs of providing discretionary approvals, entitlements, planning, grading, and building permits and inspections and fire prevention services. For convenience this shall include the payments due under sub sections 3.6(a) and 3.6(e).

(e) The City shall, pursuant to City's standard contracting procedures, maintain on-call contracts with at least three qualified entities or persons, mutually acceptable to both the City and HF, who can be called upon to immediately provide the services set forth above when the City's WLC Coordinator determines that the City, utilizing typical City staff resources, is unlikely to be able to meet the time limits set forth above. HF shall be solely responsible for the cost of using the qualified private entities or persons. HF shall deposit with City a sum City then determines necessary for such consultants, immediately upon written request from City. HF shall replenish such funds, from time to time, upon written request from City. If any funds are not received per City's request, the consultants shall, without liability, cease work until such money is received.

(f) The City's WLC Coordinator shall cooperate with HF in obtaining any permits or approvals needed from any other agency at full cost to HF.

(g) The City, at HF's request, shall meet with HF to consider in good faith, economic incentives sought by HF similar to those approved for logistics projects in other areas of the City after the Effective Date.

3.7 Time of the Essence. The Parties expressly acknowledge and agree that time is of the essence in the performance of the provisions of this Agreement.

3.8 Mutual Waiver of Estoppel Defenses by Parties. Notwithstanding any legal authorities to the contrary concerning the doctrines of waiver and estoppel as applied to public entities and the actions or inactions of public agencies or public agency officers and officials, the

Parties acknowledge and agree that each Party and its successors and assigns to all or any interest in the Subject Property are relying upon the contents of this Agreement and the Parties' execution of this Agreement and the recordation hereof, and that in consideration of such material reliance, each Party shall now be estopped from denying the underlying validity of this Agreement and each Party knowingly and expressly waives any such claim or defense.

ARTICLE 4 DEVELOPMENT OF THE PROPERTY.

4.1 Vested Right to Develop. During the Term, HF or its Assignee, shall have a vested right to develop the Subject Property in accordance with the Existing Regulations, and as subject to the provisions of this Agreement.

4.2 Effect of Agreement on Land Use Regulations. Except as otherwise provided under the terms of this Agreement, the rules, regulations and official policies governing permitted uses of the Subject Property, the density and intensity of use of the Subject Property, the maximum height and size of proposed buildings, and the design, improvement, and construction standards and specifications applicable to Development of the Subject Property, shall be only the Existing Regulations and those contained in the Development Plan.

4.3 Subsequent Development Approvals. When required by the Moreno Valley Municipal Code, the City shall accept for processing, review and take action upon all properly filed applications for Subsequent Development Approvals. The City further agrees that, unless otherwise requested by HF, the City shall not amend or rescind any Subsequent Development Approvals after such approvals have been granted by the City except as otherwise provided for in Title 9 of the City Municipal Code, or as directed by court order, or as related to approvals not granted by the City. Any Subsequent Development Approval, when granted, shall be deemed to be part of the Existing Regulations from the date of approval except as mandated by court order, or as specified in approvals not granted by the City.

4.4 Timing of Development. HF represents that it intends to commence and complete the physical improvements specified in the Development Plan for the Project. HF cannot specify the specific timing of development. HF will use its best efforts to commence construction at the earliest possible date consistent with market conditions. Because the California Supreme Court held in *Pardee Construction Co. v. City of Camarillo* (1984) 37 Ca1.3d 455, that the failure of the parties therein to provide for the timing of development resulted in a latter adopted initiative restricting the timing of development to prevail over such parties' agreement, it is the Parties' intent to cure that deficiency by expressly acknowledging and providing that HF shall have the right to develop the Subject Property at its own timing. In addition, to the extent HF decides to proceed with the Development of the Subject Property, City shall cooperate with HF with respect to the improvement of the Development of the Subject Property. If HF determines, in its sole and absolute discretion, to develop portions or phases of the Project, the City shall allow the phasing of public improvements unless the City determines that generally applied City of Moreno Valley Municipal engineering or planning requirements demand that additional or complete public improvements be made. The public improvements to be provided would be only those needed to serve the portion or phase being developed consistent with the environmental analysis which shall demonstrate to the City that the public improvements to be provided would be only those needed to serve the portion or phase being developed.

4.5 Terms of Maps and Other Project Approvals. Pursuant to California Government Code Sections 66452.6(1) and 65863.9, the term of any subdivision or parcel map that may be processed on all or any portion of the Subject Property and the term of each of the Development approvals, including Tentative Parcel Map 36457, and any Subsequent Development Approvals, shall be extended until the expiration of the Term.

4.6 Changes and Amendments. The Parties acknowledge that although Development of the Project may require Subsequent Development Approvals, such Development shall be in compliance with this Agreement including the Development Plan. The above notwithstanding, HF may determine that changes are appropriate and desirable in the existing Project Approvals or Development Plan. In the event HF finds that such a change is appropriate or desirable, HF may apply in writing for an amendment to the existing Project Approvals or the Development Plan to effectuate such change. The City shall review and process any request for an amendment in the same manner that it would review and process a similar request for an amendment from any other owner of commercial or industrial land in similar circumstances. Any amendment to the Project Approvals or the Development Plan, when granted, shall be deemed to be part of the Existing Regulations from the date of the grant. Such amendments shall not be unreasonably withheld.

4.7 Reservation of Authority.

4.7.1 Limitations, Reservations and Exceptions. Notwithstanding any other provision of this Agreement, the following Subsequent Regulations shall apply:

(a) Procedural regulations consistent with this Agreement relating to hearing bodies, petitions, applications, notices, findings, records, hearing, reports, recommendations, appeals and any other matter of procedure subject to the City's obligations under Section 3.6, and as may be the subject to future general law enactments by the State of California.

(b) Changes adopted by the California Building Standards Commission as part of the then current versions of Title 24 – the California Building Standards Code – and also adopted by the City as Subsequent Regulations.

(c) Subsequent Regulations, not otherwise specified under this Section 4.7.1, that are not in conflict with the Existing Regulations and the Development Plan.

(d) Subsequent Regulations, not otherwise specified under this Section 4.7.1, that are in conflict with the Existing Regulations or the Development Plan provided HF has given written consent to the application of such regulations to Development of the Subject Property at HF's sole and absolute discretion.

(e) Increased DIF, as defined in Section 1.5 of this Agreement, which shall be paid in the amount of the DIF in effect at the time that they are to be paid.

(f) Judgment(s) and/or federal, state and county laws and regulations which the City is required to enforce as against the Subject Property or the Development of the Subject Property.

4.7.2 Further Future Discretion of City. This Agreement shall not prevent the City, in acting on Subsequent Development Approvals, from applying Subsequent Regulations allowed under Section 4.7.1. Further, it is also understood and acknowledged by the Parties that the Project Approvals contemplate that the City may be required, in certain circumstances, to undertake further environmental review of Subsequent Development Approvals. If the circumstances set forth in CEQA Guideline Section 15162 occur in the context of the City considering Subsequent Development Approvals, or if otherwise required by the EIR, the City is required to, and shall, without being subject to claim, assertion of breach or other challenge by HF or Assignee exercise the maximum discretion authorized by law, consistent with the terms of CEQA and this Agreement.

4.7.3 Modification or Suspension by Federal or State, County, or Multi-Jurisdictional Law. In the event that any Judgment(s) or federal, state, county, or multi-jurisdictional laws or regulations, enacted after the Effective Date of this Agreement, prevent or preclude compliance with one or more of the provisions of this Agreement, such provisions of this Agreement shall be modified or suspended as may be necessary to comply with such Judgment(s) or federal, state, county, or multi jurisdictional laws or regulations, and this Agreement shall remain in full force and effect to the extent it is not inconsistent with such laws or regulations and to the extent such laws or regulations do not render such remaining provision impractical to enforce.

4.8 Payment of, and Reimbursement for, the Cost of Improvements Paid for by HF Which Are in Excess of HF's Fair Share. HF shall satisfy the requirements imposed by Mitigation Measure 4.15.7.4.A, as set forth in the EIR, to ensure that all of the Development's impacts on the City's circulation system, including, but not limited to, improvements to arterial streets, traffic signals and interchanges, are mitigated. Because HF will be responsible for paying for or constructing all circulation-related improvements, it shall not pay the fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals) and 3.42.050 (interchange improvements). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.9 Provision of a "turnkey" Fire Station. HF shall, at its own cost, provide a fully constructed, fully equipped fire station and fire station site, including fire trucks, as specified by the City's Fire Chief. The fire station's furniture and fixtures shall be reasonably comparable to those of the most recently completed fire station within the City. The fire station, equipment and trucks shall be provided as and when directed by the Fire Chief. Because HF will be responsible for the provision of the fire station, fire station site, equipment, and trucks, it shall not pay the fee imposed by Moreno Valley Municipal Code Section 3.42.060 (fire facilities). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.10 City's Provision of Public Infrastructure and Services. Except as otherwise prescribed in this Agreement and/or as required of the development through existing or future mitigation measures, development standards, and conditions of approval, the City shall provide the public infrastructure and services which are not HF's responsibility as determined by the City with timing at the sole and absolute discretion of the City.

4.11 Local Hiring Program. HF will establish a WLC Local Hiring Program, at HF's cost to identify, align, and facilitate educational interests and programs with workforce development programs that facilitate the hiring of Moreno Valley residents for job opportunities at the World Logistics Center, and associated jobs not directly at WLC, but in industries that support WLC. HF will require its contractors, suppliers and tenants to be active participants in Moreno Valley Employment Resource Center ("ERC") programs including, but not limited to, the job opportunity announcement program. World Logistics Center employers will be requested to submit all job announcements to the ERC at least one week prior to providing such announcements to other agencies or to the general public. Potential employers will be requested to provide information regarding job opportunities to the ERC including details regarding job titles, minimum qualifications, application processes, and employer contact information. HF shall request that subsequent users to make good faith efforts to hire Moreno Valley City residents. HF shall, upon City's request from time to time, provide to the City proof of its efforts under this section and the success of HF's efforts. HF shall also participate with the Hire MoVal Incentive Program, which was adopted by the City Council on April 28, 2015, and as it may be amended from time to time.

4.12 Education/Innovation/Training/Library Funding.

The City and HF are especially interested in ensuring that the residents of Moreno Valley are provided education resources and obtain every opportunity to secure the jobs which will be created by the operation of the World Logistics Center. Toward that end, HF is willing to contribute six million, nine hundred and ninety three thousand dollars (\$6,993,000), to be used by the City to provide and enhance educational and workforce development training in the supply chain and logistics industries, as follows:

(a) HF shall contribute no less than five million, two hundred sixty eight thousand dollars (\$5,268,000), one million dollars (\$1,000,000) to be contributed at the issuance of the first building permit for a logistics building on the Subject Property and \$0.11/square foot to be paid at the time of the issuance of the building permit for each succeeding building, excluding the fire station;

(b) In addition to the foregoing, beginning on the Effective Date and on each anniversary of that date thereafter, HF shall contribute to the City one hundred thousand dollars (\$100,000) per year for the next six (6) years; and

(c) In addition to the foregoing, beginning in the 7th year on the anniversary date of the Effective Date and continuing throughout the Term, HF shall contribute to the City one hundred twenty five thousand dollars (\$125,000) per year, on the specified anniversary date of the Effective Date, so long as this Agreement is in effect.

4.13 State Route 60 Landscape, Signage, Bridge Design Program. City shall set up a joint City/HF committee to develop freeway related landscaping, bridge architectural concepts, engineering and freeway signage regulations for SR-60 between Redlands Boulevard and Gilman Springs Road. The guidelines, concepts and regulations shall be developed in an expeditious manner. The City shall contribute up to Fifty Thousand Dollars (\$50,000) and HF

shall match the City’s contributions on a ten to one basis, up to Five-Hundred Thousand dollars (\$500,000).

4.14 Air Filtration Systems for Seven Properties on World Logistics Parkway and Dracaea Avenue. Notwithstanding the findings of the EIR, Owner agrees to fund the installation of air filtration systems meeting ASHRSE Standard 52.2 MERV-13 standards at the locations listed below, not to exceed \$25,000 per property. Property owners shall be under no obligation to accept such offer. Prior to the issuance of the first grading permit within the WLCSP, Owner shall provide documentation to the City confirming that an offer has been extended to each of the owners of said properties, and \$175,000 shall be deposited in a City account designated for this purpose and an agreement regarding the use and distribution of funds shall be executed between City and Owner. The affected property owners shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, Owner shall work with each owner to ensure the filtration system is properly installed within one year of acceptance. Owner shall invoice City for reimbursement of payments up to \$25,000 per property. This provision applies only to the following seven houses:

12400 World Logistics Center Parkway, Moreno Valley, CA 92555 current APN: 422-020-010

13100 World Logistics Center Parkway, Moreno Valley, CA 92555 current APN: 422-070-029

13200 World Logistics Parkway, Moreno Valley, CA 92555 current APN: 422-070-032

13241 World Logistics Parkway, Moreno Valley, CA 92555 current APN: 478-220-014

29080 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 478-220-030

29140 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 478-220-009

30240 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 422-070-037

ARTICLE 5 REVIEW FOR COMPLIANCE.

5.1 Periodic Review. The City shall review this Agreement annually, on or before the anniversary of the Effective Date, in order to ascertain the good faith compliance by HF with the terms of the Agreement. As part of that review, HF or its successor and assigns shall submit an annual monitoring review statement describing its actions in compliance with this Agreement, in a form acceptable to the Community Development Director or his/her authorized designee, within thirty (30) calendar days after written notice therefrom requesting such a statement. The statement shall be accompanied by an annual review and administration fee sufficient to defray the estimated costs of review and administration of the Agreement during the succeeding year. The amount of the annual review and administration fee shall be set by resolution of the City Council. No failure on part of the City to conduct or complete the review as provided herein shall have any impact on the validity of this Agreement. HF shall, for the first year, deposit \$1,000.00 on the Effective Date for the first year of review.

5.2 Procedure. Each Party shall have a reasonable opportunity to assert matters which it believes have not been undertaken in accordance with the Agreement, to explain the basis for such assertion, and to receive from the other Party a justification of its position on such matters.

5.2.1 If on the basis of the Parties' review of any terms of the Agreement, either Party concludes that the other Party has not complied in good faith with the terms of the Agreement, then such Party may issue a written "Notice of Non-Compliance" specifying the grounds therefor and all facts demonstrating such non-compliance.

5.2.2 The Party receiving a Notice of Non-Compliance shall have thirty (30) calendar days to cure or remedy the non-compliance identified in the Notice of Non-Compliance, or if such cure or remedy is not reasonably capable of being cured or remedied within such thirty (30) days period, to commence to cure or remedy the non-compliance and to diligently and in good faith prosecute such cure or remedy to completion.

5.2.3 If the Party receiving the Notice of Non-Compliance does not believe it is out of compliance and contests the Notice, it shall do so by responding in writing to said Notice within thirty (30) calendar days after receipt of the Notice.

5.2.4 If a Notice of Non-Compliance is contested, the Parties shall, for a period of not less than fifteen (15) calendar days following receipt of the response, seek to arrive at a mutually acceptable resolution of the matter(s) occasioning the Notice. In the event that a cure or remedy is not timely effected or, if the Notice is contested and the Parties are not able to arrive at a mutually acceptable resolution of the matter(s) by the end of the fifteen (15) calendar day period, the party alleging the non-compliance may thereupon pursue the remedies provided in Article 6 of this Agreement.

5.2.5 Neither Party hereto shall be deemed in breach if the reason for non-compliance is due to a "force majeure" as defined in, and subject to the provisions of, Section 11.9 below or any other non performance authorized by this Agreement.

5.3 Certificate of Agreement Compliance. If, at the conclusion of an annual review, HF is found to be in compliance with this Agreement, City shall, upon request by HF, issue a Certificate of Agreement Compliance ("Certificate") to HF stating that after the most recent Periodic Review and based upon the information known or made known to the City that (1) this Agreement remains in effect and that (2) HF is in compliance. The Certificate, shall be in recordable form, shall contain information necessary to communicate constructive record notice of the finding of compliance, and shall state that the Certificate expires upon the earlier of (i) one (1) year from the date thereof, or (ii) the date of recordation of a Notice of Termination of Development Agreement. HF may record the Certificate with the County Recorder. Additionally, HF may at any time request from the City a Certificate stating, in addition to the foregoing, which obligations under this Agreement have been fully satisfied with respect to the Subject Property, or any lot or parcel within the Subject Property.

ARTICLE 6 DEFAULT AND REMEDIES.

6.1 Specific Performance; Waiver of Damages. The Parties acknowledge and agree that specific performance is the preferred remedy available for the enforcement of this Agreement. Accordingly, both Parties hereby waive the right to obtain monetary damages from the other Party by reason of default of this Agreement. Subject to the procedure set forth in Section 5.2 above, any material default by HF or the City of the Agreement that is not timely cured by HF or the City shall be deemed a material default by HF or the City of this Agreement.

6.2 Termination of the Agreement.

6.2.1 Termination of Agreement for Default of HF. The City in its reasonable discretion may terminate this Agreement for any failure of HF to perform any material duty or obligation of HF hereunder or to comply in good faith with the terms of this Agreement (hereinafter referred to as "default" or "breach"); provided, however, the City may terminate this Agreement pursuant to this Section only after following the procedure set forth in Section 5.2 and HF and/or Assignee fail to remedy any issue. Further, if a mortgage of HF comes into possession of the Subject Property by default of HF, City may without liability, and in its sole and absolute discretion, terminate this Agreement. A bankruptcy filing by HF or general Partner of HF, or HF's successors and assigns, shall also be grounds by City for termination of this Agreement.

6.2.2 Termination of Agreement for Default of City. HF in its reasonable discretion may terminate this Agreement for any default by the City; provided, however, HF may terminate this Agreement pursuant to this Section only after following the procedure set forth in Section 5.2 and thereafter providing written notice by HF to the City of the default setting forth the nature of the default and the actions, if any, required by the City to cure such default and, where the default can be cured, the failure of the City to cure such default within thirty (30) days after the effective date of such notice or, in the event that such default cannot be cured within such thirty (30) day period, the failure of the City to commence to cure such default within such thirty (30) day period and to diligently proceed to complete such actions and to cure such default.

6.2.3 Rights and Duties Following Termination. Upon the termination of this Agreement, no Party shall have any further right or obligation hereunder and City shall treat HF and the Subject Property pursuant to all ordinances, policies, and laws as uniformly applied in the City.

6.3 Institution of Legal Action. Subject to notice of default and opportunity to cure under Section 5.2, in addition to any other rights or remedies, any Party to this Agreement may institute an equitable action to cure, correct, or remedy any default, to enforce any covenants or agreements herein, to enjoin any threatened or attempted violation hereof, or to obtain any other equitable remedies consistent with this Agreement. Any action at law or in equity arising under this Agreement or brought by any Party hereto for the purpose of enforcing, construing or determining the validity of any provision of this Agreement shall be filed and tried in the Superior Court of the County of Riverside, State of California, or such other appropriate court in said County, and the Parties hereto waive all provisions of law providing for the filing, removal or change of venue to any other court. Service of process on the City shall be made in

accordance with California law. Service of process on HF shall be made in any manner permitted by California law and shall be effective whether served inside or outside California. If an action or proceeding is brought by any Party to this Agreement because of default, or to enforce a provision hereof, the prevailing Party shall be entitled to reimbursement of all costs and expenses, including attorneys' fees, incurred in prosecuting such legal action or proceeding. This provision is separate and severable, and shall survive the merger of this Agreement into any judgment on this Agreement. In all instances, the Parties agree that §6.1 also survives and controls the actions of the Parties, and further, that the Parties shall stipulate to the limitation on remedies imposed by §6.1.

ARTICLE 7 THIRD PARTY LITIGATION.

7.1 Notice, Defense and Indemnification of Third Party Litigation. The City shall promptly notify HF of any claim, action, or proceeding filed and served against the City to challenge, set aside, alter, void, annul, limit or restrict the approval and continued implementation and enforcement of this Agreement or any Existing Regulation, including but not limited to Project Approvals and CEQA challenges, as they may be filed from time to time by one or more third parties. HF agrees to fully defend, indemnify and hold the City harmless for all costs of defense and/or judgment(s) obtained in any such action or proceeding by reimbursing City, on a monthly basis, for any and all costs. The City shall notify HF within ten (10) calendar days after the City has selected the defense counsel(s). The City and HF agree to cooperate in the defense of such action(s), which includes HF being provided the opportunity to present City its views and recommendations regarding defense counsel or defense strategy. City shall use its best efforts to reasonably manage case costs and seek reasonable attorney rates.

7.2 Effect of Third Party Litigation on Implementation of Agreement. If any third party litigation referred to in Section 7.1 is filed, the City shall continue to comply with the terms of this Agreement unless prohibited from doing so by court order.

7.3 If third party litigation is filed and if HF decides, in its sole and absolute discretion, not to defend the litigation then upon providing written notice of that decision to the City not to defend the litigation this Agreement shall terminate and no Party shall thereafter have any rights or obligations under it. Nothing in this Agreement shall prevent the City, if it decides in its sole and absolute discretion, from defending the litigation at its own sole cost.

ARTICLE 8 MORTGAGEE AND LENDER PROTECTION.

8.1 The Parties hereto agree that this Agreement shall not prevent or limit HF, in any manner, at HF's sole discretion, from encumbering the Subject Property or any portion thereof or any improvement thereon by any mortgage, deed of trust or other security device securing financing with respect to the Subject Property. The City acknowledges that the lenders providing such financing may require certain Agreement interpretations and modifications and agrees upon request, from time to time, to meet with HF and representatives of such lenders to negotiate in good faith any such request for interpretation or modification but City reserves the right to make the final decisions, pursuant to law of such requests. The City is not bound nor is there any predetermination as to matters requiring public hearing or any adjudicative proceeding. Subject to compliance with applicable laws, the City will not unreasonably withhold its consent

to any such requested interpretation or modification provided the City determines such interpretation or modification is consistent with the intent and purposes of this Agreement and not harmful to City in any manner, in City's sole and absolute discretion. HF shall reimburse City for all costs incurred by City in connection with compliance with this Section 8.1 HF represents and warrants that there are presently no financing of any type or nature that encumber the Subject Property and further represents there are no covenants, financings or other burdens that impair City's rights under this Agreement, and further, no third party holds rights to the Subject Property superior to this Agreement as regards to City's rights.

8.2 Any Mortgagee of the Subject Property shall be entitled to the following rights and privileges:

(a) Neither entering into this Agreement nor a breach of this Agreement shall defeat, render invalid, diminish or impair the lien of any mortgage on the Subject Property made in good faith and for value, unless otherwise required by law.

(b) The Mortgagee of any mortgage or deed of trust encumbering the Subject Property, or any part thereof, which Mortgagee has submitted a request in writing to the City in the manner specified herein for giving notices, shall be entitled to receive written notification from the City of any default by HF in the performance of HF's obligations under this Agreement.

(c) If the City timely receives a request from a Mortgagee requesting a copy of any notice of default given to HF under the terms of this Agreement, the City shall make a good faith effort to provide a copy of that notice to the Mortgagee within ten (10) days of sending the notice of default to HF. The Mortgagee shall have the right, but not the obligation, to cure the default during the period that is the longer of (i) the remaining cure period allowed such Party under this Agreement, or (ii) thirty (30) days.

(d) Any Mortgagee who comes into possession of the Subject Property, or any part thereof, pursuant to foreclosure of the mortgage or deed of trust, or deed in lieu of such foreclosure, shall take the Subject Property, or part thereof, subject to the terms of this Agreement. Notwithstanding any other provision of this Agreement to the contrary, no Mortgagee shall have an obligation or duty under this Agreement to perform any of HF's obligations or other affirmative covenants of HF hereunder, or to guarantee such performance; except that (i) to the extent that any covenant to be performed by HF is a condition precedent to the performance of a covenant by the City, the performance thereof shall continue to be a condition precedent to the City's performance hereunder, and (ii) in the event any Mortgagee seeks to develop or use any portion of the Subject Property acquired by such Mortgagee by foreclosure, deed of trust, or deed in lieu of foreclosure, such Mortgagee shall strictly comply with all of the terms, conditions and requirements of this Agreement and the Development Plan applicable to the Subject Property or such part thereof so acquired by the Mortgagee. The successor Mortgagee is hereby on notice that the event of taking possession of the Subject Property allows, but does not require City to terminate this Agreement without cost or liability to City.

8.3 The City shall, at HF's cost paid to City immediately upon City's request, provide publically available information requested by potential lenders in a timely fashion. City shall not

be required, but may, provide any information exempt from disclosure under the California Public Records Act. (G.C. 6250 et. seq.)

ARTICLE 9 INSURANCE.

9.1 Liability Insurance. HF shall maintain an insurance policy protecting against death or injury to person or property for claims arising out of activities on the Subject Property in the amount of at least five million dollars (\$5,000,000) with the City, its officers, officials, employees, agents and representatives named as additional insured. This requirement is in addition to any liability insurance requirement which the City routinely imposes as a condition to the issuance of a building, grading or encroachment permit. In addition, all such insurance:

- (a) shall be primary insurance and not contributory with any other insurance the City or its officers, officials, employees, agents, and representatives may have;
- (b) shall contain no special limitations on the scope of protection affordable to the City and its officers, officials, employees, agents, and representatives;
- (c) shall be claims made and not dates of occurrence insurance;
- (d) shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability;
- (e) shall provide that the policy shall not be canceled by the insurer or Owner unless there is a minimum of thirty (30) days prior written notice to the City;
- (f) shall be endorsed to include a waiver of subrogation rights against the City or its officers, officials, employees, agents, and representatives; and
- (g) shall not require Owner to meet a deductible of more than One Hundred Thousand Dollars (\$100,000) unless approved in writing by the City's Community Development Director in his/her sole and absolute discretion.

9.2 Workers Compensation Insurance. HF shall ensure that any consultant or contractor hired by HF for work on or related to the Subject Property shall carry workers compensation insurance as required by the State of California. This requirement is in addition to any workers compensation insurance requirement which the City routinely imposes as a condition to the issuance of a building, grading or encroachment permit.

ARTICLE 10 INDEMNITY FOR INJURY TO PERSON OR PROPERTY.

HF agrees to and shall indemnify, defend, and hold harmless the City and the City's officers, officials, members, employees, agents, and representatives, from and against any, and all claims, liabilities, awards, settlements, agreements, damages, and losses, including without limitation reasonable attorneys' fees and litigation expenses, including court and expert witness fees (collectively, "Claims"), with respect to any action brought due to the death or personal injury of any person, or physical damage to any person's real or personal property, caused by the construction of improvements by, or construction-related activities of, HF or HF's employees,

agents, representatives, servants, invitees, consultants, contractors, or subcontractors (collectively, "HF's Representatives") on the Subject Property, or for any construction defects in any improvements constructed by HF or HF's Representatives on the Subject Property or for any other work related to this Agreement. The foregoing indemnification provision shall survive the termination of this Agreement.

Notwithstanding the above, HF agrees to and shall indemnify, defend, and hold harmless the City and the City's officers, officials, members, employees, agents and representatives, from and against any and all claims, liabilities, damages, and losses, including without limitation reasonable attorneys' fees and litigation expenses, including court and expert witness with respect to any action brought to challenge the Project's entitlement approvals and/or the EIR.

ARTICLE 11 MISCELLANEOUS PROVISIONS.

11.1 Recordation of Agreement. The City Clerk shall have this Agreement recorded with the County Recorder within the period required by Government Code section 65868.5. Any amendments to this Agreement approved by the Parties, and any cancellation hereof, shall be similarly recorded. A failure to record this Agreement in a timely fashion shall not affect its validity in any manner.

11.2 Entire Agreement. This Agreement sets forth and contains the entire understanding and agreement of the Parties with respect to the subject matter set forth herein, and there are no oral or written representations, understandings or ancillary covenants, undertakings or agreements which are not contained or expressly referred to herein. No testimony or evidence of any such representations, understandings or covenants shall be admissible in any proceeding of any kind or nature to interpret or determine the terms or conditions of this Agreement except as to future and further agreements and the exercise of the Existing Regulations.

11.3 Severability. If any term, provision, covenant or condition of this Agreement shall be determined invalid, void or unenforceable, the invalid provision shall be deemed to be severable from the remaining provisions contained within the Agreement. The Parties hereby state and acknowledge they would have adopted each provision contained within this Agreement notwithstanding the presence of an invalid provision.

11.4 Interpretation and Governing Law. This Agreement and any dispute arising hereunder shall be governed and interpreted in accordance with the laws of the State of California. This Agreement shall be construed as a whole according to its fair language and common meaning to achieve the objectives and purposes of the Parties, and the rule of construction to the effect that ambiguities are to be resolved against both the drafting parties or in favor of the City or HF shall not be employed in interpreting this Agreement, all Parties having been represented by counsel in the negotiation and preparation, adoption, application and execution hereof.

11.5 Section Headings. All section headings and subheadings are inserted for convenience only and shall not affect any construction or interpretation of this Agreement.

11.6 Singular and Plural. As used herein, the singular of any word includes the plural.

11.7 Waiver. Failure of a Party to insist upon the strict performance of any of the provisions of this Agreement by the other Party, or the failure by a Party to exercise its rights upon the default of the other Party, shall not constitute a waiver of such Party's right to insist and demand strict compliance by the other Party with the terms of this Agreement thereafter.

11.8 No Third Party Beneficiaries. This Agreement is made and entered into for the sole protection and benefit for the Parties and their successors and assigns. No other person shall have any right of action based upon any provision of this Agreement.

11.9 Force Majeure. Neither Party shall be deemed to be in default where failure or delay in performance of any of its obligations under this Agreement is caused by earthquakes, acts of God, pandemics, fires, wars, riots or similar hostilities, strikes and other labor difficulties beyond the Party's control (including the Party's employment force), economic or environmental/physical conditions (such as lack of utilities) beyond HF's control which make Development uneconomic or infeasible, other causes beyond the Party's reasonable control or court actions (such as restraining orders or injunctions). If any such events shall occur, the Term of this Agreement and the time for performance shall be extended for the duration of each such event, provided that the Term shall not be extended under any circumstances for more than three (3) years regardless of the number or length of individual extensions and further, in no instance, shall be for a duration longer than the circumstance serving to cause the delay. Notwithstanding the foregoing, if construction ceases after commencement, but prior to the issuance of new Certificates of Occupancy, HF, at its sole cost, shall secure, preserve and prevent any nuisance conditions from occurring on the Subject Property.

11.10 Mutual Covenants. The covenants contained herein are mutual covenants and also constitute conditions to the concurrent or subsequent performance by the Party benefited thereby of the covenants to be performed hereunder by such benefited Party.

11.11 Counterparts. This Agreement may be executed by the Parties in counterparts, which counterparts shall be construed together and have the same effect as if all of the Parties had executed the same instrument.

11.12 Covenant Not To Sue Each Other Regarding the Construction of the Agreement. The Parties to this Agreement, and each of them, agree that this Agreement and each term hereof are legal, valid, binding, and enforceable. The Parties to this Agreement, and each of them, hereby covenant and agree that each of them will not commence, maintain, or prosecute any claim, demand, cause of action, suit, or other proceeding against any other Party to this Agreement, in law or in equity, or based on an allegation, or assert in any such action, that this Agreement or any term hereof is void, invalid, or unenforceable.

11.13 Project as a Private Undertaking. It is specifically understood and agreed by and between the Parties that the Development of the Subject Project is a private development, that neither Party is acting as the agent of the other in any respect hereunder, and that each Party is an independent contracting entity with respect to the terms, covenants and conditions contained in this Agreement. No partnership, joint venture or other association of any kind is formed by this Agreement. The only relationship between the City and HF is that of a government entity

regulating the Development of private property, on the one hand, and the holder of legal or equitable title to such property, on the other hand.

11.14 Further Actions and Instruments. Each of the Parties shall cooperate in good faith with and provide reasonable assistance to the other to the extent contemplated hereunder in the performance of all obligations under this Agreement and the satisfaction of the conditions of this Agreement. Upon the request of either Party at any time, the other Party shall promptly execute, with acknowledgment or affidavit if reasonably required, and file or record such required instruments and writings and take any actions as may be reasonably necessary under the terms of this Agreement to carry out the intent and to fulfill the provisions of this Agreement or to evidence or consummate the transactions contemplated by this Agreement.

11.15 Amendments in Writing/Cooperation. This Agreement may be amended only by written consent of both Parties specifically approving the amendment and in accordance with the Government Code section 65868. The Parties shall cooperate in good faith with respect to any amendment proposed in order to clarify the intent and application of this Agreement, and shall treat any such proposal on its own merits, and not as a basis for the introduction of unrelated matters. Subject to the provisions of Moreno Valley Municipal Code Section 9.02.110E, minor, non-material modifications which are clerical or strictly technical corrections which do not affect the substantive terms and conditions of the Agreement may be approved by the Community Development Director in consultation with the City Attorney as an operating Memorandum. City, upon its request, may be compensated for its costs reasonably incurred in reviewing and processing any request under this section, including costs arising from third parties engaged by the City in furtherance of any request.

11.16 Operating Memoranda. The Parties acknowledge and agree that the provisions of this Agreement require a close degree of cooperation between the City and HF, and Development of the Subject Property hereunder may demonstrate that refinements or clarifications are appropriate with respect to the details of performance of the City and HF. If and when, from time to time, during the Term of this Agreement, the City and HF agree that such refinements or clarifications are necessary or appropriate, they will effectuate such refinements or clarifications through operating memoranda approved by the City and HF, which, after execution, will be attached to this Agreement as addenda and become a part hereof, and may be further refined or clarified from time to time as necessary with future approval by the City and HF. The Community Development Director, in consultation with the City Attorney, will be authorized to make the determination whether a requested refinement or clarification and corresponding operating memoranda may require a public hearing and approval by the City Council. Notwithstanding the foregoing, the City staff or contract staff may decline to execute any operating Memoranda and may instead submit the matter to the City Council for its consideration and action.

11.17 Corporate Authority. The person(s) executing this Agreement on behalf of each of the Parties hereto represent and warrant that (i) such Party are duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said Party, (iii) without representing and warranting whether or not the Agreement is lawful by so executing this Agreement, such Party is formally bound to the provisions of this Agreement, and (iv) the

entering into this Agreement does not violate any provision of any other agreement to which such Party is bound.

11.18 Notices. All notices under this Agreement shall be effective upon any of the following: personal delivery, via e-mail, via facsimile so long as the sender receives confirmation of successful transmission from the sending machine, or three (3) business days after deposit in the United States mail, registered, certified, postage fully prepaid and addressed to the respective Parties as set forth below or as to such other address as the Parties may from time to time designate in writing:

To City: City of Moreno Valley
14177 Frederick Street
Moreno Valley, California 92552
Attn: City Manager
Telephone: (951) 413-3000
Facsimile: (951) 413-3200
E-mail address: cmoffice@moval.org

Copies to: City Attorney
14177 Frederick Street
Moreno Valley, California 92552
Telephone: (951) 413-3036
Facsimile: (951) 413-3034
E-mail address: cityclerk@moval.org

To HF: Iddo Benzeevi
President and Chief Executive Officer
Highland Fairview Operating Co.
14225 Corporate Way
Moreno Valley, CA 92553
Telephone: (951) 867-5327
Facsimile: (951) 867-5328
E-mail Address: ibenzeevi@highlandfairview.com

Copy to: Kenneth B. Bley, Esq.
Cox, Castle & Nicholson LLP
2029 Century Park East, Suite 2100
Los Angeles, CA 90067
Telephone: (310) 284-2231
Facsimile: (310) 284-2100
E-mail address: kbley@coxcastle.com

11.19 Nonliability of City Officials. No officer, official, member, employee, contractor, attorney, agent, or representatives of the City shall be liable for any amounts due hereunder, and no judgment or execution thereon entered in any action hereon shall be personally enforced against any such officer, official, member, employee, agent, or representative.

11.20 No Brokers. The City and HF represent and warrant to the other that neither has employed any broker and/or finder to represent its interest in this transaction. Each Party agrees to indemnify and hold the other free and harmless from and against any and all liability, loss, cost, or expense (including court costs and reasonable attorney's fees) in any manner connected with a claim asserted by any individual or entity for any commission or finder's fee in connection with this Agreement arising out of agreements by the indemnifying Party to pay any commission or finder's fee.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the day and year first set forth above.

City:

CITY OF MORENO VALLEY

By

Mayor, City of Moreno Valley

ATTEST:

By

City Clerk

APPROVED AS TO FORM:

By

City Attorney

HF:

HF PROPERTIES,
a California general partnership

By: _____

Name: Iddo Benzeevi

Its: President

SUNNYMEAD PROPERTIES,
a Delaware general partnership

By: _____

Name: Iddo Benzeevi

Its: President

THEODORE PROPERTIES PARTNERS,
a Delaware general partnership

By: _____

Name: Iddo Benzeevi

Its: President

13451 THEODORE, LLC,
a California limited liability company

By: _____

Name: Iddo Benzeevi

Its: President

05118111421417v4

Ordinance No. XXX
Date Adopted: June 16, 2020

HL PROPERTY PARTNERS,
a Delaware general partnership

By: _____

Name: Iddo Benzeevi

Its: President

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

05118111421417v4

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Ordinance No. XXX
Date Adopted: June 16, 2020

State of California)
County of _____)

On _____, before me,
(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature (Seal)

State of California)
County of _____)

On _____, before me,
(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature (Seal)

State of California)
County of _____)

On _____, before me,
(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature (Seal)

EXHIBIT "A-1"
LEGAL DESCRIPTION

THOSE CERTAIN PARCELS OF LAND IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

(APN: 478-220-01)

LOTS 1, 2 AND 7 IN BLOCK 59 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-3, 4)

LOTS 5 AND 6 IN BLOCK 55 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-7)

LOT 4 IN BLOCK 60 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 423-250-2, 7, 10, 11, 18)

PARCELS 1, 2 AND 10 OF PARCEL MAP 17905, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGES 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 422-070-18, 20, 22)

THAT PORTION OF THE NORTH HALF OF THE NORTH HALF OF FRACTION 7, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF, WHICH LIES NORTH OF THE SOUTH LINE OF LOTS 1, 2, 3 AND 4 IN BLOCK 57 AND WHICH LIES NORTH OF THE SOUTH LINE OF LOT 1 AND ITS EASTERLY EXTENSION AND LOT 2 IN BLOCK 58 AS LOTS AND BLOCKS ARE SHOWN ON MAP 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY RECORDED IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO RECORDS.

EXCEPT THAT PORTION LYING WEST OF THE EAST LINE OF PARCELS 2 AND 3 OF PARCEL MAP NO. 8113, ON FILE IN BOOK 28, PAGE 38 OF PARCEL MAPS, RIVERSIDE COUNTY RECORDS.

Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

Ordinance No. XXX
Date Adopted: June 16, 2020

PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-230-19-0, 20)

LOTS 2 AND 7 IN BLOCK 109 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

EXCEPT FROM SAID LOT 7 BLOCK 109 THAT PORTION CONVEYED TO THE COUNTY OF RIVERSIDE IN DEED RECORDED JULY 24, 1973 AS FILE NO. 97183 OF OFFICIAL RECORDS.

TOGETHER WITH:

(APN: 478-230-11, 14)

LOTS 1 AND 8 IN BLOCK 109 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-230-9, 10)

LOTS 3 AND 4 IN BLOCK 110 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA AS PER MAP RECORDED IN BOOK 11 PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-210-54-9)

LOTS 1 THROUGH 4, BLOCK 1 OF THE TOWN OF MORENO, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 19, OF MAPS. IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THE NORTHERLY 10 FEET OF THAT PORTION OF BAY AVENUE, VACATED BY RESOLUTION RECORDED JANUARY 10, 1974 AS FILE NO. 4002 OF OFFICIAL RECORDS, LYING BETWEEN THE SOUTHERLY PROLONGATION OF THE EAST LINE OF RUSSELL STREET AND THE SOUTHERLY PROLONGATION OF EAST LINE OF LOT 4 IN BOOK 1 AS SHOWN ON AS MAP OF TOWN OF MORENO.

TOGETHER WITH:

(APN: 478-210-55-0)

LOTS 1 THROUGH 4, BLOCK 2 OF TOWN OF MORENO, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN

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BOOK 11, PAGE(S) 19, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THE NORTHERLY 10 FEET OF THAT PORTION OF BAY AVENUE, VACATED BY RESOLUTION RECORDED JANUARY 10, 1974 AS FILE NO. 4002 OF OFFICIAL RECORDS, LYING BETWEEN THE SOUTHERLY PROLONGATION OF THE EAST LINE OF REDLANDS BOULEVARD AND THE SOUTHERLY PROLONGATION OF THE WEST LINE OF RUSSEL STREET AS SHOWN ON SAID MAP OF TOWN OF MORENO.

TOGETHER WITH:

(APN: 478-220-4, 5, 8, 10, 11)

LOTS 1, 2, 3, 7 AND 8 IN BLOCK 60 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-8, 9, 10)

LOTS 6, 7 AND 8 IN BLOCK 56 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-2, 3, 12, 13)

LOTS 3, 4, 5 AND 6 IN BLOCK 59 AS SHOWN BY MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-5)

LOT 7 IN BLOCK 55 OF MAP NO. 1, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TOGETHER WITH THAT PORTION OF EUCALYPTUS AVENUE, WITHIN SAID BLOCK LYING SOUTHERLY AND ADJACENT TO SAID LOT 7.

TOGETHER WITH:

(APN: 488-350-6)

LOT 8 IN BLOCK 55 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TOGETHER WITH THOSE PORTIONS

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OF EUCALYPTUS AVENUE AND SINCLAIR STREET, WITH SAID BLOCK LYING SOUTHERLY, EASTERLY AND ADJACENT TO SAID LOT 8.

TOGETHER WITH:

(APN: 488-350-7)

LOT 5 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 423-250-8, 9, 12 AND 423-260-10)

PARCELS 3 THROUGH 5, AND 11 OF PARCEL MAP 17905, IN THE CITY OF, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGE(S) 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 423-260-3, 4, 5, 7, 8, 9 AND 423-310-1, 2)

PARCELS 6 THROUGH 9 AND 14 THROUGH 17 OF PARCEL MAP 17905, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGE(S) 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: PORTION 488-350-15)

ALL THOSE PORTIONS OF LOTS 1, 2, 3 AND 4 OF BLOCK 55, MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP ON FILE IN BOOK 11 PAGE 10 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

EXCEPTING THEREFROM THAT PORTIONS OF LOTS 3 AND 4 OF BLOCK 34 CONVEYED TO THE STATE OF CALIFORNIA IN DEED RECORDED MAY 25, 1962 AS INSTRUMENT NO. 48967 IN BOOK 3147 PAGE 181 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

ALSO EXCEPTING THEREFROM ONE HALF OF ALL OIL, GAS, MINERAL AND SUBSURFACE RIGHTS 500 FEET OR MORE BELOW THE SURFACE, BUT WITHOUT ANY RIGHTS WHATSOEVER TO THE USE OF THE SURFACE OR THE SUBSURFACE AREA OF SAID LAND TO A DEPTH OF 500 FEET FROM SAID SURFACE FOR ANY PURPOSE INCIDENTAL TO THE OWNERSHIP OF SAID SUBSTANCES, AS RESERVED IN DEED RECORDED JULY 12, 1961 AS INSTRUMENT NO. 59232 IN BOOK 2942 PAGE 318 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA. SAID EXCEPTION AFFECTS LOTS 1, 2 AND 4 OF SAID BLOCK 55.

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TOGETHER WITH:

(APN 478-240-011-3, 017-9, 026-7, 027-8, 030-0)
 LOT(S) 3, 4, 5, 6 AND 7 IN BLOCK 136, MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE, SINCLAIRE STREET AND CACTUS AVENUE, WITHIN SAID BLOCK, LYING WESTERLY OF THE EAST LINE OF SAID LOTS PROLONGED NORTHERLY AND SOUTHERLY, THAT WOULD PASS WITH A CONVEYANCE OF SAID LOTS.

TOGETHER WITH:

(APN 478-240-028-9)
 LOT 1 IN BLOCK 136 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING NORTHERLY OF THE SOUTH LINE OF SAID LOT PROLONGED EASTERLY AND EASTERLY OF THE EAST WEST LINE OF SAID LOT PROLONGED NORTHERLY.

TOGETHER WITH:

(APN 478-240-019-1)
 LOT 8 IN BLOCK 136 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF CACTUS AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING EASTERLY OF THE WEST LINE OF SAID LOT PROLONGED SOUTHERLY AND SOUTHERLY OF THE NORTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

(APN 478-240-025-6)
 LOT 8 IN BLOCK 113 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING EASTERLY OF THE WEST LINE OF SAID LOT PROLONGED SOUTHERLY AND SOUTHERLY OF THE NORTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

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(APN 478-240-29-0)

LOT 2 IN BLOCK 136 OF MAP NO.1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, CALIFORNIA, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE, THEODORE STREET, CACTUS AVENUE, AND SINCLAIR STREET WHICH WOULD PASS BY OPERATION OF LAW.

TOGETHER WITH:

(APN 478-240-24-5)

LOT 7 IN BLOCK 113 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET WHICH WOULD PASS BY OPERATION OF LAW.

TOGETHER WITH:

(APN 478-240-005-8, 008-1)

LOTS 3 AND 6, BLOCK 113, MAP NO. 1 BEAR VALLEY & ALESSANDRO DEVELOPMENT COMPANY., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, CALIFORNIA.

TOGETHER WITH:

(APN 422-070-033-1)

PARCEL 4 OF PARCEL MAP 8113, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 28, PAGE 38 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN 422-130-002-8, 003-9)

THE EASTERLY 80 ACRES OF THAT PORTION OF FRACTION SECTION 8, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY UNITED STATES GOVERNMENT SURVEY, LOCATED SOUTHWESTERLY OF THE SOUTHWESTERLY LINE OF THE PORTION OF SAID SECTION GRANTED TO THE STATE OF CALIFORNIA FOR HIGHWAY PURPOSES BY DEED RECORDED MARCH 17, 1937 IN BOOK 318, PAGE 57 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

EXCEPT FROM GOVERNMENT LOTS 3, 4, 5, 6 AND 9, THE SOUTH 30 FEET THEREOF, AS GRANTED TO RIVERSIDE COUNTY FOR ROAD PURPOSES BY DEED RECORDED JUNE 23, 1918 IN BOOK 433, PAGE 192 OF DEEDS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, AND AS SHOWN ON LICENSED SURVEYOR'S MAP ON FILE IN BOOK 5, PAGE 44 OF RECORDS OF SURVEY, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

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THE WESTERLY LINE OF SAID 80 ACRES BEING PARALLEL WITH THE WESTERLY LINE OF SAID SECTION 8.

TOGETHER WITH:

(APN 422-130-001, 422-110-001)

THAT PORTION OF FRACTION SECTION 8, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, LYING SOUTHWESTERLY OF THE SOUTHWESTERLY LINE OF THE PORTION OF SAID LAND DESCRIBED IN DEED TO THE STATE OF CALIFORNIA RECORDED MARCH 17, 1937 IN BOOK 318, PAGE 57 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

EXCEPT THE EASTERLY 80 ACRES THEREOF, THE WESTERLY LINE OF SAID 80 ACRES BEING PARALLEL WITH THE WESTERLY LINE OF SAID SECTION.

ALSO EXCEPT THE SOUTH 30.00 FEET AS DESCRIBED IN DEED TO THE COUNTY OF RIVERSIDE RECORDED JUNE 23, 1916 IN BOOK 433, PAGE 192 OF DEEDS.

ALSO EXCEPTING THEREFROM ANY PORTION THAT LIES WITHIN PARCEL 3 OF PARCEL MAP 16950 AS PER MAP ON FILE IN BOOK 99 OF PARCEL MAPS, AT PAGES 34 THROUGH 42, RIVERSIDE COUNTY RECORDS.

ALSO EXCEPT ONE HALF OF ALL GAS, OIL, AND MINERAL RIGHTS 500.00 FEET FROM BELOW THE SURFACE AS RESERVED BY MARIE B. ERRAMUSPE, A WIDOW, BY DEED RECORDED SEPTEMBER 01, 1960 AS INSTRUMENT NO. 77098, OFFICIAL RECORDS.

TOGETHER WITH:

(APN 422-070-8, 10, 17, 19, 21, AND 422-080-01, 02, 03, 04)

LOTS 1 THROUGH 4 BOTH INCLUSIVE, IN BLOCK 111; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 83; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 84; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 85; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 86; LOTS 5 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 57; LOTS 5, 6, 7 AND 8 IN BLOCK 58 AND LOTS 1 THROUGH 4 BOTH INCLUSIVE, IN BLOCK 112, OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO COUNTY RECORDER, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH THOSE PORTIONS OF THEODORE STREET, ULYSSES STREET, VIRGINIA STREET, DRACAEA AVENUE, COTTONWOOD AVENUE, BAY AVENUE AND ALESSANDRO BOULEVARD ADJOINING SAID LOTS WITHIN SAID BLOCKS.

TOGETHER WITH THAT PORTION OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, WHICH LIES EAST OF THE EAST LINE OF SAID BLOCKS 57, 84, 85 AND 112.

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EXCEPT THAT PORTION OF BLOCK 58 LYING WITHIN PARCEL. MAP 8113 AS PER MAP RECORDED IN BOOK 28, PAGE 38 OF PARCEL MAPS, RECORDS OF RIVERSIDE COUNTY.

ALSO EXCEPT THAT PORTION LYING NORTHEAST OF THE SOUTHWEST LINE OF THE LAND DESCRIBED IN DEEDS TO THE COUNTY OF RIVERSIDE RECORDED OCTOBER 27, 1938 IN BOOK 300, PAGES 344 AND 345 OF OFFICIAL RECORDS, RECORDED JULY 09, 1936 IN BOOK 287, PAGE 315 AND AUGUST 07, 1936 IN BOOK 292, PAGE 85, AND MARCH 17, 1937 IN BOOK 318, PAGE 57, ALL OF OFFICIAL RECORDS.

ALSO EXCEPT PORTION LYING SOUTHERLY OF THE NORTH LINE OF THE LAND DESCRIBED IN DEED TO THE COUNTY OF RIVERSIDE RECORDED DECEMBER 13, 1915 IN BOOK 432, PAGE 254 OF DEEDS.

ALSO EXCEPT THAT PORTION DESCRIBED IN DEED RECORDED NOVEMBER 27, 1934 IN BOOK 205, PAGE 29 OF OFFICIAL RECORDS AND OCTOBER 23, 1934 IN BOOK 199, PAGE 97 OF OFFICIAL RECORDS.

ALSO EXCEPT ONE-HALF OF ALL GAS, OIL AND MINERALS 500.00 FEET FROM BELOW THE SURFACE AS RESERVED IN DEED RECORDED SEPTEMBER 01, 1960 AS INSTRUMENT NOS. 77097, 77098, 77099, 77100 AND 77101, ALL OF OFFICIAL RECORDS.

TOGETHER WITH:

(APN 478-220-029-8)

PARCEL(S) 1 OF PARCEL MAP NO. 9880, AS PER PLAT RECORDED IN BOOK 47 OF PARCEL MAPS, PAGE(S) 25, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN 488-350-019)

LOT 1 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., AS SHOWN BY MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH THOSE PORTIONS OF FIR AVENUE AND THEODORE STREET WITHIN SAID BLOCK LYING EAST OF THE WEST LINE OF SAID LOT PROLONGED NORTHERLY AND NORTH OF THE SOUTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

(APN 488-350-021)

LOT 2 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

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Date Adopted: June 16, 2020

TOGETHER WITH:

(APN 488-350-023)

LOT 3 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH:

(APN 488-350-025)

LOT 4 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH THOSE PORTIONS OF SINCLAIR STREET WITHIN SAID BLOCK LYING WESTERLY AND NORTHERLY AND ADJACENT TO SAID LOT 4.

TOGETHER WITH:

(APN 478-240-006,007)

LOTS 1 AND 2 IN BLOCK 113 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-014)

LOT 8 IN BLOCK 59 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-27)

LOT 7 IN BLOCK 82 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

THIS DESCRIPTION WAS PREPARED BY ME OR UNDER MY DIRECTION.

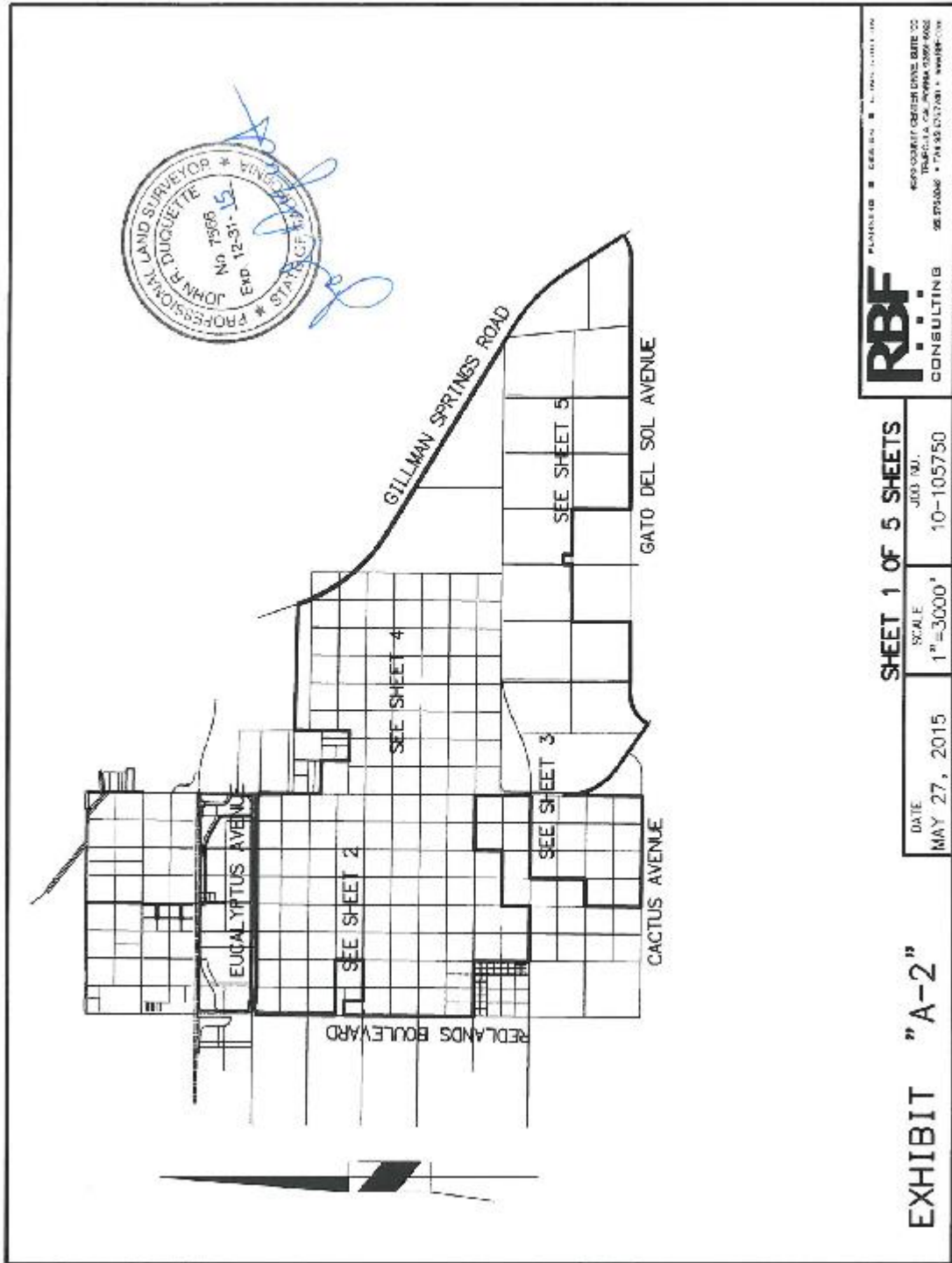
John R. Duquette
JOHN R. DUQUETTE, PLS 7566

DATE: 5/27/15



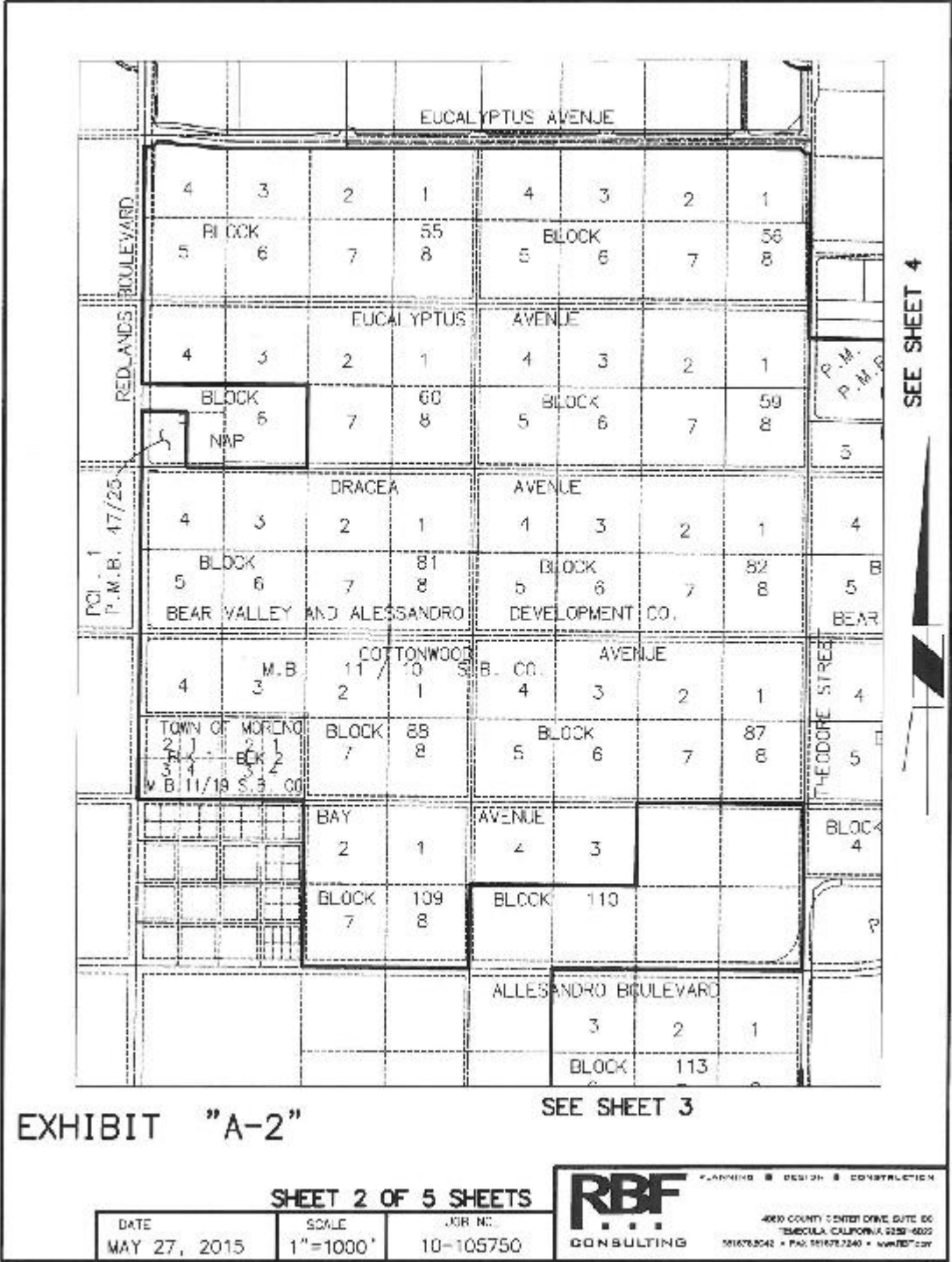
Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

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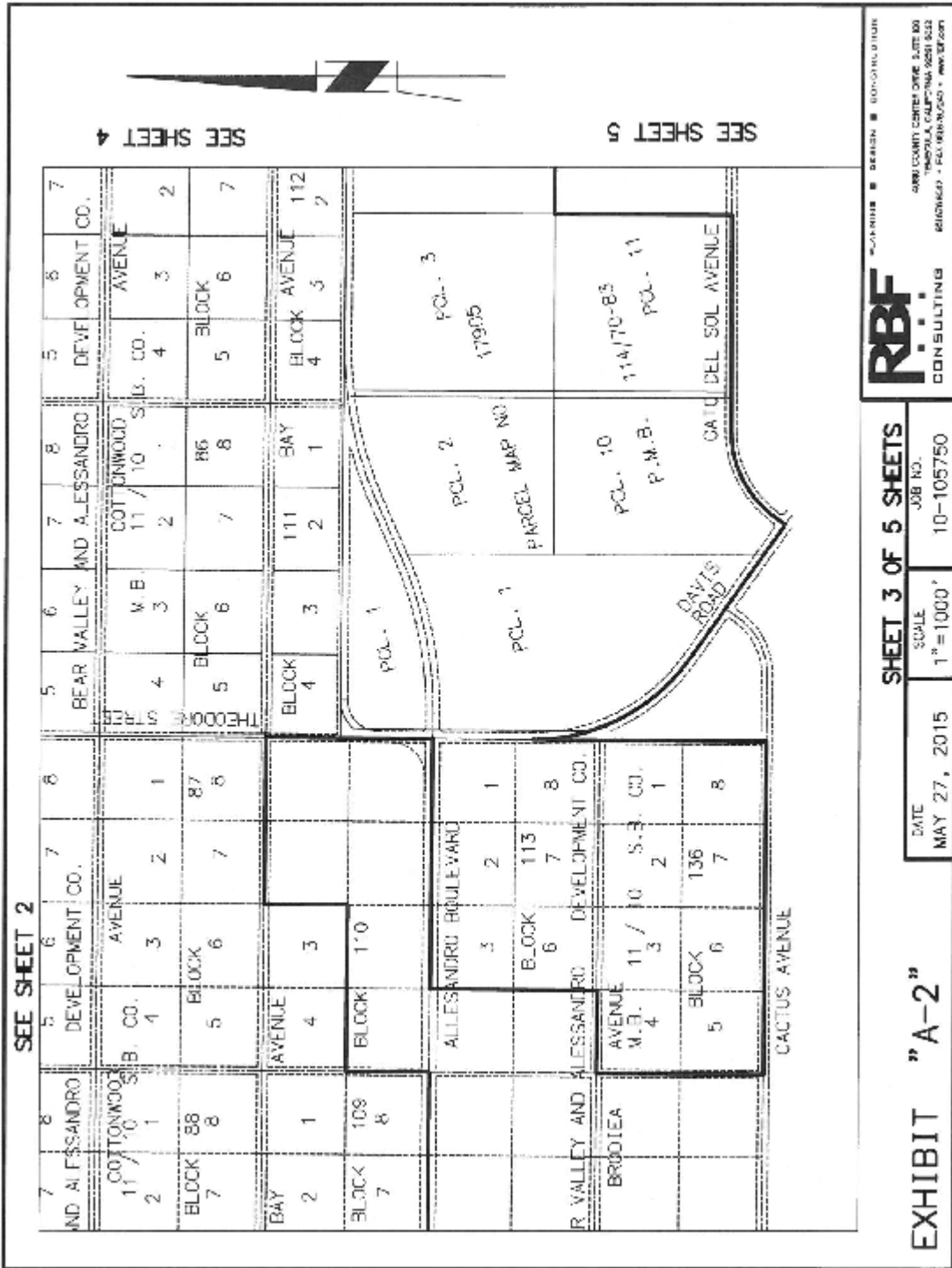
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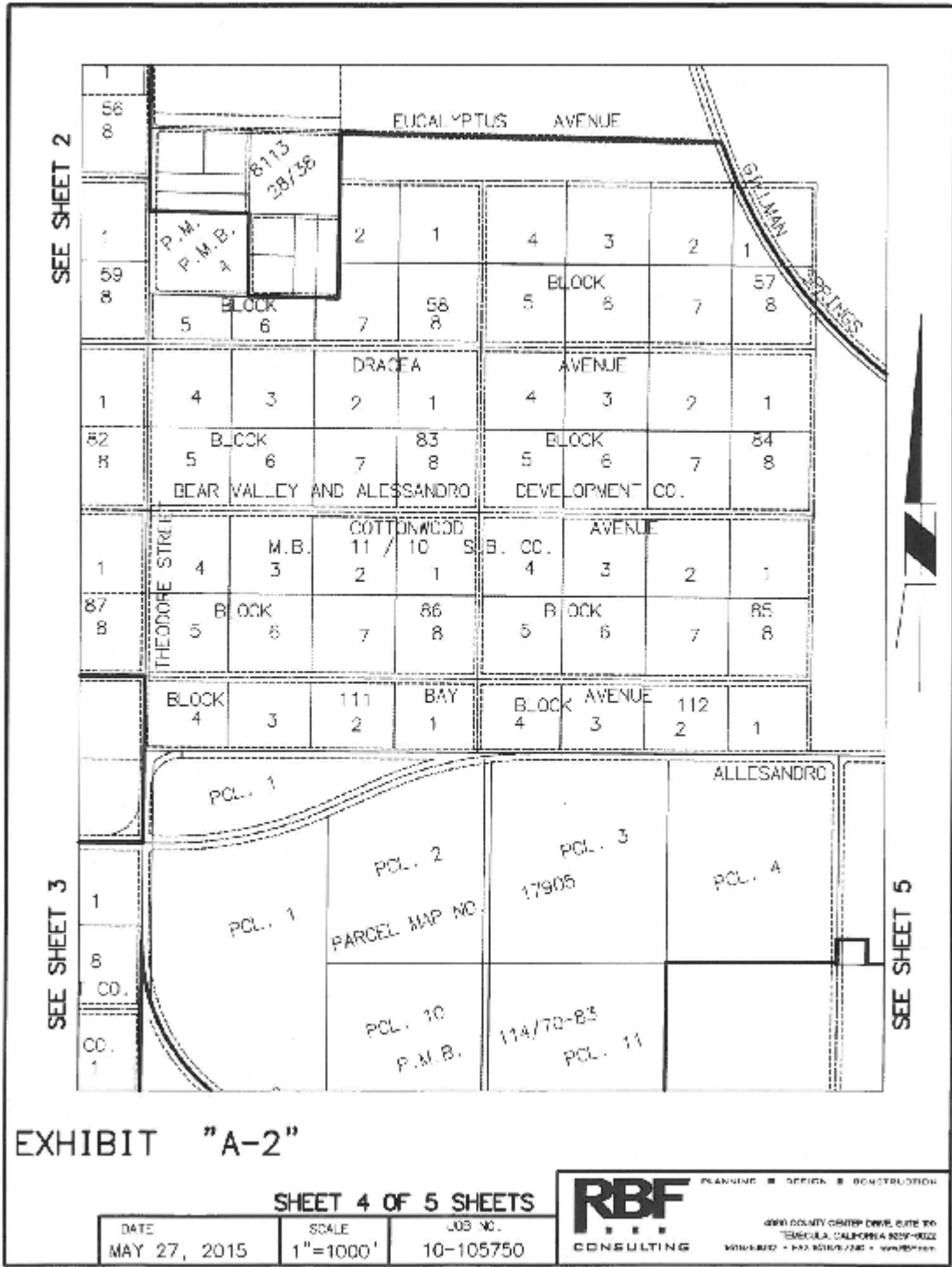


Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

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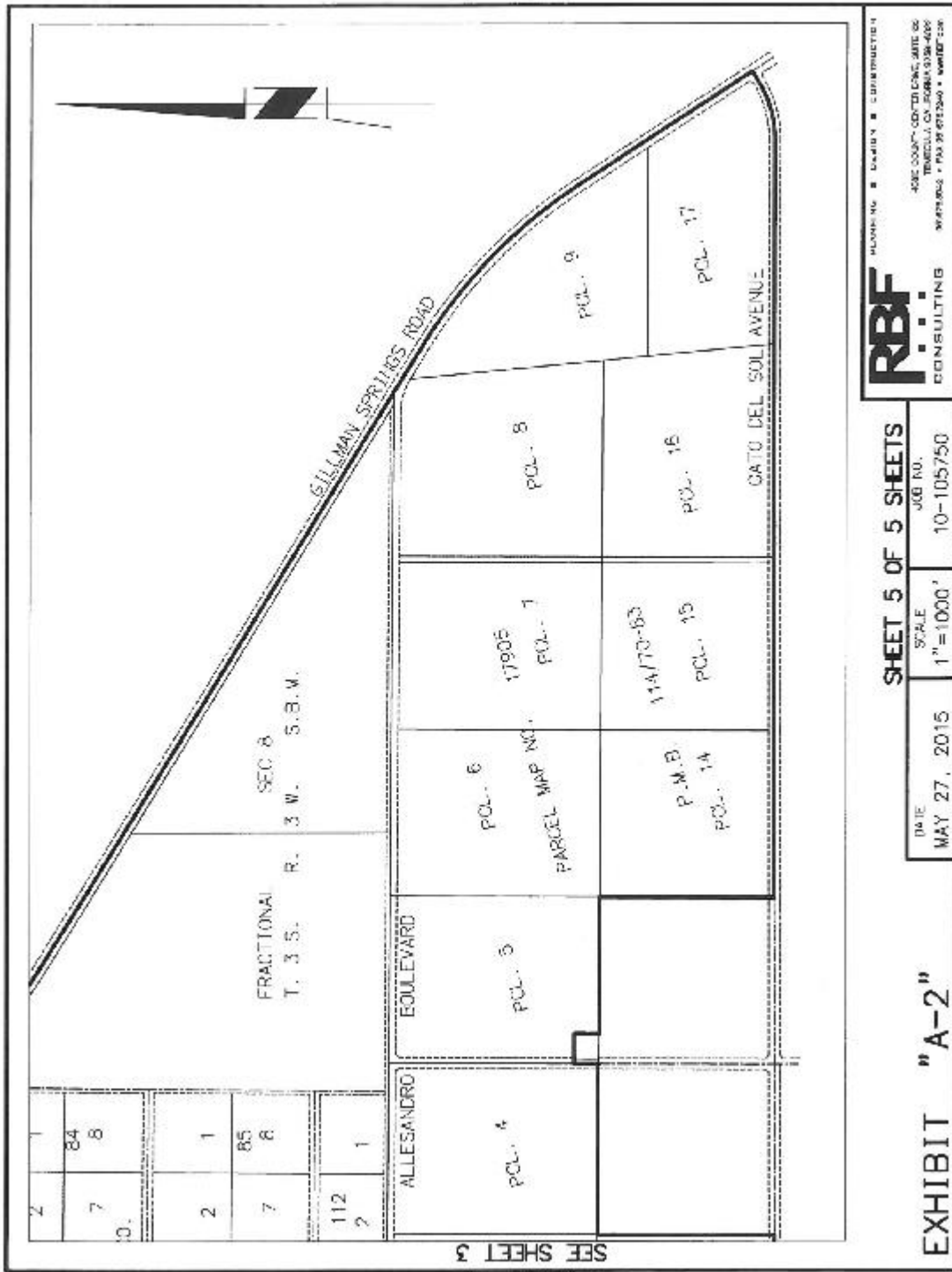


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Attachment: Ordinance No. XXX WLC Development Agreement with DA (4074 : World Logistics Center)

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EXHIBIT NO. A-3

Public Benefits: all are viewed as material consideration for this Agreement, by the City and its Council (not listed in priority).

1. Representation and Warranty in support of HF's legal or equitable interest in the land composing the area subject to this Agreement. (Recital E and 3.2)
2. DIF fees, public improvements, or both will be paid to the City to further public improvements. (1.5, 4.8, 4.9)
3. City has oversight over transfer of land or buildings within the area covered by the Agreement. (3.4)
4. HF pays for special staff and consultants. (3.6)
5. Education/Library/Job training/funding to City/Job opportunities. (4.11, 4.12)
6. Fire station: "turn key" fire station will be built on HF provided land and will be fully funded and equipped by HF. (4.8)
7. Land owners are bound, contractually, to provide City benefits beyond those available via a nexus condition.
8. City advances its General Plan's goals, policies and objectives as anticipated when it was adopted.
9. City controls when HF has qualified to release itself, in whole or part, from the Development Agreement. (3.4, 3.5)
10. City preserves its right to impose the enhanced development standards on the Project outlined in the specific plan. (4.2)
11. City has set performance criteria for the Terms of the Agreement. (3.5, 4.4)
12. City preserves the right to update standards and, as required and lawful, require further CEQA reviews. (4.7.1)
13. City Code Standards are imposed for any reimbursements to HF for oversizing any infrastructure. (4.8)
14. City required and is able to hold HF accountable for a local hiring program for City residents. (4.11)
15. City obtains Education, Library, Training, and Innovation funding for residents in the amount up to \$6,993,000, during the Term of the Development Agreement, with One Million Dollars (\$1,000,000) of that being provided in a single lump sum payment upon issuance of the first building permit.

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Exhibit A-3-1

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16. HF will contribute \$500,000 toward the City's development of SR 60 landscape, signage, bridge design enhancement. (4.13)
17. City will annually review and enforce its benefits, and ensure performance of its duties. (Article 5)
18. Defaults and issues in dispute have a specified resolution process. (Article 6)
19. City is covered by HF funded liability insurance (9.1) and from tort claims. (Article 10)
20. City is protected as to ensuring HF performance, despite external causation. (11.9)

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Exhibit A-3-2

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Date Adopted: June 16, 2020

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Date Adopted: June 16, 2020

June 9, 2020

Ms. Julia Descoteaux, Associate Planner
Community Development
City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92553

Subject: World Logistics Center – Additional Errata to the Revised Final EIR

Dear Ms. Descoteaux:

Subsequent to the distribution of the Final Response to Comments and Revised Final EIR for the World Logistics Center (WLC) Project, Errata to the Revised Final EIR (Part 3) were identified. These revisions are clarifications and not substantive modifications. The revisions identified below do not change the significance conclusions presented in the Revised Final EIR or substantially alters the analysis presented for public review. Deleted text is shown in ~~strike-through~~ and additional text is shown as underline.

Pages 35-37 and Pages 755 - 756 of the Revised Final EIR (Part 1)

Revisions to Section 4.7.7.1, which includes Mitigation Measure 4.7.7.1, has been made as shown below. This revision is due to a refinement in Mitigation Measure 4.7.7.1 and does not result in a change in the ultimate impact determination and no new significant information is included.

4.7.7 NET ZERO MITIGATION MEASURE ~~CONDITIONED ON THE OUTCOME OF THE APPEAL IN PAULEK V. MORENO VALLEY~~

~~An appeal of the judgement entered on June 7, 2018, in the CEQA litigation, is currently pending in the Court of Appeal, Fourth Appellate District, Division Two, as *Paulek v. Moreno Valley Community Services District*, Case No. E071184. The appeal seeks judicial review of the FEIR’s application of California’s Cap and Trade Program to the analysis of GHG emissions for the construction and operation of the WLC. Specifically, the FEIR determined that the GHG emissions attributable to fuel suppliers and energy producers under Cap and Trade (capped emissions) could be deducted from the total GHG emissions to be evaluated against the significance threshold because capped emissions were already accounted for and mitigated at the producer/supplier level. To address the yet unknown determination of the appeal and to eliminate uncertainty as to how capped GHG emissions should be accounted for in determining the significance of at the pProject’s GHG emissions without consideration of Cap and Trade (capped emissions) under CEQA, a new mitigation measure, Mitigation Measure 4.7.7.1, shall apply requiring that the WLC Project’s GHG emissions be mitigated to net zero where the amount of GHG emissions to be mitigated is either “Total Uncapped” GHG emissions from Table 4.7-8 or “Project Emissions” from new Table 4.7-16, depending on the outcome of the appeal.~~

Attachment: WLC Errata_9JUNE2020 (4074 : World Logistics Center)

Ms. Descoteaux
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Page 2

~~If the trial court's judgment is affirmed after the appellate process is completed or if the appeal is dismissed, then the GHG emissions to be mitigated to net zero will be the "Total Uncapped" GHG emissions from Table 4.7-8.~~

~~If the trial court's judgment is reversed after the appellate process is completed, then the amount of GHG emissions to be mitigated to net zero will be the "Project Emissions" shown on Table 4.7-16. As shown in Table 4.7-16, Project GHG emissions, both capped and uncapped, with implementation of Project Design Features and mitigation measures would, prior to the application of mitigation, exceed the SCAQMD's significance threshold of 10,000 mt CO₂e per year.~~

To mitigate the WLC Project's GHG emissions to net zero and to remove uncertainty as to how GHG emissions should be accounted for, the following mitigation, Mitigation Measure 4.7.7.1, shall apply. Mitigation Measure 4.7.7.1 shall read as follows:

- 4.7.7.1** ~~The developer shall mitigate the WLC Project's GHG emissions to net zero by purchasing and retiring providing offsets and/or carbon credits, based upon where the amount of GHG emissions set forth in to be mitigated is either "Total Uncapped" GHG emissions from Table 4.7-8 or "Project Emissions" from new Table 4.7-16 of the Revised Final EIR, depending on the outcome of the appeal in *Paulek v. Moreno Valley Community Services District ("Paulek")*. If the trial court's judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed, then the GHG emissions to be mitigated to net zero will be the "Total Uncapped" GHG emissions from Table 4.7-8. If the trial court's judgment is reversed after the appellate process is completed, then the amount of GHG emissions to be mitigated to net zero will be the "Project Emissions" shown on Table 4.7-16. Upon the purchase and retirement provision of offsets and/or the retirement of carbon credits, no further analysis of capped and uncapped GHG emissions will be required, and no further reduction of those emissions will be required.~~

~~The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of provide the city with any combination of qualified offsets and/or carbon credits in its sole determination provided that the following conditions are satisfied:~~

- ~~a) Offsets: A developer shall provide proof of offsets to reduce or sequester GHG emissions (as distinguished from carbon credits) to the City's Planning Official that the offsets are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.~~
- ~~ba) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), the carbon credits represent~~

Ms. Descoteaux
June 9, 2020
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~~reductions in GHG emissions that are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency. Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, or Verra (formerly Verified Carbon Standard), or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above. In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.~~

- e) Timing: The developer shall provide proof to the City ~~that with offsets and/or carbon credits equal to the proportionate amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows:~~ (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent, for the facilities proposed in each plot plan (by square footage as compared to the total square footage of the project) as a condition of the issuance of a certificate of occupancy for such facilities, using either Table 4.7-8 or Table 4.7-16, as appropriate. The City shall retire the carbon credits upon their receipt. The developer shall have the right at any time to provide such offsets and/or carbon credits in advance of the issuance of any certificate of occupancy for any of the facilities in the WLC Project.

With the application of all previous mitigation measures (pages 4.7-27 – 4.7-30) and the new Mitigation Measure 4.7.7.1, the WLC Project's GHG emissions will be reduced to net zero at buildout, ~~as shown in Table 4.7-8 (Table 4.7-8 will be revised in Final RSFEIR as shown below) and Table 4.7-15. Revised Table 4.7-8 and Table 4.7-16 shows the mitigated GHG emissions, including new Mitigation Measure~~

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June 9, 2020
Page 4

4.7.7.1, for each year from 2020 through construction and 30-years operation of all Project facilities. Since total Project GHG emissions will be reduced to net zero, they are below the threshold of significance for every year and are therefore less than significant after mitigation.

Level of Impact After Mitigation. Less than significant.

Page 4.12-25 of the Revised Final EIR (Part 3)

Clarifications to the introductory paragraph of Mitigation Measure MM 4.12.6.1A have been made as shown below.

4.12.6.1A Prior to issuance of any discretionary project approvals that allow construction activity, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City’s daytime (except for sensitive receptors located within 500 feet of active construction areas) and nighttime average hourly noise standard of 60 dBA L_{eq} and 55 dBA L_{eq} , respectively. The construction noise reduction measures shall include, but not be limited to, the following measures:

Page 4.12-25, last sentence

A clarification to the text for level of significance after mitigation incorporation has been included to show the distance at which impacts would remain significant. No revision to the impact determination has been made and no new significant information has been included.

With regard to daytime construction, sensitive receptors located within and to the west of the project (within 500 feet of active construction areas) would continue to be exposed to construction noise levels that would exceed the City’s daytime exterior noise standard of 60 dBA L_{eq} even with implementation of mitigation.

Page 4.4-62 of the Revised Final EIR (Part 3)

A clarification to Mitigation Measure 4.4.5.2B has been made as shown below.

4.4.5.2B Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County ~~Resource~~ Regional Conservation Agency Authority (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the satisfaction of the City Planning Division and Riverside County ~~Resource~~ Regional Conservation Agency Authority (“RCA”).

Attachment: WLC Errata_9JUNE2020 (4074 : World Logistics Center)

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Page 4.4-76 of the Revised Final EIR (Part 3)

A clarification to the first paragraph of Mitigation Measure 4.4.6.2B has been made as shown below.

4.4.6.2B As required by the ~~Resource-Regional~~ Conservation ~~Agency-Authority~~ (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the ~~Resource-Regional~~ Conservation ~~Agency-Authority~~ prior to project grading permit approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.

The above revisions to portions of the Revised Final EIR, specifically Part 1 (Final Response to Comments) and Part 3 (RSFEIR), are modifications and clarifications, but none of the revisions provide significant new information that requires recirculation of the Revised Final EIR in accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15088.5.

Sincerely,



Michael E. Houlihan, AICP
Principal Associate

APPEAL APPLICATION PAA20-0001

“Revised Final EIR (PEN18-0050)”

Angel E. Lopez-Ramirez

Email: calissav@hotmail.com

May 28, 2020

Appeal Application PAA20-0001

Letter To Moreno Valley Elected Representatives,

Mayor Yxstian Gutierrez: yxstiang@moval.org

Mayor Pro Tem Victoria Baca: victoriab@moval.org

Councilman Ulises Cabrera: ulisesc@moval.org

Councilwoman Carla J. Thornton: carlat@moval.org

Councilman David Marquez: davidma@moval.org

City of Moreno Valley

14177 Frederick St.

Moreno Valley, CA 92552

May 28, 2020. It is with great sorrow that as a United States Citizen, Combat Veteran and Wounded Warrior with 24 years of distinguished, honorable military service. As a Moreno Valley homeowner since 2008, taxpayer and patron that I must submit in writing to my elected representatives to the City of Moreno Valley. Pursuant to “Title 9 Planning and Zoning, Chapter 9.02 Permits and Approvals; Sections 9.02.040 and 9.14.050” of the Moreno Valley Municipal Code. A letter for an Appeal Application to PAA20-0001 for the Public Hearing Item #2 that was voted and passed by the Planning Commission on May 14, 2020:

Planning Commission

Regular Meeting

5/14/2020 7:00 PM

City Hall Council Chamber

Moreno Valley City Hall 14177 Frederick Street Moreno Valley, CA 92552

In relation to:

#2 Case: PEN18-0050 Revised Final EIR (RFEIR)

PEN20-0017 Tentative Parcel Map 36457 (Finance)

PEN20-0018 Development Agreement

From correspondence received by Julia Descoteaux, Associate Planner, Community Development, City of Moreno Valley <juliad@moval.org> on Wednesday 5/20/2020 5:57 PM:

“To: 'calissav@hotmail.com'”

Good Afternoon Mr. Lopez,

I understand you were at City Hall today and would like information on filing appeals for the WLC project from the May 14, 2020 Planning Commission hearing.

Here is the process during Covid-19.

If you have any questions, please feel free to contact the Planning Division at 951-413-3206 and we will assist you.

Best Regards,

Julia

The appeal period for the Planning Commission’s actions at the May 14, 2020 meeting are as follows:

Tentative Parcel Map for Finance and Conveyance Purposes Only (PEN20-0017) – the ten (10) consecutive calendar days appeal period begins Saturday May 16, 2020, and ends on Tuesday May 26, 2020 at 5:30pm

Revised Final EIR (PEN18-0050) – the fifteen (15) consecutive calendar days appeal period begins Saturday May 16, 2020, and ends on Monday June 1, 2020 at 5:30pm.

Appeals require a letter stating the specific reasons for the appeal and a processing fee of \$750 for each project.

There are two ways to file the appeals.

Contact 951-413-3206 for specific instructions.

Option 1

Set up an appointment to deliver your appeal letter and a check to City Hall. (You must have an appointment and submit prior to 5:30pm).

Option 2

If you wish to file an appeal electronically, please call 951-413-3206 to request Record Number, Invoice and uploading instructions. Invoices and uploads must be completed and verified prior to the 5:30pm deadline).

Julia Descoteaux

Associate Planner

Community Development

City of Moreno Valley

p: 951.413.3209 | e: juliad@moval.org w: www.moval.org

14177 Frederick St., Moreno Valley, CA 92553”

Further correspondence with Chris Ormsby and Sean Kelleher, I received the Appeals Application information with instructions for submission for Option 2:

“From: ANGEL LOPEZ <calissav@hotmail.com>

Sent: Friday, May 22, 2020 10:10 AM

To: Chris Ormsby <chriso@moval.org>; Sean P. Kelleher <seanke@moval.org>

Subject: Fw: WLC appeal process

Warning: External Email – Watch for Email Red Flags!

Good morning Mr. Ormsby and Mr. Kelleher,

My name is Angel Lopez-Ramirez, Moreno Valley resident. Combat Veteran and Wounded Warrior with Public Service.

As a private citizen, I contacted the planning division this morning at 9am by telephone to 951-413-3206. No one answered my call and it went directly to voicemail. Please see message below that I received from Julia Descoteaux.

I left a detailed voicemail message my request to file an appeals application with Option 2, to submit an appeals application for the Revised Final EIR. I also requested the Record Number, Invoice and uploading instructions. I want to file as a private citizen.

The voicemail greeting did not advise me that City Hall was closed today and did give me your hours of operation for Friday, today.

I sincerely request that I receive a reply to my voicemail with instructions requested to my cell number 818-388-1231, please call my number. I also provided my email calissav@hotmail.com as a second option for the planning division to respond.

Thank you.

Angel Lopez-Ramirez”

Mr. Ormsby replied to my request with instructions for completing the Appeals Application with assigned number PAA20-0001:

“From: Chris Ormsby

Sent: Friday, May 22, 2020 12:33 PM

To: 'ANGEL LOPEZ' <calissav@hotmail.com>; Sean P. Kelleher <seanke@moval.org>

Cc: Patty Nevins <pattyn@moval.org>; Julia Descoteaux <juliad@moval.org>

Subject: RE: WLC appeal process

Angel,

The appeal application has been created and is PAA20-0001. The invoice is attached.

For payment, you can access the portal at <https://aca.accela.com/MOVAL/Default.aspx>. Follow the steps to register as a user. Once you log in as a user, search on the application, PAA20-0001. You will then be able to add the payment to the cart and make a payment and upload the application. If you need me to walk you through the process, please let me know, or one of our Planning Technicians can contact you on Tuesday.

Our apologies regarding the voice message. It will be updated. This is the first Friday that the City has begun closing on Fridays.

Chris”

From correspondence communicated between Julia Descoteaux, Chris Ormsby and myself, I shall now submit my objections with arguments to the City Council under Appeal Application PAA20-0001 to vacate the Planning Commission’s decision to pass #2 Case: PEN18-0050 Revised Final EIR (RFEIR) by a Yes vote, with the exception that Robert Harris had recused himself.

Objections and Arguments

In an email correspondence dated May 12, 2020 at 5:55pm. I sent an email electronically to all five members of the City Council and Cc’d the City Clerk, City Attorney and Mr. Beau Yarbrough from the Press Enterprise. The correspondence was voicing my objections with evidence that Planning Commissioners Alvin DeJohnette, Joann Stephan, Rafael Brugueras recuse their selves from voting on #2 Case: PEN18-0050 Revised Final EIR (RFEIR) due to “Prejudice” and “Bias”. In this letter, I am reinforcing my objections with initial email correspondence Appealing to the City Council to vacate the vote from the Planning Commission.

“From: ANGEL LOPEZ

Sent: Tuesday, May 12, 2020 5:55 PM

To: yxstiang@moval.org <yxstiang@moval.org>; victoriab@moval.org

<victoriab@moval.org>; ulisesc@moval.org <ulisesc@moval.org>; Dr. Carla J. Thornton

<carlat@moval.org>; David Marquez <davidma@moval.org>

Cc: cityclerk@moval.org <cityclerk@moval.org>; cmooffice@moval.org

<cmooffice@moval.org>; cityattorney@moval.org <cityattorney@moval.org>;

byarbrough@scng.com <byarbrough@scng.com>

Subject: Planning Commission Regular Meeting 05/14/2020 7pm

Good evening City Council Members,

I am writing to convey my objections to the Planning Commission Regular meeting scheduled 05/14/2020 at 7pm. The meeting must not go forward with certain Planning Commissioners who are not fit to legislate Public Hearing Item #2. In addition, I request the City Clerk submit comments in their entirety to the public record and I have included Mr. Beau Yarbrough of The Press Enterprise.

My objections are for Public Hearing Item #2:

#2 Case: PEN18-0050 Revised Final EIR (RFEIR)

PEN20-0017 Tentative Parcel Map 36457 (Finance)

PEN20-0018 Development Agreement

Applicant: Highland Fairview

Property Owner: Highland Fairview

Planning Commissioners Alvin DeJohnette, Joann Stephan, Robert Harris and Rafael Brugueras are not fit to convene at the Public Hearing item #2 due to their connections to both the Mayor of Moreno Valley, Dr. Yxstian Gutierrez and Iddo Benzeevi of Highland Fairview.

The Planning Commission Agenda was posted in accordance with the Ralph M. Brown Act:
54954.2.

(a) (1) At least 72 hours before a regular meeting, the legislative body of the local agency, or its designee, shall post an agenda containing a brief general description of each item of business to be transacted or discussed at the meeting, including items to be discussed in closed session. A brief general description of an item generally need not exceed 20 words. The agenda shall specify the time and location of the regular meeting and shall be posted in a location that is freely accessible to members of the public and on the local agency's Internet Web site, if the local agency has one. If requested, the agenda shall be made available in appropriate alternative formats to persons with a disability, as required by Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Sec. 12132), and the federal rules and regulations adopted in implementation thereof. The agenda shall include information regarding how, to whom, and when a request for disability-related modification or accommodation, including auxiliary aids or services, may be made by a person with a disability who requires a modification or accommodation in order to participate in the public meeting.

As such, I am now exercising my rights under the Ralph M. Brown Act to submit my public comments and raise my objections due to prejudice and bias by the four named Planning Commissioners, further that they must recuse their votes to the matter:

54954.3.

(a) Every agenda for regular meetings shall provide an opportunity for members of the public to directly address the legislative body on any item of interest to the public, before or during the

legislative body's consideration of the item, that is within the subject matter jurisdiction of the legislative body, provided that no action shall be taken on any item not appearing on the agenda unless the action is otherwise authorized by subdivision (b) of Section 54954.2. However, the agenda need not provide an opportunity for members of the public to address the legislative body on any item that has already been considered by a committee, composed exclusively of members of the legislative body, at a public meeting wherein all interested members of the public were afforded the opportunity to address the committee on the item, before or during the committee's consideration of the item, unless the item has been substantially changed since the committee heard the item, as determined by the legislative body. Every notice for a special meeting shall provide an opportunity for members of the public to directly address the legislative body concerning any item that has been described in the notice for the meeting before or during consideration of that item.

Prejudice is defined in The Free Dictionary as follows:

"A forejudgment; bias; partiality; preconceived opinion. A leaning toward one side of a cause for some reason other than a conviction of its justice.

A juror can be disqualified from a case for being prejudiced, if his or her views on a subject or attitude toward a party will unduly influence the final decision."

Source: <https://legal-dictionary.thefreedictionary.com/prejudice>

Bias is defined in The Legal Dictionary as follows:

"The term *bias* refers to the tendency of a person to favor one thing, idea, or person over another.

In a legal context, bias can lead an individual, such as a judge or juror, to treat someone unfairly,

in spite of the fact that hearings and trials are designed to be *unbiased* assessments of the facts of a case. Bias may also affect such issues as applications for jobs or entry into the country, and recruitment of individuals for other purposes. To explore this concept, consider the following bias definition."

Source: <https://legaldictionary.net/bias/>

Alvin DeJohnette is a Special Education Teacher with the Moreno Valley Unified School District. As such, I am submitting a link to Transparent California which shows his perceived connection to Mayor Yxstian Gutierrez as Special Ed Teachers. Based on this connection, Alvin DeJohnette must recuse himself due to the prejudice of "leaning toward one side of a cause" from the perceived connection to the Mayor; further, from bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Alvin DeJohnette Employment with Moreno Valley Unified School

District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/alvin-d-dejohnette/>

Mayor Yxstian Gutierrez Employment with Moreno Valley Unified School

District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/yxstian-a-gutierrez/>

Joann Stephan, Robert Harris and Rafael Brugueras are listed as Principal Officers with the Political Action Committee "Moreno Valley Jobs Coalition, Supporting Jobs Creation and Workforce Training Initiatives and The World Logistics Center Development, Major Funding by

Highland Fairview." As filed with The Moreno Valley City Clerk on 05/12/2016 on California Form 410 (attached).

Joann Stephan, in addition has openly supported the World Logistics Center as an advocate for them from this video posted on YouTube October 7, 2013. Joann Stephan from her comments, presents prejudice and bias. Further Joann Stephan must recuse herself due to the prejudice of "leaning toward one side of a cause" from YouTube video; further, from bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Source: <https://www.youtube.com/watch?v=XygdNfohiw>

A second video of Joann Stephan openly advocating for the World Logistics Center can be seen on YouTube, posted 08/05/2015 with video evidence from 06/11/2015. In the video, from the 1 minute, 40 second mark you will find Joann Stephan advocating, and turning her head directly toward Iddo Benzeevi of Highland Fairview. This video footage presents clear and convincing evidence for a "conflict of interest" with prejudice and bias that Joann Stephan must recuse herself.

Source: https://www.youtube.com/watch?v=Ou6_Gc1rQZY&feature=youtu.be&fbclid=IwAR0ZOpAOdDFT9NTjrj1yL7skym99jCCv2eSe20RbGMIn11FWapxq71pibZU

The following link I am presenting was brought to my attention, which was a Photo taken with Iddo Benzeevi, Robert Harris and Rafael Brugueras on 04/15/2019 by a Real Estate seller on Facebook with her page made public. And I may add was a celebration before a City Council Vote the next day on 04/16/2019 to vote on the Skechers Building Expansion project.

Because of the photo taken with Iddo Benzeevi. There is clear and convincing evidence Robert Harris and Rafael Brugueras must recuse their selves for a "conflict of interest" with prejudice and bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Source: <https://www.facebook.com/233736366829261/photos/a.415890128613883/968618826674341/?type=3&theater>

The photo itself is attached.

For my City Council members. I have presented clear and convincing evidence the Planning Commissioners named. Alvin DeJohnette, Joann Stephan, Robert Harris and Rafael Brugueras must recuse their selves from Public Hearing Item #2.

Very respectfully,

Angel Lopez-Ramirez

Combat Veteran, Wounded Warrior and Public Servant

Cell: 818-388-1231”

The following evidence, I am resubmitting as follows:

Alvin DeJohnette Employment with Moreno Valley Unified School

District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/alvin-d-dejohnette/> (Exhibit 1A).

Mayor Yxstian Gutierrez Employment with Moreno Valley Unified School

District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/yxstian-a-gutierrez/> (Exhibit 1B).

The following evidence, I am resubmitting as follows:

Joann Stephan, and Rafael Brugueras are listed as Principal Officers with the Political Action Committee "Moreno Valley Jobs Coalition, Supporting Jobs Creation and Workforce Training Initiatives and The World Logistics Center Development, Major Funding by Highland Fairview." As filed with The Moreno Valley City Clerk on 05/12/2016 on California Form 410 (Exhibit 1C).

The following evidence, I am resubmitting as follows:

Joann Stephan, in a video posted on YouTube October 7, 2013. Source: <https://www.youtube.com/watch?v=XygdNfohiw> Openly supporting the World Logistics Center, I am resubmitting as evidence (Exhibit 1D).

Joann Stephan in a second video openly advocating for the World Logistics Center can be seen on YouTube, posted 08/05/2015 with video evidence from 06/11/2015.

Source: https://www.youtube.com/watch?v=Ou6_Gc1rQZY&feature=youtu.be&fbclid=IwAR0ZOpAOdDFT9NTjrj1yL7skym99jCCv2eSe20RbGMIn11FWapxq71pibZU

In the video, from the 1 minute, 40 second mark. I am resubmitting as evidence (Exhibit 1E).

The following evidence, I am resubmitting as follows:

Photo taken with Iddo Benzeevi and Rafael Brugueras on 04/15/2019 by a Real Estate seller on Facebook. A celebration before a City Council Vote the next day on 04/16/2019 to vote on the Skechers Building Expansion project.

Source: <https://www.facebook.com/233736366829261/photos/a.415890128613883/968618826674341/?type=3&theater>

The Photo I am resubmitting as evidence (Exhibit 1F).

In an email correspondence follow up from May 17, 2020 at 12:37pm. I submitted further arguments to the City Council and argued the error the City Attorney committed during the Planning Commission from May 14, 2020. I added further objections with my arguments:

“**From:** ANGEL LOPEZ <calissav@hotmail.com>

Sent: Sunday, May 17, 2020 12:37 PM

To: yxstiang@moval.org <yxstiang@moval.org>; victoriab@moval.org

<victoriab@moval.org>; ulisesc@moval.org <ulisesc@moval.org>; Dr. Carla J. Thornton

<carlat@moval.org>; David Marquez <davidma@moval.org>

Cc: cityclerk@moval.org <cityclerk@moval.org>; cmoffice@moval.org

<cmoffice@moval.org>; cityattorney@moval.org <cityattorney@moval.org>;

byarbrough@scng.com <byarbrough@scng.com>

Subject: Re: Planning Commission Regular Meeting 05/14/2020 7pm

Good afternoon City Council Members,

In a follow up to my initial email with which I received no reply.

In response to the City Attorney's comments in which he opined to my claims of bias.

The City Attorney stated Commissioner Harris decided for himself he thought he needed to recuse himself, due to a petition he submitted in support for the WLC.

Further stating, "public officials are prohibited from voting on matters in which they stand to benefit" in reference to the planning commissioners. Further stating that "public officials must make decisions that benefit the public." And was not uncommon for public officials to publicly express their support for a project that publicly benefit the community as a whole, including taking a photograph with a developer who may bring jobs.

The City Attorney erred on his opinion and I now introduce two additional terms to further solidify my arguments.

The term "Ex Parte."

Ex Parte is defined in Merriam-Webster Dictionary as follows:

Definition of *ex parte*

1: on or from one side or party only —used of legal proceedings

2: from a one-sided or partisan point of view

Source: <https://www.merriam-webster.com/dictionary/ex%20parte>

Rafael Brugueras stated for the record before the motion to vote on the matter. First by stating in his own words, "we heard truth and we heard lies!"

Further stating for the record, "for Moreno Valley to take the fight to the school board, to fight for the trades for children to grow up in the logistic era" in reference to the World Logistics Center and children not having a problem finding a job in the future.

Second, attacking me personally for accusing him of citing his claims of "not doing favors for others", having "to live in the City and not wanting to be looked in a certain way." Further "doing his research to make a decision" and relying on the "City Staff." Further adding to know the character getting involved to know "the Mayor, to know Iddo Benzeevi, the staff and commissioners." Closing his remarks that he will "vote for the project" before the motion was brought forward to a vote by the Planning Commission Chair. The Vice Chair motioned to approve and adopt the measure for the World Logistics Center revised FEIR for a vote. The motion was second by Rafael Brugueras in excitement. Rafael made his intentions known to the public in a predetermined manner by his vote, further solidifying my objections to a vote with prejudice and bias with grounds of a one-sided partisan point of view.

I wish to further add "Political Influence" in my arguments.

Political Influence is defined in Law Insider as follows:

"Political influence or "authority" means a tribal council, leadership, internal process or other mechanism which the tribe or group has used as a means of influencing or controlling the behavior of its members in significant respects, and/or making decisions for the tribe or group which substantially affect its members, and/or representing the tribe or group in dealing with outsiders in matters of consequence. This process is to be understood in the context of the history, culture and social organization of the tribe or group."

Source: <https://www.lawinsider.com/dictionary/political-influence>

Iddo Benzeevi of Highland Fairview has influenced the named Planning Commissioners Rafael Brugueras and Joann Stephan when they were named as Principal Officers with the Political Action Committee "Moreno Valley Jobs Coalition, Supporting Jobs Creation and Workforce Training Initiatives and The World Logistics Center Development, Major Funding by Highland Fairview." As filed with The Moreno Valley City Clerk on 05/12/2016 on California Form 410.

How was the vote by the Planning Commission not marred with prejudice and bias by "Ex Parte" and "Political Influence" exerted by Iddo Benzeevi to his benefit when the vote will be brought before the City Council where Iddo Benzeevi retains "Ex Parte" and "Political Influence" over City Council members Yxstian Gutierrez, Victoria Baca, Ulises Cabrera and Carla Thornton through California Form 460 documents as a direct contributor to their campaigns?

Rafael Brugueras has had relationships with Yxstian Gutierrez and Iddo Benzeevi for years, citing an article from The Press Enterprise the relationship and extent Rafael Brugueras has: "Some residents raised criticisms about Brugueras' ties to Iddo Benzeevi, developer of the 40.6 million-square-foot World Logistics Center warehouse complex planned in the city.

Brugueras campaigned for Gutierrez and belongs to the Moreno Valley Jobs Coalition, a political action committee funded by Benzeevi's company Highland Fairview to campaign for the project. The company has also been a big financial supporter of Gutierrez, spending \$232,835 to support him through direct contributions and political action committees since 2014, campaign finance reports show."

Source: <https://www.pe.com/2017/04/04/after-monthlong-standoff-moreno-valley-selects-planning-commissioners/>

I wish to further add from the photo I had submitted taken on 04/15/2019 between Iddo Benzeevi, Rafael Brugueras and Robert Harris who sit on the Planning Commission.

That photo was in celebration and I will quote the remarks from Real Estate seller on Facebook with her page made public:

"Dinner at Iddo Benzeevi's home. Supporting his new Skechers Building Project coming to Moreno Valley Soon."

These comments were made in the photo before the City Council voted on the Skechers Building Expansion Project on 04/16/2019 per the City Council meeting Agenda. In which Rafael Brugueras himself was also present at that meeting (photo attached).

The same Real Estate seller on Facebook with her page made public posted on Facebook a photo with a celebration after the motion had passed (photo attached).

And I quote from the photo, "Hanging out at the Moreno Valley Council Chamber Supporting the Skechers Building Expansion and it looks like the Building was Approved."

Source: <https://www.facebook.com/233736366829261/photos/a.415890128613883/969125143290376/?type=3&theater>

With subsequent photo from City Hall after the motion passed with Rafael Brugueras as Planning Commissioner still in the audience (photo attached, red arrow pointing to Rafael).

I have presented further evidence that the City Attorney erred in his opinion with Planning Commissioners Rafael Brugueras and Joann Stephan not recusing their selves for prejudice, bias and conflicts of interest their votes were intended to benefit Iddo Benzeevi of Highland Fairview.

And now finally a question for the City Council, is it the "Modus Operandi" for Planning Commissioners to personally attack Moreno Valley residents (myself) by name to exert their personal views and bias during a Planning Commission hearing to vote on matters? Because Rafael Brugueras personally attacked me by name, first I demand an apology. Second, I demand that he be relieved immediately from his duties as Planning Commissioner and to vacate the vote by the Planning Commission from 05/14/2020 and return the manner to a new Planning Commission with no ties to the City Council, nor Iddo Benzevi of Highland Fairview for a hearing free from prejudice and bias.

I demand a response to my objections, additional arguments and evidence presented by certified mail.

Address: 10210 Via Pescadero, Moreno Valley CA 92557

Angel Lopez-Ramirez

Combat Veteran, Wounded Warrior and Public Servant

Cell: 818-388-1231”

For the record, today I have not received a reply from my demands to respond by Certified Mail from the City Council.

In the photo from the City Council voted on the Skechers Building Expansion Project on 04/16/2019 per the City Council meeting Agenda. In which Rafael Brugueras himself was also present at that meeting. I am resubmitting as evidence (Exhibit 1G).

In the Photo from Real Estate seller on Facebook with her page made public posted on Facebook a photo with a celebration after the Skechers Building Expansion had passed.

Source: <https://www.facebook.com/233736366829261/photos/a.415890128613883/969125143290376/?type=3&theater> I am resubmitting as evidence (Exhibit 1H).

The subsequent photo from City Hall after the motion passed with Rafael Bruguera as Planning Commissioner still in the audience, with red arrow pointing to him. I am resubmitting as evidence (Exhibit 1I).

Further, in my opinion stating the City Attorney erred in his opinion from Planning Commission proceedings on May 14, 2020. I am submitting additional arguments citing Case Law between BreakZone Billiards v. City of Torrance:

Source: <https://law.justia.com/cases/california/court-of-appeal/4th/81/1205.html>

“BreakZone Billiards v. City of Torrance (2000)

[No. B128098. Second Dist., Div. Two. June 30, 2000.]

BREAKZONE BILLIARDS et al., Plaintiffs and Appellants, v. CITY OF TORRANCE,
Defendant and Respondent.

(Superior Court of Los Angeles County, No. BS050766, David P. Yaffe, Judge.)

(Opinion by Goodman, J., fn. † with Boren, P. J., and Nott, J., concurring.)

COUNSEL

Grossblatt & Booth and Hillary Arrow Booth for Plaintiffs and Appellants.

Rutan & Tucker, Philip D. Kohn, M. Katherine Jenson; John L. Fellows III, City Attorney, and Patrick Q. Sullivan, Deputy City Attorney, for Defendant and Respondent. **[81 Cal. App. 4th 1208]**”

I am bringing to the focus of the City Council and City Attorney the following information from this Case Law:

“3. Was the impartiality of the decision makers impermissibly tainted by the campaign contributions?

[2] BreakZone contends that the receipt of campaign contributions by four members of the Torrance City Council deprived BreakZone of a **[81 Cal. App. 4th 1226]** decision by an impartial tribunal, thus depriving BreakZone of a fair hearing. fn. 15”

I made distinct arguments of prejudice with bias, depriving the public from a fair hearing solely in the favor of the applicant Iddo Benzeevi of Highland Fairview.

Further, I want to bring to your attention the arguments for “Common Law Conflict of Interest” from the Case Law:

“d. Common law conflict of interest.

BreakZone argues that the history of contributions by La Caze to four sitting council members and his financial interest in the outcome of litigation between him and BreakZone "provides the appearance of unfairness and **[81 Cal. App. 4th 1232]** bias." The existence of such unfairness, it is argued, is sufficient basis to reverse the judgment below. fn. 22

Analyzing BreakZone's contention requires that we answer these questions: Is there a "common law" conflict of interest doctrine notwithstanding Woodland Hills? Can a history of campaign contributions support a finding that a hearing in which the recipients sit as government officials make that hearing fundamentally unfair?

There is language predating Woodland Hills which may be read to suggest there is a common law of conflict of interest. Thus, in *Terry v. Bender*, supra, 143 Cal. App. 2d 198, a case in which it was alleged that a public official had a disqualifying personal interest in a public contract, the court stated: "A public office is a public trust created in the interest and for the benefit of the people. Public officers are obligated ... to discharge their responsibilities with integrity and fidelity.... [T]hey may not exploit or prostitute their official position for their private benefits. When public officials are influenced in the performance of their public duties by base and improper considerations of personal advantage, they violate their oath of office and vitiate the trust reposed in them, and the public is injured by being deprived of their loyal and honest services. It is therefore the general policy of this state that public officers shall not have a personal interest in any contract made in their official capacity." (Id. at p. 206.)

The facts of *Terry v. Bender* reveal that the public official there under scrutiny was alleged to have a direct and personal interest in the contract before that city council. (*Terry v. Bender*, supra, "143 Cal.App.2d at p. 206.) There is no similar factual allegation in the instant case and no authority cited by BreakZone can be read as establishing that a common law conflict of interest exists when the conflict is bottomed on campaign contributions made several years earlier. [**81 Cal. App. 4th 1233**]

We contrast the facts of this case with one in which it is alleged the campaign contribution is made in return for an express promise to act in a particular way in exercising governmental authority with respect to a particular matter then pending or which may be presented for governmental review and action at a later date. No such factual circumstance is alleged to exist in the instant case. (We do not foreclose a circumstance in which an earlier governmental action is "rewarded" in an illegal manner; this circumstance also is not suggested in this case.)

We have previously expressed caution over "general principles of conflict of interest." Thus, in *Friends of La Vina v. County of Los Angeles* (1991) 232 Cal. App. 3d 1446 [284 Cal. Rptr. 171], we reviewed a trial court's determination that it was a conflict of interest for responses to an environmental impact report to be drafted by a consultant to an agency rather than by the agency itself. In rejecting such a contention, we stated: "Except where the law clearly provides rules for identification and rectification of what might be termed conflicts of interest, that is a legislative not a judicial function. [Citations.]" (Id. at p. 1456.)

We find inapposite BreakZone's citation of *Clark v. City of Hermosa Beach*, supra, 48 Cal. App. 4th 1152. While the common law may recognize the appearance of unfairness, and provide remedies, such as writs of mandate, for allegations of denial of a fair hearing, BreakZone has not made the necessary record to invoke those protections, whether they be founded on statute or common law. We continue to be cautious in finding common law conflicts of interest. On the facts of this case, that caution is fully warranted. We reject the application of the doctrine in this case, assuming, arguendo, it exists."

My arguments from the Case Law, citing *BreakZone Billiards v. City of Torrance*. The evidence I have submitted with arguments clearly present "the appearance of unfairness and [81

Cal. App. 4th 1232] bias." The existence of such unfairness, it is argued, is sufficient basis to reverse the judgment.”

My arguments with objections and evidence presented, to include public testimony from the participants with overwhelming objections to vote No on Agenda Item #2 Case: PEN18-0050 Revised Final EIR (RFEIR). Were completely not taken into consideration and ignored by the Planning Commission. The Planning Commission was intent on passing the measure in a predetermined manner regardless of evidence presented, to please Iddo Benzeevi of Highland Fairview and sitting City Council members Mayor Yxstian Gutierrez, Mayor Pro Tem Victoria Baca, Councilman Ulises Cabrera and Councilwoman Carla J. Thornton who their selves were direct recipients from campaign contributions by Iddo Benzeevi and Highland Fairview.

Although BreakZone did not provide sufficient “arguendo” to secure protections for unfairness and bias under common law conflict of interest. My arguments with evidence presented, I believe, to include Campaign Contribution forms supporting Mayor Yxstian Gutierrez from 2014 (Supporting Document 1, Supporting Document 2), is sufficient to secure protections to vacate the Planning Commission decision on a Yes vote in favor of Iddo Benzeevi with Highland Fairview:

“We find inapposite BreakZone's citation of *Clark v. City of Hermosa Beach*, supra, 48 Cal. App. 4th 1152. While the common law may recognize the appearance of unfairness, and provide remedies, such as writs of mandate, for allegations of denial of a fair hearing, BreakZone has not made the necessary record to invoke those protections, whether they be founded on statute or common law. We continue to be cautious in finding common law conflicts of interest. On the

facts of this case, that caution is fully warranted. We reject the application of the doctrine in this case, assuming, arguendo, it exists.”

With urgency, my recommendation is for the City Council to Appeal the Planning Commission decision for a Yes vote #2 Case: PEN18-0050 Revised Final EIR (RFEIR). And vacate that vote on the grounds of prejudice, bias, and common law conflicts of interest and remand the matter back to the Planning Commission.

My next arguments are related to the Letter sent by California Attorney General, Xavier Becerra to Julia Descoteaux, Associate Planner with the Moreno Valley Planning Division. In a letter dated May 14, 2020. The same date of the Planning Commission meeting. Did no one in the Planning Division read that letter received? Did City Council members not read that letter received? Did Planning Commissioners not read that letter received? Based on the letter from the California Attorney General (attached), and I quote:

**“RE: World Logistics Center Revised Final Environmental Impact Report
(SCH # 2012021045)**

Dear Ms. Descoteaux:

Attorney General Xavier Becerra, in his independent capacity,¹ and the California Air Resources Board (CARB) jointly submit the following comments on the April 2020 Final Environmental Impact Report (FEIR) prepared for the World Logistics Center (the Project) in advance of the Project’s May 14, 2020 Moreno Valley (City) Planning Commission hearing. The Attorney General and CARB have the following concerns regarding the FEIR, as explained in detail below:

1. The FEIR does not correct the improper GHG analysis the Attorney General and CARB critiqued in multiple comment letters on prior versions of the Project's environmental impact report.²
2. The FEIR also continues to misrepresent CARB's positions.
3. The FEIR's new GHG Mitigation Measure 4.7.7.1 is inadequate.
4. The FEIR fails to adopt feasible mitigation measures that would substantially lessen the Project's significant adverse effects.
5. The addition of Mitigation Measure 4.7.7.1 is "significant information" that requires recirculation of the FEIR.

Until these shortcomings are corrected, the FEIR should not be certified by the City."

I was appalled the Planning Commission, despite my arguments with objections and evidence presented. Despite overwhelming objections from the public to the World Logistics Center Revised Final EIR (RFEIR), to vote No for the measure. I was further appalled the City Attorney opined during Planning Commission proceedings, the Revised Final EIR did remedy shortcomings and allowed a vote to proceed. Ignoring a letter from the California Attorney General further strengthens my arguments of prejudice, with bias under common law conflicts of interest the Planning Commission was predetermined to vote Yes on the measure regardless of opinion, public testimony, arguments or evidence presented.

My last argument to make is from a letter dated May 13, 2020 from the State of California Department of Fish and Wildlife (attached). One day prior to the Planning Commission meeting and decision made on May 14, 2020 in favor of Iddo Benzeevi with

Highland Fairview for the Revised Final EIR (RFEIR). The letter was submitted to Julia Descoteaux, Associate Planner with the Moreno Valley Planning Division. Once again, I present the same questions. Did no one in the Planning Division read that letter received? Did City Council members not read that letter received? Did Planning Commissioners not read that letter received?

And once again, I present the same arguments that ignoring a letter from State of California Department of Fish and Wildlife strengthens my arguments of prejudice, with bias under common law conflicts of interest the Planning Commission was predetermined to vote Yes on the measure regardless of opinion, public testimony, arguments or evidence presented.

Therefore the City Council has the responsibility to vacate that vote. By vacating that vote, further litigation may be avoided by a “writ of mandate” or affidavits to courts I can submit as a private citizen, Moreno Valley residents can submit making their voices heard, to force the City Council to Appeal the Planning Commission’s vote from May 14, 2020.

Respectfully submitted,



Angel E. Lopez-Ramirez (e-signed)

Moreno Valley Homeowner, Taxpayer

Combat Veteran, Wounded Warrior and Public Servant

Address: 10210 Via Pescadero, Moreno Valley CA 92557

Tel: 818-388-1231

Exhibit 1A

The screenshot shows a web browser window displaying the Transparent California website. The address bar shows the URL: https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/alvin-d-dejohnette/. The page features a search bar at the top with the text "YOUR RECORDS ARE HERE" and a search button labeled "SEARCH NOW". Below the search bar, the website title "TRANSPARENT CALIFORNIA" is displayed in large red letters, followed by the subtitle "California's largest public pay and pension database". A navigation breadcrumb trail includes "Home", "School Districts", "2018", "Moreno Valley Unified", and "Alvin D Dejohnette". The main content area displays the name "Alvin D Dejohnette" in a large, bold font, with the job title "Special Ed Teacher - Rsp (2018)" below it. A table lists the following pay information:

Regular pay:	\$94,780.23
Overtime pay:	\$0.00
Other pay:	\$8,800.86
Total pay:	\$103,581.09
Benefits:	\$28,490.07
Total pay & benefits:	\$132,071.16

At the bottom of the page, there is a "Share:" section with a "Tweet" button and a "Share" button. The footer of the page reads "© 2020 Transparent California".

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Exhibit 1B

TC <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/yxstian-a-gutierrez/>

TC Alvin D Dejohnette | Transpare... TC Yxstian A Gutierrez | Transp...

File Edit View Favorites Tools Help

Norton Safe Search THIS PAGE IS SAFE VAULT IS CLOSED SHARE VIA FACEBOOK

YOUR RECORDS ARE HERE Instant Checkmate

First Name Last Name State SEARCH NOW

TRANSPARENT CALIFORNIA

California's largest public pay and pension database

[Stay updated by joining our mailing list!](#)

[Home](#) [School Districts](#) [2018](#) [Moreno Valley Unified](#) Yxstian A Gutierrez

Yxstian A Gutierrez

Special Ed Teacher - Rsp (2018)

Regular pay:	\$79,510.39
Overtime pay:	\$0.00
Other pay:	\$273.13
Total pay:	\$79,783.52
Benefits:	\$20,242.60
Total pay & benefits:	\$100,026.12

Share: [Tweet](#) [Share](#)

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Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Exhibit 1C, page 1

Statement of Organization Recipient Committee

CITY CLERK
MORENO VALLEY
RECEIVED

16 MAY 12 PM 12: 33

CALIFORNIA FORM **410**

For Official Use Only

Statement Type Initial
Not yet qualified or
_____/_____/_____
Date qualified as committee

Amendment
List I.D. number:

_____/_____/_____
Date qualified as committee
(If applicable)

Termination - See Part
List I.D. number:
1379766
04 / 30 / 2016
Date of Termination

1. Committee Information

NAME OF COMMITTEE MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

STREET ADDRESS (NO P.O. BOX)
[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	[REDACTED]

MAILING ADDRESS (IF DIFFERENT)

FAX / E-MAIL ADDRESS
[REDACTED]

COUNTY OF DOMICILE	JURISDICTION WHERE COMMITTEE IS ACTIVE
MARIN	MORENO VALLEY

2. Treasurer and Other Principal Officers

NAME OF TREASURER
JASON D. KAUNE

STREET ADDRESS (NO P.O. BOX)
[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	[REDACTED]

NAME OF ASSISTANT TREASURER, IF ANY
JAMES W. CARSON

STREET ADDRESS (NO P.O. BOX)
[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	[REDACTED]

NAME OF PRINCIPAL OFFICER(S)
LEONARDO DANIEL GONZALEZ

STREET ADDRESS (NO P.O. BOX)
[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92557	[REDACTED]

Attach additional information on appropriately labeled continuation sheets.

3. Verification

I have used all reasonable diligence in preparing this statement and to the best of my knowledge the information contained herein is true and complete. I certify under penalty of perjury under the laws of the State of California that this statement is true and correct.

Executed on 5/6/2016 By [REDACTED] SIGNATURE OF TREASURER OR ASSISTANT TREASURER

Executed on _____ By [REDACTED] SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT

Executed on _____ By _____ SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT

Executed on _____ By _____ SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Statement of Organization
Recipient Committee

CALIFORNIA FORM 410
Page 2 of 6

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

I.D. NUMBER
1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S)
MARSHALL SCOTT
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
JOANN STEPHAN
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
GABRIEL COLANGELO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
DANNY SCHWIER
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
ROBERT HARRIS
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
PEDRO HURTADO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
LANCE MARTIN
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92553 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
JOE CHACKO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]

Statement of Organization
Recipient Committee

CALIFORNIA FORM 410
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INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

I.D. NUMBER
1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S)
DAVID LARA-TELLEZ
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
TOM R. GERELE, SR.
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
ANTONIO REZA
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92553 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
TED BOECKER
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92553 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
IDDO BENZEEVI
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92553 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S)
RAFAEL BRUGUERAS
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE

Statement of Organization Recipient Committee

CALIFORNIA FORM 410
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INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

I.D. NUMBER
1379766

- All committees must list the financial institution where the campaign bank account is located.

NAME OF FINANCIAL INSTITUTION BANK OF MARIN	AREA CODE/PHONE (415) 927-8905	BANK ACCOUNT NUMBER [REDACTED]
ADDRESS 504 TAMALPAIS DRIVE	CITY CORTE MADERA	STATE CA
		ZIP CODE 94925

4. Type of Committee Complete the applicable sections.

Controlled Committee

- List the name of each controlling officeholder, candidate, or state measure proponent. If candidate or officeholder controlled, also list the elective office sought or held, and district number, if any, and the year of the election.
- List the political party with which each officeholder or candidate is affiliated or check "nonpartisan."
- If this committee acts jointly with another controlled committee, list the name and identification number of the other controlled committee.

NAME OF CANDIDATE/OFFICEHOLDER/STATE MEASURE PROPONENT	ELECTIVE OFFICE SOUGHT OR HELD (INCLUDE DISTRICT NUMBER IF APPLICABLE)	YEAR OF ELECTION	PARTY
			<input type="checkbox"/> Nonpartisan
			<input type="checkbox"/> Nonpartisan

Primarily Formed Committee

Primarily formed to support or oppose specific candidates or measures in a single election. List below:

CANDIDATE(S) NAME OR MEASURE(S) FULL TITLE (INCLUDE BALLOT NO. OR LETTER)	CANDIDATE(S) OFFICE SOUGHT OR HELD OR MEASURE(S) JURISDICTION (INCLUDE DISTRICT NO., CITY OR COUNTY, AS APPLICABLE)	CHECK ONE	
		SUPPORT	OPPOSE
MORENO VALLEY JOBS INITIATIVE	CITY OF MORENO VALLEY	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MORENO VALLEY WORKFORCE TRAINING INITIATIVE : .	CITY OF MORENO VALLEY	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Exhibit 1C, page 5

Statement of Organization Recipient Committee

CALIFORNIA FORM **410**

INSTRUCTIONS ON REVERSE

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COMMITTEE NAME

I.D. NUMBER

MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT MAJOR FUNDING BY HIGHLAND FAIRVIEW

Primarily Formed Committee

Primarily formed to support or oppose specific candidates or measures in a single election. List below

CANDIDATE(S) NAME OR MEASURE(S) FULL TITLE (INCLUDE BALLOT NO. OR LETTER)	CANDIDATE(S) OFFICE SOUGHT OR HELD OR MEASURE(S) JURISDICTION (INCLUDE DISTRICT NO., CITY OR COUNTY, AS APPLICABLE)	CHECK ONE	
		SUPPORT	OPPOSE
WLC LAND BENEFIT INITIATIVE : .	CITY OF MORENO VALLEY	X	

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Statement of Organization
Recipient Committee**

CALIFORNIA FORM 410	
Page 5 of 6	
I.D. NUMBER	1379766

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
 MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

4. Type of Committee (Continued)

General Purpose Committee Not formed to support or oppose specific candidates or measures in a single election. Check only one box:
 CITY Committee COUNTY Committee STATE Committee

PROVIDE BRIEF DESCRIPTION OF ACTIVITY

Sponsored Committee List additional sponsors on an attachment.

NAME OF SPONSOR		INDUSTRY GROUP OR AFFILIATION OF SPONSOR		
HIGHLAND FAIRVIEW OPERATING CO.		LOGISTICS FACILITY BUILDER/DEVELOPER		
STREET ADDRESS	NO. AND STREET	CITY	STATE	ZIP CODE
		MORENO VALLEY	CA	92553

Small Contributor Committee _____
 Date qualified

5. Termination Requirements By signing the verification, the treasurer, assistant treasurer and/or candidate, officeholder, or proponent certify that all of the following conditions have been met:

- This committee has ceased to receive contributions and make expenditures;
 - This committee does not anticipate receiving contributions or making expenditures in the future;
 - This committee has eliminated or has no intention or ability to discharge all debts, loans received, and other obligations;
 - This committee has no surplus funds; and
 - This committee has filed all campaign statements required by the Political Reform Act disclosing all reportable transactions.
- There are restrictions on the disposition of surplus campaign funds held by elected officers who are leaving office and by defeated candidates. Refer to Government Code Section 89519.
- Leftover funds of ballot measure committees may be used for political, legislative or governmental purposes under Government Code Sections 89511 - 89518, and are subject to Elections Code Section 18680 and FPPC Regulation 18521.5.

Exhibit 1D

https://www.youtube.com/watch?v=XygdPnfohiw

Joann Stephan, World Logis...

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Joann Stephan, World Logistics Center supporter

World Logistics Center
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Published on Oct 7, 2013
Joann Stephan explains the need to create jobs in Moreno Valley so we can be more than a bedroom community and provide meaningful-wage jobs to people right here in our city.

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Exhibit 1E

https://www.youtube.com/watch?v=Ou6_Gc1rQZY&feature=youtu.be&fbclid=IwAR0ZOpAdDFT9NTj1yL7skym99jCCv2eSe20RbGMinlFWapxq71

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PLANNING COMMISSION JUNE 11, 2015
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Published on Aug 5, 2015
The world Logistics Center, Moreno valley, Politics, progress, distribution centers, WLC, Iddo Benzeevi, Moreno Valley Matters, Future of Moreno valley, Sketchers, Corporate Park, Yes For Jobs, The Press Enterprise.

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Exhibit 1F

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Patricia Hillman Sells Real Estate



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Dinner at Iddo Benzeevi's Home, Supporting his new Skechers Building Project Coming to Moreno Valley Soon. Realtor Patricia, supporting her Community Highland Fairview Community 🙌

2

2 Comments



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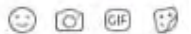


Amado Hernandez Patricia Campos
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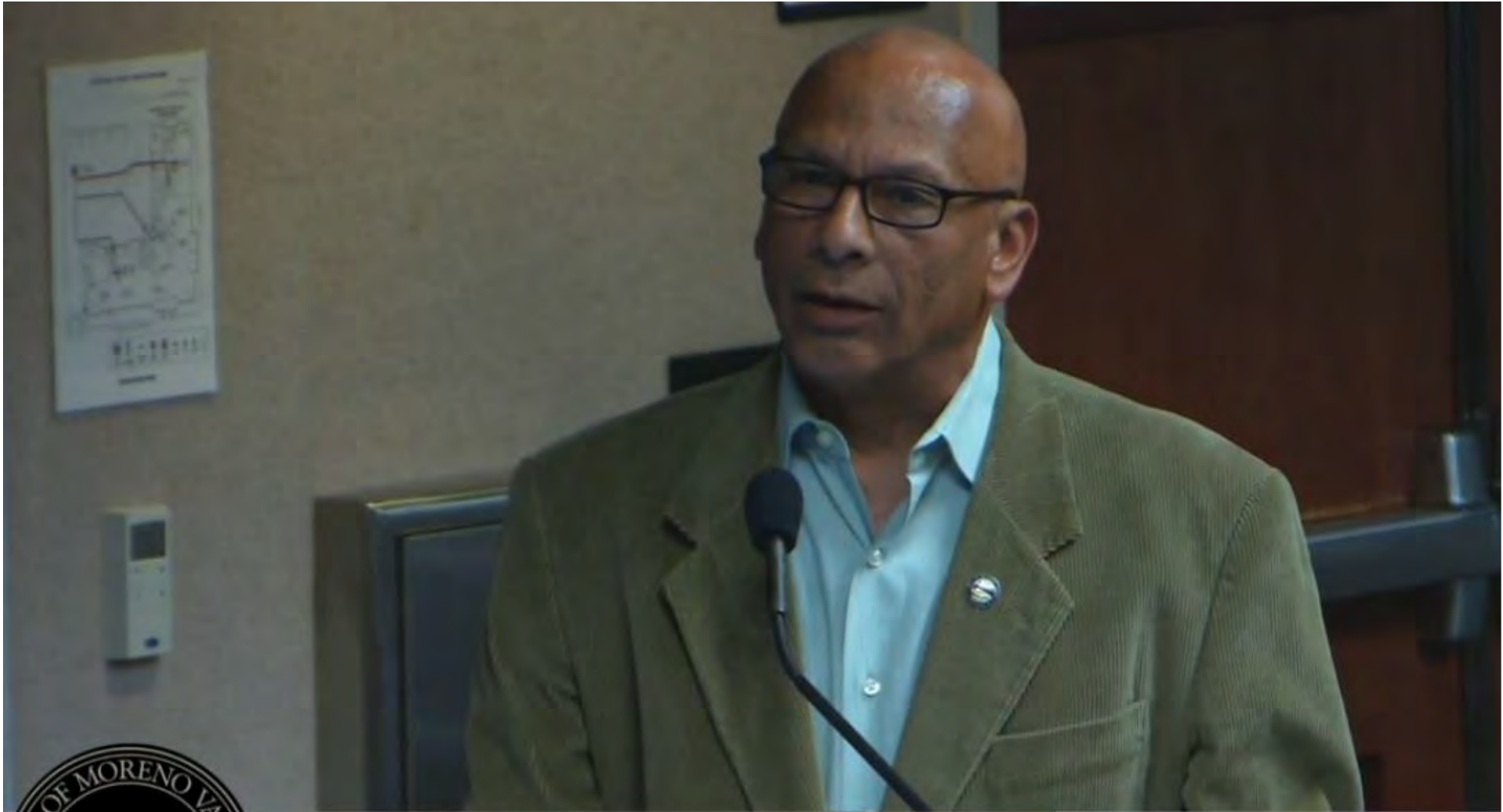


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Exhibit 1G



MORENO VALLEY CITY COUNCIL
REGULAR CITY COUNCIL MEETING

April 16, 2019

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Exhibit 1H

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Hanging out at the Moreno Valley Council Chamber. Supporting the Skeches building expansion 🙌 and it looks like the Building was Approved 🎉 Congratulations to Iddo Benzeevi 🌟 Highland Fairview Community.

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Exhibit 1I



MORENO VALLEY CITY COUNCIL
REGULAR CITY COUNCIL MEETING

April 16, 2019

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World



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May 14, 2020

VIA E-MAIL ONLY

Julia Descoteaux, Associate Planner
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**RE: World Logistics Center Revised Final Environmental Impact Report
(SCH # 2012021045)**

Dear Ms. Descoteaux:

Attorney General Xavier Becerra, in his independent capacity,¹ and the California Air Resources Board (CARB) jointly submit the following comments on the April 2020 Final Environmental Impact Report (FEIR) prepared for the World Logistics Center (the Project) in advance of the Project’s May 14, 2020 Moreno Valley (City) Planning Commission hearing.

The Attorney General and CARB have the following concerns regarding the FEIR, as explained in detail below:

1. The FEIR does not correct the improper GHG analysis the Attorney General and CARB critiqued in multiple comment letters on prior versions of the Project’s environmental impact report.²

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14–15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the FEIR’s compliance with the California Environmental Quality Act (CEQA).

² The Attorney General and CARB previously reviewed the City’s July 2018 Revised Final Environmental Impact Report (RFEIR) and submitted comments regarding the RFEIR on September 7, 2018. As noted in those comment letters, the RFEIR’s analysis of greenhouse gas (GHG) related impacts does not meet CEQA’s requirements. On January 30, 2020, CARB also

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World Logistics Center)

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2. The FEIR also continues to misrepresent CARB's positions.
3. The FEIR's new GHG Mitigation Measure 4.7.7.1 is inadequate.
4. The FEIR fails to adopt feasible mitigation measures that would substantially lessen the Project's significant adverse effects.
5. The addition of Mitigation Measure 4.7.7.1 is "significant information" that requires recirculation of the FEIR.

Until these shortcomings are corrected, the FEIR should not be certified by the City.

I. THE FEIR CONTINUES TO RELY ON ENVIRONMENTALLY IRRESPONSIBLE AND LEGALLY FLAWED ARGUMENTS TO AVOID PROPERLY ANALYZING AND MITIGATING THE PROJECT'S ENORMOUS GREENHOUSE GAS IMPACTS.

Under CEQA, a project's significant GHG impacts must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact. 14 Cal. Code Regs. (CEQA Guidelines) § 15064.4. Yet, the FEIR continues to improperly divide the Project's GHG emissions into two categories, which it terms "capped" and "uncapped"; classifications that are created by the FEIR and have no relevance under CEQA. The FEIR asserts that "capped" emissions are "covered" by CARB's Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation.³

To purportedly support its improper approach to GHG analysis and mitigation, the FEIR relies on a few weak, misguided bases: (1) two mitigated negative declarations (MND); (2) an outdated guidance document from an air district with no jurisdiction in the South Coast Air Basin; (3) an inapposite appellate court decision that did not benefit from the input of California's expert agencies and other key stakeholders, and (4) unsupported arguments about indirect costs.

The FEIR does not, and cannot, explain why its GHG analysis and mitigation approach did not comply with the CEQA Guidelines, applicable case law, and other relevant guidance regarding GHG analysis and mitigation. In addition, the FEIR ignores the objections in our previous comment letters.

filed comments on the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR). These three comment letters are attached to this letter as Exhibits A-C. Further, the Attorney General and CARB's amicus brief in *Paulek et al. v. Moreno Valley Community Services District et al.* (E071184) (*Paulek*), which further discusses the legal inadequacies of the GHG analysis, is attached hereto as Exhibit D.

³ Though Mitigation Measure 4.7.7.1 agrees to offset "capped" emissions in the event the City's GHG analysis is invalidated in *Paulek*, the improper legal arguments regarding the distinction between "capped" and "uncapped" emissions will remain.

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The City cites the San Joaquin Valley Air Pollution Control District (SJVAPCD) Policy APR-2025, issued in 2014, and two MNDs approved by SCAQMD in 2014. The City states that its approach has been applied “for years” in light of those same documents. (FEIR at 23.) However, as the California Supreme Court has repeatedly held in more recent years, GHG law continues to evolve, and lead agencies have an obligation under CEQA to “stay in step.” *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504 (*SANDAG*).⁴ The documents the City relied on are out of date and not the appropriate guidance for analyzing GHG impacts under CEQA.

Note that in 2014, the California Supreme Court had not yet issued its seminal *Newhall* decision, which was published on November 30, 2015. *Center for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 230 (*Newhall*). The Court then issued the *SANDAG* decision on July 13, 2017. (*SANDAG, supra*, (2017) 3 Cal.5th 497.) The FEIR ignores post-2014 materials that establish its approach is unlawful, including the *SANDAG* California Supreme Court decision referenced above, as well as CARB’s 2017 Scoping Plan.⁵

The City also relies on *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*). However, as previously noted, *AIR* did not broadly validate the City’s approach of excluding all fuel and electricity related emissions from its GHG analysis, particularly for a project that is not regulated by the Cap-and-Trade Regulation. (See FEIR at 22, 23.) That issue simply was not before the court, and was not given due consideration as a result. (See Exhibit A at 6; Exhibit B at 11-12; Exhibit D at 30-31.) *AIR* is thus inapposite.

Finally, the City also attempts to argue that the Project would effectively be paying for GHG mitigation through fuel and electrical costs passed down to the end consumer. (FEIR at 18-19.) It still remains unclear how there would be any price signal to Project proponents in this situation, given that any fuel-related costs would be paid by the fuel suppliers, and potentially passed down to the Project’s tenant logistics companies. Regardless, these fuel costs would not be paid by the Project proponents.

⁴ As the California Supreme Court has held, “CEQA requires public agencies ... to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG* at 504.) The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Ibid.*) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17.)

⁵ Available at https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. See, in particular, the “Climate Action through Local Planning and Permitting” chapter beginning at page 99, which describes the critical role played by local government contributions to CEQA reductions, including through the CEQA review process. See also CARB’s 2018 comment letter for more information on this point.

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In sum, the City's weak attempts to support the FEIR's unlawful GHG analysis and mitigation approach are without merit. Thus, the FEIR violates CEQA by failing to fully analyze and mitigate the significant GHG impacts of the Project.

II. THE FEIR CONTINUES TO INCORRECTLY CLAIM THAT CARB SUPPORTS THE WLC'S GHG APPROACH.

The FEIR continues to misrepresent CARB's views on GHG analysis and mitigation.⁶ As noted in CARB's September 7, 2018 letter and in its *Paulek* amicus brief, CARB does not support the approach proposed; the approach is unlawful, inconsistent with relevant climate plans and regulations, and likely to set back the state's climate mitigation efforts if applied. Once again, the Cap-and-Trade Program was not designed to mitigate all GHG impacts associated with land use planning decisions. Rather, it was designed with responsible local CEQA compliance in mind as a complementary strategy. (See, e.g., 2017 Scoping Plan at 99-102.) Cap-and-Trade, which is neither tailored to nor affected by the Project, simply does not provide project-level mitigation in this case.

The FEIR points to several cherry-picked provisions from the 2011 Final Statement of Reasons for the Cap-and-Trade Project. (FEIR at 18-19.) Yet it fails to explain why there is not a single provision, from any point in time, indicating that CARB intended Cap-and-Trade compliance to constitute CEQA mitigation for unregulated entities and projects, or that it excuses land use projects wholesale from evaluating or mitigating their GHG emissions. Cap-and-Trade does not and CARB plainly never intended Cap-and-Trade to obviate CEQA mitigation requirements; that is a much bigger change that CARB would have expressly addressed had that been the intent. While the FEIR points out selected Scoping Plan provisions (FEIR at 25), it conveniently omits the directly applicable "Climate Action through Local Planning and Permitting" chapter describing how CARB relies on complimentary local planning actions (including robust CEQA analysis and mitigation) to accomplish the state's GHG mandates and goals. (See 2017 Scoping Plan at 99-102.) The City's approach would effectively render superfluous the CEQA mitigation recommendations in CARB's Scoping Plan, as there would be essentially nothing left to mitigate if agencies took the City's approach. It would also allow lead agencies to disregard their CEQA obligations and make less informed decisions. (See, e.g.,

⁶ In the *Paulek* litigation, attorneys for the developer argued that because CARB did not specifically object to the project's GHG significance methodology in its early comment letters, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions." (Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, p. 18, lines 3-7.) The City has failed to address this issue or otherwise correct this clear and consequential misrepresentation in its responses to comments.

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SANDAG, supra, 3 Cal.5th at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”].)

Despite failing to mitigate 95% of the Project’s emissions, the FEIR appears to claim that the Project would be consistent with the “Climate Action through Local Planning and Permitting” chapter of the Scoping Plan mentioned above. (FEIR at 29.) This is incorrect. As noted above, that chapter of the Scoping Plan discusses how the State needs more, not less, responsible GHG planning and mitigation from project developers and lead agencies. Here, the City seeks to avoid almost entirely its obligation to mitigate its GHG emissions.

III. THE NEW GHG MITIGATION MEASURE 4.7.7.1 IS INADEQUATE.

As stated in our previous comments, under CEQA, the City must revise the FEIR to analyze all of the Project’s significant impacts relating to GHG emissions, including capped emissions. The FEIR must also adopt all feasible mitigation to address the Project’s significant GHG impacts. (*Newhall, supra*, 62 Cal.4th at p. 231.) Instead, the City revised the FEIR to add a mitigation measure for the Project, but this measure does not correct the FEIR’s CEQA violations. The new GHG mitigation measure would require the Project to purchase GHG offsets to mitigate its emissions, but only if the City loses the *Paulek* appellate litigation. (Measure 4.7.7.1.) This measure is inadequate for multiple reasons.

First, the City should adopt meaningful GHG mitigation measures in the FEIR, rather than continuing to avoid its responsibility to require mitigation unless specifically so ordered by a court. The City has conceded that such a measure is feasible by including its contingent GHG mitigation measure in the FEIR. (CEQA Guidelines, § 15092, subd. (b)(2)(A) [“A public agency shall not decide to approve or carry out a project for which an EIR was prepared unless . . . [t]he agency has . . . [e]liminated or substantially lessened all significant effects on the environment where feasible.”].) Indeed, more beneficial mitigation measures are feasible – including the use, for instance, of electrified trucks for the Project, which would reduce both GHGs and air pollution risk, as CARB has long recommended. Yet, the Project has not even adopted its inadequate offset measure, much less failed to explain why it has not adopted ostensibly feasible measures presented by CARB regarding design changes to favor zero emission vehicles. There is no indication in the record that even a more robust, legally-adequate GHG mitigation measure would be infeasible for the Project.

Second, the proposed measure, if it ever becomes effective, may not actually reduce the Project’s GHG emissions. Mitigation Measure 4.7.7.1 uses similar language to CARB’s offsets program, it lacks the essential safeguards that make CARB’s program successful. For example, the measure states that any offsets used must be “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” (FEIR at 36.) However, these terms are not defined in the mitigation measure. They are left to the sole interpretation and discretion of the City’s Planning Official and thus not enforceable as CEQA requires. (See Pub. Resources Code, § 21081.6, subd. (b); CEQA Guidelines, § 15126.4, subd. (a)(2).) There is a broad continuum of voluntary-market offsets available for purchase by project proponents, ranging

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from ineffective and unenforceable to rigorous. It remains unclear which types of offsets would be deemed by the City’s Planning Official to meet these undefined criteria.

In the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. Offsets do not provide the important co-benefits of on-site mitigation such as local jobs, reduced local air pollution, local infrastructure and efficiency improvements. (See e.g. 2017 Scoping Plan at 102 (“CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from [vehicle miles traveled], and direct investments in GHG reductions within the project’s region that contribute potential air quality, health, and economic co-benefits locally.”) This is why the 2017 Scoping Plan prioritizes local direct investments, and recommends turning to offset credits “[w]here further project design or regional investments are infeasible or not proven to be effective.” (2017 Scoping Plan at 102.) The proposed measure, by contrast, does not obligate the Project to first consider additional direct reductions, or other local or regional GHG emissions reductions, before deciding to purchase offsets. Such direct or local measures could otherwise benefit those in the Project vicinity. Furthermore, the measure does not in any way limit the percentage of offsets which may be used to mitigate the Project’s GHG emissions, as compared to more direct methods of GHG reduction. California’s Cap-and-Trade Program, for its part, sets a quantitative usage limit, which allows only 4-8% (depending on the calendar year) of an entity’s compliance obligation to be met through surrendering offsets. (See 17 Cal. Code Regs., § 95854.) This helps ensure that offsets are a relatively small part of the overall Cap-and-Trade Program, ensuring that the majority of GHG reductions come from reductions by regulated entities rather than from non-covered sectors.

The FEIR’s proposed measure entirely lacks this protection, instead allowing offsets (even ones that may not actually result in GHG reductions, as described above) as the sole GHG mitigation mechanism. These disadvantages, combined with the lack of any adequate criteria to ensure quality or enforceability of the offsets that may be purchased in this case, make the mitigation measure ineffective and unreliable.

Mitigation Measure 4.7.7.1 also seems to imply that CARB has broadly “approved” the offset registries it lists. The measure’s text states: “Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, Verra (formerly Verified Carbon Standard) or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above.” (FEIR at 36). CARB has approved only the American Carbon Registry, Climate Action Reserve, and Verra for the limited purpose of participation as Offset Project Registries in CARB’s Cap-and-Trade Program, pursuant to the process set forth in section 95986 of Title 17 of the California Code of Regulations. This approval only pertains to the registry’s participation in the Cap-and-Trade Regulation, in connection with issuing CARB offset credits. By contrast, the offsets contemplated by Mitigation Measure 4.7.7.1 are known as “voluntary market” offsets, which are generated under separate protocols adopted by the registries. CARB does not review

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these voluntary market protocols. CARB’s “approval” of a registry as an Offset Project Registry under the Cap-and-Trade Program does not mean CARB has reviewed or approved that registry’s voluntary market offset protocols.

Mitigation Measure 4.7.7.1 improperly bypasses onsite and local mitigation and violates CEQA because of its unenforceability and thus must be revised.

IV. THE FEIR IMPROPERLY DECLINES TO ADOPT FEASIBLE MITIGATION MEASURES THAT WOULD SUBSTANTIALLY LESSEN THE PROJECT’S SIGNIFICANT ADVERSE EFFECTS.

The FEIR simultaneously argues the proposed use of offsets and credits is a feasible mitigation measure, and yet refuses to adopt such a measure now by conditioning it on the outcome of the *Paulek* litigation. This approach violates CEQA, which instructs that “public agencies should not approve projects as proposed if there are... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects.” (Pub. Res. Code 21002). The FEIR recognizes it is possible to offset the entire 232,402 metric tons of GHG from this Project but only guarantees the offset of 8,563 metric tons of GHG emissions. (See FEIR at page 39.) The entire 232,403 metric tons of GHGs will *not* be offset if the “trial court’s judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed.” However, if the appeal is dismissed, an appellate court will not have upheld the City’s GHG analysis and, as described above, the City’s misleadingly-named “capped” emissions would be considered a significant environmental effect. These emissions would need to be mitigated, and could be via a feasible and rigorous GHG mitigation measure (as described above). By refusing to adopt such a feasible mitigation measure here, the FEIR violates CEQA. (See CEQA Guidelines, § 15092.)

V. MITIGATION MEASURE 4.7.7.1 IS “SIGNIFICANT NEW INFORMATION” THAT REQUIRES RECIRCULATION OF THE FINAL EIR.

Pursuant to Public Resources Code section 21092.1, Mitigation Measure 4.7.7.1 is “significant new information” that requires a new opportunity for public comment. “Significant new information” includes a new “feasible way to mitigate or avoid [a substantial adverse environmental effect]... that the project’s proponents have declined to implement.” (*Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1129, as modified on denial of reh. (Feb. 24, 1994)). As described above, Mitigation Measure 4.7.7.1 identifies a feasible, although not necessarily proper, way to mitigate the Project’s greenhouse gas emissions, yet declines to adopt such mitigation unconditionally.

When “significant new information... is added to an environmental impact report after notice... but prior to certification” the public agency must “give notice again pursuant to Section 21092... before certifying the environmental impact report.” (Pub. Resources Code, § 21092.1). Notice pursuant to Public Resources Code Section 21092(b)(2) requires a comment period.

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However, Mitigation Measure 4.7.7.1 was added to the FEIR through a “Response to Comments on the Revised Sections of the Final EIR and Draft Recirculated Revised Sections of the Final EIR” without any such comment period. Instead, the City simultaneously released that document and a Notice of Completion informing the public that the Moreno Valley Planning Commission would review the Revised FEIR at a public hearing on May 14, 2020. Moreno Valley should have recirculated the EIR and provided an opportunity for public comment on the EIR with the addition of Mitigation Measure 4.7.7.1.⁷

VI. CONCLUSION

The Attorney General and CARB urge the City of Moreno Valley not to certify the FEIR without further revisions to the GHG analysis as described above. As stated in our previous comments, the City must take its obligations as a local government to mitigate climate change impacts seriously. The addition of a weak GHG measure that would apply only if the City’s approach is invalidated on appeal is not enough. However, if the City implements the actions that the state’s expert agencies have requested for years, the Project could be an important environmental leadership project. Indeed, the Project could create jobs by building a world-leading clean logistics project, protecting communities all along its supply chains. We encourage the City to take this opportunity to innovate and to lead. As always, we would be happy to work with the City to take the additional steps needed to fully comply with CEQA’s GHG analysis and proper mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 Deputy Attorney General

For XAVIER BECERRA
 Attorney General

⁷ In its January 30, 2020 comments, CARB informed the City of its concerns with not being able to review the new GHG-related mitigation measure. (See January 30, 2020 CARB comment letter at page 1.) When CARB reached out to a City representative at that time, CARB was informed that the reference to the new GHG mitigation measure was included in the RRSFEIR in error, and it would be removed in the FEIR. Rather than remove that measure, the FEIR now includes a new GHG mitigation measure that has never before been circulated for public review, and which the City had previously indicated would not be part of the FEIR. The City only now has decided to release this measure as part of a vast FEIR package, just 14 days prior to the Project approval hearing.

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Richard W. Corey
Executive Officer, CARB

cc: Albert Armijo, Interim Planning Manager, alberta@moval.org
Kenneth B. Bley, Attorney for Project Proponents, kbley@coxcastle.com

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World Logistics Center)

EXHIBIT A



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September 7, 2018

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Phone: (951) 413-3206
Email: alberta@moval.org

RE: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project

Dear Mr. Armijo:

Attorney General Xavier Becerra submits the following comments on the Revised Sections of the Final Environmental Impact Report (“RFEIR”) prepared for the World Logistics Center (the “Project”).¹ The Project, a proposed warehouse and logistics complex in the City of Moreno Valley (“City”), would be one of the largest warehouse facilities in the world, with square footage equaling approximately 700 regulation-size football fields.

INTEREST OF THE ATTORNEY GENERAL

For well over a decade, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change. It is now well-established that California, through law and policy, and consistent with sound science, is committed to achieving a low-carbon future by 2050 in order to reduce and avoid the most catastrophic effects of climate change. California has already begun to experience adverse climate effects, such as rising sea levels and longer, more intense fire seasons. The Attorney General is particularly concerned about how such effects may impact our most vulnerable communities, such as Inland Empire residents, who are already burdened by some of the worst air quality in the country.

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RFEIR’s compliance with the California Environmental Quality Act (“CEQA”).

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Every large development project has the potential either to facilitate, or instead hinder, the State's achievement of its climate goals. It is therefore important that as lead agencies consider the impacts of individual development projects – many of which will operate for decades into the future – they evaluate and impose feasible mitigation for climate change impacts.

With these goals in mind, the Attorney General has provided guidance to local governments, commented on potential projects, and engaged with local interest organizations concerned with climate change and environmental justice. (See California Department of Justice, Office of the Attorney General, *California Environmental Quality Act*, <https://oag.ca.gov/environment/ceqa> (as of Sept. 7, 2018).) The Attorney General has also participated in litigation throughout the State to ensure that local governments comply with state requirements to fully analyze and implement all feasible mitigation measures to lessen significant impacts from greenhouse gas emissions (“GHGs”) caused by land use development projects. (See, e.g., *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497; *People of the State of California v. County of San Bernardino* (Cty. of San Bernardino filed April 12, 2007) No. CIVSS700329.) The Attorney General also has a long-standing interest in ensuring environmental justice throughout the State and for communities in the Inland Empire. (See, e.g., *CCA EJ v. County of Riverside, et al.*, Case No. RIC1112063; California Department of Justice, Office of the Attorney General, *Environmental Justice at the Local and Regional Level: Legal Background* (July 10, 2012) https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.)

After review of the GHG analysis in the RFEIR, the Attorney General believes that the City has failed to comply with CEQA's requirements for analyzing and implementing feasible mitigation for the significant GHG emissions that will result from this Project. For the reasons outlined below, the City's approach falls substantially short of meeting the requirements of CEQA, the regulations implementing CEQA – the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), and applicable case law. The City's approach in the RFEIR has the potential to seriously undermine the overall effort to meet the State's science-based GHG reduction goals for the transportation and land use sectors, and to disproportionately disadvantage environmental justice communities.

THE RFEIR'S GHG ANALYSIS VIOLATES CEQA AND UNDERMINES THE STATE'S CLIMATE OBJECTIVES.

As the RFEIR acknowledges, this Project at buildout will cause over 281,000 metric tons of GHGs to be released into the atmosphere every year, and will result in over 200,000 metric tons of GHG emissions beginning as early as 2028. (RFEIR at 4.7-35.) These emissions will presumably continue throughout the life of the project, though the RFEIR does not address this.

The RFEIR takes a very unusual and troubling approach to addressing the Project's GHG-related impacts, especially since climate pollution is undeniably a *cumulative* problem. (*Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 256-257.) The RFEIR divides the Project's GHG emissions into two categories, which it terms

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“capped” and “uncapped” – classifications created by this RFEIR. What the RFEIR deems “uncapped” emissions constitute only about 3% of the Project emissions. They include the comparatively minor landfill emissions caused by waste generated at the Project and the use of refrigerants at the Project. (RFEIR at 4.7-33.) For these emissions, the RFEIR follows the approach that would be expected under CEQA: the City has, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHGs as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold.² (RFEIR at p. 4.7-19.) What the RFEIR terms “capped” emissions, however, constitute the remaining 97% of the Project’s predicted emissions. Those include emissions caused by mobile sources (namely, diesel trucks) and electricity use at the Project. (RFEIR at p. 4.7-33.) With respect to these emissions, the RFEIR deviates dramatically from standard CEQA methodology. The RFEIR asserts that these emissions are “covered” by the California Air Resources Board’s (“CARB”) Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation. (RFEIR at p. 4.7-22.) This is a novel and unsupportable approach under CEQA.

As discussed below, the RFEIR’s approach does not comply with CEQA, for several reasons. First, the Project is not regulated under the State’s Cap-and-Trade Program, so purported compliance with that Program cannot be used to exclude 97% of the Project’s GHG emissions from the analysis of whether the Project’s GHG emissions will result in significant climate change impacts. Second, CEQA requires that all of the emissions attributable to the Project be evaluated for significance, regardless of their source. Third, when comparing all of the Project’s emissions to California’s ambitious, science-based climate goals, as well as statewide, regional, and local plans for the reduction or mitigation of GHG emissions, the Project’s GHG emissions are clearly significant, requiring further feasible mitigation measures.

We are concerned about the City’s use of this analytical approach, both in the context of this Project and more generally. If the RFEIR’s approach is put into general use by the City, or followed by other lead agencies, emissions from transportation and electricity could largely be exempt from analysis and mitigation under CEQA. This is directly counter to the purposes of CEQA, and the Legislature’s considered decision to make clear that GHG emissions must be analyzed. (Senate Bill 97 (2007); Pub. Resources Code, § 21083.05.) The State cannot meet its well-established, long-term environmental GHG reduction goals if new local projects are free to add hundreds of thousands of tons of GHGs to the atmosphere every year without undergoing the

² Lead agencies may choose to use a “threshold of significance,” a working presumption that can assist in determining whether an impact is significant. (Cal. Code Regs., tit. 14, §§ 15064.4(b)(2); 15064.7.) “A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” (Cal. Code Regs., tit. 14, § 15064.7, subd. (a).)

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analysis and mitigation that CEQA requires. Moreover, the RFEIR's approach will likely expose already-burdened communities in the State to greater amounts of GHG co-pollutants, such as diesel particulate matter and nitrogen oxides.

We urge the City to revise its GHG analysis to comply with CEQA by properly evaluating whether *all* of the Project's emissions—for all phases of the Project, direct and indirect, short-term and long-term—are cumulatively significant, and adopting feasible mitigation to ensure those emissions do not have a significant impact on the environment.

I. THE RFEIR'S NOVEL APPROACH TO "CAPPED" EMISSIONS VIOLATES CEQA.

The purpose of an environmental impact report is "to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project." (Pub. Resources Code § 21061.)

The City's approach violates a number of well-established CEQA principles. Lead agencies must "consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect." (Cal. Code Regs., tit. 14 § 15003, subd. (h).) This Project as a whole includes both the "capped" and "uncapped" GHG emissions, but the RFEIR fails to analyze and mitigate "capped" emissions. Moreover, both "direct and indirect significant effects" and "short-term and long-term effects" should be considered. (Cal. Code Regs., tit. 14, § 15126.2, subd. (a).) The RFEIR fails to inform the public of the long-term effects of the Project's GHG emissions by failing to analyze GHG emissions past buildout.

In addition to violating these more general principles, the City's approach to "capped" emissions contradicts the CEQA Guidelines specific to GHG analysis. "The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data." (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The CEQA Guidelines advise lead agencies on how to determine the significance of a Project's GHG emissions. A lead agency should consider three non-exclusive methods for determining climate significance:

- (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project[;]
- (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. . . . If there is substantial evidence that the possible effects of

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a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. (Cal. Code Regs., tit. 14, § 15064.4, subd. (b)).

While “[a]n ironclad definition of significant effect is not always possible,” (Cal. Code Regs., tit. 14 § 15064, subd. (b)), the RFEIR’s conclusion that the Project’s GHG impacts are not significant under CEQA (RFEIR at p. 4.7-33) is based solely on its unjustifiable exclusion of the vast majority of the GHG emissions of the Project. That exclusion is neither consistent with CEQA nor justified by the Cap-and-Trade Program, which does not apply to the Project.

A. Since the Project is Not Regulated Under Cap-and-Trade, The RFEIR Cannot Use Cap-and-Trade to Ignore the Significance of the Project’s GHG Emissions.

The RFEIR effectively treats the Cap-and-Trade Program as if it is a qualified mitigation plan for the Project and its “capped” emissions. (See Cal. Code Regs., tit. 17, §§ 15064, subd. (h)(3); 15064.4 subd. (b)(3)). It is not.

California’s Cap-and-Trade Program applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for compliance instruments.” (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) The Cap-and-Trade Program only applies to expressly identified entities, such as cement producers, petroleum refiners, electricity generators, natural gas supplies, fuel importers, and liquid petroleum gas supplies. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities.

Although the operator of a refinery that produces liquefied petroleum gas in California is subject to the Cap-and-Trade Program, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing its own GHG emissions or surrendering compliance instruments, but the gas station that resells the gas, the truck drivers who purchase it, and the warehouses to which the trucks drive do not. Because CEQA Guidelines section 15064.4, subdivision (b)(3) instruct lead agencies to consider the extent to which *the project* complies with GHG regulations or requirements, it is inappropriate to rely upon compliance with Cap-and-Trade by other entities downstream in the chain of commerce as a basis for avoiding analysis of project-related emissions. In the Final Statement of Reasons for the CEQA Guidelines addressing GHG emissions, the California Natural Resources Agency confirmed that, in implementing CEQA Guidelines section 15064.4, a lead agency must show that a GHG reduction plan “actually addresses the emissions that would result from the project.” (California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009), available at http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf, at p. 27.)

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Further, the City's approach is not, as the RFEIR claims (RFEIR at 4.7-20), supported by *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 ("AIR"). Without commenting on whether or not that case was rightly decided, AIR is facially inapposite because the project being evaluated under CEQA in that case was a refinery, a covered entity under the Cap-and-Trade Program. Because this Project is not a covered entity under the Cap-and-Trade Program, it is unjustifiable for the RFEIR to use compliance with Cap-and-Trade as a factor in analyzing the significance of the Project's GHG emissions. There is no basis in the law for the use of Cap-and-Trade to exclude a full 97% of the Project's GHG emissions from analysis or mitigation.

The flaw in the City's approach becomes even more apparent when one considers its incongruous results. The RFEIR describes the Project, in part, as follows: "Goods imported through the Ports of Long Beach and Los Angeles as well as other locations are delivered via truck to the proposed distribution centers and distributed via truck both in and out of state locations. . . ." (Original FEIR at 3-27-3-28.) The heart of this Project is this movement of goods via trucks. Yet, the City's approach avoids any analysis of 210,596 metric tons of GHG emissions associated with the movement of goods via trucks. (RFEIR at p. 4.7-33.) 97% of the Project's total GHG emissions are simply dismissed under this approach. CEQA does not permit such a dismissal.

B. The RFEIR Must Consider All Emissions in Determining Significance.

Correctly applying CEQA requires an evaluation of *all* the Project's GHG emissions in determining significance. (See Cal. Code Regs., tit. 14, §§ 15064.4, subd. (b)(2); 15378 (defining "project" as "the whole of an action. . . .")) There is no basis here for comparing some of the Project's emissions to the significance threshold, but not others. Here, the City elected to use a threshold of 10,000 metric tons of GHGs. (RFEIR at p. 4.7-19.) CEQA Guidelines section 15064.4, subdivision (b)(2), notes that when using a threshold, an agency should compare all of the "project emissions" of GHGs to that threshold. Emissions from trucks and electricity are a result of the Project just as much as the "uncapped" emissions. They therefore must be compared to the significance threshold, and mitigated to the extent feasible.

Further, the City's attempt to exempt an impact from any significance analysis based solely on purported compliance with a single rule or regulation is unwarranted. Courts have repeatedly held compliance with a single environmental or land use law or regulation does not create an exemption from CEQA's requirement that lead agencies evaluate all of a project's significant environmental impacts. For example, "compliance with a general plan in and of itself 'does not insulate a project from the EIR requirement, where it may be fairly argued that the project will generate significant environmental effects.'" (*East Sacramento Partnerships for a Livable City v. City of Sacramento* (2016) 5 Cal.App.5th 281, 301; see also *Keep Our Mountains Quiet v. County of Santa Clara* (2015) 236 Cal.App.4th 714, 732 ("[A]n EIR is required if substantial evidence supports a fair argument that [a project] may have significant unmitigated noise impacts, even if other evidence shows the [project] will not generate noise in excess of [a] County's noise ordinance or general plan."))

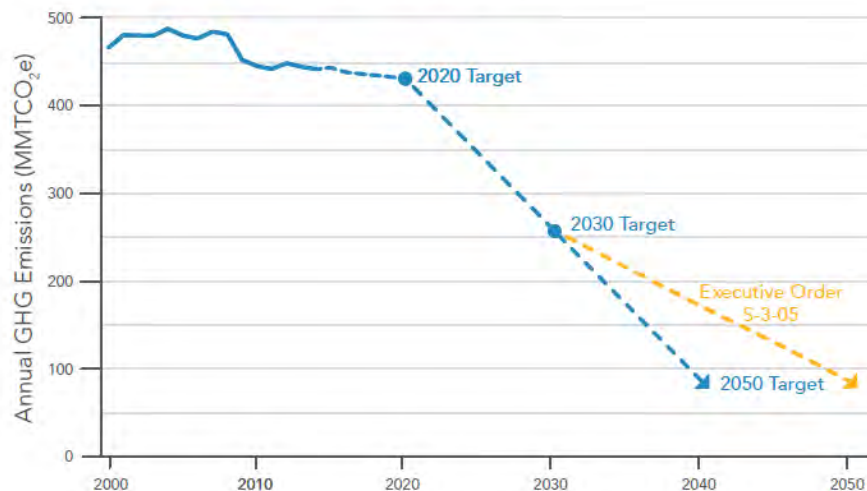
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C. In Light of the Project’s Substantial, Long-Term Projected Emissions, Its GHG Impacts Must Be Deemed Significant.

It seems impossible a proper evaluation of the Project’s emissions under CEQA could support a finding that the Project’s emissions are not significant. This Project—as currently designed—will lock in hundreds of thousands of tons of GHG emissions for decades to come, and may put this City and the region on a path that deeply undermines the State’s climate goals.

To reduce and avoid the most catastrophic effects of climate change, science tells us that we must dramatically reduce our annual statewide GHG emissions. California has taken ambitious steps to accomplish that objective. Assembly Bill 32 (“AB 32”) requires California to reduce its total statewide GHG emissions to 1990 levels by 2020. (Health & Saf. Code, § 38550.) Under Senate Bill 32 (“SB 32”), California must reduce its GHG emissions to 40% below 1990 levels by 2030. (Health & Saf. Code, § 38566.) In addition, the Governor’s Executive Order S-3-5 (“EO S-3-05”) directs state agencies to reduce statewide GHG emissions to 80% below 1990 levels by 2050. To achieve such ambitious but necessary goals, California will have to reduce GHG emissions from various sectors of the economy. Transportation, industry, and electricity generation are the top three contributing sectors to the State’s total GHG emissions. (CARB, 2017 Climate Change Scoping Plan (Nov. 2017) at p. 11 (“Scoping Plan”).) Below is a graph showing the dramatic downward trajectory of statewide GHG reductions necessary to achieve the State’s climate goals.

FIGURE 5: PLOTTING CALIFORNIA’S PATH FORWARD

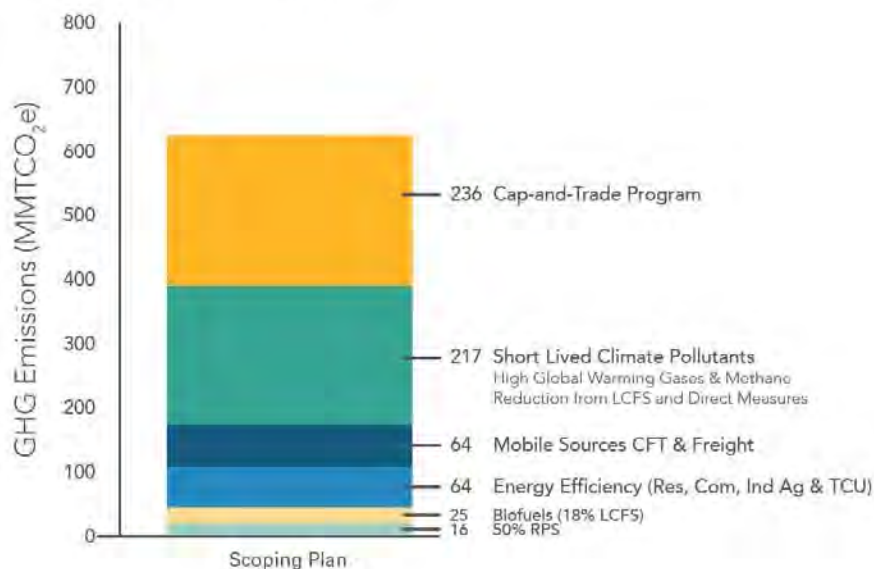


(Scoping Plan at p. 24.)

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California has adopted a multitude of regulations, requirements, plans, and policies to achieve the substantial reductions in statewide GHG emissions required by AB 32, SB 32, and EO S-3-5. CARB identified, in its Climate Change Scoping Plan, multiple required and voluntary measures working in concert as necessary for California to achieve its ambitious climate goals as depicted in the graph below. (See Scoping Plan at p. 28.)

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴

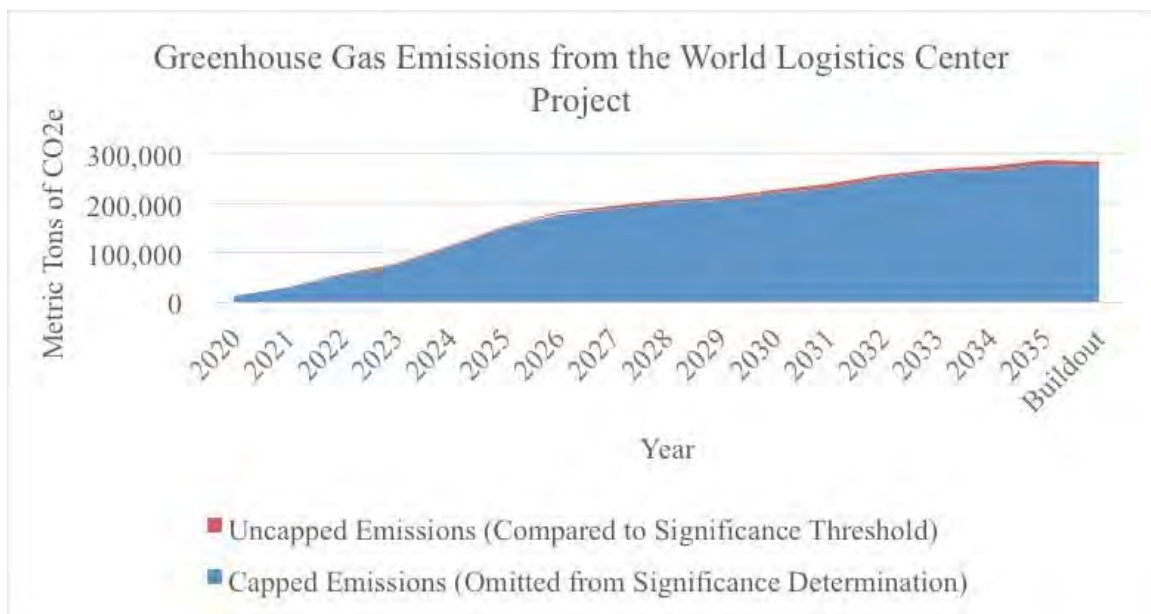


The Scoping Plan proposes various strategies for reductions in emissions from transportation and energy sectors. The Scoping Plan notes that for the GHG reductions from the transportation sector, “[vehicle miles traveled (“VMT”)] reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan.” (Scoping Plan at p. 112.) In addition, under SB 375, CARB assigns California’s 18 Metropolitan Planning Organizations targets for GHG emission reductions in the transportation sector which are to be achieved based on land use patterns and transportation systems. (CARB, Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (2017), available at https://www.arb.ca.gov/cc/sb375/final_staff_proposal_sb375_target_update_october_2017.pdf.) CARB’s recommended target for the Southern California Association of Governments is a 19% reduction in GHG emissions from transportation by 2035. (*Id.* at p. 34.)

CEQA requires the City evaluate the consistency of the Project’s substantial increases in GHG emissions with state and regional plans and policies calling for a dramatic reduction in GHG emissions. The Supreme Court in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (“*SANDAG*”) affirmed that an EIR should consider the project’s long-range greenhouse gas emission impacts through the year 2050, and address whether the project as a whole is in accord with the state’s climate goals. (*Id.* at p. 515.) The Supreme Court further instructed lead agencies to “stay in step with evolving scientific knowledge and state regulatory schemes.” (*Id.* at p. 504.)

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The RFEIR estimates that the Project's total emissions will increase from the existing conditions of no emissions at the Project site to over 281,000 metric tons of GHG emissions annually at full buildout of the Project in 2040. (RFEIR at p. 4.7-33.) See the graph below depicting the trajectory of the Project's GHG emissions.³



The Project's substantial *increase* in GHG emissions conflicts with the downward trajectory for GHG emissions necessary to achieve state climate goals. This is illustrated clearly in the sharp difference in the upward trajectory of the graph of the Project's GHG emissions versus the steep downward trajectory in the graph of the State's climate goals as depicted in Figure 5 of the Scoping Plan and reproduced above. Yet, the RFEIR failed to evaluate the Project's consistency with state and regional goals, requirements, plans, and policies to reduce

³ Visual depictions such as this graph make it easier to understand the significant impact of GHG emissions from the Project on the environment. Such clarity is encouraged by the CEQA Guidelines, which state that EIRs should be "written in plain language and may use appropriate graphics so that decisionmakers and the public can rapidly understand the documents." (Cal. Code Regs., tit. 17, § 95811.) Such graphs are also helpful because they allow the decisionmakers to see a project's proposed greenhouse gas emissions as a trajectory and assess the "significance of the *shape* of that emissions curve as a whole." (Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17, 19, available at http://legal-planet.org/wp-content/uploads/2018/09/environmental-law-news_2017_vol-26-no-2_fall_the-sandag-decision.pdf.) To better inform the public of the Project's unmitigated GHG emissions, we recommend revising the RFEIR to include graphical representations of the emissions trajectory of the project.

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GHGs that should have been analyzed under CEQA. Comparing the Project's GHG trajectory against the state's climate goals would inform the public of the Project's GHG impacts. For example, the RFEIR's GHG analysis should have considered whether the Project will increase VMT. Because it did not, it is inconsistent with SB 375. Although the RFEIR's revised traffic analysis does include a VMT analysis, it is included only to address air quality issues, and not GHGs. (RFEIR at pp. 4.7-19 and 4.15-3.) Under CEQA, the City is required to consider how the project can reduce VMT and electricity use, "rather than expecting[ing] these reductions to come [only] from technological advances or other measures." (SANDAG, at 523.) The City ignores its CEQA obligations and instead, the RFEIR obscures the Project's GHG impacts by improperly exempting them from CEQA analysis.

In addition, there is no discussion in the RFEIR of the GHG emissions from the Project over its expected lifespan. GHG emissions are estimated up until the Project's full buildout in 2040 (RFEIR at p. 4.7-33), but the Project will clearly continue beyond that point, and the RFEIR gives no indication of how long that will be. The cumulative impact of the Project's GHG emissions over its entire lifespan should be considered and mitigated to the greatest extent feasible. Notably, by failing to estimate emissions through 2050, the RFEIR obscures the extent to which the Project does or does not comply with California's explicit 2050 climate goals.

D. The RFEIR Should Analyze and Adopt Feasible Mitigation Measures to Avoid or Lessen the Project's GHG Impacts.

CEQA requires that an EIR consider and adopt feasible alternatives or mitigation measures that would substantially lessen the significant and harmful environment effects of the project being analyzed. (See Pub. Resources Code, § 21002.) The RFEIR's failure to properly analyze the Project's significant GHG impacts also results in a failure to mitigate those impacts as required by CEQA. If the RFEIR's analysis were done properly, the Project's GHG emissions from vehicles and electricity would have vastly exceeded the significance threshold selected by the City. Those emissions would therefore have to be reduced through changes or alterations in the Project, or the City would be required to explain why "[s]pecific economic, legal, social, technological, or other considerations including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives... ." (Cal. Code Regs., tit. 22, § 15091, subds. (a)(1) and (a)(3).) There may be mitigation measures or project alternatives that could reduce or avoid the Project's GHG emissions, such as the adoption of requirements mandating the use of zero emission vehicles or a certain percentage of electricity from renewable electricity sources, such as on-site solar power generation.⁴ By

⁴ The Attorney General recognizes that devising climate mitigation on a project-by-project basis can be challenging. Many local governments have therefore elected to move toward enforceable Climate Action Plans ("CAPs") integrated with their general plans. (CARB, California Climate Action Portal Map, <https://webmaps.arb.ca.gov/capmap/> (as of Sept. 7, 2018).) Done correctly, CAPs can put local governments on the path to a lower-carbon future

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excluding 97% of the Project's GHG emissions from its significance determination, the RFEIR obscures the extent of the Project's emissions and improperly evades the City's obligation to mitigate the Project's GHG impacts.

II. ADOPTION OF THIS METHOD OF EXEMPTING "CAPPED" EMISSIONS FROM CEQA ANALYSIS WILL UNDERMINE THE STATE'S VARIOUS POLICIES AND PROGRAMS TO REACH OUR AMBITIOUS CLIMATE GOALS.

The RFEIR's failure to comply with CEQA will have real consequences. If this RFEIR's approach is widely adopted, the State will not be able to achieve its ambitious climate goals. The RFEIR exempts the Project's emissions attributable to mobile sources and electricity use from CEQA analysis and mitigation. And yet transportation and electricity are two of the State's three largest sources of GHG emissions. (Scoping Plan at p. 11). Transportation and electricity are thus two of the most important areas in which GHG emissions must be reduced.

The RFEIR's approach to the transportation and electricity sectors incorrectly presumes that the Cap-and-Trade Program will achieve *all* GHG reductions necessary in those areas. But as CARB's 2017 Scoping Plan points out, "[l]ocal land use decisions play a particularly critical role in reducing GHG emissions associated with transportation, both at the project level, and in long-term plans..." (Scoping Plan at pp. 100-101.) If other lead agencies adopt the City's approach, millions of metric tons of GHGs resulting from development projects would be ignored and unmitigated through what amounts to a categorical exemption from CEQA. Local governments would therefore not be doing their part to help the State reach its ambitious, yet necessary, climate goals of emitting 40% below 1990 GHG levels by 2030 and 80% below 1990 levels by 2050. (Heath & Saf. Code, § 38566, Governor's Executive Order No. S-3-05 (June 1, 2005).)

Instead of claiming that no amount of transportation and electricity emissions can be significant under CEQA, and thus excluding them from any analysis and mitigation, lead agencies have an obligation to acknowledge the significance of such emissions and work to implement feasible mitigation of them.⁵

III. REVISING THE GHG ANALYSIS WILL LIKELY LEAD TO GREATER PROTECTION OF ENVIRONMENTAL JUSTICE COMMUNITIES.

In addition to, and separate from, the CEQA issues, revising the RFEIR's GHG analysis will likely help mitigate some of the Project's direct harmful effects on environmental justice communities. Moreno Valley contains some of the most pollution-burdened census tracts in the

while substantially streamlining the approval of individual projects that are consistent and comply with the CAP.

⁵ There are several examples of economically viable land use development projects that contributed no net additional GHG emissions. (Scoping Plan at p. 99.)

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State according to California Environmental Protection Agency's CalEnviroScreen tool.⁶ City residents experience ozone and particulate matter (PM) 2.5 at rates higher than 90% of the State. The South Coast Air Basin, where Moreno Valley is located, exceeds federal public health standards for ozone, ozone precursors, and particulate matter. Exposure to these air contaminants contributes to asthma, lung cancer, and cardiovascular disease. Indeed, residents in Moreno Valley experience higher than average emergency room visits due to asthma and higher than average rates of cardiovascular disease, particularly residents living along freeways.

Furthermore, environmental justice concerns are significant for the residents of Moreno Valley. Moreno Valley residents are predominately people of color, made up of 56.5% Hispanic and 18% African American populations. (United States Census Bureau, Quick Facts for Moreno Valley, California, <https://www.census.gov/quickfacts/fact/table/morenovalleycitycalifornia.ca/PST045217> (as of Sept. 7, 2018).) The rates of poverty are dramatically higher in Moreno Valley compared to the state—according to U.S. Census data, 18.6% of Moreno Valley residents live in poverty, compared with the statewide poverty rate of 14.4%. (*Ibid.*, and United States Census Bureau, Quick Facts for California, <https://www.census.gov/quickfacts/fact/table/ca/PST045217> (as of Sept. 7, 2018).) They experience high rates of unemployment and housing burdens (paying more than 50% of their income for housing costs). These socioeconomic characteristics of Moreno Valley residents increase their sensitivity to the health effects of the heavy pollution burdens they experience.

Adding to these burdens, Riverside County as a whole, and the City of Moreno Valley specifically, are experiencing a great influx of logistics warehouse projects. Recent developments in Moreno Valley alone include an 825,000 square-foot distribution facility for the Aldi grocery chain, a 1.6 million square-foot distribution facility for Deckers Brands footwear company, and a 1.25 million square-foot fulfillment center for Amazon. These large projects, and their related impacts on the low-income communities of color who live nearby and in the communities residing along the freeways serving them, are dwarfed by the over 40 million square-foot Project.

By conducting a proper GHG analysis in the RFEIR and adopting feasible mitigation, the City will likely better protect the environmental justice communities living near both the Project and along the freeways that trucks will use to reach the Project. Reduction of GHG emissions leads to the reduction of co-pollutant emissions. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL'Y REV. 377, 387 (“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant

⁶ CalEnviroScreen is a tool that uses environmental, health, and socioeconomic information to produce scores and rank every census tract in the state. A census tract with a high score is one that experiences a much higher pollution burden than a census tract with a low score. (See CalEnviroScreen 3.0 Report, Office of Environmental Health Hazard Assessment, January 2017, available at <https://oehha.ca.gov/media/downloads/calenviroscreen/report/ces3report.pdf>.)

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reductions as GHGs are being reduced [which] should improve the health of local communities.”)) This is especially true in the context of diesel truck emissions, where a VMT reduction would reduce both GHG emissions and co-pollutant emissions. Indeed, the RFEIR acknowledges that “[t]he *most effective way to reduce air pollution* impacts on the health of our nearly 17 million residents, including those in disproportionately impacted and environmental justice communities that are concentrated along our transportation corridors and goods movement facilities, *is to reduce emissions from mobile sources*,” and that those mobile sources constitute “the principal contributor to our air quality challenges.” (RFEIR at 4.3-11 (emphasis added).) Therefore, while revising the GHG analysis is necessary to comply with CEQA, the City should also see this as an opportunity to implement mitigation measures that would benefit the City’s residents and the other environmental justice communities impacted by this Project.

CONCLUSION

We appreciate the difficulty in analyzing GHG emissions under CEQA. However, local agencies must comply with the CEQA Guidelines for GHG analysis and cannot exempt GHG emissions from any significance analysis because of California’s Cap-and-Trade Program. We urge the City of Moreno Valley to revise the GHG analysis in the RFEIR as described above so as to support this State’s efforts to reduce GHG emissions, achieve our ambitious but necessary climate goals, and benefit local communities in the area who are already suffering some of the worst air pollution in the country. We would be happy to work with the City of Moreno Valley to take the additional steps needed to fully comply with CEQA’s GHG analysis and mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 BRIAN BILFORD
 Deputy Attorneys General

For XAVIER BECERRA
 Attorney General

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EXHIBIT B



Mary D. Nichols, Chair
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 Edmund G. Brown Jr., Governor

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Re: World Logistics Center Revised Final Environmental Impact Report
 (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the World Logistics Center (WLC or project) Revised Final Environmental Impact Report (RFEIR). CARB appreciates the opportunity to comment on the RFEIR. Unfortunately, despite revisions, the RFEIR mischaracterizes (1) the scope of the Cap-and-Trade Program administered by CARB as they relate to the state's overall greenhouse gas reduction mandates, and (2) how that program may be relevant to a CEQA analysis. Because the RFEIR's GHG analysis relies almost entirely on those mischaracterizations for its GHG analysis and significance determination, it does not meet California Environmental Quality Act (CEQA) requirements.

The RFEIR's core flaw with regard to greenhouse gases (GHGs) is that it declines fully to analyze or mitigate emissions from fuel and electricity demand that the project will cause - the vast majority of the project's emissions - on the ground that CARB's Cap-and-Trade Program purportedly "covers" the project's emissions for this purpose. In fact, the Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground. The RFEIR's approach obscures the project's significant potential contribution to greenhouse gas emissions, and does not properly account for the combination of federal, state, and local approaches to address climate change that the crisis demands and the law requires.

We also note that the project still has not been modified to address serious health concerns from criteria and toxic air pollutants that CARB discussed in prior letters. Although this letter focuses on GHGs, we continue to be very concerned that local communities may face undue pollution from this project, if completed, as a result of inadequate mitigation.

We urge the City of Moreno Valley (City) to address the criteria and toxics issues we previously raised, and to revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, adopt feasible mitigation to

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ensure those emissions would not cause significant impacts, and recirculate the RFEIR, all as required by CEQA.

I. CARB's Participation in This Project's Review Process

CEQA requires analysis of a project's GHG emissions. Like all CEQA analyses, these disclosures must inform the public and provide appropriate information on mitigation. Planning for greenhouse gas reductions is critical at the project level, as CARB and other state agencies have repeatedly determined. Although various statewide programs address the climate change crisis as well, the CEQA guidelines, and state guidance documents, are clear that achieving the necessary reductions requires project-level focus.

The WLC project proponents have taken a different view in prior versions of the RFEIR and in related litigation, *Paulek v. City of Moreno Valley* (Riverside County Superior Court Case No. RIC 1510967) ("*Paulek*"). That case addresses, among other topics, the initial GHG analysis conducted for the WLC, and in the RFEIR. There, WLC advocates contended that, because some of the suppliers of the fuels and electricity consumed by the project are in the Cap-and-Trade Program CARB administers, the project was not required to analyze or mitigate the significant emissions impacts it would cause. Attorneys for the WLC also argued that because CARB did not specifically object to the project's GHG significance methodology, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions."¹

CARB had, in fact, recommended an array of project-based emissions reductions strategies contrary to these claims. CARB takes this opportunity to reiterate those recommendations (prior letters are attached) and to explain why the Cap-and-Trade Program's operations do not allow a departure from CEQA's general rule that project-level impacts be properly addressed.²

¹ Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, page 18, Lines 3-7.

² In both of CARB's comment letters, which we again incorporate by reference, CARB indicated that its recommendations were for the purpose of reducing not only criteria and toxics pollutants, but also for GHG emissions. CARB reviewed the Draft Environmental Impact Report (DEIR) and provided comments to the City of Moreno Valley in a letter dated April 16, 2013. CARB's comment letter expressed concern over the increase in health risk in the immediate area and the significant and unavoidable air quality and greenhouse gas (GHG) related impacts caused by the proposed WLC. To address those concerns, CARB recommended actions to support the development, demonstration, and deployment of zero and near-zero emission technology at the WLC. On June 8, 2015, CARB again provided comments on the Final Environmental Impact Report (FEIR), making similar recommendations. In those comments, CARB noted that the FEIR was unresponsive to the comments CARB provided in its April 16, 2013 letter regarding the DEIR. (See CARB April 16, 2013 letter at 2; CARB June 8, 2015 letter at 1, 3, and 8.)

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II. The RFEIR's Claims About CARB's Cap-and-Trade Regulation Are Incorrect

CEQA translates between high-level policy goals, and individual project choices to better inform the public and support decision-making. The GHG section of the RFEIR takes a novel, and factually unsupported, departure from ordinary CEQA practice by essentially excusing analysis and potential mitigation of GHG emissions when they are indirectly "covered" by a state program. Yet, state programs regularly address at least some aspect of essentially all CEQA impact areas – from state water pollution standards to habitat conservation laws to building codes to endangered species mandates, projects are always considered against a backdrop of state rules. In the ordinary course, the presence of state programs is not taken simply to "cover" the relevant project level impact. On the contrary, CEQA requires project proponents to inquire as to how the project affects environmental resources of statewide concern and to focus on project-level analysis and mitigation. The same rule applies with regard to greenhouse gases. As the California Supreme Court has held, "[l]ocal governments thus bear the primary burden of evaluating a land use project's impacts on greenhouse gas emissions."³

Project proponents may refer to statewide analyses and programs, but, as the Court held, ultimately must provide "substantial evidentiary support" explaining how project-level decisions relate to state-level programs to justify findings of significance based on those programs.⁴ This is particularly important for new projects, as, per the Court, "a greater degree of reduction may be needed from new projects than from the economy as a whole."⁵ And these projects may not simply point to *any* statewide regulations; on the contrary, "[a] significance analysis based on compliance with such statewide regulations ... only goes to impacts within the area governed by the regulations."⁶

In this instance, the Cap-and-Trade Program simply does not cover the project, or require it do anything to mitigate its emissions. As the Court explained, CARB has not "propose[d] statewide regulations of land use planning, but relies instead on local governments." (*Id.* at 230).

CARB has expressed its non-binding views on these matters via the Scoping Plans it is required to prepare under AB 32. The California Supreme Court has recognized the

CARB was not silent. Moreover, an inference from silence would be improper, in any event. CARB sometimes does not comment on individual projects' GHG or other analyses due to resource constraints and other considerations. Nothing should be inferred from silence on a particular matter.

³ *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 230).

⁴ *Id.* at 226-230.

⁵ *Id.* at 225.

⁶ *Id.* at 229.

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Scoping Plan as a valuable source of data for local governments.⁷ As each version of CARB's Scoping Plan, including the recent 2017 Scoping Plan Update, explains, on the basis of extensive modeling and analysis, the Cap-and-Trade Program is not intended to address project-level impacts and does not do so. Rather, complementary measures, including land-use planning and project-level analyses, are vital adjuncts to the Cap-and-Trade Program, serve additional purposes to address climate change, and, if neglected, put undue and unanticipated pressure on the Program. The RFEIR's analysis would thus make the problem it purports to analyze even worse; if followed generally, it would result in development patterns and mitigation choices that would lessen the state's ability to address climate change, and would contribute to cumulatively considerable impacts.

Rather than address project-level emissions, the Cap-and-Trade Program covers activities related to electricity generation, natural gas supply, oil and gas extraction, refining, and transportation fuel supply and combustion. The points of regulation are the operators of electricity generating plants, natural gas fuel suppliers, operators of oil and gas extraction facilities, refinery operators, and transportation fuel suppliers at the rack. See Tit. 17, Cal. Code Regs., § 95811. The Program also addresses GHG emissions in aggregate at the state level and is not intended nor designed to mitigate greenhouse gas from, or otherwise inform, local land use decisions. Without adequate analysis and mitigation, local jurisdictions may not appropriately consider the greenhouse gas implications of their decisions, conflicting with a core CEQA principle of promoting informed decisionmaking. Rather, demand for fuels and electricity created by poorly-planned local projects creates unnecessary demand on the Cap-and-Trade system, potentially raising prices in the system and making statewide compliance more difficult.

These impacts could be substantial because the transportation sector is the state's largest source of GHG emissions (as well as criteria and toxic pollutant emissions, as we have previously addressed with regard to this project). The recently released California Greenhouse Gas Emission Inventory – 2018 Edition shows that while the state's overall GHG emissions declined from 2015 to 2016, the emissions in the transportation sector increased 2 percent over that same time period.⁸ This increase was driven by increases in fuel purchases and use. To effectively achieve the State's GHG target, both production and demand for energy and fuels must be addressed. The

⁷ As the California Supreme Court has held "CEQA requires public agencies...to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Cleveland National Forest Foundation v. San Diego Ass'n of Governments* (2017) 3 Cal. 5th 497, 504.) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17))

⁸ See https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf.

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Legislature recognized this need with regard to electricity when passing SB 350 (Stats. 2015 Ch. 547, De León) to increase the Renewable Portfolio Standard and double energy savings. A similar approach is needed for transportation sector emissions. State-level production side policies such as the Renewable Portfolio Standard, Low Carbon Fuel Standard, and Cap-and-Trade Program cannot alone achieve the State's GHG reduction targets.

In this instance, the RFEIR not only improperly relies on the Cap-and-Trade Regulation; it also fails fully to address consistency with the local measures that *do* more clearly apply. There are a suite of potential emissions reduction strategies identified in the 2017 Scoping Plan aimed at reducing GHG emissions from on-road vehicle travel (e.g., fuel economy standards, technology advancements, SB 375⁹), and the majority of such emissions are not covered in any way by the Cap-and-Trade program.

The City chose not to analyze the project's consistency with the applicable Regional Transportation Plan (RTP), for example, which is subject to GHG emissions reduction targets set by CARB pursuant to SB 375. The City asserted that the RTP does not apply to this project (Table 4.7-11, page 4.7-41 of the RDEIR). We disagree, and suggest that a more appropriate analysis would be whether the project's GHG emissions from on-road transportation would be consistent with, or conflict with, assumptions in the applicable RTP found to comply with SB 375. The city might also refer to the additional nonbinding recommendations offered in CARB's Scoping Plan, though the application of these recommendations, if used, depend on the circumstances of a particular project.

We discuss these points in more detail below.

A. The Cap-and-Trade Regulation Was Never Designed to Achieve All Necessary GHG Reductions From Land Use and Logistics Planning.

The Cap-and-Trade Program was designed from the start as one of a diverse suite of measures, some statewide and some local, to move California toward achieving its GHG targets. To understand the Cap-and-Trade Program's purposes and limitations, the Scoping Plan provides helpful context. The Cap-and-Trade Program covers about 80 percent of all GHG emissions in California.¹⁰ Crucially, just because emissions are "covered" by Cap-and-Trade does not mean all of those emissions from any particular covered entity are mitigated or reduced. It simply means they are included in the cap.

⁹ SB 375 (Steinberg, Statutes of 2008).

¹⁰ Scoping Plan at ES16.

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Thirty-nine percent of California's GHG emissions come from the transportation sector, including logistics-related transportation (like the WLC would involve).¹¹ Another 19 percent of the state's GHG emissions comes from electricity generation.¹² In addition to Cap-and-Trade, the Scoping Plan includes various other CARB measures, some of which also address transportation and electricity sector emissions, including SB 350, the Low Carbon Fuel Standard, the Mobile Source Strategy, and the Sustainable Freight Action Plan. In addition to the other complementary Scoping Plan measures, the Scoping Plan also clearly states that "[l]ocal government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals."¹³

The RFEIR's GHG methodology departs from this science, and has enormous implications for other projects across the state: it would amount to a determination that massive logistics centers, sprawling far-flung residential developments, and other types of remote greenfield development need not do anything to address and mitigate their GHG emissions because those emissions are already "taken care of" by the Cap-and-Trade Program. This is simply not true.

B. The Cap-and-Trade Regulation Is Not Intended to Bear the Burden of Achieving the State's Transportation and Energy Sector GHG Goals Alone.

Cap-and-Trade is not intended to achieve California's climate goals on its own. Rather, Cap-and-Trade is designed to motivate behavior by capping and pricing carbon at the regulated entity level – that is, at the industrial facility and fuel/energy supplier level. It does not send a direct price signal to developers of land use or logistics projects. This means, if CEQA and other "checks" on unsustainable development are weakened as the WLC analysis proposes, such development would simply continue without direct cost to the developers, while adding market demand without mitigating the WLC's emissions.

Moreover, if land use development does not account for GHG emissions, more and more of our state's carbon "cap" would be taken up by increasing transportation emissions. Developers do not receive a price signal from Cap-and-Trade, meaning that there will be no clear incentive to alter this pattern, even as it impacts the Cap-and-Trade system. Thus, the prices of compliance instruments under the Cap-and-Trade Program would increase at a higher rate than was contemplated when CARB developed the Cap-and-Trade Program. This would eventually cause a greater cost burden than

¹¹ As noted above, transportation-related GHG emissions have increased, from 37% in 2015, to 39% in 2016. See CARB, *California Greenhouse Gas Emissions for 2000 to 2016, Trends of Emissions and Other Indicators* (July 2018) at 1 (available at https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf); see also Scoping Plan at ES1.

¹² Scoping Plan at ES1.

¹³ Scoping Plan at 99.; see also page 101.

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anticipated, and it would be borne by all Californians rather than dealt with during the project design phase. Properly-designed local policies, by contrast, may account for GHG emissions of development in a direct way—which furthers the equity objectives of AB 32, complements Cap-and-Trade, and better achieves California’s climate goals.

C. There Is No Substantial Evidence Showing that the Project’s Transportation and Electricity Related Emissions Would Actually Be Mitigated.

In the face of these substantial difficulties, the RFEIR does not articulate substantial evidence demonstrating a rational connection to the Cap-and-Trade Program – and that connection is badly attenuated, as we have explained. The project developer in this instance is claiming it may do nothing with regard to fuels and electricity, and will rely on reductions other entities may achieve. This is not the tight evidentiary connection required by the Supreme Court and by CEQA, and it is not consistent with the State’s GHG reduction programs.

The Final Statement of Reasons (FSOR) prepared when section 15064.4 of the CEQA guidelines, concerning GHGs, was promulgated demonstrates that to properly rely on subsection (b)(3), concerning compliance with statewide programs, a project must demonstrate *with evidence in the record* how the regulations of GHG emissions would actually address the emissions that result from the project. That document states:

Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. *Thus, for example, a subdivision project could not demonstrate consistency with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision.* (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)¹⁴

Here, there is no evidence in the RFEIR regarding who is responsible for complying with Cap-and-Trade for all the GHG emissions at issue in this case – and it certainly is not the project itself. The project is a logistics facility, with trucks involved in interstate commerce, and it is not covered by that Program. Indeed, there is no basis for the

¹⁴ See Natural Resources Agency, Final Statement of Reasons for Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009) at 27 (emphasis added).

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RFEIR's conclusion that the fuel for all of the vehicles serving the project would be covered under the Cap-and-Trade regulation, since it is not clear that all of these vehicles would even purchase their fuel in California.

D. The Project Fails to Account for the Duration of the Project Compared to the Duration of the Cap-and-Trade Program.

The RFEIR states the project's buildout year is 2035,¹⁵ yet the GHG analysis seems to stop after 2035. This raises multiple problems for the RFEIR analysis.

First, it is unclear why the analysis stops at buildout, when GHG emissions (and other environmental impacts) would continue into the indefinite future – at their highest levels – once full operations begin. Without further analysis throughout the project's anticipated life (which does not appear to be stated in the RFEIR but, presumably, would be at least 30 years after buildout), the analysis is incomplete and dramatically understates the project's GHG emissions. This also means the project would likely place a much higher burden on the Cap-and-Trade program than disclosed in the RFEIR – a burden that, as described above, is pushed onto all Californians instead of the project developer as a result of the project's failure to mitigate the vast majority of its GHG emissions.

Second, the RFEIR fails to account for, or even consider, the fact that the current Cap-and-Trade regulation extends only to 2030 – which is five years *before* the project's full buildout is achieved. This means that the RFEIR has no plan whatsoever to account for its GHG emissions once the project is fully built out. The RFEIR also does not address the inconsistency between the project's GHG emissions and Executive Order S-03-05, which, among other things, establishes a state GHG reduction target to reduce GHG emissions to 80 percent below 1990 levels by 2050.¹⁶ The California Supreme Court has emphasized the importance of California's GHG targets in selecting appropriate CEQA thresholds.¹⁷ Despite these considerations, there is no substantial evidence in the record to ensure that *any* of the project's post-buildout operational emissions are mitigated by the Cap-and-Trade program.

E. The Project Fails to Include a Backstop In Case Cap-and-Trade is Altered.

¹⁵ Revised FEIR at 3-1.

¹⁶ See Governor's Executive Order No. S-03-05 (June 1, 2005) (available at [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf)); see also Governor's Executive Order No. B-30-15 (April 29, 2015) (available at <https://www.gov.ca.gov/2015/04/29/news18938/>).

¹⁷ See *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497 at 516-519.

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In addition to its other evidentiary flaws, the RFEIR does not analyze how the analysis would change, and how the project's significant GHG impacts would be mitigated, if Cap-and-Trade were revised in a way that affects the state's GHG levels. In other words, the RFEIR's approach puts an almost complete reliance on the Cap-and-Trade Program in ways that, if adopted generally, would considerably affect the Program, and then fails to consider the possibility that the Program might change even as the Project continues to exist. This could include, for example, a scenario in which:

- The Cap-and-Trade program ceased to exist, or
- If the scope of the program were limited to exclude fuels and electricity, or
- If the Legislature or other factors required the program to be amended in a way that allows a higher cap.

Rather than anticipating any of these or other potential contingencies and building in an appropriate backstop to ensure the project's GHG emissions are mitigated below significance, the RFEIR instead blindly relies on the current Cap-and-Trade Program, with no further commitments or requirements. As a result, the RFEIR fails to provide substantial evidence supporting its conclusion that the project will result in less than significant GHG emissions, while forwarding an analysis that, if accepted, would make the state significantly less able to address climate change impacts resulting from its built infrastructure.

III. The RFEIR is Inconsistent with CEQA Requirements.

The RFEIR's multiple errors with regard to the Cap-and-Trade Program render it contrary with CEQA law. The RFEIR misapplies the key CEQA Guideline, section 15064.4(b), which provides in pertinent part:¹⁸

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 3. The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and

¹⁸ CEQA Guidelines § 15064.4(b) (emphasis added).

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must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. *If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Thus, the CEQA Guidelines focus on project-level compliance and project-level impacts. State programs are available for consideration, but they are not held out as a panacea, for GHGs any more than for any other resource area.

Yet, the RFEIR relies upon subsection (b)(3) of this provision to claim that emissions which are indirectly included under the “cap” created by the Cap-and-Trade Program (referred to in the RFEIR as “capped emissions”) need not be analyzed and mitigated under CEQA. This approach would excuse all of the WLC’s transportation and electricity related emissions, leaving the project only “on the hook” for analyzing and mitigating a tiny fraction of its emissions. The following sections explain why this approach is legally and factually flawed.

A. Subsection (b)(3) Itself Does Not Allow The Approach Used in the Revised Final EIR.

As noted above, subsection (b)(3) of CEQA Guidelines section 15064.4 can be used as a factor to assess GHG significance when “*the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions...*” Here, the RFEIR concedes that the project is not subject to the Cap-and-Trade Regulation.¹⁹ This in itself should be sufficient to demonstrate that subsection (b)(3) is inapplicable to the project, as “the project” does not “comply” with Cap-and-Trade at all.

B. The RFEIR’s Hybrid Approach Used To Determine Significance Is Not Allowed.

In addition to improperly relying on subsection (b)(3), as described above, the RFEIR improperly attempts to create a “hybrid” significance scheme based on selectively combining subsection (b)(3) with the South Coast Air Quality Management District’s (SCAQMD) bright-line threshold. As explained in the RFEIR, a potentially appropriate significance threshold in this case is the SCAQMD’s 10,000 metric ton threshold.²⁰ The problem here is that the RFEIR does not compare the project’s GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Rather, the RFEIR simply subtracts from its emissions quantifications any GHG emissions that it deems to be “capped,” and compares only the net “non-capped” emissions against the bright-line threshold.

¹⁹ See page 4.7-4.

²⁰ RFEIR at 4.7-21.

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This approach is unsupported in law. Regardless of which threshold applies, CEQA requires lead agencies to “make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project.”²¹ CEQA then provides that the lead agency must consider “whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project.”²² Thus, even if subsection (b)(3) properly applied here (which it does not, as explained above), nothing in the CEQA Guidelines allows this hybrid approach of cherry-picking what emissions are applied to an otherwise-applicable bright-line threshold. The City has not even attempted to satisfy its burden of providing such substantial evidence. As noted elsewhere in this letter, Cap-and-Trade does not result in ton-for-ton mitigation of each metric ton covered by the program. Rather, it is a declining market-wide cap designed to achieve certain statewide goals – which, as explained elsewhere in this document, is not designed to mitigate all GHG emissions from land use and logistics facilities.

Because the REFIR fails to properly apply the vast majority of the project’s GHG emissions to the applicable bright-line significance threshold, it also fails to mitigate those emissions, as it simply dismisses them as “less than significant”. If the full scope of the GHG emissions attributable to the project were compared to the applicable bright-line threshold, the mitigated emissions would still be substantially over the threshold. CEQA requires that the project’s significant GHG emissions must be mitigated to the extent feasible. Additional mitigation measures are available to further reduce the project’s GHG emissions that were not considered due to the inappropriate exclusion of the majority of project-generated emissions from the analysis.

C. Reliance Upon *AIR v. Kern County* Is Improper.

While the RFEIR provides little support for the GHG significance approach it takes, the briefing for *Paulek* further explains the reasoning behind the project’s GHG analysis. In those briefs, attorneys for the developer claim that an unrelated appellate ruling, the *AIR v. Kern County* decision²³ is relevant. That decision concerned CEQA analyses for sources actually covered by the Cap-and-Trade Regulation, but the claim is that it somehow applies not only to GHGs from projects that are directly subject to the Cap-and-Trade Regulation, but also to all transportation and electricity related GHG

²¹ CEQA Guidelines § 15064.4(a).

²² CEQA Guidelines § 15064.4(b)(2).

²³ *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal. App. 5th 708. In CARB’s view this case was wrongly decided as to the Cap-and-Trade issue, and it is certainly not apposite in this very different context.

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emissions, the logic being that those emissions are technically included in the statewide "cap" on emissions. This is incorrect factually, for all the reasons discussed above.

It is also not a controlling case legally. The holding in *AIR v. Kern County* addressed whether it "is appropriate for a lead agency to conclude a *project compliance* [sic] with the cap-and-trade program provides a sufficient basis for determining the impact of the project's greenhouse gas emissions will be less than significant."²⁴ The project at issue in that case was a refinery that was directly subject to the Cap-and-Trade Regulation. The court did not address the broader question of whether *all* GHG emissions from resources that are indirectly covered by Cap-and-Trade, at some undefined upstream point, may be cast aside as less than significant. Here, as noted above, the WLC is *not* subject to the Cap-and-Trade regulation. It therefore does not "comply" with the Cap-and-Trade program, and is distinguishable from the project at issue in *AIR v. Kern County*.

C. Reliance Upon Obscure 2013 Negative Declarations and a Policy Document from Another District Is Similarly Uncompelling.

The RFEIR itself also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations,²⁵ and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD) titled Policy APR-2025. The RFEIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a 2014 policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. Furthermore, the primary SJVAPCD guidance documents regarding analyzing and mitigating GHG emissions under CEQA make no mention of Policy APR-2025, including the guidance documents relied upon in the *AIR v. Kern County* decision.²⁶

To the extent the RFEIR is considering what other air districts have done, it is worth noting that the California Air Pollution Control Officers' Association (CAPCOA) has considered a range of potential CEQA significance thresholds, none of which summarily

²⁴ *AIR v. Kern County* at 743 (emphasis added).

²⁵ The Revised FEIR only cryptically references these MNDs, without citations or links to the documents, and without any other information explaining the basis for their CEQA significance approach. The RFEIR's failure to include or adequately reference these mitigated negative declarations hampers the public's ability to review and comment on the RFEIR.

²⁶ See, e.g., *AIR v. Kern County* at 743-744; see also http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf; <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>.

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exclude emissions that are indirectly included within the Cap-and-Trade program.²⁷ While that document was generated in 2008, it makes multiple references to the Cap-and-Trade program, and does not endorse simply subtracting all so-called “capped emissions” from GHG analyses.

D. Even If CEQA Guideline 15064.4(b)(3) Applied Here, The RFEIR Ignores Other Requirements in the CEQA Guidelines.

The sections above provide in-depth analysis regarding why subsection (b)(3) of CEQA Guideline 15064.4 does not allow this project to simply disregard the vast majority of its GHG emissions. Even if that subsection did apply, there are other deficiencies in the RFEIR’s GHG analysis that must be addressed.

First, the CEQA Guidelines make clear that an agency cannot focus solely on a single significance consideration while ignoring other evidence or indicators showing potentially significant impacts. For example:

- Section 15064.4(b) states that “[a] lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment.”
- Section 15064.4(b)(3) provides in pertinent part: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.”
- Section 15064(h)(3) provides: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding that the project complies with the specified plan or mitigation program addressing the cumulative problem, an EIR must be prepared for the project.”

As discussed in depth above, there is evidence in this record showing significant GHG impacts that were not analyzed or mitigated in the RFEIR. CEQA does not allow these impacts to be overlooked, even if the lead agency believes the project’s GHG emissions would be less than significant under one particular (and here, improper) significance metric.

IV. Criteria Pollutants and Toxic Emissions Must Still Be Considered

In its 2013 and 2015 comment letters, CARB noted its substantial concerns regarding the project’s air pollutant and toxics emissions, and suggested several feasible means of reducing the significant impacts from those emissions. These emissions raise

²⁷ See CAPCOA, CEQA & Climate Change (January 2008). Available at <http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf>.

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substantial local exposure and environmental justice concerns, as Moreno Valley already suffers from very substantial air pollution exposures. These exposures would likely be worsened without appropriate mitigation measures.²⁸ CARB incorporates the comments from those letters into this letter by reference, and strongly recommends that the RFEIR be revised to incorporate all mitigation recommended in its 2013 and 2015 comment letters.

V. Conclusion

While the WLC has enormous GHG implications in itself, the attention this project has received, and the recent legal developments in the emerging *AIR v. Kern County* and *Paulek* line of cases, demonstrate that the City's decisions in the RFEIR have implications beyond the WLC project as well. The City should revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, and adopt feasible mitigation to ensure those emissions would not cause significant impacts, as required by CEQA.

Sincerely,



Richard W. Corey
Executive Officer

²⁸ On these issues of acute local exposure, especially to roadway emissions, and the importance of fully addressing these sources of risk, see Ann Carlson, *The Clean Air Act's Blind Spot: Microclimates and Hotspot Pollution* (2018) 65 UCLA L. Rev. 1036.

EXHIBIT C



Gavin Newsom, Governor
 Jared Blumenfeld, CalEPA Secretary
 Mary D. Nichols, Chair

January 30, 2020

Albert Armijo, Interim Planning Manager
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Re: World Logistics Center Draft Recirculated Revised Sections of the Final Environmental Impact Report (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR) for the World Logistics Center (WLC or Project). CARB appreciates the opportunity to comment on the RRSFEIR, and raises two primary issues with the RRSFEIR in this letter.

1. The RRSFEIR contains the same flawed GHG analysis as the RFEIR.

CARB previously reviewed the City's July 2018 Revised Final Environmental Impact Report (RFEIR), and submitted comments regarding the RFEIR on September 7, 2018. As noted in that comment letter, CARB believes the RFEIR's analysis of greenhouse gas (GHG) related impacts does not meet California Environmental Quality Act (CEQA) requirements, as it relies almost entirely on mischaracterizations to reach its less-than-significant impact determination.

Unfortunately, the flaws described in CARB's September 7, 2018 comment letter remain in the RRSFEIR, which continues to rely upon mischaracterizations regarding California's Cap-and-Trade Program to dismiss any serious analysis or mitigation of the Project's GHG emissions. Therefore, as part of its comments on the current draft RRSFEIR, CARB re-submits its September 7, 2018 comment letter (attached to this letter) in its entirety. CARB directs its comments toward both the direct and cumulative impact analysis sections in the RRSFEIR.

2. The RRSFEIR does not include the new GHG mitigation measures it references.

The RRSFEIR includes passing references to new GHG-related mitigation measures, particularly measures 4.7.6.1E-1 and 4.7.6.1E-2 (see pages 4.7-20, 6.7-14, and 6.7-20). However, it appears the measures themselves have not been included in the RRSFEIR. Without the ability to review the mitigation measures relied upon by the City in reaching its significance determinations, the public has no way to evaluate the effectiveness of those measures, thwarting CEQA's public disclosure purpose.


Mr. Albert Armijo
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Conclusion

Both this comment letter and CARB's September 7, 2018 comment letter set forth substantial deficiencies in the environmental analysis prepared for the WLC project. Given these deficiencies, the City should revise the RRSFEIR to include adequate analysis and mitigation regarding all of the Project's environmental impacts, including GHG, air quality, and cumulative impacts. The City should then re-circulate the document for public review to allow the public to review and comment on the City's revised proposal.

Thank you for your consideration. As always, we welcome any questions from the City regarding ways to adequately analyze and mitigate the Project's GHG emissions.

Sincerely,



Richard W. Corey
Executive Officer

Enclosure: CARB's September 7, 2018 comment letter regarding the WLC RFEIR.

EXHIBIT D

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FOURTH APPELLATE DISTRICT, DIVISION TWO

ALBERT THOMAS PAULEK, et al.,

Plaintiffs and Respondents,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Appellants.

HF PROPERTIES, et al.,

Real Parties in Interest and Appellants.

Case No. E071184
(Riverside Cty.
Super. Ct. No.
RIC1510967 MF,
RIC1511279, RIC1511327,
RIC1511421, &
RIC1511195)

**LABORERS INTERNATIONAL UNION OF
NORTH AMERICA, LOCAL 1184, et al.,**

Plaintiffs and Appellants,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Respondents.

HF PROPERTIES, et al.,

Real Parties in Interest and Respondents.

(Riverside Cty. Super. Ct.
No. RIC 1511279 &
RIC1511327)

Riverside County Superior Court
The Honorable Sharon J. Waters, Judge

**BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE
CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS
AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND
PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION
OF NORTH AMERICA, LOCAL 1184, ET AL.**

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INTRODUCTION

The massive World Logistics Center (Project) will cause approximately 70,000 daily truck trips transporting goods from the ports of Long Beach and Los Angeles to Moreno Valley. (AR 003039, 058605–06.) These vehicle trips will emit hundreds of thousands of metric tons of greenhouse gas (GHG) emissions every year over the life of the Project. (AR 002729.) These GHG emissions, along with emissions from electricity needed to power the more than 40-million-square-foot project, will add to the existing climate pollutant problem, accumulating in the atmosphere and persisting for decades or longer.

Rather than analyzing and mitigating the Project’s emissions, lead agency Respondents Moreno Valley Community Services District, *et al.* (Respondents) shirk their responsibility as a local government to address climate change. They improperly rely on CARB’s statewide Cap-and-Trade climate program (Cap-and-Trade Program), which does not impose any regulatory requirements on this Project, as an excuse not to analyze and mitigate the Project’s climate change impacts. Respondents improperly ignore roughly 95% of the GHG emissions from the Project (AR 002718–19), disregarding the significance of those emissions, avoiding their duty to adopt all feasible mitigation measures, and failing to properly disclose their responsibility for this pollution to the public.

Respondents’ approach mischaracterizes the way state climate policies work and violates the California Environmental Quality Act (CEQA). CEQA directs that Respondents take “all action necessary” to protect the environment, recognizing the importance of local action driven through “meaningful” consideration of environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21002, 21002.1.) CEQA does not allow Respondents to waive their CEQA obligations by pointing to a regulation that does not bind them (Cal. Code Regs., tit. 14, § 15000 et seq. (CEQA

Guidelines), § 15064.4), and Respondents wholly misconstrue the regulatory scheme they seek to use.

Although Respondents claim their approach is consistent with state climate policy, it is not. (See Plaintiffs/Appellants’ Supplemental Request Regarding Judicial Notice, Exhibit 1, California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) (2017 Scoping Plan) at pp. 19 [“Local actions are critical for implementation of California’s ambitious climate agenda”], 97–99 [more extensive discussion about the need for local action to achieve California’s climate goals]; see also Health & Saf. Code, §§ 38502, subd. (h) [identifying competing priorities to balance in emissions reductions], 38592 [nothing in this division relieves any person, entity, or agency of compliance with other law], 38690 [identifying overlapping automobile emissions policy].) Respondents’ approach has been repudiated by CARB, the Attorney General’s Office, and the Natural Resources Agency, as contrary to critical state climate goals. The state has long—and expressly—relied on a portfolio of climate change measures, including significant efforts by local governments, to address emissions that result from their land use decisions.

Respondents rely on the Cap-and-Trade Program to excuse their obligation to make better land use decisions. Cap-and-Trade is not intended as a stand-alone climate policy; instead, it assumes steady efforts to reduce emissions across the state. While Cap-and-Trade has an important role to play in limiting emissions from entities like power plants and refineries, the Program does not cover a host of other sources, including warehouses. Although the Program creates financial and legal obligations on fuel suppliers and electricity generators that may ultimately supply this Project, the Project experiences neither the direct legal requirements of the Program nor the full economic costs associated with its additional emissions. If projects were allowed to evade responsibility in

this way, they would steadily increase Cap-and-Trade Program costs upstream, while locking the state into ever-more expensive and inappropriate high-emitting development patterns. This is a recipe for failure in achieving the state’s climate goals. To avoid this scenario, the state relies on local governments to limit emissions from new development projects. Emissions from such projects are the responsibility of local governments and should be mitigated through the proper application of CEQA. Eliminating this crucial piece of the state’s portfolio approach undermines the state’s climate goals.

We have arrived at a crossroads for the future of GHG analysis under CEQA. If Respondents prevail, this case could singlehandedly undo the will of the Legislature by excusing essentially all projects from the obligation to consider GHG impacts from vehicle trips and energy use. This Court should reject Respondents’ argument and confirm that all lead agencies must do their part if we are to meet the state’s long-term climate stabilization objective.

STATEMENT OF INTERESTS

I. INTEREST OF THE ATTORNEY GENERAL

California has already begun to experience significant adverse impacts from climate change such as “more frequent, more catastrophic and more costly” wildfires, drought, “coastal erosion, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.” (2017 Scoping Plan at p. ES2.) As California’s chief law enforcement officer, the Attorney General has the independent power and duty to protect the interest of all of California’s current and future residents in a clean, health, and safe environment. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 15.)

Upholding this duty, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change for well over a decade. (See, e.g., *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”]; *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465; *People v. County of San Bernardino* (San Bernardino County 2007) No. CIVSS0700329.)

The World Logistics Center, like every large development project, has the potential to either facilitate or hinder the state’s achievement of its climate goals. Here, Respondents’ unsupported approach to analyzing the Project’s GHG emissions has the potential to seriously undermine the overall effort to meet the state’s science-based GHG reduction goals for the transportation and land use sectors and to disproportionately affect environmental justice communities.¹ Given these significant interests, the Attorney General submits this amicus brief in support of Appellants,² in compliance with rule 8.200(c)(7) of the California Rules of Court in his independent capacity and on behalf of the California Air Resources Board (CARB).

¹ The Attorney General opposed this methodology in a comment letter it submitted on the revised sections of the Final EIR for this Project (Revised Final EIR or RFEIR). (Letter re: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project, Sept. 7, 2018, at:

<<https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/comments-revised-sections-feir.pdf?>>.) The Revised Final EIR is not at issue in this litigation, but it includes the original EIR’s same flawed GHG analysis.

² This brief is submitted in support of Plaintiffs and Respondents Albert Thomas Paulek, et al. and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, et al.

II. INTEREST OF THE CALIFORNIA AIR RESOURCES BOARD

CARB has a strong interest in participating in this case as amicus curiae. CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. As creator and administrator of the Cap-and-Trade Program, and as the lead agency on the Scoping Plan setting out many of the state’s climate policies, CARB is an expert on how the Cap-and-Trade Program was designed to function and interact with other state laws and programs as part of California’s portfolio approach to addressing GHG emissions. In their briefing, Respondents misrepresent CARB as effectively endorsing the EIR’s approach to GHG analysis. (Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 17, 36–38, 47–48, 56, 63.) But CARB has repeatedly made clear it does *not* support Respondents’ approach.³ As explained more fully below, Respondents’ arguments regarding GHG analysis are contrary to the construction given to applicable regulations by CARB, and by the Natural Resources Agency, agencies charged with interpreting and enforcing the programs at issue.

BACKGROUND

I. LEGAL BACKGROUND REGARDING CALIFORNIA’S EFFORTS TO COMBAT CLIMATE CHANGE

In 2006, recognizing the importance of combatting climate change and furthering the objectives of Executive Order S-3-05, the Legislature enacted the Global Warming Solutions Act of 2006, commonly known as

³ CARB also explained this approach when it formally opposed the GHG analysis Respondents rely on here through its comments on the RFEIR for this Project. (Letter re: World Logistics Center Revised Final Environmental Impact Report, Sept. 7, 2018, at: <https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.236813640.855160185.1575908432-1460774677.1564163003>.)

AB 32. (Health & Saf. Code, § 38500, et seq.) AB 32 mandates that, by 2020, California must reduce its total statewide annual GHG emissions to the level they were in 1990, and to 40 percent below that level by 2030. (Health & Saf. Code, §§ 38550, 38566.) This mandate puts the state on a trajectory of significant and continuous GHG emissions reductions through 2050, in order to stabilize the atmospheric levels of GHGs and reduce the risk of dangerous climate change.

Under AB 32, the Legislature tasked CARB with preparing a guidance planning document, known as the Scoping Plan that, while not binding, set out the state’s views based on extensive environmental and economic analyses on how policies may be effectively implemented so that California will meet the its ambitious GHG reduction goals. (See Health & Saf. Code, §§ 38561 et seq.) The Scoping Plan emphasizes the need for a multi-pronged emissions reduction approach that can be carried out by many entities and reflects the state’s position that it is necessary to reduce emissions at the source and through reductions in demand for energy. (2017 Scoping Plan, pp. 12, 19, 28).

The Scoping Plan includes a suite of regulations, measures, and policies designed to operate together to reduce GHG emissions. The Cap-and-Trade Program is one such policy. Entities that are directly subject to the Cap-and-Trade Program—like power plants, factories, refineries, and electricity generators and importers—must purchase and surrender compliance instruments (e.g., allowances) for their emissions. (See Cal. Code Regs., tit. 17, § 95812.) Downstream emitters such as cars and trucks, much less warehouses that such cars and trucks drive to, are not covered entities under Cap-and-Trade and have no such obligation to purchase or surrender allowances. The existence of the Program, in other words, does not obviate the need for action at other levels of the economy. On the contrary: If sources like the long-lasting development project in this

case build without regard to their emissions, they will increase overall state emissions and hence increase pressure and costs within the Cap-and-Trade Program.

To address the wide range of GHG emissions sources that are not directly controlled through the Cap-and-Trade Program, the state relies on other policies⁴—many of which require collaboration between the state and local governments. Agencies large and small across the state (including, crucially, cities and counties) are responsible for ensuring that proposed new land use plans, transportation projects, and development projects are consistent with evolving scientific knowledge and state regulatory schemes; CEQA is a critical tool for implementing these obligations.⁵ (See *SANDAG, supra*, 3 Cal.5th at p. 519; see also CEQA Guidelines, § 15064.4, subd. (b).)

The Scoping Plan makes clear that the Cap-and-Trade Program was *not* designed to replace local governments’ long-term planning obligations, but rather designed to work in concert with those policies to achieve the

⁴ See, e.g., Health & Saf. Code, §§ 38561, subd. (e) (requiring CARB to consider “the relative contribution of each source or source category to statewide greenhouse gas emissions”), 43018.5, subd. (a) (requiring CARB to “adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles”).

⁵ For example, CARB provides regional emission reduction targets for local jurisdictions’ land use and transportation planning obligations under Senate Bill (SB) 375. (See Health & Saf. Code, § 65080, subd. (b)(2)(A) [known as “The Sustainable Communities and Climate Protection Act”].) CARB also works with regional air pollution control districts and air quality management districts to address emission sources that have both local and global effect, including methane from landfills and hydrofluorocarbons (HFCs), as well as to support state- and federally-mandated permitting of certain industrial sources of GHG emissions. (See California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) pp. 3, 104 <https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf>.)

state’s goals. (2017 Scoping Plan at p. 102 [“California’s future climate strategy will require increased focus on integrated land use planning”].)

Recent state reports have shown that California’s vehicular GHG emissions continue to increase year after year, and CARB has emphasized the need for local action. (See California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) These increasing emissions demonstrate the crucial need for *more* complementary local action—not less—to ensure the state meets its GHG targets in cost-effective ways.

In light of the state’s GHG reduction policies, and CEQA’s focus on embedding environmental considerations in local decision-making, the Supreme Court has emphasized that careful CEQA analysis of GHG impacts will be required going forward, as lead agencies must “stay in step” with the evolving science and law related to the state’s long-term climate objectives in order to carry out their duties under CEQA. (*SANDAG, supra*, 3 Cal.5th at p. 519.)

II. OVERVIEW OF THE GHG ANALYSIS IN RESPONDENTS’ EIR

Mischaracterizing the collaborative efforts required to combat climate change and the role of the Cap-and-Trade Program, Respondents’ EIR takes a very unusual and troubling approach to addressing the Project’s GHG-related impacts.⁶ Respondents divide the Project’s GHG emissions into two categories, which the EIR terms “capped” and “uncapped.” (AR 002719.) What the EIR deems “uncapped” emissions constitute only about 4.6% of the Project’s emissions. (*Ibid.*) The “uncapped” category includes comparatively minor landfill emissions caused by waste generated at the

⁶ The Attorney General and CARB only address Respondents’ inappropriate use of the Cap-and-Trade Program in the GHG analysis of the EIR. This amicus brief is not intended to and should not be construed as an exhaustive discussion of the EIR’s compliance with CEQA.

Project and the use of refrigerants at the Project. (*Ibid.*) For these emissions, the EIR follows the approach that would be expected under CEQA: the City of Moreno Valley, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHG emissions as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold. (AR 002719, AR 002729.)

What the EIR terms “capped” emissions, however, constitute the remaining 95.4% of the Project’s predicted emissions. (AR 002719.) Those include emissions caused by mobile sources (namely, diesel trucks), as well as natural gas and electricity use at the Project. (*Ibid.*) For these emissions, the EIR deviates dramatically from standard CEQA methodology. The EIR asserts these emissions are “covered” by Cap-and-Trade and therefore wholly exempt from any further CEQA analysis or mitigation. (AR 002723.) The EIR does *not* compare the Project’s “capped” emissions to the 10,000 metric ton threshold. (AR 002725.) Indeed, after mitigation measures are applied to the Project, the “capped” emissions remain nearly 40 times greater than the significance threshold. (AR 002729.) In forgoing any attempt to decrease the Project’s true total emissions to a less-than-significant level, Respondents fail to consider further mitigation measures that could have made this Project more compatible with the state’s climate goals. As described below, this approach is unlawful.

ARGUMENT

Respondents avoid disclosing and addressing mitigation for thousands of tons of GHG emissions each year pursuant to the misguided theory that those emissions are addressed by Cap-and-Trade. This argument is founded on misunderstandings of both the Cap-and-Trade Program and

CEQA—both of which require different industries and projects to take responsibility for their own impacts, rather than rely on others for mitigation. Most fundamentally, warehouse projects like the Project are not subject to Cap-and-Trade. Respondents therefore cannot accurately assert that “compliance” with Cap-and-Trade provides any legal basis to avoid analyzing and adequately mitigating the majority of the Project’s emissions.

The CEQA Guidelines allow projects to consider regulations “[with] which the project complies” for purposes of considering significance of GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3).) However, that consideration does not apply here and Respondents’ approach, which in effect relies on other entities to undertake Respondents’ CEQA mitigation, not only violates both CEQA’s legal requirements and public disclosure and mitigation purposes, but also undermines the state climate objectives Cap-and-Trade is intended to further. Cap-and-Trade is designed to act in tandem with—not in spite of—critical tools like local land use planning to reduce GHG emissions. If allowed for Respondents and adopted by other local jurisdictions, such abdication by local governments would dramatically hinder the state’s ability to achieve its legislatively mandated long-term climate stabilization objectives and forgo pollution reduction co-benefits from GHG mitigation measures that are vital for environmental justice communities.

The Resources Agency agrees with CARB that “to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project.” (See California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009),

<http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf>, at p. 27.)

I. WAREHOUSE AND LOGISTICS PROJECTS ARE NOT REGULATED BY CAP-AND-TRADE AND THEIR EMISSIONS MUST STILL BE MITIGATED BY LOCAL GOVERNMENTS

Warehouse and logistics complexes are not regulated by Cap-and-Trade. The Cap-and-Trade Program thus provides no legal or policy basis for Respondents to avoid their obligation to evaluate and mitigate GHG emissions. Cap-and-Trade applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for” such allowances. (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) Respondents seek to use Cap-and-Trade to zero-out and excuse the application of feasible mitigation measures to over 95% of all GHG emissions from the Project. Cap-and-Trade applies only to expressly identified entities (“covered entities”) such as cement producers, petroleum refiners, electricity generators, natural gas suppliers, fuel importers, and liquid petroleum gas suppliers. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities. Cap-and-Trade compliance instruments do not factor in *whatsoever* because this Project is not covered by Cap-and-Trade.

The mere fact that warehouse and logistics complexes are in the chain of commerce with covered entities does not transform them into covered entities themselves. As an example, although the operator of a refinery that produces gasoline in California is subject to Cap-and-Trade, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing the refinery’s own GHG emissions or surrendering allowances, but the gas station that resells the gas, the truck drivers who purchase it, and

the warehouses to which the trucks drive do not have compliance obligations. Under the state's portfolio approach, while the refinery may have met some or all of its climate obligations via Cap-and-Trade, the downstream entities have not. Because warehouses receive no set price or regulatory signals from Cap-and-Trade, they are not being directly incentivized to reduce emissions. Instead, other components of the state's portfolio address those emissions. Nothing in Cap-and-Trade explicitly or impliedly repealed the use of other measures to address climate change; they were designed to work together. (See, e.g., 2017 Scoping Plan at p. 28.) Local governments must responsibly plan new development to further the state's climate goals.

II. ALLOWING RESPONDENTS' UNTENABLE APPROACH TO GHG ANALYSIS WOULD HAVE SIGNIFICANT, NEGATIVE STATEWIDE CONSEQUENCES

If Respondents' approach to GHG analysis is endorsed, other lead agencies will undoubtedly follow this approach, and emissions from the transportation and land use sectors will be largely omitted from analysis and mitigation under CEQA. Widespread adoption of this approach would: (1) place the entire burden of California's well-established, long-term land-use related GHG reduction goals on Cap-and-Trade, thereby straining the program beyond its intended purpose and (2) expose already burdened communities in the state to greater amounts of GHG emissions and co-pollutants that accompany GHG emissions, such as diesel particulate matter and nitrogen oxides.

A. Respondents' GHG analysis undermines California's GHG reduction goals

As explained above, the Cap-and-Trade Program is just one part of a suite of complementary measures designed to achieve California's ambitious GHG reduction and climate stabilization objectives. Cap-and-

Trade provides no legal basis for Respondents to avoid local governments' obligations as lead agencies under CEQA to evaluate and mitigate GHG emissions from a project that the Cap-and-Trade Program does not even cover.

While any one policy may be insufficient or at risk of circumvention, the suite of policies work in concert toward the state's goals.^{7,8} This overlap is by design, and makes the suite of policies more resilient to changed circumstances, enforcement problems, and legal challenges. The upstream Cap-and-Trade Program thus works in tandem with downstream choices, including planning choices, to ensure both that total emissions decline and that projects throughout the state are designed to avoid putting undue upstream pressure on emissions or control costs. Weakening one policy because another policy might address it runs contrary to this approach.

⁷ See 2017 Scoping Plan, *supra*, pp. ES7–8, 10, 22, 97; cf. Elinor Ostrom, A Polycentric Approach for Coping with Climate Change (2014) 15 *Annals Econ. & Fin.* 97, 123 <<https://perma.cc/YSF4-B7N8>> (Nobel laureate describing an ideal policy approach to climate change as “Complex, Multi-Level Systems to Cope with a Complex, Multi-Level Problem”); Amir Bazaz, et al., Global Covenant of Mayors, Summary for Urban Policymakers: What the IPCC Special Report on Global Warming of 1.5.°C Means for Cities (Dec. 2018) pp. 22–23 <<https://perma.cc/R37B-3WDD>> (identifying interaction between sources of governance and importance of incentives beyond financial consequences at the community level).

⁸ Complementary measures are also important in light of the risk to any one measure posed by litigation. Private parties and the federal government have challenged California's GHG reduction policies, including aspects of the Cap-and-Trade Program. California's GHG vehicle emissions regulatory authority is currently also under challenge. The wisdom of the portfolio approach endorsed by the Scoping Plan is to ensure that the state's efforts continue via many channels, rather than relying on any one potentially challenged measure.

If other lead agencies adopt Respondents’ approach to GHG analysis under CEQA, their development projects would produce millions of metric tons of GHG emissions that would go unmitigated through what amounts to an unauthorized categorical exemption from CEQA. The economic analyses and feasibility of achieving the state’s legislatively mandated goals in the Scoping Plan account for all policies working in tandem. If any one policy fails to deliver reductions, this would put strain on the Cap-and-Trade Program to deliver more reductions than anticipated and at higher costs.

Respondents’ failure to account for the significance of the Project’s GHG emissions from transportation is particularly troubling in light of the fact that the transportation sector accounts for over 35% of the state’s total GHG emissions and these emissions continue to rise. (2017 Scoping Plan, *supra*, pp. ES1, 11 [charts of emissions by source]; see also California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) As the California Supreme Court noted, “transportation emissions are affected by the location and density of residential and commercial development, the Scoping Plan does not propose statewide regulation of land use planning but *relies instead on local governments.*” (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 230; emphasis added.) Local governments thus play a unique role in decreasing GHG emissions from the transportation sector.

Respondents contend that because statewide emissions are capped under the Cap-and-Trade Program, the amount of emissions from “capped” sources will be the same with or without their Project, but this claim ignores both their obligations under CEQA to disclose and mitigate their emissions and the intended design of the Cap-and-Trade Program. (See

Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 48–49.)

Cap-and-Trade is not a program designed to reduce emissions from local government actions, or land use; instead, it was designed on the assumption that local actors would simultaneously work to reduce emissions within their spheres. Cap-and-Trade alone was designed to account for less than 40% of the total emissions reductions needed to achieve California’s 2030 climate goals, and on the explicit assumption that local design choices would continue to reduce overall emissions (and hence economy-wide costs in the Cap-and-Trade Program). (2017 Scoping Plan at p. 28.) Indeed, relying entirely on the Cap-and-Trade Program to address land use would produce a mismatch that would strain the Program by functionally increasing demand for emissions reductions as unregulated entities displace their obligations onto the Program rather than taking action themselves, raising compliance costs for covered entities across all sectors and all consumers across the state at all income levels. California’s portfolio approach was designed to meet AB 32’s requirement that “greenhouse gas emissions reduction activities . . . adopted and implemented by [CARB] are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.” (Cal. Health & Saf. Code, § 38561.) By taking a portfolio approach, the state has recognized that taking GHG action in specific sectors ensures that we achieve our broader climate and energy demand reduction goals. (See 2017 Scoping Plan at pp. 2, 24, 100 [describing Governor Brown’s five key climate change strategy “pillars”].) Ultimately, cost increases could make the Cap-and-Trade Program less effective as a key part of the suite of California’s climate policies.

In sum, Respondents’ position is fundamentally inconsistent with the state’s approach to climate change, and so disregards significant emissions

that should properly be addressed under CEQA, not an unrelated emissions program like Cap-and-Trade. Moreover, Respondents' approach would allow similar emissions from other projects that would follow its lead. (See Part III(A), *infra.*) The majority of land use projects are, like this Project, not covered by the Cap-and-Trade Program. Freight alone is an enormous industry; over 1.5 billion tons of freight were moved in California during 2015. (*Id.* at p. 73.) And other types of projects such as residential developments or agricultural enterprises may seek to invoke precedent created by this case. Thus, even if the Project standing alone does not excessively strain the Cap-and-Trade system, the collective weight of new projects failing to address GHG emissions in the CEQA process would.

B. Respondents' GHG analysis prevents co-pollutant reduction measures necessary to protect California's environmental justice communities

Permitting massive land development projects without requiring the necessary mitigation measures to decrease project emissions will also harm California's environmental justice communities—those already suffering from the worst environmental pollution in the state. The census tract the Project will be built in is ranked in the 75th to 80th percentile of census tracts in California in terms of greatest pollution burden indicators and health and vulnerability factors for population characteristic indicators. (CalEnviroScreen 3.0 for Census Tract 6065042624, Office of Environmental Health Hazard Assessment, last visited November 27, 2019 <<https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>>.) Even without the Project, residents of this census tract already experience ozone, the main ingredient of smog, at a rate higher than 98% of the rest of California. (*Ibid.*) Relatedly, these residents also experience cardiovascular disease, which can result from exposure to air pollution, at a rate higher than 95% of the state. (*Ibid.*)

Considering additional mitigation properly may have resulted in additional zero-emissions technologies used for the Project, including, perhaps, from its trucks, as many commenters recommended. If such measures are not considered from this Project and other future projects like it are not mitigated, Moreno Valley and communities throughout the state will likely continue to suffer from worse air pollution. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL’Y REV. 377, 387 [“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant reductions as GHGs are being reduced [which] should improve the health of local communities.”]; see also Scoping Plan at p. 74 [“Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions . . . , low income communities, and communities of color.”].)

III. RESPONDENTS’ EIR VIOLATES CEQA

As explained above, the EIR’s approach to GHG analysis misrepresents the Cap-and-Trade Program and the Project’s place in that scheme. As a result, the EIR takes an unsupportable approach to evaluating the significance of GHG emissions from the Project. Contrary to CEQA’s focus on information disclosure and local responsibility for mitigation, the EIR ignores the vast majority of the Project’s emissions, and, in a misleading analysis, compares only a small fraction of the Project’s emissions to the applicable significance threshold. This flawed analysis leads the EIR to conclude that the impact from GHG emissions would be mitigated to a less-than-significant level, misleading the public and shirking mitigation responsibilities. Even if the Cap-and-Trade Program directly

applied to the Project’s emissions (it does not since, as explained above, this Project is not a covered entity under the Program), this method of evaluating a project’s significance *after* taking into account purported “mitigation” or impact-reducing components is not allowed by CEQA. As a result of its flawed analysis, the EIR fails to adopt all feasible mitigation measures and subverts CEQA’s important political function of ensuring informed decision making and informed public participation.

The EIR’s approach to GHG analysis fails on multiple levels. Perhaps most critically, in addition to pointing to “compliance” with a regulation that simply does not cover the Project to excuse mitigation, the EIR focuses on a single significance consideration while ignoring other evidence showing potentially significant impacts. CEQA does not allow clearly significant GHG impacts to be overlooked, even if a lead agency believes those impacts are considered less than significant under one particular metric. (See, e.g., *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal.App.3d 872, 274 [citizens’ personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards]; accord *SANDAG, supra*, 3 Cal.5th at p. 515 [“An adequate description of adverse environmental effects is necessary to inform the critical discussion of mitigation measures and project alternatives at the core of the EIR”].) This failure to address potentially significant impacts not only minimizes the Project’s significant impacts, but also warps the evaluation of whether the Project’s contribution to GHG emissions is a cumulatively considerable impact. (CEQA Guidelines, § 15064.) The cumulative effect of dozens of similar warehouse projects in the Moreno Valley area could—and almost certainly will—be significant.

A. The EIR improperly applies CEQA Guidelines Section 15064.4 to determine the significance of the Project’s GHG emissions.

The Resources Agency, the state’s expert on CEQA, has rejected the approach of using purported “compliance” with an inapplicable program to mitigate emissions. (Final Statement of Reasons for the CEQA Guidelines Amendments (2018) at p. 27 [“a subdivision project could not demonstrate ‘consistency’ with [CARB’s] Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision”].)

The EIR misapplies CEQA Guidelines section 15064.4, which offers multiple factors a lead agency should consider in assessing the significance of impacts from GHG emissions. That Guideline provides, in pertinent part:

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
 - (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 - (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - (3) The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project’s incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a *particular project* are still cumulatively considerable notwithstanding compliance with the adopted

regulations or requirements, an EIR must be prepared for the project.⁹

(CEQA Guidelines, § 15064.4, subd. (b), italics added.)

As reflected in subdivision (b)(3), compliance with “regulations or requirements adopted to implement a statewide, regional, or local plan” can factor into the assessment of GHG significance, but only when *the project complies* with those regulations or requirements. Yet, the EIR relies upon subsection (b)(3) to claim that emissions for which upstream suppliers surrendered allowances need not be analyzed and mitigated under CEQA. This approach excuses all of the Project’s transportation- and electricity-related emissions, thus requiring analysis and mitigation of only a tiny fraction of the Project’s emissions.

⁹ The 2018 update to the CEQA Guidelines added the following language:

(b) In determining the significance of a project’s greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.

(b)(3) . . . In determining the significance of impacts, the lead agency may consider a project’s consistency with the State’s long-term climate goals or strategies, provided that substantial evidence supports the agency’s analysis of how those goals or strategies address the project’s incremental contribution to climate change.

(c) A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Respondents' application of subdivision (b)(3) to this Project is wrong. Because the Project is not a covered entity under the Cap-and-Trade Program, subsection (b)(3) is inapplicable, as the project cannot "comply" with Cap-and-Trade at all. Moreover, as discussed above, such "compliance" would undermine Cap-and-Trade's purposes if adopted as a CEQA approach, not serve the environmental goals both AB 32 and CEQA set out to deliver.

B. The EIR failed to apply the SCAQMD's GHG emissions threshold to *all* of the Projects' GHG emissions.

The EIR takes an impermissible approach of applying the Cap-and-Trade Program to ostensibly reduce the Project's emissions significantly, then comparing only that reduced quantity to the bright-line significance threshold. This approach is not supported in law.¹⁰

CEQA requires lead agencies to "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." (CEQA Guidelines, § 15064.4.) CEQA then provides that the lead agency must consider "whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project." (*Id.* at subd. (b)(2).) As explained in the EIR, a potentially appropriate

¹⁰ The EIR also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations from other lead agencies, and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD). (EIR 4.7-33.) The EIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. These irrelevant, project-specific documents do not constitute substantial evidence supporting Respondents' argument.

significance threshold in this case is the South Coast Air Quality Management District's (SCAQMD) SCAQMD's 10,000 metric ton limit.¹¹ (EIR at p. 4.7-32.)

The problem here is that the EIR does not compare the Project's total GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Instead, the EIR simply subtracts from the total any GHG emissions it deems to be "capped," and compares only the few "non-capped" emissions to the bright-line threshold. Because the EIR only compares a small fraction of the Project's GHG emissions to the applicable bright-line significance threshold, it only requires relatively minor mitigation measures to reduce the Project's emissions to what the EIR considers "less than significant." (EIR at pp. 1-55–57.)

Respondents' approach improperly applies so-called "mitigation" (the Cap-and-Trade Program) *before* comparing GHG emissions to the significance threshold. By combining impacts and mitigation analyses, it is unclear how the purported mitigation reduces impacts. This approach was rejected in *Lotus v. Dept. of Transportation* (2014) 223 Cal.App.4th 645, where the court stated:

The failure of the EIR to separately identify and analyze the significance of the impacts . . . before proposing mitigation measures is not merely a harmless procedural failing. . . . [T]his shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decisionmaking and informed public participation. It precludes both identification of potential

¹¹ It is worth noting that the Scoping Plans are not binding as to any particular CEQA methodology, or as to land use planning generally, and do not require use of any particular significance threshold. They are guidance documents; individual land use authorities can and do depart from particular suggestions in them if they have appropriate reasons to do so. The issue in this case, however, is that the Cap-and-Trade program does *not* provide such an appropriate reason.

environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The deficiency cannot be considered harmless.

(*Id.* at p. 658.)

Furthermore, if the full scope of the GHG emissions attributable to the Project were compared to the applicable bright line threshold, the emissions, as mitigated, would still be substantially over the threshold—and would therefore require consideration of additional mitigation measures. (See EIR, pp. 4.7-35–36.)

Applying appropriate mitigation measures to reduce the so-called “capped” emissions would not “result in double counting and double mitigating emissions that are already mitigated through cap-and-trade” as Respondents assert. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 57.) Gesturing towards Cap-and-Trade regulated entities is not proper mitigation because Cap-and-Trade does not apply to this Project in any way, and the Project itself has ample mitigation opportunities onsite. To mitigate this Project’s GHG emissions, Respondents would have to address emissions from mobile sources, which account for over 70% of the Project’s total emissions (which again are nearly 40 times greater than the significance threshold). (AR002729.) To reduce these emissions, fewer trucks could drive from the Project to the Ports of Long Beach and Los Angeles every day, the Project could be built closer to the ports, the Project could require more zero emission vehicles be used or provide charging equipment or incentives to encourage their use, or any number of other meaningful mitigation measures. But Cap-and-Trade does not require any of this. Such measures are instead included by local governments in local land use projects to ensure approved project impacts fall below significance thresholds. By never counting the “capped” emissions toward the significance threshold, there is *no* counting and *no*

project-level mitigation of hundreds of thousands of tons of yearly GHG emissions from this Project.

C. Respondents fail to consider the long-term GHG impacts of the Project.

The Supreme Court has made clear that an EIR should consider a project’s long-term GHG impacts, and should address whether the project as a whole is in accord with the state’s climate goals. (*Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 515.)¹² The state’s climate change goals extend beyond 2030. (See, e.g., Executive Order S-03-05 [established a statewide target of reducing GHG emissions to 80 percent below 1990 levels by 2050].) Because the Project is expected to operate for decades into the future, Respondents must account for emissions beyond 2030. But Respondents fail to account for emissions beyond that point—despite the fact that the Project’s full operation will not start until *five years later*, in 2035. (EIR at p. 4.3-61.) Respondents present no substantial evidence that any of the Project’s post-buildout operational emissions are mitigated by the Cap-and-Trade Program. (See, e.g., EIR, pp. 4.7-36–37 [stating, without citation, that “[s]ome of the project’s GHG emissions are subject to the requirements of the AB 32 Cap and Trade Program and will have a GHG allocation based on current GHG emissions levels”].) This is not an adequate CEQA analysis. (See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 904 [EIR must contain substantial evidence that mitigation measures will reduce associated impacts to less-

¹² The parties in *AIR v. Kern* did not have the opportunity to brief the significance of *SANDAG* because the California Supreme Court filed its opinion in *SANDAG* over a month after the close of briefing in *AIR v. Kern*. It appears to amici that this is the first case at the California Court of Appeal where parties have had the opportunity to address both *SANDAG* and *AIR v. Kern* in their briefs.

than-significant-levels, such as by requiring compliance with applicable regulatory standards and preparation of site-specific studies]; Cal. Code Regs. tit. 14, § 15370, subd. (d) [“mitigation” includes “[r]educing or eliminating the impact over time by preservation and maintenance operations during the life of the action”].)

D. Reliance on *AIR v. Kern County* is improper.

Respondents incorrectly claim the Fifth Appellate District’s decision in *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*) upheld the use of the same GHG methodology as Respondents attempt to use here. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 53.) Respondents’ use of the Cap-and-Trade Program here goes far beyond what was sanctioned in *AIR*. In *AIR*, the project being evaluated under CEQA was a refinery, a *covered entity* under Cap-and-Trade. The court held a lead agency was authorized “to determine that a project’s greenhouse gas emissions will have a less than significant effect on the environment based on *the project’s* compliance with the cap-and-trade program.” (*Id.* at p. 718; italics added.) Regardless of whether or not *AIR* was rightly decided, *here*, the question is much simpler and different from the question before the court in *AIR*. Here, it is undisputed that the Project is *not* a covered entity required to comply with the Cap-and-Trade Program. (Cal. Code Regs., tit. 17, § 95811.) Accordingly, this Court need only decide if projects that are *not* covered entities under Cap-and-Trade are nonetheless allowed to use the program to ignore significant GHG emissions they cause. The answer to that question is no.

Respondents argue the distinction between covered and non-covered entities is “a distinction without a difference.” (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 63.) Respondents are incorrect.

This distinction is crucial under CEQA and vital to the success of California’s ambitious climate policies.

From a CEQA perspective, the distinction is important because CEQA Guidelines section 15064.4, subdivision (b)(3) instructs lead agencies to consider the extent to which *a project* complies with GHG regulations or requirements. It is thus inappropriate for entities downstream in the chain of commerce from a covered entity to rely upon compliance with the Cap-and-Trade Program as a basis for avoiding analysis of project-related emissions.

From a policy perspective, as described above, the distinction is crucial because projects that are not subject to the Cap-and-Trade Program do not have the same direct incentives to reduce their GHG emissions as covered facilities, and Cap-and-Trade alone is not designed to achieve California’s ambitious climate goals. The distinction between covered and not-covered entities is thus crucial to the portfolio of climate change measures the state is relying on to protect our citizens going forward.

E. Respondents’ GHG analysis obfuscates the climate change impacts of this Project, undermining CEQA’s public disclosure purpose.

By failing to comply with CEQA Guidelines Section 15064.4, failing to compare all of the Project’s emissions to the GHG emissions threshold, and failing to consider the long-term GHG impacts of the Project, Respondents’ analysis undermines the informational purpose of CEQA. The purpose of an EIR “is to inform the public generally of the environmental impact of a proposed project.” (Cal. Code Regs. tit. 14, § 15003, subd. (c).)

CEQA prohibits public agencies from approving or carrying out a project that will have significant effects on the environment unless the agency makes “findings” demonstrating either that it made changes to the

project to avoid or mitigate those significant impacts, or that certain overriding considerations outweigh the impact. (Pub. Resources Code, § 21081.) Without a full and accurate disclosure of the Project’s impacts, Respondents erroneously concluded that the GHG impact would be less-than-significant, and thereby avoided making the subsequent findings that would inform the public whether the Project’s significant impacts are unavoidable and/or justified. Additionally, Respondents’ approach hinders the public’s ability to submit informed comments during the EIR’s public comment period—aside from addressing the *lack* of analysis—because the public is not provided with, and thus cannot evaluate, complete information or proper CEQA analysis.

CONCLUSION

California is striving on all fronts to meet its ambitious, long-term GHG reduction objectives; the health of its citizens and the environment depend on it. But this Court’s approval of Respondents’ approach to GHG analysis and mitigation would treat the Cap-and-Trade Program as the sole remedy to limit GHG emissions from land-use projects, placing unnecessary strain on Cap-and-Trade’s cost-effectiveness and seriously undermining the state’s critical climate change efforts. Amici respectfully request this Court reject the trial court’s holding and find in favor of Appellants as to GHG analysis.

Dated: January 10, 2020

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 Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World Logistics Center)

CERTIFICATE OF COMPLIANCE

I certify that the attached Brief of Amici Curiae the Attorney General and the California Air Resources Board in Support of Plaintiffs and Respondents Albert Thomas Paulek, *et al.* and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, *et al.* uses a 13 point Times New Roman font and contains 7,647 words.

Dated: January 10, 2020

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DECLARATION OF ELECTRONIC SERVICE VIA TRUEFILING

Case Name: **PAULEK, ET AL., V. MORENO VALLEY COMMUNITY SERVICES DISTRICT, ET AL., California Court of Appeal, Fourth Appellate District, (Amicus Brief)**

No.: **E071184**

I declare:

I am employed in the Office of the Attorney General, which is the office of a member of the California State Bar, at which member's direction this service is made. I am 18 years of age or older and not a party to this matter. I am familiar with the business practice at the Office of the Attorney General. Correspondence that is submitted electronically is transmitted using the TrueFiling electronic filing system. Participants who are registered with TrueFiling will be served electronically.

On January 10, 2020, I electronically served the attached:

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I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on January 10, 2020, at Sacramento, California.

PAULA CORRAL
Declarant

/s/ Paula Corral
Signature

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Document received by the CA 4th District Court of Appeal Division 2.
Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World Logistics Center)



State of California - Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
 Inland Deserts Region
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1.A.e

May 13, 2020
 Sent via email

Ms. Julia Descoteaux
 Associate Planner
 City of Moreno Valley
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 PO Box 88005
 Moreno Valley, CA 92552-0805
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Subject: Revised Final Environmental Impact Report
 City of Moreno Valley, World Logistics Center Project
 State Clearinghouse No. 2012021045

Dear Ms. Descoteaux:

The California Department of Fish and Wildlife (CDFW) received the Revised Final Environmental Impact Report (RFEIR) on May 5, 2020 from the City of Moreno Valley (City) for the World Logistics Center Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.¹

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code. CDFW is concerned with the adequacy of the City's assessment of impacts to the San Jacinto Wildlife Area (Wildlife Area; SJWA), and with the adequacy and enforceability of mitigation measures for biological resources. CDFW's concerns related to the SJWA and recommended edits to the City's mitigation measures to improve specificity and enforceability are identified and discussed below.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA

¹ CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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Guidelines § 15386, subd. (a.) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW previously provided comments on the Draft EIR on April 8, 2013, on the Final EIR June 11, 2015, and on the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Determination of Biologically Equivalent or Superior Preservation (DBESP) on December 19, 2014.

CDFW Comments and Recommendations

CDFW's comments and recommendations on the Project are summarized below.

Impacts to rare, listed, and sensitive species

Mitigation Measures (MM) 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E identify the preparation of translocation plans for rare and listed plant species (MM 4.4.6.2A), burrowing owl (MM4.4.6.4D), and Los Angeles pocket mouse (MM 4.4.6.4E).

Sensitive Plant Species

MM 4.4.6.2A provides mitigation measures for impacts to sensitive plant species:

Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant's discretion, an impact

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fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

CDFW is concerned that City's "Planning Official" is not sufficiently qualified to review and approve a translocation plan for rare plant species. Further, thread-leaved brodiaea is a state endangered and federally threatened species and CDFW should review this proposal. To ensure that this proposal is implemented in compliance of rules and regulations related to state and/or federally listed plant species CDFW recommends that the City revise mitigation measure (MM) 4.4.6.2A and condition the measure to include the following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.2A Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, **the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review and approval** ~~they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A.~~ Alternatively, at the applicant's discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

Burrowing Owl

MM 4.4.6.4D provides mitigation measures for impacts to burrowing owl:

If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife. A relocation plan may be required by California Department of Fish and Wildlife if active and/or passive relocation is necessary. The relocation plan will outline the basic process and provides options for avoidance and mitigation. Artificial burrows - may be constructed within the buffer area south of the World Logistics Center

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Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.

A relocation plan may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated to the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor.

CDFW previously provided comments on the City's proposal to translocate burrowing owl to the "250-foot buffer area" in a joint CDFW – US Fish and Wildlife Service (USFWS) comment letter written in response to the City's DBESP submitted for review as required by the Western Riverside MSHCP. In the joint letter (dated December 19, 2014) CDFW and the USFWS articulated to the City that the 250-foot buffer area is not appropriate as a receptor site for burrowing owl because it is insufficient in terms of area, spatial configuration, and conflicting planned use (the City has proposed the construction of detention basins, etc., within the buffer area). Burrowing owl require large open expanses of sparsely vegetated habitat to forage and nest, and the 250-foot buffer area would not provide these ecological needs. Further, because the buffer area is proposed to be planted with trees, CDFW and the USFWS also stated that the City's proposal to plant trees within the buffer area would provide perch sites for bird-eating raptors, such as red-tailed hawks, which eat burrowing owls, further reducing the appropriateness of the City's proposed mitigation approach.

MM 4.4.6.4D also includes reference to Planning Area 30. CDFW maintains similar concerns regarding the suitability of this area for burrowing owl: Planning Area 30 is insufficient in terms of area and spatial configuration. Further, based on CDFW's review of aerial photography the topography of much of Planning Area 30 is unlikely to be suitable for burrowing owl.

CDFW appreciates that the City has included an additional relocation option: CDFW's San Jacinto Wildlife Area. However, CDFW is concerned that MM 4.4.6.4D does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of burrowing owl (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant. CDFW is unable to assume this financial burden, and it is the responsibility of the Project Applicant to mitigate Project impacts.

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MM 4.4.6.4D identifies that CDFW would review any active and/or passive relocation plan for burrowing owl. Please note that these plans will also need to be reviewed and approved by the USFWS and the Western Riverside County Regional Conservation Authority (RCA).

To improve the specificity and enforceability of MM 4.4.6.4D and to ensure consistency with the MSHCP, CDFW recommends that the City revise mitigation measure MM 4.4.6.4D and condition the measure as following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.4D If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (**CDFW**), **U.S. Fish and Wildlife Service (USFWS)**, and the **Western Riverside County Regional Conservation Authority (RCA)**. A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and the RCA~~ if active and/or passive relocation is necessary. The relocation plan will outline the basic process, ~~and provides options for avoidance and mitigation,~~ **identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site.** Artificial burrows - may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW, **the USFWS, and RCA.**

A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and RCA~~ if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated **following written approval by CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas).** Construction activity may occur within 500 feet of the burrows at the discretion of

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the biological monitor, **following consultation with CDFW, the USFWS, and RCA.**

Los Angeles Pocket Mouse

MM 4.4.6.4E provides mitigation measures for impacts to Los Angeles pocket mouse (LAPM):

Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas as determined by the United States Fish and Wildlife Service. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division.

MM 4.4.6.4E identifies that the City will review LAPM “protocol surveys,” and the USFWS will review any relocation plan for LAPM. CDFW is concerned that City staff are not appropriately qualified to determine if appropriate survey methodology has been employed by the Project Applicant, or review trapping results. CDFW recommends that proposed survey methodology and trapping results be reviewed and/or approved by CDFW and the USFWS. Further, any relocation plan prepared for LAPM will also need to be reviewed and approved by CDFW (in addition to the USFWS).

CDFW appreciates that MM 4.4.6.4E identifies that LAPM translocation, if deemed necessary, may occur to a site other than the 250-foot buffer area. CDFW and the USFWS previously commented that the 250-foot buffer area may not be appropriate as a receiver site because of size and configuration (it will be a narrow, relatively restricted area), and because of potential disruptions to existing small mammal populations, and predator-prey relationships. CDFW appreciates that the City has included an additional relocation option however, CDFW is concerned that MM 4.4.6.4E does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of

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LAPM (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant.

To improve the specificity and enforceability of MM 4.4.6.4E CDFW recommends that the City revise mitigation measure MM 4.4.6.4E and condition the measure as following (edits are in **bold** and ~~strike~~through):

MM 4.4.6.4E Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to **CDFW and the USFWS for review and approval prior to submission to the City**. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated **to locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas)** ~~as determined by the United States Fish and Wildlife Service~~. **All costs associated with the relocation, as well as short-and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant**. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biologically Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division **following coordination with CDFW and the USFWS**.

Fish and Game Code section 1602

MM 4.4.6.3C conditions the Project Applicant(s) to submit to the City copies of appropriate permits/agreements for impacts to Waters of the State and Waters of the U.S. The measure identifies the “need for permits based on the results of the 2012 jurisdictional delineation.” Please note that CDFW will require that any stream mapping submitted to CDFW as a component of a Notification of Lake or Streambed Alteration be current. CDFW recommends the measure be revised to remove all reference to the “2012 jurisdictional delineation.” In addition to removing reference to out-of-date mapping, CDFW recommends that errors

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included in the measure be corrected. CDFW recommends that the City revise mitigation measure MM 4.4.6.3C as follows (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.3C Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), **Regional Water Quality Control Board**, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements **are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City** ~~will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required.~~ **The Applicant shall consult with** ~~However, permitting through the~~ Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (i.e., Streambed ~~Alteration~~ **Alteration** Agreement) ~~may still be required for these improvements. The applicant shall consult with~~ **and** United States Army Corps of Engineers, ~~California Department of Fish and Wildlife and Regional Water Quality Control Board~~ to establish the need for permits based on the results of the 2012 **current stream mapping jurisdictional delineation** and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the ~~U.S. Fish and Wildlife Service~~ **Regional Water Quality Control Board**, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.

Wildlife Movement

The Biological Resources section (Section 4.4) of the Revised Sections of the FEIR (page 4.4-37) discusses that the Project will incorporate fencing to separate development areas from MSHCP open space areas to the south and along Gilman Springs Road. CDFW agrees that fencing is appropriate to minimize unauthorized public access, illegal trespass, and dumping. In addition, fencing

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along Gilman Springs Road should be designed to minimize wildlife movement and direct wildlife towards wildlife crossings. CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the construction of such fences as the Project is developed. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the construction of fencing along the Project's southern and eastern boundaries, and wildlife fencing along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.

CDFW is concerned about the project's potential to restrict wildlife movement to and from the San Timoteo Badlands (Badlands) and SJWA/Mystic Lake area. As proposed, the Project will border the Badlands along portions of its northern border as well as its nearly 2-mile long eastern border at Gilman Springs Road, creating an obstruction to wildlife movement between the Badlands and open areas to the south (Mystic Lake, Lake Perris, and SJWA). The Project is located between the SJWA and the two existing culverts under State Route 60 (SR-60), and will also be located immediately west of Gilman Springs Road and the existing culverts under this road. Because the Project encompasses logistics centers that will significantly increase traffic volume, CDFW argues that the Project will have substantial effects on existing wildlife movement patterns. Species of concern include mountain lion, bobcat, badger, coyote, deer, long-tailed weasel, black-tailed jackrabbit, and desert cottontail. A fair argument can be made that the Project will increase noise, lighting, and traffic which may in turn negatively affect wildlife through direct mortality or alter movement patterns by forcing wildlife to move east or west, away from the Project. CDFW recommends that the Project install appropriate fencing along Gilman Springs Road and SR-60 to reduce wildlife mortality and direct animals to future or existing wildlife crossings.

CDFW recommends that the City condition the Project to require the installation of wildlife fencing along SR-60 and Gilman Springs Road to reduce Project-related wildlife mortality. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

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Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.

Section 4.4 of the Revised Sections of the FEIR (page 4.4-61) discusses that the RCA submitted comments to the City stating that the project would likely cause an increase in truck traffic along Gilman Springs Road which “could significantly affect wildlife movement between Core H and proposed Core 3.” To mitigate these impacts the Revised Sections of the FEIR (page 4.4-61) states that it would be appropriate for the Project to contribute (financially) to the “fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings.” CDFW agrees that contribution of funding for improvements to wildlife crossings along Gilman Springs Road would be appropriate, but CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the contribution of funds for this purpose. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the contribution of funds to a mitigation account, to held by CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.

Impacts to the San Jacinto Wildlife Area

CDFW previously provided comments on the Project’s proposal to construct buildings within 450 feet of the SJWA (refer to CDFW’s April 8, 2013, and June 11, 2015 comment letters). SJWA is an active hunting area, and hunts are regularly conducted along the SJWA’s northern boundary. Fish and Game Code Section 3004 prohibits the discharging of firearms within 150 yards (450 feet) of any building without express permission of the owner. Given that the City is proposing the construction of buildings within 450 feet of the northern property boundary of the SJWA, the City’s actions will directly constrain the public’s use of the SJWA. CDFW reiterates that unless the City increases the buffer distance between the SJWA and constructed elements of the Project to a minimum of 450 feet, the City will have effectively created restraints on hunting with the Wildlife

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Area. Further unless the environmental document is revised, it continues to be deficient in its analysis of impacts on public access and recreational pursuits within the SJWA.

CDFW strongly recommends that the buffer distance between the northern boundary of the SJWA and the Project be increased to a minimum of 450 feet.

Project's Consistency with Adopted HCPs/NCCPs

Projects proposed for construction within the MSHCP and the Stephens' kangaroo rat Habitat Conservation Plan (SKR HCP) are subject to payment of mitigation fees. Pages 4.4-60 and 4.4-61 discuss the required payment of these fees, however the City did not include a mitigation measure to ensure the enforceability of payment of fees. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the payment of MSHCP and SKR HCP fees, as appropriate, prior to issuance of grading permits. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.

Resource Management

MM 4.4.6.4F discusses the development of a Biological Resource Management Plan for the proposed 250-foot setback area. The measure discusses that the plan will be reviewed by the City's "Planning Official in consultation with the San Jacinto Wildlife Area Manager." CDFW is unaware that the City contacted CDFW's SJWA manager to verify that CDFW were available and able to contribute to the review of this plan, or whether this workload element could be accommodated based on CDFW's current staffing levels. CDFW appreciates that the City is requesting review of the proposed Biological Resource Management Plan, but we request that review of this document be determined by CDFW.

CDFW recommends that the City revise mitigation measure MM 4.4.6.4F as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained **in perpetuity**. This plan will identify frequent and infrequent vegetation management requirements (i.e.,

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removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. **The Biological Resource Management Plan will include an estimate of short-and long-term management costs, a discussion of how funds will be made available in perpetuity, and entities responsible for contribution of funds to support the Biological Resource Management Plan.** The Biological Resource Management Plan will also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E.

The Biological Resource Management Plan, **including the short-and long-term funding strategy** shall be reviewed and approved by the Planning Official in consultation with **California Department of Fish and Wildlife** ~~San Jacinto Wildlife Area Manager~~. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist, to the satisfaction of the City Planning Division.

Fuel Management

MM 4.4.6.4J discusses the preparation of a Fuel Management Plan for those Planning Areas adjacent to the south and east boundary of the Project and MSHCP lands. The measure identifies that the plan shall demonstrate that adjacent MSHCP lands are adequately protected from expected fire risks. CDFW recommends that MM 4.4.6.4J be revised to also demonstrate that the Fuel Management Plan adequately protect CDFW's SJWA lands. CDFW recommends that the City revise mitigation measure MM 4.4.6.4J as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4J A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas **and/or San Jacinto Wildlife Area (SJWA) lands**. The Fuel Management Plan shall be prepared by the project proponent and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan **and/or SJWA** boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:

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- A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area.
- A list of non-native invasive plants that are prohibited from installation.
- Maintenance activities and a maintenance schedule.

Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas **and SJWA lands** are adequately protected from expected fire risks.

Minor Errors

MM4.4.6.2B and 4.4.6.3B include reference to the “Resource Conservation Agency (RCA).” CDFW assumes that the City is referring to the Western Riverside County **Regional Conservation Authority**. CDFW recommends that the City review the aforementioned mitigation measures and correct all references to the Regional Conservation Authority.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDDB). Information can be submitted online or via completion of the CNDDDB field survey form at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The completed form can be mailed electronically to CNDDDB at the following email address: CNDDDB@wildlife.ca.gov. The types of information reported to CNDDDB can be found at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>.

Ms. Julia Descoteaux, Associate Planner
 World Logistics Center Project
 May 13, 2020
 Page 14 of 16

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CDFW CONCLUSIONS AND FURTHER COORDINATION

CDFW appreciates the opportunity to comment on the RFEIR for the City of Moreno Valley's World Logistics Center Project (SCH No. 2012021045) and recommends that the City address the CDFW's comments and concerns prior to adoption of the RFEIR. Pursuant to CEQA Guidelines section 15097(f) CDFW has prepared a draft mitigation monitoring and reporting program (MMRP) for the new mitigation measures identified in this letter. The draft MMRP is enclosed at the end of this letter.

If you should have any questions pertaining to the comments provided in this letter, and to schedule a meeting, please contact Joanna Gibson at (909) 987-7449 or at Joanna.Gibson@wildlife.ca.gov.

Sincerely,

DocuSigned by:

 8091B1A9242F49C...

Scott Wilson
 Environmental Program Manager

ec: California Department of Fish and Wildlife
 HCPB CEQA Coordinator

Office of Planning and Research, State Clearinghouse
State.clearinghouse@opr.ca.gov

Ms. Julia Descoteaux, Associate Planner
 World Logistics Center Project
 May 13, 2020
 Page 15 of 16

Mitigation Monitoring and Reporting Program for the City of Moreno Valley's World Logistics Center Project

Mitigation Measure	Timing	Responsible Parties
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and to the City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.</p>	<p>Prior to issuance of grading permit.</p>	<p>City of Moreno Valley</p>

Ms. Julia Descoteaux, Associate Planner
World Logistics Center Project
May 13, 2020
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Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.	Prior to issuance of grading permit.	City of Moreno Valley
--	--------------------------------------	-----------------------

**Recipient Committee
Campaign Statement
Cover Page**

(Government Code Sections 84200-84216.5)

Type or print in ink.



CITY CLERK
MORENO VALLEY
RECEIVED

NOV 24 AM 10:17

CC 1.A.e

CALIFORNIA
FORM 460

Page 1 of 24

For Official Use Only

SEE INSTRUCTIONS ON REVERSE

Statement covers period

from 10/01/2014

through 10/18/2014

Date of election if applicable
(Month, Day, Year)

11/04/2014

1. Type of Recipient Committee: All Committees – Complete Parts 1, 2, 3, and 4.

- Officeholder, Candidate Controlled Committee
 - State Candidate Election Committee
 - Recall
(Also Complete Part 5)
- General Purpose Committee
 - Sponsored
 - Small Contributor Committee
 - Political Party/Central Committee
- Primarily Formed Ballot Measure Committee
 - Controlled
 - Sponsored
(Also Complete Part 6)
- Primarily Formed Candidate/Officeholder Committee
(Also Complete Part 7)

2. Type of Statement:

- Preelection Statement
- Semi-annual Statement
- Termination Statement
(Also file a Form 410 Termination)
- Amendment (Explain below)
- Quarterly Statement
- Special Odd-Year Report
- Supplemental Preelection Statement - Attach Form 495

AMEND TO INCLUDE ADDITIONAL ACCRUED EXPENSES AND INCREASE SCH. D

3. Committee Information

I.D. NUMBER
1372065

COMMITTEE NAME (OR CANDIDATE'S NAME IF NO COMMITTEE)
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES,
SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR
FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

STREET ADDRESS (NO P.O. BOX)
2350 KERNER BLVD., SUITE 250

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	(415) 389-6800

MAILING ADDRESS (IF DIFFERENT) NO. AND STREET OR P.O. BOX

CITY	STATE	ZIP CODE	AREA CODE/PHONE
------	-------	----------	-----------------

OPTIONAL: FAX / E-MAIL ADDRESS
form410@nmgovlaw.com

Treasurer(s)

NAME OF TREASURER
JASON D. KAUNE

MAILING ADDRESS
2350 KERNER BLVD., SUITE 250

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	(415) 389-6800

NAME OF ASSISTANT TREASURER, IF ANY
JAMES W. CARSON

MAILING ADDRESS
2350 KERNER BLVD., SUITE 250

CITY	STATE	ZIP CODE	AREA CODE/PHONE
SAN RAFAEL	CA	94901	(415) 389-6800

OPTIONAL: FAX / E-MAIL ADDRESS

4. Verification

I have used all reasonable diligence in preparing and reviewing this statement and to the best of my knowledge the information contained herein and in the attached schedules is true and complete. I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on 11/20/14
Date

Executed on _____
Date

Executed on _____
Date

Executed on _____
Date

By [Redacted Signature]
Signature of Controlling Officeholder, Candidate, State Measure Proponent or Responsible Officer of Sponsor

By _____
Signature of Controlling Officeholder, Candidate, State Measure Proponent

By _____
Signature of Controlling Officeholder, Candidate, State Measure Proponent

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Recipient Committee Campaign Statement Cover Page — Part 2

Type or print in ink.

COVER PAGE - PART 2

CALIFORNIA FORM	460
Page <u>2</u> of <u>24</u>	

5. Officeholder or Candidate Controlled Committee

NAME OF OFFICEHOLDER OR CANDIDATE

OFFICE SOUGHT OR HELD (INCLUDE LOCATION AND DISTRICT NUMBER IF APPLICABLE)

RESIDENTIAL/BUSINESS ADDRESS (NO. AND STREET) CITY STATE ZIP

Related Committees Not Included in this Statement: *List any committees not included in this statement that are controlled by you or are primarily formed to receive contributions or make expenditures on behalf of your candidacy.*

COMMITTEE NAME	I.D. NUMBER
----------------	-------------

NAME OF TREASURER	CONTROLLED COMMITTEE? <input type="checkbox"/> YES <input type="checkbox"/> NO
-------------------	---

COMMITTEE ADDRESS STREET ADDRESS (NO P.O. BOX)

CITY STATE ZIP CODE AREA CODE/PHONE

COMMITTEE NAME	I.D. NUMBER
----------------	-------------

NAME OF TREASURER	CONTROLLED COMMITTEE? <input type="checkbox"/> YES <input type="checkbox"/> NO
-------------------	---

COMMITTEE ADDRESS STREET ADDRESS (NO P.O. BOX)

CITY STATE ZIP CODE AREA CODE/PHONE

6. Primarily Formed Ballot Measure Committee

NAME OF BALLOT MEASURE

BALLOT NO. OR LETTER	JURISDICTION	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
----------------------	--------------	---

Identify the controlling officeholder, candidate, or state measure proponent, if any.

NAME OF OFFICEHOLDER, CANDIDATE, OR PROPONENT

OFFICE SOUGHT OR HELD	DISTRICT NO. IF ANY
-----------------------	---------------------

7. Primarily Formed Candidate/Officeholder Committee *List names of officeholder(s) or candidate(s) for which this committee is primarily formed.*

NAME OF OFFICEHOLDER OR CANDIDATE YXSTIAN GUTIERREZ	OFFICE SOUGHT OR HELD City Council Member	<input checked="" type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
--	--	--

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

Attach continuation sheets if necessary

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Campaign Disclosure Statement Summary Page

Type or print in ink.
Amounts may be rounded
to whole dollars.

SUMMARY PAGE

Statement covers period from <u>10/01/2014</u>	CALIFORNIA FORM 460
through <u>10/18/2014</u>	
Page <u>3</u> of <u>24</u>	

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

Contributions Received

	Column A TOTAL THIS PERIOD (FROM ATTACHED SCHEDULES)	Column B CALENDAR YEAR TOTAL TO DATE
1. Monetary Contributions Schedule A, Line 3	\$ <u>82,000.00</u>	\$ <u>82,000.00</u>
2. Loans Received Schedule B, Line 3	<u>0.00</u>	<u>0.00</u>
3. SUBTOTAL CASH CONTRIBUTIONS Add Lines 1 + 2	\$ <u>82,000.00</u>	\$ <u>82,000.00</u>
4. Nonmonetary Contributions Schedule C, Line 3	<u>0.00</u>	<u>0.00</u>
5. TOTAL CONTRIBUTIONS RECEIVED Add Lines 3 + 4	\$ <u>82,000.00</u>	\$ <u>82,000.00</u>

Calendar Year Summary for Candidates Running in Both the State Primary and General Elections

	1/1 through 6/30	7/1 to Date
20. Contributions Received	\$ _____	\$ _____
21. Expenditures Made	\$ _____	\$ _____

Expenditures Made

	Column A TOTAL THIS PERIOD (FROM ATTACHED SCHEDULES)	Column B CALENDAR YEAR TOTAL TO DATE
6. Payments Made Schedule E, Line 4	\$ <u>62,601.42</u>	\$ <u>62,601.42</u>
7. Loans Made Schedule H, Line 3	<u>0.00</u>	<u>0.00</u>
8. SUBTOTAL CASH PAYMENTS Add Lines 6 + 7	\$ <u>62,601.42</u>	\$ <u>62,601.42</u>
9. Accrued Expenses (Unpaid Bills) Schedule F, Line 3	<u>35,386.17</u>	<u>35,386.17</u>
10. Nonmonetary Adjustment Schedule C, Line 3	<u>0.00</u>	<u>0.00</u>
11. TOTAL EXPENDITURES MADE Add Lines 8 + 9 + 10	\$ <u>97,987.59</u>	\$ <u>97,987.59</u>

Expenditure Limit Summary for State Candidates

22. Cumulative Expenditures Made* (If Subject to Voluntary Expenditure Limit)	
Date of Election (mm/dd/yy)	Total to Date
____/____/____	\$ _____
____/____/____	\$ _____

Current Cash Statement

12. Beginning Cash Balance Previous Summary Page, Line 16	\$ <u>0.00</u>
13. Cash Receipts Column A, Line 3 above	<u>82,000.00</u>
14. Miscellaneous Increases to Cash Schedule I, Line 4	<u>0.00</u>
15. Cash Payments Column A, Line 8 above	<u>62,601.42</u>
16. ENDING CASH BALANCE Add Lines 12 + 13 + 14, then subtract Line 15	\$ <u>19,398.58</u>

If this is a termination statement, Line 16 must be zero.

17. LOAN GUARANTEES RECEIVED Schedule B, Part 2	\$ <u>0.00</u>
---	----------------

Cash Equivalents and Outstanding Debts

18. Cash Equivalents See instructions on reverse	\$ <u>0.00</u>
19. Outstanding Debts Add Line 2 + Line 9 in Column B above	\$ <u>35,386.17</u>

To calculate Column B, add amounts in Column A to the corresponding amounts from Column B of your last report. Some amounts in Column A may be negative figures that should be subtracted from previous period amounts. If this is the first report being filed for this calendar year, only carry over the amounts from Lines 2, 7, and 9 (if any).

*Amounts in this section may be different from amounts reported in Column B.

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule A
Monetary Contributions Received**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA FORM 460
Page 4 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE RECEIVED	FULL NAME, STREET ADDRESS AND ZIP CODE OF CONTRIBUTOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CONTRIBUTOR CODE *	IF AN INDIVIDUAL, ENTER OCCUPATION AND EMPLOYER (IF SELF-EMPLOYED, ENTER NAME OF BUSINESS)	AMOUNT RECEIVED THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/01/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		20,000.00	82,000.00	
10/10/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		52,000.00	82,000.00	
10/15/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		10,000.00	82,000.00	
		<input type="checkbox"/> IND <input type="checkbox"/> COM <input type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC				
		<input type="checkbox"/> IND <input type="checkbox"/> COM <input type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC				
SUBTOTAL \$				82,000.00		

Schedule A Summary

1. Amount received this period – itemized monetary contributions.
(Include all Schedule A subtotals.) \$ 82,000.00

2. Amount received this period – unitemized monetary contributions of less than \$100 \$ 0.00

3. Total monetary contributions received this period.
(Add Lines 1 and 2. Enter here and on the Summary Page, Column A, Line 1.) **TOTAL \$** 82,000.00

***Contributor Codes**
IND – Individual
COM – Recipient Committee
(other than PTY or SCC)
OTH – Other (e.g., business entity)
PTY – Political Party
SCC – Small Contributor Committee

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period		CALIFORNIA FORM 460
from	10/01/2014	
through	10/18/2014	Page <u>5</u> of <u>24</u>

SCHEDULE

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/03/2014	YKSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,348.95	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/03/2014	YKSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,504.90	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/03/2014	YKSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	479.50	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
SUBTOTAL \$				5,333.35		

Schedule D Summary

- Contributions and independent expenditures made this period of \$100 or more. (Include all Schedule D subtotals.) \$ 65,074.53
- Unitemized contributions and independent expenditures made this period of under \$100 \$ 0.00
- Total contributions and independent expenditures made this period. (Add Lines 1 and 2. Do not enter on the Summary Page.) **TOTAL \$** 65,074.53

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT.)

Statement covers period		CALIFORNIA FORM 460
from	10/01/2014	
through	10/18/2014	Page <u>6</u> of <u>24</u>

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/04/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	15,000.00	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/04/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	VOTER LISTS	692.65	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/08/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/08/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,858.45	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					

SUBTOTAL \$ 19,804.16

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT.)

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA FORM 460
Page 7 of 24

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/08/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	PHONE BANK	2,100.30	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/08/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	118.00	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/11/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	15,000.00	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/16/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					

SUBTOTAL \$ 19,471.36

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT.)

Statement covers period		CALIFORNIA FORM 460
from	10/01/2014	
through	10/18/2014	Page <u>8</u> of <u>24</u>

NAME OF FILER	I.D. NUMBER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.	1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/16/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	125.50	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/16/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,084.55	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/18/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	15,000.00	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/18/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
SUBTOTAL \$				18,463.11		

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT.)

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA FORM 460

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NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER

1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/18/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	918.00	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/18/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,084.55	65,074.53	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
		<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input type="checkbox"/> Independent Expenditure				
	<input type="checkbox"/> Support <input type="checkbox"/> Oppose					
		<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input type="checkbox"/> Independent Expenditure				
	<input type="checkbox"/> Support <input type="checkbox"/> Oppose					

SUBTOTAL \$ 2,002.55

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule E
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA
FORM **460**

1.A.e
SCHEDULE E

Page 10 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER

1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponso |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	2,348.9
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,504.9
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND		CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	10,000.0

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 14,853.8

Schedule E Summary

- | | | |
|--|-----------------|-----------|
| 1. Itemized payments made this period. (Include all Schedule E subtotals.) | \$ | 62,551.42 |
| 2. Unitemized payments made this period of under \$100 | \$ | 50.00 |
| 3. Total interest paid this period on loans. (Enter amount from Schedule B, Part 1, Column (e).) | \$ | 0.00 |
| 4. Total payments made this period. (Add Lines 1, 2, and 3. Enter here and on the Summary Page, Column A, Line 6.) | TOTAL \$ | 62,601.42 |

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE E (CONT.)

1.A.e

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA
FORM **460**

Page 11 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.00
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,858.45
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND		CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	35,000.00
CANDID RESEARCH SOLUTIONS 3601 HALBRITE AVENUE LONG BEACH, CA 90808	POL			5,610.00
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	723.00

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 45,444.51

FPPC Form 460 (January/05)

FPPC Toll-Free Helpline: 866/ASK-F

Packet Pg. 539

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE E (CONT.)

1.A.e

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA
FORM **460**

Page 12 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.00

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 2,253.00

Schedule F Accrued Expenses (Unpaid Bills)

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period		CALIFORNIA FORM 460
from	10/01/2014	
through	10/18/2014	Page 13 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
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| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	0.00	25,000.00	0.00	25,000.00
R.T. BURNS INC. 8456 HUNT VALLEY DRIVE Vienna, VA 22182	IND PHONE BANK SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	2,100.30	0.00	2,100.30
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	1,084.55	0.00	1,084.55
SUBTOTALS \$		0.00\$	28,184.85\$	0.00\$	28,184.85\$

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

Schedule F Summary

- Total accrued expenses incurred this period. (Include all Schedule F, Column (b) subtotals for accrued expenses of \$100 or more, plus total unitemized accrued expenses under \$100.) **INCURRED TOTALS \$** 35,386.17
- Total accrued expenses paid this period. (Include all Schedule F, Column (c) subtotals for payments on accrued expenses of \$100 or more, plus total unitemized payments on accrued expenses under \$100.) **PAID TOTALS \$** 0.00
- Net change this period. (**Subtract** Line 2 from Line 1. Enter the difference here and on the Summary Page, Column A, Line 9.) **NET \$** 35,386.17
May be a negative number

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule F
(Continuation Sheet)
Accrued Expenses (Unpaid Bills)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE F (CONT.)

Statement covers period	CALIFORNIA FORM 460
from <u>10/01/2014</u>	
through <u>10/18/2014</u>	Page <u>14</u> of <u>24</u>

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

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NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	2,253.06	0.00	2,253.00
HF PROPERTIES 14225 CORPORATE WAY Moreno Valley, CA 92553	IND VOTER LISTS FOR CANVASSING AND MAILERS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	692.65	0.00	692.65
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	0.00	2,253.06	0.00	2,253.00
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND DESIGN OF MAILER SUPPOERTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	918.00	0.00	918.00
SUBTOTALS \$		0.00\$	6,116.77\$	0.00 \$	6,116.77

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule F
(Continuation Sheet)
Accrued Expenses (Unpaid Bills)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE F (CONT.)

Statement covers period from <u>10/01/2014</u> through <u>10/18/2014</u>	CALIFORNIA FORM 460
	Page <u>15</u> of <u>24</u>

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
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| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	0.00	1,084.55	0.00	1,084.55
SUBTOTALS \$		0.00\$	1,084.55\$	0.00 \$	1,084.55\$

**Schedule G
Payments Made by an Agent or Independent
Contractor (on Behalf of This Committee)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA
FORM

1.A.e
460

Page 16 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

STAR MAILING INC.

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
US POSTMASTER MORENO VALLEY, CA	POS	.		1,869.9
US POSTMASTER MORENO VALLEY, CA	POS	.		1,869.9
US POSTMASTER MORENO VALLEY, CA	POS	.		1,618.0
US POSTMASTER MORENO VALLEY, CA	POS	.		1,618.0

Attach additional information on appropriately labeled continuation sheets.

TOTAL * \$ 6,975.9

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

**Schedule G
Payments Made by an Agent or Independent
Contractor (on Behalf of This Committee)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA
FORM **460**
Page 1 of 24

1.A.e

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
PETRA CLARK [REDACTED]		CANVASSER	825.0
VILMA ENDERICA [REDACTED]		CANVASSER	945.0
ALEJANDRO ESCUTIA [REDACTED]		CANVASSER	555.0
CAROLINA ESCUTIA [REDACTED]		CANVASSER	555.0

Attach additional information on appropriately labeled continuation sheets.

TOTAL * \$ 2,880.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE

1.A.e

Statement covers period
 from 10/01/2014
 through 10/18/2014

CALIFORNIA FORM 460

Page 18 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
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| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
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| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MARK FAVORITE [REDACTED]			CANVASSER	570.00
ELVIA FREGOSO [REDACTED]			CANVASSER	945.00
VICTOR GARCIA [REDACTED]			CANVASSER	945.00
NORMA GONZALEZ [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 3,405.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE **1.A.e**

Statement covers period
 from 10/01/2014
 through 10/18/2014

CALIFORNIA FORM 460
 Page 19 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
LILIANA HERNANDEZ [REDACTED]			CANVASSER	945.00
LUZ HERNANDEZ [REDACTED]			CANVASSER	825.00
ALEX MARTINEZ [REDACTED]			CANVASSER	945.00
ORLANDO MARTINEZ [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 3,660.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

**Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE **1.A.e**

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA FORM 460
Page 20 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
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| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
IRENE PAYAN [REDACTED]		CANVASSER	2,232.00
JENNIFER PRIETO [REDACTED]		CANVASSER	870.00
ENRIQUE PUENTE [REDACTED]		CANVASSER	945.00
ROSALBA PUENTE [REDACTED]		CANVASSER	855.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 4,902.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

FPPC Form 460 (January/05)
FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Packet Pg. 548

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE

1.A.e

Statement covers period
 from 10/01/2014
 through 10/18/2014

CALIFORNIA FORM 460

Page 2 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
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| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ARACELI RAMIREZ [REDACTED]			CANVASSER	1,125.00
ELIZABETH RAMIREZ [REDACTED]			CANVASSER	1,920.00
ILENE REYNOSO [REDACTED]			CANVASSER	945.00
RUBI RIVERA [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 4,935.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE

1.A.e

Statement covers period
 from 10/01/2014
 through 10/18/2014

CALIFORNIA
 FORM **460**

Page 23 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
 MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
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| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MIGUEL RODRIGUEZ [REDACTED]			CANVASSER	870.00
MANUEL SANCHEZ [REDACTED]			CANVASSER	945.00
LUIS SAUCEDO [REDACTED]			CANVASSER	720.00
JESSE ANDREW SIDA [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 3,480.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

FPPC Form 460 (January/05)
 FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Packet Pg. 550

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE

1.A.e

Statement covers period
from 10/01/2014
through 10/18/2014

CALIFORNIA FORM **460**

Page 23 of 24

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
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* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
PORFIRIO SIORDIA JR. [REDACTED]			CANVASSER	945.00
LEONELA TAPIA [REDACTED]			CANVASSER	720.00
ZULMA TAPIA CHACARA [REDACTED]			CANVASSER	630.00
JULISSA WENCE [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL * \$ 3,240.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE

1.A.e

Statement covers period
 from 10/01/2014
 through 10/18/2014

CALIFORNIA FORM 460

Page 24 of 24

I.D. NUMBER
 1372065

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
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| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MARCO ZARATE [REDACTED]			CANVASSER	945.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 945.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Recipient Committee
Campaign Statement
Cover Page**

(Government Code Sections 84200-84216.5)

COPY

SEE INSTRUCTIONS ON REVERSE

Type or print in ink.



Date Stamp
**CITY CLERK
MORENO VALLEY
RECEIVED**

Date of election if applicable:
(Month, Day, Year) **15 JAN 12 AM 11:22**

CALIFORNIA
FORM

1.A.e
460

Page 1 of 32

For Official Use Only

1. Type of Recipient Committee: All Committees – Complete Parts 1, 2, 3, and 4.

- Officeholder, Candidate Controlled Committee
 - State Candidate Election Committee
 - Recall
(Also Complete Part 5)
- General Purpose Committee
 - Sponsored
 - Small Contributor Committee
 - Political Party/Central Committee
- Primarily Formed Ballot Measure Committee
 - Controlled
 - Sponsored
(Also Complete Part 6)
- Primarily Formed Candidate/Officeholder Committee
(Also Complete Part 7)

2. Type of Statement:

- Preelection Statement
- Semi-annual Statement
- Termination Statement
(Also file a Form 410 Termination)
- Amendment (Explain below)
- Quarterly Statement
- Special Odd-Year Report
- Supplemental Preelection Statement - Attach Form 495

3. Committee Information

I.D. NUMBER
1372065

COMMITTEE NAME (OR CANDIDATE'S NAME IF NO COMMITTEE)

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES,
SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR
FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

STREET ADDRESS (NO P.O. BOX)

2350 KERNER BLVD., SUITE 250

CITY STATE ZIP CODE AREA CODE/PHONE

SAN RAFAEL CA 94901 (415) 389-6800

MAILING ADDRESS (IF DIFFERENT) NO. AND STREET OR P.O. BOX

CITY STATE ZIP CODE AREA CODE/PHONE

OPTIONAL: FAX / E-MAIL ADDRESS

form410@nmgovlaw.com

Treasurer(s)

NAME OF TREASURER

JASON D. KAUNE

MAILING ADDRESS

2350 KERNER BLVD., SUITE 250

CITY STATE ZIP CODE AREA CODE/PHONE

SAN RAFAEL CA 94901 (415) 389-6800

NAME OF ASSISTANT TREASURER, IF ANY

JAMES W. CARSON

MAILING ADDRESS

2350 KERNER BLVD., SUITE 250

CITY STATE ZIP CODE AREA CODE/PHONE

SAN RAFAEL CA 94901 (415) 389-6800

OPTIONAL: FAX / E-MAIL ADDRESS

4. Verification

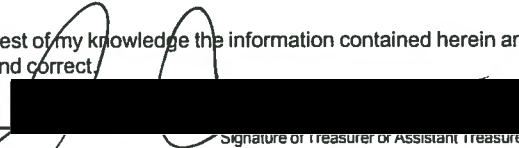
I have used all reasonable diligence in preparing and reviewing this statement and to the best of my knowledge the information contained herein and in the attached schedules is true and complete. I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on 1/6/15 Date

Executed on _____ Date

Executed on _____ Date

Executed on _____ Date

By  Signature of Treasurer or Assistant Treasurer

By  Signature of Controlling Officeholder, Candidate, State Measure Proponent or Responsible Officer of Sponsor

By _____ Signature of Controlling Officeholder, Candidate, State Measure Proponent

By _____ Signature of Controlling Officeholder, Candidate, State Measure Proponent

**Recipient Committee
Campaign Statement
Cover Page — Part 2**

Type or print in ink.

1.A.e

COVER PAGE - PART 2

CALIFORNIA
FORM **460**

Page 2 of 32

5. Officeholder or Candidate Controlled Committee

NAME OF OFFICEHOLDER OR CANDIDATE

OFFICE SOUGHT OR HELD (INCLUDE LOCATION AND DISTRICT NUMBER IF APPLICABLE)

RESIDENTIAL/BUSINESS ADDRESS (NO. AND STREET) CITY STATE ZIP

Related Committees Not Included in this Statement: *List any committees not included in this statement that are controlled by you or are primarily formed to receive contributions or make expenditures on behalf of your candidacy.*

COMMITTEE NAME I.D. NUMBER

NAME OF TREASURER CONTROLLED COMMITTEE?
 YES NO

COMMITTEE ADDRESS STREET ADDRESS (NO P.O. BOX)

CITY STATE ZIP CODE AREA CODE/PHONE

COMMITTEE NAME I.D. NUMBER

NAME OF TREASURER CONTROLLED COMMITTEE?
 YES NO

COMMITTEE ADDRESS STREET ADDRESS (NO P.O. BOX)

CITY STATE ZIP CODE AREA CODE/PHONE

6. Primarily Formed Ballot Measure Committee

NAME OF BALLOT MEASURE

BALLOT NO. OR LETTER	JURISDICTION	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
----------------------	--------------	---

Identify the controlling officeholder, candidate, or state measure proponent, if any

NAME OF OFFICEHOLDER, CANDIDATE, OR PROPONENT

OFFICE SOUGHT OR HELD	DISTRICT NO. IF ANY
-----------------------	---------------------

7. Primarily Formed Candidate/Officeholder Committee *List names of officeholder(s) or candidate(s) for which this committee is primarily formed.*

NAME OF OFFICEHOLDER OR CANDIDATE YXSTIAN GUTIERREZ	OFFICE SOUGHT OR HELD City Council Member	<input checked="" type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
--	--	--

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

NAME OF OFFICEHOLDER OR CANDIDATE	OFFICE SOUGHT OR HELD	<input type="checkbox"/> SUPPORT <input type="checkbox"/> OPPOSE
-----------------------------------	-----------------------	---

Attach continuation sheets if necessary

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Campaign Disclosure Statement Summary Page

Type or print in ink.
Amounts may be rounded
to whole dollars.

1.A.e

SUMMARY PAGE

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460
	Page <u>3</u> of <u>32</u>

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

Contributions Received

	Column A TOTAL THIS PERIOD (FROM ATTACHED SCHEDULES)	Column B CALENDAR YEAR TOTAL TO DATE
1. Monetary Contributions Schedule A, Line 3	\$ <u>84,500.00</u>	\$ <u>166,500.00</u>
2. Loans Received Schedule B, Line 3	<u>0.00</u>	<u>0.00</u>
3. SUBTOTAL CASH CONTRIBUTIONS Add Lines 1 + 2	\$ <u>84,500.00</u>	\$ <u>166,500.00</u>
4. Nonmonetary Contributions Schedule C, Line 3	<u>751.57</u>	<u>751.57</u>
5. TOTAL CONTRIBUTIONS RECEIVED Add Lines 3 + 4	\$ <u>85,251.57</u>	\$ <u>167,251.57</u>

Calendar Year Summary for Candidates Running in Both the State Primary and General Elections

	1/1 through 6/30	7/1 to Date
20. Contributions Received	\$ _____	\$ _____
21. Expenditures Made	\$ _____	\$ _____

Expenditures Made

	Column A TOTAL THIS PERIOD (FROM ATTACHED SCHEDULES)	Column B CALENDAR YEAR TOTAL TO DATE
6. Payments Made Schedule E, Line 4	\$ <u>103,898.58</u>	\$ <u>166,500.00</u>
7. Loans Made Schedule H, Line 3	<u>0.00</u>	<u>0.00</u>
8. SUBTOTAL CASH PAYMENTS Add Lines 6 + 7	\$ <u>103,898.58</u>	\$ <u>166,500.00</u>
9. Accrued Expenses (Unpaid Bills) Schedule F, Line 3	<u>-35,386.17</u>	<u>0.00</u>
10. Nonmonetary Adjustment Schedule C, Line 3	<u>751.57</u>	<u>751.57</u>
11. TOTAL EXPENDITURES MADE Add Lines 8 + 9 + 10	\$ <u>69,263.98</u>	\$ <u>167,251.57</u>

Expenditure Limit Summary for State Candidates

22. Cumulative Expenditures Made* (If Subject to Voluntary Expenditure Limit)	
Date of Election (mm/dd/yy)	Total to Date
____/____/____	\$ _____
____/____/____	\$ _____

Current Cash Statement

12. Beginning Cash Balance Previous Summary Page, Line 16	\$ <u>19,398.58</u>
13. Cash Receipts Column A, Line 3 above	<u>84,500.00</u>
14. Miscellaneous Increases to Cash Schedule I, Line 4	<u>0.00</u>
15. Cash Payments Column A, Line 8 above	<u>103,898.58</u>
16. ENDING CASH BALANCE Add Lines 12 + 13 + 14, then subtract Line 15	\$ <u>0.00</u>

If this is a termination statement, Line 16 must be zero.

17. LOAN GUARANTEES RECEIVED Schedule B, Part 2	\$ <u>0.00</u>
---	----------------

Cash Equivalents and Outstanding Debts

18. Cash Equivalents See instructions on reverse	\$ <u>0.00</u>
19. Outstanding Debts Add Line 2 + Line 9 in Column B above	\$ <u>0.00</u>

To calculate Column B, add amounts in Column A to the corresponding amounts from Column B of your last report. Some amounts in Column A may be negative figures that should be subtracted from previous period amounts. If this is the first report being filed for this calendar year, only carry over the amounts from Lines 2, 7, and 9 (if any).

*Amounts in this section may be different from amounts reported in Column B.

FPPC Form 460 (January/0:
FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Schedule A Monetary Contributions Received

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/19/2014
through 12/31/2014

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER

1372065

DATE RECEIVED	FULL NAME, STREET ADDRESS AND ZIP CODE OF CONTRIBUTOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CONTRIBUTOR CODE *	IF AN INDIVIDUAL, ENTER OCCUPATION AND EMPLOYER (IF SELF-EMPLOYED, ENTER NAME OF BUSINESS)	AMOUNT RECEIVED THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/24/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		20,000.00	176,627.33	
10/27/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		13,000.00	176,627.33	
10/31/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		20,000.00	176,627.33	
11/06/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		31,500.00	176,627.33	
		<input type="checkbox"/> IND <input type="checkbox"/> COM <input type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC				
SUBTOTAL \$				84,500.00		

Schedule A Summary

- Amount received this period – itemized monetary contributions.
(Include all Schedule A subtotals.) \$ 84,500.00
- Amount received this period – unitemized monetary contributions of less than \$100 \$ 0.00
- Total monetary contributions received this period.
(Add Lines 1 and 2. Enter here and on the Summary Page, Column A, Line 1.) **TOTAL \$** 84,500.00

*Contributor Codes
 IND – Individual
 COM – Recipient Committee
 (other than PTY or SCC)
 OTH – Other (e.g., business entity)
 PTY – Political Party
 SCC – Small Contributor Committee

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule C
Nonmonetary Contributions Received**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period		CALIFORNIA FORM 460
from	10/19/2014	
through	12/31/2014	Page 5 of 32

SEE INSTRUCTIONS ON REVERSE
NAME OF FILER

I.D. NUMBER
1372065

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

DATE RECEIVED	FULL NAME, STREET ADDRESS AND ZIP CODE OF CONTRIBUTOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CONTRIBUTOR CODE *	IF AN INDIVIDUAL, ENTER OCCUPATION AND EMPLOYER (IF SELF-EMPLOYED, ENTER NAME OF BUSINESS)	DESCRIPTION OF GOODS OR SERVICES	AMOUNT/ FAIR MARKET VALUE	CUMULATIVE TO DATE CALENDAR YEAR (JAN 1 - DEC 31)	PER ELECTION TO DATE (IF REQUIRED)
11/04/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		ELECTION NIGHT EVENT	751.57	176,627.33	
12/03/2014	HIGHLAND FAIRVIEW OPERATING CO. 14225 CORPORATE WAY Moreno Valley, CA 92553	<input type="checkbox"/> IND <input type="checkbox"/> COM <input checked="" type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC		PAYMENT OF PAC ADMINISTRATIVE SERVICES BY SPONSOR	9,375.76 Memo	176,627.33	
		<input type="checkbox"/> IND <input type="checkbox"/> COM <input type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC					
		<input type="checkbox"/> IND <input type="checkbox"/> COM <input type="checkbox"/> OTH <input type="checkbox"/> PTY <input type="checkbox"/> SCC					

Attach additional information on appropriately labeled continuation sheets.

SUBTOTAL \$ 751.57

Schedule C Summary

- Amount received this period – itemized nonmonetary contributions.
(Include all Schedule C subtotals.) \$ 751.57
- Amount received this period – unitemized nonmonetary contributions of less than \$100 \$ 0.00
- Total nonmonetary contributions received this period.
(Add Lines 1 and 2. Enter here and on the Summary Page, Column A, Lines 4 and 10.) **TOTAL \$** 751.57

*Contributor Codes
IND – Individual
COM – Recipient Committee
(other than PTY or SCC)
OTH – Other (e.g., business entity)
PTY – Political Party
SCC – Small Contributor Committee

**Schedule D
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period		CALIFORNIA FORM 460
from	10/19/2014	
through	12/31/2014	Page <u>6</u> of <u>32</u>

SCHEDULE D-

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN 1 - DEC 31)	PER ELECTION TO DATE (IF REQUIRED)
10/23/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,084.55	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/23/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/23/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	852.00	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
SUBTOTAL \$				4,189.61		

Schedule D Summary

- Contributions and independent expenditures made this period of \$100 or more. (Include all Schedule D subtotals.) \$ 88,227.24
- Unitemized contributions and independent expenditures made this period of under \$100 \$ 0.00
- Total contributions and independent expenditures made this period. (Add Lines 1 and 2. Do not enter on the Summary Page.) **TOTAL \$** 88,227.24

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT)

Statement covers period		CALIFORNIA FORM 460
from	10/19/2014	
through	12/31/2014	Page <u>7</u> of <u>32</u>

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/25/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	25,000.00	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	420.00	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
SUBTOTAL \$				29,926.12		

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT)

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460 Page <u>8</u> of <u>32</u>
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NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC 31)	PER ELECTION TO DATE (IF REQUIRED)
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	345.00	153,301.77	
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,030.05	153,301.77	
10/28/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,030.05	153,301.77	
10/29/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	2,253.06	153,301.77	

SUBTOTAL \$ 4,658.16

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT)

Statement covers period		CALIFORNIA FORM 460
from <u>10/19/2014</u>		
through <u>12/31/2014</u>		Page <u>9</u> of <u>32</u>

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
10/29/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	SIGNS	190.00	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/29/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	1,030.05	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/29/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	SIGNS	4,905.00	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
10/29/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	MAILER	130.50	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					

SUBTOTAL \$ 6,255.55

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT)

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460 Page <u>10</u> of <u>32</u>
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NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
11/01/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	DOORHANGERS	109.50	153,301.77	
11/01/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	DOORHANGERS	1,155.40	153,301.77	
11/01/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	20,000.00	153,301.77	
11/03/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4 <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	CANVASSING	21,257.00	153,301.77	

SUBTOTAL \$ 42,521.90

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule D
(Continuation Sheet)
Summary of Expenditures
Supporting/Opposing Other
Candidates, Measures and Committees**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE D (CONT)

Statement covers period	CALIFORNIA FORM 460
from <u>10/19/2014</u>	
through <u>12/31/2014</u>	Page <u>11</u> of <u>32</u>

NAME OF FILER
RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

DATE	NAME OF CANDIDATE, OFFICE, AND DISTRICT, OR MEASURE NUMBER OR LETTER AND JURISDICTION, OR COMMITTEE	TYPE OF PAYMENT	DESCRIPTION (IF REQUIRED)	AMOUNT THIS PERIOD	CUMULATIVE TO DATE CALENDAR YEAR (JAN. 1 - DEC. 31)	PER ELECTION TO DATE (IF REQUIRED)
11/04/2014	YXSTIAN GUTIERREZ City Council Member CITY OF MORENO VALLEY District: 4	<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input checked="" type="checkbox"/> Independent Expenditure	PHONE BANK	675.90	153,301.77	
	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose					
		<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input type="checkbox"/> Independent Expenditure				
	<input type="checkbox"/> Support <input type="checkbox"/> Oppose					
		<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input type="checkbox"/> Independent Expenditure				
	<input type="checkbox"/> Support <input type="checkbox"/> Oppose					
		<input type="checkbox"/> Monetary Contribution <input type="checkbox"/> Nonmonetary Contribution <input type="checkbox"/> Independent Expenditure				
	<input type="checkbox"/> Support <input type="checkbox"/> Oppose					

SUBTOTAL \$ 675.90

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule E
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/19/2014
through 12/31/2014

Page 12 of 32

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/spons |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,084.
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.
BRIAN FLOYD & ASSOCIATES 721 CORDOVA STREET #6 Pasadena, CA 91101	CNS			2,500.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 5,837.

Schedule E Summary

- | | |
|--|----------------------------|
| 1. Itemized payments made this period. (Include all Schedule E subtotals.) | \$ 103,898.58 |
| 2. Unitemized payments made this period of under \$100 | \$ 0.00 |
| 3. Total interest paid this period on loans. (Enter amount from Schedule B, Part 1, Column (e).) | \$ 0.00 |
| 4. Total payments made this period. (Add Lines 1, 2, and 3. Enter here and on the Summary Page, Column A, Line 6.) | TOTAL \$ 103,898.58 |

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460
	Page <u>13</u> of <u>32</u>

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.	I.D. NUMBER 1372065
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CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/spons
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPOERTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	918.
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	852.
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND		CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	25,000.
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,084.
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 30,107.

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460
	Page <u>14</u> of <u>32</u>

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/spons
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	2,253.
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	130.
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	420.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 7,309.

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE 1.A.e

Statement covers period from 10/19/2014 through 12/31/2014	CALIFORNIA FORM 460
	Page 15 of 32

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/sponsor
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	345.
R.T. BURNS INC. 8456 HUNT VALLEY DRIVE Vienna, VA 22182	IND		PHONE BANK SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	2,100.
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND		CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	20,000.
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		SIGNS SUPPORTING YXSTIAN GUTTIEREZ, MORENO VALLEY CITY COUNCIL	190.
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTTIERREZ, MORENO VALLEY CITY COUNCIL	1,030.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 23,665.

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

SCHEDULE 1.A.e

Statement covers period
from 10/19/2014
through 12/31/2014

CALIFORNIA FORM 460
Page 16 of 32

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,030.00
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,030.00
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		DOORHANGERS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,155.00
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND		DESIGN OF DOORHANGERS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	109.00
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND		SIGNS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	4,905.00

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 8,230.00

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460
	Page <u>17</u> of <u>32</u>

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/spons
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
R.T. BURNS INC. 8456 HUNT VALLEY DRIVE Vienna, VA 22182		PHONE BANK	675.
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND	CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	21,257.
HF PROPERTIES 14225 CORPORATE WAY Moreno Valley, CA 92553	IND	VOTER LISTS FOR CANVASSING AND MAILERS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	692.
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND	MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,084.
NIELSEN MERKSAMER PARRINELLO GROSS & LEONI LLP TRUST ACCOUNT 1415 L STREET, SUITE 1200 Sacramento, CA 95814		REIMBURSEMENT FROM STAR MAILING SERVICE INC. FOR POSTAGE REFUND	-969.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 22,740.

**Schedule E
(Continuation Sheet)
Payments Made**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/19/2014
through 12/31/2014

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/spons
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF PAYEE (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204		REFUND		-926.
NIELSEN MERKSAMER PARINELLO GROSS & LEONI LLP 1415 L STREET, SUITE 1200 Sacramento, CA 95814	PRO			6,934.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTAL \$ 6,008.

Schedule F Accrued Expenses (Unpaid Bills)

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period
from 10/19/2014
through 12/31/2014

CALIFORNIA
FORM **460**
Page 19 of 32

1.A.e

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

CMP campaign paraphernalia/misc.	MBR member communications	RAD radio airtime and production costs
CNS campaign consultants	MTG meetings and appearances	RFD returned contributions
CTB contribution (explain nonmonetary)*	OFC office expenses	SAL campaign workers' salaries
CVC civic donations	PET petition circulating	TEL t.v. or cable airtime and production costs
FIL candidate filing/ballot fees	PHO phone banks	TRC candidate travel, lodging, and meals
FND fundraising events	POL polling and survey research	TRS staff/spouse travel, lodging, and meals
IND independent expenditure supporting/opposing others (explain)*	POS postage, delivery and messenger services	TSF transfer between committees of the same candidate/sponsor
LEG legal defense	PRO professional services (legal, accounting)	VOT voter registration
LIT campaign literature and mailings	PRT print ads	WEB information technology costs (internet, e-mail)

NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
TORRES CONSULTING 9339 GUATEMALA AVENUE Downey, CA 90240	IND CANVASSING SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	25,000.00	0.00	25,000.00	0.
R.T. BURNS INC. 8456 HUNT VALLEY DRIVE Vienna, VA 22182	IND PHONE BANK SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	2,100.30	0.00	2,100.30	0.
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,084.55	0.00	1,084.55	0.

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

SUBTOTALS \$ 28,184.85\$ 0.00\$ 28,184.85\$ 0.

Schedule F Summary

- Total accrued expenses incurred this period. (Include all Schedule F, Column (b) subtotals for accrued expenses of \$100 or more, plus total unitemized accrued expenses under \$100.) **INCURRED TOTALS \$** 0.00
- Total accrued expenses paid this period. (Include all Schedule F, Column (c) subtotals for payments on accrued expenses of \$100 or more, plus total unitemized payments on accrued expenses under \$100.) **PAID TOTALS \$** 35,386.17
- Net change this period. (**Subtract** Line 2 from Line 1. Enter the difference here and on the Summary Page, Column A, Line 9.) **NET \$** -35,386.17
May be a negative number

FPPC Form 460 (January/05)
FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Packet Pg. 571

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**Schedule F
(Continuation Sheet)
Accrued Expenses (Unpaid Bills)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460 Page <u>20</u> of <u>32</u>
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NAME OF FILER RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.	I.D. NUMBER 1372065
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CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.06	0.00	2,253.06	0.
HF PROPERTIES 14225 CORPORATE WAY Moreno Valley, CA 92553	IND VOTER LISTS FOR CANVASSING AND MAILERS SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	692.65	0.00	692.65	0.
STAR MAILING INC. 3050 ROSSLYN ST. Los Angeles, CA 90065-1408	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL; SEE SCHEDULE G	2,253.06	0.00	2,253.06	0.
MOBLEY MARKETING GROUP 5100 VICTORIA HILL DRIVE Riverside, CA 92506	IND DESIGN OF MAILER SUPPOERTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	918.00	0.00	918.00	0.
SUBTOTALS \$		6,116.77\$	0.00\$	6,116.77 \$	0.

**Schedule F
(Continuation Sheet)
Accrued Expenses (Unpaid Bills)**

Type or print in ink.
Amounts may be rounded
to whole dollars.

Statement covers period from <u>10/19/2014</u> through <u>12/31/2014</u>	CALIFORNIA FORM 460
	Page <u>21</u> of <u>32</u>

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
1372065

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR DESCRIPTION OF PAYMENT	(a) OUTSTANDING BALANCE BEGINNING OF THIS PERIOD	(b) AMOUNT INCURRED THIS PERIOD	(c) AMOUNT PAID THIS PERIOD (ALSO REPORT ON E)	(d) OUTSTANDING BALANCE AT CLOSE OF THIS PERIOD
ALCO PRINTING, INC. 3649 SAN FERNANDO ROAD Glendale, CA 91204	IND MAILER SUPPORTING YXSTIAN GUTIERREZ, MORENO VALLEY CITY COUNCIL	1,084.55	0.00	1,084.55	0.
SUBTOTALS \$		1,084.55 \$	0.00 \$	1,084.55 \$	0.

Schedule G
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

Statement covers period
 from 10/19/2014
 through 12/31/2014

CALIFORNIA
 FORM **460**

Page 22 of 32

I.D. NUMBER
 1372065

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
 MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

NAME OF AGENT OR INDEPENDENT CONTRACTOR

STAR MAILING INC.

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|--|
| OMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponsor |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
US POSTMASTER MORENO VALLEY, CA	POS	.	1,618.00
US POSTMASTER MORENO VALLEY, CA	POS	.	1,618.00
US POSTMASTER MORENO VALLEY, CA	POS	.	1,618.00
US POSTMASTER MORENO VALLEY, CA	POS	.	1,618.00

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 6,472.00

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded to whole dollars.

Statement covers period
 from 10/19/2014
 through 12/31/2014

CALIFORNIA FORM **460**
 Page 23 of 32

1.A.e

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponso |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
DENISE CHAVEZ Riverside, CA 92509		CANVASSER	1,395.
PETRA CLARK Moreno Valley, CA 92553		CANVASSER	510.
EMMANUEL CORDENO Moreno Valley, CA 92553		CANVASSER	1,395.
VILMA ENDERICA Moreno Valley, CA 92553		CANVASSER	1,920.

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 5,220.

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

FPPC Form 460 (January/03)
 FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Packet Pg. 575

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded to whole dollars.

Statement covers period
 from 10/19/2014
 through 12/31/2014

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|---|---|--|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponso |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
TAMMARA FEATHERSTONE [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,260.
ELVIA FREGOSO [REDACTED] Moreno Valley, CA 92551			CANVASSER	1,710.
GLORIA GALLO [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,245.
LIZETH GARCIA [REDACTED] Moreno Valley, CA 92557			CANVASSER	1,860.

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 6,075.

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

SCHEDULE **1.A.e**

Statement covers period
 from 10/19/2014
 through 12/31/2014

CALIFORNIA FORM 460

Page 26 of 32

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
 MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

- | | | |
|--|--|---|
| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
| CNS campaign consultants | MTG meetings and appearances | RFD returned contributions |
| CTB contribution (explain nonmonetary)* | OFC office expenses | SAL campaign workers' salaries |
| CVC civic donations | PET petition circulating | TEL t.v. or cable airtime and production costs |
| FIL candidate filing/ballot fees | PHO phone banks | TRC candidate travel, lodging, and meals |
| FND fundraising events | POL polling and survey research | TRS staff/spouse travel, lodging, and meals |
| IND independent expenditure supporting/opposing others (explain)* | POS postage, delivery and messenger services | TSF transfer between committees of the same candidate/sponso |
| LEG legal defense | PRO professional services (legal, accounting) | VOT voter registration |
| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
VICTOR GARCIA [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,920.
NORMA GONZALEZ [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,920.
FRANCISCA GUZMAN [REDACTED] Riverside, CA 92508			CANVASSER	1,470.
LILIANA HERNANDEZ [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,065.

Attach additional information on appropriately labeled continuation sheets.

TOTAL * \$ 6,375.

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

FPPC Form 460 (January/05)
 FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Packet Pg. 578

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

Schedule G (Continuation Sheet)
Payments Made by an Agent or Independent Contractor (on Behalf of This Committee)

Type or print in ink.
 Amounts may be rounded
 to whole dollars.

Statement covers period
 from 10/19/2014
 through 12/31/2014

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

I.D. NUMBER
 1372065

NAME OF AGENT OR INDEPENDENT CONTRACTOR

TORRES CONSULTING

CODES: If one of the following codes accurately describes the payment, you may enter the code. Otherwise, describe the payment.

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| CMP campaign paraphernalia/misc. | MBR member communications | RAD radio airtime and production costs |
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| LIT campaign literature and mailings | PRT print ads | WEB information technology costs (internet, e-mail) |

* Payments that are contributions or independent expenditures must also be summarized on Schedule D.

NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
LUZ HERNANDEZ [REDACTED] Moreno Valley, CA 92557			CANVASSER	1,845.
ALEX MARTINEZ [REDACTED] Riverside, CA 92507			CANVASSER	1,260.
ORLANDO MARTINEZ [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,935.
BRYANT MORALES [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,110.

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 6,150.

* Do not transfer to any other schedule or to the Summary Page. This total may not equal the amount paid to the agent or independent contractor as reported on Schedule E.

Schedule G (Continuation Sheet)
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Statement covers period		SCHEDULE	1.A.e
from	10/19/2014	CALIFORNIA FORM	460
through	12/31/2014		
		Page	28 of 32

SEE INSTRUCTIONS ON REVERSE

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 RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
YVETTE MORENO [REDACTED] Moreno Valley, CA 92551			CANVASSER	780.
IRENE PAYAN [REDACTED] Los Angeles, CA 90065			CANVASSER	2,467.
EDUARDO PRIETO [REDACTED] Moreno Valley, CA 92553			CANVASSER	945.
JENNIFER PRIETO [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,560.

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 5,752.

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Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

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ENRIQUE PUENTE [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,920
ROSALBA PUENTE [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,830
ARACELI RAMIREZ [REDACTED] Moreno Valley, CA 92557			CANVASSER	2,475
ELIZABETH RAMIREZ [REDACTED] Moreno Valley, CA 92557			CANVASSER	3,770

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 9,995.

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Schedule G (Continuation Sheet)
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Statement covers period		SCHEDULE 1.A.e	
from	10/19/2014	CALIFORNIA FORM 460	
through	12/31/2014	Page	30 of 32
		I.D. NUMBER	1372065

SEE INSTRUCTIONS ON REVERSE

NAME OF FILER

RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014, MAJOR FUNDING BY HIGHLAND FAIRVIEW OPERATING CO.

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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
ILENE REYNOSO [REDACTED] Moreno Valley, CA 92557			CANVASSER	1,830
RUBI RIVERA [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,770
MITIGUEL RODRIGUEZ [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,860
MANUEL SANCHEZ [REDACTED] Moreno Valley, CA 92553			CANVASSER	675

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 6,135

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FPPC Form 460 (January/15)
 FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

Schedule G (Continuation Sheet)
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through	12/31/2014		
		Page	31 of 32
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RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I.D. NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
JESSE ANDREW SIDA [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,920
ROBERTO SIORDIA JR. [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,950
ZULMA TABIA CHACARA [REDACTED] Moreno Valley, CA 92553			CANVASSER	1,545
JULISSA WENCE [REDACTED] Moreno Valley, CA 92557			CANVASSER	1,845

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 7,260

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FPPC Form 460 (January/يناير)
 FPPC Toll-Free Helpline: 866/ASK-FPPC (866/275-3772)

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SCHEDULE **1.A.e**

CALIFORNIA FORM 460

Statement covers period
from 10/19/2014
through 12/31/2014

Page 32 of 32

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RESIDENTS FOR A BETTER MORENO VALLEY, MORE JOBS & LESS TAXES, SUPPORTING GUTIERREZ FOR CITY COUNCIL DISTRICT 4 IN 2014,
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NAME AND ADDRESS OF PAYEE OR CREDITOR (IF COMMITTEE, ALSO ENTER I D NUMBER)	CODE	OR	DESCRIPTION OF PAYMENT	AMOUNT PAID
MARCO ZARATE [REDACTED] Moreno Valley, CA 92555			CANVASSER	1,980

Attach additional information on appropriately labeled continuation sheets.

TOTAL* \$ 1,980

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Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0001) A. Lopez-Ramirez (4074 : World

**CENTER FOR BIOLOGICAL DIVERSITY
 CENTER FOR COMMUNITY ACTION & ENVIRONMENTAL JUSTICE
 COALITION FOR CLEAN AIR
 SAN BERNARDINO VALLEY AUDUBON SOCIETY
 SIERRA CLUB**

May 26, 2020

Via Email

Honorable Mayor and Members of the City Council
 City of Moreno Valley
 14177 Frederick St.
 Moreno Valley, CA 92552
planningemail@moval.org

Re: Appeal of Planning Commission Approval of Tentative Parcel Map and Certification of Final Revised Environmental Impact Report for World Logistics Center Project (Case Nos. PEN18-0050 and PEN20-0017)

Dear Honorable Mayor and Members of the City Council:

On behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, we write to appeal two decisions of the City of Moreno Valley Planning Commission (“Planning Commission”) related to the World Logistics Center Project (“WLC” or “Project”): (1) Resolution No. 2020-20 and associated exhibits (certifying a Revised Final Environmental Impact Report and adopting a Mitigation Monitoring and Reporting Program and Statement of Overriding Considerations for the Project); and (2) Resolution No. 2020-21 and associated exhibits (approving Tentative Parcel Map 37457 and associated conditions of approval). These items went to the Planning Commission on the evening of Thursday, May 14, 2020, but were ultimately approved on May 15, 2020. The Planning Commission approved the two items despite significant public opposition and documented non-compliance with the requirements of the California Environmental Quality Act (“CEQA”).

This letter serves as the formal appeal of the Planning Commission’s approvals pursuant to Chapter 9.02, Chapter 9.14, and/or other applicable provisions of the Moreno Valley Municipal Code. For the reasons set forth below, the approvals fail to meet the requirements of CEQA and other applicable law. Specifically, the Revised Final Environmental Impact Report (“Revised FEIR”) does not comply with CEQA. As a result, the City cannot make the findings required for approval of a tentative parcel map pursuant to Chapter 9.14 of the municipal code. In addition, the above-referenced organizations and others have previously described the legal failings of the Planning Commission’s determinations in written and oral comments submitted prior to or at the

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

WLC Appeal
 May 26, 2020
 Page 2

Planning Commission's public hearing on the two approvals. In particular, Appellants specifically incorporate by reference the following letters filed in response to the 2019 Revised Final EIR:

- Letter from Ileene Anderson to Planning Commissioners (May 13, 2020) (Exhibit 1);
- Letter from Scott Wilson to Julia Descoteaux (May 13, 2020) (Exhibit 2);
- Letter from Heather Leslie and Richard Corey to Julia Descoteaux (May 14, 2020) (Exhibit 3);
- Letter from Adrian Martinez to Julia Descoteaux (May 14, 2020) (Exhibit 4);
- Letter from Tom Thornsley to Julia Descoteaux (May 14, 2020) (Exhibit 5);
- Karen Jakpor letter regarding particulates increasing COVID 19 infections with cited sources; and
- Lindsay Robinson letter raising concerns and conflicts of interest for PC members and new road improvements.

These comments and their attachments also set forth reasons for these appeals and are therefore incorporated by reference in their entirety. In addition, we seek to bring the following studies to the City Council's attention:

- Wu, Xiao, et al., Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study, Department of Biostatistics, Harvard (Exhibit 6); and
- Andrée, Pieter Johannes, Incidence of COVID-19 and connections with air pollution exposure, Policy Research Working Paper 9221, April 2020, World Bank Group (Exhibit 7).

These studies provide new evidence of the harms of COVID-19 to communities exposed to elevated levels of air pollution.

Accordingly, we respectfully request that the City Council reverse, reject and/or overrule the Planning Commission's approvals and remand both determinations back to the Planning Commission with directions to undertake a lawful environmental review.

I. BACKGROUND OF THE PROJECT

The immense proposed WLC would harm the region's environment. The Project would occupy 40.6 million square feet, dramatically changing the City and committing a significant portion of its total land area to warehouses, distribution centers, and associated facilities. The Project has a host of impacts ranging from degradation of biological resources to impairing air quality to localized impacts that will harm adjacent community members.

Moreover, the Project's impacts would reach far beyond the City. The Project could add more than 14,000 new diesel truck trips per day to freeways linking the City to seaports more than 80 miles away in Los Angeles and Long Beach. In all, the Project will generate thousands of daily vehicle trips, according to the final EIR's traffic analysis.

1. The Project Approval Process.

Highland Fairview filed its Project application with the City in April 2012. On February 26, 2012, the City issued a Notice of Preparation of an EIR. Subsequently, on February 5, 2013, the City released a draft EIR, which found numerous "significant" and "unavoidable" environmental impacts, for a 60-day public comment period. Over a hundred residents, environmental groups, and government agencies submitted comments. In May 2015, the City released the final EIR, containing substantial changes from the draft EIR.

On August 19, 2015, after the City's Planning Commission approved Highland Fairview's proposal, the City Council adopted *Resolution No. 2015-56* certifying the final EIR, adopting a statement of overriding considerations without employing the many feasible mitigation measures put forth by agency and other commenters, and approving a mitigation monitoring program. The City also issued other approvals in reliance on the EIR, including: (1) *Resolution No. 2015-57*, approving general plan amendments; (2) *Resolution No. 2015-58*, approving a tentative parcel map for financing purposes; (3) *Resolution No. 2015-59*, requesting that Riverside County Local Agency Formation Commission ("LAFCO") begin proceedings to allow the City to annex an 85-acre site within the Project area; and (4) *Resolution No. CSD 2015-29*, requiring the City's Community Services District to initiate LAFCO proceedings for the expansion of the District's boundaries to include the annexed 85-acre site. Subsequently, on August 25, 2015, the City Council passed *Ordinance No. 900*, adopting the WLC Specific Plan and other zoning modifications, and *Ordinance No. 901*, approving a development agreement between the City and Highland Fairview.

The City filed a Notice of Determination on August 26, 2015, summarizing the approvals and environmental review. Subsequently, in September 2015, community, labor, environmental, and governmental entities filed seven lawsuits challenging the City's failure to comply with CEQA. To date, the City and Highland Fairview have settled three of the lawsuits, and one case has been dismissed.

On June 7, 2018, the San Bernardino Superior Court entered judgement in favor of the groups challenging the original CEQA document based on an opinion entered on February 8, 2018. On June 14, 2018, the Superior Court issued a Peremptory Writ of Mandate. An appeal and a cross appeal have been filed in this case, but no final determination of the issues have been made.

A. Highland Fairview’s Ballot Initiatives and Related Litigation.

In response to the many CEQA lawsuits, Highland Fairview subsidized an effort to secure enough petition signatures to qualify three initiative measures for the ballot. (*Center for Community Action & Environmental Justice v. City of Moreno Valley* (2018) 26 Cal.App.5th 689, 694-97 (hereafter *Center for Community Action & Environmental Justice*.) By repealing and reapproving some of the City’s August 25, 2015, approvals through the initiative process, the measures were intended to reapprove the Project without any CEQA review. (See *Tuolumne Jobs & Small Business Alliance v. Superior Court* (2014) 59 Cal.4th 1029, 1036-39 [CEQA review not required prior to legislative body’s decision to adopt initiative measure or submit it to voters].)

First, the Land Use Initiative (also known as the “Moreno Valley Jobs Initiative”) repealed the Project’s land use entitlements, Ordinance 900, and Resolutions 2015-57 and 2015-59. It then re-amended the general plan and zoning map, re-repealed the Moreno Highlands Specific Plan, and re-adopted the WLC Specific Plan, and included the mitigation-monitoring program as “conditions of development.” Second, the Development Agreement Initiative (also called the “Moreno Valley Workforce Training Initiative”) repealed the Project’s development agreement, and then adopted a “new” development agreement substantially similar to the original agreement adopted by Ordinance 901. And third, the WLC Land Benefit Initiative repealed Resolution No. CSD 2015-29, which called for the expansion of the Community Service District boundary to accommodate the Project.

On November 16, 2015, the City Clerk determined that each measure had sufficient signatures. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 696.) On November 24, 2015, the City Council voted to adopt the three initiatives outright instead of allowing a vote by the electorate. (*Ibid.*; Elec. Code, § 9215.)

2. Land Use and Development Agreement Initiative Litigation.

In response, several petitioners in the pending CEQA actions filed lawsuits challenging the validity of the Land Use and Development Agreement initiatives. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 694-96.) In September 2016, the Superior Court entered judgment in favor of the City and Highland Fairview. Appellants Center for Community Action and Environmental Justice and other organizations appealed the Superior Court’s decision on the Development Agreement Initiative on the ground that a development agreement cannot be adopted by initiative.

On August 23, 2018, the Court of Appeals ruled in favor of Appellants in a published opinion. The City and the developer filed a petition for review with the Supreme Court, which denied review. (*Center for Community Action & Environmental Justice v. City of Moreno Valley*, review den. Nov. 28, 2018, S251674.) The Development Agreement Initiative provided that in the event of a successful legal

challenge, the original Ordinance No. 901 approving a development agreement between the City and Highland Fairview would be reinstated.

The initiatives did not repeal Resolution No. 2015-56, which among other approvals certified the final EIR. Nor did the initiatives repeal Resolution No. 2015-58, which approved a tentative parcel map for financing purposes. These approvals, along with the revived Ordinance No. 901, remain subject to CEQA notwithstanding the initiative measures.

3. The Subsequent EIRs.

In July of 2018, the City released a revised final EIR for the Project. In December of 2019, the City released a new revised final EIR for the Project. On May 14, 2020, the Planning Commission decided several items related to this project, including certification of the Revised Final EIR. The Planning Commission made a decision on the Revised FEIR on May 15, 2020.

The following points outline the major deficiencies regarding the Board's environmental determination:

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project's Significant Climate Impacts.

The City's review of this Project's climate and greenhouse gas ("GHG") emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a revised final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA's requirements.

a. Legal Standards

The City's determinations regarding the significance of greenhouse gas ("GHG") emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency's use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the Revised FEIR continues

to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the Revised FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO₂e”) per year, the same quantitative evidentiary standard controls.

CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (See Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

regulatory requirements. (See CARB, *California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring and measurement requirements that can be ... enforced by ARB.” (*Id.*, p. 4.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 7-8.)

b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (Revised FEIR 1a at 755-56.) As a threshold matter, the difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet, MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency” and surplus or “additional.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency or documentation whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.

The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.

First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (Revised FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”].) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review whatsoever of whether those credits or the protocols they were generated under satisfy the measure’s stated criteria, and without any ability even to question whether the credit is adequate.

Second, CARB “approval” of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is “approved by CARB” does not establish that voluntary market carbon credits sold by that

³ Notably, despite MM 4.7.7.1’s suggestion to the contrary, the “GHG RX” registry has *not* been approved by CARB to list Cap-and-Trade compliance offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The “GHG Rx” program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)

registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB’s procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1’s reference to “approved” registries reflects a misinterpretation of CARB’s regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure’s reliance on CARB “approval” is legally erroneous. As a result, a registry’s “CARB-approved” status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure’s purported criteria, or the significance of the Project’s impacts after mitigation.

Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB’s regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB’s compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism (“CDM”) methodologies.⁴ Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting “any methodology developed under the [CDM] ... for projects and programs registering with VCS).

ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project's GHG emissions (whether those measures are denominated "offsets" or "carbon credits"), it must meet CEQA's requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards "the mitigation *will* achieve." (CEQA Guidelines § 15126.4(a)(1)(B).) The measure's list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries' processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by "presuming" otherwise. Nor is there any evidence the City's Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, "[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place." *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (Revised FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA's prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on "forecasted" emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA's requirement that mitigation be in place before impacts occur.

iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third party who may list offset credits for sale. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between a carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased....” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (Revised FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the Revised FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the Revised FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to

meet its long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

vi. The Revised FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The Revised FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The Revised FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the Revised FEIR of any evidentiary support.

c. The Revised FEIR Must Be Recirculated for Full Public Review and Comment.

The Revised FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The Revised FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the Revised FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the Revised FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

Recirculation is required here for at least two reasons. First, the Revised FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the Revised FEIR only a few days before the Planning Commission hearing, the City has thwarted

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the Revised FEIR's new analysis reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised Sections of the Final Environmental Impact Report measured only "Total Uncapped" Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though "Total Capped" emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The Revised FEIR, in contrast, at least conditionally considers all Project emissions—both "capped" and "uncapped"—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The Revised FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after, avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The Revised FEIR must be recirculated.

III. The Revised FEIR's Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques of the GHG analysis reflected in prior comments. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project.

Importantly, CARB, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the "[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground."⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:

Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): "Project-related greenhouse gas emissions resulting from

⁶ Letter from CARB to Moreno Valley, September 7, 2018, available at https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

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sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

Response 44.37

The Agency declines to make any changes in response to this comment. The decision in *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (“*AIR v. Kern*”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated by referencing CARB’s letter on the WLC.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at*

http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

⁸ *Id.*

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, both CARB (the agency responsible for implementation of AB 32 and the Cap-and-Trade Program) and the Natural Resources Agency (the agency responsible for drafting the CEQA Guidelines the Revised FEIR relies upon for authority) agree that the City cannot rely on Cap-and-Trade to dismiss the significance of all transportation and energy emissions.

Instead of recognizing that both CARB and the Natural Resources Agency disagree with its approach, the Revised FEIR continues to rely on outdated decisions in other projects by the South Coast AQMD and the San Joaquin Valley APCD--two agencies that have no jurisdiction over the GHG emissions from this Project and deserve no deference on this issue.

But, even if these agencies' positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised FEIR includes new attachments A and B, which are the specific South Coast AQMD documents the Revised FEIR claims support the use of Cap-and-Trade to discount energy emissions under CEQA. Initially, neither document allows transportation emissions – the vast majority of GHG emissions associated with the WLC – to be discarded from a significance determination.

Moreover, both of these documents are from 2014. Since that time, the South Coast AQMD has produced several other CEQA documents. In fact, in the most recent document from 2020, the agency does not appear to contend that energy-related and transportation emissions are insignificant for CEQA purposes because they are purportedly “covered” under the Cap-and-Trade program. *See* South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>.

In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. Analysis of Important Mitigation Measures has been Curtailed by the Revised FEIR's Failure to Analyze Impacts

Mitigation of a project's significant impacts is one of the “most important” functions of CEQA. *See Sierra Club v. Gilroy City Council*, 222 Cal.App.3d 30, 41 (1990). If the EIR is the heart of CEQA, then mitigation is its teeth. *See Env'tl. Council of*

⁹ *Id.*

Sacramento v. City of Sacramento, 142 Cal.App.4th 108 at 1039. Under CEQA, feasible mitigation measures must be adopted that will avoid or substantially lessen significant environmental effects. Pub. Res. Code § 21002. CEQA is clear that “[m]itigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding agreements.” CEQA Guidelines § 15126.5(a)(2).

The Revised Final EIR fails to meaningfully analyze requirements that would mitigate the harmful greenhouse gas and air quality impacts from this project, including requirements for use of trucks cleaner than the current commitment of trucks meeting 2010 emission standards – a standard that would allow trucks 10 years or older to enter the project in perpetuity. Several zero-emissions models are either available and/or will be increasingly available as this project is built. Moreover, CARB will adopt a vehicle sales standard in June to require manufacturers to produce zero-emission trucks in California across a range of truck classes. The Revised FEIR fails to provide sufficient evidence refuting requirements for use of zero-emission trucks is feasible.

The Revised Final EIR similarly fails to adequately consider mitigation measures requiring zero-emissions forklifts and yard dogs (e.g. yard hostlers). There are many zero-emissions models, and the Revised Final EIR should require the use of this technology for all onsite vehicles that fall into these categories.

In addition, the project fails to commit to feasible technologies to reduce the impacts of the buildings, including increased solar to cover more than just the office energy of the buildings and all-electric buildings to prevent the need for combustion for appliances. These and other technologies identified by several commenters are feasible and should be implemented to mitigate the significant Nitrogen Oxide and other criteria pollutant emissions, in addition to the significant GHG emissions.

Because the WLC project fails to include all feasible mitigation, the document should be recirculated.

V. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Biological Impacts.

The Revised FEIR’s biological resources sections include glaring gaps and inconsistent language in contravention of the CEQA’s requirements. For example, section 15130 of the CEQA Guidelines require an EIR to analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. A cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts. CEQA Guidelines § 15355. And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, supra, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho*

Cordova (2007) 40 Cal. 4th 412, 428.) Here the Revised FEIR failed to provide a cumulative analysis of the Project's impact on biological resources. Nearby projects, including the Village of Lakeview housing development that will also impact the southern portion of the San Jacinto Wildlife Area are not included in the Revised FEIR's analysis, in violation of CEQA. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721. (Absent meaningful cumulative analysis there would be no control of development and "piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment").)

The Revised FEIR also claims, without providing substantial evidence, "250-foot development setback is adequate for a project-SJWA buffer separation and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity." (RFEIR at pg. 4.4-97, emphasis original.) However, as numerous commenters raised, negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems. These negative edge effects were not fully analyzed nor mitigated in the Revised FEIR.

Additionally, while truck and vehicle traffic will increase on Gilman Springs Road and all roads adjacent to the San Jacinto Wildlife Area for both construction and operation, the Revised FEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife "roadkill". The Revised FEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states "these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road" (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the Revised FEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, "the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project's impact on the environment, the agency's approval of the proposed project followed meaningful consideration of alternatives and mitigation measures." (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA's and the County's responsibility to analyze, avoid, minimize and mitigate the impacts from this project; it is the developer's responsibility as the applicant, and the City's responsibility as the lead agency.

Because the biological impacts section is faulty, the document should be recirculated.

VI. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project's Significant Noise Impacts.

The Revised Final EIR has significantly weakened mitigation measures designed to protect the public from noise pollution. When the original final EIR was approved it used the "**Noise Assessment for the WLCSP**" to establish mitigation measures that would be necessary to limit construction impacts to those residents in the surrounding homes. It noted that work within the project area may be done on a 24 hour, 7 days per week schedule, which goes beyond the Moreno Valley Municipal Code's (MVMC Section 8.14.040 Miscellaneous standards and regulations) listed hours of 7 a.m. to 7 p.m. The Noise Assessment defined construction limits so as to limit noise impacts on the surrounding residences outside the standard construction hours and clearly outlined the high level of noise that could be expected both during daytime and nighttime hours beyond the allowed decibel levels defined by the MVMC. Thus the study included "**Mitigation Measure N-2. No Nighttime Grading Within 2,800 Feet of Residences South of the Freeway.**" It goes on to allow closer nighttime construction at 1,580 feet after the installation of an appropriate sound barrier.

The new "**Noise and Vibration Technical Report Assessment**" proposed a substantially different evaluation and lesser mitigation for the noise impacts. It states that "No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends, and a 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity."

The mitigation requirement for a sound barrier is similar to the original MM, but the active setback is now moved forward by 2,000 feet, three and a half times closer. Additionally, the MM includes options that would eliminate the need to install the on-site sound barrier if a vote by those affected fails to garner 50% favorable votes or 100% favorable votes for a sound barrier placed on private property.¹⁰ These two provisions were never a consideration in the original noise analysis nor do they seem to be fair to the community due to the speculative nature of whether a sound barrier will be used or not. In addition, the developer's ownership of properties in those locations subject to the noise impacts are entitled to a vote on sound barrier installations. Those property holdings collectively could prevent any opportunity for a favorable vote to occur. While the clause in MM **4.12.6.2A** may be a greater benefit to the developer than to the surrounding

¹⁰ Allowing a vote on whether or not sound barriers will be installed also raises serious constitutional questions concerning the City's ability to delegate its basic land use authority to private property owners. (See, e.g., *Vaquero Energy, Inc. v. County of Kern* (2019) 42 Cal.App.5th 312, 328-334 [discussing federal and state case law].)

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residents, it poses a vague and unclear mitigation measures and makes it impossible to assess the efficacy at blocking noise impacts.

The EIRs for this Project have included multiple noise studies, including the following:

“**Noise Assessment for the WLCSP**” (Mestre Greve Associates) original dated January 2013, revised September 2014. (This document is still referenced in the 12-2019 Draft Recirculated Revised Sections of the Final Environmental Impact Report); and

“**Noise and Vibration Technical Report Assessment** (ESA)”, July 2018 which was not in the original 2014 DEIR for WLC.

Both studies have been cited for noise impacts, but the Revised FEIR has taken away significant mitigation measures designed to protect residents from noise pollution. The May 14, 2020 letter from Tom Thornsley attached as Exhibit 5 provides several examples of mitigation measures either being vague and speculative and/or less effective than prior mitigation measures. This failure to articulate and mitigate the noise impacts from the WLC project violates CEQA. This violation of CEQA means the noise analysis needs to be improved to provide effective and feasible mitigation.

VII. The Failure to Provide Spanish Translation of the Environmental Impact Report and Oral Comments at the Hearing Violates State Law.

The Final EIR should have been translated into Spanish for better review by the public. Moreover, there was at least once instance where a speaker at the Planning Commission spoke Spanish during oral testimony, and there was no translation provided to the Planning Commissioners. This failure to provide translation undermined the informational purposes of CEQA and otherwise fell short of the requirements of state law.

VIII. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Agricultural Impacts.

The Revised Final EIR fails to adequately address and mitigate the agricultural impacts related to this Project. In particular, the Revised FEIR continues to fail to acknowledge the significant agricultural impacts. In fact, the Revised FEIR improperly defers mitigation of agricultural impacts until future plans are produced related to the development of Parcels 10 and 12. This deferral of mitigation for agricultural impacts is not permitted under CEQA.

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IX. The Final EIR for this Project Makes it Impossible for the Public and Decision-Makers to Be Adequately Informed.

The current EIR for the project is a complex web with two revised versions of the EIR having been completed since the Superior Court struck down the entire EIR. Overall, the document was amended in significant ways up to two weeks before the Planning Commission meeting. The many versions of the document and reliance on information from an invalidated EIR from 2014, in addition to the two subsequent versions, have rendered the EIR's overall analysis incomprehensible. The public and decision-makers have not been provided with sufficient information to participate meaningfully in the process or proceed with rational decision-making.

X. Conclusion

The above referenced organizations have attached several of the relevant letters and attachments filed related to this appeal. We respectfully request that this information be incorporated into the record for this appeal.

For the reasons stated in the incorporated prior comments and in this letter, (1) the Revised FEIR fails to comply with CEQA, and (2) the City cannot make the required findings to approve the tentative parcel map and other actions reliant upon the Revised Final EIR. Accordingly, the Planning Commission's decisions on its approvals must be reversed, rejected and/or overruled.

Thank you for your consideration of this appeal.

Sincerely,



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Counsel for Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)



Protecting and restoring natural ecosystems and imperiled species through science, education, policy, and environmental law

submitted via email

May 13, 2020

Planning Commissioners
City of Moreno Valley
City Hall Council Chamber
14177 Frederick Street
Moreno Valley, CA 92553
ashleya@moval.org

RE: Deny Public Hearing Item #2 - Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, Revised Final Environmental Impact Report, a Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary.

Dear Planning Commissioners,

These comments are submitted on behalf of the Center for Biological Diversity’s (the “Center”) members, staff and supporters, regarding the Revised Final Environmental Impact Report (“RFEIR”) for the World Logistics Center. The Center has reviewed the RFEIR and provides comments on primarily the biological issues. At this point, we urge the Planning Commission to reject the project and instead require the issues we raise below be addressed in a renewed CEQA process. The Center has closely monitored this project for many years and remains concerned about the RFEIR inadequate analysis and mitigation of the project’s impacts to sensitive species and habitats. The current RFEIR fails to adequately preserve southern California’s, and specifically western Riverside County’s incredible biodiversity. Troublingly, extensive conservation investments by State, County and local agencies remain imperiled by inconsistent language and inadequate impact analysis in the current RFEIR.

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 1.7 million members and online activists throughout California and the United States. The Center has worked for many years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life for people in western Riverside County.

I. The RFEIR Fails to Provide a Cumulative Impacts Analysis

The RFEIR simply fails to provide a cumulative impact analysis to biological resources (at page 4.4-118 to 119). While Table 1.1-1: World Logistics Center Project Environmental Impact Summary provides a section on Cumulative Biological Impacts (at pg. 1-26) it does not

actually provide an analysis, but instead references proposed project mitigation measures. In accordance with CEQA (CEQA Guidelines Section 15130 *et seq.*) an EIR must analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. According to CEQA, a cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts (CEQA Guidelines Section 15355). And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, supra, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 428 [hereinafter *Vineyard*].)

Therefore, to comply with CEQA, a cumulative scenario needs to be developed that identifies and evaluates past, present, and reasonably foreseeable future projects within the cumulative study area that would be constructed or commence operation during the timeframe of activity associated with the proposed project. For example, but not limited to, the Villages of Lakeview housing development will also impact the southern portion of the San Jacinto Wildlife Area (“SJWA”). The lack of a cumulative impact analysis to biological resources violates CEQA. The purpose of analyzing cumulative environmental impacts is to assess adverse environmental change “as a whole greater than the sum of its parts.” (*Environmental Protection Information Center v. Johnson* (1985) 170 Cal.App.3d 604, 625.) Absent meaningful cumulative analysis there would be no control of development and “piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment.” (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721.)

II. The RFEIR Fails to Provide an Adequate Development Setback for the SJWA

The RFEIR still proposes only a 250-foot wide development setback from the southernmost property line along the SJWA boundary with a 150-foot area for truck traffic and other activities other than actual buildings (at pg. 4.4-97). Negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems (Environmental Law Institute 2003). The RFEIR states “250-foot development setback is adequate for a project-SJWA **bufferseparation** and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity” (at pg. 4.4-97, emphasis original), but the RFEIR does not provide the literature and studies to support this assertion.

The SJWA is a core area under the Western Riverside Multi-Species Habitat Conservation Plan (“WR HCP”), serves as a mitigation site for a prior project’s impacts and is a regionally important wildlife area. Therefore, a larger development setback needs to be incorporated to prevent negative edge effects from occurring to the project’s southernmost property line along the SJWA boundary. While down lighting as required in the RFEIR will help minimize light pollution, the other negative edge effects – increased traffic, noise, pollutants, invasive weeds and increased fire frequency - have not been adequately addressed.

For example, Mitigation Measure 4.4.6.3J requires “A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas” (at pg. 4.4-118), but absent that plan being available, the plan’s adequacy is unclear. In this case, the fuels to be manage are actually wildlife habitat. The RFEIR should require a comprehensive Fire Management Plan to protect not only the development where fire ignitions are more likely to occur but also requirements to prevent the fires from escaping onto the SJWA, as well as actions to implement if indeed fire originating on the development spreads to the SJWA.

III. The RFEIR Proposes Inconsistent Mitigation Measures

Despite the inadequate 250-foot development setback along the boundary with the SJWA, the RFEIR proposes inconsistent information as to where impact-mitigating fences/walls are to be constructed. First, MM 4.4.6.1A states “All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area” (at pg. 1-16). MM 4.4.6.1A also states “all truck activity areas adjacent to the 250- foot buffer area along the southern property line shall be enclosed by minimum 11-foot tall solid walls” (at pg. 1-17). The purpose of the mitigation measure is to reduce impacts to the SJWA. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 180.) Therefore, in order to minimize negative edge effect impacts, a solid wall, not a chain link fence, needs to be constructed. Secondly, the RFEIR states that “Warehousing will have a minimum 11-foot solid wall along the SJWA boundary” (at pg. 4.4-60) and “the Specific Plan requires solid walls along the property line.” (at pg. 4.4-97). However, having a wall at the boundary of the 250-foot development setback with the SJWA defeats the setback’s impact minimization purpose. The wall needs to be placed at the northern edge of the development setback nearest the development in order to help minimize the edge effect impacts.

IV. The RFEIR Fails to Provide All Required Plans

The RFEIR does not provide even a draft of all of the required plans in order for the decision-makers and the public to be able to evaluate the adequacy of the avoidance, minimization and mitigation. In addition to the Fuel Management Plans, other missing plans include but are not limited to:

- Traffic Control Plan (at pg. 1-10)
- Landscape plan for the 250-foot setback area (at pg. 1-17 and 1-23)
- Compensatory Mitigation Plan (at pg. 1-18)
- Burrowing owl Relocation plan (at pg. 1-22) and,
- Biological Resource Management Plan (BRMP) to prescribe how the 250-foot setback area is maintained (at pg. 1-23)

These plans are all key parts to evaluating the effectiveness of the proposed mitigation measures and should be included as part of the RFEIR.

V. The RFEIR Fails to Address Traffic Impacts to Wildlife on Gilman Springs Road including through the SJWA

While truck and vehicle traffic will increase on Gilman Springs Road for both construction and operation, the RFEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife “roadkill”. The RFEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states “these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the RFEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, “the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project’s impact on the environment, the agency’s approval of the proposed project followed meaningful consideration of alternatives and mitigation measures.” (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA’s and the County’s responsibility to analyze, avoid, minimize and mitigate the impacts from this project, it the developer and the City’s responsibility as the lead agency.

VI. CONCLUSION

Thank you for the opportunity to comment on the RFEIR for the World Logistics Center. Because of the numerous inaccuracies, short-comings and confusion in the RFEIR, we request that the Planning Commission deny recommending certification of the RFEIR, and the Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, the Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary. Rather than allowing this project to move forward with inadequate and incomplete environmental review, the City should send the RFEIR back t for revisions to address the failures identified above.

Please keep the Center to your notice list for all future updates to the Project and do not hesitate to contact the Center with any questions at the number or email listed below.

Sincerely,



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/S/
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cc:

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References

Environmental Law Institute. (2003). *Conservation thresholds for land use planners.*

Environmental Law. Pgs. 64 <https://www.eli.org/research-report/conservation-thresholds-land-use-planners>



State of California - Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
 Inland Deserts Region
 3602 Inland Empire Blvd., Suite C-220
 Ontario, CA 91764
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
 CHARLTON H. BONHAM, Director



May 13, 2020
 Sent via email

Ms. Julia Descoteaux
 Associate Planner
 City of Moreno Valley
 14177 Frederick Street
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 Moreno Valley, CA 92552-0805
juliad@moval.org

Subject: Revised Final Environmental Impact Report
 City of Moreno Valley, World Logistics Center Project
 State Clearinghouse No. 2012021045

Dear Ms. Descoteaux:

The California Department of Fish and Wildlife (CDFW) received the Revised Final Environmental Impact Report (RFEIR) on May 5, 2020 from the City of Moreno Valley (City) for the World Logistics Center Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.¹

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code. CDFW is concerned with the adequacy of the City's assessment of impacts to the San Jacinto Wildlife Area (Wildlife Area; SJWA), and with the adequacy and enforceability of mitigation measures for biological resources. CDFW's concerns related to the SJWA and recommended edits to the City's mitigation measures to improve specificity and enforceability are identified and discussed below.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA

¹ CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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Guidelines § 15386, subd. (a.) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW previously provided comments on the Draft EIR on April 8, 2013, on the Final EIR June 11, 2015, and on the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Determination of Biologically Equivalent or Superior Preservation (DBESP) on December 19, 2014.

CDFW Comments and Recommendations

CDFW's comments and recommendations on the Project are summarized below.

Impacts to rare, listed, and sensitive species

Mitigation Measures (MM) 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E identify the preparation of translocation plans for rare and listed plant species (MM 4.4.6.2A), burrowing owl (MM4.4.6.4D), and Los Angeles pocket mouse (MM 4.4.6.4E).

Sensitive Plant Species

MM 4.4.6.2A provides mitigation measures for impacts to sensitive plant species:

Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant's discretion, an impact

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fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

CDFW is concerned that City's "Planning Official" is not sufficiently qualified to review and approve a translocation plan for rare plant species. Further, thread-leaved brodiaea is a state endangered and federally threatened species and CDFW should review this proposal. To ensure that this proposal is implemented in compliance of rules and regulations related to state and/or federally listed plant species CDFW recommends that the City revise mitigation measure (MM) 4.4.6.2A and condition the measure to include the following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.2A Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, **the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review and approval** ~~they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A.~~ Alternatively, at the applicant's discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

Burrowing Owl

MM 4.4.6.4D provides mitigation measures for impacts to burrowing owl:

If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife. A relocation plan may be required by California Department of Fish and Wildlife if active and/or passive relocation is necessary. The relocation plan will outline the basic process and provides options for avoidance and mitigation. Artificial burrows - may be constructed within the buffer area south of the World Logistics Center

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Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.

A relocation plan may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated to the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor.

CDFW previously provided comments on the City's proposal to translocate burrowing owl to the "250-foot buffer area" in a joint CDFW – US Fish and Wildlife Service (USFWS) comment letter written in response to the City's DBESP submitted for review as required by the Western Riverside MSHCP. In the joint letter (dated December 19, 2014) CDFW and the USFWS articulated to the City that the 250-foot buffer area is not appropriate as a receptor site for burrowing owl because it is insufficient in terms of area, spatial configuration, and conflicting planned use (the City has proposed the construction of detention basins, etc., within the buffer area). Burrowing owl require large open expanses of sparsely vegetated habitat to forage and nest, and the 250-foot buffer area would not provide these ecological needs. Further, because the buffer area is proposed to be planted with trees, CDFW and the USFWS also stated that the City's proposal to plant trees within the buffer area would provide perch sites for bird-eating raptors, such as red-tailed hawks, which eat burrowing owls, further reducing the appropriateness of the City's proposed mitigation approach.

MM 4.4.6.4D also includes reference to Planning Area 30. CDFW maintains similar concerns regarding the suitability of this area for burrowing owl: Planning Area 30 is insufficient in terms of area and spatial configuration. Further, based on CDFW's review of aerial photography the topography of much of Planning Area 30 is unlikely to be suitable for burrowing owl.

CDFW appreciates that the City has included an additional relocation option: CDFW's San Jacinto Wildlife Area. However, CDFW is concerned that MM 4.4.6.4D does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of burrowing owl (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant. CDFW is unable to assume this financial burden, and it is the responsibility of the Project Applicant to mitigate Project impacts.

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MM 4.4.6.4D identifies that CDFW would review any active and/or passive relocation plan for burrowing owl. Please note that these plans will also need to be reviewed and approved by the USFWS and the Western Riverside County Regional Conservation Authority (RCA).

To improve the specificity and enforceability of MM 4.4.6.4D and to ensure consistency with the MSHCP, CDFW recommends that the City revise mitigation measure MM 4.4.6.4D and condition the measure as following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.4D If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (**CDFW**), **U.S. Fish and Wildlife Service (USFWS)**, and the **Western Riverside County Regional Conservation Authority (RCA)**. A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and the RCA~~ if active and/or passive relocation is necessary. The relocation plan will outline the basic process, ~~and provides options for avoidance and mitigation,~~ **identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site.** Artificial burrows - may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW, **the USFWS, and RCA.**

A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and RCA~~ if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated **following written approval by CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas).** Construction activity may occur within 500 feet of the burrows at the discretion of

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the biological monitor, **following consultation with CDFW, the USFWS, and RCA.**

Los Angeles Pocket Mouse

MM 4.4.6.4E provides mitigation measures for impacts to Los Angeles pocket mouse (LAPM):

Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas as determined by the United States Fish and Wildlife Service. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division.

MM 4.4.6.4E identifies that the City will review LAPM “protocol surveys,” and the USFWS will review any relocation plan for LAPM. CDFW is concerned that City staff are not appropriately qualified to determine if appropriate survey methodology has been employed by the Project Applicant, or review trapping results. CDFW recommends that proposed survey methodology and trapping results be reviewed and/or approved by CDFW and the USFWS. Further, any relocation plan prepared for LAPM will also need to be reviewed and approved by CDFW (in addition to the USFWS).

CDFW appreciates that MM 4.4.6.4E identifies that LAPM translocation, if deemed necessary, may occur to a site other than the 250-foot buffer area. CDFW and the USFWS previously commented that the 250-foot buffer area may not be appropriate as a receiver site because of size and configuration (it will be a narrow, relatively restricted area), and because of potential disruptions to existing small mammal populations, and predator-prey relationships. CDFW appreciates that the City has included an additional relocation option however, CDFW is concerned that MM 4.4.6.4E does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of

Ms. Julia Descoteaux, Associate Planner
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LAPM (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant.

To improve the specificity and enforceability of MM 4.4.6.4E CDFW recommends that the City revise mitigation measure MM 4.4.6.4E and condition the measure as following (edits are in **bold** and ~~striketrough~~):

MM 4.4.6.4E Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to **CDFW and the USFWS for review and approval prior to submission to the City**. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated **to locations pre-approved by CDFW and the USFWS (which may include to** the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas) ~~as determined by the United States Fish and Wildlife Service~~. **All costs associated with the relocation, as well as short-and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant**. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biologically Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division **following coordination with CDFW and the USFWS**.

Fish and Game Code section 1602

MM 4.4.6.3C conditions the Project Applicant(s) to submit to the City copies of appropriate permits/agreements for impacts to Waters of the State and Waters of the U.S. The measure identifies the “need for permits based on the results of the 2012 jurisdictional delineation.” Please note that CDFW will require that any stream mapping submitted to CDFW as a component of a Notification of Lake or Streambed Alteration be current. CDFW recommends the measure be revised to remove all reference to the “2012 jurisdictional delineation.” In addition to removing reference to out-of-date mapping, CDFW recommends that errors

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included in the measure be corrected. CDFW recommends that the City revise mitigation measure MM 4.4.6.3C as follows (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.3C Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), **Regional Water Quality Control Board**, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements **are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City** ~~will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required.~~ **The Applicant shall consult with** ~~However, permitting through the Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) may still be required for these improvements. The applicant shall consult with~~ **and United States Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board** to establish the need for permits based on the results of the 2012 **current stream mapping jurisdictional delineation** and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the ~~U.S. Fish and Wildlife Service~~ **Regional Water Quality Control Board**, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.

Wildlife Movement

The Biological Resources section (Section 4.4) of the Revised Sections of the FEIR (page 4.4-37) discusses that the Project will incorporate fencing to separate development areas from MSHCP open space areas to the south and along Gilman Springs Road. CDFW agrees that fencing is appropriate to minimize unauthorized public access, illegal trespass, and dumping. In addition, fencing

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along Gilman Springs Road should be designed to minimize wildlife movement and direct wildlife towards wildlife crossings. CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the construction of such fences as the Project is developed. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the construction of fencing along the Project's southern and eastern boundaries, and wildlife fencing along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.

CDFW is concerned about the project's potential to restrict wildlife movement to and from the San Timoteo Badlands (Badlands) and SJWA/Mystic Lake area. As proposed, the Project will border the Badlands along portions of its northern border as well as its nearly 2-mile long eastern border at Gilman Springs Road, creating an obstruction to wildlife movement between the Badlands and open areas to the south (Mystic Lake, Lake Perris, and SJWA). The Project is located between the SJWA and the two existing culverts under State Route 60 (SR-60), and will also be located immediately west of Gilman Springs Road and the existing culverts under this road. Because the Project encompasses logistics centers that will significantly increase traffic volume, CDFW argues that the Project will have substantial effects on existing wildlife movement patterns. Species of concern include mountain lion, bobcat, badger, coyote, deer, long-tailed weasel, black-tailed jackrabbit, and desert cottontail. A fair argument can be made that the Project will increase noise, lighting, and traffic which may in turn negatively affect wildlife through direct mortality or alter movement patterns by forcing wildlife to move east or west, away from the Project. CDFW recommends that the Project install appropriate fencing along Gilman Springs Road and SR-60 to reduce wildlife mortality and direct animals to future or existing wildlife crossings.

CDFW recommends that the City condition the Project to require the installation of wildlife fencing along SR-60 and Gilman Springs Road to reduce Project-related wildlife mortality. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

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Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.

Section 4.4 of the Revised Sections of the FEIR (page 4.4-61) discusses that the RCA submitted comments to the City stating that the project would likely cause an increase in truck traffic along Gilman Springs Road which “could significantly affect wildlife movement between Core H and proposed Core 3.” To mitigate these impacts the Revised Sections of the FEIR (page 4.4-61) states that it would be appropriate for the Project to contribute (financially) to the “fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings.” CDFW agrees that contribution of funding for improvements to wildlife crossings along Gilman Springs Road would be appropriate, but CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the contribution of funds for this purpose. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the contribution of funds to a mitigation account, to held by CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.

Impacts to the San Jacinto Wildlife Area

CDFW previously provided comments on the Project’s proposal to construct buildings within 450 feet of the SJWA (refer to CDFW’s April 8, 2013, and June 11, 2015 comment letters). SJWA is an active hunting area, and hunts are regularly conducted along the SJWA’s northern boundary. Fish and Game Code Section 3004 prohibits the discharging of firearms within 150 yards (450 feet) of any building without express permission of the owner. Given that the City is proposing the construction of buildings within 450 feet of the northern property boundary of the SJWA, the City’s actions will directly constrain the public’s use of the SJWA. CDFW reiterates that unless the City increases the buffer distance between the SJWA and constructed elements of the Project to a minimum of 450 feet, the City will have effectively created restraints on hunting with the Wildlife

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Area. Further unless the environmental document is revised, it continues to be deficient in its analysis of impacts on public access and recreational pursuits within the SJWA.

CDFW strongly recommends that the buffer distance between the northern boundary of the SJWA and the Project be increased to a minimum of 450 feet.

Project's Consistency with Adopted HCPs/NCCPs

Projects proposed for construction within the MSHCP and the Stephens' kangaroo rat Habitat Conservation Plan (SKR HCP) are subject to payment of mitigation fees. Pages 4.4-60 and 4.4-61 discuss the required payment of these fees, however the City did not include a mitigation measure to ensure the enforceability of payment of fees. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the payment of MSHCP and SKR HCP fees, as appropriate, prior to issuance of grading permits. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.

Resource Management

MM 4.4.6.4F discusses the development of a Biological Resource Management Plan for the proposed 250-foot setback area. The measure discusses that the plan will be reviewed by the City's "Planning Official in consultation with the San Jacinto Wildlife Area Manager." CDFW is unaware that the City contacted CDFW's SJWA manager to verify that CDFW were available and able to contribute to the review of this plan, or whether this workload element could be accommodated based on CDFW's current staffing levels. CDFW appreciates that the City is requesting review of the proposed Biological Resource Management Plan, but we request that review of this document be determined by CDFW.

CDFW recommends that the City revise mitigation measure MM 4.4.6.4F as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained **in perpetuity**. This plan will identify frequent and infrequent vegetation management requirements (i.e.,

removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. **The Biological Resource Management Plan will include an estimate of short-and long-term management costs, a discussion of how funds will be made available in perpetuity, and entities responsible for contribution of funds to support the Biological Resource Management Plan.** The Biological Resource Management Plan will also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E.

The Biological Resource Management Plan, **including the short-and long-term funding strategy** shall be reviewed and approved by the Planning Official in consultation with **California Department of Fish and Wildlife** ~~San Jacinto Wildlife Area Manager~~. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist, to the satisfaction of the City Planning Division.

Fuel Management

MM 4.4.6.4J discusses the preparation of a Fuel Management Plan for those Planning Areas adjacent to the south and east boundary of the Project and MSHCP lands. The measure identifies that the plan shall demonstrate that adjacent MSHCP lands are adequately protected from expected fire risks. CDFW recommends that MM 4.4.6.4J be revised to also demonstrate that the Fuel Management Plan adequately protect CDFW's SJWA lands. CDFW recommends that the City revise mitigation measure MM 4.4.6.4J as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4J A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas **and/or San Jacinto Wildlife Area (SJWA) lands**. The Fuel Management Plan shall be prepared by the project proponent and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan **and/or SJWA** boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:

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- A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area.
- A list of non-native invasive plants that are prohibited from installation.
- Maintenance activities and a maintenance schedule.

Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas **and SJWA lands** are adequately protected from expected fire risks.

Minor Errors

MM4.4.6.2B and 4.4.6.3B include reference to the “Resource Conservation Agency (RCA).” CDFW assumes that the City is referring to the Western Riverside County **Regional Conservation Authority**. CDFW recommends that the City review the aforementioned mitigation measures and correct all references to the Regional Conservation Authority.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDDB). Information can be submitted online or via completion of the CNDDDB field survey form at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The completed form can be mailed electronically to CNDDDB at the following email address: CNDDDB@wildlife.ca.gov. The types of information reported to CNDDDB can be found at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>.

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FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CDFW CONCLUSIONS AND FURTHER COORDINATION

CDFW appreciates the opportunity to comment on the RFEIR for the City of Moreno Valley's World Logistics Center Project (SCH No. 2012021045) and recommends that the City address the CDFW's comments and concerns prior to adoption of the RFEIR. Pursuant to CEQA Guidelines section 15097(f) CDFW has prepared a draft mitigation monitoring and reporting program (MMRP) for the new mitigation measures identified in this letter. The draft MMRP is enclosed at the end of this letter.

If you should have any questions pertaining to the comments provided in this letter, and to schedule a meeting, please contact Joanna Gibson at (909) 987-7449 or at Joanna.Gibson@wildlife.ca.gov.

Sincerely,

DocuSigned by:

 8091B1A9242F49C...

Scott Wilson
 Environmental Program Manager

ec: California Department of Fish and Wildlife
 HCPB CEQA Coordinator

Office of Planning and Research, State Clearinghouse
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Mitigation Monitoring and Reporting Program for the City of Moreno Valley's World Logistics Center Project

Mitigation Measure	Timing	Responsible Parties
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and to the City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.</p>	<p>Prior to issuance of grading permit.</p>	<p>City of Moreno Valley</p>

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Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.	Prior to issuance of grading permit.	City of Moreno Valley
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May 14, 2020

VIA E-MAIL ONLY

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**RE: World Logistics Center Revised Final Environmental Impact Report
(SCH # 2012021045)**

Dear Ms. Descoteaux:

Attorney General Xavier Becerra, in his independent capacity,¹ and the California Air Resources Board (CARB) jointly submit the following comments on the April 2020 Final Environmental Impact Report (FEIR) prepared for the World Logistics Center (the Project) in advance of the Project’s May 14, 2020 Moreno Valley (City) Planning Commission hearing.

The Attorney General and CARB have the following concerns regarding the FEIR, as explained in detail below:

1. The FEIR does not correct the improper GHG analysis the Attorney General and CARB critiqued in multiple comment letters on prior versions of the Project’s environmental impact report.²

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14–15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the FEIR’s compliance with the California Environmental Quality Act (CEQA).

² The Attorney General and CARB previously reviewed the City’s July 2018 Revised Final Environmental Impact Report (RFEIR) and submitted comments regarding the RFEIR on September 7, 2018. As noted in those comment letters, the RFEIR’s analysis of greenhouse gas (GHG) related impacts does not meet CEQA’s requirements. On January 30, 2020, CARB also

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

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2. The FEIR also continues to misrepresent CARB's positions.
3. The FEIR's new GHG Mitigation Measure 4.7.7.1 is inadequate.
4. The FEIR fails to adopt feasible mitigation measures that would substantially lessen the Project's significant adverse effects.
5. The addition of Mitigation Measure 4.7.7.1 is "significant information" that requires recirculation of the FEIR.

Until these shortcomings are corrected, the FEIR should not be certified by the City.

I. THE FEIR CONTINUES TO RELY ON ENVIRONMENTALLY IRRESPONSIBLE AND LEGALLY FLAWED ARGUMENTS TO AVOID PROPERLY ANALYZING AND MITIGATING THE PROJECT'S ENORMOUS GREENHOUSE GAS IMPACTS.

Under CEQA, a project's significant GHG impacts must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact. 14 Cal. Code Regs. (CEQA Guidelines) § 15064.4. Yet, the FEIR continues to improperly divide the Project's GHG emissions into two categories, which it terms "capped" and "uncapped"; classifications that are created by the FEIR and have no relevance under CEQA. The FEIR asserts that "capped" emissions are "covered" by CARB's Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation.³

To purportedly support its improper approach to GHG analysis and mitigation, the FEIR relies on a few weak, misguided bases: (1) two mitigated negative declarations (MND); (2) an outdated guidance document from an air district with no jurisdiction in the South Coast Air Basin; (3) an inapposite appellate court decision that did not benefit from the input of California's expert agencies and other key stakeholders, and (4) unsupported arguments about indirect costs.

The FEIR does not, and cannot, explain why its GHG analysis and mitigation approach did not comply with the CEQA Guidelines, applicable case law, and other relevant guidance regarding GHG analysis and mitigation. In addition, the FEIR ignores the objections in our previous comment letters.

filed comments on the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR). These three comment letters are attached to this letter as Exhibits A-C. Further, the Attorney General and CARB's amicus brief in *Paulek et al. v. Moreno Valley Community Services District et al.* (E071184) (*Paulek*), which further discusses the legal inadequacies of the GHG analysis, is attached hereto as Exhibit D.

³ Though Mitigation Measure 4.7.7.1 agrees to offset "capped" emissions in the event the City's GHG analysis is invalidated in *Paulek*, the improper legal arguments regarding the distinction between "capped" and "uncapped" emissions will remain.

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The City cites the San Joaquin Valley Air Pollution Control District (SJVAPCD) Policy APR-2025, issued in 2014, and two MNDs approved by SCAQMD in 2014. The City states that its approach has been applied “for years” in light of those same documents. (FEIR at 23.) However, as the California Supreme Court has repeatedly held in more recent years, GHG law continues to evolve, and lead agencies have an obligation under CEQA to “stay in step.” *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504 (*SANDAG*).⁴ The documents the City relied on are out of date and not the appropriate guidance for analyzing GHG impacts under CEQA.

Note that in 2014, the California Supreme Court had not yet issued its seminal *Newhall* decision, which was published on November 30, 2015. *Center for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 230 (*Newhall*). The Court then issued the *SANDAG* decision on July 13, 2017. (*SANDAG, supra*, (2017) 3 Cal.5th 497.) The FEIR ignores post-2014 materials that establish its approach is unlawful, including the *SANDAG* California Supreme Court decision referenced above, as well as CARB’s 2017 Scoping Plan.⁵

The City also relies on *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*). However, as previously noted, *AIR* did not broadly validate the City’s approach of excluding all fuel and electricity related emissions from its GHG analysis, particularly for a project that is not regulated by the Cap-and-Trade Regulation. (See FEIR at 22, 23.) That issue simply was not before the court, and was not given due consideration as a result. (See Exhibit A at 6; Exhibit B at 11-12; Exhibit D at 30-31.) *AIR* is thus inapposite.

Finally, the City also attempts to argue that the Project would effectively be paying for GHG mitigation through fuel and electrical costs passed down to the end consumer. (FEIR at 18-19.) It still remains unclear how there would be any price signal to Project proponents in this situation, given that any fuel-related costs would be paid by the fuel suppliers, and potentially passed down to the Project’s tenant logistics companies. Regardless, these fuel costs would not be paid by the Project proponents.

⁴ As the California Supreme Court has held, “CEQA requires public agencies ... to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG* at 504.) The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Ibid.*) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17.)

⁵ Available at https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. See, in particular, the “Climate Action through Local Planning and Permitting” chapter beginning at page 99, which describes the critical role played by local government contributions to CEQA reductions, including through the CEQA review process. See also CARB’s 2018 comment letter for more information on this point.

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In sum, the City's weak attempts to support the FEIR's unlawful GHG analysis and mitigation approach are without merit. Thus, the FEIR violates CEQA by failing to fully analyze and mitigate the significant GHG impacts of the Project.

II. THE FEIR CONTINUES TO INCORRECTLY CLAIM THAT CARB SUPPORTS THE WLC'S GHG APPROACH.

The FEIR continues to misrepresent CARB's views on GHG analysis and mitigation.⁶ As noted in CARB's September 7, 2018 letter and in its *Paulek* amicus brief, CARB does not support the approach proposed; the approach is unlawful, inconsistent with relevant climate plans and regulations, and likely to set back the state's climate mitigation efforts if applied. Once again, the Cap-and-Trade Program was not designed to mitigate all GHG impacts associated with land use planning decisions. Rather, it was designed with responsible local CEQA compliance in mind as a complementary strategy. (See, e.g., 2017 Scoping Plan at 99-102.) Cap-and-Trade, which is neither tailored to nor affected by the Project, simply does not provide project-level mitigation in this case.

The FEIR points to several cherry-picked provisions from the 2011 Final Statement of Reasons for the Cap-and-Trade Project. (FEIR at 18-19.) Yet it fails to explain why there is not a single provision, from any point in time, indicating that CARB intended Cap-and-Trade compliance to constitute CEQA mitigation for unregulated entities and projects, or that it excuses land use projects wholesale from evaluating or mitigating their GHG emissions. Cap-and-Trade does not and CARB plainly never intended Cap-and-Trade to obviate CEQA mitigation requirements; that is a much bigger change that CARB would have expressly addressed had that been the intent. While the FEIR points out selected Scoping Plan provisions (FEIR at 25), it conveniently omits the directly applicable "Climate Action through Local Planning and Permitting" chapter describing how CARB relies on complimentary local planning actions (including robust CEQA analysis and mitigation) to accomplish the state's GHG mandates and goals. (See 2017 Scoping Plan at 99-102.) The City's approach would effectively render superfluous the CEQA mitigation recommendations in CARB's Scoping Plan, as there would be essentially nothing left to mitigate if agencies took the City's approach. It would also allow lead agencies to disregard their CEQA obligations and make less informed decisions. (See, e.g.,

⁶ In the *Paulek* litigation, attorneys for the developer argued that because CARB did not specifically object to the project's GHG significance methodology in its early comment letters, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions." (Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, p. 18, lines 3-7.) The City has failed to address this issue or otherwise correct this clear and consequential misrepresentation in its responses to comments.

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SANDAG, supra, 3 Cal.5th at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”].)

Despite failing to mitigate 95% of the Project’s emissions, the FEIR appears to claim that the Project would be consistent with the “Climate Action through Local Planning and Permitting” chapter of the Scoping Plan mentioned above. (FEIR at 29.) This is incorrect. As noted above, that chapter of the Scoping Plan discusses how the State needs more, not less, responsible GHG planning and mitigation from project developers and lead agencies. Here, the City seeks to avoid almost entirely its obligation to mitigate its GHG emissions.

III. THE NEW GHG MITIGATION MEASURE 4.7.7.1 IS INADEQUATE.

As stated in our previous comments, under CEQA, the City must revise the FEIR to analyze all of the Project’s significant impacts relating to GHG emissions, including capped emissions. The FEIR must also adopt all feasible mitigation to address the Project’s significant GHG impacts. (*Newhall, supra*, 62 Cal.4th at p. 231.) Instead, the City revised the FEIR to add a mitigation measure for the Project, but this measure does not correct the FEIR’s CEQA violations. The new GHG mitigation measure would require the Project to purchase GHG offsets to mitigate its emissions, but only if the City loses the *Paulek* appellate litigation. (Measure 4.7.7.1.) This measure is inadequate for multiple reasons.

First, the City should adopt meaningful GHG mitigation measures in the FEIR, rather than continuing to avoid its responsibility to require mitigation unless specifically so ordered by a court. The City has conceded that such a measure is feasible by including its contingent GHG mitigation measure in the FEIR. (CEQA Guidelines, § 15092, subd. (b)(2)(A) [“A public agency shall not decide to approve or carry out a project for which an EIR was prepared unless . . . [t]he agency has . . . [e]liminated or substantially lessened all significant effects on the environment where feasible.”].) Indeed, more beneficial mitigation measures are feasible – including the use, for instance, of electrified trucks for the Project, which would reduce both GHGs and air pollution risk, as CARB has long recommended. Yet, the Project has not even adopted its inadequate offset measure, much less failed to explain why it has not adopted ostensibly feasible measures presented by CARB regarding design changes to favor zero emission vehicles. There is no indication in the record that even a more robust, legally-adequate GHG mitigation measure would be infeasible for the Project.

Second, the proposed measure, if it ever becomes effective, may not actually reduce the Project’s GHG emissions. Mitigation Measure 4.7.7.1 uses similar language to CARB’s offsets program, it lacks the essential safeguards that make CARB’s program successful. For example, the measure states that any offsets used must be “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” (FEIR at 36.) However, these terms are not defined in the mitigation measure. They are left to the sole interpretation and discretion of the City’s Planning Official and thus not enforceable as CEQA requires. (See Pub. Resources Code, § 21081.6, subd. (b); CEQA Guidelines, § 15126.4, subd. (a)(2).) There is a broad continuum of voluntary-market offsets available for purchase by project proponents, ranging

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from ineffective and unenforceable to rigorous. It remains unclear which types of offsets would be deemed by the City’s Planning Official to meet these undefined criteria.

In the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. Offsets do not provide the important co-benefits of on-site mitigation such as local jobs, reduced local air pollution, local infrastructure and efficiency improvements. (See e.g. 2017 Scoping Plan at 102 (“CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from [vehicle miles traveled], and direct investments in GHG reductions within the project’s region that contribute potential air quality, health, and economic co-benefits locally.”) This is why the 2017 Scoping Plan prioritizes local direct investments, and recommends turning to offset credits “[w]here further project design or regional investments are infeasible or not proven to be effective.” (2017 Scoping Plan at 102.) The proposed measure, by contrast, does not obligate the Project to first consider additional direct reductions, or other local or regional GHG emissions reductions, before deciding to purchase offsets. Such direct or local measures could otherwise benefit those in the Project vicinity. Furthermore, the measure does not in any way limit the percentage of offsets which may be used to mitigate the Project’s GHG emissions, as compared to more direct methods of GHG reduction. California’s Cap-and-Trade Program, for its part, sets a quantitative usage limit, which allows only 4-8% (depending on the calendar year) of an entity’s compliance obligation to be met through surrendering offsets. (See 17 Cal. Code Regs., § 95854.) This helps ensure that offsets are a relatively small part of the overall Cap-and-Trade Program, ensuring that the majority of GHG reductions come from reductions by regulated entities rather than from non-covered sectors.

The FEIR’s proposed measure entirely lacks this protection, instead allowing offsets (even ones that may not actually result in GHG reductions, as described above) as the sole GHG mitigation mechanism. These disadvantages, combined with the lack of any adequate criteria to ensure quality or enforceability of the offsets that may be purchased in this case, make the mitigation measure ineffective and unreliable.

Mitigation Measure 4.7.7.1 also seems to imply that CARB has broadly “approved” the offset registries it lists. The measure’s text states: “Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, Verra (formerly Verified Carbon Standard) or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above.” (FEIR at 36). CARB has approved only the American Carbon Registry, Climate Action Reserve, and Verra for the limited purpose of participation as Offset Project Registries in CARB’s Cap-and-Trade Program, pursuant to the process set forth in section 95986 of Title 17 of the California Code of Regulations. This approval only pertains to the registry’s participation in the Cap-and-Trade Regulation, in connection with issuing CARB offset credits. By contrast, the offsets contemplated by Mitigation Measure 4.7.7.1 are known as “voluntary market” offsets, which are generated under separate protocols adopted by the registries. CARB does not review

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these voluntary market protocols. CARB's "approval" of a registry as an Offset Project Registry under the Cap-and-Trade Program does not mean CARB has reviewed or approved that registry's voluntary market offset protocols.

Mitigation Measure 4.7.7.1 improperly bypasses onsite and local mitigation and violates CEQA because of its unenforceability and thus must be revised.

IV. THE FEIR IMPROPERLY DECLINES TO ADOPT FEASIBLE MITIGATION MEASURES THAT WOULD SUBSTANTIALLY LESSEN THE PROJECT'S SIGNIFICANT ADVERSE EFFECTS.

The FEIR simultaneously argues the proposed use of offsets and credits is a feasible mitigation measure, and yet refuses to adopt such a measure now by conditioning it on the outcome of the *Paulek* litigation. This approach violates CEQA, which instructs that "public agencies should not approve projects as proposed if there are... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." (Pub. Res. Code 21002). The FEIR recognizes it is possible to offset the entire 232,402 metric tons of GHG from this Project but only guarantees the offset of 8,563 metric tons of GHG emissions. (See FEIR at page 39.) The entire 232,403 metric tons of GHGs will *not* be offset if the "trial court's judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed." However, if the appeal is dismissed, an appellate court will not have upheld the City's GHG analysis and, as described above, the City's misleadingly-named "capped" emissions would be considered a significant environmental effect. These emissions would need to be mitigated, and could be via a feasible and rigorous GHG mitigation measure (as described above). By refusing to adopt such a feasible mitigation measure here, the FEIR violates CEQA. (See CEQA Guidelines, § 15092.)

V. MITIGATION MEASURE 4.7.7.1 IS "SIGNIFICANT NEW INFORMATION" THAT REQUIRES RECIRCULATION OF THE FINAL EIR.

Pursuant to Public Resources Code section 21092.1, Mitigation Measure 4.7.7.1 is "significant new information" that requires a new opportunity for public comment. "Significant new information" includes a new "feasible way to mitigate or avoid [a substantial adverse environmental effect]... that the project's proponents have declined to implement." (*Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1129, as modified on denial of reh. (Feb. 24, 1994)). As described above, Mitigation Measure 4.7.7.1 identifies a feasible, although not necessarily proper, way to mitigate the Project's greenhouse gas emissions, yet declines to adopt such mitigation unconditionally.

When "significant new information... is added to an environmental impact report after notice... but prior to certification" the public agency must "give notice again pursuant to Section 21092... before certifying the environmental impact report." (Pub. Resources Code, § 21092.1). Notice pursuant to Public Resources Code Section 21092(b)(2) requires a comment period.

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However, Mitigation Measure 4.7.7.1 was added to the FEIR through a “Response to Comments on the Revised Sections of the Final EIR and Draft Recirculated Revised Sections of the Final EIR” without any such comment period. Instead, the City simultaneously released that document and a Notice of Completion informing the public that the Moreno Valley Planning Commission would review the Revised FEIR at a public hearing on May 14, 2020. Moreno Valley should have recirculated the EIR and provided an opportunity for public comment on the EIR with the addition of Mitigation Measure 4.7.7.1.⁷

VI. CONCLUSION

The Attorney General and CARB urge the City of Moreno Valley not to certify the FEIR without further revisions to the GHG analysis as described above. As stated in our previous comments, the City must take its obligations as a local government to mitigate climate change impacts seriously. The addition of a weak GHG measure that would apply only if the City’s approach is invalidated on appeal is not enough. However, if the City implements the actions that the state’s expert agencies have requested for years, the Project could be an important environmental leadership project. Indeed, the Project could create jobs by building a world-leading clean logistics project, protecting communities all along its supply chains. We encourage the City to take this opportunity to innovate and to lead. As always, we would be happy to work with the City to take the additional steps needed to fully comply with CEQA’s GHG analysis and proper mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 Deputy Attorney General

For XAVIER BECERRA
 Attorney General

⁷ In its January 30, 2020 comments, CARB informed the City of its concerns with not being able to review the new GHG-related mitigation measure. (See January 30, 2020 CARB comment letter at page 1.) When CARB reached out to a City representative at that time, CARB was informed that the reference to the new GHG mitigation measure was included in the RRSFEIR in error, and it would be removed in the FEIR. Rather than remove that measure, the FEIR now includes a new GHG mitigation measure that has never before been circulated for public review, and which the City had previously indicated would not be part of the FEIR. The City only now has decided to release this measure as part of a vast FEIR package, just 14 days prior to the Project approval hearing.

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cc: Albert Armijo, Interim Planning Manager, alberta@moval.org
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EXHIBIT A



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September 7, 2018

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RE: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project

Dear Mr. Armijo:

Attorney General Xavier Becerra submits the following comments on the Revised Sections of the Final Environmental Impact Report (“RFEIR”) prepared for the World Logistics Center (the “Project”).¹ The Project, a proposed warehouse and logistics complex in the City of Moreno Valley (“City”), would be one of the largest warehouse facilities in the world, with square footage equaling approximately 700 regulation-size football fields.

INTEREST OF THE ATTORNEY GENERAL

For well over a decade, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change. It is now well-established that California, through law and policy, and consistent with sound science, is committed to achieving a low-carbon future by 2050 in order to reduce and avoid the most catastrophic effects of climate change. California has already begun to experience adverse climate effects, such as rising sea levels and longer, more intense fire seasons. The Attorney General is particularly concerned about how such effects may impact our most vulnerable communities, such as Inland Empire residents, who are already burdened by some of the worst air quality in the country.

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RFEIR’s compliance with the California Environmental Quality Act (“CEQA”).

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

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Every large development project has the potential either to facilitate, or instead hinder, the State's achievement of its climate goals. It is therefore important that as lead agencies consider the impacts of individual development projects – many of which will operate for decades into the future – they evaluate and impose feasible mitigation for climate change impacts.

With these goals in mind, the Attorney General has provided guidance to local governments, commented on potential projects, and engaged with local interest organizations concerned with climate change and environmental justice. (See California Department of Justice, Office of the Attorney General, *California Environmental Quality Act*, <https://oag.ca.gov/environment/ceqa> (as of Sept. 7, 2018).) The Attorney General has also participated in litigation throughout the State to ensure that local governments comply with state requirements to fully analyze and implement all feasible mitigation measures to lessen significant impacts from greenhouse gas emissions (“GHGs”) caused by land use development projects. (See, e.g., *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497; *People of the State of California v. County of San Bernardino* (Cty. of San Bernardino filed April 12, 2007) No. CIVSS700329.) The Attorney General also has a long-standing interest in ensuring environmental justice throughout the State and for communities in the Inland Empire. (See, e.g., *CCA EJ v. County of Riverside, et al.*, Case No. RIC1112063; California Department of Justice, Office of the Attorney General, *Environmental Justice at the Local and Regional Level: Legal Background* (July 10, 2012) https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.)

After review of the GHG analysis in the RFEIR, the Attorney General believes that the City has failed to comply with CEQA's requirements for analyzing and implementing feasible mitigation for the significant GHG emissions that will result from this Project. For the reasons outlined below, the City's approach falls substantially short of meeting the requirements of CEQA, the regulations implementing CEQA – the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), and applicable case law. The City's approach in the RFEIR has the potential to seriously undermine the overall effort to meet the State's science-based GHG reduction goals for the transportation and land use sectors, and to disproportionately disadvantage environmental justice communities.

THE RFEIR'S GHG ANALYSIS VIOLATES CEQA AND UNDERMINES THE STATE'S CLIMATE OBJECTIVES.

As the RFEIR acknowledges, this Project at buildout will cause over 281,000 metric tons of GHGs to be released into the atmosphere every year, and will result in over 200,000 metric tons of GHG emissions beginning as early as 2028. (RFEIR at 4.7-35.) These emissions will presumably continue throughout the life of the project, though the RFEIR does not address this.

The RFEIR takes a very unusual and troubling approach to addressing the Project's GHG-related impacts, especially since climate pollution is undeniably a *cumulative* problem. (*Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 256-257.) The RFEIR divides the Project's GHG emissions into two categories, which it terms

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“capped” and “uncapped” – classifications created by this RFEIR. What the RFEIR deems “uncapped” emissions constitute only about 3% of the Project emissions. They include the comparatively minor landfill emissions caused by waste generated at the Project and the use of refrigerants at the Project. (RFEIR at 4.7-33.) For these emissions, the RFEIR follows the approach that would be expected under CEQA: the City has, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHGs as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold.² (RFEIR at p. 4.7-19.) What the RFEIR terms “capped” emissions, however, constitute the remaining 97% of the Project’s predicted emissions. Those include emissions caused by mobile sources (namely, diesel trucks) and electricity use at the Project. (RFEIR at p. 4.7-33.) With respect to these emissions, the RFEIR deviates dramatically from standard CEQA methodology. The RFEIR asserts that these emissions are “covered” by the California Air Resources Board’s (“CARB”) Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation. (RFEIR at p. 4.7-22.) This is a novel and unsupportable approach under CEQA.

As discussed below, the RFEIR’s approach does not comply with CEQA, for several reasons. First, the Project is not regulated under the State’s Cap-and-Trade Program, so purported compliance with that Program cannot be used to exclude 97% of the Project’s GHG emissions from the analysis of whether the Project’s GHG emissions will result in significant climate change impacts. Second, CEQA requires that all of the emissions attributable to the Project be evaluated for significance, regardless of their source. Third, when comparing all of the Project’s emissions to California’s ambitious, science-based climate goals, as well as statewide, regional, and local plans for the reduction or mitigation of GHG emissions, the Project’s GHG emissions are clearly significant, requiring further feasible mitigation measures.

We are concerned about the City’s use of this analytical approach, both in the context of this Project and more generally. If the RFEIR’s approach is put into general use by the City, or followed by other lead agencies, emissions from transportation and electricity could largely be exempt from analysis and mitigation under CEQA. This is directly counter to the purposes of CEQA, and the Legislature’s considered decision to make clear that GHG emissions must be analyzed. (Senate Bill 97 (2007); Pub. Resources Code, § 21083.05.) The State cannot meet its well-established, long-term environmental GHG reduction goals if new local projects are free to add hundreds of thousands of tons of GHGs to the atmosphere every year without undergoing the

² Lead agencies may choose to use a “threshold of significance,” a working presumption that can assist in determining whether an impact is significant. (Cal. Code Regs., tit. 14, §§ 15064.4(b)(2); 15064.7.) “A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” (Cal. Code Regs., tit. 14, § 15064.7, subd. (a).)

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analysis and mitigation that CEQA requires. Moreover, the RFEIR's approach will likely expose already-burdened communities in the State to greater amounts of GHG co-pollutants, such as diesel particulate matter and nitrogen oxides.

We urge the City to revise its GHG analysis to comply with CEQA by properly evaluating whether *all* of the Project's emissions—for all phases of the Project, direct and indirect, short-term and long-term—are cumulatively significant, and adopting feasible mitigation to ensure those emissions do not have a significant impact on the environment.

I. THE RFEIR'S NOVEL APPROACH TO "CAPPED" EMISSIONS VIOLATES CEQA.

The purpose of an environmental impact report is "to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project." (Pub. Resources Code § 21061.)

The City's approach violates a number of well-established CEQA principles. Lead agencies must "consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect." (Cal. Code Regs., tit. 14 § 15003, subd. (h).) This Project as a whole includes both the "capped" and "uncapped" GHG emissions, but the RFEIR fails to analyze and mitigate "capped" emissions. Moreover, both "direct and indirect significant effects" and "short-term and long-term effects" should be considered. (Cal. Code Regs., tit. 14, § 15126.2, subd. (a).) The RFEIR fails to inform the public of the long-term effects of the Project's GHG emissions by failing to analyze GHG emissions past buildout.

In addition to violating these more general principles, the City's approach to "capped" emissions contradicts the CEQA Guidelines specific to GHG analysis. "The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data." (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The CEQA Guidelines advise lead agencies on how to determine the significance of a Project's GHG emissions. A lead agency should consider three non-exclusive methods for determining climate significance:

- (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project[.];
- (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. . . . If there is substantial evidence that the possible effects of

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a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. (Cal. Code Regs., tit. 14, § 15064.4, subd. (b)).

While “[a]n ironclad definition of significant effect is not always possible,” (Cal. Code Regs., tit. 14 § 15064, subd. (b)), the RFEIR’s conclusion that the Project’s GHG impacts are not significant under CEQA (RFEIR at p. 4.7-33) is based solely on its unjustifiable exclusion of the vast majority of the GHG emissions of the Project. That exclusion is neither consistent with CEQA nor justified by the Cap-and-Trade Program, which does not apply to the Project.

A. Since the Project is Not Regulated Under Cap-and-Trade, The RFEIR Cannot Use Cap-and-Trade to Ignore the Significance of the Project’s GHG Emissions.

The RFEIR effectively treats the Cap-and-Trade Program as if it is a qualified mitigation plan for the Project and its “capped” emissions. (See Cal. Code Regs., tit. 17, §§ 15064, subd. (h)(3); 15064.4 subd. (b)(3)). It is not.

California’s Cap-and-Trade Program applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for compliance instruments.” (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) The Cap-and-Trade Program only applies to expressly identified entities, such as cement producers, petroleum refiners, electricity generators, natural gas supplies, fuel importers, and liquid petroleum gas supplies. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities.

Although the operator of a refinery that produces liquefied petroleum gas in California is subject to the Cap-and-Trade Program, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing its own GHG emissions or surrendering compliance instruments, but the gas station that resells the gas, the truck drivers who purchase it, and the warehouses to which the trucks drive do not. Because CEQA Guidelines section 15064.4, subdivision (b)(3) instruct lead agencies to consider the extent to which *the project* complies with GHG regulations or requirements, it is inappropriate to rely upon compliance with Cap-and-Trade by other entities downstream in the chain of commerce as a basis for avoiding analysis of project-related emissions. In the Final Statement of Reasons for the CEQA Guidelines addressing GHG emissions, the California Natural Resources Agency confirmed that, in implementing CEQA Guidelines section 15064.4, a lead agency must show that a GHG reduction plan “actually addresses the emissions that would result from the project.” (California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009), available at http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf, at p. 27.)

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Further, the City's approach is not, as the RFEIR claims (RFEIR at 4.7-20), supported by *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 ("AIR"). Without commenting on whether or not that case was rightly decided, AIR is facially inapposite because the project being evaluated under CEQA in that case was a refinery, a covered entity under the Cap-and-Trade Program. Because this Project is not a covered entity under the Cap-and-Trade Program, it is unjustifiable for the RFEIR to use compliance with Cap-and-Trade as a factor in analyzing the significance of the Project's GHG emissions. There is no basis in the law for the use of Cap-and-Trade to exclude a full 97% of the Project's GHG emissions from analysis or mitigation.

The flaw in the City's approach becomes even more apparent when one considers its incongruous results. The RFEIR describes the Project, in part, as follows: "Goods imported through the Ports of Long Beach and Los Angeles as well as other locations are delivered via truck to the proposed distribution centers and distributed via truck both in and out of state locations. . . ." (Original FEIR at 3-27-3-28.) The heart of this Project is this movement of goods via trucks. Yet, the City's approach avoids any analysis of 210,596 metric tons of GHG emissions associated with the movement of goods via trucks. (RFEIR at p. 4.7-33.) 97% of the Project's total GHG emissions are simply dismissed under this approach. CEQA does not permit such a dismissal.

B. The RFEIR Must Consider All Emissions in Determining Significance.

Correctly applying CEQA requires an evaluation of *all* the Project's GHG emissions in determining significance. (See Cal. Code Regs., tit. 14, §§ 15064.4, subd. (b)(2); 15378 (defining "project" as "the whole of an action. . . .")) There is no basis here for comparing some of the Project's emissions to the significance threshold, but not others. Here, the City elected to use a threshold of 10,000 metric tons of GHGs. (RFEIR at p. 4.7-19.) CEQA Guidelines section 15064.4, subdivision (b)(2), notes that when using a threshold, an agency should compare all of the "project emissions" of GHGs to that threshold. Emissions from trucks and electricity are a result of the Project just as much as the "uncapped" emissions. They therefore must be compared to the significance threshold, and mitigated to the extent feasible.

Further, the City's attempt to exempt an impact from any significance analysis based solely on purported compliance with a single rule or regulation is unwarranted. Courts have repeatedly held compliance with a single environmental or land use law or regulation does not create an exemption from CEQA's requirement that lead agencies evaluate all of a project's significant environmental impacts. For example, "compliance with a general plan in and of itself 'does not insulate a project from the EIR requirement, where it may be fairly argued that the project will generate significant environmental effects.'" (*East Sacramento Partnerships for a Livable City v. City of Sacramento* (2016) 5 Cal.App.5th 281, 301; see also *Keep Our Mountains Quiet v. County of Santa Clara* (2015) 236 Cal.App.4th 714, 732 ("[A]n EIR is required if substantial evidence supports a fair argument that [a project] may have significant unmitigated noise impacts, even if other evidence shows the [project] will not generate noise in excess of [a] County's noise ordinance or general plan."))

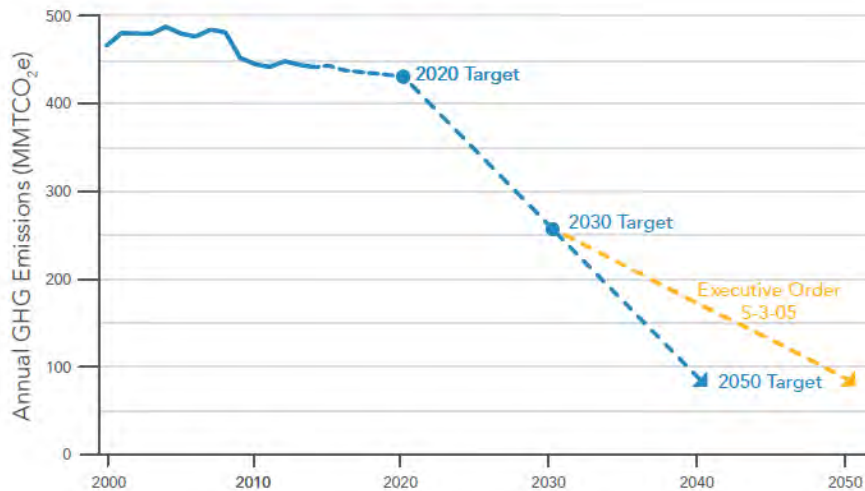
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C. In Light of the Project’s Substantial, Long-Term Projected Emissions, Its GHG Impacts Must Be Deemed Significant.

It seems impossible a proper evaluation of the Project’s emissions under CEQA could support a finding that the Project’s emissions are not significant. This Project—as currently designed—will lock in hundreds of thousands of tons of GHG emissions for decades to come, and may put this City and the region on a path that deeply undermines the State’s climate goals.

To reduce and avoid the most catastrophic effects of climate change, science tells us that we must dramatically reduce our annual statewide GHG emissions. California has taken ambitious steps to accomplish that objective. Assembly Bill 32 (“AB 32”) requires California to reduce its total statewide GHG emissions to 1990 levels by 2020. (Health & Saf. Code, § 38550.) Under Senate Bill 32 (“SB 32”), California must reduce its GHG emissions to 40% below 1990 levels by 2030. (Health & Saf. Code, § 38566.) In addition, the Governor’s Executive Order S-3-5 (“EO S-3-05”) directs state agencies to reduce statewide GHG emissions to 80% below 1990 levels by 2050. To achieve such ambitious but necessary goals, California will have to reduce GHG emissions from various sectors of the economy. Transportation, industry, and electricity generation are the top three contributing sectors to the State’s total GHG emissions. (CARB, 2017 Climate Change Scoping Plan (Nov. 2017) at p. 11 (“Scoping Plan”).) Below is a graph showing the dramatic downward trajectory of statewide GHG reductions necessary to achieve the State’s climate goals.

FIGURE 5: PLOTTING CALIFORNIA’S PATH FORWARD

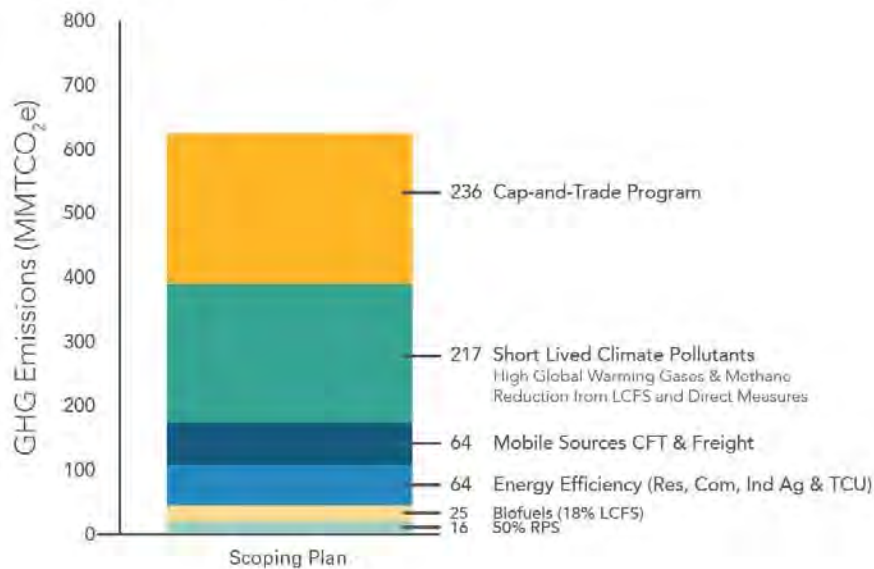


(Scoping Plan at p. 24.)

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California has adopted a multitude of regulations, requirements, plans, and policies to achieve the substantial reductions in statewide GHG emissions required by AB 32, SB 32, and EO S-3-5. CARB identified, in its Climate Change Scoping Plan, multiple required and voluntary measures working in concert as necessary for California to achieve its ambitious climate goals as depicted in the graph below. (See Scoping Plan at p. 28.)

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴

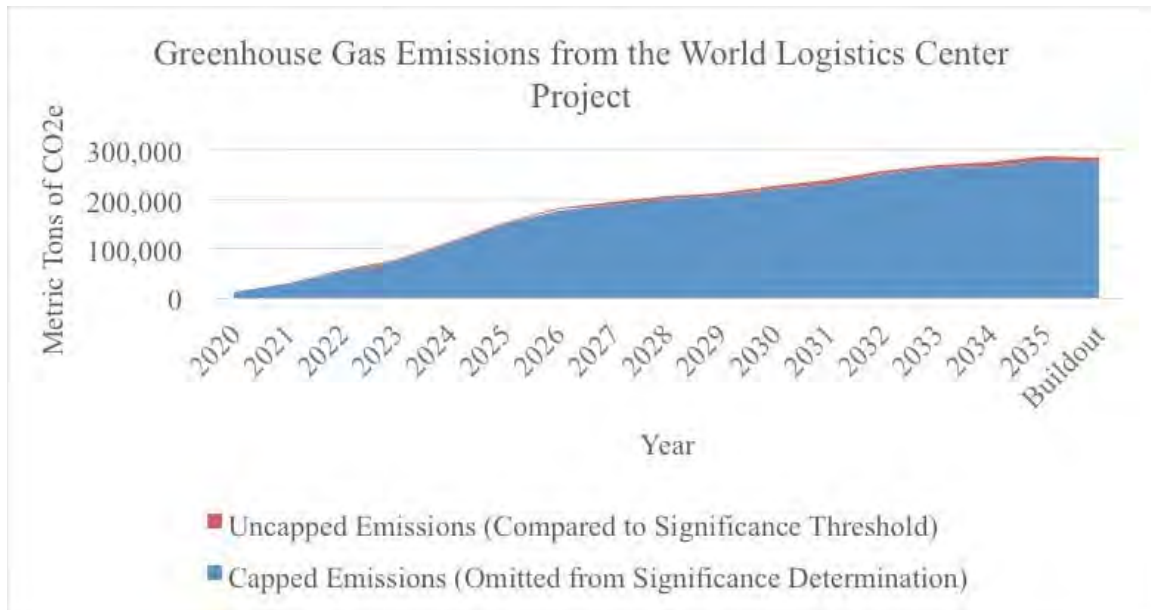


The Scoping Plan proposes various strategies for reductions in emissions from transportation and energy sectors. The Scoping Plan notes that for the GHG reductions from the transportation sector, “[vehicle miles traveled (“VMT”)] reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan.” (Scoping Plan at p. 112.) In addition, under SB 375, CARB assigns California’s 18 Metropolitan Planning Organizations targets for GHG emission reductions in the transportation sector which are to be achieved based on land use patterns and transportation systems. (CARB, Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (2017), available at https://www.arb.ca.gov/cc/sb375/final_staff_proposal_sb375_target_update_october_2017.pdf.) CARB’s recommended target for the Southern California Association of Governments is a 19% reduction in GHG emissions from transportation by 2035. (*Id.* at p. 34.)

CEQA requires the City evaluate the consistency of the Project’s substantial increases in GHG emissions with state and regional plans and policies calling for a dramatic reduction in GHG emissions. The Supreme Court in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (“*SANDAG*”) affirmed that an EIR should consider the project’s long-range greenhouse gas emission impacts through the year 2050, and address whether the project as a whole is in accord with the state’s climate goals. (*Id.* at p. 515.) The Supreme Court further instructed lead agencies to “stay in step with evolving scientific knowledge and state regulatory schemes.” (*Id.* at p. 504.)

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The RFEIR estimates that the Project's total emissions will increase from the existing conditions of no emissions at the Project site to over 281,000 metric tons of GHG emissions annually at full buildout of the Project in 2040. (RFEIR at p. 4.7-33.) See the graph below depicting the trajectory of the Project's GHG emissions.³



The Project's substantial *increase* in GHG emissions conflicts with the downward trajectory for GHG emissions necessary to achieve state climate goals. This is illustrated clearly in the sharp difference in the upward trajectory of the graph of the Project's GHG emissions versus the steep downward trajectory in the graph of the State's climate goals as depicted in Figure 5 of the Scoping Plan and reproduced above. Yet, the RFEIR failed to evaluate the Project's consistency with state and regional goals, requirements, plans, and policies to reduce

³ Visual depictions such as this graph make it easier to understand the significant impact of GHG emissions from the Project on the environment. Such clarity is encouraged by the CEQA Guidelines, which state that EIRs should be "written in plain language and may use appropriate graphics so that decisionmakers and the public can rapidly understand the documents." (Cal. Code Regs., tit. 17, § 95811.) Such graphs are also helpful because they allow the decisionmakers to see a project's proposed greenhouse gas emissions as a trajectory and assess the "significance of the *shape* of that emissions curve as a whole." (Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17, 19, available at http://legal-planet.org/wp-content/uploads/2018/09/environmental-law-news_2017_vol-26-no-2_fall_the-sandag-decision.pdf.) To better inform the public of the Project's unmitigated GHG emissions, we recommend revising the RFEIR to include graphical representations of the emissions trajectory of the project.

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GHGs that should have been analyzed under CEQA. Comparing the Project's GHG trajectory against the state's climate goals would inform the public of the Project's GHG impacts. For example, the RFEIR's GHG analysis should have considered whether the Project will increase VMT. Because it did not, it is inconsistent with SB 375. Although the RFEIR's revised traffic analysis does include a VMT analysis, it is included only to address air quality issues, and not GHGs. (RFEIR at pp. 4.7-19 and 4.15-3.) Under CEQA, the City is required to consider how the project can reduce VMT and electricity use, "rather than expecting[ing] these reductions to come [only] from technological advances or other measures." (SANDAG, at 523.) The City ignores its CEQA obligations and instead, the RFEIR obscures the Project's GHG impacts by improperly exempting them from CEQA analysis.

In addition, there is no discussion in the RFEIR of the GHG emissions from the Project over its expected lifespan. GHG emissions are estimated up until the Project's full buildout in 2040 (RFEIR at p. 4.7-33), but the Project will clearly continue beyond that point, and the RFEIR gives no indication of how long that will be. The cumulative impact of the Project's GHG emissions over its entire lifespan should be considered and mitigated to the greatest extent feasible. Notably, by failing to estimate emissions through 2050, the RFEIR obscures the extent to which the Project does or does not comply with California's explicit 2050 climate goals.

D. The RFEIR Should Analyze and Adopt Feasible Mitigation Measures to Avoid or Lessen the Project's GHG Impacts.

CEQA requires that an EIR consider and adopt feasible alternatives or mitigation measures that would substantially lessen the significant and harmful environment effects of the project being analyzed. (See Pub. Resources Code, § 21002.) The RFEIR's failure to properly analyze the Project's significant GHG impacts also results in a failure to mitigate those impacts as required by CEQA. If the RFEIR's analysis were done properly, the Project's GHG emissions from vehicles and electricity would have vastly exceeded the significance threshold selected by the City. Those emissions would therefore have to be reduced through changes or alterations in the Project, or the City would be required to explain why "[s]pecific economic, legal, social, technological, or other considerations including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives... ." (Cal. Code Regs., tit. 22, § 15091, subds. (a)(1) and (a)(3).) There may be mitigation measures or project alternatives that could reduce or avoid the Project's GHG emissions, such as the adoption of requirements mandating the use of zero emission vehicles or a certain percentage of electricity from renewable electricity sources, such as on-site solar power generation.⁴ By

⁴ The Attorney General recognizes that devising climate mitigation on a project-by-project basis can be challenging. Many local governments have therefore elected to move toward enforceable Climate Action Plans ("CAPs") integrated with their general plans. (CARB, California Climate Action Portal Map, <https://webmaps.arb.ca.gov/capmap/> (as of Sept. 7, 2018).) Done correctly, CAPs can put local governments on the path to a lower-carbon future

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excluding 97% of the Project's GHG emissions from its significance determination, the RFEIR obscures the extent of the Project's emissions and improperly evades the City's obligation to mitigate the Project's GHG impacts.

II. ADOPTION OF THIS METHOD OF EXEMPTING "CAPPED" EMISSIONS FROM CEQA ANALYSIS WILL UNDERMINE THE STATE'S VARIOUS POLICIES AND PROGRAMS TO REACH OUR AMBITIOUS CLIMATE GOALS.

The RFEIR's failure to comply with CEQA will have real consequences. If this RFEIR's approach is widely adopted, the State will not be able to achieve its ambitious climate goals. The RFEIR exempts the Project's emissions attributable to mobile sources and electricity use from CEQA analysis and mitigation. And yet transportation and electricity are two of the State's three largest sources of GHG emissions. (Scoping Plan at p. 11). Transportation and electricity are thus two of the most important areas in which GHG emissions must be reduced.

The RFEIR's approach to the transportation and electricity sectors incorrectly presumes that the Cap-and-Trade Program will achieve *all* GHG reductions necessary in those areas. But as CARB's 2017 Scoping Plan points out, "[l]ocal land use decisions play a particularly critical role in reducing GHG emissions associated with transportation, both at the project level, and in long-term plans..." (Scoping Plan at pp. 100-101.) If other lead agencies adopt the City's approach, millions of metric tons of GHGs resulting from development projects would be ignored and unmitigated through what amounts to a categorical exemption from CEQA. Local governments would therefore not be doing their part to help the State reach its ambitious, yet necessary, climate goals of emitting 40% below 1990 GHG levels by 2030 and 80% below 1990 levels by 2050. (Heath & Saf. Code, § 38566, Governor's Executive Order No. S-3-05 (June 1, 2005).)

Instead of claiming that no amount of transportation and electricity emissions can be significant under CEQA, and thus excluding them from any analysis and mitigation, lead agencies have an obligation to acknowledge the significance of such emissions and work to implement feasible mitigation of them.⁵

III. REVISING THE GHG ANALYSIS WILL LIKELY LEAD TO GREATER PROTECTION OF ENVIRONMENTAL JUSTICE COMMUNITIES.

In addition to, and separate from, the CEQA issues, revising the RFEIR's GHG analysis will likely help mitigate some of the Project's direct harmful effects on environmental justice communities. Moreno Valley contains some of the most pollution-burdened census tracts in the

while substantially streamlining the approval of individual projects that are consistent and comply with the CAP.

⁵ There are several examples of economically viable land use development projects that contributed no net additional GHG emissions. (Scoping Plan at p. 99.)

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State according to California Environmental Protection Agency's CalEnviroScreen tool.⁶ City residents experience ozone and particulate matter (PM) 2.5 at rates higher than 90% of the State. The South Coast Air Basin, where Moreno Valley is located, exceeds federal public health standards for ozone, ozone precursors, and particulate matter. Exposure to these air contaminants contributes to asthma, lung cancer, and cardiovascular disease. Indeed, residents in Moreno Valley experience higher than average emergency room visits due to asthma and higher than average rates of cardiovascular disease, particularly residents living along freeways.

Furthermore, environmental justice concerns are significant for the residents of Moreno Valley. Moreno Valley residents are predominately people of color, made up of 56.5% Hispanic and 18% African American populations. (United States Census Bureau, Quick Facts for Moreno Valley, California, <https://www.census.gov/quickfacts/fact/table/morenovalleycitycalifornia.ca/PST045217> (as of Sept. 7, 2018).) The rates of poverty are dramatically higher in Moreno Valley compared to the state—according to U.S. Census data, 18.6% of Moreno Valley residents live in poverty, compared with the statewide poverty rate of 14.4%. (*Ibid.*, and United States Census Bureau, Quick Facts for California, <https://www.census.gov/quickfacts/fact/table/ca/PST045217> (as of Sept. 7, 2018).) They experience high rates of unemployment and housing burdens (paying more than 50% of their income for housing costs). These socioeconomic characteristics of Moreno Valley residents increase their sensitivity to the health effects of the heavy pollution burdens they experience.

Adding to these burdens, Riverside County as a whole, and the City of Moreno Valley specifically, are experiencing a great influx of logistics warehouse projects. Recent developments in Moreno Valley alone include an 825,000 square-foot distribution facility for the Aldi grocery chain, a 1.6 million square-foot distribution facility for Deckers Brands footwear company, and a 1.25 million square-foot fulfillment center for Amazon. These large projects, and their related impacts on the low-income communities of color who live nearby and in the communities residing along the freeways serving them, are dwarfed by the over 40 million square-foot Project.

By conducting a proper GHG analysis in the RFEIR and adopting feasible mitigation, the City will likely better protect the environmental justice communities living near both the Project and along the freeways that trucks will use to reach the Project. Reduction of GHG emissions leads to the reduction of co-pollutant emissions. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL'Y REV. 377, 387 (“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant

⁶ CalEnviroScreen is a tool that uses environmental, health, and socioeconomic information to produce scores and rank every census tract in the state. A census tract with a high score is one that experiences a much higher pollution burden than a census tract with a low score. (See CalEnviroScreen 3.0 Report, Office of Environmental Health Hazard Assessment, January 2017, available at <https://oehha.ca.gov/media/downloads/calenviroscreen/report/ces3report.pdf>.)

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reductions as GHGs are being reduced [which] should improve the health of local communities.”)) This is especially true in the context of diesel truck emissions, where a VMT reduction would reduce both GHG emissions and co-pollutant emissions. Indeed, the RFEIR acknowledges that “[t]he *most effective way to reduce air pollution* impacts on the health of our nearly 17 million residents, including those in disproportionately impacted and environmental justice communities that are concentrated along our transportation corridors and goods movement facilities, *is to reduce emissions from mobile sources*,” and that those mobile sources constitute “the principal contributor to our air quality challenges.” (RFEIR at 4.3-11 (emphasis added).) Therefore, while revising the GHG analysis is necessary to comply with CEQA, the City should also see this as an opportunity to implement mitigation measures that would benefit the City’s residents and the other environmental justice communities impacted by this Project.

CONCLUSION

We appreciate the difficulty in analyzing GHG emissions under CEQA. However, local agencies must comply with the CEQA Guidelines for GHG analysis and cannot exempt GHG emissions from any significance analysis because of California’s Cap-and-Trade Program. We urge the City of Moreno Valley to revise the GHG analysis in the RFEIR as described above so as to support this State’s efforts to reduce GHG emissions, achieve our ambitious but necessary climate goals, and benefit local communities in the area who are already suffering some of the worst air pollution in the country. We would be happy to work with the City of Moreno Valley to take the additional steps needed to fully comply with CEQA’s GHG analysis and mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 BRIAN BILFORD
 Deputy Attorneys General

For XAVIER BECERRA
 Attorney General

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EXHIBIT B



Mary D. Nichols, Chair
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Re: World Logistics Center Revised Final Environmental Impact Report
 (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the World Logistics Center (WLC or project) Revised Final Environmental Impact Report (RFEIR). CARB appreciates the opportunity to comment on the RFEIR. Unfortunately, despite revisions, the RFEIR mischaracterizes (1) the scope of the Cap-and-Trade Program administered by CARB as they relate to the state's overall greenhouse gas reduction mandates, and (2) how that program may be relevant to a CEQA analysis. Because the RFEIR's GHG analysis relies almost entirely on those mischaracterizations for its GHG analysis and significance determination, it does not meet California Environmental Quality Act (CEQA) requirements.

The RFEIR's core flaw with regard to greenhouse gases (GHGs) is that it declines fully to analyze or mitigate emissions from fuel and electricity demand that the project will cause - the vast majority of the project's emissions - on the ground that CARB's Cap-and-Trade Program purportedly "covers" the project's emissions for this purpose. In fact, the Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground. The RFEIR's approach obscures the project's significant potential contribution to greenhouse gas emissions, and does not properly account for the combination of federal, state, and local approaches to address climate change that the crisis demands and the law requires.

We also note that the project still has not been modified to address serious health concerns from criteria and toxic air pollutants that CARB discussed in prior letters. Although this letter focuses on GHGs, we continue to be very concerned that local communities may face undue pollution from this project, if completed, as a result of inadequate mitigation.

We urge the City of Moreno Valley (City) to address the criteria and toxics issues we previously raised, and to revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, adopt feasible mitigation to

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ensure those emissions would not cause significant impacts, and recirculate the RFEIR, all as required by CEQA.

I. CARB's Participation in This Project's Review Process

CEQA requires analysis of a project's GHG emissions. Like all CEQA analyses, these disclosures must inform the public and provide appropriate information on mitigation. Planning for greenhouse gas reductions is critical at the project level, as CARB and other state agencies have repeatedly determined. Although various statewide programs address the climate change crisis as well, the CEQA guidelines, and state guidance documents, are clear that achieving the necessary reductions requires project-level focus.

The WLC project proponents have taken a different view in prior versions of the RFEIR and in related litigation, *Paulek v. City of Moreno Valley* (Riverside County Superior Court Case No. RIC 1510967) ("*Paulek*"). That case addresses, among other topics, the initial GHG analysis conducted for the WLC, and in the RFEIR. There, WLC advocates contended that, because some of the suppliers of the fuels and electricity consumed by the project are in the Cap-and-Trade Program CARB administers, the project was not required to analyze or mitigate the significant emissions impacts it would cause. Attorneys for the WLC also argued that because CARB did not specifically object to the project's GHG significance methodology, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions."¹

CARB had, in fact, recommended an array of project-based emissions reductions strategies contrary to these claims. CARB takes this opportunity to reiterate those recommendations (prior letters are attached) and to explain why the Cap-and-Trade Program's operations do not allow a departure from CEQA's general rule that project-level impacts be properly addressed.²

¹ Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, page 18, Lines 3-7.

² In both of CARB's comment letters, which we again incorporate by reference, CARB indicated that its recommendations were for the purpose of reducing not only criteria and toxics pollutants, but also for GHG emissions. CARB reviewed the Draft Environmental Impact Report (DEIR) and provided comments to the City of Moreno Valley in a letter dated April 16, 2013. CARB's comment letter expressed concern over the increase in health risk in the immediate area and the significant and unavoidable air quality and greenhouse gas (GHG) related impacts caused by the proposed WLC. To address those concerns, CARB recommended actions to support the development, demonstration, and deployment of zero and near-zero emission technology at the WLC. On June 8, 2015, CARB again provided comments on the Final Environmental Impact Report (FEIR), making similar recommendations. In those comments, CARB noted that the FEIR was unresponsive to the comments CARB provided in its April 16, 2013 letter regarding the DEIR. (See CARB April 16, 2013 letter at 2; CARB June 8, 2015 letter at 1, 3, and 8.)

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II. The RFEIR's Claims About CARB's Cap-and-Trade Regulation Are Incorrect

CEQA translates between high-level policy goals, and individual project choices to better inform the public and support decision-making. The GHG section of the RFEIR takes a novel, and factually unsupported, departure from ordinary CEQA practice by essentially excusing analysis and potential mitigation of GHG emissions when they are indirectly "covered" by a state program. Yet, state programs regularly address at least some aspect of essentially all CEQA impact areas – from state water pollution standards to habitat conservation laws to building codes to endangered species mandates, projects are always considered against a backdrop of state rules. In the ordinary course, the presence of state programs is not taken simply to "cover" the relevant project level impact. On the contrary, CEQA requires project proponents to inquire as to how the project affects environmental resources of statewide concern and to focus on project-level analysis and mitigation. The same rule applies with regard to greenhouse gases. As the California Supreme Court has held, "[l]ocal governments thus bear the primary burden of evaluating a land use project's impacts on greenhouse gas emissions."³

Project proponents may refer to statewide analyses and programs, but, as the Court held, ultimately must provide "substantial evidentiary support" explaining how project-level decisions relate to state-level programs to justify findings of significance based on those programs.⁴ This is particularly important for new projects, as, per the Court, "a greater degree of reduction may be needed from new projects than from the economy as a whole."⁵ And these projects may not simply point to *any* statewide regulations; on the contrary, "[a] significance analysis based on compliance with such statewide regulations ... only goes to impacts within the area governed by the regulations."⁶

In this instance, the Cap-and-Trade Program simply does not cover the project, or require it do anything to mitigate its emissions. As the Court explained, CARB has not "propose[d] statewide regulations of land use planning, but relies instead on local governments." (*Id.* at 230).

CARB has expressed its non-binding views on these matters via the Scoping Plans it is required to prepare under AB 32. The California Supreme Court has recognized the

CARB was not silent. Moreover, an inference from silence would be improper, in any event. CARB sometimes does not comment on individual projects' GHG or other analyses due to resource constraints and other considerations. Nothing should be inferred from silence on a particular matter.

³ *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 230).

⁴ *Id.* at 226-230.

⁵ *Id.* at 225.

⁶ *Id.* at 229.

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Scoping Plan as a valuable source of data for local governments.⁷ As each version of CARB's Scoping Plan, including the recent 2017 Scoping Plan Update, explains, on the basis of extensive modeling and analysis, the Cap-and-Trade Program is not intended to address project-level impacts and does not do so. Rather, complementary measures, including land-use planning and project-level analyses, are vital adjuncts to the Cap-and-Trade Program, serve additional purposes to address climate change, and, if neglected, put undue and unanticipated pressure on the Program. The RFEIR's analysis would thus make the problem it purports to analyze even worse; if followed generally, it would result in development patterns and mitigation choices that would lessen the state's ability to address climate change, and would contribute to cumulatively considerable impacts.

Rather than address project-level emissions, the Cap-and-Trade Program covers activities related to electricity generation, natural gas supply, oil and gas extraction, refining, and transportation fuel supply and combustion. The points of regulation are the operators of electricity generating plants, natural gas fuel suppliers, operators of oil and gas extraction facilities, refinery operators, and transportation fuel suppliers at the rack. See Tit. 17, Cal. Code Regs., § 95811. The Program also addresses GHG emissions in aggregate at the state level and is not intended nor designed to mitigate greenhouse gas from, or otherwise inform, local land use decisions. Without adequate analysis and mitigation, local jurisdictions may not appropriately consider the greenhouse gas implications of their decisions, conflicting with a core CEQA principle of promoting informed decisionmaking. Rather, demand for fuels and electricity created by poorly-planned local projects creates unnecessary demand on the Cap-and-Trade system, potentially raising prices in the system and making statewide compliance more difficult.

These impacts could be substantial because the transportation sector is the state's largest source of GHG emissions (as well as criteria and toxic pollutant emissions, as we have previously addressed with regard to this project). The recently released California Greenhouse Gas Emission Inventory – 2018 Edition shows that while the state's overall GHG emissions declined from 2015 to 2016, the emissions in the transportation sector increased 2 percent over that same time period.⁸ This increase was driven by increases in fuel purchases and use. To effectively achieve the State's GHG target, both production and demand for energy and fuels must be addressed. The

⁷ As the California Supreme Court has held "CEQA requires public agencies...to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Cleveland National Forest Foundation v. San Diego Ass'n of Governments* (2017) 3 Cal. 5th 497, 504.) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17))

⁸ See https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf.

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Legislature recognized this need with regard to electricity when passing SB 350 (Stats. 2015 Ch. 547, De León) to increase the Renewable Portfolio Standard and double energy savings. A similar approach is needed for transportation sector emissions. State-level production side policies such as the Renewable Portfolio Standard, Low Carbon Fuel Standard, and Cap-and-Trade Program cannot alone achieve the State's GHG reduction targets.

In this instance, the RFEIR not only improperly relies on the Cap-and-Trade Regulation; it also fails fully to address consistency with the local measures that *do* more clearly apply. There are a suite of potential emissions reduction strategies identified in the 2017 Scoping Plan aimed at reducing GHG emissions from on-road vehicle travel (e.g., fuel economy standards, technology advancements, SB 375⁹), and the majority of such emissions are not covered in any way by the Cap-and-Trade program.

The City chose not to analyze the project's consistency with the applicable Regional Transportation Plan (RTP), for example, which is subject to GHG emissions reduction targets set by CARB pursuant to SB 375. The City asserted that the RTP does not apply to this project (Table 4.7-11, page 4.7-41 of the RDEIR). We disagree, and suggest that a more appropriate analysis would be whether the project's GHG emissions from on-road transportation would be consistent with, or conflict with, assumptions in the applicable RTP found to comply with SB 375. The city might also refer to the additional nonbinding recommendations offered in CARB's Scoping Plan, though the application of these recommendations, if used, depend on the circumstances of a particular project.

We discuss these points in more detail below.

A. The Cap-and-Trade Regulation Was Never Designed to Achieve All Necessary GHG Reductions From Land Use and Logistics Planning.

The Cap-and-Trade Program was designed from the start as one of a diverse suite of measures, some statewide and some local, to move California toward achieving its GHG targets. To understand the Cap-and-Trade Program's purposes and limitations, the Scoping Plan provides helpful context. The Cap-and-Trade Program covers about 80 percent of all GHG emissions in California.¹⁰ Crucially, just because emissions are "covered" by Cap-and-Trade does not mean all of those emissions from any particular covered entity are mitigated or reduced. It simply means they are included in the cap.

⁹ SB 375 (Steinberg, Statutes of 2008).

¹⁰ Scoping Plan at ES16.

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Thirty-nine percent of California's GHG emissions come from the transportation sector, including logistics-related transportation (like the WLC would involve).¹¹ Another 19 percent of the state's GHG emissions comes from electricity generation.¹² In addition to Cap-and-Trade, the Scoping Plan includes various other CARB measures, some of which also address transportation and electricity sector emissions, including SB 350, the Low Carbon Fuel Standard, the Mobile Source Strategy, and the Sustainable Freight Action Plan. In addition to the other complementary Scoping Plan measures, the Scoping Plan also clearly states that "[l]ocal government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals."¹³

The RFEIR's GHG methodology departs from this science, and has enormous implications for other projects across the state: it would amount to a determination that massive logistics centers, sprawling far-flung residential developments, and other types of remote greenfield development need not do anything to address and mitigate their GHG emissions because those emissions are already "taken care of" by the Cap-and-Trade Program. This is simply not true.

B. The Cap-and-Trade Regulation Is Not Intended to Bear the Burden of Achieving the State's Transportation and Energy Sector GHG Goals Alone.

Cap-and-Trade is not intended to achieve California's climate goals on its own. Rather, Cap-and-Trade is designed to motivate behavior by capping and pricing carbon at the regulated entity level – that is, at the industrial facility and fuel/energy supplier level. It does not send a direct price signal to developers of land use or logistics projects. This means, if CEQA and other "checks" on unsustainable development are weakened as the WLC analysis proposes, such development would simply continue without direct cost to the developers, while adding market demand without mitigating the WLC's emissions.

Moreover, if land use development does not account for GHG emissions, more and more of our state's carbon "cap" would be taken up by increasing transportation emissions. Developers do not receive a price signal from Cap-and-Trade, meaning that there will be no clear incentive to alter this pattern, even as it impacts the Cap-and-Trade system. Thus, the prices of compliance instruments under the Cap-and-Trade Program would increase at a higher rate than was contemplated when CARB developed the Cap-and-Trade Program. This would eventually cause a greater cost burden than

¹¹ As noted above, transportation-related GHG emissions have increased, from 37% in 2015, to 39% in 2016. See CARB, *California Greenhouse Gas Emissions for 2000 to 2016, Trends of Emissions and Other Indicators* (July 2018) at 1 (available at https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf); see also Scoping Plan at ES1.

¹² Scoping Plan at ES1.

¹³ Scoping Plan at 99.; see also page 101.

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anticipated, and it would be borne by all Californians rather than dealt with during the project design phase. Properly-designed local policies, by contrast, may account for GHG emissions of development in a direct way—which furthers the equity objectives of AB 32, complements Cap-and-Trade, and better achieves California’s climate goals.

C. There Is No Substantial Evidence Showing that the Project’s Transportation and Electricity Related Emissions Would Actually Be Mitigated.

In the face of these substantial difficulties, the RFEIR does not articulate substantial evidence demonstrating a rational connection to the Cap-and-Trade Program – and that connection is badly attenuated, as we have explained. The project developer in this instance is claiming it may do nothing with regard to fuels and electricity, and will rely on reductions other entities may achieve. This is not the tight evidentiary connection required by the Supreme Court and by CEQA, and it is not consistent with the State’s GHG reduction programs.

The Final Statement of Reasons (FSOR) prepared when section 15064.4 of the CEQA guidelines, concerning GHGs, was promulgated demonstrates that to properly rely on subsection (b)(3), concerning compliance with statewide programs, a project must demonstrate *with evidence in the record* how the regulations of GHG emissions would actually address the emissions that result from the project. That document states:

Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. *Thus, for example, a subdivision project could not demonstrate consistency with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision.* (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)¹⁴

Here, there is no evidence in the RFEIR regarding who is responsible for complying with Cap-and-Trade for all the GHG emissions at issue in this case – and it certainly is not the project itself. The project is a logistics facility, with trucks involved in interstate commerce, and it is not covered by that Program. Indeed, there is no basis for the

¹⁴ See Natural Resources Agency, Final Statement of Reasons for Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009) at 27 (emphasis added).

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RFEIR's conclusion that the fuel for all of the vehicles serving the project would be covered under the Cap-and-Trade regulation, since it is not clear that all of these vehicles would even purchase their fuel in California.

D. The Project Fails to Account for the Duration of the Project Compared to the Duration of the Cap-and-Trade Program.

The RFEIR states the project's buildout year is 2035,¹⁵ yet the GHG analysis seems to stop after 2035. This raises multiple problems for the RFEIR analysis.

First, it is unclear why the analysis stops at buildout, when GHG emissions (and other environmental impacts) would continue into the indefinite future – at their highest levels – once full operations begin. Without further analysis throughout the project's anticipated life (which does not appear to be stated in the RFEIR but, presumably, would be at least 30 years after buildout), the analysis is incomplete and dramatically understates the project's GHG emissions. This also means the project would likely place a much higher burden on the Cap-and-Trade program than disclosed in the RFEIR – a burden that, as described above, is pushed onto all Californians instead of the project developer as a result of the project's failure to mitigate the vast majority of its GHG emissions.

Second, the RFEIR fails to account for, or even consider, the fact that the current Cap-and-Trade regulation extends only to 2030 – which is five years *before* the project's full buildout is achieved. This means that the RFEIR has no plan whatsoever to account for its GHG emissions once the project is fully built out. The RFEIR also does not address the inconsistency between the project's GHG emissions and Executive Order S-03-05, which, among other things, establishes a state GHG reduction target to reduce GHG emissions to 80 percent below 1990 levels by 2050.¹⁶ The California Supreme Court has emphasized the importance of California's GHG targets in selecting appropriate CEQA thresholds.¹⁷ Despite these considerations, there is no substantial evidence in the record to ensure that *any* of the project's post-buildout operational emissions are mitigated by the Cap-and-Trade program.

E. The Project Fails to Include a Backstop In Case Cap-and-Trade is Altered.

¹⁵ Revised FEIR at 3-1.

¹⁶ See Governor's Executive Order No. S-03-05 (June 1, 2005) (available at [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf)); see also Governor's Executive Order No. B-30-15 (April 29, 2015) (available at <https://www.gov.ca.gov/2015/04/29/news18938/>).

¹⁷ See *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497 at 516-519.

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In addition to its other evidentiary flaws, the RFEIR does not analyze how the analysis would change, and how the project's significant GHG impacts would be mitigated, if Cap-and-Trade were revised in a way that affects the state's GHG levels. In other words, the RFEIR's approach puts an almost complete reliance on the Cap-and-Trade Program in ways that, if adopted generally, would considerably affect the Program, and then fails to consider the possibility that the Program might change even as the Project continues to exist. This could include, for example, a scenario in which:

- The Cap-and-Trade program ceased to exist, or
- If the scope of the program were limited to exclude fuels and electricity, or
- If the Legislature or other factors required the program to be amended in a way that allows a higher cap.

Rather than anticipating any of these or other potential contingencies and building in an appropriate backstop to ensure the project's GHG emissions are mitigated below significance, the RFEIR instead blindly relies on the current Cap-and-Trade Program, with no further commitments or requirements. As a result, the RFEIR fails to provide substantial evidence supporting its conclusion that the project will result in less than significant GHG emissions, while forwarding an analysis that, if accepted, would make the state significantly less able to address climate change impacts resulting from its built infrastructure.

III. The RFEIR is Inconsistent with CEQA Requirements.

The RFEIR's multiple errors with regard to the Cap-and-Trade Program render it contrary with CEQA law. The RFEIR misapplies the key CEQA Guideline, section 15064.4(b), which provides in pertinent part:¹⁸

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 3. The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and

¹⁸ CEQA Guidelines § 15064.4(b) (emphasis added).

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must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. *If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Thus, the CEQA Guidelines focus on project-level compliance and project-level impacts. State programs are available for consideration, but they are not held out as a panacea, for GHGs any more than for any other resource area.

Yet, the RFEIR relies upon subsection (b)(3) of this provision to claim that emissions which are indirectly included under the “cap” created by the Cap-and-Trade Program (referred to in the RFEIR as “capped emissions”) need not be analyzed and mitigated under CEQA. This approach would excuse all of the WLC’s transportation and electricity related emissions, leaving the project only “on the hook” for analyzing and mitigating a tiny fraction of its emissions. The following sections explain why this approach is legally and factually flawed.

A. Subsection (b)(3) Itself Does Not Allow The Approach Used in the Revised Final EIR.

As noted above, subsection (b)(3) of CEQA Guidelines section 15064.4 can be used as a factor to assess GHG significance when “*the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions...” Here, the RFEIR concedes that the project is not subject to the Cap-and-Trade Regulation.¹⁹ This in itself should be sufficient to demonstrate that subsection (b)(3) is inapplicable to the project, as “the project” does not “comply” with Cap-and-Trade at all.

B. The RFEIR’s Hybrid Approach Used To Determine Significance Is Not Allowed.

In addition to improperly relying on subsection (b)(3), as described above, the RFEIR improperly attempts to create a “hybrid” significance scheme based on selectively combining subsection (b)(3) with the South Coast Air Quality Management District’s (SCAQMD) bright-line threshold. As explained in the RFEIR, a potentially appropriate significance threshold in this case is the SCAQMD’s 10,000 metric ton threshold.²⁰ The problem here is that the RFEIR does not compare the project’s GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Rather, the RFEIR simply subtracts from its emissions quantifications any GHG emissions that it deems to be “capped,” and compares only the net “non-capped” emissions against the bright-line threshold.

¹⁹ See page 4.7-4.

²⁰ RFEIR at 4.7-21.

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This approach is unsupported in law. Regardless of which threshold applies, CEQA requires lead agencies to “make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project.”²¹ CEQA then provides that the lead agency must consider “whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project.”²² Thus, even if subsection (b)(3) properly applied here (which it does not, as explained above), nothing in the CEQA Guidelines allows this hybrid approach of cherry-picking what emissions are applied to an otherwise-applicable bright-line threshold. The City has not even attempted to satisfy its burden of providing such substantial evidence. As noted elsewhere in this letter, Cap-and-Trade does not result in ton-for-ton mitigation of each metric ton covered by the program. Rather, it is a declining market-wide cap designed to achieve certain statewide goals – which, as explained elsewhere in this document, is not designed to mitigate all GHG emissions from land use and logistics facilities.

Because the REFIR fails to properly apply the vast majority of the project’s GHG emissions to the applicable bright-line significance threshold, it also fails to mitigate those emissions, as it simply dismisses them as “less than significant”. If the full scope of the GHG emissions attributable to the project were compared to the applicable bright-line threshold, the mitigated emissions would still be substantially over the threshold. CEQA requires that the project’s significant GHG emissions must be mitigated to the extent feasible. Additional mitigation measures are available to further reduce the project’s GHG emissions that were not considered due to the inappropriate exclusion of the majority of project-generated emissions from the analysis.

C. Reliance Upon *AIR v. Kern County* Is Improper.

While the RFEIR provides little support for the GHG significance approach it takes, the briefing for *Paulek* further explains the reasoning behind the project’s GHG analysis. In those briefs, attorneys for the developer claim that an unrelated appellate ruling, the *AIR v. Kern County* decision²³ is relevant. That decision concerned CEQA analyses for sources actually covered by the Cap-and-Trade Regulation, but the claim is that it somehow applies not only to GHGs from projects that are directly subject to the Cap-and-Trade Regulation, but also to all transportation and electricity related GHG

²¹ CEQA Guidelines § 15064.4(a).

²² CEQA Guidelines § 15064.4(b)(2).

²³ *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal. App. 5th 708. In CARB’s view this case was wrongly decided as to the Cap-and-Trade issue, and it is certainly not apposite in this very different context.

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emissions, the logic being that those emissions are technically included in the statewide "cap" on emissions. This is incorrect factually, for all the reasons discussed above.

It is also not a controlling case legally. The holding in *AIR v. Kern County* addressed whether it "is appropriate for a lead agency to conclude a *project compliance* [sic] with the cap-and-trade program provides a sufficient basis for determining the impact of the project's greenhouse gas emissions will be less than significant."²⁴ The project at issue in that case was a refinery that was directly subject to the Cap-and-Trade Regulation. The court did not address the broader question of whether *all* GHG emissions from resources that are indirectly covered by Cap-and-Trade, at some undefined upstream point, may be cast aside as less than significant. Here, as noted above, the WLC is *not* subject to the Cap-and-Trade regulation. It therefore does not "comply" with the Cap-and-Trade program, and is distinguishable from the project at issue in *AIR v. Kern County*.

C. Reliance Upon Obscure 2013 Negative Declarations and a Policy Document from Another District Is Similarly Uncompelling.

The RFEIR itself also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations,²⁵ and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD) titled Policy APR-2025. The RFEIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a 2014 policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. Furthermore, the primary SJVAPCD guidance documents regarding analyzing and mitigating GHG emissions under CEQA make no mention of Policy APR-2025, including the guidance documents relied upon in the *AIR v. Kern County* decision.²⁶

To the extent the RFEIR is considering what other air districts have done, it is worth noting that the California Air Pollution Control Officers' Association (CAPCOA) has considered a range of potential CEQA significance thresholds, none of which summarily

²⁴ *AIR v. Kern County* at 743 (emphasis added).

²⁵ The Revised FEIR only cryptically references these MNDs, without citations or links to the documents, and without any other information explaining the basis for their CEQA significance approach. The RFEIR's failure to include or adequately reference these mitigated negative declarations hampers the public's ability to review and comment on the RFEIR.

²⁶ See, e.g., *AIR v. Kern County* at 743-744; see also http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf; <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>.

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exclude emissions that are indirectly included within the Cap-and-Trade program.²⁷ While that document was generated in 2008, it makes multiple references to the Cap-and-Trade program, and does not endorse simply subtracting all so-called “capped emissions” from GHG analyses.

D. Even If CEQA Guideline 15064.4(b)(3) Applied Here, The RFEIR Ignores Other Requirements in the CEQA Guidelines.

The sections above provide in-depth analysis regarding why subsection (b)(3) of CEQA Guideline 15064.4 does not allow this project to simply disregard the vast majority of its GHG emissions. Even if that subsection did apply, there are other deficiencies in the RFEIR’s GHG analysis that must be addressed.

First, the CEQA Guidelines make clear that an agency cannot focus solely on a single significance consideration while ignoring other evidence or indicators showing potentially significant impacts. For example:

- Section 15064.4(b) states that “[a] lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment.”
- Section 15064.4(b)(3) provides in pertinent part: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.”
- Section 15064(h)(3) provides: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding that the project complies with the specified plan or mitigation program addressing the cumulative problem, an EIR must be prepared for the project.”

As discussed in depth above, there is evidence in this record showing significant GHG impacts that were not analyzed or mitigated in the RFEIR. CEQA does not allow these impacts to be overlooked, even if the lead agency believes the project’s GHG emissions would be less than significant under one particular (and here, improper) significance metric.

IV. Criteria Pollutants and Toxic Emissions Must Still Be Considered

In its 2013 and 2015 comment letters, CARB noted its substantial concerns regarding the project’s air pollutant and toxics emissions, and suggested several feasible means of reducing the significant impacts from those emissions. These emissions raise

²⁷ See CAPCOA, CEQA & Climate Change (January 2008). Available at <http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf>.

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substantial local exposure and environmental justice concerns, as Moreno Valley already suffers from very substantial air pollution exposures. These exposures would likely be worsened without appropriate mitigation measures.²⁸ CARB incorporates the comments from those letters into this letter by reference, and strongly recommends that the RFEIR be revised to incorporate all mitigation recommended in its 2013 and 2015 comment letters.

V. Conclusion

While the WLC has enormous GHG implications in itself, the attention this project has received, and the recent legal developments in the emerging *AIR v. Kern County* and *Paulek* line of cases, demonstrate that the City's decisions in the RFEIR have implications beyond the WLC project as well. The City should revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, and adopt feasible mitigation to ensure those emissions would not cause significant impacts, as required by CEQA.

Sincerely,



Richard W. Corey
Executive Officer

²⁸ On these issues of acute local exposure, especially to roadway emissions, and the importance of fully addressing these sources of risk, see Ann Carlson, *The Clean Air Act's Blind Spot: Microclimates and Hotspot Pollution* (2018) 65 UCLA L. Rev. 1036.

EXHIBIT C



Gavin Newsom, Governor
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January 30, 2020

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Re: World Logistics Center Draft Recirculated Revised Sections of the Final Environmental Impact Report (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR) for the World Logistics Center (WLC or Project). CARB appreciates the opportunity to comment on the RRSFEIR, and raises two primary issues with the RRSFEIR in this letter.

1. The RRSFEIR contains the same flawed GHG analysis as the RFEIR.

CARB previously reviewed the City's July 2018 Revised Final Environmental Impact Report (RFEIR), and submitted comments regarding the RFEIR on September 7, 2018. As noted in that comment letter, CARB believes the RFEIR's analysis of greenhouse gas (GHG) related impacts does not meet California Environmental Quality Act (CEQA) requirements, as it relies almost entirely on mischaracterizations to reach its less-than-significant impact determination.

Unfortunately, the flaws described in CARB's September 7, 2018 comment letter remain in the RRSFEIR, which continues to rely upon mischaracterizations regarding California's Cap-and-Trade Program to dismiss any serious analysis or mitigation of the Project's GHG emissions. Therefore, as part of its comments on the current draft RRSFEIR, CARB re-submits its September 7, 2018 comment letter (attached to this letter) in its entirety. CARB directs its comments toward both the direct and cumulative impact analysis sections in the RRSFEIR.

2. The RRSFEIR does not include the new GHG mitigation measures it references.

The RRSFEIR includes passing references to new GHG-related mitigation measures, particularly measures 4.7.6.1E-1 and 4.7.6.1E-2 (see pages 4.7-20, 6.7-14, and 6.7-20). However, it appears the measures themselves have not been included in the RRSFEIR. Without the ability to review the mitigation measures relied upon by the City in reaching its significance determinations, the public has no way to evaluate the effectiveness of those measures, thwarting CEQA's public disclosure purpose.


Mr. Albert Armijo
January 30, 2020
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Conclusion

Both this comment letter and CARB's September 7, 2018 comment letter set forth substantial deficiencies in the environmental analysis prepared for the WLC project. Given these deficiencies, the City should revise the RRSFEIR to include adequate analysis and mitigation regarding all of the Project's environmental impacts, including GHG, air quality, and cumulative impacts. The City should then re-circulate the document for public review to allow the public to review and comment on the City's revised proposal.

Thank you for your consideration. As always, we welcome any questions from the City regarding ways to adequately analyze and mitigate the Project's GHG emissions.

Sincerely,



Richard W. Corey
Executive Officer

Enclosure: CARB's September 7, 2018 comment letter regarding the WLC RFEIR.

EXHIBIT D

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FOURTH APPELLATE DISTRICT, DIVISION TWO

ALBERT THOMAS PAULEK, et al.,

Plaintiffs and Respondents,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Appellants.

HF PROPERTIES, et al.,

Real Parties in Interest and Appellants.

Case No. E071184
(Riverside Cty.
Super. Ct. No.
RIC1510967 MF,
RIC1511279, RIC1511327,
RIC1511421, &
RIC1511195)

**LABORERS INTERNATIONAL UNION OF
NORTH AMERICA, LOCAL 1184, et al.,**

Plaintiffs and Appellants,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Respondents.

HF PROPERTIES, et al.,

Real Parties in Interest and Respondents.

(Riverside Cty. Super. Ct.
No. RIC 1511279 &
RIC1511327)

Riverside County Superior Court
The Honorable Sharon J. Waters, Judge

**BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE
CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS
AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND
PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION
OF NORTH AMERICA, LOCAL 1184, ET AL.**

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Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

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INTRODUCTION

The massive World Logistics Center (Project) will cause approximately 70,000 daily truck trips transporting goods from the ports of Long Beach and Los Angeles to Moreno Valley. (AR 003039, 058605–06.) These vehicle trips will emit hundreds of thousands of metric tons of greenhouse gas (GHG) emissions every year over the life of the Project. (AR 002729.) These GHG emissions, along with emissions from electricity needed to power the more than 40-million-square-foot project, will add to the existing climate pollutant problem, accumulating in the atmosphere and persisting for decades or longer.

Rather than analyzing and mitigating the Project’s emissions, lead agency Respondents Moreno Valley Community Services District, *et al.* (Respondents) shirk their responsibility as a local government to address climate change. They improperly rely on CARB’s statewide Cap-and-Trade climate program (Cap-and-Trade Program), which does not impose any regulatory requirements on this Project, as an excuse not to analyze and mitigate the Project’s climate change impacts. Respondents improperly ignore roughly 95% of the GHG emissions from the Project (AR 002718–19), disregarding the significance of those emissions, avoiding their duty to adopt all feasible mitigation measures, and failing to properly disclose their responsibility for this pollution to the public.

Respondents’ approach mischaracterizes the way state climate policies work and violates the California Environmental Quality Act (CEQA). CEQA directs that Respondents take “all action necessary” to protect the environment, recognizing the importance of local action driven through “meaningful” consideration of environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21002, 21002.1.) CEQA does not allow Respondents to waive their CEQA obligations by pointing to a regulation that does not bind them (Cal. Code Regs., tit. 14, § 15000 et seq. (CEQA

Guidelines), § 15064.4), and Respondents wholly misconstrue the regulatory scheme they seek to use.

Although Respondents claim their approach is consistent with state climate policy, it is not. (See Plaintiffs/Appellants’ Supplemental Request Regarding Judicial Notice, Exhibit 1, California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) (2017 Scoping Plan) at pp. 19 [“Local actions are critical for implementation of California’s ambitious climate agenda”], 97–99 [more extensive discussion about the need for local action to achieve California’s climate goals]; see also Health & Saf. Code, §§ 38502, subd. (h) [identifying competing priorities to balance in emissions reductions], 38592 [nothing in this division relieves any person, entity, or agency of compliance with other law], 38690 [identifying overlapping automobile emissions policy].) Respondents’ approach has been repudiated by CARB, the Attorney General’s Office, and the Natural Resources Agency, as contrary to critical state climate goals. The state has long—and expressly—relied on a portfolio of climate change measures, including significant efforts by local governments, to address emissions that result from their land use decisions.

Respondents rely on the Cap-and-Trade Program to excuse their obligation to make better land use decisions. Cap-and-Trade is not intended as a stand-alone climate policy; instead, it assumes steady efforts to reduce emissions across the state. While Cap-and-Trade has an important role to play in limiting emissions from entities like power plants and refineries, the Program does not cover a host of other sources, including warehouses. Although the Program creates financial and legal obligations on fuel suppliers and electricity generators that may ultimately supply this Project, the Project experiences neither the direct legal requirements of the Program nor the full economic costs associated with its additional emissions. If projects were allowed to evade responsibility in

this way, they would steadily increase Cap-and-Trade Program costs upstream, while locking the state into ever-more expensive and inappropriate high-emitting development patterns. This is a recipe for failure in achieving the state’s climate goals. To avoid this scenario, the state relies on local governments to limit emissions from new development projects. Emissions from such projects are the responsibility of local governments and should be mitigated through the proper application of CEQA. Eliminating this crucial piece of the state’s portfolio approach undermines the state’s climate goals.

We have arrived at a crossroads for the future of GHG analysis under CEQA. If Respondents prevail, this case could singlehandedly undo the will of the Legislature by excusing essentially all projects from the obligation to consider GHG impacts from vehicle trips and energy use. This Court should reject Respondents’ argument and confirm that all lead agencies must do their part if we are to meet the state’s long-term climate stabilization objective.

STATEMENT OF INTERESTS

I. INTEREST OF THE ATTORNEY GENERAL

California has already begun to experience significant adverse impacts from climate change such as “more frequent, more catastrophic and more costly” wildfires, drought, “coastal erosion, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.” (2017 Scoping Plan at p. ES2.) As California’s chief law enforcement officer, the Attorney General has the independent power and duty to protect the interest of all of California’s current and future residents in a clean, health, and safe environment. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 15.)

Upholding this duty, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change for well over a decade. (See, e.g., *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”]; *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465; *People v. County of San Bernardino* (San Bernardino County 2007) No. CIVSS0700329.)

The World Logistics Center, like every large development project, has the potential to either facilitate or hinder the state’s achievement of its climate goals. Here, Respondents’ unsupported approach to analyzing the Project’s GHG emissions has the potential to seriously undermine the overall effort to meet the state’s science-based GHG reduction goals for the transportation and land use sectors and to disproportionately affect environmental justice communities.¹ Given these significant interests, the Attorney General submits this amicus brief in support of Appellants,² in compliance with rule 8.200(c)(7) of the California Rules of Court in his independent capacity and on behalf of the California Air Resources Board (CARB).

¹ The Attorney General opposed this methodology in a comment letter it submitted on the revised sections of the Final EIR for this Project (Revised Final EIR or RFEIR). (Letter re: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project, Sept. 7, 2018, at:

<<https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/comments-revised-sections-feir.pdf?>>.) The Revised Final EIR is not at issue in this litigation, but it includes the original EIR’s same flawed GHG analysis.

² This brief is submitted in support of Plaintiffs and Respondents Albert Thomas Paulek, et al. and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, et al.

II. INTEREST OF THE CALIFORNIA AIR RESOURCES BOARD

CARB has a strong interest in participating in this case as amicus curiae. CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. As creator and administrator of the Cap-and-Trade Program, and as the lead agency on the Scoping Plan setting out many of the state’s climate policies, CARB is an expert on how the Cap-and-Trade Program was designed to function and interact with other state laws and programs as part of California’s portfolio approach to addressing GHG emissions. In their briefing, Respondents misrepresent CARB as effectively endorsing the EIR’s approach to GHG analysis. (Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 17, 36–38, 47–48, 56, 63.) But CARB has repeatedly made clear it does *not* support Respondents’ approach.³ As explained more fully below, Respondents’ arguments regarding GHG analysis are contrary to the construction given to applicable regulations by CARB, and by the Natural Resources Agency, agencies charged with interpreting and enforcing the programs at issue.

BACKGROUND

I. LEGAL BACKGROUND REGARDING CALIFORNIA’S EFFORTS TO COMBAT CLIMATE CHANGE

In 2006, recognizing the importance of combatting climate change and furthering the objectives of Executive Order S-3-05, the Legislature enacted the Global Warming Solutions Act of 2006, commonly known as

³ CARB also explained this approach when it formally opposed the GHG analysis Respondents rely on here through its comments on the RFEIR for this Project. (Letter re: World Logistics Center Revised Final Environmental Impact Report, Sept. 7, 2018, at: <https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.236813640.855160185.1575908432-1460774677.1564163003>.)

AB 32. (Health & Saf. Code, § 38500, et seq.) AB 32 mandates that, by 2020, California must reduce its total statewide annual GHG emissions to the level they were in 1990, and to 40 percent below that level by 2030. (Health & Saf. Code, §§ 38550, 38566.) This mandate puts the state on a trajectory of significant and continuous GHG emissions reductions through 2050, in order to stabilize the atmospheric levels of GHGs and reduce the risk of dangerous climate change.

Under AB 32, the Legislature tasked CARB with preparing a guidance planning document, known as the Scoping Plan that, while not binding, set out the state’s views based on extensive environmental and economic analyses on how policies may be effectively implemented so that California will meet the its ambitious GHG reduction goals. (See Health & Saf. Code, §§ 38561 et seq.) The Scoping Plan emphasizes the need for a multi-pronged emissions reduction approach that can be carried out by many entities and reflects the state’s position that it is necessary to reduce emissions at the source and through reductions in demand for energy. (2017 Scoping Plan, pp. 12, 19, 28).

The Scoping Plan includes a suite of regulations, measures, and policies designed to operate together to reduce GHG emissions. The Cap-and-Trade Program is one such policy. Entities that are directly subject to the Cap-and-Trade Program—like power plants, factories, refineries, and electricity generators and importers—must purchase and surrender compliance instruments (e.g., allowances) for their emissions. (See Cal. Code Regs., tit. 17, § 95812.) Downstream emitters such as cars and trucks, much less warehouses that such cars and trucks drive to, are not covered entities under Cap-and-Trade and have no such obligation to purchase or surrender allowances. The existence of the Program, in other words, does not obviate the need for action at other levels of the economy. On the contrary: If sources like the long-lasting development project in this

case build without regard to their emissions, they will increase overall state emissions and hence increase pressure and costs within the Cap-and-Trade Program.

To address the wide range of GHG emissions sources that are not directly controlled through the Cap-and-Trade Program, the state relies on other policies⁴—many of which require collaboration between the state and local governments. Agencies large and small across the state (including, crucially, cities and counties) are responsible for ensuring that proposed new land use plans, transportation projects, and development projects are consistent with evolving scientific knowledge and state regulatory schemes; CEQA is a critical tool for implementing these obligations.⁵ (See *SANDAG, supra*, 3 Cal.5th at p. 519; see also CEQA Guidelines, § 15064.4, subd. (b).)

The Scoping Plan makes clear that the Cap-and-Trade Program was *not* designed to replace local governments’ long-term planning obligations, but rather designed to work in concert with those policies to achieve the

⁴ See, e.g., Health & Saf. Code, §§ 38561, subd. (e) (requiring CARB to consider “the relative contribution of each source or source category to statewide greenhouse gas emissions”), 43018.5, subd. (a) (requiring CARB to “adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles”).

⁵ For example, CARB provides regional emission reduction targets for local jurisdictions’ land use and transportation planning obligations under Senate Bill (SB) 375. (See Health & Saf. Code, § 65080, subd. (b)(2)(A) [known as “The Sustainable Communities and Climate Protection Act”].) CARB also works with regional air pollution control districts and air quality management districts to address emission sources that have both local and global effect, including methane from landfills and hydrofluorocarbons (HFCs), as well as to support state- and federally-mandated permitting of certain industrial sources of GHG emissions. (See California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) pp. 3, 104 <https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf>.)

state’s goals. (2017 Scoping Plan at p. 102 [“California’s future climate strategy will require increased focus on integrated land use planning”].)

Recent state reports have shown that California’s vehicular GHG emissions continue to increase year after year, and CARB has emphasized the need for local action. (See California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) These increasing emissions demonstrate the crucial need for *more* complementary local action—not less—to ensure the state meets its GHG targets in cost-effective ways.

In light of the state’s GHG reduction policies, and CEQA’s focus on embedding environmental considerations in local decision-making, the Supreme Court has emphasized that careful CEQA analysis of GHG impacts will be required going forward, as lead agencies must “stay in step” with the evolving science and law related to the state’s long-term climate objectives in order to carry out their duties under CEQA. (*SANDAG, supra*, 3 Cal.5th at p. 519.)

II. OVERVIEW OF THE GHG ANALYSIS IN RESPONDENTS’ EIR

Mischaracterizing the collaborative efforts required to combat climate change and the role of the Cap-and-Trade Program, Respondents’ EIR takes a very unusual and troubling approach to addressing the Project’s GHG-related impacts.⁶ Respondents divide the Project’s GHG emissions into two categories, which the EIR terms “capped” and “uncapped.” (AR 002719.) What the EIR deems “uncapped” emissions constitute only about 4.6% of the Project’s emissions. (*Ibid.*) The “uncapped” category includes comparatively minor landfill emissions caused by waste generated at the

⁶ The Attorney General and CARB only address Respondents’ inappropriate use of the Cap-and-Trade Program in the GHG analysis of the EIR. This amicus brief is not intended to and should not be construed as an exhaustive discussion of the EIR’s compliance with CEQA.

Project and the use of refrigerants at the Project. (*Ibid.*) For these emissions, the EIR follows the approach that would be expected under CEQA: the City of Moreno Valley, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHG emissions as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold. (AR 002719, AR 002729.)

What the EIR terms “capped” emissions, however, constitute the remaining 95.4% of the Project’s predicted emissions. (AR 002719.) Those include emissions caused by mobile sources (namely, diesel trucks), as well as natural gas and electricity use at the Project. (*Ibid.*) For these emissions, the EIR deviates dramatically from standard CEQA methodology. The EIR asserts these emissions are “covered” by Cap-and-Trade and therefore wholly exempt from any further CEQA analysis or mitigation. (AR 002723.) The EIR does *not* compare the Project’s “capped” emissions to the 10,000 metric ton threshold. (AR 002725.) Indeed, after mitigation measures are applied to the Project, the “capped” emissions remain nearly 40 times greater than the significance threshold. (AR 002729.) In forgoing any attempt to decrease the Project’s true total emissions to a less-than-significant level, Respondents fail to consider further mitigation measures that could have made this Project more compatible with the state’s climate goals. As described below, this approach is unlawful.

ARGUMENT

Respondents avoid disclosing and addressing mitigation for thousands of tons of GHG emissions each year pursuant to the misguided theory that those emissions are addressed by Cap-and-Trade. This argument is founded on misunderstandings of both the Cap-and-Trade Program and

CEQA—both of which require different industries and projects to take responsibility for their own impacts, rather than rely on others for mitigation. Most fundamentally, warehouse projects like the Project are not subject to Cap-and-Trade. Respondents therefore cannot accurately assert that “compliance” with Cap-and-Trade provides any legal basis to avoid analyzing and adequately mitigating the majority of the Project’s emissions.

The CEQA Guidelines allow projects to consider regulations “[with] which the project complies” for purposes of considering significance of GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3).) However, that consideration does not apply here and Respondents’ approach, which in effect relies on other entities to undertake Respondents’ CEQA mitigation, not only violates both CEQA’s legal requirements and public disclosure and mitigation purposes, but also undermines the state climate objectives Cap-and-Trade is intended to further. Cap-and-Trade is designed to act in tandem with—not in spite of—critical tools like local land use planning to reduce GHG emissions. If allowed for Respondents and adopted by other local jurisdictions, such abdication by local governments would dramatically hinder the state’s ability to achieve its legislatively mandated long-term climate stabilization objectives and forgo pollution reduction co-benefits from GHG mitigation measures that are vital for environmental justice communities.

The Resources Agency agrees with CARB that “to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project.” (See California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009),

<http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf>, at p. 27.)

I. WAREHOUSE AND LOGISTICS PROJECTS ARE NOT REGULATED BY CAP-AND-TRADE AND THEIR EMISSIONS MUST STILL BE MITIGATED BY LOCAL GOVERNMENTS

Warehouse and logistics complexes are not regulated by Cap-and-Trade. The Cap-and-Trade Program thus provides no legal or policy basis for Respondents to avoid their obligation to evaluate and mitigate GHG emissions. Cap-and-Trade applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for” such allowances. (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) Respondents seek to use Cap-and-Trade to zero-out and excuse the application of feasible mitigation measures to over 95% of all GHG emissions from the Project. Cap-and-Trade applies only to expressly identified entities (“covered entities”) such as cement producers, petroleum refiners, electricity generators, natural gas suppliers, fuel importers, and liquid petroleum gas suppliers. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities. Cap-and-Trade compliance instruments do not factor in *whatsoever* because this Project is not covered by Cap-and-Trade.

The mere fact that warehouse and logistics complexes are in the chain of commerce with covered entities does not transform them into covered entities themselves. As an example, although the operator of a refinery that produces gasoline in California is subject to Cap-and-Trade, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing the refinery’s own GHG emissions or surrendering allowances, but the gas station that resells the gas, the truck drivers who purchase it, and

the warehouses to which the trucks drive do not have compliance obligations. Under the state's portfolio approach, while the refinery may have met some or all of its climate obligations via Cap-and-Trade, the downstream entities have not. Because warehouses receive no set price or regulatory signals from Cap-and-Trade, they are not being directly incentivized to reduce emissions. Instead, other components of the state's portfolio address those emissions. Nothing in Cap-and-Trade explicitly or impliedly repealed the use of other measures to address climate change; they were designed to work together. (See, e.g., 2017 Scoping Plan at p. 28.) Local governments must responsibly plan new development to further the state's climate goals.

II. ALLOWING RESPONDENTS' UNTENABLE APPROACH TO GHG ANALYSIS WOULD HAVE SIGNIFICANT, NEGATIVE STATEWIDE CONSEQUENCES

If Respondents' approach to GHG analysis is endorsed, other lead agencies will undoubtedly follow this approach, and emissions from the transportation and land use sectors will be largely omitted from analysis and mitigation under CEQA. Widespread adoption of this approach would: (1) place the entire burden of California's well-established, long-term land-use related GHG reduction goals on Cap-and-Trade, thereby straining the program beyond its intended purpose and (2) expose already burdened communities in the state to greater amounts of GHG emissions and co-pollutants that accompany GHG emissions, such as diesel particulate matter and nitrogen oxides.

A. Respondents' GHG analysis undermines California's GHG reduction goals

As explained above, the Cap-and-Trade Program is just one part of a suite of complementary measures designed to achieve California's ambitious GHG reduction and climate stabilization objectives. Cap-and-

Trade provides no legal basis for Respondents to avoid local governments' obligations as lead agencies under CEQA to evaluate and mitigate GHG emissions from a project that the Cap-and-Trade Program does not even cover.

While any one policy may be insufficient or at risk of circumvention, the suite of policies work in concert toward the state's goals.^{7,8} This overlap is by design, and makes the suite of policies more resilient to changed circumstances, enforcement problems, and legal challenges. The upstream Cap-and-Trade Program thus works in tandem with downstream choices, including planning choices, to ensure both that total emissions decline and that projects throughout the state are designed to avoid putting undue upstream pressure on emissions or control costs. Weakening one policy because another policy might address it runs contrary to this approach.

⁷ See 2017 Scoping Plan, *supra*, pp. ES7–8, 10, 22, 97; cf. Elinor Ostrom, A Polycentric Approach for Coping with Climate Change (2014) 15 *Annals Econ. & Fin.* 97, 123 <<https://perma.cc/YSF4-B7N8>> (Nobel laureate describing an ideal policy approach to climate change as “Complex, Multi-Level Systems to Cope with a Complex, Multi-Level Problem”); Amir Bazaz, et al., *Global Covenant of Mayors, Summary for Urban Policymakers: What the IPCC Special Report on Global Warming of 1.5.°C Means for Cities* (Dec. 2018) pp. 22–23 <<https://perma.cc/R37B-3WDD>> (identifying interaction between sources of governance and importance of incentives beyond financial consequences at the community level).

⁸ Complementary measures are also important in light of the risk to any one measure posed by litigation. Private parties and the federal government have challenged California's GHG reduction policies, including aspects of the Cap-and-Trade Program. California's GHG vehicle emissions regulatory authority is currently also under challenge. The wisdom of the portfolio approach endorsed by the Scoping Plan is to ensure that the state's efforts continue via many channels, rather than relying on any one potentially challenged measure.

If other lead agencies adopt Respondents’ approach to GHG analysis under CEQA, their development projects would produce millions of metric tons of GHG emissions that would go unmitigated through what amounts to an unauthorized categorical exemption from CEQA. The economic analyses and feasibility of achieving the state’s legislatively mandated goals in the Scoping Plan account for all policies working in tandem. If any one policy fails to deliver reductions, this would put strain on the Cap-and-Trade Program to deliver more reductions than anticipated and at higher costs.

Respondents’ failure to account for the significance of the Project’s GHG emissions from transportation is particularly troubling in light of the fact that the transportation sector accounts for over 35% of the state’s total GHG emissions and these emissions continue to rise. (2017 Scoping Plan, *supra*, pp. ES1, 11 [charts of emissions by source]; see also California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) As the California Supreme Court noted, “transportation emissions are affected by the location and density of residential and commercial development, the Scoping Plan does not propose statewide regulation of land use planning but *relies instead on local governments.*” (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 230; emphasis added.) Local governments thus play a unique role in decreasing GHG emissions from the transportation sector.

Respondents contend that because statewide emissions are capped under the Cap-and-Trade Program, the amount of emissions from “capped” sources will be the same with or without their Project, but this claim ignores both their obligations under CEQA to disclose and mitigate their emissions and the intended design of the Cap-and-Trade Program. (See

Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 48–49.)

Cap-and-Trade is not a program designed to reduce emissions from local government actions, or land use; instead, it was designed on the assumption that local actors would simultaneously work to reduce emissions within their spheres. Cap-and-Trade alone was designed to account for less than 40% of the total emissions reductions needed to achieve California’s 2030 climate goals, and on the explicit assumption that local design choices would continue to reduce overall emissions (and hence economy-wide costs in the Cap-and-Trade Program). (2017 Scoping Plan at p. 28.) Indeed, relying entirely on the Cap-and-Trade Program to address land use would produce a mismatch that would strain the Program by functionally increasing demand for emissions reductions as unregulated entities displace their obligations onto the Program rather than taking action themselves, raising compliance costs for covered entities across all sectors and all consumers across the state at all income levels. California’s portfolio approach was designed to meet AB 32’s requirement that “greenhouse gas emissions reduction activities . . . adopted and implemented by [CARB] are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.” (Cal. Health & Saf. Code, § 38561.) By taking a portfolio approach, the state has recognized that taking GHG action in specific sectors ensures that we achieve our broader climate and energy demand reduction goals. (See 2017 Scoping Plan at pp. 2, 24, 100 [describing Governor Brown’s five key climate change strategy “pillars”].) Ultimately, cost increases could make the Cap-and-Trade Program less effective as a key part of the suite of California’s climate policies.

In sum, Respondents’ position is fundamentally inconsistent with the state’s approach to climate change, and so disregards significant emissions

that should properly be addressed under CEQA, not an unrelated emissions program like Cap-and-Trade. Moreover, Respondents' approach would allow similar emissions from other projects that would follow its lead. (See Part III(A), *infra.*) The majority of land use projects are, like this Project, not covered by the Cap-and-Trade Program. Freight alone is an enormous industry; over 1.5 billion tons of freight were moved in California during 2015. (*Id.* at p. 73.) And other types of projects such as residential developments or agricultural enterprises may seek to invoke precedent created by this case. Thus, even if the Project standing alone does not excessively strain the Cap-and-Trade system, the collective weight of new projects failing to address GHG emissions in the CEQA process would.

B. Respondents' GHG analysis prevents co-pollutant reduction measures necessary to protect California's environmental justice communities

Permitting massive land development projects without requiring the necessary mitigation measures to decrease project emissions will also harm California's environmental justice communities—those already suffering from the worst environmental pollution in the state. The census tract the Project will be built in is ranked in the 75th to 80th percentile of census tracts in California in terms of greatest pollution burden indicators and health and vulnerability factors for population characteristic indicators. (CalEnviroScreen 3.0 for Census Tract 6065042624, Office of Environmental Health Hazard Assessment, last visited November 27, 2019 <<https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>>.) Even without the Project, residents of this census tract already experience ozone, the main ingredient of smog, at a rate higher than 98% of the rest of California. (*Ibid.*) Relatedly, these residents also experience cardiovascular disease, which can result from exposure to air pollution, at a rate higher than 95% of the state. (*Ibid.*)

Considering additional mitigation properly may have resulted in additional zero-emissions technologies used for the Project, including, perhaps, from its trucks, as many commenters recommended. If such measures are not considered from this Project and other future projects like it are not mitigated, Moreno Valley and communities throughout the state will likely continue to suffer from worse air pollution. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL’Y REV. 377, 387 [“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant reductions as GHGs are being reduced [which] should improve the health of local communities.”]; see also Scoping Plan at p. 74 [“Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions . . . , low income communities, and communities of color.”].)

III. RESPONDENTS’ EIR VIOLATES CEQA

As explained above, the EIR’s approach to GHG analysis misrepresents the Cap-and-Trade Program and the Project’s place in that scheme. As a result, the EIR takes an unsupportable approach to evaluating the significance of GHG emissions from the Project. Contrary to CEQA’s focus on information disclosure and local responsibility for mitigation, the EIR ignores the vast majority of the Project’s emissions, and, in a misleading analysis, compares only a small fraction of the Project’s emissions to the applicable significance threshold. This flawed analysis leads the EIR to conclude that the impact from GHG emissions would be mitigated to a less-than-significant level, misleading the public and shirking mitigation responsibilities. Even if the Cap-and-Trade Program directly

applied to the Project’s emissions (it does not since, as explained above, this Project is not a covered entity under the Program), this method of evaluating a project’s significance *after* taking into account purported “mitigation” or impact-reducing components is not allowed by CEQA. As a result of its flawed analysis, the EIR fails to adopt all feasible mitigation measures and subverts CEQA’s important political function of ensuring informed decision making and informed public participation.

The EIR’s approach to GHG analysis fails on multiple levels. Perhaps most critically, in addition to pointing to “compliance” with a regulation that simply does not cover the Project to excuse mitigation, the EIR focuses on a single significance consideration while ignoring other evidence showing potentially significant impacts. CEQA does not allow clearly significant GHG impacts to be overlooked, even if a lead agency believes those impacts are considered less than significant under one particular metric. (See, e.g., *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal.App.3d 872, 274 [citizens’ personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards]; accord *SANDAG, supra*, 3 Cal.5th at p. 515 [“An adequate description of adverse environmental effects is necessary to inform the critical discussion of mitigation measures and project alternatives at the core of the EIR”].) This failure to address potentially significant impacts not only minimizes the Project’s significant impacts, but also warps the evaluation of whether the Project’s contribution to GHG emissions is a cumulatively considerable impact. (CEQA Guidelines, § 15064.) The cumulative effect of dozens of similar warehouse projects in the Moreno Valley area could—and almost certainly will—be significant.

A. The EIR improperly applies CEQA Guidelines Section 15064.4 to determine the significance of the Project’s GHG emissions.

The Resources Agency, the state’s expert on CEQA, has rejected the approach of using purported “compliance” with an inapplicable program to mitigate emissions. (Final Statement of Reasons for the CEQA Guidelines Amendments (2018) at p. 27 [“a subdivision project could not demonstrate ‘consistency’ with [CARB’s] Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision”].)

The EIR misapplies CEQA Guidelines section 15064.4, which offers multiple factors a lead agency should consider in assessing the significance of impacts from GHG emissions. That Guideline provides, in pertinent part:

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
 - (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 - (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - (3) The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project’s incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a *particular project* are still cumulatively considerable notwithstanding compliance with the adopted

regulations or requirements, an EIR must be prepared for the project.⁹

(CEQA Guidelines, § 15064.4, subd. (b), *italics added.*)

As reflected in subdivision (b)(3), compliance with “regulations or requirements adopted to implement a statewide, regional, or local plan” can factor into the assessment of GHG significance, but only when *the project complies* with those regulations or requirements. Yet, the EIR relies upon subsection (b)(3) to claim that emissions for which upstream suppliers surrendered allowances need not be analyzed and mitigated under CEQA. This approach excuses all of the Project’s transportation- and electricity-related emissions, thus requiring analysis and mitigation of only a tiny fraction of the Project’s emissions.

⁹ The 2018 update to the CEQA Guidelines added the following language:

(b) In determining the significance of a project’s greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.

(b)(3) . . . In determining the significance of impacts, the lead agency may consider a project’s consistency with the State’s long-term climate goals or strategies, provided that substantial evidence supports the agency’s analysis of how those goals or strategies address the project’s incremental contribution to climate change.

(c) A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Respondents' application of subdivision (b)(3) to this Project is wrong. Because the Project is not a covered entity under the Cap-and-Trade Program, subsection (b)(3) is inapplicable, as the project cannot "comply" with Cap-and-Trade at all. Moreover, as discussed above, such "compliance" would undermine Cap-and-Trade's purposes if adopted as a CEQA approach, not serve the environmental goals both AB 32 and CEQA set out to deliver.

B. The EIR failed to apply the SCAQMD's GHG emissions threshold to *all* of the Projects' GHG emissions.

The EIR takes an impermissible approach of applying the Cap-and-Trade Program to ostensibly reduce the Project's emissions significantly, then comparing only that reduced quantity to the bright-line significance threshold. This approach is not supported in law.¹⁰

CEQA requires lead agencies to "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." (CEQA Guidelines, § 15064.4.) CEQA then provides that the lead agency must consider "whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project." (*Id.* at subd. (b)(2).) As explained in the EIR, a potentially appropriate

¹⁰ The EIR also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations from other lead agencies, and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD). (EIR 4.7-33.) The EIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. These irrelevant, project-specific documents do not constitute substantial evidence supporting Respondents' argument.

significance threshold in this case is the South Coast Air Quality Management District's (SCAQMD) SCAQMD's 10,000 metric ton limit.¹¹ (EIR at p. 4.7-32.)

The problem here is that the EIR does not compare the Project's total GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Instead, the EIR simply subtracts from the total any GHG emissions it deems to be "capped," and compares only the few "non-capped" emissions to the bright-line threshold. Because the EIR only compares a small fraction of the Project's GHG emissions to the applicable bright-line significance threshold, it only requires relatively minor mitigation measures to reduce the Project's emissions to what the EIR considers "less than significant." (EIR at pp. 1-55–57.)

Respondents' approach improperly applies so-called "mitigation" (the Cap-and-Trade Program) *before* comparing GHG emissions to the significance threshold. By combining impacts and mitigation analyses, it is unclear how the purported mitigation reduces impacts. This approach was rejected in *Lotus v. Dept. of Transportation* (2014) 223 Cal.App.4th 645, where the court stated:

The failure of the EIR to separately identify and analyze the significance of the impacts . . . before proposing mitigation measures is not merely a harmless procedural failing. . . . [T]his shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decisionmaking and informed public participation. It precludes both identification of potential

¹¹ It is worth noting that the Scoping Plans are not binding as to any particular CEQA methodology, or as to land use planning generally, and do not require use of any particular significance threshold. They are guidance documents; individual land use authorities can and do depart from particular suggestions in them if they have appropriate reasons to do so. The issue in this case, however, is that the Cap-and-Trade program does *not* provide such an appropriate reason.

environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The deficiency cannot be considered harmless.

(*Id.* at p. 658.)

Furthermore, if the full scope of the GHG emissions attributable to the Project were compared to the applicable bright line threshold, the emissions, as mitigated, would still be substantially over the threshold—and would therefore require consideration of additional mitigation measures. (See EIR, pp. 4.7-35–36.)

Applying appropriate mitigation measures to reduce the so-called “capped” emissions would not “result in double counting and double mitigating emissions that are already mitigated through cap-and-trade” as Respondents assert. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 57.) Gesturing towards Cap-and-Trade regulated entities is not proper mitigation because Cap-and-Trade does not apply to this Project in any way, and the Project itself has ample mitigation opportunities onsite. To mitigate this Project’s GHG emissions, Respondents would have to address emissions from mobile sources, which account for over 70% of the Project’s total emissions (which again are nearly 40 times greater than the significance threshold). (AR002729.) To reduce these emissions, fewer trucks could drive from the Project to the Ports of Long Beach and Los Angeles every day, the Project could be built closer to the ports, the Project could require more zero emission vehicles be used or provide charging equipment or incentives to encourage their use, or any number of other meaningful mitigation measures. But Cap-and-Trade does not require any of this. Such measures are instead included by local governments in local land use projects to ensure approved project impacts fall below significance thresholds. By never counting the “capped” emissions toward the significance threshold, there is *no* counting and *no*

project-level mitigation of hundreds of thousands of tons of yearly GHG emissions from this Project.

C. Respondents fail to consider the long-term GHG impacts of the Project.

The Supreme Court has made clear that an EIR should consider a project’s long-term GHG impacts, and should address whether the project as a whole is in accord with the state’s climate goals. (*Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 515.)¹² The state’s climate change goals extend beyond 2030. (See, e.g., Executive Order S-03-05 [established a statewide target of reducing GHG emissions to 80 percent below 1990 levels by 2050].) Because the Project is expected to operate for decades into the future, Respondents must account for emissions beyond 2030. But Respondents fail to account for emissions beyond that point—despite the fact that the Project’s full operation will not start until *five years later*, in 2035. (EIR at p. 4.3-61.) Respondents present no substantial evidence that any of the Project’s post-buildout operational emissions are mitigated by the Cap-and-Trade Program. (See, e.g., EIR, pp. 4.7-36–37 [stating, without citation, that “[s]ome of the project’s GHG emissions are subject to the requirements of the AB 32 Cap and Trade Program and will have a GHG allocation based on current GHG emissions levels”].) This is not an adequate CEQA analysis. (See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 904 [EIR must contain substantial evidence that mitigation measures will reduce associated impacts to less-

¹² The parties in *AIR v. Kern* did not have the opportunity to brief the significance of *SANDAG* because the California Supreme Court filed its opinion in *SANDAG* over a month after the close of briefing in *AIR v. Kern*. It appears to amici that this is the first case at the California Court of Appeal where parties have had the opportunity to address both *SANDAG* and *AIR v. Kern* in their briefs.

than-significant-levels, such as by requiring compliance with applicable regulatory standards and preparation of site-specific studies]; Cal. Code Regs. tit. 14, § 15370, subd. (d) [“mitigation” includes “[r]educing or eliminating the impact over time by preservation and maintenance operations during the life of the action”].)

D. Reliance on *AIR v. Kern County* is improper.

Respondents incorrectly claim the Fifth Appellate District’s decision in *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*) upheld the use of the same GHG methodology as Respondents attempt to use here. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 53.) Respondents’ use of the Cap-and-Trade Program here goes far beyond what was sanctioned in *AIR*. In *AIR*, the project being evaluated under CEQA was a refinery, a *covered entity* under Cap-and-Trade. The court held a lead agency was authorized “to determine that a project’s greenhouse gas emissions will have a less than significant effect on the environment based on *the project’s* compliance with the cap-and-trade program.” (*Id.* at p. 718; italics added.) Regardless of whether or not *AIR* was rightly decided, *here*, the question is much simpler and different from the question before the court in *AIR*. Here, it is undisputed that the Project is *not* a covered entity required to comply with the Cap-and-Trade Program. (Cal. Code Regs., tit. 17, § 95811.) Accordingly, this Court need only decide if projects that are *not* covered entities under Cap-and-Trade are nonetheless allowed to use the program to ignore significant GHG emissions they cause. The answer to that question is no.

Respondents argue the distinction between covered and non-covered entities is “a distinction without a difference.” (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 63.) Respondents are incorrect.

This distinction is crucial under CEQA and vital to the success of California’s ambitious climate policies.

From a CEQA perspective, the distinction is important because CEQA Guidelines section 15064.4, subdivision (b)(3) instructs lead agencies to consider the extent to which *a project* complies with GHG regulations or requirements. It is thus inappropriate for entities downstream in the chain of commerce from a covered entity to rely upon compliance with the Cap-and-Trade Program as a basis for avoiding analysis of project-related emissions.

From a policy perspective, as described above, the distinction is crucial because projects that are not subject to the Cap-and-Trade Program do not have the same direct incentives to reduce their GHG emissions as covered facilities, and Cap-and-Trade alone is not designed to achieve California’s ambitious climate goals. The distinction between covered and not-covered entities is thus crucial to the portfolio of climate change measures the state is relying on to protect our citizens going forward.

E. Respondents’ GHG analysis obfuscates the climate change impacts of this Project, undermining CEQA’s public disclosure purpose.

By failing to comply with CEQA Guidelines Section 15064.4, failing to compare all of the Project’s emissions to the GHG emissions threshold, and failing to consider the long-term GHG impacts of the Project, Respondents’ analysis undermines the informational purpose of CEQA. The purpose of an EIR “is to inform the public generally of the environmental impact of a proposed project.” (Cal. Code Regs. tit. 14, § 15003, subd. (c).)

CEQA prohibits public agencies from approving or carrying out a project that will have significant effects on the environment unless the agency makes “findings” demonstrating either that it made changes to the

project to avoid or mitigate those significant impacts, or that certain overriding considerations outweigh the impact. (Pub. Resources Code, § 21081.) Without a full and accurate disclosure of the Project’s impacts, Respondents erroneously concluded that the GHG impact would be less-than-significant, and thereby avoided making the subsequent findings that would inform the public whether the Project’s significant impacts are unavoidable and/or justified. Additionally, Respondents’ approach hinders the public’s ability to submit informed comments during the EIR’s public comment period—aside from addressing the *lack* of analysis—because the public is not provided with, and thus cannot evaluate, complete information or proper CEQA analysis.

CONCLUSION

California is striving on all fronts to meet its ambitious, long-term GHG reduction objectives; the health of its citizens and the environment depend on it. But this Court’s approval of Respondents’ approach to GHG analysis and mitigation would treat the Cap-and-Trade Program as the sole remedy to limit GHG emissions from land-use projects, placing unnecessary strain on Cap-and-Trade’s cost-effectiveness and seriously undermining the state’s critical climate change efforts. Amici respectfully request this Court reject the trial court’s holding and find in favor of Appellants as to GHG analysis.

Dated: January 10, 2020

Respectfully submitted,

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Document received by the CA 4th District Court of Appeal Division 2.
 Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

CERTIFICATE OF COMPLIANCE

I certify that the attached Brief of Amici Curiae the Attorney General and the California Air Resources Board in Support of Plaintiffs and Respondents Albert Thomas Paulek, *et al.* and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, *et al.* uses a 13 point Times New Roman font and contains 7,647 words.

Dated: January 10, 2020

XAVIER BECERRA
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DECLARATION OF ELECTRONIC SERVICE VIA TRUEFILING

Case Name: **PAULEK, ET AL., V. MORENO VALLEY COMMUNITY SERVICES DISTRICT, ET AL., California Court of Appeal, Fourth Appellate District, (Amicus Brief)**

No.: **E071184**

I declare:

I am employed in the Office of the Attorney General, which is the office of a member of the California State Bar, at which member's direction this service is made. I am 18 years of age or older and not a party to this matter. I am familiar with the business practice at the Office of the Attorney General. Correspondence that is submitted electronically is transmitted using the TrueFiling electronic filing system. Participants who are registered with TrueFiling will be served electronically.

On January 10, 2020, I electronically served the attached:

BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION OF NORTH AMERICA, LOCAL 1184, ET AL.

by transmitting a true copy via this Court's TrueFiling system to the parties as follows:

SEE ATTACHED SERVICE LIST

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on January 10, 2020, at Sacramento, California.

PAULA CORRAL

Declarant

/s/ Paula Corral

Signature

SA2019105249

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Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

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May 14, 2020

Ms. Julia Descoteaux
 Associate Planner
 City of Moreno Valley
 juliad@moval.org

Re: NOTICE OF COMPLETION - Revised Final Environmental Impact Report (Revised Final EIR) (2012021045); Agenda Item No. 2 on May 14, 2020 Planning Commission Meeting (World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report)

Dear Ms. Descoteaux:

I respectfully submit the following comments to the 2020 Revised Final Environmental Impact Report (“Revised FEIR”) for the World Logistics Center Project (“WLC” or “Project”), in addition to the World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes Only. Please present these comments and the attachments to the Planning Commission prior to hearing this matter.

As described in the Revised FEIR, this Project entails construction of the largest warehouse development in the nation. For a development of this magnitude, it is vital to properly disclose the environmental consequences of the proposed action and to identify and adopt all feasible mitigation measures and alternatives. Unfortunately, the Revised FEIR continues to fail in its duty to comply with the California Environmental Quality Act (“CEQA”). As such, the City cannot rely on the environmental review contained in the document for the purpose of Project approval, and must require preparation and circulation of a new Recirculated Draft Environmental Impact Report (“Recirculated DEIR”) to allow the public and decision-makers an opportunity for meaningful review of the Project’s impacts, prior to issuing any Project approvals.

I. The Air Quality Analysis Continues To Be Flawed.

The various versions of the EIR constantly have sought to understate air quality impacts from this project. But, high levels of emissions and impacts will result from this Project. The thousands of trucks and other vehicles associated with this project will harm a large area of the region with impacts to local residents in the project vicinity most acutely. The decision on this Project is being based on a flawed air quality analysis.

For example, the Statement of Overriding Considerations concludes “[c]urrently, the 2016 AQMP is being reviewed by the U.S. EPA and CARB. Until the approval of the EPA and

CARB, the current regional air quality plan is the Final 2012 AQMP adopted by the SCAQMD on December 7, 2012. Therefore, consistency analysis with the 2016 AQMP has not been included.” Statement of Overriding Considerations, at 151. This is wrong. The EPA approved the 2016 AQMP on October 1, 2019. 84 Fed. Reg. 52005 (Oct. 1, 2019). Therefore, the EIR must analyze the projects compliance against the 2016 AQMP. Moreover, conclusory statements about compliance with the 2016 AQMP are not sufficient. The Revised FEIR and the Statement of Overriding Considerations must actually analyze compliance with this most recently approved air plan.

The Revised FEIR also continues to ignore the feasibility of implementing zero-emission technologies, including zero-emission trucks – amongst many classes (ie class 2-8) – as a mitigation measure. The Revised FEIR notes “[t]he mitigation measures adopted included some of the suggestions from [California Air Resources Board’s (“CARB”)] previous letters, but do not include the zero-emission technology requirements. Subsequent environmental review may require that specific technology that work with future users be required as condition of approval, but a broad requirement that unknown future users use a specific technology is not currently feasible since current zero-emission technology is very limited in medium-duty and heavy-duty trucks.” Revised FEIR, at 89.

The Revised FEIR’s dismissal of zero-emissions technologies for a project that spans decades based on an analysis from the past is not supported by CEQA. The Revised FEIR notes that “[t]he status of zero-emission technology was addressed in the responses to both of CARB’s previous letters. Essentially, as CARB’s ongoing multi-year planning (not implementation) effort on the Sustainable Freight Plan to lay out pathways to get to a zero-emission freight sector demonstrates, there are no commercially available technology zero-emission on-road heavy-duty trucks available and as CARB’s own progress report on heavy-duty technology and fuels assessment states zero- and non-zero emission technologies are still at the demonstration phase.” Revised FEIR, at 89. This basis is largely based on an analysis completed by CARB in 2015.

In fact in a more recent fact sheet from the Air Resources Board, the commercial availability is answered with the following:

Are any zero-emission trucks commercial available?

There are more than 70 different models of zero-emission vans, trucks, and buses that already are commercially available from several manufacturers. Most trucks and vans operate less than 100 miles per day and several zero-emission configurations are available to serve that need. As technology advances, zero-emission trucks will become suitable for more applications. Most major truck manufacturers have announced plans to introduce market ready zero-emission trucks in the near future.

California Air Resources Board, Advanced Clean Trucks Accelerating Zero-Emission Truck Markets, available at <https://ww2.arb.ca.gov/sites/default/files/2019-07/190521factsheet.pdf>. In fact, CARB feels comfortable enough with this feasibility of zero-emission trucks that next month it will adopt the Advanced Clean Trucks Rule, which will require manufacturers to produce zero-emission trucks starting as soon as 2024. The Revised FEIR never explains with substantial evidence why zero-emission trucks for any of the classes that will visit this Project

are infeasible to be used at the project start for a portion (or all) of the trucks servicing the new warehouses as they are built. And the Revised FEIR also does not provide substantial evidence why these zero-emission technologies cannot be used out into the future when CARB will require manufacturers to make zero-emission trucks across a broad class of trucks. *See* CARB, Proposed Amendments to the Proposed Clean Trucks Regulation, *available at* <https://ww3.arb.ca.gov/regact/2019/act2019/30daynotice.pdf>. The Revised FEIR failure to address new data on feasibility of zero-emission trucks, including addressing the forthcoming sales mandate from CARB, violates CEQA.

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Climate Impacts.

The City’s review of this Project’s climate and greenhouse gas (“GHG”) emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA’s requirements.

a. Legal Standards

The City’s determinations regarding the significance of greenhouse gas (“GHG”) emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency’s use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the FEIR continues to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO_{2e}”) per year, the same quantitative evidentiary standard controls.

CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (*See* Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and regulatory requirements. (See CARB, *California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring requirements that can be ... enforced by ARB.” (AR 1383:66171.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 66174-75.)

b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (FEIR 1a at 755-56.) As a threshold matter, the

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.

The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.

First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[.]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”.]) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review

whatsoever of whether those credits or the protocols they were generated under satisfy the measure's stated criteria, and without any ability even to question whether the credit is adequate.

Second, CARB "approval" of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is "approved by CARB" does not establish that voluntary market carbon credits sold by that registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB's procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1's reference to "approved" registries reflects a misinterpretation of CARB's regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure's reliance on CARB "approval" is legally erroneous. As a result, a registry's "CARB-approved" status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure's purported criteria, or the significance of the Project's impacts after mitigation.

Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB's regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB's compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism ("CDM") methodologies.⁴

³ Notably, despite MM 4.7.7.1's suggestion to the contrary, the "GHG RX" registry has *not* been approved by CARB to handle transactions in Cap-and-Trade offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The "GHG Rx" program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)

⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting "any methodology developed under the [CDM] ... for projects and programs registering with VCS).

Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project’s GHG emissions (whether those measures are denominated “offsets” or “carbon credits”), it must meet CEQA’s requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards “the mitigation *will* achieve.” (CEQA Guidelines § 15126.4(a)(1)(B).) The measure’s list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries’ processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by “presuming” otherwise. Nor is there any evidence the City’s Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, “[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place.” *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA’s prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on “forecasted” emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA’s requirement that mitigation be in place before impacts occur.

iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third-party broker of offset credits. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between an carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased....” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to meet its

long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

vi. The FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the FEIR of any evidentiary support.

c. The FEIR Must Be Recirculated for Full Public Review and Comment.

The FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

Recirculation is required here for at least two reasons. First, the FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the FEIR only a few days before the Planning Commission hearing, the City has thwarted meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the FEIR’s new analysis in reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

Sections of the Final Environmental Impact Report measured only “Total Uncapped” Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though “Total Capped” emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The FEIR, in contrast, at least conditionally considers all Project emissions—both “capped” and “uncapped”—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after. avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The FEIR must be recirculated.

III. The Revised FEIR’s Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques to the GHG analysis. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project. This letter solely addresses a few new items included in the Revised FEIR.

Importantly, the California Air Resources Board, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the “[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground.”⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:

Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions

Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): “Project-related greenhouse gas emissions resulting from sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

⁶ Letter from California Air Resources Board to Moreno Valley, September 7, 2018, *available at* https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at* http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

Response 44.37

The Agency declines to make any changes in response to this comment. The decision in *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (“AIR v. Kern”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated referencing the Air Resources Board’s letter on the exact project studied in the Draft Recirculated FEIR.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, in addition to the agency responsible for drafting the CEQA Guidelines the Draft Recirculated FEIR relies upon for authority disagrees with the approach taken by the City to rely on Cap-and-Trade for all transportation and energy emissions.

Instead of adhering to the position of the relevant agency, the Revised FEIR continues to rely on two agencies that deserve no deference on this issue. But, even if these agencies positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised Final EIR includes new attachments A and B, which are the specific South Coast AQMD Documents relied upon for the conclusion to support the use of cap and trade to erase

⁸ *Id.*

⁹ *Id.*

transportation and energy emissions. Importantly, both of these documents are from 2014. Since that time, the South Coast has produced several other CEQA documents. In fact, in the most recent document from 2020, they do not use this same approach of arguing emissions from transportation will be addressed under the cap and trade program. See South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>. The Developer asked the South Coast to weigh in on its settlement in Attachment Q, so it is unclear why the Developer failed to ask whether the South Coast AQMD continues to use this clearly flawed cap and trade rationale for transportation and energy-related emissions. In reviewing the other CEQA documents where the South Coast AQMD was a lead agency, I could not find other instances of this approach being used after 2014.

In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. The FEIR Must Be Recirculated Before Project Approval and Certification.

Under CEQA, an EIR must be re-circulated for review and comment whenever significant new information becomes known to the lead agency and is added to the EIR after public notice of the availability of the draft document has been made, and before the EIR is certified. Pub. Res. Code § 21092.1. Under such circumstances the lead agency is specifically required to re-notice the environmental review document to the public and all responsible agencies, and is required to obtain comments from the same, before certifying the document's impacts and alternatives analyses as well as any mitigation measures. See *id.*; see also, Pub. Res. Code § 21153. A lead agency's decision not to recirculate an EIR must be supported by substantial evidence. Cal. Code Regs. tit. 14 ("CEQA Guidelines" or "Guidelines") § 15088.5(e). "Significant new information" includes any information regarding changes in the environmental setting of the project under review. Guidelines § 15088.5(a). It also includes information or data that has been added to the EIR and is considered "significant" because it deviates from that which was presented in the draft document, depriving the public from a meaningful opportunity to comment upon a significant environmental effect of the project, or a feasible way to mitigate or avoid such an effect at the time of circulation of the draft. *Id.* Some examples of significant new information provided in the CEQA Guidelines are: "(1) information relating to a new significant environmental impact that would result from the project or a new mitigation measure; (2) a substantial increase in the severity of an environmental impact [that] would result unless mitigation measures are adopted; and (3) any feasible alternative or mitigation measure considerably different from others previously analyzed ..." Guidelines § 15088.5 (a)(1)-(3). Recirculation is further required where the draft EIR is "so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." Guidelines § 15088.5 (a).

The required re-noticing and new comment period for a re-circulated EIR is essential to meeting CEQA's procedural and substantive environmental review requirements, as the EIR's

assessment of a project's impacts, mitigation measures and alternatives and the public's opportunity to weigh in on the same is at the heart of CEQA. *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1123. Where new information is added to an EIR in such a way as to highlight informational deficiencies in the draft document's environmental impacts, mitigation and alternatives analyses, the public must be allowed the opportunity and additional time to comment on the changes made in the final document's analyses. Moreover, where significant new information that is added to the EIR's assessment of a particular impact area falls within the purview of another responsible agency's area of expertise that agency must also be allowed a meaningful opportunity to review and respond to such new information and any changes implicated in the EIR's analyses.

While re-circulation is indeed an exception and not the rule in the preparation of final environmental review documents, it is an exception that must be invoked here – where the absence of significant information rendered the draft EIR ineffective in meeting CEQA's substantive mandates, and now, where included, the addition of significant new information substantially changes the FEIR's analyses and conclusions regarding the Project's impacts, feasible alternatives and required mitigation. *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1132. As stated in numerous comments to the various versions of the EIR, that document failed to provide critical information regarding the project area and scope of the project's impacts; it failed to adequately describe fundamental information relating to the phasing and timing of the project's massive structural and infrastructural developments; it lacked adequate detail specifically regarding the construction and operations phases of the project; and it contained analyses and mitigation measures relating to the Project's air quality, traffic, human health and biological resources impacts based on outdated or inapplicable studies and data. In some instances the Revised FEIR erratically and arbitrarily includes selective new data into its analysis of the Project's impacts and mitigation measures, and in others critical information remains absent from the document. Whether referenced in the Revised FEIR as new information, or wholly omitted from the document's analyses, the addition of such information is essential to the public's ability to participate in the environmental review process. The Revised FEIR must therefore be re-drafted and re-circulated document to provide the public at large and the Project's numerous other responsible agencies with more time to review and analyze the Project's impacts and to assess or prescribe necessary mitigation measure to minimize those impacts. The City cannot render a determination on the issuance of the project approvals under consideration until such recirculation occurs, and CEQA compliance is assured.

V. The Draft Statement of Overriding Considerations is Unsupported by Substantial Evidence and Fails To Justify the Project's Significant Impacts and Interference with Health Protective Air Quality Standards Attainment

The Statement of Overriding Considerations is insufficient to justify the Project's significant and unavoidable impacts for the reasons explained below. The statement's terms are insufficiently analyzed in both the draft EIR and in the Revised FEIR. Moreover because the Revised FEIR as a whole suffers from serious deficiencies that taint the whole of the analyses contained in the document, the draft statement cannot adequately weigh the Project's adverse, significant impacts with the espoused benefits from the Project contained in any statement of overriding considerations. *Vedanta Society of So. California v. California Quartet, Ltd.* (2000)

84 Cal.App.4th 517, 530 (a project with significant and unmitigated environmental impacts can only be approved when “the elected decision makers have their noses rubbed” in the Project’s environmental effects, and still vote to move forward). As such the statement and its purported benefits must be rejected.

As the lead agency for the Project, if the City is to approve a project of this magnitude, and with the unmitigated significant environmental and human health impacts that the Project will cause, it “must adopt a statement of overriding considerations.” Pub Res. Code § 21081, subd. (b); Guidelines, § 15093. In contrast with mitigation and feasibility findings, overriding considerations can be “larger, more general reasons for approving the project, such as the need to create new jobs, provide housing, generate taxes, and the like.” *Concerned Citizens of South Central L.A. v. Los Angeles Unified School Dist.* (1994) 24 Cal.App.4th 826, 847. Yet, like mitigation and feasibility studies, a statement of overriding consideration is also subject to a substantial evidence standard of review. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).” Thus, an agency's unsupported claim that the project will confer general benefits is insufficient, and the asserted overriding considerations must be supported by substantial evidence in the FEIR or somewhere in the record. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).”

As part of the EIR review process, statements of overriding consideration are intended to “vindicate the ‘right of the public to be informed in such a way that it can intelligently weigh the environmental consequences’ of a proposed project[;]” and they must make a good-faith effort to inform the public of the risks and potential benefits of the Project whose approval is proposed. *Woodward Park Homeowners Ass'n, Inc. v. City of Fresno* (2007) 150 Cal.App.4th 683, 717-718 (citing *Karlson v. City of Camarillo* (1980) 100 Cal.App.3d 789, 804).

In accordance with this standard, before approving the Project and the FEIR the City must show that it has considered each of the Project’s significant and unavoidable impacts in light of *each* of the alleged overriding considerations that it asserts will justify those impacts. *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 357 (upholding a statement of overriding consideration on the basis that “the City found the project had eight benefits, each of which ‘separately and individually’ outweighed its unavoidable impacts). Thus, the City must specifically consider and set forth overriding considerations to justify the Project’s significant and unavoidable direct indirect and cumulative impacts in each of the following areas: aesthetics, land use and biological resources, noise, traffic and air quality.

The statement of overriding consideration attached to the FEIR asserts two general areas of benefits that it asserts outweigh the Project’s significant and detrimental, un-mitigated impacts: (1) an increase in jobs that improves the job to housing ratio in the City of Moreno Valley, and (2) an increase the in the City’s overall tax revenue, which could be used to improve schools and confer other public benefits to the residents of the City. Any additional public benefits that the draft statement assumes may result from approval of the Project flow from one of those two underlying considerations.

These two alleged benefits are, however, based on erroneous assumptions that (a) the

Project will bring secure, desirable and certain jobs to the City of Moreno Valley; and (b) that the environmental degradation caused by the Project's significant and unavoidable impacts will not outweigh the benefits conferred by the Project in monetary terms, or based on any other form of valuation methodologies. While the draft statement sites thoroughly to "appendix O" the Fiscal and Economic Impact Study, it fails to account for aspects of the job market that will undoubtedly impact the nature and desirability of the jobs made available at the Project, if it is approved, constructed and permitted to operate. Just some of these unmentioned aspects include trends towards employing largely contract, part-time or temporary or short-term labor to fill the jobs created by the WLC. Indeed the study is based on an assumption that either the WLC or other logistics uses will result in the permanent employment of .5 employees per 1,000 building square feet. Appendix O, at 20. Yet the study fails to calculate what the rate of employment would be if some or all of those jobs were characterized as part-time or temporary contract labor employment.

The draft statement of overriding considerations similarly fails to account for any discrepancy in full-time vs. part time, temporary or contract jobs. Moreover, additional aspects of job desirability including working conditions for laborers employed at the WLC or similar logistics enterprises that would operate in the project area are left wholly omitted from both the Appendix O study and the statement, and to the extent the draft statement relies on the development agreement to ensure that such jobs are actually ensured, such assurances are illusory as the development agreement terms remain unclear.

The draft statement of overriding considerations also fails to adequately quantify, either monetarily or based on some other form of valuation method, the consequences of the Project's impacts, specifically including its impacts to human health, the environment and invaluable threatened and endangered biological resources that surround the proposed project area.

Weighing the Project's true impacts against its purported benefits is a critical environmental review requirement. *See Woodward Park Homeowners Ass'n, Inc. v. City of Fresno*, 150 Cal.App.4th, 720. The City must therefore engage in a good faith effort to thoroughly analyze of the full scope of the impacts for which the statement of overriding consideration is being offered.

Doing so here would involve some process by which to measure conclusory statements that fully contradict the evidence on the record, such as the statement that the Project will improve health public health. Draft Statement of Overrid., at 209.

Finally, the draft statement of overriding considerations fails to justify the Project's impediment to the South Coast Air Basin achieving federal and state NAAQS, and it's steady, foreseeable future contribution to the region's ability to meet Air Quality Management Plan targets, which are essential to ensuring compliance with state and federal law. The statement of overriding consideration cannot, in essence justify the Project's apparent conflict of potentially causing violations of air quality standards, which carry severe economic sanctions for the 18 million people living the South Coast Air Basin based on parochial economic justifications for one city.

For these reasons stated herein and because the alleged Project benefits included in the draft statement of overriding consideration run counter to the evidence on the record, the City cannot approve the Project, and cannot certify the Revised FEIR as an informational document.

Given the limited time, this comment only raises some of the issues that are of concern related to this project. We appreciate your consideration of these comments. Please do not hesitate to contact us at amartinez@earthjustice.org if you have questions about this comment letter.

Sincerely,



Adriano L. Martinez
Earthjustice

The following Exhibits have been emailed to the Planning Commission for Review.

Exhibit List
(All exhibits submitted in electronic format)

Exhibit	Title
A	California Air Resources Board, <i>California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation</i> (May 2013).
B	Haya, B., A. Strong, E. Grubert, and D. Cullenward, <i>Carbon Offsets in California: Science in the Policy Development Process</i> , in J.L. Drake et al. (eds.), <i>Communicating Climate-Change and Natural Hazard Risk and Cultivating Resilience, Advances in Natural and Technological Hazards Research</i> 241-254 (2016) ("Haya et al. 2016").
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California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation

1 BACKGROUND

Under the Cap-and-Trade Program, covered entities may use compliance offset credits to satisfy up to eight percent of their compliance obligation.¹ This limit applies to each individual covered or opt-in covered entity for each compliance period. Compliance offsets are tradable credits that represent verified greenhouse gas (GHG) emissions reductions or removal enhancements from sources not subject to a compliance obligation in the Cap-and-Trade Program and resulting from one of the following: (1) a project undertaken using an Air Resources Board (ARB or Board) approved Compliance Offset Protocol pursuant to Subarticle 13 of the Cap-and-Trade Regulation; (2) an offset credit issued by a linked jurisdiction pursuant to Subarticle 12 of the Cap-and-Trade Regulation; or (3) a sector-based offset credit issued by an approved sector-based crediting program pursuant to Subarticle 14 of the Cap-and-Trade Regulation. In almost all cases, these GHG sources are outside of the industrial, energy, and transportation sectors. This document describes ARB's process for the review and approval of new ARB Compliance Offset Protocols. As an important market feature, offset credits can provide covered entities a source of low-cost emissions reductions for compliance flexibility. The inclusion of offset credits will also support the development of innovative projects and technologies from sources outside capped sectors that can play a key role in reducing emissions both inside and outside California.

As required by Division 25.5 of the Health and Safety Code (Assembly Bill 32 or AB 32), any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code §38562(d)(1) and (2)). Any offsets issued by ARB must be quantified according to Board-approved Compliance Offset Protocols. The Cap-and-Trade Regulation (Regulation) includes provisions for collecting and submitting the appropriate monitoring documentation to support the verification and enforcement of reductions realized through the generation and retirement of Compliance offset credits. The regulatory provisions and the requirements of the Compliance Offset Protocols will ensure that the reductions are quantified accurately, represent real GHG emissions reduction, and are not double-counted within the system. Compliance Offset Protocols are considered regulatory documents and are made publicly available so that anyone interested in

¹ "Compliance obligation" is defined as "the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB." Title 17, California Code of Regulations, section 95802(a).

developing an offset project can do so if their project meets Board-approved standards. Information on existing and proposed protocols can be found here:

<http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

It is important to note that compliance offset credits are only one way to incentivize voluntary GHG reductions outside of the Cap-and-Trade Program. Projects that could reduce GHG reductions could be incentivized through the use of grants, the generation of voluntary offsets, and potentially as regulatory offsets for compliance with the California Environmental Quality Act.

2 COMPLIANCE OFFSET PROTOCOL REQUIREMENTS

2.1 How will ARB determine which protocols to take through the approval process?

Periodically, ARB staff will review offset protocols that are available for use in the voluntary offset programs. These voluntary protocols will be assessed against the protocol criteria listed below. This process will be coordinated with our Western Climate Initiative (WCI) partners. Staff will also consider proposed protocols submitted by stakeholders that include elements to ensure any resulting offsets would meet the AB 32 offset and ARB protocol requirements presented in section 2.2. The specific process and steps prior to Board consideration are provided in section 3 below.

In addition to the ability to generate offsets that meet the AB 32 criteria, there are several other factors that are considered when deciding which project types will be considered for potential development of a Compliance Offset Protocol. These factors include, but are not limited to, the following:

- Potential for projects in California;
- Potential offset supply;
- Cost-effectiveness; and
- Co-benefits.

ARB staff is also working with our WCI partner jurisdictions to identify which offset project types to evaluate next as part of the regional trading program, which may also include a review of existing protocols from voluntary offset programs.² Staff will determine if a proposed protocol for a project type can be applied in California and/or at the regional level, and if it has the potential to meet the criteria listed above. There may be instances where a protocol is not applicable in every jurisdiction of a linked program. In all cases, all linked jurisdictions will have to agree on offset project protocols to

² See: <http://www.westernclimateinitiative.org/component/remository/Offsets-Committee-Documents/> accessed May 3, 2013.

ensure nothing will impact the fungibility of offsets across a regional Cap-and-Trade Program.

ARB staff will continue to meet with stakeholders and consider additional proposed offset project types that meet the AB 32 offset and ARB protocol requirements as we coordinate with WCI partner jurisdictions.

2.2 What criteria will ARB use to evaluate new protocols?

ARB must ensure that all GHG emissions reductions issued as offset credits under a Compliance Offset Protocol meet the AB 32 offset criteria as defined in the Regulation. ARB's decision not to develop a Compliance Offset Protocol does not preclude that project type from being incentivized through grants, development of voluntary offsets, or potentially as mitigation for compliance with the California Environmental Quality Act.

The Regulation also specifies the criteria for Compliance Offset Protocols in section 95972. These requirements will be broadly applied to each offset project type for which ARB is developing a protocol. There may be additional considerations that staff, in collaboration with stakeholders, may look at for specific offset project types.

New protocols can only be considered for project types that meet the following requirements:

- The resulting GHG emission reductions are from sources that are not covered by the cap and that are not subject to a compliance obligation. This is because there is no net reduction (i.e. no "offset") as a result of emissions being shifted from one source under the cap to another source under the cap. As a matter of policy, we do not issue offset credits for reductions from sources that would be covered by the cap but are located outside the State. For example, energy-related projects, such as the installation of solar panels, would not be eligible for offsets as the actual emission reductions are associated with power generation and all electricity generation is already covered under the Cap-and-Trade Program. Similarly, transportation fuels are covered in the program starting in 2015, so ARB will not adopt a Compliance Offset Protocol for cleaner vehicle fleets.
- The GHG emissions reduction must be a direct reduction within a confined project boundary. Recycling activities would not be eligible for offset credit as the recycling activities do not have a direct GHG reduction at the recycling facility, but may have an emissions impact upstream when new materials are extracted or manufactured in lieu of the recycling. Currently, to avoid double counting

issues in the Cap-and-Trade Program, ARB does not plan to adopt protocols that include a lifecycle analysis.

- The GHG emissions reduction must be permanent. For avoided GHG emissions, there must be no opportunity for a reversal of the avoided emissions. An example of this type of permanence is methane flaring in livestock digester projects, which permanently destroys methane. For GHG sequestration, the project must be able to ensure the GHG will not be released into the atmosphere for at least one hundred years. Both the U.S. Forest and Urban Forestry Projects Compliance Offset Protocols require a commitment to keep any credited carbon stocks sequestered for at least 100 years.
- The GHG emissions reduction must be conservatively quantified to ensure that only real reductions are credited. This requires a sound foundation and understanding of the underlying quantification for all sources, sinks, and reservoirs within a project boundary so that the net change from implementing the project represents a real reduction for issuing credit.
- The GHG emissions reduction must be verifiable and enforceable. This requires a Compliance Offset Protocol to have clear monitoring and measurement requirements that can be audited by a verifier and enforced by ARB.
- The GHG emissions reduction must be additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative³ business-as-usual scenario.⁴ In order for ARB to ensure offset credits are additional, ARB would not adopt a protocol for a project type that includes technology or GHG abatement practices that are already widely used. See section 4 for more information.

³ “Conservative,” in the context of offsets, means “utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements.” Title 17, California Code of Regulations, section 95802(a).

⁴ “Business-as-usual scenario” means “the set of conditions reasonably expected to occur within the offset project boundary in the absence of the financial incentives provided by offset credits, taking into account all current laws and regulations, as well as current economic and technological trends.” Title 17, California Code of Regulations, section 95802(a).

3 PROCESS FOR ADOPTION OF COMPLIANCE OFFSET PROTOCOLS

3.1 What are the rulemaking requirements for approving Compliance Offset Protocols?

Compliance Offset Protocols are considered regulatory documents and are subject to the Administrative Procedure Act (APA).⁵ As with any regulation that is considered by the Board, each Compliance Offset Protocol must be developed through a full stakeholder process. As part of this APA process and consistent with ARB's certified regulatory program, staff will also develop an environmental analysis that is included in the staff report prepared for any Compliance Offset Protocol to be considered by the Board. This process satisfies the requirements of the California Environmental Quality Act (CEQA). The primary steps and details of the APA process and how it applies to protocol review and adoption are as follows:

- **Offset Protocol Announcements and Timing:** Staff will announce decisions to develop new offset protocols in a public setting, open to all stakeholders. Information related to new offset protocols will be shared in a transparent and public process so as not to give any one entity a potential market information advantage over another entity.
- **Informal Development Activities:** During this step, staff will hold public workshops or technical meetings to discuss the development of a potential offset protocol, focusing on areas such as, but not limited to, project specific mitigation methods, defining a project boundary, quantification of baseline conditions, and quantification of actual GHG reductions or removal enhancements. Staff will look at offset supply potential that could be generated under each potential Compliance Offset Protocol, prioritizing those with supply in California and then broadly across the United States. When considering offset supply, staff will be interested not only in the potential supply from a single project and the potential supply if only small projects can occur, but also in whether the mitigation methods or technology(ies) are easily transferrable for a larger volume of reductions. This process would, where appropriate, also include the development of draft protocol text following stakeholder input.

Depending on the complexity of the project type, ARB may hold a series of workshops or technical workgroup meetings. Dates of the workshops or

⁵ Government Code, § 11340 et seq. Although Health and Safety Code section 38571 exempts quantification methodologies from the Administrative Procedure Act (APA), Compliance Offset Protocols and the corresponding adoption through the Cap-and-Trade Regulation would include regulatory components that are subject to APA requirements.

meetings will be posted on the ARB website and posted to the relevant email listservs. When possible, such meetings are webcast for broad public participation.

All workshop presentations will be posted on the ARB website and a protocol-specific development webpage will be posted that contains information about the development of that specific protocol. During the first public workshop, a protocol staff lead for ARB will be identified along with his or her contact information.

- **Issuing the Notice:** This step initiates the APA rulemaking action. When, after completing the preliminary activities described above, ARB determines that it would like to proceed with a formal rulemaking on a proposed Compliance Offset Protocol, ARB will issue a notice of proposed rulemaking, which is included in the California Regulatory Notice Register. This notice will include the Board hearing date when staff will present the proposed Compliance Offset Protocol for Board consideration. This notice is posted at least 45-days prior to the Board hearing.
- **Availability of the Proposed Text and the Initial Statement of Reasons:** At least 45-days prior to the Board hearing, ARB will make available the proposed Compliance Offset Protocol text and a staff report that includes an explanation of why certain decisions were made in the development of the proposed Compliance Offset Protocol, any relevant analyses to support the proposed Compliance Offset Protocol, and an analysis of potential environmental impacts. ARB will post the proposed text and the staff report on its rulemaking website with the 45-day notice. ARB practice is to notify the public of the availability of these documents through the relevant email listservs.
- **45-Day Comment Period:** ARB will provide at least 45 days for the public to review the proposed Compliance Offset Protocol text and staff report and provide written comments to ARB.
- **Public Hearing:** Staff will present the proposed Compliance Offset Protocol to the Board for its consideration. This process usually includes a staff presentation at a regularly scheduled Board hearing. The dates and agendas for each hearing are posted on the rulemaking website. Stakeholders can provide written and oral testimony to the Board before the Board takes any action on the proposed Compliance Offset Protocol text. The Board may choose to adopt the proposed Compliance Offset Protocol text as written or to direct staff to make changes and release amended material for a formal comment period of at least 15-days. ARB will consider all formal comments on its proposed Compliance Offset Protocol as required by the APA and Board policy.

- Summary and Response to Comments:** ARB must summarize and respond to all formal comments submitted during the 45-day comment period, at the Board hearing, and during any subsequent 15-day comment periods on the proposed Compliance Offset Protocol in a document referred to as the Final Statement of Reasons. In this document, ARB will indicate where it made a change in response to a comment, or why a change is not appropriate. When applicable, the written responses to comments addressing the environmental analysis will be considered by the Board prior to making any findings required by the CEQA before a proposed protocol is adopted. This process ensures that ARB has understood and considered all relevant material presented to it before adopting a proposed protocol.
- Submission of a Rulemaking Action to the Office of Administrative Law (OAL) for Review:** Following final ARB approval, the rulemaking record is submitted to OAL for review. ARB also posts a Notice of Decision with the Secretary of Natural Resources in accordance with its CEQA certified program. OAL has 30 working days to review the rulemaking record to determine whether it demonstrates that ARB satisfied the requirements of the APA. Upon OAL approval, the Board-adopted Compliance Offset Protocol is filed with Secretary of State and becomes effective within a quarterly time schedule provided in the APA.

The Administrative Procedures Act mandates that ARB complete a rulemaking within one calendar year from the date the 45-day notice is published in the California Notice Register. If ARB does not submit the final protocol and regulatory amendments to the Office of Administrative Law by that date, ARB must initiate a new rulemaking. This includes a new 45-day comment period and Board hearing.

4 ADDITIONALITY

AB 32 and the Cap-and-Trade Regulation require any reductions used for compliance to be beyond what would otherwise be required by law, regulation, or legally binding mandate, and that exceed what would otherwise occur in a conservative business-as-usual scenario. For each proposed Compliance Offset Protocol, staff will establish whether GHG reductions or removal enhancements that result from the implementation of offset projects under the protocol are already being required by a local, state, or federal regulation. If a specific GHG mitigation method is already required by regulation, any reductions from that mitigation method would not meet the requirements for additionality. In this case the proposed Compliance Offset Protocol could not include

that specific GHG mitigation method and compliance offsets would not be issued for that reduction activity.

To assess if a specific GHG mitigation method may have “otherwise occurred,” staff will establish if that method is common practice in the geographic area in which the proposed Compliance Offset Protocol is applicable. Where possible, this review would include staff’s best estimate of the percent of the technology or mitigation in use for that sector. This can be done through outreach to the sector that would generate potential offsets, discussions with trade organizations, data research, and reviews of technology trends. Staff will take into consideration cost barriers that may prohibit technology or GHG mitigation methods from occurring in the absence of revenues from the generation of offset credits. For each proposed Compliance Offset Protocol, staff will share their findings during a stakeholder process and solicit feedback to determine whether a specific technology or GHG mitigation method is beyond common practice, and if the resulting reductions would meet the requirements for additionality.

5 HOW DOES ENVIRONMENTAL CREDIT STACKING WORK UNDER THE CALIFORNIA COMPLIANCE OFFSET PROGRAM?

Environmental credit stacking refers to a situation where a single activity provides more than one marketable environmental credit. For example, forest projects can result in carbon sequestration and improved watershed quality benefits. ARB believes that environmental co-benefits are a desired result of its Compliance Offset Protocols. The additional incentives such as other environmental credits would not by themselves disqualify a project type from being considered for the development of a Compliance Offset Protocol. ARB’s assessment of additionality will be based on how prevalent a mitigation practice or technology is within a sector, regardless of whether or not the activity could generate other marketable environmental credits.

6 WILL ARB PERIODICALLY REVIEW COMPLIANCE OFFSET PROTOCOLS?

Yes, ARB will continue to monitor the adoption of new or modified regulations that could affect additionality, as well as new developments in scientific data and quantification related to adopted Compliance Offset Protocols that would warrant a change to an existing Compliance Offset Protocol. Staff will propose amendments to Compliance Offset Protocols as necessary through a stakeholder process prior to Board consideration. Staff will weigh the decision to update a protocol against the market desire for certainty to support an active and robust compliance offset program. Any amendments to an existing Compliance Offset Protocol would involve the same APA process as developing a new Compliance Offset Protocol.

Once ARB updates an existing Compliance Offset Protocol, the previous version would no longer be used by new projects from the date that OAL approves the new version. Any existing projects under the previous version of the protocol would be required to use the new version of the protocol once the existing crediting period has ended.

7 HOW CAN I PARTICIPATE IN THE COMPLIANCE OFFSET PROTOCOL DEVELOPMENT PROCESS?

ARB encourages interested parties, including subject matter experts and general members of the public to attend Compliance Offset Protocol development workshops and provide informal and formal written feedback on proposed content during the Compliance Offset Protocol development process. Stakeholders can also request meetings with ARB staff to discuss protocol-related issues. Stakeholders are encouraged to sign up for the Cap-and-Trade listserv to make sure they are notified of any workshops or public information related to Compliance Offset Protocol development:

http://www.arb.ca.gov/listserv/listserv_ind.php?listname=capandtrade.

8 SUBMITTING IDEAS FOR COMPLIANCE OFFSET PROTOCOLS?

8.1 Can a voluntary offset program recommend a protocol for review?

Yes. Voluntary offset programs such as the American Carbon Registry, Climate Action Reserve, Verified Carbon Standard, and others may submit protocols to ARB for review. However, regardless of how the voluntary protocols are developed, ARB staff must determine whether the voluntary protocol should be developed for use in the Cap-and-Trade Program and if so, to conduct its own rulemaking process under the Administrative Procedure Act. As outlined above, under this process ARB would review, modify, and present a proposed Compliance Offset Protocol for Board consideration. This process ensures that any voluntary protocol modified for consideration by the Board demonstrates the resulting reductions meet the offset criteria in AB 32 as defined in the Cap-and-Trade Regulation and the criteria listed earlier in this document.

Protocols developed by the voluntary programs are not Compliance Offset Protocols as they are not developed through a rulemaking process, may not meet the AB 32 and Cap-and-Trade Regulation criteria, and were not approved by the Board.

8.2 Why has ARB not developed Compliance Offset Protocols for all of the existing voluntary offset protocols?

There are many existing voluntary offset protocols for use in the voluntary offset market. However, ARB must ensure any Compliance Offset Protocol it develops will result in

offset credits that meet the AB 32 offset criteria and the general protocol criteria in section 2.2. ARB will periodically review the available voluntary offset protocols and the potential to develop them into Compliance Offset Protocols.

8.3 Why can't we limit offset protocols just to California projects?

An important role for compliance offsets in the Cap-and-Trade Program is to provide cost containment for covered entities in the program. A covered entity can meet up to eight percent of its compliance obligation by using offsets in each compliance period. It is important to note that if all entities under the cap were to maximize the use of offsets up to the eight percent limit, there would still need to be on-site GHG emissions reductions at covered entities to meet the overall cap limits through 2020. Since the Cap-and-Trade Program already covers most sectors of California's economy under the cap, limiting offsets to just projects in California would significantly reduce the offset supply potential available to covered entities. This would increase their cost for compliance under the Cap-and-Trade Program. As stated in section 2.1, ARB will try to identify potential Compliance Offset Protocols that may be applicable in California, as well as across the United States.

8.4 What if I have a good idea for an offset protocol?

ARB encourages stakeholders to engage with staff regarding the development of new Compliance Offset Protocols and potential new project types that may fit the criteria for compliance offsets. Section 2.2 of this document contains the requirements for Compliance Offset Protocols. These requirements can help stakeholders discern if their ideas could potentially be considered for the Compliance Offset Program.

8.5 Will ARB only approve protocols based on a standardized approach?

Yes, approved Compliance Offset Protocols serve as a cornerstone of the Compliance Offset Program to ensure that reductions are appropriately quantified, monitored, reported, and documented. Those protocols taken to the Board for adoption will consist of standardized methods that quantify reductions based on specific criteria and pre-established calculation methods. This approach streamlines the calculation of project baselines and determination of the additionality of projects by using standard eligibility criteria that ensure projects are additional. By establishing the standardized criteria in the Compliance Offset Protocol, there is less subjectivity by verifiers or offset project developers as to whether a project may be additional and this supports consistent quantification rigor in the offset program.

8.6 Will ARB approve protocols developed under a project-based approach?

No, ARB is not planning to accept project-based protocols because each individual project protocol must be approved by the Board and such a process would be lengthy and administratively burdensome.

Additional Information

More information on the Cap-and-Trade Program, compliance offsets, and current rulemaking activities can be found here:

<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

Staff contacts for the Cap-and-Trade Program can be found here:

http://www.arb.ca.gov/cc/capandtrade/contacts/capandtrade_contacts.htm

Chapter 15

Carbon Offsets in California: Science in the Policy Development Process

Barbara Haya, Aaron Strong, Emily Grubert, and Danny Cullenward

Abstract Natural and social scientists are increasingly stepping out of purely academic roles to actively inform science-based climate change policies. This chapter examines a practical example of science and policy interaction. We focus on the implementation of California’s global warming law, based on our participation in the public process surrounding the development of two new carbon offset protocols. Most of our work on the protocols focused on strategies for ensuring that the environmental quality of the program remains robust in the face of significant scientific and behavioral uncertainty about protocol outcomes. In addition to responding to technical issues raised by government staff, our contributions—along with those from other outside scientists—helped expand the protocol development discussion to include important scientific issues that would not have otherwise been part of the process. We close by highlighting the need for more scientists to proactively engage the climate policy development process.

Keywords Carbon offsets • Climate change policy • Carbon markets • Science and policy

15.1 Introduction and Background

Natural and social scientists in the field of global climate change are increasingly stepping out of purely academic roles to inform and support policy that is science-based. This chapter explores the roles that science and scientists play in climate policy development using an example from the California climate policy process. Beginning in the spring of 2013, we participated in the public process for

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developing two new carbon offset protocols in California. We relay our experiences as scientists in these processes with two main goals. First, we describe the types of input we and other natural and social scientists provided to regulators, in order to shed light on how scientific issues emerge in policy development and the associated role scientists play in practice. Second, we hope this example will encourage interested scientists to engage the climate policy process more directly. Fundamentally, we believe that scientists' active participation in climate policy development can improve policy outcomes and generate useful research agendas.

The primary theme of our work is supporting the robustness of California's offsets policies, a topic on which most of our efforts focused. As used in discussions of global climate change, another term—*resilience*—most commonly refers to the ability of communities or nature to adapt to the uncertain impacts of climate change. In the context of climate change policy, *robustness* offers a similar framing. It refers to the ability of a policy to reliably meet its goals despite substantial uncertainty in predicting or measuring its outcomes (Lempert and Schlesinger 2000).

The concept of policy robustness is particularly relevant in the context of policies concerning carbon offsets because of the deep scientific and behavioral uncertainties involved in calculating accurate emission reductions from offset projects. Because greenhouse gas emitters in a climate policy system that recognizes offsets—such as California's carbon market—use offset credits to justify increased emissions within the policy system's boundaries, it is critical that offsets accurately represent true emission reductions. Meeting this standard is no simple matter, however, as it requires scientifically complex and inherently uncertain methodologies.

The uncertainty stems from the need to calculate emission reductions by comparing an offset project's emissions against an inherently unknowable counterfactual scenario: the emissions that would have occurred without the offset project. Both estimates are subject to uncertain physical, social, and economic drivers. In light of this uncertainty, ensuring that offset credits represent true emission reductions requires conservative decisions about project and baseline emissions to ensure that protocols actually reduce the credited emissions reductions. Accordingly, our participation in California's public policy development processes focused on ways to preserve the robustness of the two offset protocols on which we worked.

The chapter is organized as follows. We begin with an overview of California's climate mitigation policies, describing how offsets fit into the state policy system, as well as the key challenges offsets pose for policy-makers. Next, we describe our activities as stakeholders in the public process for developing new offset protocols. We illustrate our work with a handful of examples that highlight scientific issues that emerged in the policy process, including issues that the regulatory agency identified for public input, as well as those issues we raised in our independent capacity. In the final section, we offer some concluding thoughts about our experience and the various roles we and other scientists played in these policy processes. Finally, we encourage other environmental scientists to explore proactive models of policy engagement.

15.1.1 *California's Climate Policy*

In 2006, California passed the Global Warming Solutions Act (AB 32), launching the state's comprehensive approach to climate mitigation policy. Its key feature is a legally binding requirement to reduce statewide greenhouse gas (GHG) emissions back to 1990 levels by the year 2020. To accomplish this goal, state law delegated broad authority to the California Air Resources Board (CARB), which developed a suite of climate policy instruments over the last several years (CARB 2008, 2014a). The most prominent is California's cap-and-trade program. This program applies to California's electricity, industrial, and fuels sectors, covering about 85 % of state-wide emissions.

Briefly, cap-and-trade carbon markets set an overall limit (or *cap*) on anthropogenic greenhouse gas emissions within the covered sectors. The regulator then issues tradable emissions allowances, with the total number equal to the cap. Each emissions allowance credit confers the right to emit one tonne of GHG pollution (measured in tonnes of CO₂ equivalent, tCO₂e). Covered entities must submit one allowance per tCO₂e of pollution they emit. Since allowances are tradable, if a regulated emitter can reduce emissions more cheaply than the price of a permit, it can do so, freeing up permits to sell to others who face costlier mitigation opportunities. This lowers compliance costs compared to a system in which each emitter must meet an established standard without trading.

Carbon offsets extend the flexibility of this approach by allowing covered entities to seek lower-cost emission reduction opportunities outside of the carbon market—for example, in another state or in an economic sector not covered by the cap—instead of reducing emissions within the capped sectors. The financial benefits to regulated emitters are straightforward: expanding the range of mitigation opportunities outside the capped system through offsets reduces compliance costs. Since climate change is driven by the global stock of GHGs in the atmosphere, reducing one tonne of emissions has the same effect regardless of location.¹ As we discuss below, however, accurately calculating the net emissions reductions raises new challenges.

15.1.2 *Offsets in California*

Companies subject to the cap-and-trade market can use offset credits to cover up to 8 % of their total emissions. This limit on the use of offsets appears significantly more generous when expressed as a percentage of the total mitigation required in the carbon market: if all regulated parties use the maximum amount allowed, offsets

¹ Though other pollution impacts that are coincident with the greenhouse gas emissions may have important local and regional effects, including on public health

would contribute about half of the total emission reductions expected under California's climate policy through 2020 (Haya 2013).

Carbon offsets in California work as follows. CARB issues offset credits for projects that follow approved protocols. The protocols themselves determine what project activities are eligible and define the methodologies by which projects estimate their emission reductions. Thus, offset protocols must be designed to anticipate all of the emissions-related drivers that apply in a given sector—a task that typically involves complex issues of environmental and social science.

Although the decision to develop a new protocol lies entirely at CARB's discretion, offset protocol methodologies must meet certain standards. State law and market regulations both require that emission reductions from offsets be “real, additional, quantifiable, permanent, verifiable, and enforceable.”² Each of these terms has a formal legal definition. The most challenging requirement has been *additionality*, defined in AB 32 as crediting only those emission reductions that are made “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.”³ CARB's climate regulations provide more context on how additionality is to be tested, requiring the use of a “conservative, business-as-usual scenario.”⁴

The regulations also directly address uncertainty and risk management, defining conservative scenarios as those whose “project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG emission reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of [net GHG reductions].”⁵

Finally, it is important to recognize that political perspectives on offsets vary widely. Many stakeholders, including most major emitters in the market, are strongly supportive of offsets as a mechanism to keep compliance costs low. After all, the supply of offset credits is widely expected to meaningfully reduce carbon market prices relative to a market without offsets (Borenstein et al. 2014; EPRI 2013). In contrast, several nonprofit stakeholders have expressed concerns about whether California's offsets truly represent reductions in GHG emissions. For example, two environmental groups sued CARB, claiming that the agency's decision to evaluate additionality using a performance standard at the protocol level does not satisfy the requirements of AB 32. The trial court rejected the plaintiffs' claims, finding that CARB had the necessary legal authority to adopt its performance standard approach. The court then applied a highly deferential standard to review CARB's treatment of additionality in each of its existing protocols (*Our Children's Earth Foundation v. CARB* 2015). Beyond highlighting the political opposition to offsets, this decision suggests that future legal challenges to CARB's protocol methodologies would face a difficult legal test under which the regulator is likely to prevail.

² Cal. Code Regs. tit. 17, § 95802(a)(14); see also Cal. Health & Safety Code § 38562(d)(1)-(2).

³ Cal. Health & Safety Code § 38562(d)(2).

⁴ Cal. Code Regs. tit. 17, § 95802(a)(4).

⁵ Cal. Code Regs. tit. 17, § 95802(a)(76).

15.1.3 *Critical Issues for Carbon Offsets*

Offsets raise a number of technical challenges, and CARB's two new protocols are no exception. A carbon market maintains its environmental integrity only if the offset credits it recognizes represent actual net reductions in greenhouse gas emissions. In practice, however, uncertainty about those reductions requires detailed scientific input and is often the subject of significant controversy.

A critical task for policy-makers is establishing a robust standard for offset additionality. An offset project is considered additional only if it occurred because of the financial investment made in return for offset credits. In other words, an offset program should only credit those emission reductions it causes and should not credit reductions that would otherwise have occurred. This standard is necessary to ensure that any climate policy system that accepts offsets achieves its intended emission reductions. But additionality is difficult to achieve in practice. Several studies have shown that a large portion of credits generated by the Clean Development Mechanism (CDM, the Kyoto Protocol's offsets program) were non-additional projects that would have occurred without the financial incentive of offset credits and thus do not represent net emission reductions (Cullenward and Wara 2014; Haya 2009; Haya and Parekh 2011; Wara 2008). As a result, their use by countries to meet Kyoto Protocol targets came at the expense of real reductions in greenhouse gas emissions.

Two issues further complicate the basic question of establishing whether offset credits represent real additional emission reductions. First, uncertainty analysis is particularly important for offset projects in the land-use and agricultural sectors, where emissions vary widely across location, crop, and ecosystem types. Second, there is the risk that offset program incentives cause emissions to increase outside of offset project boundaries. The most egregious example involves offset credits in the CDM awarded for the destruction of hydrofluorocarbons (HFCs), a potent family of greenhouse gases emitted as byproducts in the production of certain refrigerants. Manufacturers realized they could earn greater profits from destroying HFCs than from the sale of the refrigerant itself. There is strong evidence that they increased their production as a result of this incentive, creating surplus HFC byproducts that they subsequently destroyed to earn offset income (Wara 2008). Beyond enticing non-additional credits, the income from HFC-related offsets might have discouraged national governments from directly regulating HFC emissions, in order to maintain offset project eligibility—an effect that has been documented for a range of other project types (Figueres 2006).

Although the problems observed in past offset systems remain relevant, it is important to recognize that CARB's approach to additionality is different than that of its predecessor, the Kyoto Protocol's CDM. The CDM requires individual offset project applicants to evaluate their counterfactual emissions scenarios and demonstrate additionality for each individual project. In contrast, the California system makes these determinations at the protocol level by defining project eligibility criteria. Once CARB has approved a protocol, a project applicant needs only to

demonstrate compliance with the protocol's eligibility criteria in order to earn credit. Given the use of up-front project eligibility criteria, robust protocol design is particularly critical to ensuring that California's offset credits represent real emission reductions.

Finally, we note the importance of CARB's early offset protocols as institutional precedents in American climate policy. As one of the first legally binding climate policies in the United States, California's cap-and-trade system has already become a standard point of reference for climate policy design. In turn, CARB's treatment of complex and uncertain scientific issues in its offset protocol development process will surely set an important example for others.

15.1.4 Proposed Mine Methane Capture and Rice Cultivation Protocols

By the beginning of 2013, CARB had approved four offset protocols covering projects in the following areas: (1) forestry, (2) urban forestry, (3) livestock waste management, and (4) destruction of ozone-depleting substances. We participated in the policy development process for two new protocols: (1) mine methane capture and (2) rice cultivation, which we describe briefly here for background.

CARB approved the Mine Methane Capture (MMC) protocol in April 2014 (CARB 2014b), following a year of development and stakeholder engagement. The protocol awards credits to projects that capture methane that otherwise would have been released into the atmosphere from coal and trona⁶ mining activities. CARB's MMC protocol recognizes two types of projects. Methane can be captured for use as a fuel, such as by injecting captured gas into natural gas pipelines or using it to fire an on-site power plant. Alternatively, MMC projects can destroy methane without putting it to productive use through flaring or oxidation. In any of these cases, methane (CH₄) is converted to carbon dioxide (CO₂), a much less potent greenhouse gas.

At the time that this chapter was written, CARB was in the process of developing a rice cultivation protocol and responding to comments submitted on a discussion draft of the protocol released in March 2014. This protocol would credit reductions in methane emissions from changes in rice cultivation practice in California and the South Central United States. Rice cultivation produces methane emissions because production fields are submerged under water for a large portion of the year. This causes biomass to decompose without oxygen, producing CH₄ rather than CO₂. Methane emissions can be reduced if the fields are submerged for less time or if less biomass is left on the field to decompose anaerobically.

⁶Trona is a mineral mined as the primary source of sodium carbonate in the United States.

15.2 Science in the Policy Development Process

In April 2013, CARB established technical working groups to bring together stakeholders to inform the development of two new offset protocols. The working groups included offset project developers, project verifiers (who verify that project developers have met the protocol's requirements), representatives from industries facing compliance obligations in the carbon market (i.e., offset buyers), environmental nonprofit staff, academic research scientists, representatives from organizations that develop offsets standards for voluntary carbon markets, and state and federal officials from outside agencies. Each working group convened approximately once every three months, though additional discussion continued between meetings.

15.2.1 *The Interdisciplinary Nature of Climate Change Policy Development*

As a preliminary matter, we note that the scientific and technical expertise needed to ensure the environmental integrity of carbon offset protocols spans a wide range of disciplines. For example, the MMC and rice cultivation protocols drew on experts—including a number of outside scientists, in addition to our group—who provided advice on statistical uncertainty assessment, biogeochemical and ecological modeling, field measurements of gas fluxes, economic analysis, life-cycle analysis, basic mineralogy, engineering of mine construction, wildlife ecology, insect population dynamics, the sociology of agricultural crop production practices, modeling hydrological connectivity above- and belowground, state and federal water law, land-use law, environmental law, and organizational theory. As this list indicates, there are many opportunities for a variety of scientific experts to proactively engage the climate policy process—no agency has all of the necessary experts on staff.

15.2.2 *What Did We Do?*

Our participation in the offset protocol development process included a wide range of activities. We interfaced with a variety of stakeholders, including CARB staff, CARB board members, offset project developers, and nonprofit groups. Similarly, our communications ranged from informal conversations in person to formal written comment letters. As members of the technical working groups for each protocol, we attended meetings at the agency's headquarters in Sacramento and brought attention to issues we viewed as critical to the environmental integrity of the draft protocols as they developed, based on detailed independent analysis.

We provided our assessments to CARB staff as informal communications and later submitted formal comment letters during public comment periods in the administrative process. At times when we believed that CARB was not adequately addressing critical concerns, we spoke with individual CARB staff and board members outside of the formal working group process, occasionally with the participation of other stakeholders; we also raised our concerns through public testimony at formal board meetings.

The overarching goal of our involvement was to apply our research team's interdisciplinary expertise to helping ensure the environmental quality of the protocols. We did not use a single set of methods in our contributions, but rather, each of us brought methods from our respective disciplines to our shared goal. Below, we offer examples of scientific issues that highlight the kinds of input we offered in an effort to ensure that California's offset protocols reflect the best available science and are robust in the face of significant uncertainty.

Our examples are organized according to different ways that scientific issues arose in the policy development process—at the agency's request or according to our independent review of the protocols—rather than by protocol or chronology. In this way, we hope to illustrate both how science was used in developing the protocols and what roles scientists can expect (or be expected) to play in such processes.

15.2.3 Scientific Issues Raised by the Agency

Our first category of scientific engagement in the policy development process focuses on those issues that CARB proactively identified, either via agency staff asking stakeholders directly for input or by inclusion on agency-drafted meeting agendas. We review one such example in this section.

15.2.3.1 Scale of Uncertainty Assessment in Model-Estimated Emissions from Rice Cultivation

If the proposed rice cultivation protocol is adopted, it will become the first California protocol to use a computer-based model to estimate emission reductions. Using a model is necessary in this case because direct field measurements of emissions are technically challenging, costly, and time-consuming. The proposed protocol relies on a mechanistic biogeochemical model, the DeNitrification-DeComposition (DNDC) model, originally developed at the University of New Hampshire (2012).

The DNDC model is used to estimate offset project emissions and emission reductions. Through the technical working group, we—along with other scientists, including DNDC model developers, biogeochemists, and agricultural experts—addressed questions about model uncertainty and validation, the model's ability to estimate emissions of the potent GHG nitrous oxide (N_2O), and specific biogeochemical parameters used in the model.

Models are by definition simplifications of complex processes and are not perfectly accurate. Accordingly, the draft protocol applies a *deduction* that reduces the model-estimated emission reductions to conservatively account for any model error. Early drafts of the protocol included this deduction, but applied only one value for all eligible projects. Since DNDC must be field-calibrated to particular crop types, however, we were concerned that a blanket assessment of an uncertainty deduction for model error was too general and would not reflect the uncertainty of the model as it would be applied in the rice cultivation protocol—specifically, to fields in different ecosystems, with different cultivars, and in different regions around the country.

We focused our attention on how finely to parse assessments of model uncertainty, raising this issue in both formal and informal comments. Ultimately, the draft protocol included separate uncertainty deduction calculations for each of the rice-growing regions, rather than a single uncertainty deduction for all applications of the model. Furthermore, CARB decided to update the uncertainty deduction coefficients on an annual basis, a feature that will make the protocol more robust in light of new information. On the other hand, there is no formal mechanism for updating the model itself in response to newly published scientific information that directly affects relevant calculations. In the end, the potential for model structures and inputs to change highlights the profound challenge of integrating active scientific research into a fixed policy structure. Inevitably, there will be trade-offs between the adaptability of the protocol to new information and the stability of compliance rules that offset project developers desire.

15.2.4 *Scientific Issues We Raised*

A second category of scientific engagement describes our independent evaluation of issues that emerged during the protocol development process, as opposed to the assessment of issues on which CARB specifically requested input. In this section, we discuss examples of issues we raised about the conservative estimation of emission reductions from individual projects, additionality assessment, and the risk of unintended consequences caused by interactions between offset protocols and other policies. In some cases, we raised questions that were not being addressed at the time, and in others, we advanced new perspectives on issues that were already under agency consideration.

15.2.4.1 **Statistical Bias in the Rice Cultivation Emissions Model**

Statistical bias occurs when a prediction repeatedly over- or underestimates real-world outcomes. A model is unbiased if its outcomes are equally likely to over- and underpredict actual emissions as determined by direct field measurements. An unbiased model may still over- or underestimate the reductions achieved by an

individual offset project, but the uncertainty deduction factor (discussed above) ensures that over-crediting is still avoided with a high degree of certainty. However, a model that has not been validated as statistically unbiased for the project types credited under the protocol may result in an overestimation of the emissions reduced by those project types, even after the uncertainty deduction factor is applied.

During the rice protocol development process, CARB staff referred to hundreds of field measurements that had validated the DNDC model, finding no trend in the estimates. Thus, they concluded that the model was not biased. We were concerned, however, that some of the project types eligible under the protocol were not included in the data used to validate the model. Noting this gap, we argued that an assessment of bias at the level of the entire DNDC model was insufficient, and that project-type specific assessment of model bias was warranted. To avoid over-crediting, we suggested that CARB approve the eligibility of a project type under the protocol only if the DNDC model has been validated to have no statistical bias for the type of activities credited by that project type. As of this writing and to the best of our knowledge, CARB staff provided the technical working group with only a list of published references, not the actual data from the model runs used in the bias assessment.

As CARB continues to collect field data to validate the model, we hope to view the complete dataset on which CARB validates the DNDC model. This example illustrates the important role scientists play in reviewing the technical basis of policy—in this case, the methods used to assess statistical bias in an emissions model, in order to avoid over-crediting. It also illustrates the importance of transparency and access to data, both of which are necessary to enable scientific review.

15.2.4.2 Additionality of Methane Capture at Abandoned Mines

Our second example in this category concerns the treatment of additionality in the MMC protocol. CARB determines the additionality of different project types by assessing whether the project activity is *common practice* among a relevant population; a project type is considered additional if it is not common practice. Applying this approach to methane capture at abandoned mines under the MMC protocol, CARB staff studied abandoned underground mines in the United States, finding that “few currently capture and destroy mine methane. Methane capture and destruction is therefore deemed not to be business-as-usual at these mines” (CARB 2013, p. 7). This language suggests that CARB was prepared to deem all abandoned mine methane control projects additional under the MMC protocol.

The case of methane capture at abandoned mines demonstrates the importance of assessing additionality for subcategories of project types and not just for the entire population of possible projects as a whole. It also highlights the value of performing a conservative quantitative assessment to examine compliance with the protocol level additionality standard. While only 38 of the more than 10,000 abandoned mines in the United States have implemented methane capture projects, these 38 mines emit one third of all methane released from abandoned mines in the country (Ruby Canyon Engineering 2013a). Thus, existing methane capture projects at

abandoned mines are correlated with high rates of methane emissions—exactly as one would expect, given that the costs of capturing methane decrease as the rate and concentration of methane emissions at mines increase.

If all abandoned mines were eligible for MMC offset credits, the protocol could generate non-additional credits from projects that would have proceeded regardless of the financial incentives offsets provide. Indeed, if methane capture project development trends at abandoned mines from the last two decades were to continue, the volume of non-additional credits enabled by CARB's initial common practice assessment would likely far exceed methane capture from truly additional projects enabled by the financial incentive created by the offsets program as assessed by Ruby Canyon Engineering (2013b).

A more detailed analysis of abandoned mines suggested a path forward. Currently, most methane capture at abandoned mines occurs at mines that captured methane for pipeline injection when they were active. In fact, all mines that captured methane and were closed within the last ten years continued to capture methane after being abandoned. Methane capture at this subcategory of mines is undoubtedly common practice. Accordingly, CARB narrowed its eligibility criteria in the final protocol it adopted in April 2014, excluding those abandoned mines where methane had been captured and injected into pipelines when the mine was active (CARB 2014b, p. 14).

Our calculations showed that this approach excludes most, but not all, of the non-additional crediting that would conceivably be generated under CARB's initial definition of common practice at abandoned mines. While most non-additional methane capture is excluded from crediting by the narrowing of CARB's eligibility criteria for abandoned mines, past trends suggest that a smaller amount of methane capture may still be cost-effective on its own. We performed a quantitative analysis on the narrowed pool of eligible projects.

We found that if past trends in the development of new methane capture projects at abandoned mines that never previously captured methane were to continue, the expected generation of credits from non-additional projects is likely to be small compared to the expected effect of the protocol on new project development. Our analysis further indicated that under-crediting from conservative methodologies used to estimate emission reductions from abandoned mines under the protocol can reasonably be expected to counterbalance this non-additional crediting.⁷ In other words, even though it is likely that some abandoned mines that would have chosen to implement methane capture technology regardless of the offset credit could generate credits under the protocol, the total quantity of offset credits generated by the protocol is unlikely to exceed the net emission reductions enabled by the protocol.

⁷For a more detailed description of this assessment, please see comments submitted by Barbara Haya on behalf of our research team dated February 14, 2014, "RE: Comments on the informal draft of the Mine Methane Capture (MMC) Projects Compliance Offset Protocol released 31 January 2014" available on California Air Resources Board's Workshop Comments Log: <http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=discussion-draft-ws>.

As a result, we concluded that the protocol is expected to meet the additionality requirement defined under AB 32.

In addition to describing how the regulator's approach to a particular technical issue evolved during the MMC protocol development process, this example illustrates a methodological issue that speaks to the broader architecture of California's offsets policy. CARB's common practice approach appears to be designed to avoid the subjectivity of other eligibility metrics by referring to objective measurements of the frequency of emission-reducing activities. Nevertheless, we believe that this approach belies a persistent analytical subjectivity. As the abandoned mine issue shows, how CARB defines the population of project types against which it makes its common practice determination has important implications for the additionality of the offset protocol as whole. This example illustrates the importance of performing additionality assessments on subcategories of projects and conservatively excluding subcategories that could be considered common practice. More broadly, it also shows that the decision to use a common practice standard does not avoid the need for careful risk assessments of possible outcomes; these assessments remain necessary to identify appropriate project eligibility criteria that contain the risk of over-crediting.

15.2.4.3 Potential Conflicts with Clean Air Act Implementation

Our final example concerns a prospective impact that could occur beyond offset project boundaries. Here, our analysis focused on the potential for California's MMC protocol to interfere with other states' implementation of regulations under the federal Clean Air Act. The problem is this: although California's offset regulations exclude as ineligible those offset projects whose emission-reducing activities are separately required by law, they do not consider the incentive California's offset protocols create to keep legal standards in other jurisdictions low.

Under the Clean Air Act, any major new source of greenhouse gases is required to apply for a Prevention of Significant Deterioration (PSD) permit from its state environmental agency. In turn, the state agency is required to determine the best available control technology (BACT) for that particular project. State agencies have broad discretion in setting each project's BACT, with limited room for the federal Environmental Protection Agency (EPA) to review their findings. We expressed concern that California's MMC protocol would create incentives for out-of-state agencies to keep GHG BACT standards for mines artificially low. After all, were an out-of-state regulator to require methane destruction under the BACT determination for a PSD permit that methane destruction project would become ineligible for offset credits (and revenues).

In order to mitigate this risk, we recommended a do-no-harm precaution, temporarily excluding from the MMC protocol those mines that would require a PSD permit under the Clean Air Act. Once a specified number of PSD permits were

issued to comparable mines, however, we suggested the MMC protocol could then expand its eligibility to mines that required PSD permits—so long as the early BACT determinations indicate that this course would be appropriate. Ultimately, these issues were not addressed in the adopted protocol and will be monitored informally.

15.3 Conclusions

The development of two new carbon offset protocols in California provides a rich case study in science-based policy-making. As public members of the technical working groups established by the California Air Resources Board, we both observed and contributed to the scientific discussions that arose during the course of protocol development. In addition to responding to the issues and questions raised by CARB directly, we—along with other outside scientists—played an essential role in expanding the protocol development discussion.

Most importantly, our engagement focused extra attention on the robustness of the protocols, providing strategies to avoid over-crediting despite substantial uncertainty in predicting protocol outcomes. Robustness is critical in the development of carbon offset protocols because of the significant scientific and behavioral uncertainty involved in accurately calculating emission reductions from individual projects. Fundamentally, this uncertainty stems from the challenge of estimating emission reductions (and the number of offset credits awarded) against an inherently unknowable counterfactual scenario of what would have happened without the offset program. Because offset credits are used in place of emission reductions within existing climate policy systems, methodological decisions must be made conservatively and guided by scientific risk assessments in order to avoid weakening these systems. Protocols should also be responsive to new scientific information and changes in the socioeconomic drivers of emissions. By conducting independent analyses of these kinds of issues, we aimed to increase the agency's capacity to evaluate key risks and improve the robustness of the offset protocols.

Finally, we hope the examples in this chapter encourage more members of the scientific community to seek ways to actively engage the development of climate policies. Although the offset protocols on which we worked were certainly informed by traditional scientific publications, our experience shows how the full treatment of scientific issues in the policy process occurs more through direct participation than literature reviews. Many of the critical policy questions involving science and uncertainty analysis would be difficult, if not impossible, to anticipate from a detached distance. In addition, their successful resolution depends on professional relationships built through iterative interactions in the policy process. Collectively, these factors suggest the need for more academics to explore ways to actively engage the climate policy process in the future.

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POLICY BRIEF: The California Air Resources Board's U.S. Forest offset protocol underestimates leakage

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SUMMARY

Analysis of projects generating 80% of total offset credits issued by the California Air Resources Board's (ARB) U.S. Forest offset protocol finds that 82% of these credits likely do not represent true emissions reductions due to the protocol's use of lenient leakage accounting methods. The U.S. Forest protocol has generated 80% of the offset credits in California's cap-and-trade program. The total quantity of emissions allowed because of this over-crediting equals approximately 80 million tons of CO₂, which is one third of the total expected effect of California's cap-and-trade program during 2021 to 2030 (ARB 2017).

Leakage, in the context of the protocol, occurs when a reduction in timber harvesting at a project site causes an increase in timber harvesting elsewhere to meet timber demand. The way ARB's protocol accounts for leakage when calculating the number of credits awarded has three serious problems.

First, the protocol uses a 20% leakage rate when a rate of 80% or higher is supported by published studies of leakage rates from reduced timber harvesting in the United States (Gan & McCarl 2007, Wear & Murray 2004). Using an unsupported low rate results in over-crediting.

Second and more importantly, there is an inconsistency between the timing of when increases in on-site carbon storage and releases due to leakage are accounted for in the protocol's methods. Most improved forest management projects assume and credit a large reduction in timber harvesting in the first year of the offset project, but deduct the associated leakage over 100 years. This outcome is physically inconsistent, as it assumes the forest would be harvested in the first year for the purpose of giving credit but assumes harvesting would be spread out over 100 years for the purpose of reducing credits to account for leakage. As a result, most forest offset projects begin in greenhouse gas debt; project landowners generate offset credits that allow emitters in California to emit more than the state's emissions cap today, in exchange for promises that their lands will continue to increase their storage of carbon over 100 years.

Third, it is unclear whether the protocol requires forestland owners to increase carbon stocks to cover leakage for 25 years or for 100 years. The ambiguity relates to whether forestland owners are required to continue to maintain on-site growth to cover the impacts of leakage after the end of the project's 25-year crediting period. If forestland owners are only required to account for leakage for 25 years, participating projects could result in no net increase in carbon storage over 100 years compared to the baseline scenario.

The below table presents the actual emissions reductions achieved by projects under the protocol under different assumptions, reported as proportions of the credits already issued. For example, the cell on the upper left (100%) represents the assumptions underlying current policy. If these

assumptions are accurate, then 100% of the credits issued represent true emissions reductions. On the other hand, if these assumptions are inaccurate, the proportion of credits that represent actual emissions reductions can be much lower. The cell on the lower right (18%) shows that if the true leakage rate is 80% and ARB chose to only credit reductions already achieved, rather than reductions expected in the future, then the real reductions achieved to date by the project add up to only 18% of the credits issued.

This analysis was performed on all credits generated by 36 compliance forest offset projects through March 23, 2019. Collectively, these projects generated offset credits equal to 97 million tons of CO₂ reductions, which is 80% of the total credits that ARB has issued under its U.S. Forest protocol.

Actual emissions reductions by U.S. Forest offset projects as percent of credits issued to date

		Expected over 100 years (ARB's current approach)	Achieved to date (Recommended approach)
If the true leakage rate is:	20%	100%	65%
	40%	99%	49%
	60%	97%	33%
	80%	96%	18%

ARB can avoid the over-crediting discussed here with a few modifications to its protocol. ARB should (1) apply a leakage rate that is 80% or higher; and (2) determine the net benefits of reduced harvesting on an annual basis by accounting for both the increased carbon storage on site and the decreased carbon storage elsewhere due to leakage at the same time. This solution is reflected in the bottom right cell of the above table (18%).

These changes are needed for the protocol to be in accordance with current law and regulation. First, given the uncertainty in true leakage rates from reduced timber harvesting within the United States, using an 80% leakage rate or higher, as is supported by the academic literature, better fulfills the conservativeness principle laid out in ARB's cap-and-trade regulations.¹ Using low rates that are not reflected in published literature is unjustified and does not fulfill the conservativeness principle. Second, generating credits today for expected net reductions over many decades into the future runs contrary to the goals of California's Global Warming Solutions Act (AB32), the 2006 law authorizing California's cap-and-trade and offsets programs. This law states that for any trade in credits using a market-based compliance mechanism, the reductions credited should occur "over the same time period" and be "equivalent in amount to any direct emission reduction required" under California's climate change law.²

¹ " 'Conservative' means, in the context of offsets, utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements." California Code of Regulations, title 17, § 95802.

² California Health & Safety Code § 38562(d)(3).

DETAILED DISCUSSION

How the U.S. Forest offset protocol works

The large majority of U.S. Forest offset projects credit forestland owners for holding more carbon on site per acre than they would have in the business-as-usual baseline scenario. Landowners must commit to maintaining those higher carbon levels for 100 years. Projects can be anywhere in the United States, and to date, approximately 20% of credits generated have been from projects in California, and 80% have been from projects elsewhere in the United States.

Most of these improved forest management projects define a business-as-usual baseline scenario that involves aggressive timber harvesting that brings on-site carbon storage close to the average per acre for forests in their region. The assumption is that these offset projects maintain higher on-site carbon stocks by reducing timber harvesting.

In the first year of an improved forest management offset project, the landowner earns offset credits for the amount of carbon on their land above the business-as-usual baseline scenario minus two factors. First, estimates of carbon released due to leakage are deducted. Second, not all loss of on-site carbon is released into the atmosphere. The protocol accounts for the portion of harvested timber that remains long-term in wood products like in houses and furniture and buried in landfills, which would be reduced if total timber harvesting is reduced by the project. Each subsequent year, the landowner is credited for any incremental increase in carbon sequestration on the participating lands as trees grow and sequester more carbon, minus the same two factors.

Leakage rate

ARB's U.S. Forest offset protocol uses a 20% leakage rate. A 20% leakage rate means that 20% of the reduction in timber harvesting caused an offset project is replaced by an increase in harvesting on other forestlands. The other 80% of the reduction is assumed not to be replaced and simply represents a decrease in timber use (i.e., fewer houses built, less paper produced, etc.)

Published literature suggests the leakage rate from reduced timber harvesting in the United States is at least 80%. Using a computable general equilibrium model, Gan & McCarl (2007) estimate that if timber production were reduced in the United States, 77% of that that timber harvesting would be displaced to other countries. Wear & Murray (2004) use econometric modeling to trace the effects of reductions in federal timber sales in the western United States in the late 1980s through the 1990s. They estimate that 84% of the reduced timber production was displaced to elsewhere within North America. Both articles underrepresent total leakage from conservation on U.S. forestlands. The former only estimates international leakage, ignoring leakage that might occur among forestland within the United States; the latter only estimates leakage in North America, ignoring leakage that could occur elsewhere. The existing academic literature on leakage rates from reduced forest harvesting does not support a 20% leakage rate. A conservative approach to addressing uncertainty in the true leakage rate would apply a leakage rate that is at least 80%.

The Climate Action Reserve, which developed the original U.S. Forest offset protocol on which ARB based its own protocol, revised its leakage rate from 20% to a sliding scale up to 80%,

depending on the amount of timber harvesting performed by the offset project itself. Under this protocol, an 80% leakage rate is applied to offset projects that do not harvest at all.

The timing issue explained

As is typically done with offset projects, emissions reductions are estimated against a baseline scenario representing what would likely have happened without the offset program. Almost all ARB improved forest management offset projects define baseline scenarios that are well below their actual carbon stocks in their first year. On average across all projects analyzed, these baselines equal 70% of current carbon stocks. This means that in the first year of a project, the land owner is issued a quantity of credits equal to, on average, around 30% of the carbon stocks on their project lands, adjusted downward to account for leakage and any reduction in carbon held long-term in harvested wood products and landfills.

To create a baseline, the landowner models the carbon stocks and fluxes associated with a 100-year timber harvest scenario that reflects the harvesting expected to take place without the financial incentives from the offset program. The modeled scenario should be financially feasible and fulfill all legal and contractual obligations. In order for most projects to earn credits under the protocol, the calculated average carbon stocks in the baseline scenario over 100-years should be no less than that of the average forestlands for the project's region and forest type.

This modeled scenario is then abstracted into two key parameters used to calculate emissions reduced and credits generated by the project. Baseline on-site carbon storage and harvesting rates are assumed to equal the average values generated by the modeled scenario over 100 years. This simplified baseline is treated as equivalent, in terms of carbon accounting, to the range of financially feasible timber harvest scenarios that could have happened without the offset program. Flat average baseline values have the advantage of not requiring the landowner to calculate year-to-year increases in carbon storage against the harvest and growth cycles in one specific baseline management regime for each of 100 years. But this approach has one important disadvantage—flat average baseline values for carbon storage and harvest rates are internally contradictory and physically impossible.

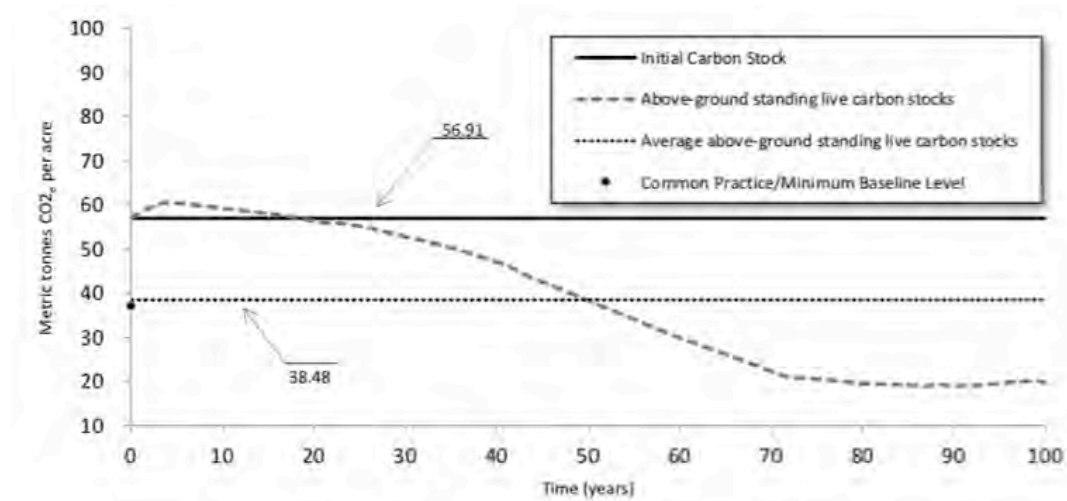
The figure below presents an example of a modeled harvesting scenario used to define the baseline for one large offset project – ACR360, a half million acre project in southern Alaska. The curved dotted line is the modeled business-as-usual scenario for above-ground standing live carbon stocks. The straight dotted line is the baseline used to generate credits, which is the average above-ground standing live carbon stock in the 100-year modeled scenario. The solid line is the actual carbon storage on the project lands at the start of the project.

This simplified baseline scenario suggests that, if the project were not earning offset credits, its lands would be harvested to baseline levels in year 1 and maintained at those carbon stocking levels for 100 years. However, contradicting this assumption, the baseline also assumes that a constant quantity of timber is harvested each year over the project life, equal to the average rate over the 100-year modeled scenario. This second assumption is used to calculate leakage.

These two assumptions are contradictory because it is not possible for both carbon storage and harvesting to simultaneously remain at their respective average values over the project life. Carbon storage and harvesting rates are correlated with one another, and inextricably tied to the actual net growth rate of the project forest. If carbon storage is assumed to drop to the baseline in year 1, that

would happen because of a large amount of timber harvesting. If the harvesting rate is assumed to be constant over 100 years, however, then the carbon storage on the land will also decrease slowly, rather than abruptly in year 1. By mixing these two assumptions into a physically impossible baseline scenario, the protocol maximizes credits generated without reflecting the actual rate at which emissions to the atmosphere are avoided. The protocol calculates gains in carbon against the baseline using the first assumption, and losses in carbon from leakage using the second assumption. As a result, credit generation is frontloaded, and landowners need to continue to increase net carbon storage for decades to make up for the leakage effects associated the reduced harvesting credited at the start of the projects.

Baseline carbon stocks for Finite Carbon – Ahtna Native Improved Forest Management offset project



From: ACR360 “Finite Carbon – Ahtna Native Alaskan IFM” Version 1.3, Attachments G and H: Baseline Carbon Stocks, Submittal Date: 1/19/2018

This over-crediting allows emitters in California to emit more than the state’s emissions cap today in exchange for promises of forest carbon sequestration over 100 years to cover leakage from the start of the project. This is problematic for several reasons. First, emissions today are not equivalent to reductions decades from now given the urgency of climate change mitigation to avoid tipping points. California is designing its cap-and-trade and offset programs as models for other jurisdictions. If California exports a model that trades emissions today with reductions decades from now, California would promote a form of climate policy that fails to reduce emissions in these immediate critical years. Second, these promises can be difficult to keep since productivity slows in ageing forests (Gray et al 2016) and as forests respond to a warming climate. On project lands with less harvesting, fewer older trees will be replaced with younger trees, and the average tree age will increase over the 100 years of the project.

ACR360 generated close to 15 million offset credits in its first year, equal to more than 60% of the expected average annual effect of California’s cap-and-trade program on emissions during 2021-2030.

The 25 year versus 100 year issue explained

If forestland owners are required to increase carbon to cover leakage for 100 years, then there would be no over-crediting over 100 years of the project. Over-crediting in the early years of the project would slowly be compensated as leakage is deducted each year for the project life.

However, it is unclear whether the protocol requires forestland owners to account for the emissions from leakage for 25 or for 100 years. The crediting period of a U.S. Forest offset project is 25 years. After the end of each 25-year crediting period, landowners can choose to renew their offset project for another 25 years but are not required to do so. For each year of a crediting period, landowners must report the net impact of the project on emissions taking into account any change in on-site carbon storage, and any releases due to leakage or reductions in carbon held long-term in harvested wood products and in landfills. If the net impact of the project in any year is negative, a *reversal* is understood to have occurred. The carbon reductions that were previously credited and later released must be replaced with additional procurement of allowance or offset credits.

How a reversal is defined after the last year of crediting is unclear in the protocol. Following the last year of crediting, forestland owners are required to maintain the credited on-site carbon storage for another 100 years. It is unclear if they are also required to ensure their forestland continues to grow to cover off-site releases due to leakage and due to reductions in carbon held long-term in harvested wood projects and landfills.

If forestland owners are only required to account for leakage for 25 years, crediting for reduced harvesting in the first year of the project will be awarded in full, while potentially, as low as only 1% of the leakage associated with that reduced harvest is deducted each year for only 25 years. It would be possible for participating projects to result in a net decrease in carbon storage over 100 years compared to the baseline.³

Methods

Landowners report how they calculate their requested credit issuance in Offset Project Data Reports (OPDRs) based on instructions laid out in the protocol. These reports are made public through the offset registries. We reproduce these calculations for all credits issued to 36 projects as of March 23, 2019. We use data provided by the landowner in their OPDRs and supplemental materials, and adjust the projects' assumptions for leakage and the timing of harvesting in the baseline to investigate the quantity of over-crediting.

Adjusted leakage rate

Using data reported in the OPDRs, we reproduce the calculations of leakage (also called *secondary effects*), carbon in harvested wood products and landfills (HWP&L), and total reductions achieved using leakage rates of 40%, 60%, and 80% instead of 20%.

³ Please see public comments submitted to ARB on May 10, 2018, *Comments on proposed cap-and-trade regulatory amendments*, for a more detailed discussion of this need to clarify and revise how the protocol defines a reversal after the last year of credit issuance, found at <http://bhaya.berkeley.edu>.

Adjusted timing of baseline harvesting

We recalculate the credits that would have been generated if the protocol's leakage calculations matched its assumption that timber is harvested in year 1 of the baseline scenario to bring carbon storage down to baseline levels, and continues to be harvested at smaller rates needed to maintain the baseline carbon storage level for one hundred years.

We do this in the following manner:

First, the baseline harvesting level prior to delivery to the mill (PDM) in the first year of the project is calculated as the difference between standing live carbon in the project compared to the baseline.

Second, we calculate the baseline carbon in trees harvested in years 2 to 100 so that the sum of the baseline PDM over 100 years is the same as the sum using ARB's current methods. We calculate the baseline PDM in years 2 through 100 (99 years) as:

$$\text{PDM}_{\text{annual after year 1}} = (\text{PDM}_{\text{total}} - \text{PDM}_{\text{year 1}}) / 99$$

Third, we recalculate the carbon in baseline HWP&L in a similar manner, by:

- a) using the ratio of HWP&L to PDM in year 1 of the baseline in the OPDR to recalculate carbon in HWP&L in year 1 of the baseline for the revised PDM value;
- b) calculating carbon in HWP&L in years 2 through 100 using the same process as for timber harvesting, so that the sum of carbon in HWP&L over 100 years of the baseline is the same in our estimates as it is in ARB's current estimates over the project life;

Fourth, we recalculate emissions reductions from the project using these revised leakage and carbon in HWP&L figures, and otherwise following the methods defined by the protocol.

When baseline or project PDM figures are missing from any of the OPDRs, we calculate the missing PDMs mathematically from other reported figures when possible, and apply the following assumptions when needed:

- The ratios of carbon in HWP&L to PDM remain the same across reporting periods.
- When the first reporting period does not equal exactly one year, the PDM in the first year is a prorated amount, reflecting what most projects with at least two reporting periods have done.
- The ratio of carbon in HWP&L to PDM is the same in both the baseline and project scenarios.

Other than the changes and assumptions described above, we repeat the methods used in the OPDRs to re-estimate emissions reduced and credits generated.

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Counting California Forest Carbon Offsets

Greenhouse Gas Mitigation Lessons from California's
Cap-and-Trade U.S. Forest Compliance Offset Program

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Cover photo from Flickr Creative Commons, available at <https://goo.gl/6lbL3Q>.

Executive Summary

In 2013, California launched a multisector cap-and-trade market designed to reduce greenhouse gas pollution and meet the greenhouse gas mitigation targets set forth in Assembly Bill 32 (2006). Building on many years of effort and policy deliberation, California included in the cap-and-trade market the ability for covered entities with a compliance obligation to pay actors outside the program to reduce *their* emissions, frequently referred to as purchasing ‘offsets’. Since 2013, California has operated a first-of-its-kind forest carbon offset program, in which 39 forest projects across the United States have earned credits through July 2016.

This research analyzes California’s experience in running a first-ever compliance offset program for forests. To our knowledge, no official program evaluations of the forest offset program have been conducted to date. In the absence of identified and measurable official metrics and goals, this paper takes a more general ‘lessons learned’ approach, asking what the State has gotten from this policy innovation and what insights can be applied to other forest carbon sequestration efforts, like California’s ongoing natural and working lands inventory.

From project design document review, survey responses and interviews with project owners and developers, we have four core findings. First, the California program has gone much further towards assuring additionality than other programs, including most voluntary forest offset programs, though some lingering and perhaps unavoidable questions remain. Second, a wide variety of California compliance entities buy forest offset credits, including some that operate facilities located in areas identified by the State as disadvantaged communities. Third, environmental benefits have been created by the program, though their financial importance may be minimal. Finally, California has taken forest offset protocols and policy to new levels, though the future of the market is quite uncertain given the need for supermajority reauthorization of the cap-and-trade program.

This paper first provides an overview of the forest offset program, its history and development, and some data about the current state of the program. It then describes the methods used in this study, and presents the above findings in detail. It concludes by illustrating several ‘lessons learned’ that should be incorporated by the Air Resources Board and cooperating agencies into the broader natural and working lands effort in California.

Overview and Development of the California Forest Carbon Offset Program

Before presenting the results of our research into the offset program, it is necessary to briefly describe the origins, history, policy design choices, and project performance of the California forest offset program in order to inform readers and put our findings in proper context. As of this writing, no comprehensive program evaluations have been conducted of the forest offset program.

Climate Change, Forests, and California Policy

Forest Carbon History and Potential

Forests have played an integral role in climate forcing emissions throughout American history, though only more recently have they served as a net carbon sink. Historically, American forests served as a significant net source of emissions in the 19th and early 20th Centuries, as old growth forests were harvested and trees were a primary building material and energy source. As fossil fuels replaced wood as a fuel source, and as forests regrew in the middle decades of the 20th Century, American forests became a net carbon sink, reaching their lowest net emissions rate (or, alternatively, highest carbon storage rate) in the 1980s. Since then, increased harvesting has lessened American forests' utility as a carbon sink, however significant carbon storage potential remains if deforestation is avoided in the 21st Century.¹ It has been estimated that forest carbon sequestration is equivalent to 12-19% of US fossil fuel emissions,² and the Obama Administration's Climate Action Plan noted the sequestration role being played by US forests,³ though net carbon sinks from land use and forestry changes have been smaller in recent years than in 1990.⁴

California's Experience

Although the concept of forest offsets and other land use-related policies designed to incentivize carbon sequestration stretch back before the adoption of the

¹ Richard Birdsey et al., *Forest Carbon Management in the United States: 1600-2100*, 35 J. ENVIRON. QUAL. 1461, 1465 (July 2006).

² Michael Ryan et al., *A Synthesis of the Science on Forests and Carbon for U.S. Forests*, ISSUES IN ECOL. 13 (Spring 2010), at 1.

³ Executive Office of the President, THE PRESIDENT'S CLIMATE ACTION PLAN (June 2013), at 11, available at <https://goo.gl/KX1ULM>.

⁴ See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015* (February 2017) (Table 6-3 at 6-3, 6-4), available at <https://goo.gl/GYpaXH>.

Kyoto Protocol,⁶ California's commitment to forest offsets can be traced to Senate Bill (SB) 1771 (Sher) in 2000.⁷ That bill established the California Climate Action Registry (CCAR), a voluntary emissions inventory established by the state to define, measure and track greenhouse gas emissions. As part of its Climate Change Inventory, CCAR was instructed to acquire and develop data on the "costs, technical feasibility, and demonstrated effectiveness of . . . net reductions through the management of natural forest reservoirs."⁸

Land trust organizations sought to take this forest carbon data-gathering role at CCAR further, and promoted Senate Bill 812 in 2002 (Sher).⁹ SB 812 directed CCAR to develop procedures and protocols for measuring and crediting the emissions impacts of "conservation and conservation-based management [activities in] . . . native forest reservoirs in California" that went beyond "applicable federal, state, and local land use laws and regulations."¹⁰ How, exactly, CCAR would implement this measuring and crediting was a policy design task delegated to a state-convened working group that engaged land trusts, state foresters, forest industry representatives and an electric utility.¹¹

This first 2002-2005 working group fleshed out many of the initial policy design questions, which led to the opening of California's voluntary carbon offset market in 2005. Importantly, from the very beginning, the state focused on a carbon-based payment structure, that is, strict accounting for forest carbon on a per-ton basis that could interface with cap-and-trade programs. The state chose not to take a practice-based or area-based payment approach to offset crediting that would have involved more general and less reliable carbon estimation and impact assumptions.¹² This tradeoff likely resulted in greater carbon sequestration from the projects who participated, perhaps multiple times more, but at the price of increasing project development and monitoring costs and thus a smaller population of potentially eligible projects. Indeed, this initial voluntary protocol (and its update in 2006) drew criticisms from other landowners not involved in conservation or conservation-based

⁶ Cornelis van Kooten et al., *How Costly Are Carbon Offsets? A Meta-Analysis of Carbon Forest Sinks*, 7 ENVION. SCI. & POL. 239, 239 (2004); Marissa Schmitz and Erin Kelly, *Ecosystem Service Commodification: Lessons from California*, 16 GLOB. ENVIRON. POLIT. 90, 90 (Nov. 2016). See also Mark Trexler et al., FORESTRY AS A RESPONSE TO GLOBAL WARMING (1989), available at <http://goo.gl/Pwd8sg>.

⁷ 2000 Cal. Stat. 7482 et seq. (Ch. 1018).

⁸ 2000 Cal. Stat. 7493 (Ch. 1018).

⁹ Schmitz and Kelly, *supra* note 6 at 97.

¹⁰ 2002 Cal. Stat. 2406 (Ch. 423).

¹¹ Schmitz and Kelly, *supra* note 6 at 97.

¹² See Ing-Marie Gren and Abenezer Aklilu, *Policy Design for Forest Carbon Sequestration: A Review of the Literature*, 70 FOREST POL. & ECON. 128, 130 (discussing studies of policies that took these approaches, at left).

management, as its stringent environmental and permanence requirements made initial participation rather unattractive for many for-profit private landowners and the California forest industry at the prices offered by voluntary carbon markets.¹³

A second working group, engaging more forest industry participants, followed after passage of California's landmark Assembly Bill (AB) 32 in 2006. From the beginning of planning the cap-and-trade portion of AB 32 compliance, the California Air Resources Board (ARB) signaled that forest offsets would play a cost-containment role in this new market. Cost-containment was an important concern – ARB's expectations for carbon prices in the cap-and-trade market ranged as high as \$50/ton before the market began operating¹⁴ (though in actual program experience, the allowance price has not risen above \$20/ton since market launch¹⁵). Eventually, the State decided that entities could use offsets to meet up to 8% of their compliance burden, though use of offsets was optional and no particular participation goals were set.¹⁶ With all reductions required to be “real, permanent, quantifiable, verifiable, enforceable, and additional” under AB 32,¹⁷ the second protocol working group focused on “revis[ing] the early protocol to make it compliance-ready,” a shift that had never before been attempted in any other jurisdiction.¹⁸ In addition, to serve the goal of maximum participation and lower project costs (thus greater cost-containment for the cap-and-trade market), the new protocol was to be available for use nationwide, not just for projects in California.¹⁹

¹³ Schmitz and Kelly, *supra* note 6 at 92, 97.

¹⁴ Marc Lifisher, *California's First Auction of Greenhouse-Gas Credits Nears*, L.A. TIMES (November 6, 2012), available at <https://goo.gl/hjzu2F>

¹⁵ Danny Cullenward and Andy Coghlan, *Structural Oversupply and Credibility in California's Carbon Market*, 29 ELECTR. J. 7, 9 (2016).

¹⁶ See California Air Resources Board, Resolution 11-32 (October 2011), at 4, available at <https://goo.gl/s3IbTZ>; see also Press Release, CARB, California Air Resources Board Adopts Key Element of State Climate Plan (Release 11-44; October 20, 2011) available at <https://goo.gl/leoq5M>.

¹⁷ CARB, California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation [hereinafter Protocol FAQ], at 1, available at <https://goo.gl/DL8ZoV>; 2006 Cal. Stat. 3427 (Ch. 488), now CAL. HEALTH AND SAFETY CODE § 38562(d) (2017). See also Timothy Fahey et al., *Forest Carbon Storage: Ecology, Management, and Policy*, 8 FRONT. ECOL. ENVIRON. 245, 249 (2010) (providing a more general elaboration on what these terms entail in the forestry context).

¹⁸ Schmitz and Kelly, *supra* note 6 at 100, 101.

¹⁹ Protocol FAQ, *supra* note 17 at 10.

Program History: The Design Challenges of Forest Offsets

Two Key Periods of Policy Design

Throughout this formative period from 2002-2009, when California went through two full rounds of forest offset protocol design, stakeholders grappled with five critical design challenges in creating standards for offset projects. First, three commodification hurdles stemming from the United Nations Framework Convention on Climate Change proceedings had to be navigated: additionality, permanence, and leakage.²⁰ In short, to deliver credible climate mitigation, carbon offset projects must only receive credit for emissions reductions that would not have otherwise happened without program intervention (i.e. be ‘additional’ versus a conservative, business-as-usual scenario), must show that the reductions they deliver will persist over time (be ‘permanent’) and must demonstrate that no other emission-causing land use changes will result (no ‘leakage’). In addition, two other design challenges were present – how to maintain the environmental integrity of forests managed for carbon storage, and how to ensure market availability and acceptance of offsets as a salable commodity. Table 1 below summarizes how the 2002-05 and 2007-09 working group protocol-writing periods addressed these key design questions.²¹

²⁰ Steven Ruddell et al., *The Role for Sustainably Managed Forests in Climate Change Mitigation*, 105 J. OF FORESTRY 314, 316-17 (September 2007). The Kyoto Protocol’s Clean Development Mechanism offset program uses similar, though not exactly the same, terms. See UN Framework Convention on Climate Change, GLOSSARY – CDM TERMS (Version 8.0) (defining “additional”, “leakage”, and “long term certified emissions reduction”), available at <https://goo.gl/rZQCQ3>.

²¹ One update did occur between these dates in 2007, though most of the changes came with respect to more technical details of forest data and verification steps. See Climate Action Reserve, VERSION 2.1 at <https://goo.gl/HpcpJJ> (last visited March 15, 2017).

Table 1. Protocol Evolution on Key Design Questions, 2005 and 2009

<u>Design Challenge</u>	<u>Description</u>	<u>Early Protocol Approach</u> (Version 1.0, 2005) ²²	<u>Compliance-Ready Protocol Approach</u> (Version 3.0, 2009) ²³
Additionality	Proving emissions reductions as compared to a no-project counterfactual (a 'baseline')	<ul style="list-style-type: none"> • Crediting sequestration on project lands up to the maximum allowable harvest under CA forest rules 	<ul style="list-style-type: none"> • Quantifying primary effect, consisting of: Crediting sequestration on project lands above a standardized Common Practice baseline, taking into account growth models, legal obligations and project start date
Permanence	Delivering a long-term guarantee of emissions reductions	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement 	<ul style="list-style-type: none"> • Requiring a 100-year commitment • Percentage contribution to buffer pool of credits depending on project-specific reversal risks • Allowed voluntary termination
Leakage	Preventing concomitant emissions from induced land use change and activities elsewhere	<ul style="list-style-type: none"> • Perform an assessment for activity-shifting leakage (required) and market leakage (optional) 	<ul style="list-style-type: none"> • Quantifying secondary effects, including a project-specific leakage adjustment factor, but not including energy effects of alternate materials. • Market leakage adjustment only for IFM projects
Environmental Integrity	Guaranteeing sustainable and environmentally-conscious management (i.e. avoiding mere 'tree farm' projects)	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement • Maintenance of native forests • Natural forest management (preventing even-aged cutting) 	<ul style="list-style-type: none"> • Requiring adherence to sustainable harvesting practices (certification) • Natural forest management for the project area • Increasing standing live carbon stocks
Market Availability and Acceptance	Ensuring offset credit availability and purchaser confidence for a functioning offset market	<ul style="list-style-type: none"> • Five-year third-party certification of forest project results 	<ul style="list-style-type: none"> • Lifting the conservation easement requirement • Permitting even-aged management (with limits) • Six-year third-party verification, with periodic desk reviews

As Table 1 details, the two California working groups engaged in an intricate policy design process in order to meet AB 32's requirement that offsets be real, permanent, quantifiable, verifiable, enforceable, and additional. Several tradeoffs were made in order to expand the possible pool of projects that could participate across the

²² Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 1.0 (September 2005) at <https://goo.gl/1oyTIs> (last visited March 15, 2017) (see PDF of that name on this webpage).

²³ Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.0 (September 1, 2009) at <https://goo.gl/5clWdB> (last visited March 15, 2017) (same).

program. Changes were made to the additionality, permanence and environmental integrity requirements that facilitated greater program participation.

Analyzing California's Protocol Changes in the Second Working Group

For additionality, California first chose a performance benchmark test in 2005, allowing credit above harvest floors permitted by California regulations.²⁴ Once the program expanded to cover the continental US, however, a new approach was needed rather than one reliant on California regulations.²⁵ The second 2009 working group developed a multi-part approach to additionality that would be applicable across the country. Projects would only receive credit for:

- 1) actions taken after a defined project start date;
- 2) sequestration above all legal, regulatory and financial harvesting and stocking constraints; and,
- 3) credit relative to an area-specific 'Common Practice' baseline developed using US Forest Service Forest Inventory and Analysis Program Data ('FIA data').

This approach combines three types of additionality 'tests'—legal or regulatory, common practice, and timing tests, as identified in Trexler et al (2006). This generally represents a more stringent approach to additionality than in the earlier 2005 protocol. Having multiple additionality screens almost certainly increases the proportion of credited reductions in the program that are truly additional, but at a higher cost of participation and with less supply flexibility.²⁶

Stakeholders also eased the permanence requirement to broaden participation. In order to incentivize lands managed for multiple uses (and not just conservation management), the 2009 protocol no longer required conservation easements. Instead, projects were required to give a 100-year sequestration commitment, and agree to set aside a project-specific proportion of their credits in a 'buffer pool' as insurance against later losses of carbon stock, referred to as 'reversals'.

This permanence policy change no doubt made the program more attractive to for-profit timber companies and family landowners, though it did not eliminate all potential reversal risks program-wide. Buffer pools, later described as the "most commonly used" approach to program impermanence risk, neatly manage the

²⁴ See Mark Trexler et al., *A Statistically-Driven Approach to Offset-Based GHG Additionality Determinations: What Can We Learn?*, 6 SUSTAIN. DEVEL. L. & POL. 30, 31 (Winter 2006) (describing various illustrative types of additionality 'tests').

²⁵ In general, states must be careful about designing state programs that affect out of state entities, since regulations with 'extraterritorial' effect are vulnerable to legal attack under the Commerce Clause of the US Constitution or federal laws. See generally *North Dakota v. Heydinger*, 825 F. 3d 912 (8th Cir. 2016) (finding that a Minnesota clean energy law had impermissible out of state effect).

²⁶ See Trexler et al., *supra* note 24 at 38 (showing tradeoff between flexibility and additionality in Fig. 8).

individual risk of projects by essentially making them insure both themselves and others in the currency of the program – credits. However, this approach to risk does *not* take into account program-level reversal risks, i.e. the fact that individual project risks may under certain circumstances, be correlated.²⁷ The buffer approach essentially assumes that even if one project falls victim to a reversal event (e.g. a wildfire), most others will not. This program-level assumption may not hold if projects share certain common risk-relevant characteristics, like being located in close geographic proximity to one another. Cross-cutting risks, like the increased potential for wildfires as global temperatures rise and climate change progresses, can increase reversal risk across the board, not just for isolated individual projects.

Finally, with respect to environmental integrity, several changes helped make the program more attractive to timber companies and other landowners. Instead of a conservation easement, the 2009 protocol allowed a sustainable forestry certification to suffice as a commitment to environmental integrity. Though natural forest management remained a requirement, this definition was altered to allow some degree of even-aged management over portions of the project area, and in increments less than 40 acres. Projects were also expected to maintain or increase standing live carbon stocks,²⁸ as a way to promote biodiversity and wildlife habitat. In general, the 2009 protocol took several important steps to ensure greater participation while generally not changing the strict verification requirements that help facilitate investor confidence in offset credits.

Administration by ARB and Subsequent Challenges

The 2005 and 2009 protocols had been adopted pursuant to SB 1771 and SB 812, in stakeholder processes run through the CCAR, which was restructured and relaunched as the Climate Action Reserve (Reserve) in 2008. When ARB included forest offsets as part of the broader cap-and-trade program, however, the protocols then became official documents of the ARB, which noted that they had been drawn from version 3.2 of the Reserve's protocol.²⁹ After several years of accepting projects

²⁷ David Cooley et al., *Managing Dependencies in Forest Offset Projects: Toward a More Complete Evaluation of Reversal Risk*, 17 MITIG. ADAPT. STRATEG. GLOB. CHANGE 17, 17 (2011) (describing three different kinds of correlated catastrophic reversal risks – fat tails, micro-correlations, and tail-dependence – that may be present, yet are unaccounted for by buffer pools). See also Christopher Galik and Robert Jackson, *Risks to Forest Carbon Offset Projects in a Changing Climate*, 257 FOREST ECOL. & MGMT. 2209, 2209 (describing systemic climate risks not accounted for in project-by-project analysis).

²⁸ Compare the 2005 protocol, *supra* note 19 at 15-16, with the 2009 protocol, *supra* note 20 at 12.

²⁹ See CARB Resolution 11-32, *supra* note 13 at 10. See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: OCTOBER 20, 2011) [2011 Forest Offset Protocol], at 7 available at <https://goo.gl/OpLQvv>.

designated as Early Action, the compliance portion of the offset market launched in 2013 with the beginning of the cap-and-trade program.³⁰

ARB implemented compliance protocols based on the 2009 protocol and updated the protocol in 2011, 2014, and 2015. Most of the key issues described above have not changed in these updates, including project-level risk assessments.³¹ Some distinctions and developments have occurred across protocol updates, though there has been more consistency than change.³² Since 2011, ARB has mandated higher levels of professional education and skills in verification teams.³³ Also, two updates to the protocol were released in 2014 and then in 2015, along with growing amounts of interpretive guidance and FAQs posted on the ARB website.³⁴

Importantly, ARB's approach to additionality under this protocol and the other offset protocols was upheld as lawful by the California Court of Appeal in 2015 in *Our Children's Earth Foundation v. California Air Resources Board*.³⁵ That case decided that as a legal matter, ARB had the authority under AB 32 to implement the "standards-based approach" it has taken in adopting offset regulations and protocols since 2011, including for the US forest program.³⁶ CARB did not have to take an idiosyncratic project-specific approach to additionality, as the challengers had wanted. Observing that it is "virtually impossible to *know* what otherwise would have occurred in most cases," ARB could not be held to an additionality standard of omniscience and perfection – the legislature had directed ARB to "establish a workable method of

³⁰ CARB, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (updated February 9, 2015) at 2 <https://goo.gl/qxOSqZ>.

³¹ See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: JUNE 25, 2015) [2015 Forest Offset Protocol], at <https://goo.gl/hJuX8c>. See also CARB, COMPLIANCE OFFSET PROGRAM (updated March 8, 2017) (website with links to the protocols and other details from past iterations) available at <http://goo.gl/WUBm4Y>.

³² For example, starting with the 2011 protocol, ARB has used the language of 'intentional' versus 'unintentional' reversals in dealing with project owner compensation liability, whereas the previous protocols had distinguished between avoidable and unavoidable reversals, though the substantive standards remain the same. Compare 2011 Forest Offset Protocol, supra note 25 at 59 with Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.2 (August 31, 2010) at <http://goo.gl/XX3ubS> (last visited March 15, 2017) at 63. See also CAL. CODE REGS. tit. 17 § 95802(a)(190) (2017) (defining intentional reversal), available at <https://goo.gl/PUMgye>.

³³ See Climate Action Reserve, COMPARISON OF RESERVE FOREST PROJECT PROTOCOL TO ARB COMPLIANCE OFFSET PROTOCOL FOR FOREST PROJECTS (last accessed March 15, 2017), available at <https://goo.gl/jVrLLE> (comparing Version 3.2 to the first CARB protocol).

³⁴ See CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST OFFSET PROJECTS: ADOPTED JUNE 25, 2015 (updated December 2, 2015), available at <https://goo.gl/7XiB8G> (website explaining 2015 protocol).

³⁵ 184 Cal Rptr. 3d 365, 378 (2015). See also Alan Ramo, *The California Offset Game: Who Wins and Who Loses?*, 20 J. ENV. L. & POL. 109, 133-43 (Winter 2014), available at <https://goo.gl/eCWrlQ> (providing more background on the case).

³⁶ *Our Children's Earth Foundation*, 184 Cal Rptr.3d at 371, 373, 378.

ensuring additionality with respect to offset credits” in the context of “a market-based compliance mechanism,” which is precisely what ARB did.³⁷

Another important event came in 2014, when ARB recorded its first invalidation of offset credits under any protocol. The Clean Harbors Environmental Services waste incinerator in El Dorado, Arkansas participated in the Ozone Depleting Substances (ODS) protocol up until 2014, when a compliance issue with their hazardous waste environmental permit came to ARB’s attention. For a period in 2012, it was found that Clean Harbors was not in compliance with their hazardous waste permit, though an investigation revealed no environmental integrity concerns with their ODS activities. After investigation, assessment, lobbying from market participants, and a final determination, ARB decided to invalidate 88,955 of the approximately 4.3 million tons of offset credits Clean Harbors had earned, sending ripples of concern through the offset marketplace.³⁸

Though not the precise subject of legal action, or at least not yet, environmental justice concerns have been leveled at the offset program. Offsets are viewed skeptically by environmental justice advocates because they allow facilities located in disadvantaged communities to cover their emissions with offset reductions that happen elsewhere. This has been particularly concerning since several industry sectors have shown increased emissions since the 2013 start of the cap-and-trade market, though to date, the data made available to the public does not permit a very detailed assessment of these equity concerns. A 2016 analysis from scientists at UC Berkeley and several other California universities showed that most compliance entities did not use offsets, though those that did tended to have larger GHG emissions.³⁹ We discuss these environmental justice questions further in the Findings section.

³⁷ *Id.* at 379.

³⁸ See California Air Resources Board, Final Determination: Air Resources Board Compliance Offset Investigation Destruction of Ozone Depleting Substances (November 14, 2014), available at <https://goo.gl/KGeHrr>; Laurel Rosenhall, CalMatters, *A Little Town in Arkansas and its California Connection* 89.3 KPCC (July 26, 2015), available at <https://goo.gl/bnwIu1>; Gloria Gonzalez, *Despite Market Outcry, California Voids Some Carbon Offsets*, ECOSYSTEM MARKETPLACE (November 14, 2014), available at <https://goo.gl/Obv367>.

³⁹ Lara Cushing et al., USC Dornsife Program for Environmental and Regional Equity, A PRELIMINARY ENVIRONMENTAL QUALITY ASSESSMENT OF CALIFORNIA’S CAP-AND-TRADE PROGRAM: RESEARCH BRIEF – SEPTEMBER 2016 [hereinafter Climate Equity Brief] at 7-10, available at <http://goo.gl/2VrnXm>.

Current Status of Today's Forest Offset Market

A Small But Notable Part of the Cap-and-Trade Market

According to the latest ARB Compliance Instrument Report at the time of this writing (up through Q4 2016), 95% of program compliance has been achieved through the use of allowances. Of the remaining 5% of offsets, a majority (3% of the total) comes from US Forest projects, with the remainder primarily coming from the Ozone Depleting Substances protocol and smaller amounts from livestock and mine methane capture projects. The amount of offset credits issued is slightly greater, as seen in Table 2. More credits have been issued than have been retired to-date, and Table 2 includes credits that are held back in the forest buffer pool and those that are held by offset project owners, market participants or compliance entities for future compliance. These figures are presented in Figure 2 and Table 2 below.

Table 2. ARB Offset Credits Issued as of March 11, 2017

Project Type	Ozone Depleting Substances	Livestock	U.S. Forest	Urban Forest	Mine Methane Capture	Rice Cultiv.	<u>Totals</u>
Compliance	7,222,320	1,521,590	21,851,822	--	1,259,314	--	31,855,046
Early Action	6,336,710	1,695,029	13,276,494	--	2,879,684	--	24,187,917
Totals	13,559,030	3,216,619	35,128,316	--	4,138,998	--	56,042,963

Source: ARB, Compliance Offset Program website,⁴⁰ at <https://goo.gl/gBSWoj>

⁴⁰ The text appearing alongside this table on the CARB website is: *Table includes all offset credits issued including offset credits placed in ARB's Forest Buffer Account, offset credits returned to an Early Action Offset Program's forest buffer pool, and offset credits subsequently invalidated.*

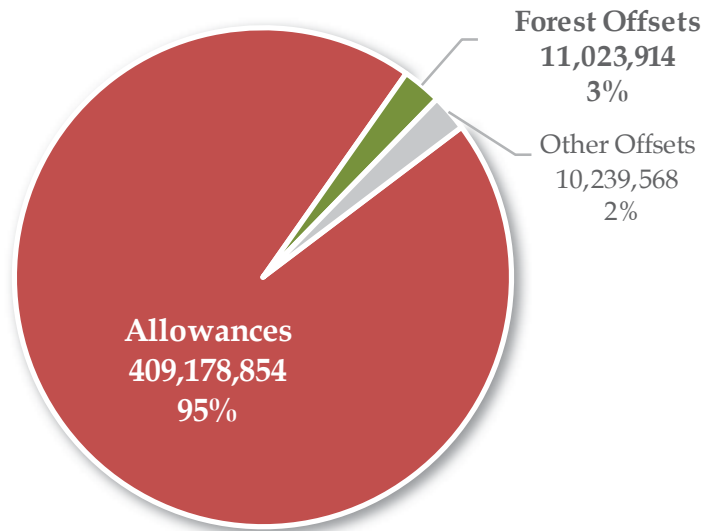


Figure 1. Retired Compliance Instruments Used 2013-16 in the California Cap-and-Trade Program. Source: ARB Compliance Instrument Report, Data through Q4 2016, accessed March 11, 2017, available at <https://goo.gl/Jsj8kf>

Given that offsets account only for 5% of the total compliance instruments used so far in the cap-and-trade program, it would be easy to dismiss their role in the sweep of California’s aggressive climate policies. Indeed, one author likened the cap-and-trade market as a whole to ‘dessert’ after a full meal of other ‘complimentary policies’ for climate action including building energy efficiency standards, tailpipe emission standards, the Low Carbon Fuel Standard and renewable energy mandates. These policies are expected to account for approximately 70% of California’s climate action, with cap-and-trade’s 30% “no ton is left behind” contribution following at the end.⁴¹ In this conception, offsets would be the garnish on that dessert – playing a small role in the last-in-line climate policy. Depending on the future carbon price, of course, offsets could stand to play a much larger role. If carbon prices increase considerably and more entities use closer to their full 8% allotment of offset-based compliance, then it is possible that offsets will exert considerable influence over the overall cap-and-trade program’s economic and environmental outcomes.

Whether a large or small portion of compliance, offsets are somewhat financially beholden to the vagaries of the broader cap-and-trade market. Given that they are substitutes, offset prices according to market participants are generally pegged to the going rate for allowances, though at a small discount likely due to the additional search and transactions costs investing in offsets requires. With market data indicating

⁴¹ Michael Wara, *California’s Energy and Climate Policy: A Full Plate, But Perhaps Not a Model Policy*, 70 BULL. OF THE ATOM. SCI. 26, 27, 28 (2014).

a structural oversupply of compliance instruments in the cap-and-trade market,⁴² the latest allowance price floor⁴³ of \$13.57 may operate as somewhat of a price ceiling on offsets, especially when allowances are abundantly available for purchase from ARB or in the secondary market.

However, as a financial matter offsets should not so easily be dismissed. Both from published data made public by ARB,⁴⁴ and from anonymous survey results collected in this research, offset prices have been in the general vicinity of \$9-13 per ton CO₂e. This price range combined with the information in Table 2 above suggests that the 56 million offsets issued to-date by ARB are in total worth around \$500 million, with about \$300 million of that in forest offsets alone. As a matter of state policy and as an unprecedented experiment in carbon sequestration program design, the forest offset program is certainly worthy of close examination.

Explaining the Distribution of Offset Credits by Project Type

As seen in Table 2 and Figure 2 above, the US Forest offset program accounts for a clear majority of both the credits earned and the offsets surrendered for compliance. This research also draws on project design documents available through the forest offset program, pulled from the climate registry websites as of July 2016. This analysis was conducted for all the projects that had then earned or were earning credits in the program.⁴⁵ Looking at just these projects that had made it all the way through the application process helps show how the project protocols are playing out in practice. From the project document data analyzed for this study, we draw the following project summary statistics in Tables 3 and 4, and the map in Figure 3 below.

Table 3. Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

	Number of Projects	Total Credits	Total Acres
Improved Forest Management	33	24,142,947	854,598
Avoided Conversion	6	1,376,803	8,588
Reforestation	0	0	0
Totals	39	25,519,750	863,186

⁴² Cullenward and Coghlan, *supra* note 15 at 13.

⁴³ CARB, FEBRUARY 2017 JOINT AUCTION #10: SUMMARY RESULTS REPORT (last accessed March 15, 2017), available at <https://goo.gl/MSDdTD>.

⁴⁴ See CARB, 2015 SUMMARY TABLE OF MARKET TRANSFERS (last accessed March 15, 2017), available at <https://goo.gl/qwxFDS>.

⁴⁵ Other analysis has focused on all projects listed in the program, an earlier step in the crediting process. See Erin Kelly and Marissa Schmitz, *Forest Offsets and the California Compliance Market: Bringing an Abstract Ecosystem Good to Market*, 75 GEOFORUM 99, 102 (2016).

Table 4. Credit-Earning Projects in the Offset Program by Protocol Type

	<i>Compliance Program</i>			<i>Early Action Program</i>		
	Number of Projects	Total Credits	Total Acres	Number of Projects	Total Credits	Total Acres
Improved Forest Management	16	16,757,595	691,393	17	7,385,352	163,204
Avoided Conversion	0	0	0	6	1,376,803	8,588
Reforestation	-	-	-	-	-	-
Totals	16	16,757,595	691,393	23	8,762,155	171,792

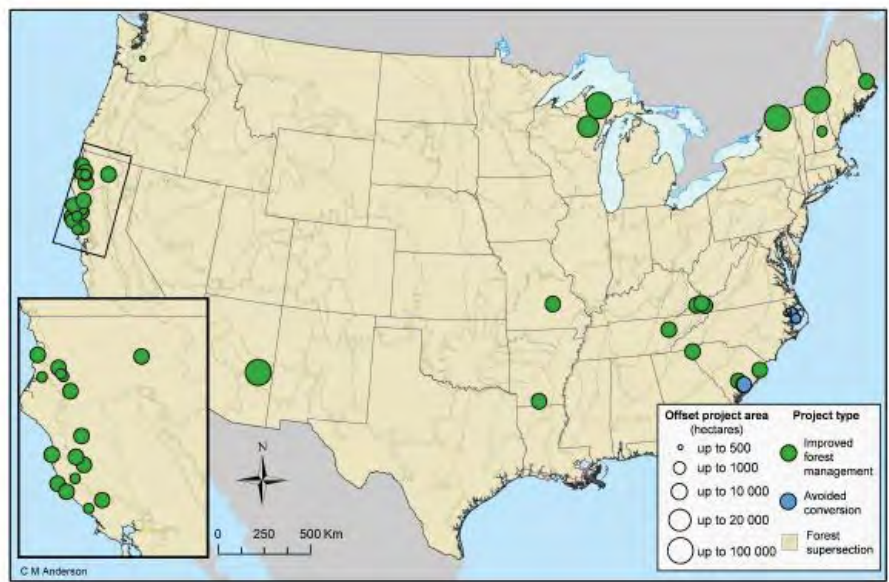


Figure 2. Map of Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

Several trends stand out in the project data presented above. First, improved forest management (IFM) projects dominate the pool of projects that have made it to the crediting phase of the program. The potential reasons for this are several, though interviewees highlighted three important ones. Given that tree growth from plantings does not begin to show financially significant returns in terms of carbon accumulation for 15-20 years, the financial payback period for reforestation projects is simply too

long, explaining why no projects have yet been credited. Second, only a handful of avoided conversion projects have been successfully credited in the program. This may be in part because in ARB's protocol, projects must show that the anticipated alternative land use for the project is more than 80% higher than its current forested value or face credit reductions.⁴⁶ This requirement essentially imposes a property conversion value test whereby converting to another land use must nearly double the value of the land, or face credit erosion by an 'uncertainty discount factor'. The purpose of this discount factor is additionality – only projects with high potential conversion values (i.e. those most likely to actually be converted) can make it into the program and receive full credit. Finally, IFM projects have the benefit of obtaining credit in the first year for the amount of carbon stock above their own modeled harvest baseline and above the Common Practice baseline. Put differently, this means that when an IFM project comes into the program, in the first year they are eligible for an initial crop of carbon offset credits for their current carbon stock that is above both the regional average stock (Common Practice baseline), and above the project-specific modeled baseline that includes financial, legal, and regulatory constraints. In short, above-average forests earn significant credits up front, and multiple interviewees acknowledged that this initial tranche of credits is all but essential for IFM project participation.⁴⁷ Many interviewees note that part of the initial revenue inflow is often used to finance startup costs.

Two additional pieces of evidence reinforce the essential role of up-front revenue. Published research on the potential financial returns from potential small offset projects in the northeastern US found that initial carbon stocking above the Common Practice baseline was the strongest predictive variable of financial returns.⁴⁸ Also, our analysis of project documents for the IFM projects currently earning credits indicates that 4 out of every 5 IFM projects in the program entered with carbon stocking above the Common Practice baseline. The quartile boxplot in Figure 4 below shows that most projects come in above, and many come in significantly above their area's Common Practice baseline. For a project at the median carbon stock (32 tons/acre above) and of a median size (9,753 acres for IFM projects), this means roughly 300,000 credits will be awarded up-front. At approximately \$9 a credit, that amounts to \$2.7 million in year 1 revenue for the project. Figure 5 below shows how IFM projects earn credit over time, demonstrating that about 70% of credits come in the first year and small annual amounts after, reflecting the (slow) net growth of carbon stock after year one.

⁴⁶ 2015 Forest Offset Protocol, *supra* note 31 at 72.

⁴⁷ See also Kelly and Schmitz, *supra* note 45 at 105.

⁴⁸ Charles Kerchner and William Keeton, *California's Regulatory Forest Carbon Market: Viability for Northeast Landowners*, 50 FOREST POL. & ECON. 70, 75 (2015).

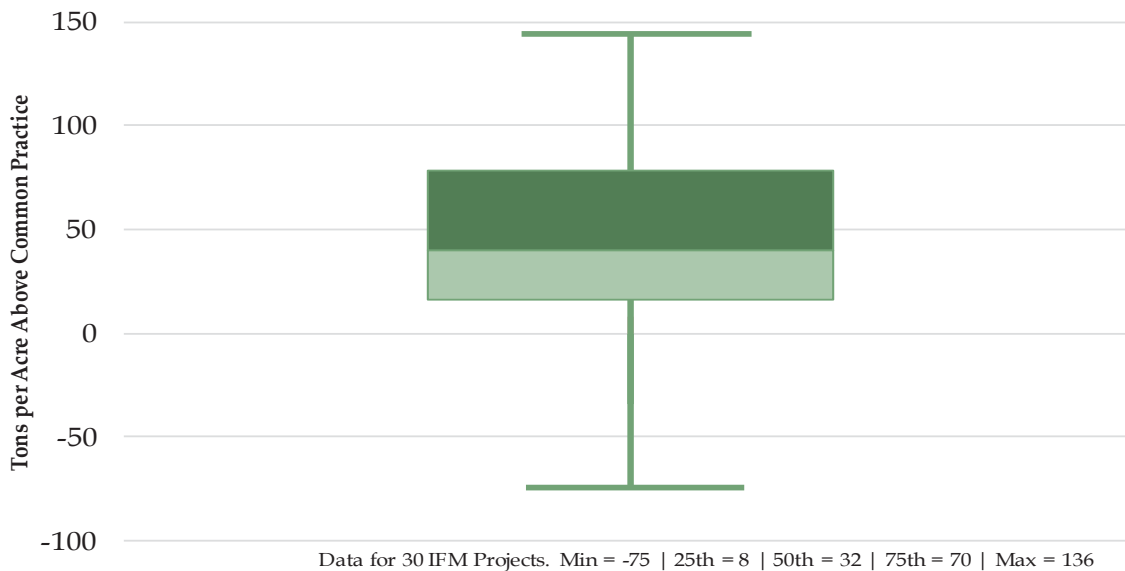


Figure 3. Boxplot of Initial Tons per Acre Above Common Practice from IFM Projects in the US Forest Offset Program as of July 2016.

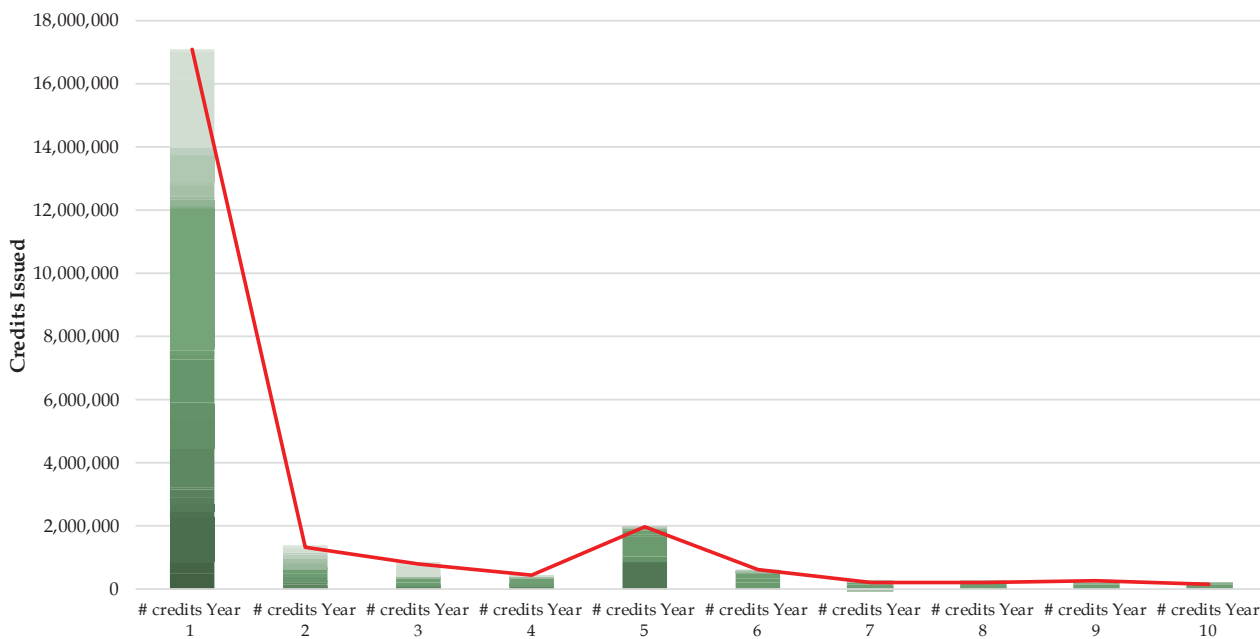


Figure 4. Total Credits per Year Earned by IFM Projects in the US Forest Offset Program as of July 2016.

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

Summary

In summary, today's California forest offset market is populated by several dozen projects selected for their exceedingly good fit under the rules of the program as specified in the ARB protocol. With a multifaceted approach to additionality, stringent verification and monitoring expectations and robust carbon accounting rules, the projects in the program reflect ARB's emphasis of quality over quantity in the number of projects that earn credits. Project developers have previously reported that only 5-10% of the projects they initially investigate end up being profitable enough to proceed given these high program hurdles.⁴⁹

However, with over 100 projects listed in the program so far (an initial stage in the application process), it is possible that significantly more projects could complete the process and begin earning credits if the price of carbon increases. Reauthorization of the cap-and-trade program past 2020 could cause such a price spike, which would likely lead to the crediting of many more IFM and avoided conversion projects. These projects would presumably be less financially dependent on returns from crediting their initial stocking over the Common Practice baseline, as future growth would be more remunerative. It remains to be seen whether any plausible market scenario will bring reforestation projects into the program, though. What is clear is that future market dynamics will depend largely on future developments in state policy and carbon prices.

⁴⁹ Kelly and Schmitz, *supra* note 45 at 104.

Methods

This review undertook three approaches to assessing forest offset project and program characteristics. First, we conducted an assessment of all 39 credited forest offset projects (listed in Appendix I) using a text review of the public project documents available for each project. Projects must meet stringent reporting requirements, and must be listed on approved carbon registries with public project documents. For this research, available documents included an offset verification statement, annual offset project data reports, offset project listings, and biennial project emissions reporting, yielding a database of 46 variables for each project.

Second, we administered a survey of forest owners/operators and a separate survey of forest offset project developers to gain information beyond what is reported in project documents. The surveys included questions about participant motivations, forest offset credit sales, and other project characteristics, experiences, and opinions. Online surveys were sent to all 32 identified project owners/operators. Postcard reminders were mailed, seven survey reminders were sent by email, and hard copy surveys were sent to those who did not respond within a week. 17 complete survey responses were collected, with a survey response rate of 53%.⁵⁰ These responses covered 21 of the 39 credited projects, also 53% of the total. The same process was used for the project developer survey. Three of four project developers responded. For context, we estimate that 72% of all projects in the program used a project developer to implement their forest offset project.

Third, we conducted in depth interviews with eight project owners (including four on-site forest visits) and with two project developers. These in depth interviews provided nuanced details for specific projects and corroborated information gained from the document review and survey. Between surveys and interviews, this research obtained detailed data from the owners of 28 of the 39 projects credited in the program (72%). This paper draws on each of these three data sources—documents, survey responses, and interviews—in formulating the following findings and lessons.

Last, we compiled additional data for mapping forest offset use in disadvantaged communities (see Finding 2 below). Using a combination of publicly available data from ARB and other sources, we analyzed the share of forest offsets that were used at facilities in disadvantaged communities (estimated to be a pro-rata share of their parent entity's offset use) as compared to offset-linked facilities not located in disadvantaged communities. This analysis used forest offset data from 2013-2015, and annual emissions from facilities in 2014, as described further in footnote 60 below.

⁵⁰ The majority of projects covered in survey responses were Early Action projects.

Findings

Based on document analysis, interviews, and surveys, we elaborate four primary findings on California's forest offset program below.

Finding #1: Additionality is Much Stronger than in Other Forest Offset Programs, But Questions Remain

Project 'additionality' refers to the idea that a forest offset project earns credits for changing practices from what would have happened without the project. For example, forest owners can earn credits by cutting less timber than they would have otherwise, or by keeping forest land standing that they would have otherwise converted to agriculture. The challenge with credit accounting under this approach is that it is never possible to know the counterfactual (what would have happened in the absence of the forest offset project) for certain. By definition, all counterfactuals are hypothetical exercises. Many forest offset programs have been plagued by difficulty in determining the appropriate counterfactual or 'baseline' activity level. California's program continues to face this challenge as well, but it has gone several steps further than prior efforts on forest offsets.

Efforts to Ensure Additionality

This analysis finds that California's forest offset program has incorporated several accounting and protocol elements in an effort to ensure project additionality. First, projects entail rigorous carbon accounting with standardized baselines across the country which are established with long-term forest data from the US Forest Service Forest Inventory and Analysis program.⁵²

Second, forests are required to provide data showing that the project-specific harvest baseline against which their project will be credited would have been financially viable.⁵³ That is, when forests set counterfactual timber harvest levels or forest conversion rates, they are required to provide a net present value analysis or recent sales records from neighboring forests showing that the proposed baseline timber harvest is financially viable for the duration of the offset project.

Third, projects are required to exclude any forest carbon that is already legally protected by another mechanism.⁵⁴ Forest carbon that is already legally protected from harvest would by definition not be harvested, and any crediting for such carbon would

⁵² 2015 Forest Offset Protocol, Appendix F, *supra* note 31 at 139.

⁵³ 2015 Forest Offset Protocol, *supra* note 31 at 28, 62.

⁵⁴ 2015 Forest Offset Protocol, *supra* note 31 at 27.

clearly not be additional. Common legally protected forest carbon in offset projects, for which projects do not receive credits, include legal prohibitions from harvest near streams, on steep slopes, or near endangered species. Another common legal prohibition that prevents some forests from participating in the offset program is the presence of a longstanding conservation easement that prohibits timber harvest on the forest land in question.⁵⁵ The rigor of these requirements is new to the California offset program; preceding voluntary forest offset programs have not generally required this level of scrupulousness.

The Views of Forest Owners and Operators on Additionality

Our survey asked forest owners and project developers to assess their confidence in the additionality of both their forest offset project and other projects. Not surprisingly, the majority of respondents were confident that both their project and other projects in the program are additional (Figure 5).

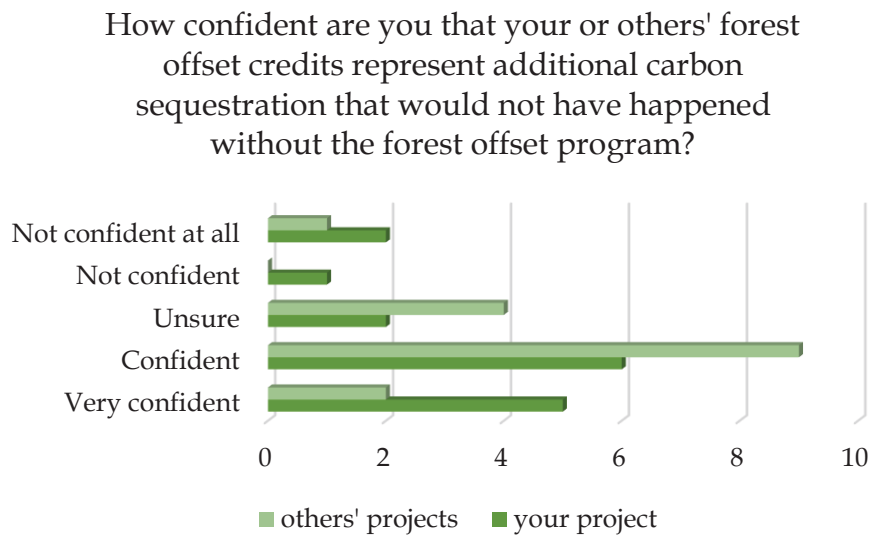


Figure 5. Survey responses from 17 forest owners re: confidence in additionality.

In more detailed narrative survey responses there were two types of information that stood out on additionality. First, some project owners and operators shared that as long as they maintained property ownership, they were unlikely to have harvested timber at the baseline level calculated in project documents. This would be a concern for project additionality. Second, in both interview and survey responses, project owners and operators emphasized that the *commitment* to carbon sequestration was

⁵⁵ For early action projects which started prior to the compliance market start, projects that already had conservation easements were grandfathered in to the program.

additional. In other words, projects were thought to be additional regardless of the counterfactual because they ensured a 100-year commitment to maintaining forest carbon. The counterfactual would be no *commitment* to maintaining carbon and thus an uncertain future for the forest carbon in question.

Our survey also asked forest owners and operators whether participation in the forest offset program changed their forest management practices. A change in forest management practices would signify a change from the baseline activity and would serve as another indicator for project additionality. Of survey respondents, 4 reported that starting a forest offset project changed their forest managed practices, an additional 6 reported that practices changed somewhat, and 6 reported that practices did not change (Figure 6). Management changes reported by project operators included decreasing harvest levels, adding a forest certification, and purchasing additional forest land.

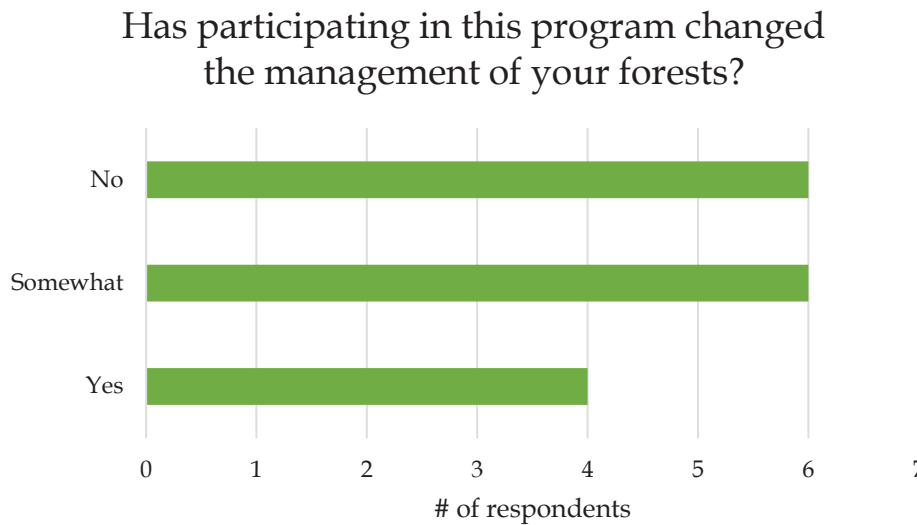


Figure 6. Survey responses from 16 forest owners re: forest management.

Concerns about Project Additionality

One of the most commonly voiced concerns about additionality in the forest offset program concerns conservation easements. California’s forest offset protocol allows projects to simultaneously implement a conservation easement together with a forest offset program, and this is a common occurrence in the program. This type of joint implementation of an easement and offsets would be considered additional under a ‘barriers test’ of additionality, which assumes that a project would not be possible (i.e. would face insurmountable barriers) without implementing both the offset project

and the easement jointly.⁵⁶ However, in the initial Early Action period of the forest offset program, projects were able to join the program even if they had long standing conservation easements already in place. Any easement stipulations prohibiting timber harvest still had to be excluded from crediting, but this early period included multiple projects with long-standing conservation easements already in place. It is an important positive amendment that such projects are no longer permitted to join the offset program.

Finding #2: A Wide Variety of Entities Purchase Offset Credits

Forest Offset Credit Buyers

In the California cap-and-trade market as of 2015, 272 entities and 438 facilities fall under the cap. (Each ‘entity’ may have multiple facility sites.) According to data from CARB⁵⁷ analyzed in this study, 150 facilities purchased offsets and 79 have used forest offsets from 2013 through 2015. The cap-and-trade policy limits each entity to covering a maximum of 8% of its obligations by using offsets. As discussed earlier, the total rate of use falls well below the 8% maximum at present.

Among forest project owners surveyed, 53% of project owners sell their forest offsets directly to entities with a California offset obligation. The remainder of owners sell their credits to brokers and intermediaries who in turn sell credits to entities in the cap-and-trade program. Offsets were initially included in California’s cap-and-trade program to serve as a cost containment mechanism. Capped facilities could avoid or delay the most expensive emissions reductions investments by purchasing offsets. However, since the carbon price in the California market has remained very low through the duration of the market to date,⁵⁸ offsets have not served as a cost containment mechanism, and the cost of offset credits has also remained low. 11 survey respondents anonymously reported on their average carbon sales price. The average price from this data is \$10.20/ton, with a range of \$9-\$13/ton. As shown below in Figures 13 and 14, most respondents anticipated that prices would increase slightly or stay about the same up to 2020. Estimations were similar for prices after 2020, with the addition of a few respondents anticipating prices to increase significantly (more than a 25% increase).

⁵⁶ See Trexler et al., *supra* note 24 at 31.

⁵⁷ See explanation in footnote 60 below.

⁵⁸ Cullenward and Coghlan, *supra* note 42 at 13.

Forest Offset Credits and Environmental Justice

The environmental justice community in California has voiced concern that use of offsets disproportionately impacts disadvantaged communities in the state. Environmental justice advocates have argued that facilities that buy offsets are likely located in disadvantaged communities, and if emissions were reduced onsite instead of through offsets, those communities would gain health benefits from reduced pollution, especially of non-GHG co-pollutants such as particulate matter and air toxics.⁵⁹ We used offsets sales data and facility emissions data from CARB to construct a first-order approximation of the connection between offsets and emissions in disadvantaged communities and to assess whether forest offsets have been used disproportionately in disadvantaged communities.⁶⁰

Forest offsets account for a small share of facility emissions across all facilities. 79 of 438 facilities in the cap-and-trade program (total as of 2015) used forest offsets. Of these facilities, 43% (34) are located in disadvantaged communities (see Figure 7). In 2014, facilities in disadvantaged communities on average offset 2.2% of their emissions with forest offsets, whereas facilities not in disadvantaged communities used offsets slightly more, covering 3.2% of their emissions. As with the rate of use, the total *number* of estimated forest offsets used is also higher outside of disadvantaged communities. Where facilities in disadvantaged communities used close to 70,000 forest offset credits on average, facilities outside of disadvantaged communities used

⁵⁹ See Climate Equity Brief, *supra* note 39 at 7-10.

⁶⁰ This analysis weaves together the forest offsets information reported in the CARB Compliance Reports (available for 2013-14 and 2015) and compares it to facility information made available in CARB's the Integrated Emissions Visualization Tool, with an overlay of the OEHHA's CalEnviroScreen 3.0 shapefile for disadvantaged community location (defined here as a score of 75 or above). We first downloaded all data for the facilities listed as subject to cap-and-trade as of 2013 in the Integrated Emissions Visualization Tool (324 facilities). Then we matched that facility information with the forest offset usage data reported in the Compliance Report's Compliance Offsets Detail tab by entity ID. This matching used the Entity ID data, and ARB GHG ID info reported in the Compliance Summary tab of the Compliance Reports to link entities, and the facilities they own, with offsets usage. Unfortunately, because CARB does not report offset usage down to the facility level, our analysis at that point had to use a pro-rata estimate for each entity; that is, if a particular entity had purchased and retired 100,000 offsets, and owned four facilities subject to cap-and-trade, we have assumed that they retired 25,000 offsets for compliance at each facility. More detailed information would need to be made public about both offset purchase and retirement as well as about facility location and emissions in order for finer and more instructive sets of analyses to be conducted. We recommend that CARB at a minimum commission a program evaluation of the environmental and equity impacts of the offsets program using more finely grained data than what has been made publicly available. For data sources, please visit CARB, INTEGRATED EMISSIONS VISUALIZATION TOOL (last accessed March 15, 2017), available at <http://goo.gl/WJGiVF>; CARB, CAP-AND-TRADE PROGRAM (last accessed March 15, 2017), available at <http://goo.gl/4qeAfj> (specifically, under Publicly Available Market Information, the 2013-14 and 2015 Compliance Reports); Office of Environmental Health Hazard Assessment, CALENVIROSCREEN 3.0 (last accessed March 15, 2017), available at <http://goo.gl/K9Foqg> (specifically the CalEnviroScreen 3.0 Results Shapefile).

more than 130,000 forest offset credits on average. Initial analysis suggests that trends are similar when all offsets, not just forest offsets, are considered. Facilities in disadvantaged communities used 6.4 million offsets cumulatively, while facilities outside of disadvantaged communities used 10.2 million offsets cumulatively. Further analysis and more finely-grained data are needed to more precisely compare the effects of offsets on emissions in and out of disadvantaged communities.

Though any lessening of the incentive to reduce pollution in disadvantaged communities is concerning, and though offset data alone cannot tell us precisely what would have happened in the absence of offset availability, it appears that the use of offsets to date affects but does not appear to disproportionately impact disadvantaged communities. As compared to other areas, fewer facilities in disadvantaged communities purchase offsets, and those that do use a smaller share of offsets. But, this trend could change over time and should continue to be monitored.

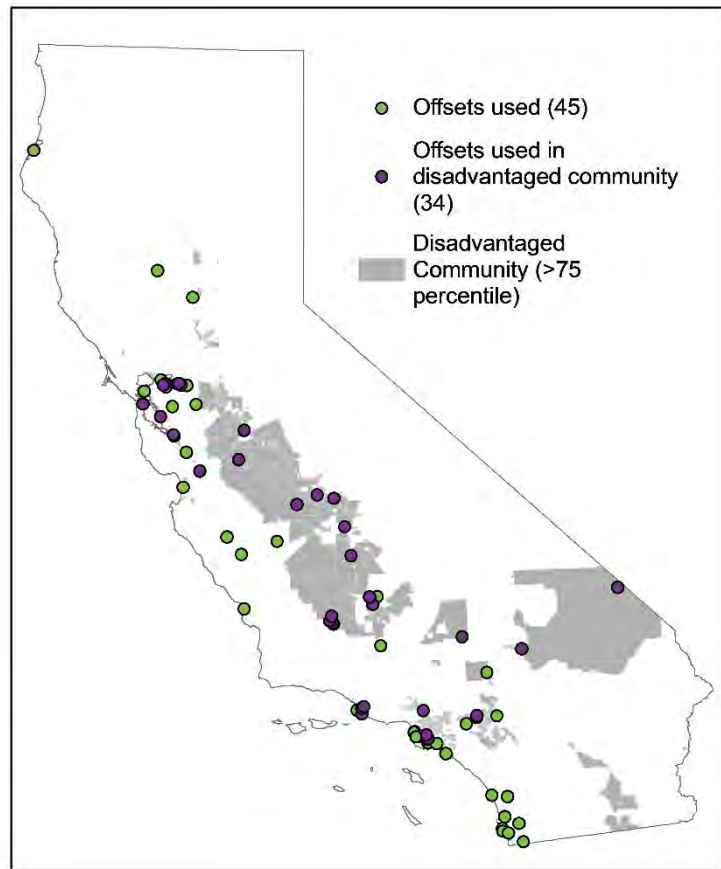


Figure 7. Location of Cap-and-Trade Facilities whose Parent Entities Retired Offsets to Meet Compliance Obligations.

Finding #3: Project Co-Benefits Are Not Monetized

Project document review, interviews, and surveys all corroborate that forest offset projects convey co-benefits for conservation and sustainable forest management. However, delivery of these project co-benefits is a decidedly secondary concern to the financial success of projects, which is conveyed by carbon credits. Project co-benefits may be of greater interest in the long run, and several projects report potential for ‘benefit stacking,’ or deriving financial benefit from co-benefits alongside carbon revenues from participating forest land.

From our analysis of project design documents, 92% of credited offset projects report having at least one environmental co-benefit. In the survey data, however, most respondents report that co-benefits are not important in the sale of their offset credits (11 of 16, 69%). This indicates that while forest owners are aware of the existence of co-benefits, these co-benefits are not financially relevant to the sale of offset credits, though they may be relevant to other ecosystem services markets. Similarly, interviewees often noted their co-benefits with interest, and enjoyed telling stories about them, but generally acknowledged that carbon credit buyers do not ascribe monetary value to co-benefits.

Survey respondents report that their projects provide a number of co-benefits. Most respondents also report that co-benefits are present, but few expend resources to measure these benefits.

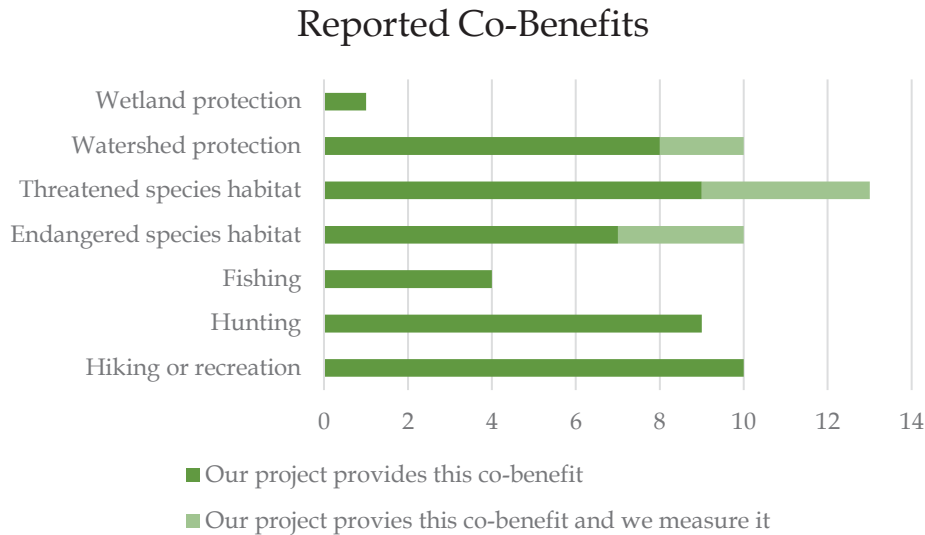


Figure 8. Survey Responses from 17 Forest Owners on project co-benefits.

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No project operators or developers that we interviewed or surveyed were interested in additional reporting requirements, on co-benefits or otherwise, although at least one noted that if nationally standardized tracking metrics were developed, the reporting burden to California would be manageable. Respondents were concerned that reporting requirements are already onerous, so any future co-benefit reporting would likely need to have clear benefits for project operators and the state. We note that higher expected carbon prices might alter these assessments.

Finding #4: California Offsets Have Broken New Ground, but Regulatory Risks Hamper Further Development

Transitioning Into a More Mature Policy and Marketplace

The California forest offset program is currently in somewhat of an interstitial period, having traveled far up the learning curve of forest carbon policy experimentation, but still beset with uncertainty about the future. Unlike some other protocols the IFM and avoided conversion portions of the forest offset program have experienced notable project uptake. These areas have delivered emissions reductions and credits used by compliance entities and stand ready to deliver more in the future. Yet judging by the lengthy project listings and the persistently low price of offsets beneath an already low allowance price floor, the offset market seems to be in somewhat of a holding pattern while market participants wait to see how California policymakers chart a climate policy course past 2020.

Survey and interview results tend to confirm these indications. As detailed below, although ARB generally receives good marks in its program implementation thus far, market participants do not have the policy certainty they need to continue growing the program with more participating projects.

Bright Spots: Readiness and Program Experience

Although the price of allowances since 2013 has never risen high enough to necessitate the use of offsets as a cost-containment mechanism,⁶¹ California's unprecedented innovation in developing a compliance-quality program and protocol for forest carbon offsets has resulted in a marketplace with dozens of credited projects. It is possible that many more could participate in the future. Projects that are now marginally economic at a carbon price of around \$10/ton could be brought into the program in the future if the price rises. If the carbon price rises significantly, it is

⁶¹ Cullenward and Coghlan, *supra* note 15 at 7.

possible that whole project types that are not currently financially attractive, such as reforestation projects and urban forest projects, may become economically viable.

In addition, ARB has received generally encouraging reviews in both survey and interview responses collected for this study. Of 17 responses, only three project owners expressed dissatisfaction with ARB's handling of the program overall, and only two expressed dissatisfaction with individual project application handling. Only two owners expressed that they would not consider expanding or bringing new land into the program in the future, while more than half of respondents expressed interest in the possibility. These results are conveyed in Figures 9, 10 and 11 below. When asked a narrative question about whether their satisfaction levels with ARB had changed over time though, responses were mixed. Some project owners remarked that ARB's project application reviews had become less predictable and more cautious, and others hypothesized that application interactions had become more frustrating because of an increase in application volume without an increase in ARB processing capacity. (Interestingly, no project owner expressed dissatisfaction with their developer or their registry, although at least one interviewee did indicate having markedly different impressions of two developer entities, one negative and one positive.)

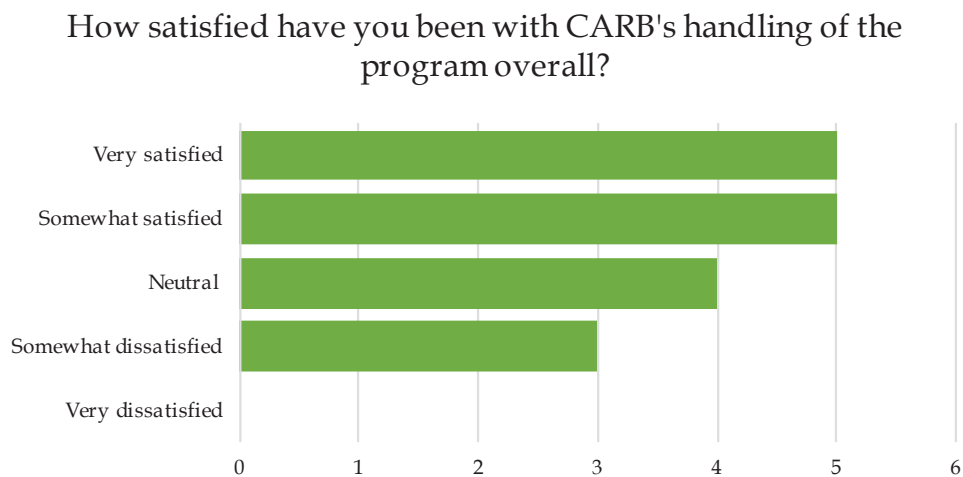


Figure 9. Survey Responses from 17 Forest Owners on CARB's performance.

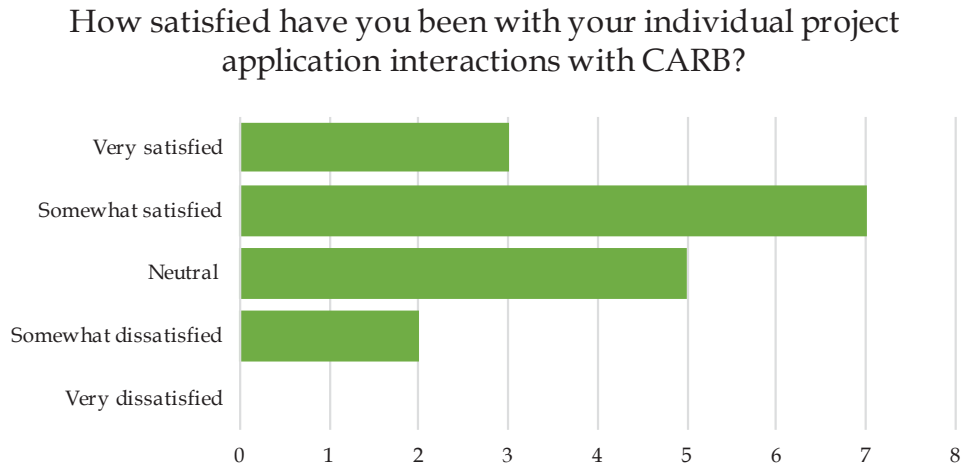


Figure 10. Survey Responses from 17 Forest Owners on CARB’s application handling.

Additional Participation: Would you consider expanding an existing project or starting a new project on other forests?

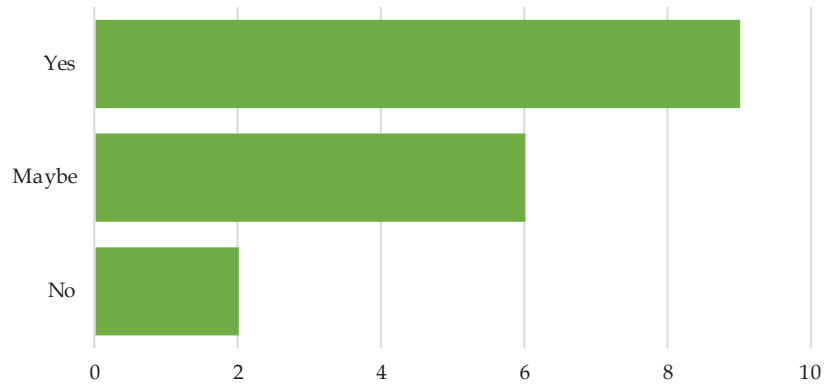


Figure 11. Survey Responses from 17 Forest Owners on additional participation.

Project developers were less sanguine in their appraisal, however. Only one respondent indicated satisfaction with the program (the others had neutral feelings), and divergent satisfied/unsatisfied opinions were reported about individual project interactions. All expressed that their satisfaction had changed over time, with two voicing concern that inefficiencies and the expense of meeting program requirements had not improved.

Both project developers and owners agreed in their general praise for CARB's approach to project risks. Two of three developers and 16 of 17 project owners reported that CARB has been appropriately accounting for project risks through the individualized project assessment and buffer pool requirements. The lonely dissenters took issue with 20% as the standard buffer pool credit contribution and advocated an individualized fire risk assessment for a particular project, respectively, but generally speaking ARB's approach to risk was reportedly appropriate in the eyes of market participants. Although the subject came up in some interviews, only one developer and one project owner reported being concerned about invalidation risks in their surveys.

Concerns: Instability, Carbon Price Uncertainty and Rising Verifier Costs

Project owners have much more divergent opinions about what the future may hold for the offset program, reflecting the general uncertainty about state policy and carbon prices that have the offset program in somewhat of a holding pattern. Although the state has committed to continuing climate programs in some form after the year 2020 with the passage and signing of Senate Bill 32 in 2016,⁶² program participants report not being sure yet whether this new policy commitment will impact the return from their current projects. Figure 12 below presents the results from a survey question asked of offset project owners, reflecting their unresolved uncertainty in the wake of SB 32. This uncertainty may help explain the six 'maybe' answers reported above with respect to additional participation in the program – so much depends on the next few steps state policymakers take in extending the cap-and-trade program (or not), that possible future projects may simply wait until there is more certainty about the future of the program.

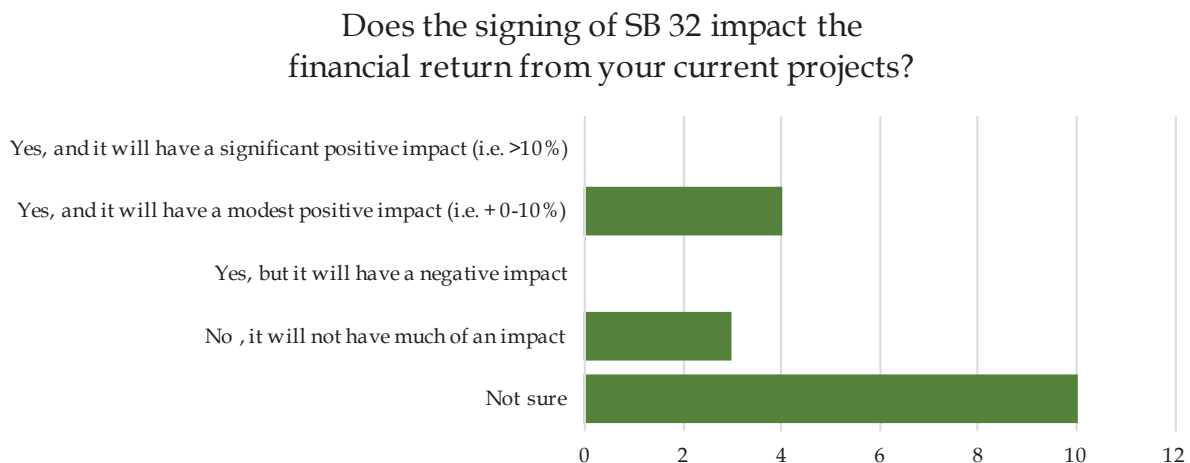


Figure 12. Survey Responses from 17 Forest Owners on the impact of Senate Bill 32.

⁶² See Chris Megerian and Liam Dillon, *Gov. Brown Signs Sweeping Legislation to Combat Climate Change* L.A. TIMES (September 8, 2016), available at <https://goo.gl/ewXwbN> (describing SB 32).

Project owners generally seem optimistic about future price trends, assuming policy stability is provided. An open-ended narrative question on the project owner survey elicited many responses that cited program complexity, changing regulations and future policy uncertainty as major barriers in the program. But, when asked in an anonymous portion of the survey for their opinions about future price trends, project owners in general expressed bullishness and confidence about both near and longer term price trends. As seen in Figures 13 and 14 below, a 60% majority of respondents thought average sale prices for offsets would increase slightly in the time before 2020, and a majority believed they would rise slightly or significantly after 2020 as compared to today. However, when read together with the more cautious additional participation responses and concerns about policy certainty and complexity, this optimism may not translate to deeper program participation without more stability.

Expected Price Trend Between Now and 2020

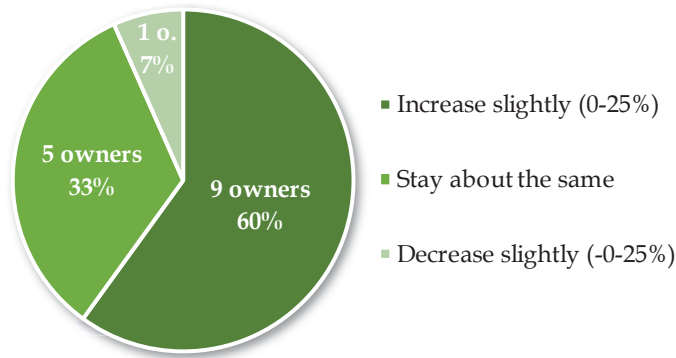


Figure 13. Survey Responses from 15 project owners re: near term price trend expectations

Expected Price Trend After 2020

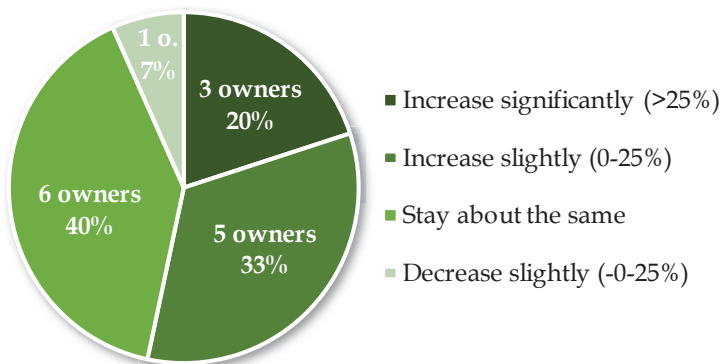


Figure 14. Survey Responses from 15 project owners re: longer term price trend expectations

While owners were conditionally bullish about future price trends, a worry that was repeatedly raised in multiple interviews and in survey data as well was rising verification costs. Other answers to the barriers question cited the steep and rising costs of monitoring and verification. In response to a question asking for their opinion of published verification and monitoring costs appearing in Kerchner and Keeton,⁶³ several respondents with recent verification cost experience stated that the published verification costs were much lower than actual costs. While opinions on that question were somewhat mixed and included five 'I don't know' answers, multiple interviewees expressed the same concern about rising verification costs. Some speculated that invalidation risk concerns had increased the length of verifications and financial exposure of the verifiers. However, most interviewees who mentioned the subject indicated that the likely causes are a short supply of verifiers and verification bodies, and large demands of verification in a compliance program as compared to in the voluntary market. ARB staff have reported that expanded training opportunities for verifiers are on the way to address this shortage. But, these efforts may need to bear fruit in the nearer term in order to keep pending projects from being dissuaded from joining the program at current carbon prices.

⁶³ See Kerchner and Keeton, *supra* note 49 at 75 (reporting ~\$8,000 annual monitoring costs plus \$15,000 costs incurred every six and \$27,000 every 12 years).

Lessons for Natural and Working Lands

The State of California is in the process of updating its climate scoping plan, which sets goals for GHG emissions in each state sector. For the first time, the scoping plan will cover the period to 2030 and will include goals for carbon on natural and working lands, including agricultural lands and forests.⁶⁴ The draft scoping plan sets as an overarching goal that natural and working lands would be an overall emissions sink rather than a source. There are a number of activities and plans associated with this goal. We offer several recommendations for the state's goals in natural and working lands based on its experience thus far managing land-based carbon through the forest offset program:

- **Lesson #1:** Rigor of approach to carbon accounting drives implementation cost

The Forest Offset Program requires a very rigorous approach to carbon accounting, estimating the exact tonnage of forest carbon present on individual project lands. This is currently achieved at the project level through forest inventory, growth and yield modeling, and third party verification.⁶⁵ Detailed accounting through these methods cannot be scaled statewide. This level of detailed accounting is appropriate and feasible when dealing with compact and contiguous project lands, but costly and infeasible to conduct on a statewide basis. The State should and does consider methods of carbon accounting on Natural and Working Lands that are significantly less onerous than the Forest Offset Program, but that are still meaningful in terms of measuring changes in emissions and carbon sinks.⁶⁶ This is a case in which the Forest Offset Program uses a method that works well, but cannot be used at the scale of Natural and Working Lands.

The Proposed Plan offers a scale-appropriate method for carbon accounting on lands in California. It indicates that an updated Natural and Working Lands emissions inventory presently underway “applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon.”⁶⁷ Combining remotely-sensed data with ground-based data is a good approach to take at the scale of the state-wide inventory, and should be continued as the inventory is expanded in the coming years.

⁶⁴ California Air Resources Board, THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET (January 20, 2017), at 107-17, available at <https://goo.gl/ZBkyCN>. Hereafter 'Proposed Plan'.

⁶⁵ See generally 2015 Forest Offset Protocol, *supra* note 31.

⁶⁶ See Proposed Plan at 108.

⁶⁷ Proposed Plan at 108.

➤ **Lesson #2:** Transparency and Accessibility of Program Information

The Forest Offset Program produces voluminous data about carbon accounting, project details, and offset usage, and much of it is available to the public through CARB’s website and project registries. However, these data are not easy to locate or interpret. Data sheets can be difficult to find online, and reporting categories change over time, making consistent comparison over time difficult. In this case, the Forest Offset Program is not using best practices, and based on this experience we recommend a more coordinated approach for Natural and Working Lands data transparency and accessibility.

A clear and pre-designed framework for reporting on Natural and Working Lands should be devised as a part of the Integrated Natural and Working Lands Climate Change Action Plan (“Action Plan”).⁶⁸ This will avoid difficulty in reporting and evaluation later on. The Proposed Plan states that the California will “develop implementation tracking and performance monitoring systems for the Action Plan.”⁶⁹ This is especially important and should be a high priority as reporting in the Natural and Working Lands sector requires complex multi-agency efforts.

➤ **Lesson #3:** Approaches to Uncertainty and Risk

Uncertainty: Emissions accounting on Natural and Working Lands, like that for forests, comes with fundamental risks and uncertainties. The designers of the Forest Offset Program developed a number of notable mechanisms to deal with risk and uncertainty in carbon accounting and carbon crediting. For uncertainty, the Forest Offset Program reduces credits earned proportional to the sampling error of an on-the-ground forest inventory.⁷⁰ A similar approach could be applied to data used for carbon accounting on Natural and Working Lands.

At present neither the Proposed Plan nor Appendix G refer to estimation of uncertainty in developing goals or in developing the Action Plan for Natural and Working Lands.⁷¹ Including uncertainty estimates in ongoing modeling and in the Action Plan will help ensure that the State accomplishes its carbon sink goal for Natural and Working Lands. Including uncertainty estimates is also consistent with

⁶⁸ Proposed Plan at 114.

⁶⁹ Proposed Plan at 117.

⁷⁰ 2015 Forest Offset Protocol at 112.

⁷¹ See Proposed Plan at 117; see also California Air Resources Board, PROPOSED PLAN: APPENDIX G, NATURAL AND WORKING LANDS MODELING (January 2017), available at <https://goo.gl/axN6vS>.

IPCC Good Practice Guidance.⁷² This is a case in which the Forest Offset Program is using a successful practice that can be adapted for use on Natural and Working Lands.

Risk: For risk, the Forest Offset Program also reduces carbon crediting based on the estimated risk of fire, pests, and other ‘reversal’ risks – the risk of releasing forest carbon to the atmosphere over the life of the project.⁷³ Carbon credits deducted based on a project’s risk rating are allocated to a buffer pool of credits, which can be used in case of carbon loss due to fire, disease, or other unintentional losses.

The Natural and Working Lands sector does not need an explicit buffer account because of its more general carbon sink goals (discussed below), but it does need to plan for unavoidable carbon reversals. The Proposed Plan rightly acknowledges that “recent trends indicate that significant pools of carbon [are at] risk [of] reversal,” and that climate change may exacerbate these risks, especially for wildland fire.⁷⁴ Risk should be explicitly incorporated into ongoing Natural and Working Lands modeling to ensure that the State meets its goals for the sector. We recommend adapting the buffer pool approach used in the Forest Offset Program and ‘buffer’ the Action Plan with activities that would exceed the State’s carbon sink goal. This would ensure a ‘contingency fund’ of emissions reductions and enhanced sinks in case of ‘reversal’. Risk estimations could be improved over time as improved data and modeling are available. At present, the Proposed Plan and Appendix G do not discuss accounting for risk in GHG emissions goal-setting for Natural and Working Lands.

➤ **Lesson #4:** Setting a Broad Carbon Sink Goal is Advisable

The experience of the Forest Offset Program shows that modeling future carbon stock, even at the project scale, is a difficult task. Land-based carbon stocks carry risk and uncertainty, as discussed above. The Forest Offset Program dealt with risk by carefully measuring carbon and creating a forest buffer pool—a sort of insurance pool or contingency fund of carbon credits to be used in case of unintentional loss of carbon. The Forest Offset Program further ensures accuracy by requiring multiple levels of verification. While measurement methods for Natural and Working Lands should continue to take advantage of improvements in remote sensing and ground-based data, the method of detailed ton-by-ton carbon accounting used by the Forest Offset Program is not currently feasible at a statewide scale.

⁷² See generally Intergovernmental Panel on Climate Change, 2013 REVISED SUPPLEMENTARY METHODS AND GOOD PRACTICE GUIDANCE ARISING FROM THE KYOTO PROTOCOL at 2.57-2.60 (Section 2.4.3 ‘Uncertainty Assessment’), available at <https://goo.gl/bJWwZW>.

⁷³ 2015 Forest Offset Protocol, *supra* note 31 at 131-36.

⁷⁴ Proposed Plan at 108.

The Proposed Plan states that “California’s climate objective of natural and working lands is to maintain them as a carbon sink (i.e., net zero or even negative GHG emissions).”⁷⁵ The Proposed Plan rightly acknowledges that “the State’s lands, as well as sub-tidal waters, can be both a source and a sink for GHG emissions.”⁷⁶ The State’s goal of maintaining Natural and Working Lands as a carbon sink is an appropriate one. An alternative goal would be to specify a particular percentage or numerical decrease in emissions and/or increase in sinks on Natural and Working Lands. Such an exact goal would be inappropriate because it would necessitate many of the onerous measurements and verification activities pursued under project-based programs like the Forest Offset Program, which are impractical for statewide inventories, as mentioned above. Also, measuring carbon in some sectors of Natural and Working Lands (such as soils) remains quite difficult. The overall ‘carbon sink’ goal is less precise but is also therefore feasible to both measure and attain in a statewide inventory.

While we support the overall ‘carbon sink’ goal for Natural and Working Lands, we recommend that the Proposed Plan clarify whether this is a cumulative or annual goal covering the years between now and 2030. There is likely to be considerable year-to-year variability in emissions from Natural and Working Lands, due to fire and other natural causes. The goal is referred to as cumulative on page 109 of the Proposed Plan, but the measure is not specified in the initial statement of the goal.⁷⁷ The Initial Scoping Plan (2008) set a specific annual goal for forest carbon sequestration,⁷⁸ and this goal has been difficult to measure and attain on an annual basis.

- **Lesson #5:** The Offsets Program Does Not Measure Co-Benefits, But Many Are Clearly Delivered

In part because the Forest Offset Program has stringent and detailed carbon accounting requirements, it was not practical, at least in initial years of the program, to require additional accounting of individual project co-benefits. As detailed in the attached report, we advise that the Forest Offset Program now take up ‘no cost’ opportunities for co-benefits reporting. Co-benefits reporting is even more feasible and important for Natural and Working Lands. Because the Natural and Working Lands goals and accounting can take advantage of remotely sensed data, and can tolerate

⁷⁵ Proposed Plan at 107.

⁷⁶ Proposed Plan at 108.

⁷⁷ Proposed Plan at ES5, 107.

⁷⁸ California Air Resources Board, CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE (December 2008) at 64-65, available at <https://goo.gl/UFhkyT>.

greater uncertainty in acre-level carbon data, state agencies should be able to collect data and account for carbon *and* co-benefits.

The Proposed Plan rightly notes that policies must advance both carbon sequestration and co-benefits⁷⁹ and states that “strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors.”⁸⁰ Accounting for these co-benefits will allow the state to measure the synergies and efficiency gains it is earning by implementing policies that have win-win benefits for carbon, water, agriculture, biomass utilization, land restoration, and conservation. As the State develops tracking and monitoring systems for Natural and Working Lands, these co-benefits should be included. In the Proposed Plan section for ‘Scoping and Tracking Progress’,⁸¹ the text should be amended to read, “develop implementation tracking and performance monitoring systems for the Action Plan, *[including accounting of carbon and other co-benefits]*.”⁸²

⁷⁹ Proposed Plan at 107.

⁸⁰ Proposed Plan at 110.

⁸¹ Proposed Plan at 116-17.

⁸² Proposed insertion in brackets. See Proposed Plan at 117.

Appendixes

Below are two appendixes that provide more information about the sources, methods, and findings of this analysis. The first appendix presents a list of the 39 projects for whom we compiled and analyzed project design document information. The second appendix presents the list of entities who were reported as retiring forest offsets from 2013-15, and the forest offset projects those offsets came from.

Appendix I – Projects Included in Design Document Analysis

	<u>ARB Project ID #</u>	<u>Project Name</u>	<u>State</u>	<u>Type of Protocol</u>	<u>Registry⁸³</u>	<u>Project Documentation Locator</u>
1	CAFR0030	Blue Source – Francis Beidler Improved Forest Management Project	SC	Early Action	CAR	CAR683
2	CAFR0087	Finite Carbon – Brosnan Forest	SC	Early Action	CAR	CAR658
3	CAFR0063	Green Assets – Middleton <u>Avoided Conversion</u>	SC	Early Action	CAR	CAR749
4	CAFR5034	Finite Carbon – The Forestland Group CT Lakes	NH	Compliance	ACR	ACR199
5	CAFR0088	Finite Carbon – Shannondale Tree Farm	MO	Early Action	CAR	CAR780
6	CAFR5089	Finite Carbon – The Forestland Group Champion Property IFM	NY	Compliance	CAR	CAR1088
7	CAFR5029	Green Assets- Brookgreen Gardens Improved Forest Management Project	SC	Compliance	ACR	ACR192
8	CAFR5016	Miller Forest	CA	Compliance	ACR	ACR189

⁸³ CAR = Climate Action Reserve; ACR = American Carbon Registry

9	CAFR0070	Finite Carbon – Berry Summit	CA	Early Action	CAR	CAR1004
10	CAFR0049	The Van Eck Forest	CA	Early Action	CAR	CAR101
11	CAFR0064	Yurok Tribe Sustainable Forest Project	CA	Early Action	CAR	CAR777
12	CAFR0029	Blue Source – Alligator River <u>Avoided Conversion</u>	NC	Early Action	CAR	CAR497
13	CAFR5043	Blue Source – Goodman Improved Forest Management Project (Michael Hart)	WI	Compliance	ACR	ACR202
14	CAFR5028	Round Valley Indian Tribes Improved Forest Management Project	CA	Compliance	ACR	ACR173
15	CAFR0040	Garcia River Forest	CA	Early Action	CAR	CAR102
16	CAFR5096	Brushy Mountain	CA	Compliance	CAR	CAR1095
17	CAFR0041	Big River / Salmon Creek Forests	CA	Early Action	CAR	CAR408
18	CAFR0042	Gualala River Forest	CA	Early Action	CAR	CAR660
19	CAFR0001	Willits Woods	CA	Early Action	CAR	CAR661
20	CAFR0116	Finite Carbon – NEFF (New England Forestry Foundation)	NH	Early Action	CAR	CAR672
21	CAFR5072	White Mountain Apache Tribe Forest Carbon Project	AZ	Compliance	ACR	ACR211

22	CAFR5095	Ashford III	WA	Compliance	CAR	CAR1094
23	CAFR0058	Virginia Conservation Forestry Program – Clifton Farm	VA	Early Action	CAR	CAR686
24	CAFR0057	Virginia Conservation Forestry Program – Rich Mountain	VA	Early Action	CAR	CAR696
25	CAFR5037	Virginia Highlands I	VA	Compliance	CAR	CAR1032
26	CAFR0103	Finite Carbon – MWF Brimstone IFM Project I	TN	Early Action	CAR	CAR582
27	CAFR0073	McCloud River	CA	Early Action	CAR	CAR429
28	CAFR5055	Buckeye Forest Project	CA	Compliance	CAR	CAR1013
29	CAFR0100	Rips Redwoods	CA	Early Action	CAR	CAR1015
30	CAFR5076	Trinity Timberlands University Hill Improved Forest Management Project	CA	Compliance	CAR	CAR1046
31	CAFR0031	Blue Source – Pocosin Lakes Forest Conservation Project (<u>Avoided Conversion</u>)	NC	Early Action	CAR	CAR676
32	CAFR5084	Finite Carbon – Potlatch Moro Big Pine CE IFM	AR	Compliance	CAR	CAR1086
33	CAFR0002	Finite Carbon Farm Cove Community Forest Project	ME	Early Action	CAR	CAR657
34	CAFR0026	Blue Source – Pungo River Forest Conservation	NC	Early Action	CAR	CAR659

		Project (<u>Avoided Conversion</u>)				
35	CAFR0027	Blue Source – Noles South <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR802
36	CAFR0028	Blue Source – Noles North <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR688
37	CAFR5003	Blue Source-Bishop Improved Forest Management Project	MI	Compliance	CAR	CAR973
38	CAFR5011	Yuork Tribe/Forest Carbon Partners CKGG Improved Forest Management Project	CA	Compliance	CAR	CAR993
39	CAFR5012	Hanes Ranch Forest Carbon Project	CA	Compliance	ACR	ACR182

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Appendix II – Compliance Entities Using Offset Credits

This information is drawn from the Compliance Reports available on the CARB website at <https://goo.gl/m61Kj1>, and matched with data from project design documents for the projects listed in Appendix I above.

Compliance Entities Retiring Forest Offsets, 2013-15

California Cap-and-Trade Compliance Offset Program: Retired Forest Offsets by Compliance Obligation Entity			
For Offsets Redeemed 2013-2015			
<u>CARB Entity ID</u>	<u>Compliance Obligation Entity</u>	<u># of Forest Projects Obtained From</u>	<u>Number of Retired Credits</u>
CA1248	AES Alamos, LLC	2	100,105
CA1089	Air Products and Chemicals, Inc.	1	96,601
CA1281	Algonquin Power Sanger, LLC	1	1,620
CA1328	Applied Energy, LLC - NAS North Island	3	16,605
CA1406	California Dairies, Inc.	1	10,140
CA1119	Calpine Energy Services, LP	4	686,178
CA1592	Carson Cogeneration Company	1	1,378
CA2039	Chevron Power Holdings, Inc.	1	49,187
CA1075	Chevron U.S.A., Inc.	10	4,019,283
CA1101	City of Glendale	1	17,649
CA1370	Coalinga Cogeneration Company	1	30,730
CA1311	Double C Limited	1	347
CA1183	Dynegy Moss Landing, LLC	2	165,460
CA1742	Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
CA1234	Fresno Cogeneration Partners, LP	1	1,298
CA1070	GenOn Energy Management, LLC	1	7,667
CA1116	GWF Energy, LLC	1	20,867
CA1291	High Desert Power Project, LLC	1	125,000
CA1307	High Sierra Limited	1	353
CA1253	Ingomar Packing Company, LLC	1	5,841
CA1312	Kern Front Limited	1	318
CA1343	Kern River Cogeneration Company	2	102,040
CA1017	La Paloma Generating Company, LLC	4	74,356

CA1552	Macpherson Oil Company	1	17,516
CA1077	Mariposa Energy, LLC	1	3,344
CA1476	Martinez Cogen Limited Partnership	1	9,630
CA1367	Mid-Set Cogeneration Company	1	32,547
CA1107	Midway Sunset Cogeneration Company	1	39,478
CA1138	NRG Power Marketing, LLC	1	245,756
CA1137	OLS Energy - Chino	1	19,960
CA1046	Pacific Gas and Electric Company	1	61,495
CA2106	PBF Energy Western Region, LLC	3	140,179
CA1326	Praxair, Inc.	1	5,000
CA1925	Pro Petroleum, Inc.	1	35,000
CA1204	Rio Tinto Minerals Inc.	1	26,532
CA1136	Russell City Energy Company, LLC	1	39,964
CA1371	Salinas River Cogeneration Company	1	32,244
CA1085	San Diego Gas & Electric Company	1	27,602
CA1372	Sargent Canyon Cogeneration Company	1	32,987
CA1762	SEI Fuel Services, Inc.	3	103,840
CA1251	Shell Energy North America (US), LP	2	209,000
CA1029	Southern California Edison Company	5	501,170
CA1338	Sycamore Cogeneration Company	1	100,608
CA1165	Tesoro Refining & Marketing Company, LLC	10	1,488,172
CA1325	The Procter & Gamble Paper Products Company	1	25,691
CA1195	TransAlta Energy Marketing (U.S.), Inc.	1	6,773
CA1057	Ultramar, Inc.	1	13,857
CA1419	Union Pacific Railroad Company	1	38,184
CA1056	Valero Refining Company-California, Benicia Refinery and Asphalt Plant	3	103,112
CA1590	Valley Electric Association, Inc.	2	813
Grand Total			8,903,291

Compliance Entities and The Forest Offsets They Buy

Forest Offsets -- Retired Credits by Compliance Obligation Entity and Project Name

Compliance Entities and Forest Offset Projects	# of Listings in Compliance Report	Total Quantity
AES Alamos, LLC	2	100,105
Blue Source – Francis Beidler IFM Project	1	94,705
Hanes Ranch Forest Carbon Project	1	5,400
Air Products and Chemicals, Inc.	1	96,601
Blue Source-Bishop IFM Project	1	96,601
Algonquin Power Sanger, LLC	1	1,620
Blue Source – Pungo River Forest Conservation Project	1	1,620
Applied Energy, LLC - NAS North Island	5	16,605
Finite Carbon – Shannondale Tree Farm	1	2,077
Green Assets – Middleton Avoided Conversion	3	11,687
Round Valley Indian Tribes IFM Project	1	2,841
California Dairies, Inc.	1	10,140
Garcia River Forest	1	10,140
Calpine Energy Services, LP	8	686,178
Finite Carbon – The Forestland Group CT Lakes	1	275,000
Hanes Ranch Forest Carbon Project	1	70,349
Trinity Timberlands University Hill IFM Project	1	222,398
Willits Woods	5	118,431
Carson Cogeneration Company	1	1,378
Green Assets – Middleton Avoided Conversion	1	1,378
Chevron Power Holdings, Inc.	1	49,187
Blue Source-Bishop IFM Project	1	49,187
Chevron U.S.A., Inc.	38	4,019,283
Blue Source – Francis Beidler IFM Project	3	250,000
Blue Source – Goodman IFM Project	1	693,615
Blue Source – Noles North Avoided Conversion Forest Project	6	14,795
Blue Source – Noles South Avoided Conversion Forest Project	6	14,090
Blue Source – Pungo River Forest Conservation Project	6	21,115
Blue Source-Bishop IFM Project	2	379,649

Brushy Mountain	2	1,250,441
Finite Carbon – The Forestland Group Champion Property IFM	1	678,550
Finite Carbon Farm Cove Community Forest Project	1	146,666
Willits Woods	10	570,362
City of Glendale	1	17,649
Big River / Salmon Creek Forests	1	17,649
Coalinga Cogeneration Company	2	30,730
Blue Source-Bishop IFM Project	2	30,730
Double C Limited	1	347
Willits Woods	1	347
Dynergy Moss Landing, LLC	4	165,460
Buckeye Forest Project	1	100,000
Willits Woods	3	65,460
Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
Garcia River Forest	1	9,814
Fresno Cogeneration Partners, LP	1	1,298
Willits Woods	1	1,298
GenOn Energy Management, LLC	2	7,667
Willits Woods	2	7,667
GWF Energy, LLC	3	20,867
Willits Woods	3	20,867
High Desert Power Project, LLC	2	125,000
Finite Carbon – The Forestland Group CT Lakes	2	125,000
High Sierra Limited	1	353
Willits Woods	1	353
Ingomar Packing Company, LLC	1	5,841
Green Assets – Middleton Avoided Conversion	1	5,841
Kern Front Limited	1	318
Willits Woods	1	318
Kern River Cogeneration Company	4	102,040
Blue Source-Bishop IFM Project	2	86,918
Willits Woods	2	15,122
La Paloma Generating Company, LLC	4	74,356
Finite Carbon – Brosnan Forest	1	1,314

McCloud River	1	15,038
Trinity Timberlands University Hill IFM Project	1	10,473
Willits Woods	1	47,531
Macpherson Oil Company	1	17,516
Green Assets – Middleton Avoided Conversion	1	17,516
Mariposa Energy, LLC	1	3,344
Willits Woods	1	3,344
Martinez Cogen Limited Partnership	1	9,630
The Van Eck Forest	1	9,630
Mid-Set Cogeneration Company	2	32,547
Blue Source-Bishop IFM Project	2	32,547
Midway Sunset Cogeneration Company	1	39,478
Willits Woods	1	39,478
NRG Power Marketing, LLC	4	245,756
Gualala River Forest	4	245,756
OLS Energy - Chino	2	19,960
Blue Source – Francis Beidler IFM Project	2	19,960
Pacific Gas and Electric Company	1	61,495
Willits Woods	1	61,495
PBF Energy Western Region, LLC	9	140,179
Big River / Salmon Creek Forests	3	52,762
Garcia River Forest	1	48,456
The Van Eck Forest	5	38,961
Praxair, Inc.	1	5,000
Virginia Conservation Forestry Program – Clifton Farm	1	5,000
Pro Petroleum, Inc.	1	35,000
Big River / Salmon Creek Forests	1	35,000
Rio Tinto Minerals Inc.	1	26,532
Big River / Salmon Creek Forests	1	26,532
Russell City Energy Company, LLC	1	39,964
Willits Woods	1	39,964
Salinas River Cogeneration Company	2	32,244
Blue Source-Bishop IFM Project	2	32,244

San Diego Gas & Electric Company	2	27,602
Trinity Timberlands University Hill IFM Project	2	27,602
Sargent Canyon Cogeneration Company	2	32,987
Blue Source-Bishop IFM Project	2	32,987
SEI Fuel Services, Inc	1	28,756
Finite Carbon – MWF Brimstone IFM Project I	1	28,756
SEI Fuel Services, Inc.	2	75,084
Finite Carbon – Shannondale Tree Farm	1	35,084
Green Assets – Middleton Avoided Conversion	1	40,000
Shell Energy North America (US), LP	2	209,000
Blue Source-Bishop IFM Project	1	84,000
Miller Forest	1	125,000
Southern California Edison Company	5	501,170
Blue Source – Francis Beidler IFM Project	1	30,295
Finite Carbon – The Forestland Group CT Lakes	1	125,000
Hanes Ranch Forest Carbon Project	1	6,548
Round Valley Indian Tribes IFM Project	1	241,164
Trinity Timberlands University Hill IFM Project	1	98,163
Sycamore Cogeneration Company	2	100,608
Blue Source-Bishop IFM Project	2	100,608
Tesoro Refining & Marketing Company, LLC	11	1,488,172
Blue Source – Francis Beidler IFM Project	1	908
Finite Carbon – Berry Summit	1	193,277
Finite Carbon – Shannondale Tree Farm	1	50,000
Finite Carbon – The Forestland Group CT Lakes	1	316,601
Green Assets – Middleton Avoided Conversion	2	50,000
Green Assets-Brookgreen Gardens IFM Project	1	160,000
McCloud River	1	65,000
Miller Forest	1	94,084
Trinity Timberlands University Hill IFM Project	1	13,209
White Mountain Apache Tribe Forest Carbon Project	1	545,093
The Procter & Gamble Paper Products Company	1	25,691
Blue Source-Bishop IFM Project	1	25,691

TransAlta Energy Marketing (U.S.), Inc.	1	6,773
McCloud River	1	6,773
Ultramar, Inc.	1	13,857
Blue Source – Francis Beidler IFM Project	1	13,857
Union Pacific Railroad Company	1	38,184
Finite Carbon – Brosnan Forest	1	38,184
Valero Refining Company-California, Benicia Refin. and Asphalt Plant	3	103,112
Blue Source – Francis Beidler IFM Project	1	36,143
Finite Carbon Farm Cove Community Forest Project	1	48,888
Willits Woods	1	18,081
Valley Electric Association, Inc.	2	813
Blue Source-Bishop IFM Project	1	5
The Van Eck Forest	1	808
Grand Total		8,903,291

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

The Promise and Problems of Pricing Carbon: Theory and Experience

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Abstract

Because of the global commons nature of climate change, international cooperation among nations will likely be necessary for meaningful action at the global level. At the same time, it will inevitably be up to the actions of sovereign nations to put in place policies that bring about meaningful reductions in the emissions of greenhouse gases. Due to the ubiquity and diversity of emissions of greenhouse gases in most economies, as well as the variation in abatement costs among individual sources, conventional environmental policy approaches, such as uniform technology and performance standards, are unlikely to be sufficient to the task. Therefore, attention has increasingly turned to market-based instruments in the form of carbon-pricing mechanisms. We examine the opportunities and challenges associated with the major options for carbon pricing—carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reductions—and provide a review of the experiences, drawn primarily from developed countries, in implementing these instruments. Our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing in the context of developing countries.

Keywords

global climate change, market-based instruments, carbon pricing, carbon taxes, cap-and-trade, emission reduction credits, energy subsidies, clean energy standards

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Introduction

In a modern economy, nearly all aspects of economic activity affect greenhouse gas—in particular, carbon dioxide (CO₂)—emissions, and hence the global climate. To be effective, climate change policy must affect decisions regarding these activities. This can be done in one of three ways: (a) mandate businesses and individuals to change their behavior regarding technology choice and emissions; (b) subsidize businesses and individuals to invest in and use lower emitting goods and services; or (c) price the greenhouse gas externality, so that decisions take account of this external cost.

By internalizing the externalities associated with CO₂ emissions, carbon pricing can promote cost-effective abatement, deliver powerful innovation incentives, and ameliorate rather than exacerbate government fiscal problems. By pricing CO₂ emissions (or, equivalently, by pricing the carbon content of the three fossil fuels—coal, petroleum, and natural gas), governments defer to private firms and individuals to find and exploit the lowest cost ways to reduce emissions and invest in the development of new technologies, processes, and ideas that could further mitigate emissions. A range of policy instruments can facilitate carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction.

Some of these instruments have been used with success in other environmental domains as well as for pricing CO₂ emissions. The U.S. sulfur dioxide (SO₂) cap-and-trade program cut U.S. power plant SO₂ emissions more than 50% after 1990 and resulted in compliance costs one half of what they would have been under conventional regulatory mandates (Carlson, Burtaw, Cropper, & Palmer, 2000).¹ The success of the SO₂ allowance trading program motivated the design and implementation of the European Union's Emission Trading Scheme (EU ETS), the world's largest cap-and-trade program, focused on cutting CO₂ emissions from power plants and large manufacturing facilities throughout Europe (Ellerman & Buchner, 2007). The U.S. lead phase-down of gasoline in the 1980s, by reducing the lead content per gallon of fuel, served as an early, effective example of a tradable performance standard (Stavins, 2003). These positive experiences provide motivation for considering market-based instruments as potential approaches to mitigating greenhouse gas emissions. This article focuses on the experience in industrialized countries that have implemented these instruments extensively. We hope that our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing for developing countries.

Climate Change Policy Instruments for the Regional, National, or Subnational Level

We consider five generic policy instruments that could conceivably be employed by regional, national, or even subnational governments for carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction. First, however, we examine the possibility of relying

on conventional environmental policy approaches, namely, command-and-control instruments, which have dominated environmental policy in virtually all countries over the past four decades.²

Command-and-Control Regulations

Conventional approaches to environmental policy employ uniform standards to protect environmental quality. Such command-and-control regulatory standards are either *technology based* or *performance based*. Technology-based standards typically require the use of specified equipment, processes, or procedures. In the climate policy context, these could require firms to use particular types of energy-efficient motors, combustion processes, or landfill-gas collection technologies.

Performance-based standards are more flexible than technology-based standards, specifying allowable levels of pollutant emissions or allowable emission rates, but leaving the specific methods of achieving those levels up to regulated entities. Examples of uniform performance standards for greenhouse gas abatement would include maximum allowable levels of CO₂ emissions from combustion (e.g., the grams-of-CO₂-per-mile requirement for cars and light-duty vehicles recently promulgated as part of U.S. tailpipe emission standards) and maximum levels of methane emissions from landfills.

Uniform technology and performance standards can—in principle—be effective in achieving some environmental purposes. But, given the ubiquitous nature of greenhouse gas emissions from diverse sources in an economy, it is unlikely that technology or ordinary performance standards could form the centerpiece of a meaningful climate policy.

Furthermore, these command-and-control mechanisms lead to non-cost-effective outcomes in which some firms use unduly expensive means to control pollution. Since performance standards give firms some flexibility in how they comply, performance-based standards will generally be more cost-effective than technology-based standards, but neither tends to achieve the cost-effective solution.

Beyond considerations of static cost-effectiveness, conventional standards would not provide dynamic incentives for the development, adoption, and diffusion of environmentally and economically superior control technologies. Once a firm satisfies a performance standard, it has little incentive to develop or adopt cleaner technology. Regulated firms may fear that if they adopt a superior technology, the government may tighten the performance standard. Technology standards are worse than performance standards in inhibiting innovation since, by their very nature, they constrain the technological choices available.

The substantially higher cost of a standards-based policy may undermine support for such an approach, and securing political support may require a weakening of standards and hence lower environmental benefits.³

The key limitations of command-and-control regulations can be avoided through the use of market-based policy instruments. In the context of climate change, this essentially means carbon pricing.

Carbon Taxes

In principle, the simplest approach to carbon pricing would be through government imposition of a carbon tax (Metcalf, 2007). The government could set a tax in terms of dollars per ton of CO₂ emissions (or CO₂-equivalent on greenhouse gas emissions) by sources covered by the tax, or—more likely—a tax on the carbon content of the three fossil fuels (coal, petroleum, and natural gas) as they enter the economy. To be cost-effective, such a tax would cover all sources, and to be efficient, the carbon price would be set equal to the marginal benefits of emission reduction, represented by estimates of the social cost of carbon (Interagency Working Group on Social Cost of Carbon, 2010). Over time, an efficient carbon tax would increase to reflect the fact that as more greenhouse gas emissions accumulate in the atmosphere, the greater is the incremental damage from one more ton of CO₂. Imposing a carbon tax would provide certainty about the marginal cost of compliance, which reduces uncertainty about returns to investment decisions, but would leave uncertain economy-wide emission levels (Weitzman, 1974).

The government could apply the carbon tax at a variety of points in the product cycle of fossil fuels, from fossil fuel suppliers based on the carbon content of fuel sales (“upstream” taxation/regulation) to final emitters at the point of energy generation (“downstream” taxation/regulation). Under an upstream approach, refineries and importers of petroleum products would pay a tax based on the carbon content of their gasoline, diesel fuel, or heating oil. Coal-mine operators would pay a tax reflecting the carbon content of the tons extracted at the mine mouth. Natural-gas companies would pay a tax reflecting the carbon content of the gas they bring to surface at the wellhead or import via pipelines or liquefied natural gas (LNG) terminals. Focusing on the carbon content of fuels would enable the policy to capture about 98% of U.S. CO₂ emissions, for example, with a relatively small number of covered firms—on the order of a few thousand—as opposed to the hundreds of millions of smokestacks, tailpipes, and so forth, that emit CO₂ after fossil fuel combustion.

A carbon tax would be administratively simple and straightforward to implement in most industrialized countries, since the tax could incorporate existing methods for fuel-supply monitoring and reporting to the regulatory authority. Some developing countries with effective tax systems, including monitoring and enforcement regimes to minimize tax evasion, could also implement carbon taxes in a relatively straightforward manner. Given the molecular properties of fossil fuels, monitoring the physical quantities of these fuels yields a precise estimate of the emissions that would occur during their combustion.

In the event that carbon capture and storage technologies become commercially available, a crediting system for downstream sequestration could complement the emission tax system. A firm that captures and stores CO₂ through geological sequestration, thereby preventing the gas from entering the atmosphere, could generate tradable CO₂ tax credits and sell these to firms that would otherwise have to pay the emission tax.⁴

As fuel suppliers face the emission tax, they will increase the cost of the fuels they sell. This will effectively pass the tax down through the energy system, creating incentives for fuel-switching and investments in more energy-efficient technologies that reduce CO₂ emissions.

The effects of a carbon tax on emission mitigation and the economy will depend in part on the amount and use of the tax revenue. For example, an economy-wide U.S. carbon tax of US\$20 per ton of CO₂ would likely raise more than US\$100 billion per year. The carbon tax revenue could be put toward a variety of uses. It could allow for reductions in existing distortionary taxes on labor and capital, thereby stimulating economic activity and offsetting some of a policy's social costs (Goulder, 1995; Goulder & Parry, 2008). Other socially valuable uses of revenue include reduction of debt, and funding desirable public programs, such as research and development of climate-friendly technology. The tax receipts could also be used to compensate low-income households for the burden of higher energy prices as well as compensating others bearing a disproportionate cost of the policy.

The implementation of a carbon tax (or any other meaningful climate policy instrument) will increase the cost of consuming energy and could adversely affect the competitiveness of energy-intensive industries. This competitiveness effect can result in negative economic and environmental outcomes: firms may relocate facilities to countries without meaningful climate change policies, thereby increasing emissions in these new locations and offsetting some of the environmental benefits of the policy. Such "emission leakage" may actually be relatively modest, because a majority of the emissions in developed countries occur in nontraded sectors, such as electricity, transportation, and residential buildings. However, energy-intensive manufacturing industries that produce goods competing in international markets may face incentives to relocate and advocate for a variety of policies to mitigate these impacts (Aldy & Pizer, 2011).

Additional emission leakage may occur through international energy markets—as countries with climate policies reduce their consumption of fossil fuels and drive down fuel prices, those countries without emission mitigation policies increase their fuel consumption in response to the lower prices. Since leakage undermines the environmental effectiveness of any unilateral effort to mitigate emissions, international cooperation and coordination becomes all the more important. These competitiveness impacts on energy-intensive manufacturing could be mitigated through policy designs we discuss below. Also, it is important to keep in mind that these emission leakage effects exist with any meaningful climate policy, whether carbon pricing or command-and-control.

Real-world experience with energy pricing demonstrates the power of markets to drive changes in the investment and use of emission-intensive technologies. The run-up in gasoline prices in 2008 resulted in a shift in the composition of new cars and trucks sold toward more fuel-efficient vehicles, while reducing vehicle miles traveled by the existing fleet (Ramey & Vine, 2010). Likewise, electric utilities responded to the dramatic decline in natural gas prices (and decline in the relative

gas-coal price) in 2009 and 2010 by dispatching more electricity from gas plants that resulted in lower carbon dioxide (CO₂) emissions and the lowest share of U.S. power generation by coal in some four decades (U.S. Energy Information Administration, 2009). Longer term evaluations of the impacts of energy prices on markets have found that higher prices have induced more innovation—measured by frequency and importance of patents—and increased the commercial availability of more energy-efficient products, especially among energy-intensive goods such as air conditioners and water heaters (Newell, Jaffe, & Stavins, 1999; Popp, 2002).

Cap-and-Trade Systems

A cap-and-trade system constrains the aggregate emissions of regulated sources by creating a limited number of tradable emission allowances—in sum equal to the overall cap—and requiring those sources to surrender allowances to cover their emissions (Stavins, 2007). Faced with the choice of surrendering an allowance or reducing emissions, firms place a value on an allowance that reflects the cost of the emission reductions that can be avoided by surrendering an allowance. Regardless of the initial allowance distribution, trading can lead allowances to be put to their highest valued use: covering those emissions that are the most costly to reduce and providing the incentive to undertake the least costly reductions (Hahn & Stavins, in press; Montgomery, 1972). Cap-and-trade sets an aggregate quantity, and through trading, yields a price on emissions, and is effectively the dual of a carbon tax that prices emissions and yields a quantity of emissions as firms respond to the tax's mitigation incentives. Uncertainty in the costs of abatement leads to uncertainty regarding the allowance price in a cap-and-trade system and uncertainty regarding emissions under a tax. This has potentially important economic and political implications, which we discuss below.

In developing a cap-and-trade system, policy makers must decide on several elements of the system's design. Policy makers must determine how many allowances to issue—the size or level of the emission cap. Policy makers must determine the scope of the cap's coverage: identify the types of greenhouse gas emissions and sources covered by the cap, including whether to regulate upstream (based on carbon content of fuels) or downstream (based on monitored emissions).

After determining the amount of allowances and scope of coverage, policy makers must determine whether to freely distribute or sell (auction) allowances. Free allocation of allowances to firms could reflect some historical record (“grandfathering”), such as recent fossil fuel sales. Such grandfathering involves a transfer of wealth, equal to the value of the allowances, to existing firms, whereas, with an auction, this same wealth is transferred to the government. With an auction, the government would, in theory, collect revenue identical to that from a tax producing the same amount of emission abatement. As with tax receipts, auction revenues could be used to reduce distortionary taxes or finance other programs.

In an emission trading program, cost uncertainty—unexpectedly high or volatile allowance prices—can undermine political support for climate policy and discourage

investment in new technologies and research and development. Therefore, attention has turned to incorporating “cost-containment” measures in cap-and-trade systems, including offsets, allowance banking and borrowing, safety valves, and price collars.

An offset provision allows regulated entities to offset some of their emissions with credits from emission reduction measures lying outside the cap-and-trade system’s scope of coverage. An offset provision can link a cap-and-trade system with an emission-reduction-credit system (see below). Allowance banking and borrowing effectively permit emission trading across time. The flexibility to save an allowance for future use (banking) or to bring a future period allowance forward for current use (borrowing) can promote cost-effective abatement. Systems that allow banking and borrowing redefine the emission cap as a cap on cumulative emissions over a period of years, rather than a cap on annual emissions. This makes sense in the case of climate change, because it is a function of cumulative emissions of gases that remain in the atmosphere for decades to centuries.

A safety valve puts an upper bound on the costs that firms will incur to meet an emission cap by offering the option of purchasing additional allowances at a predetermined fee (the safety valve “trigger price”). This effective price ceiling in the emission allowance market reflects a hybrid approach to climate policy: a cap-and-trade system that transitions to a tax in the presence of unexpectedly high mitigation costs. When firms exercise a safety valve, their aggregate emissions exceed the emission cap. A price collar combines the ceiling of a safety valve with a price floor created by a minimum price in auction markets or a government commitment to purchase allowances at a specific price.

Increasing certainty about mitigation cost—through a carbon tax, safety valve, or price collar—reduces certainty about the quantity of emissions allowed.⁵ Smoothing allowance prices over time through banking and borrowing reduces the certainty over emissions in any given year, but maintains certainty of aggregate emissions over a longer time period. A cost-effective policy with a mechanism insuring against unexpectedly high costs—either through cap-and-trade or a carbon tax—increases the likelihood that firms will comply with their obligations and can facilitate a country’s participation and compliance in a global climate agreement.

In a similar fashion as under a carbon tax, domestic cap-and-trade programs could include some variant of a border tax to mitigate some of the adverse competitiveness impacts of a unilateral domestic climate policy and encourage trade partners to take on mitigation policies with comparable stringency. In the case of a cap-and-trade regime, the border adjustment would take the form of an import allowance requirement, so that imports would face the same regulatory costs as domestically produced goods. However, border measures under a carbon tax or cap-and-trade raise questions about the application of trade sanctions to encourage broader and more extensive emission mitigation actions globally as well as questions about their legality under the World Trade Organization (Brainard & Sorking, 2009; Frankel, 2010).

Emission-Reduction-Credit Systems

An emission-reduction-credit (ERC) system delivers emission mitigation by awarding tradable credits for “certified” reductions. Generally, firms that are not covered by some set of regulations—be they command-and-control or market-based—may voluntarily participate in such systems, which serve as a source of credits that entities facing compliance obligations under the regulations may use. Individual countries can implement an ERC system without having a corresponding cap-and-trade program.

For example, as we discuss below, the Clean Development Mechanism (CDM) under the Kyoto Protocol provides credits used by firms covered by the EU ETS. A firm earns credits for projects that reduce emissions relative to a hypothetical “no project” baseline. In determining the number of credits to grant a firm for a project, calculation of the appropriate baseline is therefore as important as measuring emissions. Dealing with this unobserved and fundamentally unobservable hypothetical baseline is at the heart of the so-called “additionality” problem.

While ERC systems can be self-standing, as in the case of the CDM, governments can also establish them as elements of domestic cap-and-trade or other regulatory systems. These ERC systems—often referred to as offset programs—serve as a source of credits that can be used by regulated entities to meet compliance obligations under the primary system. For example, the Regional Greenhouse Gas Initiative (RGGI) in the northeast United States, which regulates CO₂ emissions from electric power plants (and which we discuss below), recognizes offsets from activities such as landfill methane capture and destruction, reductions in emissions of sulfur hexafluoride from the electric power sector, and afforestation. Electricity generators covered by RGGI can use these offset credits to cover part of their emissions. Other cap-and-trade systems that we discuss below also contain offset provisions.

Clean Energy Standards

The purpose of a clean energy standard is to establish a technology-oriented goal for the electricity sector that can be implemented cost-effectively (Aldy, 2011). Under such standards, power plants generating electricity with technologies that satisfy the standard create tradable credits that they can sell to power plants that fail to meet the standard, thereby minimizing the costs of meeting the standard’s goal in a manner analogous to cap-and-trade.

In the United States, for example, state renewable electricity standards (RESs), a restricted type of a clean energy standard, typically establish the objective of the standard as a specific renewable share of total power generation that increases over time (U.S. Congressional Budget Office, 2011). A few states have implemented alternative energy standards in their power sector that target renewables, new nuclear power generating capacity, and advanced fossil fuel power generating technologies.

The European Union and China have promoted renewable power through renewable electricity mandates that include tradable renewable energy credits.

Clean energy standards that focus on technology targets do not explicitly price the greenhouse gas externality and thus impose a higher cost for a given amount of emission reductions than a carbon tax or cap-and-trade program. A renewable mandate treats coal-fired power, gas-fired power, and nuclear power as equivalent—none of these technologies create credits necessary for compliance—despite the fact that a natural gas combined cycle power plant typically produces a unit of generation with half the CO₂ emissions of a conventional coal power plant, and a nuclear plant produces zero-emission power, as do wind, solar, and geothermal. Thus, mandating power from a limited portfolio of technologies can result in higher costs by providing no incentive to switch from emission-intensive coal to emission-lean gas or emission-free nuclear.

A more cost-effective approach to a clean energy standard would employ a technology-neutral performance standard, such as tons of CO₂ per megawatt hour of generation. All power sources, from fossil fuels to renewables, could be eligible under such a performance standard. This has the advantage over the portfolio approach of providing better innovation incentives and of enabling all possible ways of reducing the emissions intensity of power generation. The Canadian province of Alberta has employed such a tradable carbon performance standard for most large sources of CO₂ emissions and has required a 12% improvement in the emission intensity of these sources since 2007.

Power plants would be awarded credits for generating cleaner (less emission-intensive) electricity than the standard. These clean power plants could sell credits to other power plants or save them for future use. Tradable credits promote cost-effectiveness by encouraging the greatest deployment of clean energy from those plants that can lower their emission intensity at lowest cost. Those power plants could then sell their extra credits to other power plants that face higher costs for deploying clean energy. The creation and sale of clean energy credits would provide a revenue stream that could conceivably enable the financing of low- and zero-emission power plant projects.

Eligible technologies for the standard could extend beyond generation technologies and also permit improvements in energy efficiency, or a broad set of emission offset activities, to create tradable credits. Extending the price on carbon to a broader set of activities could improve cost-effectiveness, but allowing for energy efficiency and other offsets poses risks. As emphasized above, estimating offsets is complex, requires extensive review and monitoring by third parties or regulatory agencies, and risks undermining the objective of a policy because of the additionality problem.

Monitoring and enforcement could be relatively straightforward under either a portfolio or performance standard approach. For example, in the United States, electricity generation, generating technology type, and CO₂ emissions are already tracked at power plants by state and Federal regulators.

A clean energy standard represents a de facto free allocation of the right to emit greenhouse gases to the power sector. Suppose that the U.S. government created a clean energy performance standard of 0.5 tons of CO₂ per megawatt hour (the 2010 U.S. power sector emission intensity was 0.56 tons of CO₂/MWh); this is roughly comparable to a 50% clean energy standard that allows all technologies with lower emission intensity than conventional coal to qualify (with partial crediting for low- but non-zero-emitting facilities). As a result, a clean energy standard could not generate the revenues that a carbon tax or a cap-and-trade program with an allowance auction could.

Eliminating Fossil Fuel Subsidies

Phasing out fossil fuel subsidies can represent significant progress toward “getting prices right” for fossil fuel consumption, especially in some developing countries, where subsidies are particularly large. Imposing a carbon price on top of a fuel subsidy will not lead to the socially optimal price for the fuel, but removing such subsidies can deliver incentives for efficiency and fuel switching comparable to implementing an explicit carbon price. In sharp contrast with our discussion above of other policy instruments, in which we focused on ways to price externalities to correct a market failure, our overview of eliminating fossil fuel subsidies addresses the removal of policy interventions that represent “government failures” and thereby exacerbate a market failure.

At the 2009 G20 Summit in Pittsburgh, Pennsylvania, the leaders of 20 of the largest developed and developing countries agreed to phase out fossil fuel subsidies over the “medium term,” and encouraged all other nations to eliminate such subsidies. The agreement called for phasing out these subsidies while targeting support for the poor, and noted that “inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change” (G20 Leaders, 2009). Soon thereafter, leaders of the APEC nations⁶ reached agreement on fossil fuel subsidy elimination at the 2009 Singapore Summit.

The economic and climate benefits of fossil fuel subsidy reform could be significant. In 2008, fossil fuel consumption subsidies exceeded US\$500 billion globally and could exceed US\$660 billion by 2020 without policy reforms (International Energy Agency [IEA], 2011). In at least 10 countries, fossil fuel subsidies exceeded 5% of GDP, and constituted substantial fractions of government budgets (IEA, 2010). Eliminating fossil fuel subsidies could reduce global oil consumption by about 4.7 million barrels per day by 2020, representing a decline of about 5% of current consumption. The International Energy Agency (2010) estimates that eliminating all fossil fuel subsidies would reduce global CO₂ emissions by about two gigatons per year by 2020. To put this in perspective, the UN Environmental Programme (2010) estimates that the Copenhagen Accord emission pledges will reduce greenhouse gas emissions by three to seven gigatons relative to business as usual in 2020.

The vast majority of fossil fuel subsidies suppress the prices for petrol, diesel, electricity, natural gas, and coal that consumers face, primarily in developing countries.⁷ Some developing country governments have been historically reticent to let fuel and electricity prices rise to market-determined levels because of concerns of public opposition. For example, protests over reducing petrol subsidies contributed to President Suharto's downfall in Indonesia in 1998 (Beaton & Lontoh, 2010). Interestingly, Indonesia successfully reduced their fossil fuel subsidies—doubling consumers' prices for petrol and diesel and tripling consumers' prices for kerosene—in 2005 by coupling the change in the fuel price regime with a targeted, means-tested program to transfer government resources from fuel subsidies to income support. Before its late 2010 subsidy reform that significantly raised petrol and diesel prices in exchange for lump-sum cash transfers, Iran priced diesel fuel at about 10 cents per gallon (Coady et al., 2010).

Critics of subsidy reform claim it will harm low-income households, but most fossil fuel subsidies disproportionately benefit the relatively wealthy in developing countries. Indeed, about 40% of the benefits of petroleum subsidies accrue to the wealthiest quintile, while the lowest income quintile enjoys less than 10% of the subsidy benefits, on average globally (Coady et al., 2010).⁸

To promote implementation and cooperation on the G20 fossil fuel subsidies commitment, the leaders established two processes that enable a de facto “pledge and review” process. First, the leaders tasked their energy and finance ministers to compile a list of their own country's fossil fuel subsidies and present their strategies for eliminating them. After a series of staff-and ministerial-level consultations among the G20, the energy and finance ministers presented their plans in 2010 (G20 Leaders, 2010a). Second, the leaders tasked the Organization of Economic Cooperation and Development (OECD), International Energy Agency (IEA), World Bank, and the Organization of Petroleum Exporting Countries (OPEC) to evaluate fossil fuel subsidies (G20 Leaders, 2009). These international organizations subsequently produced joint reports that serve as independent benchmarks of fossil pricing policies by which countries may evaluate others' subsidy elimination plans (IEA, OPEC, OECD, & World Bank, 2010).

In 2010, the G20 leaders explicitly called on these international organizations to “further assess and review the progress made in implementing the Pittsburgh and Toronto commitments” (G20 Leaders, 2010b). While the G20 has no formal compliance mechanism to explicitly enforce the leaders' commitment, it does establish a goal, an implementation process, and what can effectively be a third-party expert review. This combination provides transparency for governments and stakeholders to assess whether nations are delivering on their leaders' commitments. This can promote credibility and trust for future international cooperation and may provide some lessons for the design of bottom-up international climate policy (see more on this below in our discussion of international coordination of carbon pricing policies).

Regional, National, and Subnational Experiences With Carbon Pricing

We briefly examine the few explicit carbon pricing policy regimes that are currently in place: the European Union's Emission Trading Scheme; New Zealand's cap-and-trade system; the Kyoto Protocol's Clean Development Mechanism; northern European carbon tax policies; British Columbia's carbon tax; and Alberta's tradable carbon performance standard (similar to a clean energy standard).⁹

European Union Emission Trading Scheme

By far the world's largest carbon pricing regime is the European Union Emission Trading Scheme (EU ETS), a cap-and-trade system of CO₂ allowances. Adopted in 2003 with a pilot phase that became active in 2005, the EU ETS covers about half of EU CO₂ emissions in 30 countries in a region of the world that accounts for about 20% of global GDP and 17% of world energy-related CO₂ emissions (Ellerman & Buchner, 2007).¹⁰ The 11,500 emitters regulated by the *downstream* program include large sources such as oil refineries, combustion installations over 20 MWth, coke ovens, cement factories, ferrous metal production, glass and ceramics production, and pulp and paper production. Up until now, the program has not covered sources in the transportation, commercial, or residential sectors (Ellerman & Buchner, 2007) although the EU plans to extend the ETS to cover aviation sector emissions starting in 2012.

The EU ETS was designed to be implemented in phases: a pilot or learning phase from 2005 to 2007, a Kyoto phase from 2008 to 2012,¹¹ and a series of subsequent phases. Penalties for violations increase from 40 Euros per ton of CO₂ in the first phase to 100 Euros in the second phase. Although the first phase allowed trading only in carbon dioxide, the second phase broadened the program to include other GHGs, such as nitrous oxide emissions.

The process for setting caps and allowances in member states was initially decentralized (Kruger, Oates, & Pizer, 2007), with each member state responsible for proposing its own national carbon cap, subject to review by the European Commission. This created incentives for individual countries to try to be generous with their allowances to protect their economic competitiveness (Convery & Redmond, 2007). Not surprisingly, the result was an aggregate cap that exceeded business-as-usual emissions.

In the spring of 2006, it became clear that the allocation of allowances in 2005 on net had exceeded emissions by about 4% of the overall cap. This led, as would be anticipated, to a dramatic fall in allowance prices. In January, 2005, the price per ton was approximately €8/tCO₂; by early 2006, it exceeded €30/tCO₂, then fell by about half in one week of April, 2006, before fluctuating and returning to about €8/tCO₂ (Convery & Redmond, 2007). This volatility was attributed to the absence of transparent, precise emissions data at the beginning of the program, a surplus of allowances, energy price volatility, and a program feature that *prevents banking* of allowances

from the first phase to the second phase (Market Advisory Committee, 2007). In truth, the “overallocation” was concentrated in a few countries, particularly in Eastern Europe, and in the nonpower sectors (Ellerman & Buchner, 2007).

The first and second phases of the EU ETS require member states to distribute almost all of the emissions allowances (a minimum of 95% and 90%, respectively) freely to regulated sources, but beginning in 2013, member states will be allowed to auction larger shares of their allowances. The initial free distribution of allowances led to complaints from energy-intensive industrial firms about “windfall profits” among electricity generators, when energy prices increased significantly in 2005. But the higher electricity prices were only partly due to allowance prices, higher fuel prices also having played a role; and it is unclear whether the large profits reported by electricity generators were due mainly to their allowance holdings or to having low-cost nuclear or coal generation in areas where the (marginal) electricity price was set by higher cost natural gas (Ellerman & Buchner, 2007).

The system’s cap was tightened for Phase 2 (2008-2012), and its scope expanded to cover new sources in countries that participated in Phase 1 plus sources in Bulgaria and Romania, which acceded to the European Union in 2007. Liechtenstein, Iceland, and Norway joined the EU ETS in 2008 although sources in Iceland are not yet subject to an emissions cap. Allowance prices in Phase 2 increased to over €20/tCO₂ in the first half of 2008, averaged €22/tCO₂ in the second half of 2008, and then fell to €13/tCO₂ in the first half of 2009, and down to €10/tCO₂ in the fall of 2011, as the economic recession brought decreased demand for allowances due to reduced output in the energy-intensive sectors and lower electricity consumption.

The European Union plans to extend the EU ETS through Phase 3, 2013-2020, with a centralized cap becoming increasingly stringent (20% below 1990 emissions), a larger share of the allowances subject to auctioning, tighter limits on the use of offsets, and unlimited banking of allowances between Phases 2 and 3.

Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is a *downstream* cap-and-trade program that was originally intended to limit CO₂ emissions in the United States from power sector sources in 10 northeastern states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey,¹² New York, Rhode Island, and Vermont).¹³ The system is both narrow in its sectoral coverage and unambitious in terms of its emissions reduction objectives.

The program took effect in 2009, after approval by individual state legislatures, and set a goal of limiting emissions from regulated sources to then current levels in the period from 2009 to 2014. Beginning in 2015, the emissions cap is set to decrease by 2.5% each year until it reaches an ultimate level 10% below 2009 emissions in 2019. It was originally anticipated that meeting this goal would require a reduction approximately 35% below business-as-usual emissions (13% below 1990 emissions levels). However, due to the combined effects of the economic recession and drastic

declines in natural gas prices relative to coal prices, the program is no longer binding and is unlikely to become binding through 2020, unless the targets are revised.¹⁴

Because RGGI only limits emissions from the power sector, incremental monitoring costs are low, because U.S. power plants are already required to report their hourly CO₂ emissions to the Federal government (under provisions for continuous emissions monitoring as part of the SO₂ allowance trading program). The system sets standards for certain categories of CO₂ offsets, and limits the number and geographic distribution of offsets. The program requires participating states to auction at least 25% of their allowances and to use the proceeds for energy efficiency and consumer-related improvements.¹⁵ The remaining 75% of allowances may be auctioned or distributed freely. In practice, states have auctioned virtually all allowances.

Several problems with the program's design can be noted. First is the leakage problem, which is potentially severe for any state or regional program, particularly given the interconnected nature of electricity markets (Burtraw, Kahn, & Palmer, 2005). Second, the program is downstream for just one sector of the economy and so very limited in scope. Third, despite considerable cost uncertainty, a true firm safety valve mechanism was not adopted. Instead, there are trigger price that allow greater reliance on offsets and external credits in the expectation that these can increase supply. The program does impose a price floor in the allowance auctions, without which the allowance prices would have approached zero (when the combined forces of the economic recession and lower natural gas prices caused emissions to fall below the declining cap). Fourth, as mentioned above, the program limits the number and geographic origin of offsets.

New Zealand Emissions Trading Scheme

In January, 2008, the New Zealand Emissions Trading Scheme (NZ ETS) was launched. Under this system, the intention is to include all sectors of the economy and all greenhouse gases by 2015, using free allocation of allowances, with special protections (output-based updating allocations) for emission-intensive, trade-sensitive sectors. The forestry sector entered the program first, in 2008; and stationary energy, industrial, and liquid fuel fossil fuel sectors joined in 2010. The waste (landfills) sector is scheduled to enter in 2013, and agriculture—which accounts for nearly half of New Zealand's gross emissions—is scheduled to enter in 2015.¹⁶

Covered sources have the option of paying a fixed fee of NZUS\$25 per ton of emissions, and until 2013, all sectors other than forestry require only one unit of allowances for each two units of emissions. Thus, although the NZ allowances are indirectly linked with the EU ETS through the CDM, the current effective price is very low while the system becomes established. Early evidence suggests that the forestry component has deterred deforestation and may be encouraging new planting, although international policy and consequent price uncertainty are major problems for investment (Karpas & Kerr, 2010).

The Climate Change Response Act of 2002, which provided for the creation of the emissions trading scheme for the purpose of meeting the country's Kyoto obligations,

required a review of the NZ ETS by an independent review panel every 5 years. The first review (Emissions Trading Scheme Review Panel, 2011) was released by the government in September, 2011. While most of the scheme was upheld, it recommended that the agriculture sector face a lower price as it enters the system and that the government should review the wisdom of allowing offsets from HFC-23 destruction projects under the Clean Development Mechanism (see below). The government hopes to link with Australia's emissions trading program, scheduled to be launched in 2015.

Clean Development Mechanism

The most significant GHG emission-reduction-credit system to date is the Kyoto Protocol's Clean Development Mechanism (CDM). Under the CDM, certified emission reduction (CER) credits are awarded for voluntary emission reduction projects in non-Annex I countries (largely, developing countries) that ratified the Protocol, but are not among the Annex I countries subject to the Protocol's emission limitation commitments—also known as the Annex B countries.¹⁷ CDM projects can potentially take the form of building new wind farms, investing in more energy efficient equipment in a manufacturing facility, and capturing methane from landfills. While CERs can be used by the Annex I countries to meet their emission commitments, they could also be used for compliance purposes by entities covered by other cap-and-trade systems, including systems in countries that are not Parties to the Protocol, such as the United States.

From the perspective of the industrialized countries, the CDM provides a means to engage developing countries in the control of GHG emissions, while from the perspective of the developing countries, the CDM provides an avenue for the financing of "sustainable development." Essentially, the purchase of CERs by industrialized country entities to offset their own emissions can reduce the aggregate cost of compliance with the Kyoto Protocol, because it tends to be much less expensive to construct new low-carbon energy infrastructure in developing nations than to modify or replace existing infrastructure in industrialized countries (Wara, 2007).

Of the six GHGs covered by the Kyoto Protocol,¹⁸ approximately 38% of projects in the CDM pipeline as of 2007 were for CO₂, 28% for HFC-23, 23% for methane, and 11% for nitrous oxide (Wara, 2007). In terms of CO₂-equivalent reductions, the CDM has accounted for annual reductions of 278 million tons, about 1% of annual global emissions of CO₂ (U.S. Energy Information Administration, 2011).¹⁹ The largest shares of CERs have been generated in China (52%) and India (16%), with Latin America and the Caribbean making up another 15% of the total, Brazil (at 7%) being the largest producer in that region (World Bank, 2010).

Because the CDM is an ERC system, it is subject to concerns about the additionality of emission-reductions associated with its projects (see generic discussion above regarding ERC systems). Empirical analysis has validated these concerns, with estimates that up to 75% of claimed reductions would have occurred in the absence of the program (Zhang & Wang, 2011).

A particular concern has centered on the fact that nearly 30% of average annual CERs have come from the destruction of HFC-23, a potent GHG that is a by-product of the manufacture of certain refrigerant gases. It is very inexpensive to destroy HFC-23, and companies can earn nearly twice as much from sale of CDM credits as they can from selling respective refrigerant gases. As a result, it has been argued that plants are being built simply for the purpose of generating CERs from destruction of HFC-23. Because of this, beginning in 2013, CERs from HFC-23 destruction will not be valid for purposes of compliance with the EU ETS.

As debate continues regarding a possible second commitment period for the Kyoto Protocol, it appears that the CDM will continue to function, in any event (Bodansky, 2011). A variety of proposals have been put forward to improve its structure and implementation, many targeted at increasing the additionality of approved projects (Hall, Levi, Pizer, & Ueno, 2010). In the meantime, as we discuss below, the CDM may provide a significant function by facilitating indirect linkages among diverse national cap-and-trade systems.

*Northern European Experience With Carbon Taxes*²⁰

In the 1990s, a number of northern European countries imposed carbon taxes to limit their greenhouse gas emissions. In 1991, Norway implemented a carbon tax that varied in its level across sectors of the economy, despite the fact that cost-effective abatement would call for a uniform tax. In the transportation sector, by 2009, the Norwegian carbon tax had increased to about US\$58/tCO₂ on gasoline, but only US\$34/tCO₂ on diesel (Government of Norway, 2009). Natural gas faced a carbon tax of US\$31/tCO₂ to US\$33/tCO₂ in 2009, depending on use. By 1999, facilities using coal paid US\$24/tCO₂ for coal for energy purposes and US\$19/tCO₂ for coal for coking purposes (Bruvoll & Larsen, 2004), but the Government of Norway exempted these activities from the carbon tax starting in 2003 (Government of Norway, 2009). In 2009, the carbon tax applied to about 55% of Norwegian greenhouse gas emissions, while the emission trading scheme that is linked to the EU ETS covered an additional 13% of emissions.²¹ In 2003, Norway also introduced a tax of about US\$33/tCO₂-equivalent on HFCs and PFCs, which slowed the growth rate of these potent greenhouse gases (Government of Norway, 2009).

Likewise in 1991, Sweden implemented a carbon tax of about US\$33/tCO₂ as a part of a fiscal reform that lowered high income tax rates (Speck, 2008). The carbon tax has since increased to more than US\$135/tCO₂ by 2009 (Government of Sweden, 2009). At the same time, Sweden reduced its general energy tax on many of the sources bearing the carbon tax. Refineries, steel, and other primary metal industries received an exemption from the carbon tax (Daugjberg & Pedersen, 2004). In addition, those industries covered by the EU ETS were exempted from the carbon tax (Government of Sweden, 2009). About 33% of Sweden's greenhouse gas emissions are covered by the EU ETS, a smaller fraction than the norm in the EU (Government of Sweden, 2009).

In 1992, Denmark implemented a carbon tax of about US\$18/tCO₂, and reduced this tax modestly to a level of about US\$17/tCO₂ in 2005, where it remained through 2009 (Speck, 2008; Government of Denmark, 2009). Manufacturing industries bear discounted tax rates of more than 90% depending on their energy intensity and participation in a voluntary agreement (Government of Denmark, 2009). The carbon tax on gasoline amounted to about 16 cents per gallon in 2009.

Since 1997, Finland has imposed a general tax on energy coupled with a surtax based on the carbon content of the energy. Like other northern European nations, Finland reduced its carbon tax for some industries covered by the EU ETS, reflecting concerns about adverse competitiveness impacts on trade-exposed manufacturing. Since 2008, the carbon surtax has been about US\$28/tCO₂ although natural gas faces half this rate (Government of Finland, 2009).

Obviously, implementation of carbon taxes in northern Europe have yielded significant variations in the effective tax per unit CO₂ across fuels and industries within each country, contrary to the cost-effective prescription of a common price on carbon among all sources. In addition, fiscal cushioning to carbon taxes—by adjustments to preexisting energy taxes—and to the EU ETS—by adjustments to then preexisting carbon taxes—was common, especially for those industries expressing concerns about their international competitiveness. Nonetheless, these nations have demonstrated that carbon taxes can deliver greenhouse gas emission reductions and raise revenues to finance government spending and lower income tax rates (OECD, 2001; Government of Denmark, 2009; Government of Finland, 2009; Government of Norway, 2009).

British Columbia Carbon Tax

Since 2008, the Canadian province of British Columbia has had in place a carbon tax as one part of its plan to reduce provincial GHG emissions by 33% by 2020 (British Columbia, 2007). The carbon tax is intended to be economy-wide, with a tax of C\$10 per ton of CO₂-equivalent emissions in 2008, increasing by C\$5 per year for 4 years, and reaching C\$30/ton in 2012. The tax is collected “upstream” at the wholesale level (fuel distributors) based on the carbon content of fuels to facilitate administration (Duff, 2008). By law, 100% of the tax revenue must be refunded through tax cuts to businesses and individuals, and low-income individuals are further protected through a Low Income Climate Action Tax Credit.

During 2008 and 2009, the tax generated C\$846 million in revenue. This was accompanied by reductions in a variety of personal and corporate income taxes, plus tax credits for low-income individuals. These cuts totaled approximately C\$1.1 billion, so that the policy yielded significant net tax reductions (Plumer, 2010). A similar pattern occurred in 2010. The government estimates that by 2020, the carbon tax will reduce British Columbia’s CO₂ emissions by approximately 3 million tons annually.

Interestingly, another part of the province’s Climate Action Plan is a provincial cap-and-trade system, which is to be linked with a similar systems planned in

California (under Assembly Bill 32), Ontario, and Quebec through the Western Climate Initiative. The province's plans have not addressed how the carbon tax and cap-and-trade system will be coordinated.²²

Alberta Tradable Carbon Performance Standard

In 2007, the Canadian province of Alberta designed a market-based policy to reduce the carbon intensity of its large sources of greenhouse gas emissions. This program established a rate-based performance standard for emission sources exceeding 100,000 metric tons of CO₂ annually. Building on emission inventories dating to 2003, each large source covered by the program was required to reduce the emission intensity of its production 12% below a base year intensity drawn from the 2003-2006 period.²³ The program covers about 100 sources from the power sector, pulp and paper, cement, and fertilizer industries, and oil sands development. The unit of measure is emissions of CO₂ per unit of physical production from that industry, for example, per barrel of oil from oil sands development (Sass, 2010).

Covered firms have four options for complying with the performance standard. First, they can reduce the emission intensity of production to meet the standard. Second, they may purchase credits from other covered firms with emission intensities below the standard. Third, they may purchase Alberta-based emission offset credits through an emission-reduction credit program. Finally, they may pay the provincial government C\$15 for every metric ton they exceed the standard by, which serves as a safety valve on the cost of compliance with the program (Province of Alberta, 2008).

In 2010, covered sources employed all four options to comply with the performance standard. These sources reduced their emissions relative to baseline by about 2.7 million tons of CO₂ (with a majority of this effort traded from low mitigation cost facilities to high mitigation cost facilities), purchased about 3.9 million tons emission offset credits, and satisfied the remaining 4.7 million ton emission reduction obligation through the C\$15/tCO₂ safety valve. This last option generated about C\$70 million of revenue directed to the Climate Change and Emissions Management Fund, which invests in emission-lean technologies and projects (Province of Alberta, 2011).

International Coordination of Carbon Pricing Policies

Climate change is truly a global commons problem: the location of greenhouse gas emissions has no effect on the global distribution of damages. Hence free-riding problems plague unilateral and multilateral approaches. Furthermore, nations will not benefit proportionately from greenhouse gas mitigation policies. Thus mitigation costs are likely to exceed direct benefits for virtually all countries. Cost-effective international policies—insuring that countries get the most environmental benefit out of their mitigation investments—will help promote participation in an international climate policy regime.

In principle, internationally employed market-based instruments can achieve overall cost effectiveness. Three basic routes stand out. First, countries could agree to apply the same tax on carbon (*harmonized domestic taxes*) or adopt a *uniform international tax*. Second, the international policy community could establish a system of *international tradable permits*—effectively a nation-state level cap-and-trade program. In its simplest form, this represents the Kyoto Protocol’s Annex B emission targets and the Article 17 trading mechanism. Third, a more decentralized system of internationally linked domestic cap-and-trade programs could ensure internationally cost-effective emission mitigation.

International Taxes and Harmonized Domestic Taxes

In principle, a carbon tax could be imposed on nation states by an international agency. The supporting agreement would have to specify both tax rates and a formula for allocating the tax revenues. Cost-effectiveness would require a uniform tax rate across all countries. It is unclear, however, what international agency could impose and enforce such a tax, and so an alternative more frequently considered has been a set of harmonized domestic carbon taxes (Cooper, 2010). In this case, an agreement would stipulate that all countries are to levy the same domestic carbon taxes and retain their revenues.

The uniformity of tax rates is necessary for cost-effectiveness. But some developing countries may argue that the resulting distribution of costs does not conform to principles of distributional equity and call for significant resource transfers. Under a harmonized tax system, an agreement could include fixed lump-sum payments from developed to developing countries, and under an international tax system, an agreement could specify shares of the total international tax revenues that go to participating countries.

As an alternative to these explicit transfers, developed countries could commit to constrain the use of their tax revenues in ways that produce global benefits. For example, carbon tax revenues in developed countries could, in part, finance major research and development programs on zero-carbon technologies and adaptation efforts in developing countries, while developing countries could freely use their tax revenues in ways that best facilitate their development.

In some developing countries reluctant to implement a carbon tax, an initial cost-effective contribution to combat climate change could take the form of reducing fossil fuel subsidies. For example, a developing country cutting a petrol subsidy equal to 10% of its price is approximately equivalent to a rich country imposing a carbon tax on petrol that raises its price 10%. Well-planned, broad fossil fuel price reforms in a developing country could deliver substantial emission mitigation just as a carbon tax in a developed country (IEA, 2010). The energy prices are higher in both countries, providing the incentive to invest in energy-efficient technologies and nonfossil energy sources, but the relative prices remain unchanged, so that energy-intensive firms do not face the incentive to relocate to the developing country.

Lowering energy subsidies can free up government revenues that could be directed to other beneficial uses and improve the allocation of resources in the economy to promote faster economic growth. Of course, some energy subsidies in developing countries address pressing, basic energy needs, and efforts to combat climate change may need to account for these social objectives.

International Tradable Permits: Cap-and-Trade and Emission-Reduction-Credits

Under an international tradable permit scheme, all participating countries would be allocated permits for “net emissions,” that is, emissions minus sequestration. A permit would define a right to emit a given volume over some time period, such as a year. In each period, countries would be free to buy and sell permits on an international exchange.

Initial permit allocations could reflect a variety of criteria, such as previous emissions, gross domestic product, population, and fossil fuel production. Whatever the initial allocation, subsequent trading can, in theory, lead to a cost-effective outcome (Montgomery, 1972), if transaction costs are not significant (Stavins, 1995). This potential for pursuing distributional objectives while assuring cost-effectiveness is an important attribute of the tradable permit approach.

Providing large initial permits to developing countries (for reasons of distributional equity) implies that they would sell permits primarily to developed countries. Since permit prices represent an implicit tax on all participating countries, the terms of trade within the coalition for countries with the same carbon intensities in production would remain unaffected. From a distributional point of view, developing countries would receive compensation, whereas developed countries would have to pay for their own emission abatement and for permit purchases from abroad to cover the balance of their emissions (Olmstead & Stavins, 2012).

An important obstacle to the successful operation of such a system is that by its very nature, the trading would be among nations (Hahn & Stavins, 1999). Nation-states are hardly simple cost-minimizers, like private firms, so there is no reason to anticipate that competitive pressures would lead to equating of marginal abatement costs across countries. The system would not have the cost-effectiveness property ordinarily associated with a domestic tradable permit system among firms. Even if nations were cost-minimizers, they do not have sufficient information about the marginal abatement costs of firms within their jurisdiction to define their own aggregate marginal costs. The notion of a simple trading program among countries may be more of a metaphor than a practical policy.

If every country participating in such a system were to devolve the tradable permits to firms within its jurisdiction, that is, if each country instituted a domestic tradable permit system as its means of achieving its national target, then the trading could be among firms, not governments, both within countries and internationally (Hahn & Stavins, 1999). Such a system could indeed be cost-effective. In the near term, this

trading system could be integrated with an emission-reduction-credit system, such as the CDM, for countries that do not take on emission caps.

The current design of the CDM does not secure all low-cost mitigation opportunities in developing countries. The project basis for credits under the CDM increases transaction costs and excludes policy reforms that undermine the cost-effectiveness of the mechanism. Modifying the CDM along several lines could improve its cost-effectiveness, increase the investment in low-carbon technologies in developing countries, and address concerns about whether CDM activities truly reflect additional emission mitigation effort (Hall et al., 2010).

First, the CDM could be expanded to cover mitigation policies. Some of the potentially low-hanging fruit in developing countries—from reducing energy subsidies to designing and enforcing building codes—do not neatly fall within a “project” under the CDM. A policy-oriented CDM could deliver price signals to a greater share of a developing country’s economy that can yield more emission mitigation and reduce the potential for emission leakage. This could also serve as a mechanism for transfers to developing countries that pursue a carbon tax. The obvious challenge lies in setting baseline emissions to assess the emission reduction benefits for any given policy. This effort may be substantial, but when spread over all of the potential emission reductions, the transaction costs may be minor in comparison to the costs of a project-based approach resulting in the same abatement.

Second, the CDM could be expanded to cover sectors as an alternative to projects. A sectoral CDM could establish emission baselines for entire sectors (such as the power sector or the steel sector), and allow countries to implement mitigation policies in those sectors to generate credits. Integrating these policies into the international regime—such as pegging a sectoral carbon tax to the international tradable permit price, or implementing a sectoral cap-and-trade system linked to the international regime—could promote cost-effectiveness. Focusing on the most energy-intensive sectors could also address concerns about competitiveness and emission leakage in developed countries. It would also provide developing countries with the experience to inform their consideration of taking on broader emission or policy commitments in future agreements.²⁴

Decentralized, Bottom-Up Architectures

Cap-and-trade systems seem to have emerged as the preferred national and regional instrument for reducing emissions of greenhouse gases throughout much of the industrialized world, and the CDM has developed a substantial constituency, despite concerns about its performance. Because linkage between tradable permit systems (that is, unilateral or bilateral recognition of allowances from one system for use in another) can reduce compliance costs and improve market liquidity, there is great interest in linking cap-and-trade systems with each other.

There are not only benefits but also concerns associated with various types of linkages (Jaffe, Ranson, & Stavins, 2010). A major concern is that when two

cap-and-trade systems are directly linked (that is, allow bilateral recognition of allowances in the two jurisdictions), key cost-containment mechanisms, such as safety valves, are automatically propagated from one system to the other. Because some jurisdictions (such as the European Union) are opposed to the notion of a safety valve, whereas other jurisdictions (such as the United States) seem very favorably predisposed to the use of a safety valve, challenging harmonization would be required.

This problem can be avoided by the use of indirect linkage, whereby two cap-and-trade systems accept offsets from a common emission-reduction-credit system, such as the Clean Development Mechanism. As a result, the allowance prices of the two cap-and-trade systems converge (as long as the ERC market is sufficiently deep), and all the benefits of direct linkage are achieved (lower aggregate cost, reduced market power, decreased price volatility), but without the propagation from one system to another of cost-containment mechanisms. Such indirect linkage may already be evolving as a key element of the de facto post-2012 international climate policy architecture.

Despite the apparent current popularity of cap-and-trade as a national policy approach in many parts of the world, in reality, there are a variety of policy instruments—both market based and conventional command-and-control—that countries can employ to reduce their GHG emissions. Hence it is important to ask whether a diverse set of heterogeneous national, subnational, or regional climate policy instruments can be linked in productive ways. The basic answer is that such a set of instruments can be linked, but the linkage is considerably more difficult than it is with a set of more homogeneous tradable permit systems (Hahn & Stavins, 1999). In fact, the basic approach behind emission reduction credit systems such as the CDM and Joint Implementation (JI) can be extended to foster linkage opportunities among diverse policy instruments, including cap-and-trade, taxes, and certain regulatory systems (Metcalf & Weisbach, 2010).

Another form of coordination can be unilateral instruments of economic protection, that is, border adjustments. In the case of a national carbon tax, this would take the form of a tax on imports that was equivalent to the implicit tax on the same domestically produced goods. In the case of a cap-and-trade system, this would take the form of an import-allowance-requirement. Such border adjustments are found as part of most existing, planned, and proposed national climate policies.

The Future of Carbon Pricing

The political responses to possible market-based approaches to climate policy in most countries have been and will continue to be largely a function of issues and structural factors that transcend the scope of environmental and climate policy. Because a truly meaningful climate policy—whether market based or conventional in design—will have significant impacts on economic activity in a wide variety of sectors (because of the pervasiveness of energy use in a modern economy) and in every region of a country, it is

not surprising that proposals for such policies bring forth significant opposition, particularly during difficult economic times.

In the United States, political polarization—which began some four decades ago, and accelerated during the economic downturn—has decimated what had long been the key political constituency in the Congress for environmental (and energy) action, namely, the middle, including both moderate Republicans and moderate Democrats (Stavins, 2011). Whereas Congressional debates about environmental and energy policy had long featured regional politics, they are now fully and simply partisan. In this political maelstrom, the failure of cap-and-trade climate policy in the U.S. Senate in 2010 was essentially collateral damage in a much larger political war.

It is possible that better economic times will reduce the pace—if not the direction—of political polarization. Furthermore, it is also possible that the ongoing challenge of large budgetary deficits in many countries will increase the political feasibility of new sources of revenue. When and if this happens, consumption taxes (as opposed to traditional taxes on income and investment) could receive heightened attention, and primary among these might be energy taxes, which can be significant climate policy instruments, depending on their design.

It is much too soon to speculate on what the future will hold for the use of market-based policy instruments for climate change. It is conceivable that two decades of relatively high receptivity in the United States, Europe, and other parts of the world to cap-and-trade and offset mechanisms will turn out to be no more than a relatively brief departure from a long-term trend of reliance on conventional means of regulation. On the other hand, it is also possible that the recent tarnishing of cap-and-trade in U.S. political dialogue will itself turn out to be a temporary departure from a long-term trend of increasing reliance on market-based environmental policy instruments. It is too soon to say.

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Notes

1. In the developing country context, refer to Coria and Sterner (2010) and Coria, Löfgren, and Sterner (2010) for an assessment of air pollutant emission trading in Chile.
2. Where market-based policy instruments have been employed, they have typically complimented rather than substituted for command-and-control regulations. Green taxes have been employed in some contexts for the purpose of raising revenue, with little concern for their impacts on environmental outcomes. The OECD (2001) provides an assessment of environmental taxes in a variety of pollution contexts. Beyond the OECD, Máca, Melichar, and

- Š asný (in press) evaluate environmental taxes and subsidies in central and eastern European countries, Cao, Ho, and Jorgenson (2009) assess green taxes in China, and Blackman (2010) and Sterner and Coria (2012) review a variety policy instruments in developing countries.
3. However, in special cases where emission monitoring and enforcement is particularly costly—such as for methane emissions in agriculture—a standards-based approach may be appropriate.
 4. Similar approaches could be undertaken to promote biological sequestration in forestry and agriculture and potentially emission-reduction projects (“offsets”) in other countries. See discussion of Emission Reduction Credit programs below.
 5. From a political perspective, environmentalists have expressed concerns about “emission certainty,” as an alternative to “cost certainty.” From an economic welfare perspective, cost certainty is more important than emission certainty if the slope of estimated marginal abatement costs is relatively steeper than the slope of estimated marginal benefits of abatement (Pizer, 2002; Weitzman, 1974).
 6. The 21 “member economies” of APEC (Asia-Pacific Economic Cooperation) are Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taipei, Thailand, United States, and Viet Nam.
 7. Refer to Badiani, Jessoe, and Plant (in press) for a detailed discussion of electricity subsidies in the agricultural sector in India.
 8. The G20 agreement permits exclusion for subsidies that are explicitly targeted to low-income households. For example, the U.S. government has indicated that it considers the Low Income Home Energy Assistance Program to be exempt from the subsidy elimination commitment for this reason.
 9. In addition to the EU ETS and the New Zealand cap-and-trade system, the Japanese Voluntary Emissions Trading System has operated since 2006, and Norway operated its own emissions trading system for several years before joining the EU ETS in 2008. Legislation to establish cap-and-trade systems is under debate in Australia (combined with a carbon tax for an initial 3-year period) and in the Canadian provinces of Ontario and Quebec. Japan is considering a compulsory emissions trading system.
 10. The EU ETS covers all 27 member states plus Iceland, Liechtenstein, and Norway.
 11. This is the first commitment period of the Kyoto Protocol, 2008-2012.
 12. In May of 2011, New Jersey Governor Chris Christie announced that his state would withdraw from the system.
 13. In addition to RGGI, other regional and state efforts to limit GHGs in the United States have begun. One of the most prominent is California’s enactment of the Global Warming Solutions Act of 2006, which set a statewide GHG emissions limit for 2020 equal to California’s 1990 emissions level. In 2008, the California Air Resources Board proposed the use of a cap-and-trade program as a primary policy for achieving this target. The cap initially would cover electric generators and large industrial facilities, and its scope would later be expanded to include smaller facilities and the transportation sector. The cap-and-trade system is scheduled to commence operations in 2012.

14. Allowance prices have reflected these realities, falling from approximately US\$3 per ton of CO₂ at the first auction in September, 2008, to the floor price of US\$1.89 per ton in 2011.
15. Three states have used some of their auction revenue to help balance their overall state budgets.
16. See <http://www.climatechange.govt.nz/emissions-trading-scheme/>
17. Parties include 37 industrialized countries and emerging market economies of central and eastern Europe. Like the CDM, Joint Implementation (JI) was established as a project-based flexibility mechanism under the Kyoto Protocol. Unlike the CDM, JI applies to emission reduction projects carried out in an Annex I country (the host country) that has a national emissions target under the Protocol. JI projects generate credits, referred to as emission reduction units (ERUs), which can be used to cover increased emissions in other countries.
18. These are CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
19. Note that carbon sequestration projects of forestation and reduced deforestation are not included in the CDM under the Kyoto Protocol's first commitment period, 2008-2012.
20. All carbon taxes reported in this subsection are in 2009 U.S. dollars, based on market exchange rates.
21. Greenhouse gas emissions in the offshore oil sector, representing 24% of the nation's emissions, are covered by both a (lower) carbon tax and the emission trading scheme (Government of Norway, 2009).
22. An important issue for national and subnational climate policies is the potential for interactions—some problematic and some positive—among overlapping policy instruments. On this, see McGuinness and Ellerman (2008); Fischer and Preonas (2010); Levinson (2010); Goulder and Stavins (2011); and Organization for Economic Cooperation and Development (2011).
23. New sources covered by the program initially bear less stringent performance standards that converge to the 12% objective over time (Province of Alberta, 2007).
24. Such an approach could be superior to some calls for sectoral policies that effectively set industry-specific performance standards common across participating developed and developing countries. This standard approach establishes walls between sectors that can increase the total mitigation cost for any given emission goal and eliminates opportunities to raise revenues, either through a carbon tax or an allowance auction, to benefit other social objectives.

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How additional is the Clean Development Mechanism?

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Abbreviations

CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CO₂	Carbon Dioxide
CORSIA	Carbon Offset and Reduction Scheme for International Aviation
CP	Crediting Period
CPA	Component Project Activity of a PoA
DOE	Designated Operational Entity
EB	Executive Board of the CDM
ETS	Emissions Trading Scheme/System
f_{NRB}	Fraction of non-renewable biomass
GHG	Greenhouse Gas
GS	Gold Standard
JCM	Joint Crediting Mechanism
LED	Light Emitting Diode
MP	Methodologies Panel under the CDM EB
MRV	Monitoring, Reporting & Verification
NDC	Nationally Determined Contribution
NRB	Non-renewable Biomass
OECD	Organisation for Economic Co-operation and Development
PDD	Project Design Document
PMR	Partnership for Market Readiness (Initiative of the World Bank)
PoA	Programme of Activities
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VCS	Verified Carbon Standard

Executive summary

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the Clean Development Mechanism (CDM) as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the CDM certainly forms an important basis for the elaboration and design of future international crediting mechanisms.

While this study provides important insights to **improve the CDM up to 2020**, the approach taken in this study could **also be applied more generally both to assess the environmental integrity of other compliance offset mechanisms**, as well as to avoid flaws in the design of new mechanisms being used or established for compliance. Many of the shortcomings identified in this study are inherent to crediting mechanisms in general, not least the considerable uncertainty involved in the assessment of additionality and the information asymmetry between project developers and regulators.

A fundamental feature of both the CDM and the mechanism under Article 6.4 is that they aim to achieve environmental integrity by ensuring that only real, measurable and additional emission reductions are generated. This study analyzes the opportunities and limits of the current CDM framework for ensuring environmental integrity, i.e. that projects are additional and that emission reductions are not overestimated. It looks at the way in which the CDM framework has evolved over time, assesses the likelihood that emission reductions credited under the CDM ensure environmental integrity and provides findings on the overall and project-type-specific environmental integrity of the CDM. In addition, it provides lessons learned and recommendations for improving additionality assessment that can be applied to crediting mechanisms generally, including to mechanisms to be used for compliance under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), and to mechanisms to be implemented under Article 6 of the Paris Agreement.

To ensure robust judgements, we have systematically analyzed the determination of additionality, the determination of baseline emissions and other issues that are key for environmental integrity. Towards this goal, we have evaluated those general CDM rules that are particularly relevant for environmental integrity and assessed in the case of specific project types the likelihood that they deliver real, measurable and additional emission reductions. Based on our analysis **key findings** include the following:

- Most **energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, energy efficiency improvements or fossil fuel switch.
- **Industrial gas projects** (HFC-23, adipic acid, nitric acid) are **likely to be additional** as long as the mitigation is not otherwise promoted or mandated through policies.
- **Methane projects** (landfill gas, coal mine methane) have a **high likelihood of being additional**.
- **Biomass power projects** have a **medium likelihood of being additional** overall because the assessment of additionality very much depends on the local conditions of individual projects.
- The additionality of the current pipeline of **efficient lighting projects** using small-scale methodologies is **highly unlikely** because in many host countries the move away from incandescent bulbs is well underway.

- In the case of **cook stove projects**, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Cook stove projects are also likely to considerably **over-estimate the emission reductions** due to a number of unrealistic assumptions and default values.

Overall, our results suggest that 85% of the projects covered in this analysis and 73% of the potential 2013-2020 Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated. Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated.

Our analysis suggests that the **CDM still has fundamental flaws in terms of overall environmental integrity**. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions.

When considering the Paris Framework, the most important change from the Kyoto architecture is that all countries have made mitigation pledges in the form of Nationally Determined Contributions (NDC). An important implication is that host countries with ambitious and economy-wide mitigation pledges have **incentives to limit international transfers of credits** to activities with a **high likelihood of delivering additional emission reductions**, so that transferred credits do not compromise the host country's ability to reach their own mitigation targets. A second important implication is that countries should **only transfer emission reductions where this is consistent with their NDC**, implying that baselines may have to be determined in relation to the host country's mitigation pledges rather than using a 'counterfactual' business as usual scenario as a default.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either **existing projects which risk discontinuing GHG abatement** when the incentive from the CDM ceases, such as landfill gas flaring or to new **projects among** the few project types identified that **have a high likelihood of ensuring environmental integrity**.
- Buyers should **accompany purchase of CERs with support for a transition of host countries to broader and more effective climate policies**. In the short-term, where offsetting is used, it should only be on the basis that purchase of CERs does not undermine the ability of host countries to achieve their mitigation pledges.
- Given the inherent shortcomings of crediting mechanisms, we recommend focusing **climate mitigation efforts** on forms of carbon pricing **that do not rely extensively on credits** and on measures such as results-based climate finance that does not result in the transfer of credits or offsetting the purchasing country's emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement alternative climate policies.
- To enhance the environmental integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We also recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report.
- We also recommend provisions that provide strong incentives to the Parties involved to ensure the integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission reductions, but could also extend to other elements, such as im-

plementation of **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche role** focusing on those project types for which additionality can be relatively assured. Crediting should serve as a stepping-stone to other, more effective policies to achieve cost-effective mitigation. Continued support to developing countries will be key. We recommend using new innovative sources of climate finance, such as revenues from auctioning of emission trading scheme allowances, rather than crediting for compliance, to support developing countries in implementing their NDCs.

Summary

Aim of the study

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the **CDM** certainly forms an **important basis** for the elaboration and design of future mechanisms for international carbon markets. One key feature of both the CDM and the mechanism under Article 6.4 is that they should generate **real and additional** emission reductions. In other words, emission reductions that are credited and transferred should not have occurred in the absence of the mechanism and should not be overestimated. This study analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides findings on the **overall and project-type-specific environmental performance of the CDM** in the form of estimates of the **likelihood that the CDM results in real and additional emission reductions**. In addition, it provides lessons and recommendations for improving additionality assessment that can be applied to future crediting mechanisms.

Methodological approach

The main focus of this study is to assess the extent to which the CDM meets its objective to deliver “real, measurable and additional” emission reductions. In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, we systematically analyze CDM rules and how they have been applied to real projects in practice. We examined the rules for 1) **additionality assessment**, for 2) the **determination of baseline emissions** and 3) a number of **other issues** including the length of crediting period, leakage effects, perverse incentives, double counting, non-permanence, monitoring provisions and third party validation and verification. We approach these aspects from two different perspectives: we evaluate 1) **general CDM rules** that are particularly relevant for the delivery of real, measurable and additional emission reductions and we evaluate 2) **specific project types** with a view to assessing how likely these project types deliver additional emission reductions. To assess the impacts of our analysis, we further estimate the **potential 2013-2020 CER supply** from different project types.

Project-types-specific results

Table 1-1 (p. 13) below provides an overview of the findings on environmental integrity based on the detailed analysis of individual project types. **Most energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, efficiency improvements or

fossil fuel switch. An important reason why these project types are unlikely to be additional is that the revenue from the CDM for these project types is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. Moreover, many projects are economically attractive, partially due to cost savings from project implementation (e.g. fossil fuel switch, waste heat recovery) or domestic support schemes (renewable power generation).

Table 1-1: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered **likely to be additional** as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and do not generate significant revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-23 and nitric acid projects, perverse incentives have been adequately addressed. With regard to **adipic acid** projects, the risks for **carbon leakage have not yet been addressed**.

Methane projects (landfill gas, coal mine methane) also have a **high likelihood of being additional**. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face **issues with regard to baseline emissions and perverse incentives** and may thus lead to over-crediting.

Biomass power projects have a **medium likelihood of being additional** since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects **can be additional**, particularly if CER revenues for **methane avoidance can be claimed**. Biomass projects also face other issues, in particular with regard to demonstrating that the **biomass used is renewable**.

The additionality of **efficient lighting** projects using small-scale methodologies is **highly problematic** because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The **new methodologies** address these problems but they are **not mandatory** and the small-scale methodologies are, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For **cook stove** projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Particularly in urban areas, the additionality of these project types is questionable. Cook stove projects are also likely to considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Overall environmental assessment

Based on these considerations, we estimate that **85% of the covered projects and 73% of the potential 2013-2020 CER supply have a low likelihood** of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only **2% of the projects and 7% of potential CER supply have a high likelihood** of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity (Table 1-1, p. 13).

Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's **performance as a whole has anything but improved**, despite improvements of a number of CDM standards. The main reason for this is a **shift in the project portfolio towards projects with more questionable additionality**. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential of these project types is only less than a quarter. A second reason is that the **CDM Executive Board (EB)** has not only improved rules but also **made simplifications** that undermined the integrity. For example, positive lists have been introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). A third reason is that the **CDM EB** did not take effective means to **exclude project types** with a low likelihood of additionality. While positive lists have been introduced, project types with more questionable additionality have not been excluded from the CDM. Standardized baselines provide a further avenue to demonstrating additionality but do not reduce the number of projects wrongly claiming additionality. The improvements to the CDM mainly aimed at **simplifying requirements and reducing the number of false negatives** but did not address the false positives.

The result of our analysis therefore suggests that the **CDM has still fundamental flaws in terms of environmental integrity**. It is likely that the large majority of the projects registered and CER issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC.

Recommendations for improving general additionality rules

For an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. **Information asymmetry** between project developers and regulators, combined with the economic incentives for project developers to have their project recognised as additional, are a major challenge. We carefully scrutinised the **four main approaches** used to determine additionality. Our analysis shows that **prior consideration** is a necessary and important but not sufficient step for ensuring additionality of CDM projects and that this step largely

works as intended. The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. Especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters, such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio. The **barrier analysis** has lost importance as a stand-alone approach of demonstrating additionality. Non-monetized barriers remain subjective and are often difficult to verify by the DOEs. In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. However, the way in which common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality; it is important to reflect that market penetration is not for all project types a good proxy for the likelihood of additionality.

Against this background, we recommend that the **common practice analysis** is given a **more prominent role in additionality determination** though only after a significant reform:

- The 'one-size-fits-all' approach of determining common practice should be replaced by **sector- or project-type-specific guidance**, particularly with regard to distinguishing between different and similar technologies and with regard to the threshold for market penetration.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country.
- The common practice analysis should at least cover the **entire country**. However, if the absolute number of activities in the host country does not ensure statistical confidence, the scope needs to be extended to other countries.
- As a default, all CDM projects should be included in the common practice analysis, unless a methodology includes different requirements.

We further recommend that the **investment analysis** is excluded as an approach for demonstrating additionality for projects types in which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence. For those project types in which the investment analysis would still be eligible, the project participant must confirm the all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders. The **barrier analysis** should be abolished entirely as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types). Barriers that can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

In addition, we recommend improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period the validity of the baseline scenario should be assessed for CDM project types for which the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex should be limited to one single crediting period. Moreover, generally abolishing the renewal of crediting periods while allowing a somewhat longer single crediting period for project types that require a continuous stream of CER revenues to continue operation may be considered.
- **Positive Lists:** The review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of na-

tional policies and measures to support low emission technologies (so-called E- policies). To maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists.

- **Standardized baselines:** Once established in a country, their use should be made mandatory and all CDM facilities should be included in the peer group used for the establishment of standardized baselines.
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity by over-crediting emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by being excluded from the crediting baseline where possible.
- **Suppressed demand:** An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand could be restricted to countries where development needs are highest and the potential for over-crediting is the smallest.

Recommendations to improve project type specific rules

Industrial gas projects: Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. Therefore, a global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects would provide for a high degree of environmental integrity. However, industrial gas projects provide for low-cost mitigation options. These emission sources could therefore also be addressed through domestic policies, such as regulations, or by including the emission sources in domestic or regional ETS, and help countries achieve their Nationally Determined Contributions (NDCs) under the Paris Agreement. Parties to the Montreal Protocol are also considering regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM.

Energy-related project types: We recommend that these project types should, in principle, no longer be eligible under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers. These project types may thus remain **eligible in least developed countries**. In cases in which **biomass power generation** is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM, provided that the corresponding provisions in the applicable methodologies are revised appropriately.

With regard to **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass and if approaches for determining the penetration rate of efficient lighting technologies were made mandatory for all new projects and CPAs while the older methodologies are withdrawn, we recommend that these project types should remain eligible.

Methane projects: Landfill gas and coal mine methane projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and requesting DOEs to verify that landfilling practices are not changed. With regard to landfill gas, we recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Implication for the future use of international carbon markets

The **CDM has provided many benefits**. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer, may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures and created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of gathering considerable experience, the **enduring limitations** of GHG crediting mechanisms are apparent.

Firstly and most notably, the **elusiveness of additionality** for all but a limited set of project types is very difficult, if not impossible, to address. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is **difficult to address through improvements of rules**. Secondly, international crediting mechanisms involve an **inherent and unsolvable dilemma**: either they might create **perverse incentives for policy makers** in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they **credit activities that are not additional** because they are implemented due to policies or regulations. Thirdly, for many project types, the **uncertainty of emission reductions** is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain for how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules. A further overarching shortcoming of crediting mechanisms is that they do **not make all polluters pay but rather they make them subsidize the reduction of emissions**. Most of these shortcomings are inherent to using crediting mechanisms, which **questions the effectiveness of international crediting mechanisms as a key policy tool** for climate mitigation.

The future role of crediting mechanisms should therefore be revisited in the light of the Paris Agreement. Several **elements of the CDM could be used** when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. The Paris Agreement therefore requires countries to **adjust their reported GHG emissions** for international transfers of mitigation outcomes, in order to **avoid double counting** of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond what they had pledged under their NDC. A second important implication relates to the incentives for host countries to ensure integrity. Host countries with ambitious and economy-wide mitigation pledges would have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. In combination, this suggests that the

future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries. A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules in assessing the additionality of projects considered for funding.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either existing **projects that are at risk of stopping GHG abatement** or the few project types that have a **high likelihood of ensuring environmental integrity**. Continued purchase of CERs should be accompanied with a plan and support to host countries to **transition to broader and more effective climate policies**. We further recommend to pursue the purchase and cancellation of CERs as a form of **results-based climate finance** rather than using CERs for compliance towards meeting mitigation targets.
- Given the inherent shortcomings of crediting mechanisms, we recommend **focusing climate mitigation efforts on** forms of carbon pricing that do **not rely extensively on credits**, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement broader climate policies.
- To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend **limiting** such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches. We also recommend curtailing the length of the crediting periods with no renewal.
- Given the high integrity risks of crediting mechanisms, we recommend provisions that provide strong incentives to the Parties involved to ensure integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission re-

ductions, but could also extend to other elements, such as **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM has had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment confirms, alongside other evaluations, the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche-specific role** in which additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

1. Introduction

With almost 7,700 Clean Development Mechanism (CDM) projects and almost 300 programmes of activities (PoAs) registered and more than 1.6 billion Certified Emissions Reductions (CER) issued, the CDM has developed into an important component of the global carbon market. However, its role in the future remains uncertain. With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end, most likely soon after 2020.

However, in terms of its standards, procedures and institutional arrangements, the CDM forms certainly an important base for the elaboration and design of future mechanisms for international carbon markets. The mechanism established under Article 6.4 of the Paris Agreement includes several provisions that are similar to the CDM. Parties also decided that the rules, modalities and procedures of the new mechanism should be adopted on the basis of the “experience gained with and lessons learned from existing mechanisms”. Moreover, experiences gained from the CDM can also be used for the development of domestic baseline and credit policies both in developed and developing countries.

One key feature of both the mechanism under the Paris Agreement (Article 6.4) and domestic baseline and credit policies is that they should generate real and additional emission reductions, in other words: the credited and transferred emission reductions should not have occurred in the absence of the mechanism and or policy. The ability to deliver such a result depends heavily on having a reasonably effective way to assess additionality both for specific project types and on an aggregate basis, and to set a baseline such that the number of credits issued does, in total, not exceed actual reductions.

Demonstrating additionality and setting baselines are the areas in which the most concerns have been raised with the CDM, in particular regarding the investment, barrier and common practice analysis and the assessment of prior consideration. Given its counterfactual nature, asymmetries of information regarding costs, financing, barriers and local project conditions, and signal-to-noise issue, it has been difficult to implement a reliable method for assessing additionality and setting baselines. Other factors that also affect the overall mitigation outcome are the length of the crediting period used, how leakage concerns are dealt with and whether any perverse incentives are addressed, among others.

The difficulties with these traditional approaches have resulted in further refinement and revision of these approaches as well as the introduction of several alternative approaches to setting of baselines and testing additionality. Examples include the use of default values, performance benchmarks or penetration rates and discounting approaches. More fundamental changes include the use of highly standardized baselines and additionality tests at the sectoral level. It remains to be seen whether the methodological difficulties with highly standardized approaches can be solved to make them operational, and whether they will result in a lower likelihood of non-additional credits being issued.

The additionality of CDM projects has been assessed in the past in several general and project-specific studies. Much of the research was conducted before the improvement of rules and the introduction of new approaches, such as standardized baselines. This study aims to assess whether and how these changes have affected the quality of CDM projects, focusing on the project portfolio available in the second commitment period of the Kyoto Protocol and taking due account of the improvements implemented over time.

In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, a systematic assessment is required of the CDM rules and how they have been applied to real projects in practice. A similar exercise should be carried out for the different reforms suggested to the existing rules. This study therefore analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides robust and quantified conclusions on the overall and project-type-specific environmental performance of the CDM in the form of estimates of the likelihood that the CDM results in real and additional emission reductions.

2. Methodological approach

2.1. General research approach

The main focus of this study is to assess the extent to which the CDM meets its objective stipulated in Article 12.5(c) of the Kyoto Protocol to deliver “real, measurable and additional” emission reductions. Based on the findings, concrete recommendations are made for further reform of the CDM and implications for the future role of the CDM are discussed.

There are two principal challenges to evaluating of the ability of the CDM to deliver additional emission reductions: the inherent uncertainty of a counter-factual baseline and the uncertainty and bias associated with project and baseline data. Therefore, any assessment of the extent of non-additional or otherwise under- or over-credited CDM activity can therefore only provide rough and directional estimates. Project design documents (PDDs) and monitoring reports provide substantial data and assumptions. However, these data and assumptions are often limited (they may not cover all relevant activity, especially non-CDM activity) and can involve considerable judgment by parties that have an interest in the outcome (e.g. selecting among alternative projections of future fuel prices) made for the purpose of meeting CDM requirements.

We examine the three main aspects as regards whether the CDM delivers additional emission reductions:

1. **Additionality assessment:** The assessment of additionality refers to the question of whether a project was implemented due to the CDM. Additionality is the most important prerequisite to providing an emissions benefit. If a project would have been implemented in the absence of the CDM incentives, the emission reductions would have occurred anyway. If a Party uses non-additional CERs rather than reducing its own emissions to meet its emission reduction commitments, global GHG emissions would be higher than they would have otherwise been. Because errors in additionally determination affect the validity of an entire project’s CERs, additionality assessment forms the main focus of this study.
2. **Determination of baseline emissions:** A second important aspect is how the baseline emissions are determined. Determining baseline emissions is associated with considerable uncertainty. A crediting baseline that is above the emissions that would most likely occur in the absence of the project can lead to significant over-crediting. Vice versa, ambitious baselines that are below the emissions that would most likely occur in the absence of the project, can result in under-crediting.
3. **Other issues:** A number of other issues are important to deliver additional emission reductions, including:
 - the length of crediting period,
 - criteria for the renewal of the crediting period,

- approaches for determining indirect emission effects, such as leakage effects,
- the way in which perverse incentives for both project developers and policy makers are addressed,
- the extent to which double counting of emission reductions within the mechanism and with other mechanisms and pledges is avoided,
- whether potential non-permanence of emission reductions is sufficiently addressed,
- whether monitoring provisions are appropriate, and
- the effectiveness of the regulatory framework for third party validation and verification.

We also touch upon these issues, in particular when they raise concerns with regard to the integrity of the CDM. They do not, however, form the focus of this study.

In our examination, we approach these aspects from two different perspectives:

- **General CDM rules:** In Chapter 3, we evaluate approaches for determining general CDM additionality rules that are particularly relevant for the delivery of real, measurable and additional emission reductions. This includes an assessment of innovative and potentially more objective approaches for setting baselines and determining additionality and an analysis of whether and how these approaches could improve the determination of additionality under the CDM.
- **Specific project types:** In Chapter 4, we evaluate specific project types with a view to assessing how likely these project types deliver additional emission reductions. A separate evaluation by project type is important as the likelihood of additional emission reductions can differ significantly among project types. This evaluation covers the major project types contributing to a large share of the emission reductions in the CDM portfolio.

Drawing on findings from Chapters 3 and 4, we provide an overall assessment of the additionality of the CDM project portfolio in Chapter 5. In Chapter 6, we provide a summary of key recommendations for further reform of the CDM. Finally, we discuss the implications for the future use of the CDM in Chapter 7.

The study employs several analytical methodologies and approaches:

- **Literature analysis** forms the basis for our evaluation of general CDM rules, specific project types, and innovative approaches towards baseline setting and additionality assessment.
- **Qualitative assessment of relevant CDM rules** with a view to their ability for ensuring additional emission reductions. We identify potential shortcomings in the current rules and propose options for addressing them.
- **Empirical, quantitative evaluation of how the CDM rules are applied** through analysis of a representative random sample of projects. The analysis will be based on information in PDDs and validation reports and, where necessary, also monitoring and verification reports. The projects will be identified through stratified random sampling, aiming to ensure representativeness of host countries and project types. This empirical analysis aims to identify possible shortcomings in the application of general CDM rules. The information and data to be evaluated is specific for each of the identified general CDM rules and the questions identified. The methodological approach of the empirical evaluation is further specified in Section 2.2 below.
- **Economic assessment** of the feasibility of different project types is another important building block of the study. The economic assessment is conducted for the evaluation of

specific project types in Chapter 4. The methodological approach of the empirical evaluation is further specified in Section 2.3 below.

- **Sectoral analysis** of the market situation for specific project types to assess whether the technology has often already been implemented without the CDM and whether an observed market uptake occurs due to the CDM. The sectoral analysis is conducted for the evaluation of specific project types in Chapter 4. The methodological approaches are further specified in the corresponding sections.

We use the CDM rules and the CDM project portfolio as of 1 January 2014 as the basis for the assessment.

To assess the impacts of our analysis, we further estimate the potential 2013-2020 CER supply for different project types. The method used to estimate the potential CER volume is described in Section 2.3.

2.2. Empirical evaluation of CDM projects

The assessment of key CDM rules for additionality demonstration in Chapter 3 is based on an in-depth evaluation of PDDs, validation reports, etc. of randomly selected CDM projects. The project samples were randomly drawn from the so-called CDM project pipeline as of 1 January 2014 (UNEP DTU 2014). This pipeline is a compilation of certain information and data provided in the project design document (PDD) of each CDM project. For this assessment, only registered CDM projects were taken into account as the PDDs usually undergo significant changes during the validation period. To ensure representativeness, the samples were stratified by the following characteristics and strata:

- Location (host country/region)
 - China
 - India
 - Asia & Pacific
 - Brazil
 - Latin America
 - Rest of the World
- Technology
 - Industry (HFC-23, N₂O, cement, energy efficiency, energy distribution, etc.)
 - Electricity generation from hydro
 - Electricity generation from wind
 - Electricity generation from renewable energy (solar, tidal, etc.)
 - Other renewable energy (biomass, geothermal, mixed renewable energy, etc.)
 - Waste sector (landfill gas, methane avoidance, etc.)
 - Other (afforestation, reforestation, agriculture, transport, etc.)
- Scale
 - Large-scale projects
 - Small-scale projects
- Time (registration year)
 - Pre 2010
 - In 2010 or 2011
 - Post 2011.

The in-depth assessment of project samples was conducted for the key additionality determination rules: investment analysis (Section 3.2), barrier analysis (Section 3.3) and common practice analy-

sis (Section 3.3). For each of these rules a separate sample of 30 randomly selected CDM projects was drawn.

Since the CDM project pipeline did not include information about which option of additionality determination was applied in the PDD, we had to conduct a two-step sampling: In the first step, we drew a representative sample of 300 projects. For each of the projects of this sample we identified which additionality determination rules were applied so that we could use this sample as population for the second sampling step in which we drew the samples for each of the additionality determination rules.¹

2.3. Estimation of the potential CER supply

We estimate the potential CER supply² for the purpose of assessing the overall integrity of the CDM based on our findings for specific project types or specific additionality tests. The potential CER supply is estimated mainly on the basis of the CDM pipeline as of 1 January 2014 (UNEP DTU 2014). Moreover, we included additional information from a similar pipeline which is provided by IGES (2014). All CDM projects which were registered by 1 January 2014 are taken into account (7,418). In the case of industrial gas projects (HFC-23, adipic acid, nitric acid), some baseline and monitoring methodologies were significantly revised, which has a major impact on the potential CER supply in the second and third crediting periods. For these projects, we use specific bottom-up estimates derived from project-specific information (Schneider & Cames 2014).

We distinguish the CER supply potential considering the duration of the commitment periods under the Kyoto Protocol:

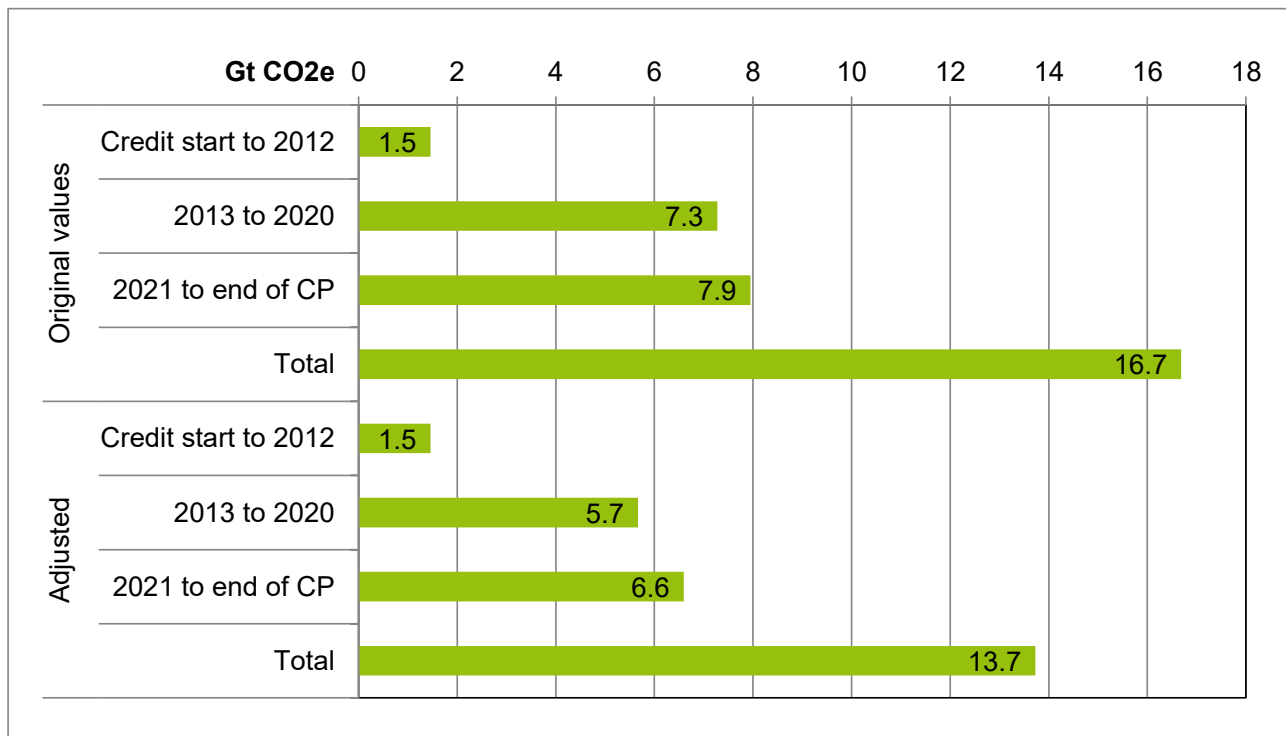
- from credit start to the end of 2012,
- from the beginning of 2013 to the end of 2020 and
- from the beginning of 2021 to the end of the crediting periods (CP).

Our study is focused on the period of 2013 to 2020.

Figures for the period from credit start to the end of 2012 reflect the actual CER issuance rather than the potential supply (UNFCCC 2015a). For the latter two periods, we take into account the issuance success rate provided in the CDM pipeline and adjust the expected CER supply accordingly. For some projects, more CERs were issued than projected while for most of the CDM projects less CERs were issued. Several projects had not issued any CERs (4,913). For those projects we assume either the average issuance rate for the respective project type or – if no CERs have been issued for that project type so far – the overall average of the issuance success rate. Figure 2-1 provides an overview of the potential CER supply.

¹ A more detailed description of the sampling approach, the code used for drawing the samples and the reference numbers of the projects drawn into each of the samples can be found in Section 8.1 of the Annex.

² The actual CER supply depends on various conditions of the global carbon market and particularly on price expectations. However, also under normal market conditions, price forecasts are very uncertain. Under post-2012 market conditions, prices are even more uncertain. We therefore only estimate the potential CER supply which is derived from information in PDDs and other project specific or general documents but ignore any interaction with the global carbon market. At price levels of less than \$1/CER, the estimated volumes will not be achieved in practice.

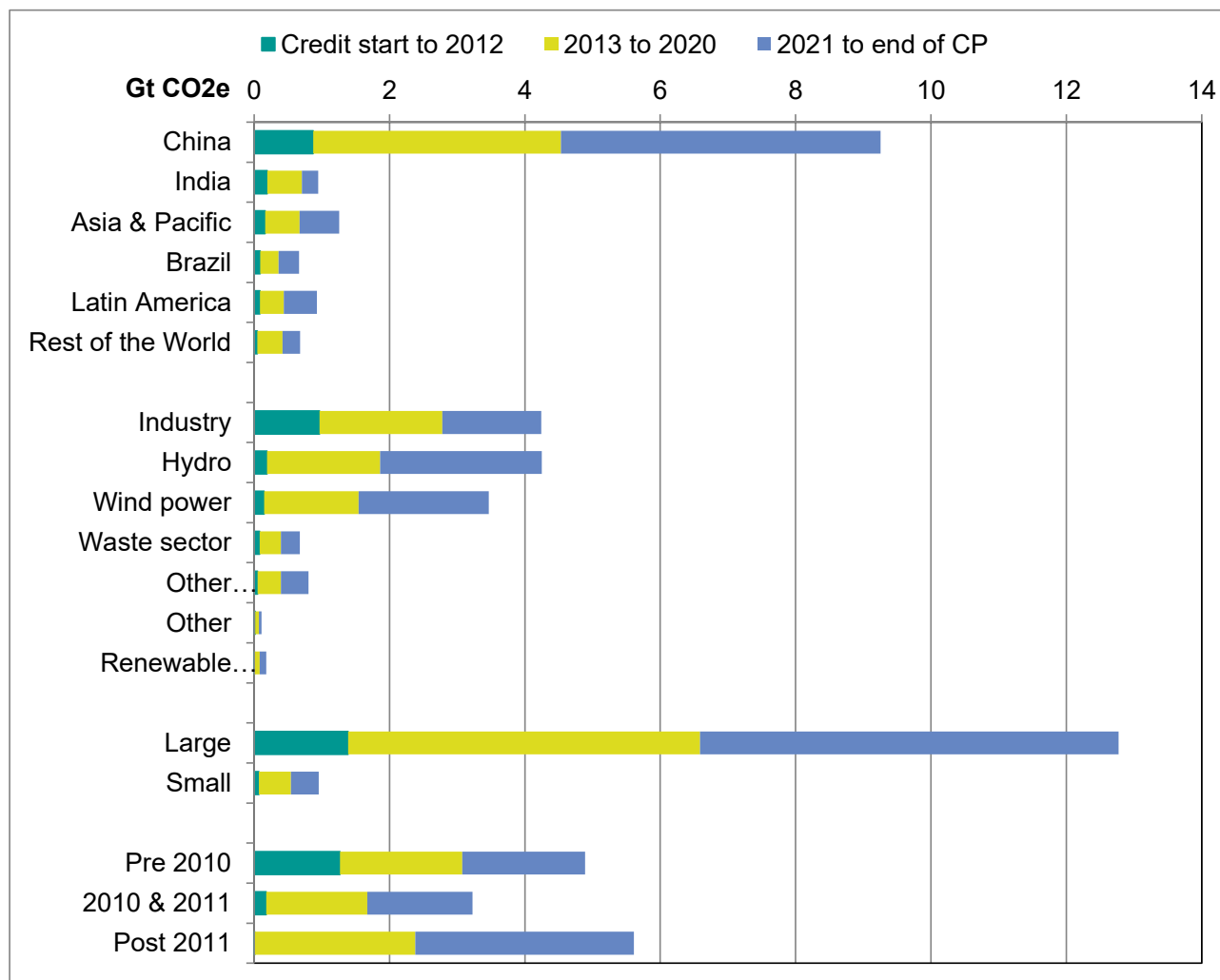
Figure 2-1: Potential CER supply, original and adjusted values

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The average adjustment factor is -22% though it ranges from -4% for N₂O projects to some -67% for transport projects. The adjusted CER supply for the period of 2013 to 2020 amounts to almost 5.7 billion CERs, almost 4 times the volume issued for the first crediting period.

Figure 2-2 illustrates where the potential CER supply stems from. Obviously China was and will remain the largest potential supplier of CERs. Almost two thirds (64.5%) of the potential CER supply in 2013 to 2020 are expected to be provided by Chinese CDM projects. In terms of project types, the large majority of supply stems from industry (32.0%), hydro (29.4%) and wind (24.6%) projects. Not surprisingly, the large majority (91.3%) of CERs stems from large scale projects while the breakdown in terms of registration period is more even: 31.8% stems from projects registered before 2010, 26.3% from projects registered in 2010 and 2011 while 41.8% of the potential CER supply in the period of 2013 to 2020 can be generated from CDM projects registered after 2011.

Figure 2-2: Potential CER supply by stratification categories



Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

In Chapter 4 we analyze the extent to which the likelihood of projects and CERs being additional depends on the project type. We look at 12 different project types, which together cover a broad range of activities and technologies. In terms of CER supply, these 12 project types amount to 85% of the potential supply in the period of 2013 to 2020 (Table 2-1). The largest supply potential is provided by hydro and wind power projects (29.4% and 24.6%, respectively). Industrial gas projects amount to almost 15% of the supply potential while biomass power, landfill gas, waste heat recovery and fossil fuel switch projects could each generate some 3-4% of the supply potential. Compared to these project types the supply potential of cook stoves (0.04%) and efficient lighting (0.07%) are almost negligible. However, since these project types are often included in government purchase programs or voluntary offset schemes and since their share among projects registered after 2012 is significant, we consider it worthwhile to examine these two project types in greater depth and to assess their likelihood of being additional and of generating additional CERs.

Table 2-1: Potential CER supply by project type

	No. of projects	Credit start to 2012	2013 to 2020	2021 to end of CP Adjusted	Total
			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production	19	507	375	547	1,429
Adipic acid	4	201	257	269	727
Nitric acid	97	57	175	172	404
Hydro power	2,010	191	1,669	2,388	4,249
Wind power	2,362	148	1,397	1,929	3,475
Biomass power	342	25	162	169	355
Landfill gas	284	57	163	159	380
Coal mine methane	83	34	170	123	327
Waste heat recovery	277	63	222	62	346
Fossil fuel switch	96	51	232	175	458
Cook stoves	38	0.1	2.3	0.4	2.7
Efficient lighting	43	0.4	3.8	0.2	4.5
Not covered	1,763	124	842	603	1,569
Total	7,418	1,459	5,671	6,596	13,726

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The first Programme of Activities (PoA) was registered in July 2009. From then until the end of 2013, 243 PoAs were registered in total, the large majority of them in 2012 (193). While cook stoves and efficient lighting account for only a small share in the CDM project pipeline, they are quite relevant in the context of PoAs. By the end of 2013, they account together for a quarter of the registered PoAs. Table 2-2 provides a breakdown of the potential CER supply from PoAs by project types.

Table 2-2: Potential CER supply from PoAs

	No. of programs	Credit start to 2012	2013 to 2020	2021 to end of CP	Total
			Mt CO ₂ e		
Hydro power	26		5	13	17
Wind power	24		18	45	63
Landfill gas	4	0	12	27	40
Coal mine methane	2		5	10	15
Fossil fuel switch	2		0	0	0
Cook stoves	31	0	33	82	115
Efficient lighting	30	2	17	63	82
Not covered	124	0	70	144	214
Total	243	2	161	385	547

Sources: UNEP DTU 2014, UNFCCC 2015b, authors' own calculations

The main difference of PoAs compared to projects bundles is that PoAs can – once registered – be extended over time by an unlimited number of so-called component project activities (CPA). An estimate of the CER supply potential is thus less reliable than the estimate for the project pipeline.

However, taking into account all CPAs included in PoAs by the end of 2013, the potential CER supply can roughly be estimated, though it is obvious that the actual supply could be much higher. PoA volumes are much more difficult to estimate, because a PoA might be registered with only one CPA that has 1,000 tCO₂ per year emissions reductions but which may ultimately include CPAs that reduce hundreds of thousands of tCO₂ per year.

Noting these limitations, all PoAs could supply some 0.16 billion CERs in total in the period of 2013 to 2020. The final volume of these PoAs could be many times this amount. Almost a third (31.4%) of this supply would be provided by cook stove or efficient lighting PoAs. CERs from renewable power generation programmes amount to 14% of the supply potential of PoAs. Interestingly, almost half of the PoAs do not fall into the project type categories which together account for 85% of the potential CER supply from CDM projects. This supports the hypothesis that PoAs address project categories or technologies that cannot be adequately addressed by individual CDM projects.

2.4. Economic assessment of CER impact

The demonstration of additionality has been a key issue in the CDM since the beginning of the Kyoto mechanisms (Chapter 3). While most researchers agree that there is no simple and objective approach to determining additionality, several authors argue that the impact of CER revenues on the economic feasibility of projects is an important indicator for the likelihood for projects to be additional (for example Sutter 2003, Schneider 2007, Spalding-Fecher et al. 2012). This builds on the assumption that project proponents are more likely to implement a project due to the CDM if CER revenues have a significant impact on the economic performance of the project. While other benefits from the CDM (e.g. the public relation aspect of registering a project under the UNFCCC) may in some cases help projects to go ahead that would not be implemented in the absence of the CDM, the economic benefit of CER revenues may be considered the main driver to implement CDM projects on a larger scale.

A high economic benefit resulting from CER revenues does not guarantee additionality, because some projects may already be economically viable without CER revenues and may only become more profitable with the CDM. However, low CER revenues are an indicator of a lower likelihood that the project is additional, because with low CER revenues it also becomes more likely that the project would be implemented in the absence of the CER revenues.

In 2005, the CDM Executive Board (EB) decided that, in order to be additional, projects have to demonstrate that they are economically unattractive; however, they are not required to demonstrate that with CER revenues they would become economically viable. Schneider (2007) highlighted that this leads to the situation in which projects with very low CER revenues can prove additionality even though the CER revenues contribute only marginally to closing the profitability gap.

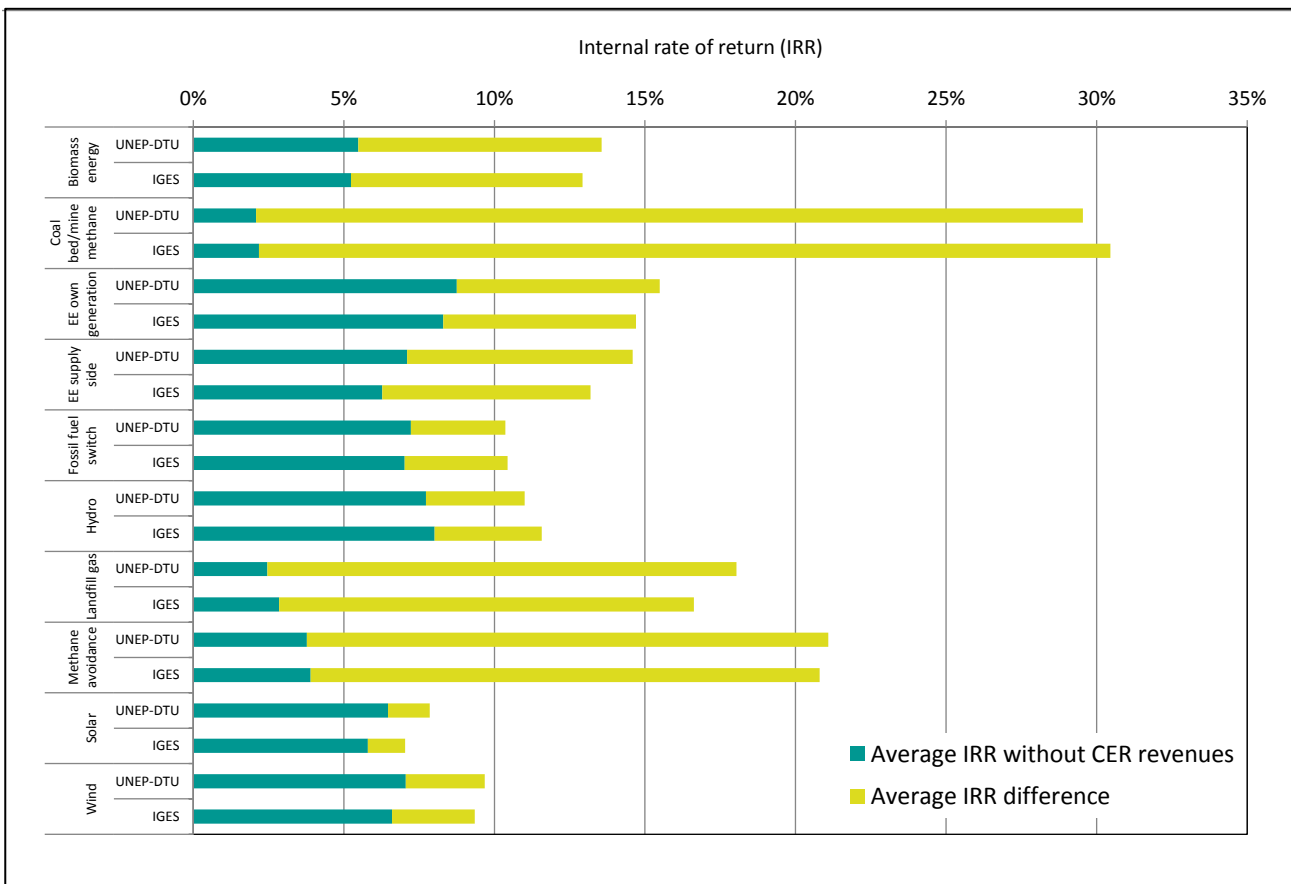
It is difficult to define a minimum required level of contribution from CER revenues that is needed to trigger an investment decision. An important concept in this context is the *signal-to-noise ratio* issue for investment analysis, as mentioned by, for example, Spalding-Fecher et al. (2012): The generally high variability and uncertainty of key parameters that determine the profitability of a mitigation project is often considerably higher than the expected economic benefit of CERs. If the economic impact of the CERs is lower than key uncertainties in the investment analysis, it is rather unlikely that the registration under the CER was the conclusive trigger for the investment and, hence, it is likely that the project is non-additional.

Table 2-3: Impact of CER revenues on the profitability of different project types

Type	Source	Projects with available IRR information	Average IRR without CER revenues	Average IRR with CER revenues	Average IRR difference
Biomass energy	UNEP-DTU	271	5.5%	13.6%	8.1%
	IGES	216	5.2%	12.9%	7.7%
Coal bed/mine methane	UNEP-DTU	70	2.1%	29.5%	27.5%
	IGES	75	2.2%	30.5%	28.3%
EE own generation	UNEP-DTU	205	8.8%	15.5%	6.7%
	IGES	202	8.3%	14.7%	6.4%
EE supply side	UNEP-DTU	36	7.1%	14.6%	7.5%
	IGES	23	6.3%	13.2%	6.9%
Fossil fuel switch	UNEP-DTU	47	7.2%	10.4%	3.1%
	IGES	39	7.0%	10.4%	3.4%
Hydro	UNEP-DTU	1,753	7.7%	11.0%	3.3%
	IGES	1,635	8.0%	11.6%	3.6%
Landfill gas	UNEP-DTU	183	2.5%	18.0%	15.6%
	IGES	165	2.8%	16.6%	13.8%
Methane avoidance	UNEP-DTU	203	3.8%	21.1%	17.3%
	IGES	204	3.9%	20.8%	16.9%
Solar	UNEP-DTU	154	6.5%	7.9%	1.4%
	IGES	122	5.8%	7.0%	1.2%
Wind	UNEP-DTU	2,162	7.1%	9.7%	2.6%
	IGES	1,804	6.6%	9.4%	2.8%

Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Figure 2-3: Impact of CER revenues on the profitability of different project types



Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Information on the impact of CER revenues on economic profitability is available from different sources. Table 2-3 and Figure 2-3 show the impact based on data included in project design documents and as documented in the databases by UNEP DTU (2014) and IGES (2014). In addition, Lütken (2012) has analyzed the annual CER revenues in relation to the capital investment and observed for some project types a (very) limited impact stemming from CER revenues. Spalding-Fecher et al. (2012) analyze the impact of CER revenues on the project IRR for different project types in the IGES database. They conclude that the CER impact on the project IRR is the lowest for renewables including hydro and wind (increase of IRR by 2-3%), fuel switch (4%), and supply-side efficiency (5%). They also provide an overview of more studies analysing the impact of CER revenues for different project types. The relatively low impact of CER revenues compared to other cash flows that are relevant for investment decisions is shown for energy efficiency projects below (Box 2-1).

Overall, the available information shows that the impact of CER revenues on the economic performance of projects varies considerably between project types:

- **Non-CO₂ projects**, such as industrial gas abatement, manure management, waste water treatment, landfill gas utilisation and coal mine methane capture, are characterised by a medium to high impact of CER revenues. For several of these project types, CER revenues increase the IRR by more than 10 percentage points, and for coal mine methane projects even by more than 25 percentage points. For these project types, the CER revenues clearly make a difference, which indicates a higher likelihood of additionality.

- **CO₂ projects in renewable energy** such as wind and hydro projects are characterised by a relatively low impact of CER revenues: for wind power, the IRR increases by about 2.5% to 3%, for hydropower by about 3% to 4%, and for solar by about 1% to 1.5%. According to Lütken (2012), the annual CER revenues in relation to investment costs (median) amounted to 1.84% for wind and 3.5% for hydro. Given the typical uncertainties surrounding costs and load factor in renewable projects, this level of CER contributions seems relatively low to justify that the project would not have been implemented in the absence of the CDM. Therefore, in many cases, the additionality of projects within these types may seem rather unlikely (though in some cases it may not be ruled out that additional CER revenues of +3.5% may be the decisive factor rendering a project attractive – though it may not be possible to prove this in an objective way). In addition, many renewable energy projects – in particular hydropower – show a relatively high economic performance without CER revenues (e.g. an IRR of nearly 8% for hydropower without CER revenues), compared to non-CO₂ projects (e.g. landfill gas, coal mine methane and methane avoidance with an IRR of about 2% to 4% without CER revenues).
- **CO₂ projects in fuel switch, energy efficiency, and waste heat utilisation** are typically characterised by relatively low investment costs. Thus, CER revenues are higher compared to investment costs (5% for waste heat and 20% for fuel switch – median value). The impact of CER revenues on the internal rate of return is about 3 to 8 percentage points. However, in this project type, fuel prices are the decisive element determining its profitability. Box 2-1 compares the impact of typical fuel costs and CER revenues for energy efficiency projects. Our analysis indicates that CER revenues tend to have a low impact on project profitability. In addition, these project types show a relatively good economic performance without CER revenues, compared to non-CO₂ projects.

Lütken's analysis was based on a CER price of €12. Our analysis in Table 2-3 and Spalding-Fetcher's build on PDD data with similar CER price assumptions. With today's much lower CER prices, the low impact of CER revenues on CO₂ projects and therefore their high risk of non-additionality is further aggravated.

In conclusion, non-CO₂ projects are characterised by a medium-to-high impact of CER revenues and a relatively low economic performance without CER revenues, while for most CO₂ project types the impact of CER revenues is much smaller and the performance without CER revenues higher. Overall, this indicates that on average non-CO₂ projects have a higher likelihood of additionality.

Box 2-1: An analysis of the impact of CER revenues for energy efficiency projects

Another way of assessing the relevance of CER revenues in investment decisions is to compare them to other important revenues or savings in the investment analysis. For instance, for energy efficiency projects to become profitable, they have to (i) save sufficient costs for fossil fuels and (ii) earn sufficient CERs to pay back the investment costs for new equipment improving the energy efficiency. Figure 2-1, Figure 2-2 and Figure 2-4 illustrate the order of magnitude of fuel cost savings in relation to one tonne of CO₂ reduced or CERs generated in the case of projects saving natural gas, light fuel oil and steam coal. For instance, if an installation implements new equipment that reduces the specific consumption of natural gas and the related GHG emissions by one tonne of CO₂, then the related reduction in fuel costs in 2010 would amount to approx. 150 USD/tCO₂ (at OECD average prices in 2010). For light fuel oil, the fuel cost reduction amounts to over 250 USD/tCO₂ and for steam coal, the savings still amount to 37 USD/tCO₂ (in 2010). With this, it becomes obvious that the impact of fuel cost savings on the project cash flow is much higher than contribution from CER revenues.

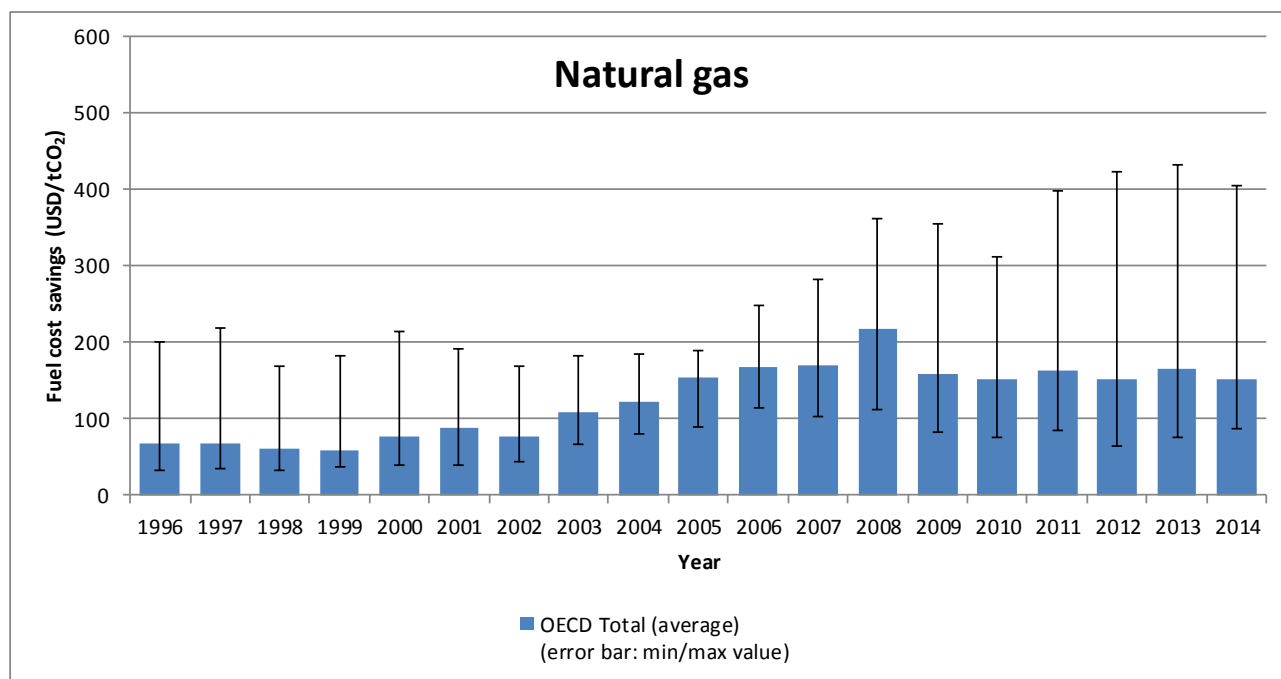
Figure 2-1, Figure 2-2 and Figure 2-4 also show the development of average (and min. and max.) OECD prices over time, which illustrates the high variability of energy prices since 1996. Average specific energy prices have fluctuated in the order of 20 USD/tCO₂ (steam coal) to 200 USD/tCO₂ (light fuel oil). Also compared to the historic fuel price variability, typical CER revenues are low to negligible compared to fuel cost savings.

Please note that because of limitations in data availability, the figures are based on fuel prices in OECD countries, which in many cases also include taxes and may not be representative for all developing countries. In particular, in some developed and developing countries fossil fuel subsidies are very high. In these cases, because of the low prices, the fuel cost savings are low and may be on a similarly low level as the contribution from CER revenues to the positive project cash flow. However, in such a low price situation, the total positive cash flow may in any case be far too small to justify investments in energy efficiency equipment and the scope for CDM may become rather limited.

Overall, it may be argued that for projects to have a high likelihood of additionality the impact of CER revenues should at least be comparable to the main contributor to a positive cash flow, the related fuel savings. This would indicate that in such project types CER prices for energy efficiency projects would need to reach a level of at least 10-20 USD/tCO₂ for steam coal, 30-50 USD/tCO₂ for natural gas and 100-200 USD/tCO₂ for light fuel oil based systems (if prices on the level of OECD countries are assumed). With such CER prices, the economic contribution from CER revenues to positive cash flow reaches a level that may be considered significant (i.e. in the order of ¼ to ½ of fuel cost savings).

At prices significantly below this level, the economic impact of CERs is insignificant and the risk of non-additionality is very high.

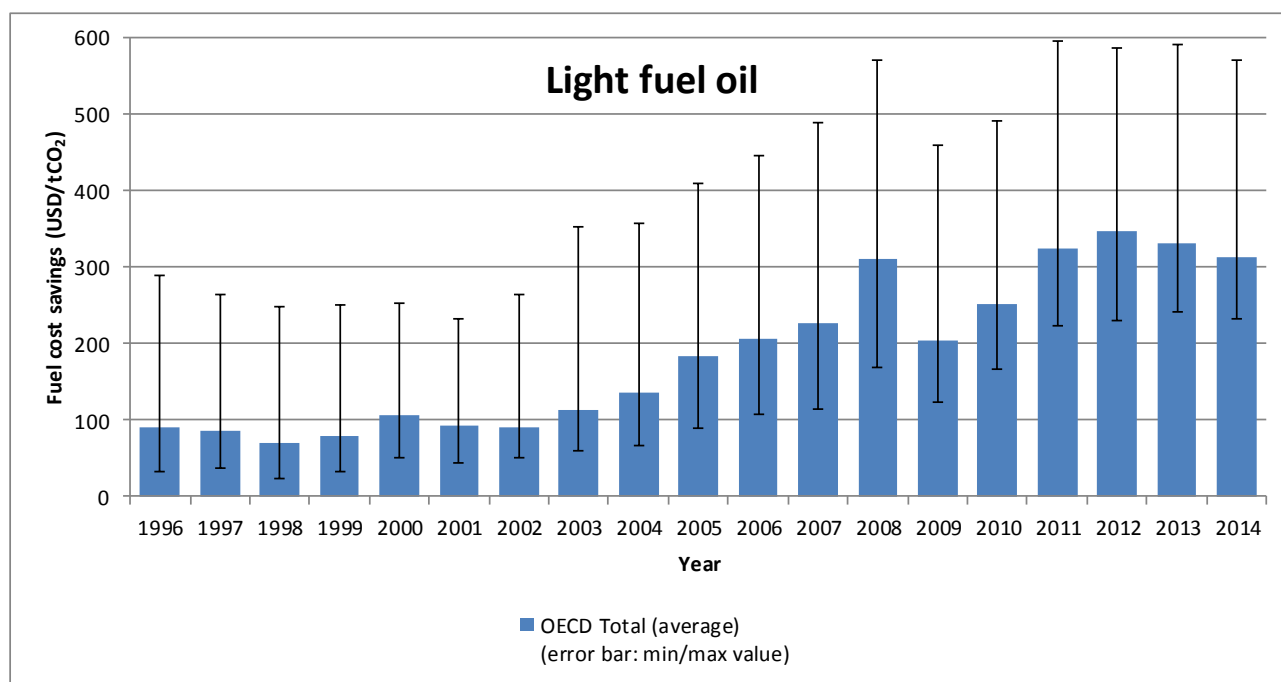
Figure 2-4: Natural gas cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

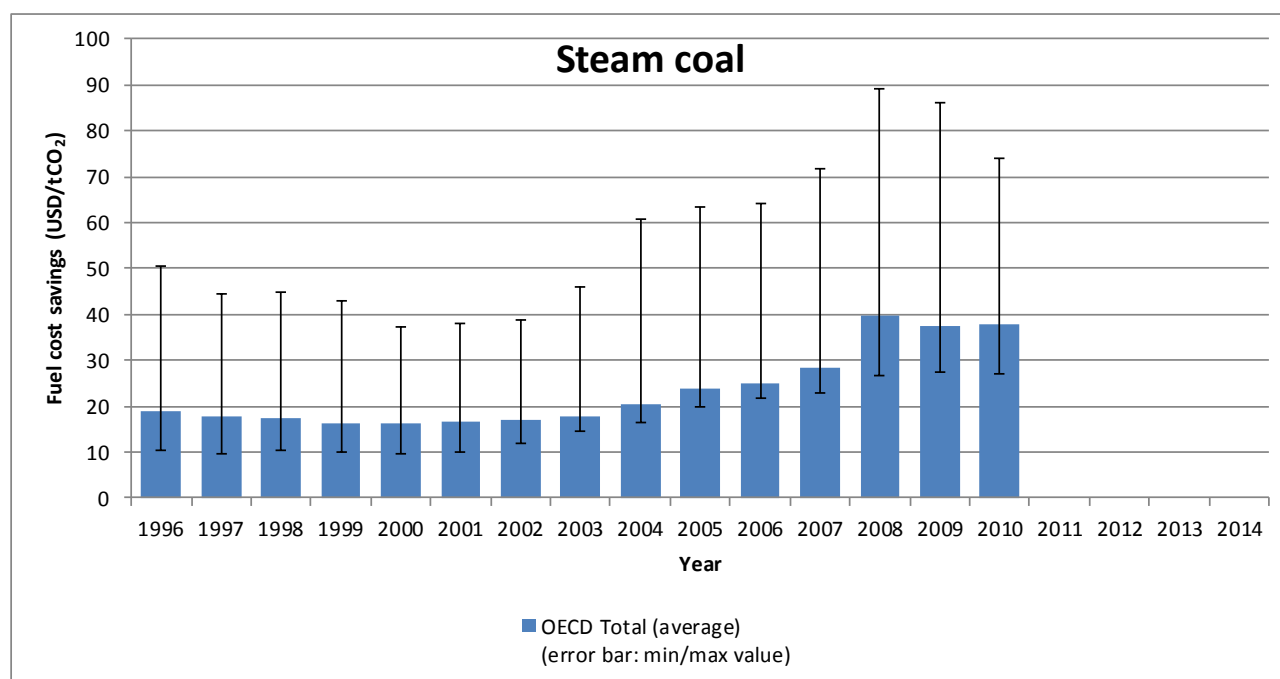
Figure 2-5: Light fuel oil cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

Figure 2-6: Steam coal cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

3. Assessment of approaches for determining additionality and rules relevant towards additionality

3.1. Prior consideration

3.1.1. Overview

Prior consideration is a key requirement in the CDM. It aims to ensure that only projects are registered in which the CDM was seriously considered when the decision to proceed with the investment was made.

In the first version of the additionality tool prepared in 2004³, a provision was introduced for projects with a crediting period starting prior to registration, which stipulated that evidence has to be provided “that the incentive from the CDM was seriously considered in the decision to proceed with the project activity” and that the “evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available to third parties at, or prior to, the start of the project activity.” The provision remained almost unchanged in the second version of the additionality tool in 2005.

In the third version of the additionality tool in 2007, the provision was removed and then included in the Guidelines for completing the PDD, which are applicable to all projects and not only those applying the additionality tool. These guidelines stipulated that “project proponents shall provide an implementation timeline of the proposed CDM project activity” and that “the timeline should include, where applicable, the date when the investment decision was made, the date when construction

³ EB 16, Annex 1: Tool for the demonstration and assessment of additionality.

works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started)". Also, according to the guidelines, "project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions"⁴.

In 2008, the CDM EB introduced general guidance on the demonstration and assessment of prior consideration⁵. The guidance was subsequently revised twice⁶, including further guidance for DOEs on how to validate real and continuing actions; in 2011 it was incorporated in the project standard (PS)⁷. According to the latest version of the project standard⁸, "if the start date of a proposed CDM project activity ... is prior to the date of publication of the PDD for the global stakeholder consultation, project participants shall demonstrate that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity". More specifically, project participants of project activities with a starting date on or after 2 August 2008 "*shall inform the host Party's designated national authority (DNA) and the secretariat of their intention to seek CDM status in accordance with the Project cycle procedure*", while "for a proposed CDM project activity with a start date before 2 August 2008 and prior to the date of publication of the PDD for global stakeholder consultation, project participants shall demonstrate that the CDM was seriously considered in the decision to implement the proposed project activity". For this purpose, "project participants shall provide evidence of their awareness of the CDM prior to the start date of the proposed project activity, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project"⁹, "*provide evidence that continuing and real actions were taken to secure CDM status for the proposed project activity in parallel with its implementation*"¹⁰ and "provide an implementation timeline of the proposed CDM project activity. The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). Project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions".

The CDM project cycle procedure¹¹ includes details about the notification process related to prior consideration (i.e. forms to be used, etc.). According to this procedure, for project activities with a start date on or after 2 August 2008, notification to the DNA of the host country and to the Secretariat must be made "within 180 days of the start date of the project activity". A list of notifications received by the Secretariat is available on the UNFCCC website.¹²

The requirements for demonstrating prior consideration set out in the project standard are generally applicable with the exception of programmes of activities (PoAs).

⁴ EB 41, Annex 12: Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM) (Version 07).

⁵ EB 41, Annex 46: Guidance on the Demonstration and Assessment of Prior Consideration of the CDM.

⁶ EB 48, Annex 61 and EB 49, Annex 22.

⁷ EB 65, Annex 5.

⁸ CDM project standard, Version 07.0, EB 79, Annex 3.

⁹ Relevant evidence could, for instance, relate to "minutes and/or notes related to the consideration of the decision by the EB of Directors, or equivalent, of the project participants, to undertake the project as a CDM project activity".

¹⁰ Relevant evidences "should include one or more of the following: contracts with consultants for CDM / PDD / methodology / standardized baseline services; draft versions of PDDs and underlying documents such as letters of authorization, and if available, letters of intent; emission reduction purchase agreement (ERPA) term sheets, ERPAs, or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds); evidence of agreements or negotiations with a DOE for validation services; submission of a new methodology or standardized baseline, or requests for clarification or revision of existing methodologies or standardized baselines to the EB; publication in a newspaper; interviews with DNA; earlier correspondence on the project with the DNA or the secretariat".

¹¹ Current version 07.0, EB 65, Annex 32.

¹² <https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>.

With regard to PoAs, the project cycle procedure includes the non-binding provision that “*the coordinating/managing entity may notify to the DNA(s) of the host Party(ies) of the PoA and the secretariat in writing of the intention to seek the CDM status for the PoA, using the [corresponding form] for the purpose of determining the start date of the PoA*”. According to the CDM project standard, the start date of a PoA is either “*the date of notification of the intention to seek the CDM status by the coordinating/managing entity to the secretariat and the DNA*” or “*the date of publication of the PoA-DD for global stakeholder consultation*”. With regard to CPAs, “*the start date of a CPA is the earliest date at which either the implementation or construction or real action of the CPA begins*” and it shall be confirmed that “*the start date of any proposed CPA is on or after the start date of the PoA*”. The only exception to this rule relates to afforestation and reforestation (A/R) PoAs, which allows “*the inclusion of any A/R project activity that started after 1 January 2000 but has not been registered as a CDM project activity as a CPA in an A/R PoA*”.¹³

3.1.2. Assessment

The issue of projects obtaining registration as CDM projects without serious consideration of the CDM benefits at the time of the investment decision was especially a concern during the first years of the CDM. The requirement to demonstrate prior consideration was only gradually introduced over time and became generally applicable only in 2007. Also, as pointed out by Schneider (2007), the requirement was also not always followed: only 36% of the projects seeking retroactive crediting provided evidence that the CDM was considered in the decision to proceed with the project and it is reported that relevant documentation has been backdated. It can, therefore, be concluded that for early CDM projects, the demonstration of prior consideration was questionable.

The approach applied as of August 2008 (i.e. for the bulk of projects and generated CERs) requires notification of the prior consideration of the CDM as well as, in situations of delay, evidence of continued interest in the CDM using a form designed for this purpose. This requirement addresses the issue of prior consideration in a more objective and appropriate manner, avoiding the risk of back-dating of company-internal information or subjective claims of prior consideration. In this regard, the rules have improved over time and there is no evident flaw in the current rules and therefore no need for the current practice to be changed.

However, it should be noted that the notification of prior consideration ensures that projects cannot claim CDM registration retroactively, but does not demonstrate whether or not a project is additional. In this regard, this rule does not provide any information on the additionality of projects since both truly additional projects and free riders may apply for the CDM status. This rule is therefore important to exclude projects which did not consider the CDM at all and are therefore clearly not additional, but it is not sufficient for assessing whether a project can be considered additional or not.

With regard to the practical implementation, a period of 180 days for notification of prior consideration can be considered quite generous. While a certain grace period is certainly reasonable due to the administrative process of making the PDDs available for global stakeholder consultation, a period of six months could mean that the project is already quite advanced, which would then call into question whether CDM benefits were actually necessary for the project to proceed. A long grace period could therefore be regarded as allowing retroactive crediting.

The requirements regarding the start date of PoAs and CPAs are sufficiently strict to avoid any project activity that has already started being registered as CPAs under a PoA. The only rule that cannot be considered adequate relates to the inclusion of old A/R activities in a newly registered

¹³ Clarification "Start date and crediting period of component project activities under an afforestation and reforestation programme of activities", EB 73, Annex 16.

A/R PoA (see above). For these A/R activities, CDM rules do not require demonstrating prior consideration of the CDM.

3.1.3. Summary of findings

There is no evident flaw in the general design of this rule with the exception of the inclusion of old A/R activities in a newly registered A/R PoA. Also, as outlined above, the time frame for notification of prior consideration appears to be quite generous.

3.1.4. Recommendations for reform of CDM rules

The only rule that needs to be changed relates to the inclusion of old A/R activities in a newly registered A/R PoA (see above). It is therefore recommended that the corresponding rule be withdrawn.

Furthermore, it is recommended that the time frame for notification of prior consideration be shortened in order to reduce the risk that projects apply for the CDM having only learned of the possibility after the project has started. The grace period for notification to the secretariat should therefore be reduced in general, e.g. to a maximum of 30 days after the project start.

3.2. Investment analysis

3.2.1. Overview

The CDM's *additionality tool* requires demonstration that a prospective project is either not financially viable without the CDM (using investment analysis) or that there is at least one barrier preventing the proposed project without the CDM (using barrier analysis). Though both methods are common (and some projects use both), investment analysis is the most widely used, by over three-quarters of all projects and over 90% of the renewable energy (especially hydro and wind) projects that are expected to dominate future CER supplies (Spalding-Fecher & Michaelowa 2013). Investment analysis (or a variation of it) is also used in the *combined tool* and in some CDM baseline and monitoring methodologies that refer neither to the *additionality tool* nor to the *combined tool* for demonstrating additionality.

The additionality tool provides three alternative options for conducting investment analysis:

- For projects with costs but no revenues (other than CERs), a **simple cost analysis** can be used to demonstrate that at least one scenario (other than the project) is less costly. This approach is quite common for a few project types (e.g. projects that capture N₂O from adipic acid plants, or methane from landfills), but it is not common overall.
- The **investment comparison analysis** compares the economic attractiveness of the project without revenues from CERs to other investment alternatives that provide similar outputs or services; this approach is common for just a few project types (e.g. higher-efficiency fossil power), and is not common overall.
- The **benchmark analysis** is used to demonstrate that a proposed project is, without revenues from CERs, economically not attractive (i.e. it does not meet a stated financial benchmark); this approach is, by far, the most common form of investment analysis.

In all cases, investment analysis relies on the premise that, if a project is not a better investment (or less costly) than an alternative or a financial benchmark, then it would not have proceeded but for the existence of the CDM. Exactly how the CDM causes it to proceed, whether through CER revenue or otherwise, does not need to be specified.

The approach to investment analysis has also been refined over time. In particular, in 2008 the CDM EB adopted “Guidelines on the assessment of investment analysis”, which aimed to provide further clarity and reduce ambiguity by, for example, clarifying how to calculate the common financial benchmarks net present value (NPV) and internal rate of return (IRR) and suggested ranges for conducting sensitivity analysis in these parameters. In 2011, this guidance was further revised to introduce default values for the expected return on equity for different project types and host countries, which can (but are not required to) be used by project developers as benchmarks for the benchmark analysis.

3.2.2. Assessment

The expected financial performance of a project is clearly one important factor in determining whether or not it will proceed (see further discussion of this in Section 2.3). For example, unless mandated by an (enforced) government policy, there is little reason for projects with no revenue (other than CER values) to proceed, simplifying the assessment of additionality.

For projects that do collect revenue other than CER values, such as by selling electricity, the CDM rules seek to determine whether the project would not have been financially attractive (and therefore not have proceeded) without the CDM. Researchers have raised several critiques of this approach, which we address in this report under two broad themes.

The first is perhaps the most fundamental, and is whether investment analysis is appropriate for investments that may be driven largely by other (non-economic) factors. This critique asserts that many investments in common CDM activities – e.g. power generation – are undertaken for a host of political, social, and strategic reasons that extend beyond simple project-level economics and may not be designed to maximise economic return. Such critics argue that a market-based test such as investment analysis is not applicable in what is largely a non-market environment, perhaps especially so in centrally planned countries such as China (He & Morse 2010). For example, Bogner & Schneider (2011) and Haya & Parekh (2011) have argued that governments have already subsidized and developed large hydroelectricity projects in developing countries well before the CDM, making them financially viable and therefore raising questions about the extent to which investment analysis can credibly determine that they would not proceed but for the incentive provided by the CDM. For investment analysis to function properly – indeed, for any additionality test to function properly – it must be able to demonstrate, with high confidence, that the CDM was the deciding factor for the project investment. For project types that are routinely constructed outside the CDM, including (but not exclusively) for broader economic, energy security, or political reasons, it remains highly difficult to determine with confidence that, in any particular case, a project’s financial returns are the reason it is not proceeding and that the financial incentive provided by the CDM is the reason for it proceeding (Dechezleprêtre et al. 2014).

Table 4-5 provides an example of how the decision of selecting a certain fuel (coal, fuel oil or natural gas) may depend on many factors that are not only insufficiently covered in an investment analysis, such as level of initial investment or flexibility in operation that may lead, for example, in investment in a natural-gas-fired boiler rather than a coal-based one, even though natural gas may be more costly than coal in terms of direct costs.

The second critique is concerned with transparency, subjectivity, and information asymmetry, such as whether project developers provide sufficient and credible information to allow replication of their calculations and justification of their conclusions, as well as the inherent information asymmetry between project developers and those, especially the CDM EB, tasked with reviewing the information. For example, early research found that project developers regularly provided investment analyzes that were opaque, relied on proprietary company information, or were incomplete (Schneider 2009).

This analysis takes a new look at several aspects of this second critique, including:

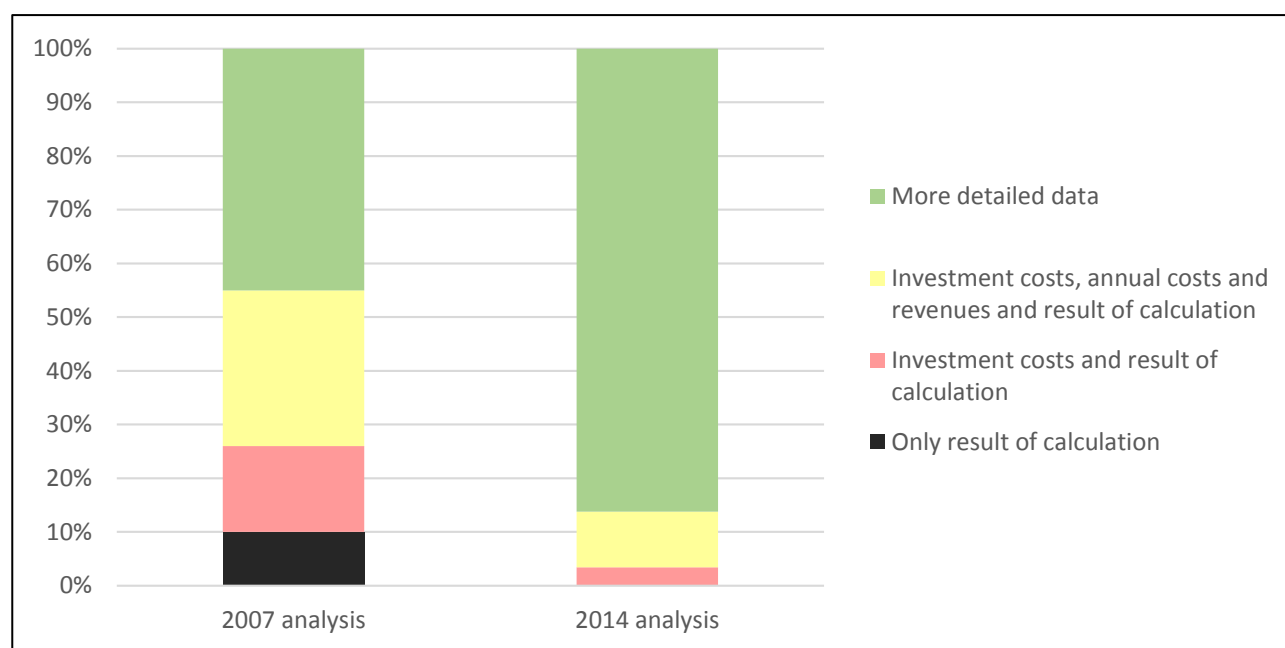
- Transparency, by re-visiting the prior work of Schneider (2009) to gauge how transparently developers conduct the investment analysis.
- Subjectivity and asymmetry, with a new exploration of benchmark rates and CER prices.

These two broad topics are addressed in turn below.

Transparency

To explore transparency in investment analyzes, Figure 3-1 updates the analysis of Schneider (2009) who reviewed a randomly selected group of PDDs for the level of information provided. In our updated analysis, 29 registered projects using the investment analysis were selected at random.¹⁴ Over 90% of the projects selected were registered after 2007, the year of Schneider's prior analysis, so this sample can indicate how practices have changed. In particular, over 80% of the 29 projects in this new analysis provided detailed input data to support their calculations of capital and operating costs and revenues, compared to 2007, when fewer than half did. Furthermore, no projects provided only the result of their calculation in this analysis, with no input data to support their findings. These findings suggest that investment analysis has become more transparent.

Figure 3-1: Level of information provided in PDDs on the investment analysis



Notes: 2007: n=31, 2014: n=29.

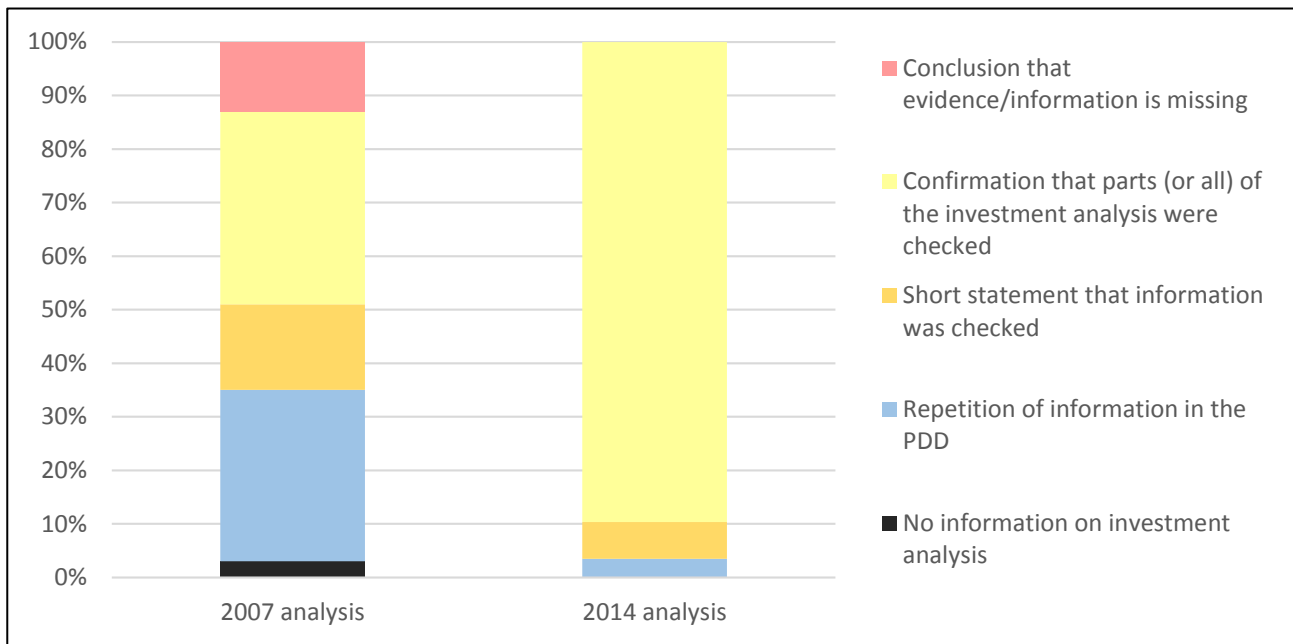
Sources: Schneider (2009), authors' own calculations

Validation reports that review the investment analyzes also appear to have become more thorough. Figure 3-2 also returns to Schneider's prior analysis to update it based on the same randomly selected group of projects as in Figure 3-1. As seen in Figure 3-2, more than 80% of the validation reports confirm that validators checked some or all of the key assumptions of the investment analyzes. The validation reports often review each of several of the most critical investment analy-

¹⁴ According to the sampling design, 30 projects using investment analysis were to be selected. Upon further examination, one of the thirty projects selected, a small-scale, run-of-river hydropower plant, had demonstrated additionality using other methods, as outlined in the "Guidelines for Demonstration Additionality of microscale project activities" and so was not considered in this analysis.

sis inputs and describe that the inputs are reasonable, in many cases citing contract or other documents reviewed to support the choice of inputs.

Figure 3-2: Information in validation reports on the investment analysis



Notes: 2007: n=31, 2014: n=29.
Sources: Schneider (2009), authors' own calculations

Subjectivity and information asymmetry

Despite the findings above, transparency and validator review of the input parameters do not remove subjectivity or choice of alternate input parameters in different contexts. For example, in some cases, project proponents have used different values for key input parameters when submitting applications to financial institutions (Haya 2009), suggesting that the metrics used (and choice of inputs therein) and reliability of such may vary. Indeed, project developers will always have much more information on the project's local conditions – including costs and technical parameters – than will outside parties, whether validators or CDM administrators, and therefore have an incentive to provide biased or inaccurate information to increase the chance of a successful additionality determination and, therefore, the eventual awarding of credits to their project (Gillenwater 2011). This phenomenon is widely referred to as *'information asymmetry'*. As shown above, validators do have more information at their disposal now than in the past, but still lack an objective basis for determining that the investment would not have been undertaken and that inputs provided are the same as they would have been had CDM credits not been sought. Small changes in a number of input parameters – even if individually well within the range of other similar projects (CDM or not), could lead to significant changes in the overall stated financial return of the project. Interestingly, under the CDM, project participants do not need to provide any confirmation that they are submitting truthful information. Some project developers reported that different versions of investment analysis were used for CDM purposes and for the purpose of securing other funding for a project (e.g. loans). Other crediting mechanisms, such as the VCS and CAR, require declaration or attestations from project developers that all information is accurate and presents the truth. To explore further the issue of subjectivity and information asymmetry in input parameters, we take a deeper look at two particular inputs: benchmark rates and CER prices.

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

Closer examination of benchmark rates

This critique concerns appropriate levels for financial benchmarks (e.g., IRR) (Michaelowa 2009). To explore this question, we reviewed data on IRR benchmarks used by wind, hydro, biomass, and waste gas or heat projects in China, wind and hydro projects in India, and hydropower projects in Vietnam.¹⁵

Nearly all projects in China use standard, government-issued IRR benchmarks. By far the most common benchmark used is 8%, which is applied for most power projects, and derives from a 2002/2003 Chinese government source, *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. Other common benchmarks based on government rules include 10% for small hydro projects, and 12-13% for waste gas/heat projects.

Table 3-1: Summary of most common benchmark rates used in IRR analysis in Chinese CDM projects

Project type	Common IRR benchmark	Fraction of projects using this benchmark	Source of this benchmark
Wind	8.0%	99%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	10.0%	71%	Government's <i>Economic Evaluation Code for Small Hydro-power Projects</i> (1995)
Hydro	8.0%	29%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	12.0%	30%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
Waste gas / heat	8.0%	98%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	13.0%	17%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
	18.0%	16%	Conch Cement Company internal WACC

Notes: In this table, and throughout this section, we report IRR benchmarks and values based on analysis of IGES's investment analysis database. We believe that most of the benchmarks, and values reported in the database, are in real terms, based on a review of a small number of PDDs and the assumption in the CDM's Guidelines on the Assessment of Investment Analysis that is conducted in real terms. We make no attempt to identify or convert values in the database that may be in nominal terms.

Sources: IGES 2014, authors' own calculations

Despite the ubiquity of the 8% government-set threshold in China, it is not clear how or why it matches the internal thresholds used by actual project inventors, who may themselves demand returns either higher or lower. (For example, benchmarks for wind power projects in India, where they are determined to a greater extent by investor hurdle rates, are more variable and, on average, higher). For this reason, it is not clear why 8% is the 'correct' benchmark for a test intended to gauge the attractiveness of an investment. Furthermore, it is not clear why common benchmarks used for hydro or waste gas are higher (10% or at least 12%, respectively), and whether these

¹⁵ These project type / country combinations were selected because each of them represents at least 1% of the registered projects in the CDM that use investment analysis (IGES 2012). Though this 1% threshold is arbitrary, it provided us with a basis for focusing the analysis.

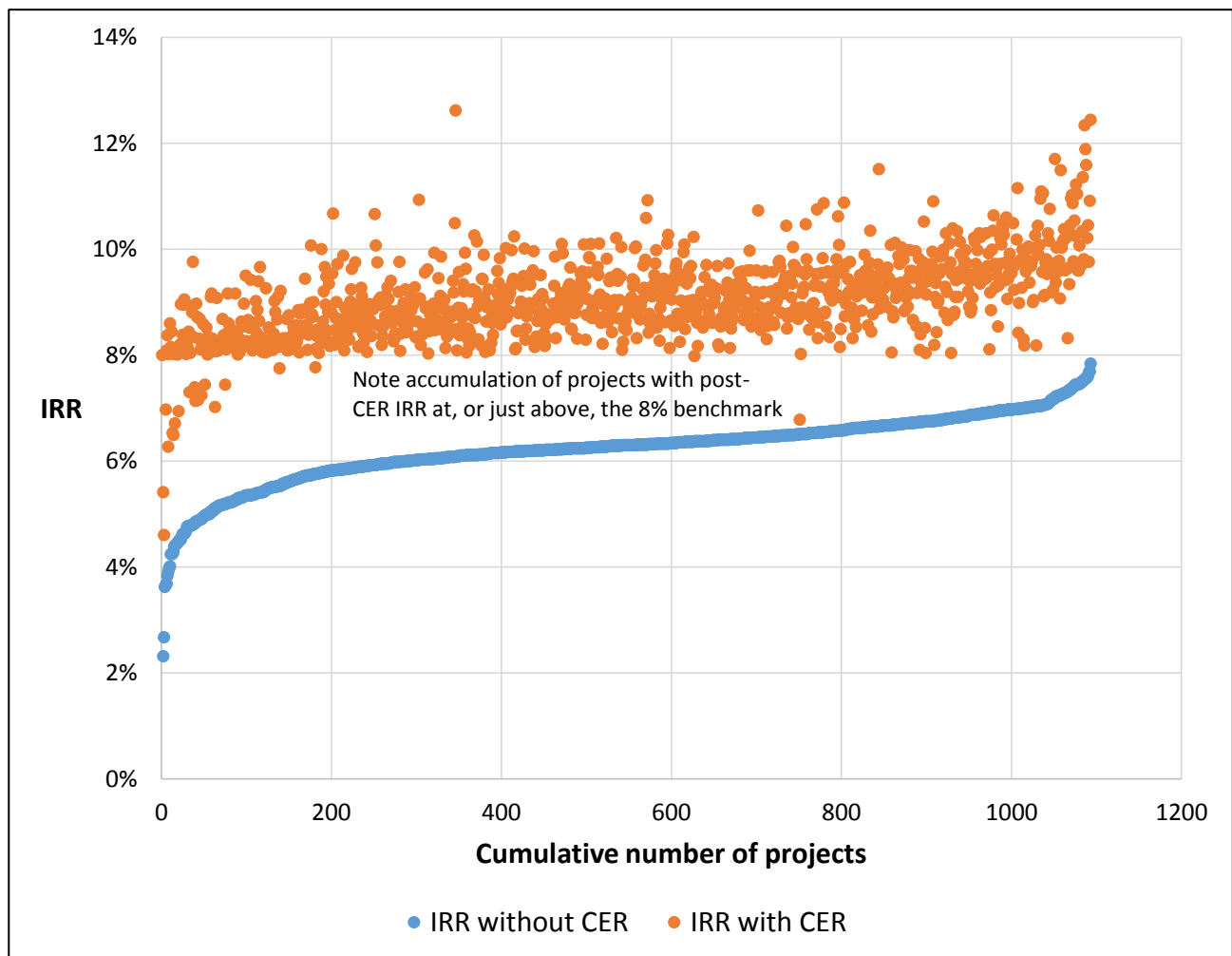
rates accurately capture the risk and expected financial returns in these types of projects. Further analysis of this issue may be warranted, e.g. by comparing it with other sources of equity rates for different investments in China or for similar projects in other countries. A source of such data for projects within China was not immediately known, however.

In principal, the logic of investment analysis is that the project would not have proceeded but for the financial incentive provided by the CDM. That financial incentive is the value of CERs. Many project developers conduct an analysis to show that, at assumed CER prices, the financial return of the project is expected to clear the financial benchmark used. However, this is not actually required by the additionality tool. (In the first versions of additionality, a step 5 'impact of the CDM' was included, which was interpreted by many project developers as an obligation to show that the project is made economically attractive through the CDM. This was later removed).

The above discussion investigated benchmarks used in China, with special attention paid to the widely used 8% benchmark. Because of its ubiquity, this 8% benchmark provides an opportunity to investigate the extent to which CER values indeed bring about expected project returns above this value and therefore, in the logic of the investment analysis, enable the project to proceed. As stated above, though projects are not required to actually show that CER values would push the project above its stated threshold, most do report results of expected return.

The following chart (Figure 3-3) shows the stated IRRs before and after CERs for all wind projects in China that use a benchmark of 8%. As seen in the figure, most of these projects state an IRR without CERs of between 6% and 7%, and an IRR after CER value of 8% to 10%. Note in particular the sharp line at 8%, at which very few projects claim an after-CER IRR of just under 8%, but a large number of projects find a post-CER IRR of just barely more than 8%.

Figure 3-3: Stated IRRs of Chinese wind projects using a benchmark of 8% before and after assumed CER value



Sources: IGES 2014, authors' own calculations

In principle, one explanation for this distribution is that projects in which the 8% threshold is not reached with CER revenues are not implemented, do not apply for CDM registration, and are therefore not represented in this graph. The fact that so many projects just barely meet the 8% threshold (even though they are not required to do so), and so few do not meet it, may instead indicate, however, that project developers are eager to claim that the CER value has allowed the project to clear the benchmark rate.

In contrast to the situation in China where standard government benchmarks are provided, most projects in India use internal, company-specific required rates of return as their IRR benchmarks. However, as in China, the CER value tends to provide a similar increase in expected return (e.g., an increase in IRR of two to three percentage points), just clearing the stated benchmark.

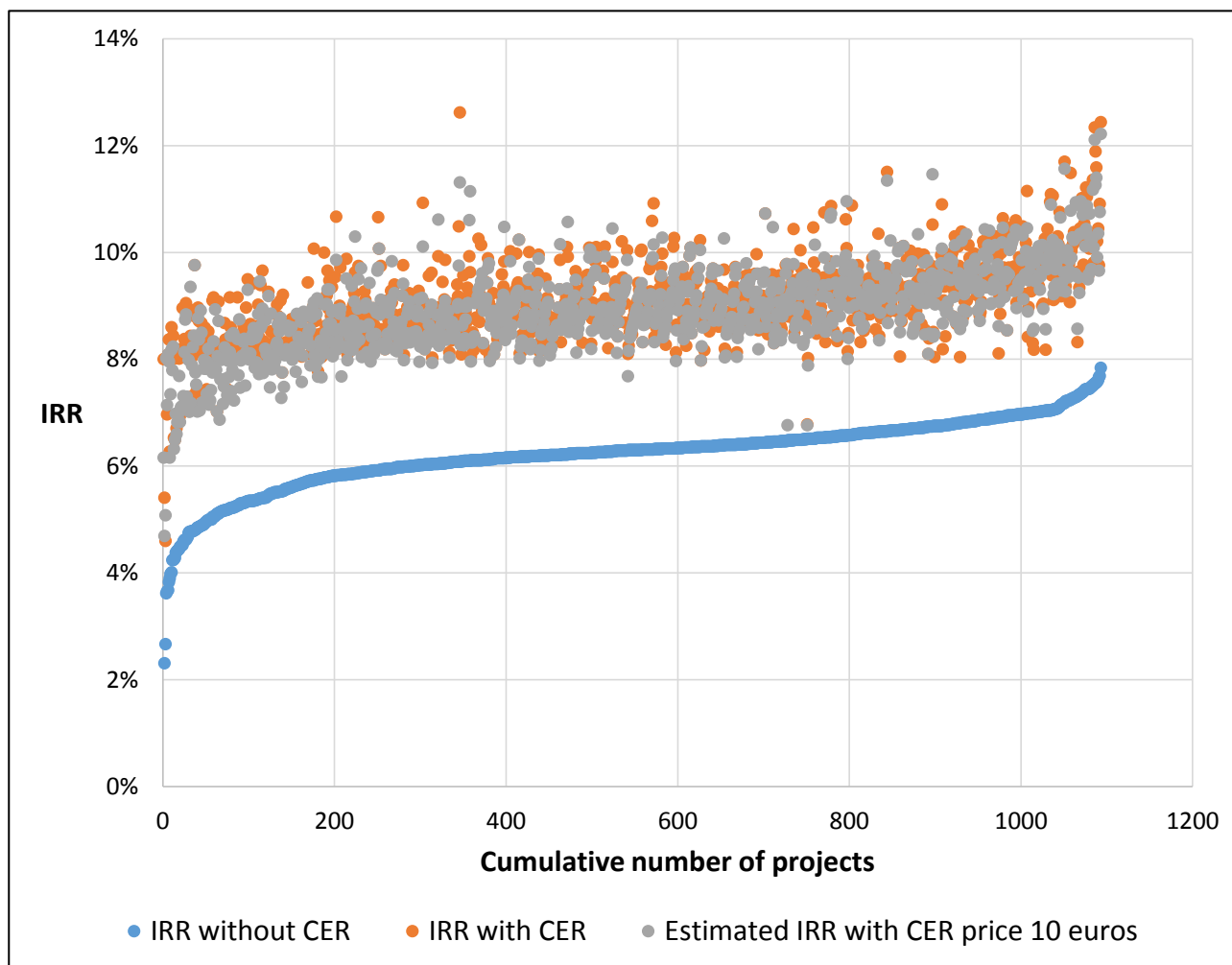
To demonstrate that projects just clear the benchmarks, project developers could select project input parameters so that the benchmark is achieved. These parameters could include CER price, load factor, electricity tariff, or a number of other inputs required in calculating an IRR.

One such parameter that could be adjusted is the expected CER price, which rose consistently through mid-2008, then fell precipitously, and for which forecasts have varied widely since, providing a potentially broad scope for selecting possible future CER prices.

Closer examination of selection of the CER price

To explore the potential effect of the CER price in more detail, Figure 3-4 adjusts the post-CER values stated in the PDDs (as displayed in Figure 3-3) to use a common CER value of €10 for all projects. (€10 is the median value used across all registered projects.) In this example, a large number of projects no longer meet the 8% benchmark. In particular, about 70 projects with pre-CER IRRs of 4% to 6% used CER prices as high as €17 in order to claim they would meet the 8% benchmark. Though this represents just a small share (about 1%) of wind power projects in China, it strongly suggests that input parameters (CER values) have been chosen to achieve the desired result of the 8% government-set IRR benchmark.

Figure 3-4: Estimated IRRs of Chinese wind projects using a benchmark of 8% before and after CER value of €10



Sources: IGES 2014, authors' own calculations

Similar to the situation for Chinese wind power projects discussed above, a number of Indian wind projects that claimed that CER values (median price assumed: €14) would lead them to exceed their benchmark would not have been able to claim that their benchmarks are met if they had used

a lower, and more common, CER price of €10. This suggests that, as found in the case of wind power projects in China, project developers in some instances may select CER values that depart from values used by their peers in order to claim that CDM revenues will make the projects financially attractive.

A similar pattern emerges for hydropower projects in Vietnam, where benchmarks (averaging 13.1%) were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate.¹⁶ Of the projects analyzed¹⁷, over half of the hydro projects would not have met their benchmarks if they had used a CER price of €10 instead of higher prices (median price assumed: €15.5, and as high as €30, in contrast to the remainder of Vietnamese hydro projects with median price assumed of €10). As above, while this is not definitive evidence of gaming, it suggests that project developers tend to invoke higher CER prices than their peers when needed to claim that their projects become economically viable under the CDM.

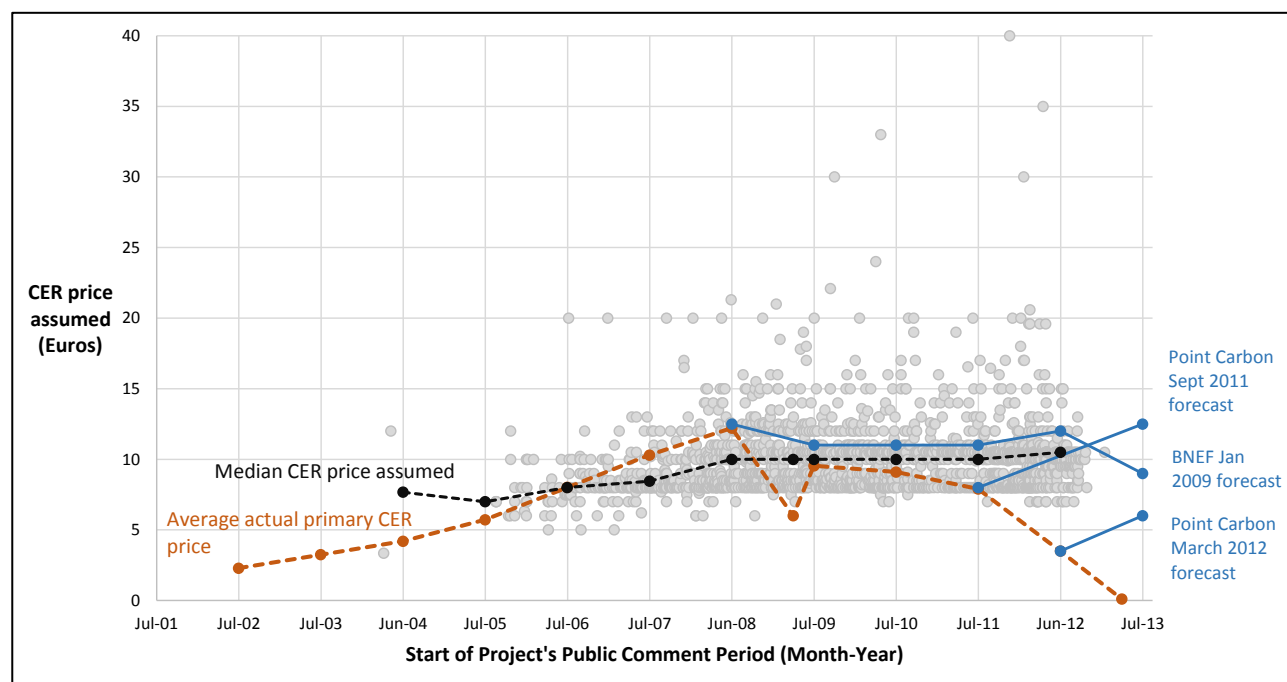
This raises the question of the plausibility of CER prices used by project developers. Looking at all registered projects (Figure 3-5), it appears that the CER prices used by project developers, though highly variable, tended to track then-current primary CER prices, through 2010, when CER prices began a steady decline. Project developers did not then use lower prices, but neither did industry analysts, who forecasted that higher prices would return.

These trends therefore display little evidence that project developers have systematically over- or under-estimated expected CER prices, at least as judged by the median (black line) values. However, the distribution of prices around that median displays a skew wherein a small fraction of projects use very high prices, perhaps because, as shown above, such high prices may be needed to demonstrate that these projects have met benchmarks.

¹⁶ In Vietnam, the median IRR benchmark used by projects in Vietnam was 13.1%, and most benchmarks were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate. The default expected return on equity for power projects in Vietnam, per the CDM's *Guidelines on the Assessment of Investment Analysis*, is 12.75%; 60% of power projects in Vietnam use an IRR benchmark higher than this rate; 5% have an IRR without a CER value exceeding this.

¹⁷ From the IGES investment analysis database, all hydro projects in Vietnam were selected that reported CER price assumptions in € as well as pre- and post-CER IRR values.

Figure 3-5: CER prices – assumed and estimated



Notes: CER prices assumed by project developers (grey dots) have been relatively consistent with industry forecasts made at the time (blue lines), even though they have been higher than market prices (orange line) since 2008.

Sources: IGES 2014, Point Carbon 2011, Point Carbon 2012

Sensitivity analysis: can it help address subjectivity?

The CDM addresses the subjectivity of input parameters, in part, through the use of sensitivity analysis required in investment analysis. As specified in the *Guidelines on the assessment of investment analysis*, “variables...that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation ... and the results of this variation should be presented.” However, the guidelines do not require that parameters be varied simultaneously, and few project developers do so. For example, in calculating project IRRs (in the PDDs), no project developer of the 30 randomly selected projects assessed the possibility that more than one of the key input variables could vary simultaneously. Furthermore, nearly all claim that even the standard variations of as much as 10% in the individual parameters are implausible, despite evidence (as presented here) that variation in the input values used is quite common. Accordingly, because the possibility that individual parameters could vary widely is discounted, and the possibility that multiple inputs could vary is not considered, the sensitivity analysis as currently applied is not sufficient to address the subjectivity in these parameters.

3.2.3. Summary of findings

Investment analysis is designed to determine whether a project would be uneconomical or less attractive than an alternative in the absence of the CDM. The premise is that if the project is not economical (most often as compared to a particular investment threshold), it would not have proceeded. From a strictly financial perspective, this may well be the case. However, researchers have pointed out that several types of projects in the CDM – especially large power projects that dominate the CDM pipeline – are pursued for reasons that extend beyond simple financial return, particularly in the largely non-market regulatory environments that are found in some of the largest CDM countries. This may be the most fundamental critique of investment analysis, and yet it is also the most analytically challenging to prove or disprove. Projects may proceed for a variety of

factors – economic, strategic, and social – that defy attempts to attribute the viability, or failure, to any one factor. Complicated statistical tests have been proposed – and some statistical research has been attempted – but few compelling approaches have yet emerged.

This research has further explored the issues of information asymmetry, transparency, and subjectivity of input assumptions. Regarding information asymmetry, project developers have considerably more information about their own project than do those – likely including validators – that are charged with reviewing and assessing their additionality. Regarding transparency, this research finds that, since 2007, the transparency of both project design documents and validator assessments has increased markedly, such that the strong majority of projects now include detailed information on input assumptions that their investment analysis could be replicated.

In some cases, there is little reason to question the validity of these input assumptions, as they are based on contract documents (e.g. with equipment providers that would seem to reflect actual prices paid). In other cases, the input assumptions are highly subjective, as in estimates of future fuel prices (e.g. for biomass), electricity tariffs that may be adjusted, or CER prices. In particular, this research has identified dozens of cases in China, India, and Vietnam in which it appears that project developers have used CER prices higher (in some cases, much higher) than their peers in order to claim that the CDM would make their project exceed the chosen financial benchmark. This demonstrates how eager some project developers may be to select input values to give results that would give the appearance of additionality.

3.2.4. Recommendations for reform of CDM rules

As stated above, for an additionality test to function properly, it must be able to demonstrate with high confidence that the CDM was the deciding factor in project implementation. This analysis has demonstrated that the subjective nature of the investment analysis limits its ability to provide that confidence. It is possible that improvements could decrease this subjectivity, such as by applying more complicated tests to assess the true motivations and financial performance of the project. Still, doubts may remain, especially for project types for which the financial impact of CERs is insufficiently large relative to variations in other potential inputs to provide a strong ‘signal-to-noise’ ratio, such as for large power projects. CDM administrators may therefore want to consider whether certain project types, if they cannot be confidently deemed additional by other tests (e.g. barrier analysis, common practice analysis, as in the next sections of this report), might be phased out of the CDM. If the investment analysis continues to be applied, we recommend further improving the guidance to reduce subjectivity. CDM rules could also require formal declarations by the project participants that information is true and accurate. Such declarations may discourage project participants from providing false information, as a violation of such a declaration may have consequences under national legislation. An even stronger form could be a declaration in lieu of an oath.

3.3. First of its kind and common practice analysis

3.3.1. Overview

The CDM uses two approaches to assess additionality based on the market penetration of technologies: the first-of-its-kind approach and the common practice analysis. Under the first-of-its-kind approach, a project is deemed automatically additional if certain conditions apply. The common practice analysis often complements the investment or barrier analysis. It requires an assessment of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. It is a credibility check to demonstrate that a project is not common practice in the region or country in which it is implemented. The common practice analysis can also be used to demonstrate that the baseline technology or practice is frequently implemented and is hence a realistic scenario. The common practice analysis is only relevant for large-scale

projects. Small-scale projects are entitled to use simplified modalities and procedures for small-scale CDM project activities, which do not require common practice analysis.

The first-of-its-kind approach was initially applied as part of the barrier analysis; it was sometimes also referred to as the barrier of lack of ‘prevailing practice’. In 2011, the EB adopted guidelines specifying how first-of-its-kind should be demonstrated. The guidelines were further revised in 2012 and reclassified as a tool in 2015.¹⁸ Showing that a project is the first-of-its-kind is the first step in the additionality tool and combined tool, which stipulate that if a project is the first-of-its-kind, it is considered additional. The steps to be followed for demonstrating first-of-its-kind are further specified in the corresponding guidelines and, since 2015, the methodological tool. According to version 03.0 of the tool, a project activity is “first of its kind in the applicable geographical area” if

- “the project is the first in the applicable geographical area that applies a technology that is different from technologies that are implemented by any other project” with the same output and that “have started commercial operation in the applicable geographical area before” the PDD “is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier”, if
- “the project implements one or more of the measures” and
- “the project participants selected a crediting period for the project activity that is “a maximum of 10 years with no option of renewal”.

The common practice test was first introduced in the additionality tool in 2004 to complement the investment and barrier analyzes, as a safeguard to ensure the environmental integrity of the CDM. In a first step, other previous or current projects which are similar to the project activity were analyzed. Projects were considered similar “if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.” Other CDM projects were excluded from this analysis. In case similar activities were identified, it was necessary to justify why these exist, while the project activity is considered to be financially unattractive or as facing barriers. ‘Essential distinctions’ had to be identified which may for instance be due to the fact that new barriers have arisen or promotional policies have ended.

For both the first-of-its-kind approach and the common practice analysis, the key issues are defining what is regarded as a comparable technology, what the appropriate geographical scale is and what threshold should be used for a technology to be regarded as first-of-its-kind or common practice. Critics pointed out that no clear definitions of when a project activity should be regarded as common practice were given in the early versions of the additionality tool (Schneider 2009). Another criticism was that the common practice test allows project developers to claim that a frequently implemented project type is not deemed common practice if they can justify ‘essential distinctions’ from other projects. Yet the key terms ‘similar’ and ‘essentially distinct’ were defined so vaguely that any project could be argued to be not common practice, simply by defining ‘similar’ very narrowly or ‘distinct’ very broadly (Schneider 2009; Spalding-Fecher et al. 2012).

The requirements for the common practice analysis in the additionality tool remained largely unchanged until September 2011 when the “Guidelines on Common Practice” were introduced, incorporating elements from the additionality tool and providing additional guidance¹⁹. In parallel to the revision of the “Guidelines on first-of-its-kind”, the “Guidelines on Common Practice” were further revised in 2012 and reclassified as a tool in 2015.

¹⁸ Methodological tool. Additionality of first-of-its-kind project activities (version 03.0).

¹⁹ The new requirements of the Guidelines on Common Practice were then also incorporated in the additionality tool in the same year.

Both guidelines or tools are applicable to four GHG reduction activities, namely, “fuel and feedstock switch, switch of technology with or without change of energy source (including energy efficiency improvement), methane destruction” and “methane formation avoidance”²⁰. Both also use similar approaches for defining similar or different technologies and the appropriate geographical area.

In the 2011 version of the common practice guidelines, the first step was to calculate the applicable output range as +/-50% of the capacity of the project activity. In the next step, all existing plants in the geographical area within this capacity range needed to be identified (with the exception of registered CDM projects). The default applicable geographical area was the entire host country. If the technology was not country-specific, the geographical area should be extended to other countries. If projects differ significantly between locations, the geographical area could also be smaller than the host country. In the next step, among the identified projects, those with different technologies from the project activity were identified. A technology was considered different if it has a different energy source/fuel, feedstock, installation size (micro, small, large), investment climate at the time of the investment decision²¹ or other features.²² Eventually, if the share of plants using similar technology as in the project activity in all plants with the same capacity as the project activity is greater than 20% and if the absolute number of projects using a similar technology is larger than three, then the project activity is considered common practice.

In revising the Guidelines on Common Practice in September 2012, the rules and definitions were further clarified. It is now mandatory to provide a justification for using a geographical area smaller than the entire host country (e.g. province, region). The reference to extending the geographical area was removed from the guidelines. The exclusion of CDM activities was broadened to include registered projects, those requesting registration and those at validation. Furthermore, several definitions and the step-wise approach were better explained (without change in substance). Minor changes to the common practice analysis were made in subsequent versions of the additionality tool.

The definition of different technologies in the first-of-its-kind approach corresponds to the common practice analysis, with the exception that investment climate at the time of the investment decision and other features are not included.

3.3.2. Assessment

The general strength of using market penetration approaches for assessing additionality is that they do not assess the motivation or intent of project developers, but provide a more objective approach to evaluating additionality, based on the extent to which the project activity is already being implemented in the host country or region (Schneider 2009).

The initial criticism of the lack of clear definitions of similar projects and essential distinctions for common practice was addressed by the introduction and further refinement of the common practice guidelines, which clearly outline steps to follow and provide a definition of terms for a common understanding between project developers. Especially, the introduction of a threshold for common practice (20% and at least three similar projects) constitutes a significant improvement since it requires a quantitative assessment against a clear threshold. Clarity about the rules related to common practice analysis has therefore improved considerably over time. Also, from the sampled projects, it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs.

²⁰ For other types of GHG reduction activities, the more general rules of the additionality tool continue to apply.

²¹ “Inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations.”

²² Such as a difference in unit cost of output by at least 20%.

However, several unresolved issues still exist. In the following, different aspects of the common practice analysis and the first-of-its-kind approach are discussed and assessed. The assessment is based on an analysis of the common practice provisions and on the findings of an empirical evaluation of 30 representatively selected projects (i.e. the review of PDDs and validation reports) (Section 2.2).²³

When defining similar projects in the common practice tool, the applicable output range is defined as “+/-50% of the design output or capacity of the proposed project activity”. This definition does not always reflect the scales of a technology, between which meaningful technological differences occur. For instance, in the case of a power plant with a size of 400 MW, power plants between 200 MW and 600 MW would need to be considered in the analysis. However, there may be smaller (e.g. 100 MW) or larger (e.g. 800 MW) power plants which still feature similar technical, economic characteristics (e.g. efficiency), a similar regulatory environment, or which are used in a similar manner (e.g. provision of electricity to the public grid). At the same time, a small power plant (e.g. 5 MW), may be significantly different in terms of technology or use. Also, when several plants are grouped to form a project (e.g. wind farm consisting of several wind generators), an output of +/-50% may be misleading. For instance, for a wind farm with 20 wind generators of 1 MW capacity, the output range would be 10 to 30 MW. However, a smaller wind farm with only 10 wind generators of 1 MW capacity has similar characteristics since the wind generator is identical. For wind power, the test may provide more meaningful results if there was no scale at all since wind parks are usually composed of different wind generators of the same size. However, small internal combustion engines may well differ, from a technological perspective, from a large combined cycle power plant. In conclusion, the definition in the common practice guidelines (+/- 50%) does not allow for a meaningful classification of scale for different technology types. This definition can therefore be considered arbitrary and may lead to the erroneous exclusion of similar plants from the analysis. In contrast to the common practice tool, the first-of-its-kind tool does not use an output range to define similar technologies. This approach seems more appropriate.

When identifying similar projects, the common practice tool excludes CDM projects (registered, submitted for registration or undergoing validation) from the analysis. In the empirical analysis, of the 30 sampled projects, only three identified similar non-CDM projects. All other projects only identified projects under the CDM. A commonly used rationale (i.e. used by 9 of the 30 projects) is that, because all other comparable facilities are either CDM projects or are awaiting registration as CDM projects, the proposed project would also be non-viable without the CDM (i.e. not common practice). However, it could be argued that the general viability of projects is assessed as part of the barriers and/or investment analyzes and should therefore not be used as a pre-emptive argument for excluding CDM projects from the common practice analysis. The exclusion of CDM projects from the common practice analysis is particularly problematic if most or all new facilities in a sector use the CDM. For example, if all new wind power plants in a country register under the CDM, wind power could never become common practice, even if it reached a market share of more than 50% and was highly economically attractive. In contrast to the common practice tool, the first-of-its-kind tool does not have provisions to exclude CDM projects, which suggests that all existing projects, including CDM projects, are considered.

²³ Of the 30 projects sampled for the evaluation of the common practice analysis, the majority stem from China (20 projects), followed by India (3), Egypt (2), Pakistan (2), Brazil (1), Nicaragua (1) and Israel (1). Ten projects were registered before 2010, eight in the 2010-2011 period and twelve after 2011. Technology types in the sample are wind power (17 projects), hydropower (5), industrial projects such as coal mine methane utilisation or waste heat recovery (3), waste projects such as landfill gas capture (4) and other renewable energies such as biomass (1). Most projects (28 of 30) are classified as large-scale. Although the sampled two small-scale projects are not required to conduct a common practice analysis, some information on common practice was given in the corresponding PDDs.

The common practice tool and the first-of-its-kind tool use the same definition of the geographical area, which should be the entire host country, unless justification can be provided for a smaller geographical area. In the common practice analysis sample, 24 of 30 projects limited the applicable geographical area to a specific area smaller than the host country (such as province, region, state, municipality, etc.). All sampled wind projects from China (11)²⁴ and from India (3) selected an area smaller than the host country as the applicable geographical area. The most commonly used justification in the corresponding PDDs for limiting the geographical area is that investment conditions, especially in terms of electricity tariffs, available resources and labour costs, differ from province to province, making provincial/state level comparison necessary.

At first sight, this appears to be plausible since China and India are large countries with regions/states being important players in infrastructure development. Notwithstanding this, the size of the country and the political structure may not be sufficient to justify the choice of the regional/state level. In China, a nationwide feed-in tariff for wind power generation was introduced in 2009, establishing four different tariff categories, ranging from 0.51 CNY/kWh (0.08 USD/kWh) to 0.61 CNY/kWh (0.10 USD/kWh), depending on the region's wind resources (International Renewable Energy Agency 2012). For projects in India, the Electricity Act of 2003 and the resulting new tariff regulations were cited as the cause of different investment climates in various states. In fact, for wind power, the tariff varies based on local wind resources. Four bands of wind power density in W/m² determine the level of the feed-in tariff (International Energy Agency 2012). This means that the feed-in tariff may differ even between project locations in the same province if these feature different wind conditions. Therefore, the fact that there are different feed-in tariffs between provinces alone does not explain fundamentally different investment conditions in the different regions, as claimed in many PDDs, but rather only accounts for locally different wind resources, while the general support scheme is national²⁵. Based on these considerations, the rationale used by many projects for limiting the geographical area to a level below the entire country seems questionable. It can also be problematic to consider only the host country as the geographical area. If no or only a very few plants providing the same service exist in the host country, market penetration approaches do not give reasonable results. For example, the first aluminium plant in a country would always automatically be deemed additional, even if it used a technology that is clearly business-as-usual.

While the introduction of the common practice guidelines aimed to address the criticism of a vague definition of what constitutes 'different' technologies, several concerns remain. The possibility of defining a technology "as being different if there is a difference with regard to energy source/fuel, feed stock, installation size (micro, small, large), investment climate at the time of the investment decision (including, "inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations") or other features (such as difference in unit cost of output by at least 20%)" still allows for significant possibilities to claim that rather similar projects are very different. This allows for the project to be defined rather narrowly and other plants very broadly, so that the threshold of 20% is not reached. With regard to the installation size, the same issue as for the output range (above) applies. Also, the criterion 'energy source/fuel' may be misleading. For instance, if a country has been using light fuel oil as a basis for its power plants, a switch to natural gas constitutes a different fuel, but does not explain a significant difference since the same generation technology can be used for both fuels. The same holds true for different solid fuels. Finally, 'other features' is a very broad term allowing for arbitrary interpretations. For example, a difference in unit cost of output does not constitute a plausible difference per se²⁶. For instance, higher unit costs

²⁴ Also all other Chinese (non-wind) projects included in the sample use a sub-national geographical area with a similar rationale as that for wind projects.

²⁵ A differentiation of the feed-in tariff depending on local wind resources is common practice in other countries as well.

²⁶ Two sampled hydro projects used this rationale.

may be required for technical or other reasons and may be compensated for by higher yields²⁷. Also, according to this interpretation, a proposed CDM project with *lower* unit costs would be considered different from projects already implemented without CDM, even though it is more profitable than other projects. Although in some cases, 'differences' may be well justified (e.g. by explaining that the investment climate was significantly different due to a change from a state-controlled to a more private investment-oriented power market), overall, the review of arguments presented in the sampled PDDs indicate that the term 'different' allows for significant room for interpretation.

The threshold of 20% market diffusion in the common practice tool cannot be considered robust if applied to all technologies and sectors. The stringency of the 20% is highly dependent on the number of technologies in a sector. In a sector with only two technologies, both available technologies could easily exceed the threshold, whereas none of the technologies may ever reach the 20% threshold in sectors with many different technologies. For instance, in a country with several fuels and technologies available for power generation (e.g. natural gas, coal, wind, hydro, biomass, PV), a low market diffusion may still constitute common practice due to the abundance of options and due to the (potentially) limited potential of some technologies. For instance, hydro electricity generation may constitute only 5% of overall electricity generation. Nevertheless, hydropower could still be considered common practice due to the fact that hydro resources are limited and most of the resources have already been exploited. In contrast, in a sector in which there are only a few technologies (e.g. for a certain industrial process) a market diffusion of 20% may constitute a reasonable value for determining common practice. Also, even though a technology may not be considered common practice considering all existing plants in a sector (i.e. considering the market saturation), it may be common practice considering the recent trend (i.e. considering the market share in a certain year)²⁸. For instance, electricity generation from wind may constitute only a small share of the overall electricity generation in a country (e.g. 1%). However, capacity additions in recent years may constitute a significant share of overall new capacity built. In the former case, wind power would not be considered common practice, whereas in the latter, trend-oriented, perspective wind power would constitute common practice. This issue is especially relevant in the case of long-lived capital stock such as in the power sector (Kartha et al. 2005). Similarly, the provision that at least three plants with a similar technology must have been constructed to consider a project common practice may not be appropriate in all situations. For example, if only four plants exist in a country and three use the same technology, thus constituting a market share of 75%, the construction of a fifth plant with the same technology would still not be regarded as common practice. In conclusion, a one-fits-all value as threshold for market diffusion cannot be considered appropriate.

With regard to the quality of evidence used for the demonstration that a project is not common practice, almost all PDDs provided anecdotal evidence to support their claims. Commonly made statements are that there is no evidence to suggest that a similar project has been, is being or will be implemented in this area and that all other projects use CDM financing as well. To support these claims, publicly available external documents such as energy statistics were used in the majority of projects (20 of 30 projects). Yet, these public documents do not provide information about different investment climates in terms of labour costs, available resources and feed-in tariffs.

As regards the validation of common practice, in 21 of 30 sampled projects, the DOE reviewed documents such as the World Bank website or energy statistics. Other means of validation were conducting interviews with stakeholders such as personnel with knowledge of the project design and implementation, local residents and officials.²⁹ However, the DOEs did not evaluate claims

²⁷ E.g. higher units costs may be required for certain equipment for small hydro in a mountainous area, which may be compensated for by higher yields due to a higher head of water.

²⁸ See Kartha/Lazarus/LeFranc (2005) for a definition of market saturation vs. market share.

²⁹ There is no further information available in the PDDs on the content of the interviews with the stakeholders.

made in the PDDs about different investment climates. In nine cases, the DOE in its validation report just repeated the claims made by the PDD.

3.3.3. Summary of findings

Overall, clarity about the rules related to first-of-its-kind and common practice analysis have improved considerably over time. In addition, from the sampled projects it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs. However, several flaws remain:

- The definition of the output range in the common practice tool is arbitrary and not linked to actual differences in scale of technologies or use.
- The exclusion of CDM projects from the analysis is questionable in a market situation in which most projects are implemented as CDM projects and significant technological changes and cost reductions occur.
- The rationale for limiting the geographical area to a level below the entire country is questionable. In some instances, limiting the geographical area to the host country can be problematic.
- The definition of a project as 'different' in the current common practice guidelines is still too vague and corresponding rules still leave significant room for interpretation.
- The share of 20% market diffusion and absolute number of three similar projects, across all sectors, cannot be considered robust since the appropriateness of these values depends on the number of available technologies in the sector. Additionally, the result of the common practice analysis is highly sensitive to whether all plants of a sector are considered or whether the recent trend (new plants built) is considered. This is especially relevant for sectors with long-lived capital stock.
- Generally, evidence used for the common practice analysis was not adequate in the sampled projects since relevant information for the determination of common practice (e.g. on different investment climates, available resources or feed-in tariffs) was not provided in the PDDs. Also, the validation by DOEs was not adequate in the sampled projects since claims on investment climates were not evaluated and since in several cases the DOE only repeated the claims made by the project participants.

3.3.4. Recommendations for reform of CDM rules

In general, the first-of-its-kind approach and the common practice analysis can be considered more objective approaches than the barrier or investment analysis due to the fact that information on the sector as a whole is taken into account rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis. In this regard, expanding the use of market penetration approaches could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way in which first-of-its-kind and common practice are currently assessed needs to be reformed in order to provide a reasonable means of demonstrating additionality. In the following, several recommendations are made for the reform of the current rules.

We identified several issues with the approach of using the same generic approach in the context of rather different sectors or project types. We therefore recommend abandoning this 'one-size-fits-all' approach and introducing specific approaches for specific project types, which adequately reflect the circumstances of the sector, in particular with regard to the definition of what is considered

a different technology and the threshold used to define common practice. A practical means of implementing this is including specific guidance in each methodology.

- Due to the inherently vague concept of ‘different’ technologies, it is recommended that the common practice rules are revised in such a way that methodologies or overarching guidance provide clearer guidance on how to support the claim of a ‘different’ technology including the evidence required (including evidence to demonstrate credible differences in the investment climate). Corresponding provisions in the VVS should also be amended in such a way to provide more specific guidance on how DOEs should assess the claim of ‘essential distinctions’ for different projects types. With regard to the above-mentioned arbitrary definition of the applicable output range, it is recommended that the common practice guidelines are revised in such a way to provide general guidance on how meaningful differences according to scale can be identified for different technologies. More specific guidance on how to define a range of capacity/output should then be defined in the corresponding methodology. In the absence of any definition of capacity/output range in the methodologies, the whole spectrum of plants or activities (from very small to very large) should be covered by the analysis.
- With regard to the exclusion of CDM projects from the common practice analysis, the rules should be amended in such a way that all CDM projects are to be included in the analysis as a general rule, unless specified otherwise by the methodology. Methodologies could specify that CDM projects are excluded to a certain extent and then gradually introduce them in the analysis. This is especially relevant if all projects of a certain technology use the CDM. As Schneider (2009) points out “other CDM projects could be included in the common practice analysis after a certain period or after a specific number of CDM projects have been implemented”. Another criterion for inclusion of CDM could be their market penetration. (International Rivers 2011) suggest that “after 3 years of full operation, a CDM project should be included in the common practice analysis”. Furthermore, a “list of project types that are not eligible for the CDM because they are common practice” (ibid.) (negative list) could also be helpful in this regard.
- Due to our finding that the selection of an area below the host country level as the applicable geographical area is a questionable assumption, it is recommended that the rules be revised to define the appropriate geographical area in the context of the specific circumstances, such as the number of projects or installations in the host country. A level below the host country level should not be used.
- The threshold for common practice should be defined depending on the type of technology and sector. Corresponding guidance should be provided in the methodologies. In sectors with long-lived capital stock (e.g. power sector), the common practice analysis could consider two different perspectives: a) common practice in the sector (e.g. power sector) as a whole (market saturation) and b) common practice in more recent investments (market share) (i.e. similar to the operating and build margin approach for projects displacing electricity). If common practice is established according to at least one of these perspectives, the project should be considered common practice. Since data availability for determining market diffusion may not be sufficient in each country and in order to ensure consistency in determining market diffusion, efforts (e.g. multilateral) for collecting this data and for providing this information to project developers could be helpful. Several global datasets already exist (e.g. UNEP DTU 2014, statistics by the World Bank, sectoral statistics, Platts database on power plants or cement statistics by Cembureau), which could be used to estimate market diffusion in different countries in a consistent manner. An extensive discussion of

the usefulness of market penetration for establishing common practice for certain projects types is included in (Kartha et al. 2005).

Due to the fact that several DOEs repeated the claims made by the project participants without documenting the way in which they actually assessed the appropriateness of the claims, we recommend strengthening efforts to ensure that all DOEs effectively comply with the reporting requirements related to the common practice analysis outlined in the VVS. For this purpose, no change in rules has to be applied, but the accreditation system may need to be strengthened to ensure compliance of all DOEs with applicable CDM requirements.

Another option for improving the analysis of common practice is to consider the overall potential available in a country. For instance, a small share of hydro in overall electricity generation may, on the one hand, be due to barriers, risks or economic unfeasibility of hydro construction (hydro electricity generation would therefore not be common practice). On the other hand, the small share of electricity generation from hydro may be due to the very limited hydro potential in the country. Most of the (small) potential may already have been exploited. Any additional hydro capacity could then be considered common practice since it has been exploited before. However, this approach would bring about the problem of defining ways to establish the potential (e.g. technical vs. economic potential, etc.), and the practicalities and transaction costs of evaluating this for many different technologies.

Furthermore, the common practice analysis could “be the first step in the additionality tool rather than the last” (International Rivers 2011). This way, instead of using often vague arguments for establishing common practice *after* the investment analysis, project developers would need to discuss common practice explicitly at the beginning of the analysis.

3.4. Barrier analysis

3.4.1. Overview

Historically, barrier analysis has been used as an important alternative or complement to the investment analysis analyzed above in Section 3.2. The barrier analysis is used to demonstrate that a project faces barriers that impede the project’s implementation in the absence of the incentives from the CDM. It is applicable to both small- and large-scale CDM projects:

Small-scale projects

According to Attachment A to Appendix B to Annex II of 4/CMP.1 the following barriers may be considered for small-scale projects:

- **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions; this includes “the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis”.³⁰ In essence, this barrier allows an investment analysis to be conducted, as described in Section 3.2, but without providing any guidance on how the investment analysis should be conducted. In practice, however, it appears that guidance for investment analysis for large-scale projects (e.g. justification of benchmark IRR or sensitivity analysis) is, in most cases, also applied to small-scale projects.
- **Access-to-finance barrier:** the project activity could not access appropriate capital without consideration of the CDM revenues;

³⁰ See “Non-binding best practice examples to demonstrate additionality for small-scale projects” (EB 35, Annex 34).

- **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- Barrier due to **prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- **Other barriers** such as institutional barriers or limited information, managerial resources, organisational capacity, or capacity to absorb new technologies.

Large-scale projects

In large-scale projects, the barrier analysis is part of the additionality tool and the combined tool. It is applied in two steps:

1. Identify barriers that would prevent the implementation of the proposed CDM project activity. Here, the eligible barriers are similar to the barriers relevant for small-scale projects, with the following differences:
 - The ‘investment barrier’ of the small-scale guidance is, in the large-scale guidance, referred to as ‘investment analysis’ (Section 3.2); a separate option for demonstrating additionality besides ‘barrier analysis’;
 - The ‘access-to-finance barriers’ of the small-scale guidance is called ‘investment barriers’ in the large-scale guidance; and
 - ‘prevailing practice’ of the small-scale guidance is, in the large-scale guidance, usually a mandatory additional step termed ‘common practice analysis’ that is required but is not sufficient in itself to prove additionality.
2. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

Another important requirement of the two tools is the following: “If the CDM does not alleviate the identified barriers that prevent the proposed project activity from occurring, then the project activity is not additional.”

If these steps are satisfied, the project is potentially additional (pending passing of the common practice analysis).

In late 2009 (EB50), the CDM EB adopted the “Guidelines for objective demonstration and assessment of barriers” with a view to improving the objectivity of the barrier analysis. The document provides guidance on the objective demonstration of different types of barriers. For instance, it requires that “barriers that can be mitigated by additional financial means can be quantified and represented as costs and should not be identified as a barrier for implementation of project while conducting the barrier analysis, but rather should be considered in the framework of investment analysis” (Guideline 4 in EB50 A13).

In addition, methodologies may – instead of using one of the tools – provide their own combination of steps from the tools.

3.4.2. Assessment

The concept of barriers preventing investments and mitigation activities is an important element of the research and discussion on technology diffusion and low carbon pathways. From this, it seems reasonable that the additionality test could also take barriers into account and not only be based on

investment analysis. However, the barrier analysis faces multiple challenges in practice that strongly limit its usefulness in the context of the CDM.

Objectivity in barrier analysis

In earlier phases of the CDM, the claim for barriers preventing the implementation of projects was often based on anecdotal evidence, and it was very difficult to provide objective proof of why a barrier is sufficient to “prevent the implementation” (Schneider 2009). In practice, the concept of barriers per se as proof for additionality is problematic, as all investment projects in all countries faces some sort of barriers to its implementation, be they financial, technical or other. In earlier CDM projects, it was sufficient for PDD consultants to state barriers without providing objective and verifiable evidence that they actually *prevent* the implementation of the project. This led to some market participants claiming that with good PDD consultants you could have any project registered based on barriers.

Guidance on objective barriers

In late 2009 (EB50), these problems with barrier analysis led to the adoption of the “Guidelines for objective demonstration and assessment of barriers” by the CDM EB (Section 3.4.1). With their requirement to monetize barriers, the guidelines aim to assess the role of barriers in preventing the implementation of projects in a more transparent way. The monetization of barriers and their inclusion in the investment analysis provide a framework that allows an objective balancing of higher barriers and associated costs with the need for higher revenues. This may be one of the reasons why investment analysis (with or without monetized barriers) has largely replaced the use of the barrier analysis without application of investment analysis in demonstrating additionality (see below).

How much alleviation is necessary to overcome a barrier?

Another weakness of the barrier analysis lies in the application of the requirement to demonstrate that the CDM “alleviates the identified barriers that prevent the proposed project activity from occurring”. The fulfilment of this requirement was not often (explicitly) provided in PDDs nor checked by DOEs. Moreover, the tools do not require that the degree of ‘alleviation’ should be at least comparable to the strengths of the barrier under consideration. To demonstrate the viability of the project with the CDM, one would need to make the case as to why, for example, €x of CER revenues are sufficient to alleviate the risk of damage to a wind farm due to severe sand storms.

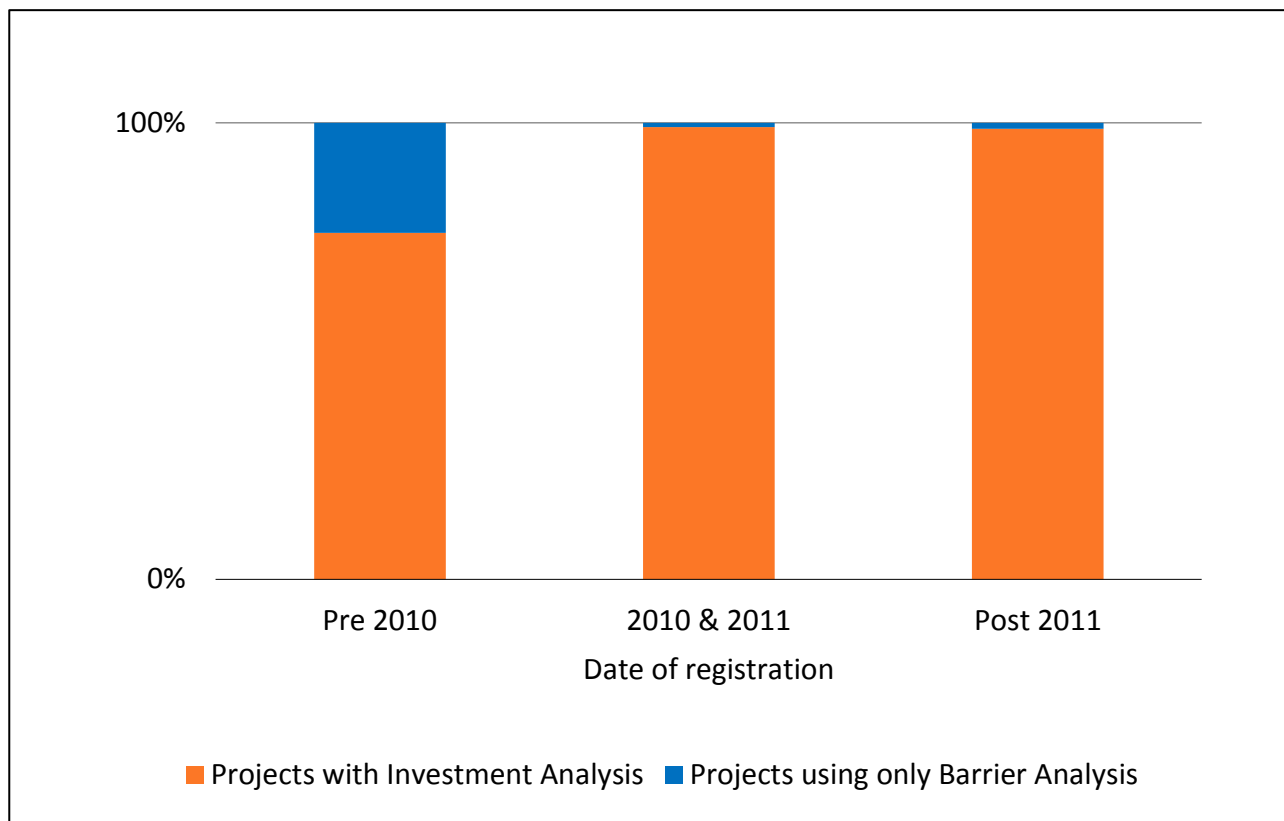
Also with regard to this requirement, the Guidelines provide greater specificity: “Demonstrate in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers” (Guideline 2 in EB50 A13).

The vanishing role of barrier analysis in the CDM

The role of barrier analysis in demonstrating additionality in the CDM has been dramatically reduced from 2010 onwards (Figure 3-6). While in the period before 2010 approx. 24% of registered projects used the barrier analysis *without applying an investment analysis in parallel*, this share was reduced to approx. 1-2% of registered projects from 2010 onwards. Since then, the barrier analysis plays a certain role in reinforcing the additionality argument made in the investment analysis, but has largely lost its role as the main approach for demonstrating additionality.

This development might be explained by the introduction of the guidelines for objective demonstration and assessment of barriers.

Figure 3-6: Share of projects using the barrier analysis without applying the investment analysis in total projects



Notes: Own research based on a representative sample of PDDs from 30 stratified and randomly sampled projects that were labelled Investment Analysis option 'none' by the IGES (2014) database revealed that a certain percentage of these PDDs used an approach that in essence follows the Investment Analysis approach of the additionality tool, but was labelled 'Barrier Analysis'. The confusion in terminology was most prominent in small-scale project PDDs, which have the option to demonstrate 'financial barriers' which includes and is often an Investment Analysis. In the representative sample, the fraction of PDDs using actually an Investment Analysis while being labelled Investment Analysis option 'none' by IGES was 36.4% pre 2010 and 90% afterwards. The share of projects using Investment Analysis from the IGES database has, therefore, been increased by these shares from the sample analysis. Without this correction, the share of projects without investment analysis in the IGES database are 38%, 10% and 14%, respectively, for the three considered time periods of registration.

Sources: IGES 2014, authors' own PDD research

With the adoption of the guidelines, the barrier analysis has largely lost its role as the main argument for demonstrating additionality. After 2010, non-financial barriers are quoted in some projects, but merely as additional information to reinforce the main case for additionality, which tends to be based almost uniformly on investment analysis. Potentially, this development may have been supported by an improved performance of DOEs in validating barrier analysis in PDDs, due to an improved accreditation system.

3.4.3. Summary of findings

In early CDM projects, the routine use of anecdotal and often subjective evidence for claiming barriers has led to the registration of projects with questionable claims for additionality, which cannot be objectively assessed by DOEs. With the adoption of the Guidelines and possibly the improved performance of DOEs, the barrier analysis has largely lost its role as the main line of argument for demonstrating additionality. Rather, barriers are monetized and reflected in the investment analysis.

In the CDM, barrier analysis has lost importance as a stand-alone approach to demonstrating additionality because of the subjectivity of the approach. With the guideline, if barriers are claimed, they are monetized and integrated as costs in the investment analysis.

3.4.4. Recommendations for reform of CDM rules

Non-financial barriers can be important factors preventing the implementation of projects even though they may be profitable. Therefore, considering barriers in approaches for additionality determination is a valid approach.

However, the objective demonstration of barriers (as required in the Guidance) has turned out to be very difficult to operationalise without the reflection and monetization in an investment analysis.

Given the de facto non-application of the barrier analysis without investment analysis approaches in the current CDM practice, we recommend removing the barrier analysis from the additionality and combined tools. In return, key aspects of the Guideline related to the monetization of barriers³¹ may be included in the investment analysis step in the additionality and combined tools.

In order to demonstrate additionality of projects with high (non-financial) barriers that may not be monetized, a comprehensive 'common practice' analysis or in small-scale projects 'prevailing practice' analysis shall be carried out (Section 3.3). Here, objective data on market shares of technologies/project types may be collected that may serve as objective proxy information for the extent to which barriers actually prevent the implementation of projects.

On another note, the approval of "Guideline on objective demonstration and assessment of barriers" by the CDM EB may be seen as a positive example of how the CDM regulator, under the right conditions, can react to an obvious flaw in the rules and practice, and rectify the system.

3.5. Crediting period and their renewal

3.5.1. Overview

Project participants can choose between one crediting period of 10 years without renewal or a crediting period of seven years for their project, which is due for renewal every 7 years for a maximum of two renewals (a total of 21 years for normal CDM projects). (For afforestation and reforestation projects, the choice is between one period of 30 years and three periods of 20 years). The Marrakesh Accords state that for each renewal, a designated operational entity shall determine that "the original project baseline is still valid or has been updated taking account of new data where applicable".

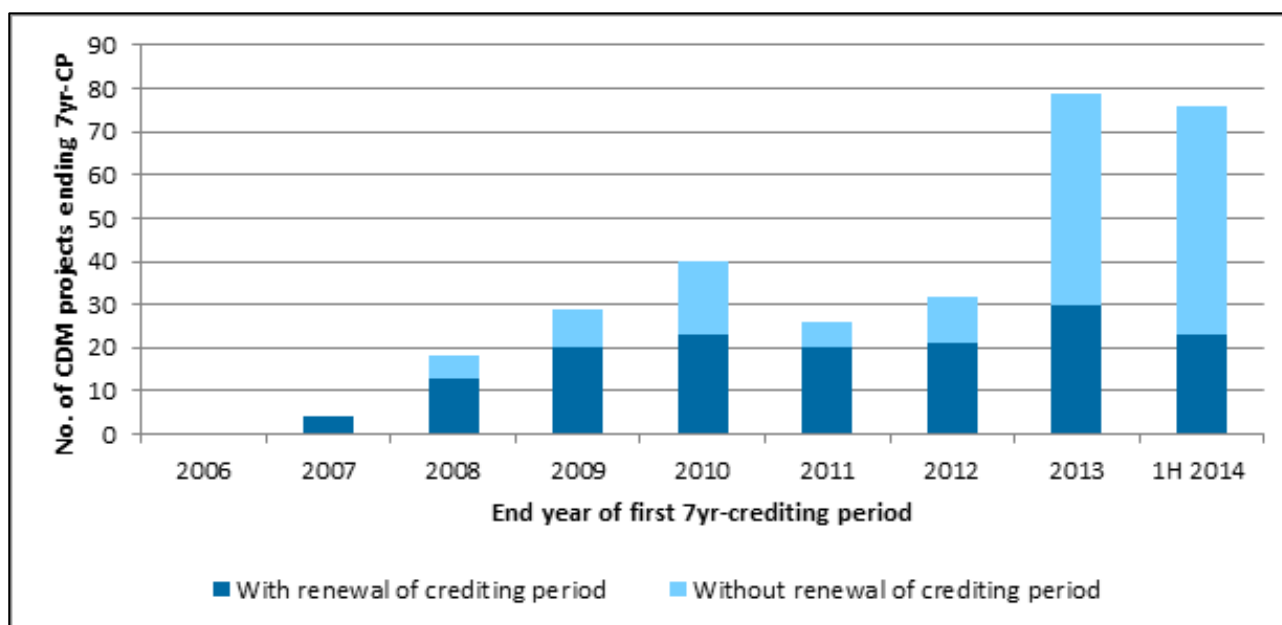
Requirements regarding the renewal of the crediting period were initially adopted in 2006 (EB28, Annex 40), subsequently revised several times (EB33, EB36, EB43, EB46, EB63, EB65, EB66), and partially incorporated in the project standard. At the renewal of crediting period, the latest valid version of a methodology must be used. If a methodology has been withdrawn or is no longer applicable, the project developers may use another methodology or request deviation from an applicable methodology. The CDM EB interpreted the 'validity test' in the Marrakech Accords in such a way that neither additionality nor the baseline scenario needs to be reassessed during the renewal of the crediting period. "The demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the emissions which would have resulted from that scenario" (Project Standard, Version 07.0, paragraph 289). The current rules mainly require an assessment of the regulatory framework, an assessment of

³¹ This relates to Guidelines no. 4 and 5 of EB50 Annex 13 that may be integrated as cost items related to barriers/risks in the investment analysis of the additionality and combined tool. Guideline 2 may also be implemented in the context of the investment analysis in the tools, in that the CER revenues should be sufficient to overcome the financial gap in project finance that is due to the barrier.

circumstances, an assessment of the remaining lifetime of technical equipment to be used in the baseline, and an update of data and parameters, such as emission factors.

Figure 3-7 plots the number of projects that have chosen a 7-year crediting period and that end their first crediting period in a given year and are therefore potentially entering a process of crediting period renewal. The increase in project registrations with the maturing of the CDM market from 2005 is mirrored by a steep increase in candidate projects for renewal seven years later, after 2012. The graph also indicates that the fraction of these candidate projects that actually underwent renewal significantly declines after 2012: While before 2012 roughly two thirds of all candidate projects underwent renewal on average, the rate dropped to roughly one third after 2012. This may be explained by the collapse in pricing and the petering out of the classical CDM market in 2011-2012, whereby CER prices below marginal transaction costs make renewal of crediting economically non-viable for most projects that do not benefit from long-term futures contracts with higher prices.

Figure 3-7: Number of CDM projects ending first seven-year-crediting period – with and without renewals



Sources: UNFCCC 2014, authors' own analysis

3.5.2. Assessment

The requirements to use the latest approved version of a methodology is a very important rule to assure that changes in the methodological ruling are also implemented in CDM projects within a reasonable timeframe and therefore seem appropriate. At the same time, it provides some certainty for investors that rules regarding the calculation of emission reductions are not changed within their crediting period.

The CDM EB's decision to interpret the Marrakesh requirement of assessing that "the original project baseline is still valid" in such a way that that only baseline emissions must be updated but that neither additionality nor the baseline scenario needs to be re-assessed could constitute a major risk for the environmental integrity of some project types. In 2011, the Meth Panel highlighted cer-

tain issues with this approach in an Information note to the EB (MP51 Annex 21³²), but the rules were not changed in response. In the following, we briefly analyze two main issues:

- The case of the baseline scenario changing over the course of the crediting period in a way that is not captured by the baseline methodology;
- The case of limited 'lifetime' of a baseline scenario.

Baseline scenario changing over of the course of crediting periods

In a number of instances, a baseline scenario could change over time during crediting periods and deviate from the assumptions in the underlying methodology. One example is a CDM project consisting of the conversion of an existing open cycle power plant to a closed cycle system. Assuming that after the first crediting period, new and lower cost technologies for the conversion would become available that would make the project economically viable, the implementation of the project activity after the first crediting period might be the most probable baseline scenario in the absence of the CDM. We are not referring here to the concept of dynamic baselines, e.g. the fact that baseline emissions are calculated based on the project output (e.g. in tons of steel or MWh per year). Rather, the scenario is changing, i.e. this refers to projects (or another low carbon activity) which, in the absence of the CDM project, would have been implemented at a later date due to changing circumstances.

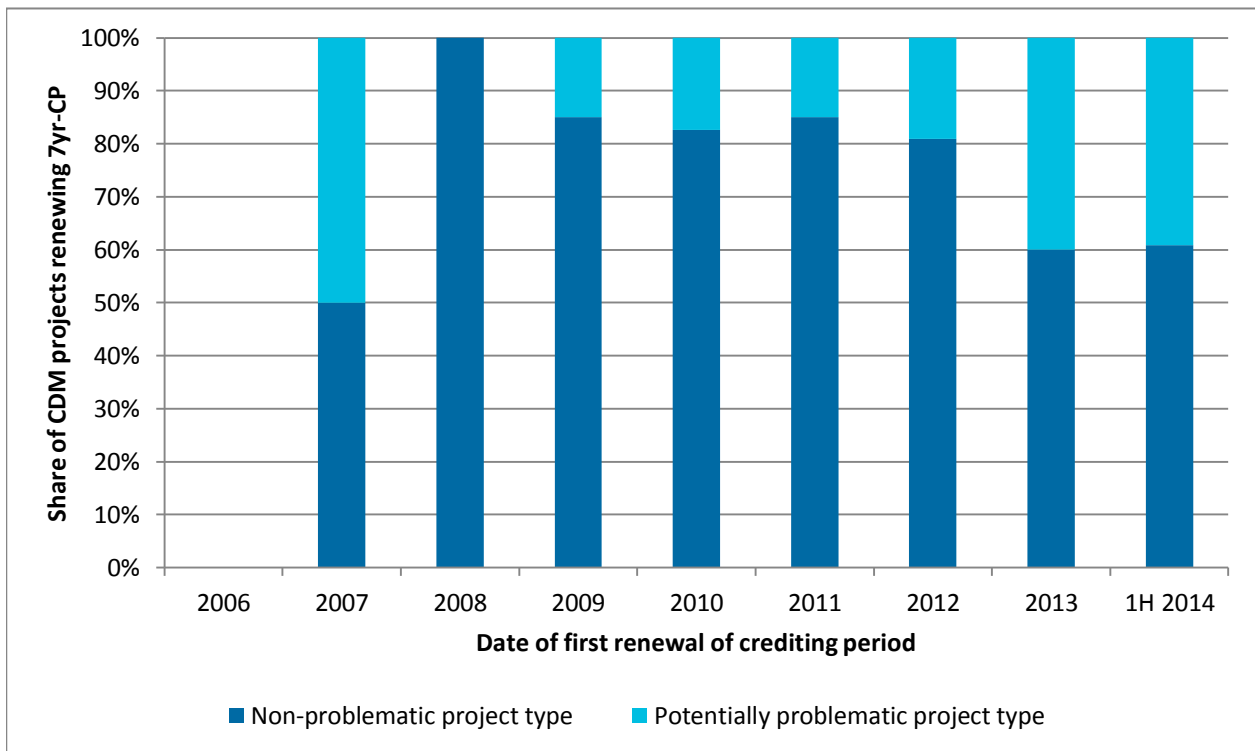
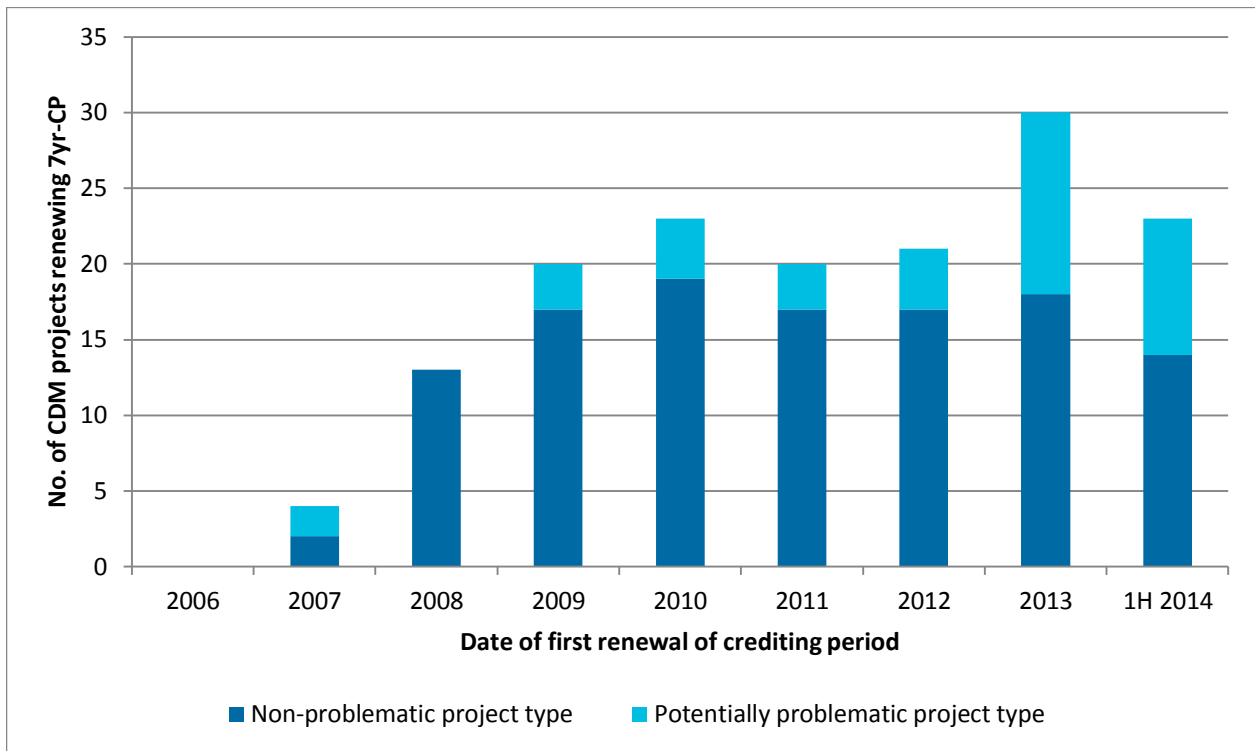
However, it is important to note that not all CDM project types are prone to changing baseline scenarios. Baseline scenarios typically change over time if they are the 'continuation of the current practice'. In such cases, changes such as retrofits could also be implemented at a later stage. In contrast, baseline scenarios do not change over time when they include a significant investment at project start in an alternative that provides similar services. This is the case if, for example, an industry can choose to fulfil their heat demand by either a new biomass boiler (project activity) or a new coal boiler (baseline). If one assumes that the project participant carries out a significant investment at the beginning of the baseline (e.g. to build the new coal boiler), it may be assumed that this investment is used until the end of its operational lifetime; replacing the coal boiler by a biomass boiler after seven years is economically not viable in general.

However, because CDM requirements explicitly rule out the re-assessment of the baseline scenario, cases with a change in baseline scenario cannot be taken into account, which leads to potential over-crediting in the second and third crediting periods in the case that the activity would have been implemented after the first crediting period due to changing circumstances.

Practical examples of such changing circumstances and related potential over-crediting can be found in Purdon (2014) for the co-generation sector. The paper provides an overview of how a change in external influence factors (e.g. sugar price) can influence the additionality and how a baseline scenario that is kept constant over several crediting periods can result in over-crediting.

³² https://cdm.unfccc.int/Panels/meth/meeting/11/051/mp51_an21.pdf.

Figure 3-8: Share of CDM projects renewing their seven year crediting period that is deemed non-problematic



Notes: Potentially non-problematic project types have been selected according to the criteria of having a lower risk of changes in the baseline scenario over several crediting periods.

Sources: UNFCCC 2014, authors' own analysis

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

Assessment of the scale of the issue

In the following, we make a very rough assessment of the scale of this issue. As mentioned above, not all project types are in danger of undergoing changes in baseline scenarios that are not foreseen in the underlying methodology. In order to arrive at a preliminary estimate of the scale of the potential issue, a list of 'potentially problematic' project types was identified that have a higher risk of changes in the baseline scenario over several crediting periods than those categorised as 'unproblematic'.³³

Please note that 'potentially problematic' does not mean that all projects in that project type have issues with the renewal of the crediting period, it simply means that the projects are in a sub-type that may contain potentially problematic projects. Figure 3-8 depicts the number of projects of a non-problematic project type in the total number of projects that actually underwent renewal of the 7-year crediting period in a given year.

The graph indicates that the number of projects renewing their crediting periods increased in 2007-2009. Until 2012, non-problematic projects made up the large majority of renewals. However, from 2013 the share of non-problematic projects dropped to approx. 60% of renewed projects. With such a low share, the issue may become more important in the future with a further increase in renewals (although the increase may be somewhat muted by the unfavourable market conditions).

In this context, it is important to note that CDM projects do not need to renew immediately, but may wait until market conditions are more favourable. Given the high number of projects that may undergo renewal at a later point in time combined with the lowering in the share of non-problematic project types may lead to considerable over-crediting.

Lifetime of baseline scenario

Another, also related, issue is that in more complex and very dynamic systems, such as the transport sector, the determination of a counterfactual baseline scenario is exposed to fundamental limitations in the ability to predict future developments. These limitations can lead to very high uncertainties in the baseline determination. In some instances even after a very few years, the actual baseline emissions could be significantly higher (or lower) than the calculated baseline emissions. For example, while it may be relatively certain that a project proponent choosing in the baseline situation to build a coal-fired boiler will continue to operate this boiler over its lifetime to meet its heat demand, the development of a city's transport system in the absence of a specific urban rail project could be very difficult and uncertain to predict: over some years one may assume that an increase in transport demand is catered for by increased use of private cars; however, street capacities may be limited and the municipalities may have to find solutions to their transport problems anyway, also in the absence of a specific project activity.

It therefore might be considered that for some project types in complex and dynamic environments, such as transport systems, the baseline scenario cannot be reasonably extended over a period of

³³ For a preliminary screening, the following projects sub-types (according to the classification of UNEP DTU) have been classified as "potentially problematic", i.e. it cannot be ruled out that the projects would be implemented later in time without the CDM under changing circumstances (please note that the sub-types may also contain projects which clearly do not have an issue): Adipic acid, Aerobic treatment of waste water, Agricultural residues: mustard crop, Air conditioning, Appliances, Biodiesel from waste oil, Biogas from MSW, Bus Rapid Transit, Cable cars, Caprolactam, Carbon black gas, EE industry - Cement, Cement heat, Charcoal production, EE industry - Chemicals, EE own generation - Chemicals heat, Clinker replacement, CMM & Ventilation Air Methane, CO₂ recycling, Coal Mine Methane, Coal to natural gas, Coke oven gas, Combustion of MSW, Composting, Domestic manure, EE public buildings, Existing dam, Food, Glass, Glass heat, HFC134a, HFC23, Industrial waste, Iron & steel, Landfill composting, Landfill aeration, Landfill flaring, Landfill power, Lighting, Machinery, Manure, Mode shift - road to rail, Natural gas pipelines, Nitric acid, EE industry - Non-ferrous metals, EE own generation - Non-ferrous metals heat, Non-hydrocarbon mining, Oil and gas processing flaring, Oil field flaring reduction, Oil to natural gas, EE industry - Paper, EE industry - Petrochemicals, PFCs, Power plant rehabilitation, Rail: regenerative braking, Solar water heating, Stoves, EE industry - Textiles, Ventilation Air Methane, Waste water. All other project types are deemed "non-problematic".

ten years and a renewal of crediting periods should not be allowed, given the risks of inadequate and very uncertain baseline scenarios for later time periods.

It was for this reason that the crediting period was initially limited to a single crediting period for some project types, including:

- PFC emissions from manufacturing in the semi-conductor industry (e.g. AM0092). This is an industry in which manufacturing technologies and composition of materials etc. change frequently compared to the duration of a 7-year crediting period
- Power saving from efficient management of data centers. Technologies and operating systems also typically have short lifespans compared to a 7-year crediting period.
- Complex transport systems such as the introduction of Bus Rapid Transport (BRT) systems in cities. In this context, the uncertainty in the baseline scenario and the resulting baseline emissions grows very rapidly, because development of transport systems over 5-10 years is difficult to predict with accuracy.

For these project types, the maximum crediting period has been set to 10 years in earlier versions of the methodology, because the uncertainty in the baseline scenario after 10 years did not allow for an objective determination of the emission reduction.

This limit in the crediting period to 10 years also allowed the methodology to be simplified, as the projection of baseline emissions over a limited period allows for simpler approaches and requires less monitoring provisions, thus reducing transaction costs.

Subsequently, however, the CDM EB took the decision (EB67, Para 107) that for each project type and methodology multiple crediting periods can be used (independent of any methodological limitations and uncertainty issues for the baseline setting as discussed above). This decision has been taken based on para 49 of the Modalities and Procedures for the CDM (decision 3/CMP.1, annex) that mentions alternative approaches. The paragraph was interpreted in such a way that both options shall be allowed in *each and every* methodology.

Since then, the relevant methodologies have been revised, allowing crediting for up to 21 years for all methodologies, without providing for further safeguards that would reduce the uncertainty in baseline scenario projection and potential over-crediting.

The issue of renewal of crediting period and more generally the updating of baseline scenarios is further discussed in Schneider et al. (2014).

3.5.3. Summary of findings

When the crediting period of a CDM project is to be renewed, the Marrakesh Accords require that the DOE check the validity of the original project baseline. A subsequent EB ruling (EB 43, Annex 13, paragraph 3) limited this check to an assessment of the regulatory framework, an assessment of the remaining lifetime of technical equipment that would be used in the baseline and an update of data and parameters, such as emission factors. The EB clarified that the validity of the baseline scenario should not be re-assessed.

With CDM project types for which the baseline scenario does not require a significant investment at the beginning of the crediting period (that would determine the baseline technology over the lifetime) this may lead to potential over-crediting. A preliminary analysis of projects that underwent renewal of the crediting period in recent years reveals that from 2013 onwards the share of potentially problematic project types (that might have issues of changing baseline scenarios leading to

over-crediting) increases to approx. 40% of projects with renewal. It is therefore recommended that this issue is resolved.

A subsequent ruling by the EB to remove the limit in the crediting period that some project types had in their methodology in sectors especially prone to baseline uncertainty over one crediting period (e.g. semi-conductor manufacturing, information technology, transport) further exacerbated the issue.

3.5.4. Recommendations for reform of CDM rules

We recommend two reforms to the current rules:

- Reassessing the baseline scenario at the renewal of the crediting period: The issue of potential over-crediting arising from inadequate checking of the validity of the baseline at the renewal of the crediting period could be addressed by expanding the assessment to the validity of the baseline scenario for CDM projects that are potentially problematic in this regard. For this, clear criteria for problematic project types should be formulated and guidance should be provided on how to test the validity of baseline scenarios for specific CDM methodologies.
- Limitation of the overall length of crediting for specific project types: Project types in sectors or systems that are highly dynamic and complex, and in which the determination of baselines is notoriously difficult (e.g. urban transport systems) should be limited to a single 10 year CDM crediting period or should be supported by other (non-crediting) finance sources.
- A further step that may be considered is a general limitation of projects to one 7 years crediting period. This may also build on the observation that when discounting future streams of CER revenue beyond 7 (or 10) years at typical hurdle rates longer crediting periods do not really matter for the NPV calculation. Longer crediting periods would only be allowed for project types that require a continuous stream of CER revenues to continue operation such as landfill gas utilization/flaring etc.

3.6. Additionality of PoAs

The advent of CDM Programmes of Activities (PoA) in 2007, and the subsequent refinement of related additionality approaches, changed the nature of additionality testing for many project types. Additionality assessment for PoAs is simplified compared to the requirements for the registration of individual projects. Project developers can establish eligibility criteria to assess additionality, including eligibility criteria, which identify project types that may be automatically additional. More importantly, because the thresholds for identifying small-scale and microscale activities with simplified additionality procedures are set at the level of the Component Project Activity (CPA) and not the level of the PoA, the overall PoA could be far larger than these thresholds. For example, the registered PoA “Installation of Solar Home Systems in Bangladesh” (Ref. 2765) has so far installed 123 MW of solar power and has estimated emissions reductions of 569,000 tCO₂ per year, or almost ten times the small-scale CDM threshold.

In the period of 2013 to 2020, PoAs potentially could supply 0.16 billion CERs. However, as discussed in Section 2.3, the eventual volume for these PoAs could be many times this amount.

3.6.1. Assessment

There are three principle issues with the demonstration of additionality in PoAs: specific additionality concerns about the technology areas covered by PoAs, the robustness of eligibility criteria to check additionality, and the use of small and microscale thresholds for PoAs that are much larger

in total than these thresholds. The first point is largely addressed in Chapter 4, because it is related to the mitigation technologies used in PoAs. As shown in Table 2-2, the majority of PoAs are in technology areas that are analyzed in this report (e.g. efficient cook stoves, efficient lighting, wind, hydropower, biomass), so these chapters should be consulted for an assessment of those technologies.

The second point concerns eligibility criteria, namely that the PoA rules require that the project participants develop a set of eligibility criteria that should guide the inclusion of CPAs. The criteria should be constructed so that, for each new CPA, simply confirming that the CPA meets the criteria is enough to ensure that the CPA is additional. These criteria should be based on approaches used in the relevant methodology or other additionality approach that is relevant for the PoA. In other words, there is not a detailed additionality assessment for each CPA in the way that project activities submitted for registration are evaluated. Instead, the eligibility criteria in the registered PoA design document (PoA-DD) should ensure that the CPA meets the relevant additionality test. For example, if part of demonstrating additionality in the relevant methodology is proving that the project is a particular scale or uses a particular technology, then the scale and technology specification would be listed as eligibility criteria against which each new CPA was checked. A possible concern could be that, if the project participants proposed eligibility criteria in the PoA-DD that did not fully capture the additionality requirements of the underlying methodology, there would be a risk that future CPAs could be included even if they were not additional. Although there was some confusion during the early days of PoAs on how to formulate eligibility criteria, this has not been the case since late 2011 when the EB published a standard for eligibility criteria. This was later replaced by the standard for “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” (CDM-EB65-A03-STAN, version 3.0). This standard provides not only the full list of issues that must be covered in the eligibility criteria, but also clear rules on how additionality may be assessed for PoAs.

The third point is perhaps the most important – whether allowing PoAs that are, in total, much larger than the size thresholds for small and microscale projects could increase the risks of non-additionality among PoAs. The small-scale CDM thresholds are 15 MW for renewable energy, 60 GWh savings for energy efficiency, and 60,000 tCO₂ per year emissions reductions for other project types with approved small-scale methodologies. The scale limits for the microscale additionality rules are 5 MW for renewable energy, 20 GWh savings for energy efficiency projects, and 20,000 tCO₂ for other project types, and are then combined with other criteria (described in detail in Chapter 4, e.g. country type, size of individual units, or even designation by a national authority), to qualify as automatically additional. However, the EB decided at their 86th meeting that microscale technologies using unit size as the basis of automatic additionality (i.e. independent units of < 1500 kW for renewables, < 600 MWh for energy efficiency and < 600 tCO₂ for other projects, all serving households and communities) would have no limit of the total scale of the project or CPA. In other words, an efficient cook stove project activity or CPA could have total emission reductions of greater than 20, or even 60, ktCO₂ per year.

Projects (in this case, CPAs) that qualify as small-scale CDM (SSC) then have access to the technology-based ‘positive list’ in the tool for “Demonstration of additionality of small-scale project activities” (Tool21, version 10.0). CPAs below the micro-scale thresholds would all be automatically additional as long as they meet both the scale and other requirements (e.g. technology, location, etc.). For small-scale CDM, the list of technologies considered automatically additional includes the following:

- Certain technologies whether grid-connected or off-grid: solar (PV and thermal), off-shore wind, marine (wave and tidal), and building-integrated wind turbines or household rooftop wind turbines up to 100 kW;

- Additional off-grid technologies below the SSC thresholds: micro/pico-hydro (with power plant size up to 100 kW), micro/pico-wind turbine (up to 100 kW), PV-wind hybrid (up to 100 kW), geothermal (up to 200 kW), biomass gasification/biogas (up to 100 kW);
- Technologies with isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;
- Rural electrification projects using renewable energy in countries with rural electrification rates less than 20%.

Both microscale additionality and the small-scale CDM positive list approaches have been used extensively by PoAs. As shown in Table 3-2, 33% of the CPAs in registered PoAs, representing 27% of expected CERs, have applied the microscale or small-scale positive list approaches ('first of its kind' is discussed in Chapter 4). An analysis by the UNFCCC Secretariat³⁴ also shows that 142 of the 282 registered PoAs use microscale or small-scale rules for automatic additionality, with 65% of PoAs targeting households utilising one of these tools (Table 3-3). Many of these PoAs have already exceeded the microscale and small-scale thresholds at an aggregate level, as allowed in the CDM PoA rules. In contrast, the 120 CDM project activities that have used small-scale positive lists or microscale guidelines comprise only 0.8% of projects and 0.1% of expected emissions reductions (UNEP DTU 2015a).

Table 3-2: Use of automatic additionality approaches in CPAs within registered PoAs

Approach for automatic additionality	Annual CERs (ktCO ₂ /yr)	CPAs	CERs	CPAs
Microscale tool: country, unit size or DNA selection	3,520	188	11%	23%
Microscale tool: SUZ	60	9	0%	0%
SSC positive list	5,078	91	16%	10%
None	21,279	551	70%	65%
Total	29,936	839	100%	100%

Notes: A more recent version of the PoA pipeline was used here because of a revision of how the use of automatic additionality is classified.

Sources: UNEP DTU 2015b

³⁴ "Concept note: Thresholds for microscale activities under programmes of activities" (CDM-EB85-AA-A09)

Table 3-3: Technology and end-user types in registered PoAs that applied microscale and/or small-scale positive list criteria

Technology type	PoAs	Share of this type of PoA
End use type: Households	92	65%
Household biogas digesters	13	
Energy efficiency - household	2	
Energy-efficient lighting (LED and CFL)	28	
Improved cookstoves	36	
Solar water heaters	7	
Water purifiers	5	
Renewable-based rural electrification	1	
End use type: Others	50	35%
Energy efficiency – industrial	2	
Fuel switch	3	
Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)	35	
Waste treatment (e.g. Wastewater, animal waste)	10	
Total	142	100%

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

Whether granting automatic additionality to PoAs that are over the small and microscale thresholds poses a risk for additionality testing depends on the *reason* for the positive list designations. One of the main issues raised by the positive list is the *unit size* of the technology, with the argument being that the unit size on its own may be sufficient to identify a project type with a high likelihood of additionality (in combination with the other microscale criteria, where relevant). On this basis, the EB recently agreed that the size criterion for the microscale additionality tool should be *only* unit size, and not total project size.³⁵ This means that even a PoA using a large-scale methodology and have a total size beyond the SSC thresholds can still apply microscale additionality guidelines, as long as the unit size and other criteria are met.

The SCC positive list sets unit size limits for most categories of eligibility, although not for rural electrification or the grid-connected technologies (other than the 15 MW limit). The microscale guidelines also include the option of using a unit size less than 1% of the SSC threshold as a justification for applying these guidelines even if the projects are not located in Least Developed Countries (LDCs) or Special Underdeveloped Zone (SUZs).

The most important categories of PoAs (in terms of their contribution to expected CERs) utilising these tools are improved cook stoves, energy efficient lighting, biogas and small unit size solar power³⁶. For the first three technologies, the unit size is inherently small, so the size of the total project or PoA should not, by itself, determine the viability of the technology (bearing in mind, however, that overhead programme costs are obviously lower per unit for larger programmes). The additionality issues with improved cook stoves and energy efficient lighting are reviewed in Sections 4.12 and 4.13, respectively. These sections raise important questions about the additionality

³⁵ The changes to the Tools for “Demonstration of additionality of small-scale activities” (version 22) and “Demonstration of additionality of microscale project activities” (version 07) were approved at EB86 (October 2015), as were changes in the Project Standard, Project Cycle Procedure, and standard on standard on “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities.”

³⁶ Although the table from the UNFCCC Secretariat refers to “Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)”, our analysis has not identified any wind or geothermal PoAs using the small-scale positive list or the microscale guidelines.

of these project types, despite their small unit size, particularly because of the role of other support programmes in promoting these technologies and possible over-crediting for cook stoves, for example. On the other hand, the extensive literature on household energy access technologies and carbon markets also points to numerous well documented barriers, and the high unit transaction costs associated with small unit size technologies (e.g. Gatti & Bryan 2013; IFC 2012; Warnecke et al. 2015, 2013). In addition, the analysis from the UNFCCC Secretariat mentioned earlier also shows that the average unit size of PoAs using the small-scale and microscale positive lists is, in fact, far below even the microscale unit size of 1% of the SSC threshold (Table 3-4).

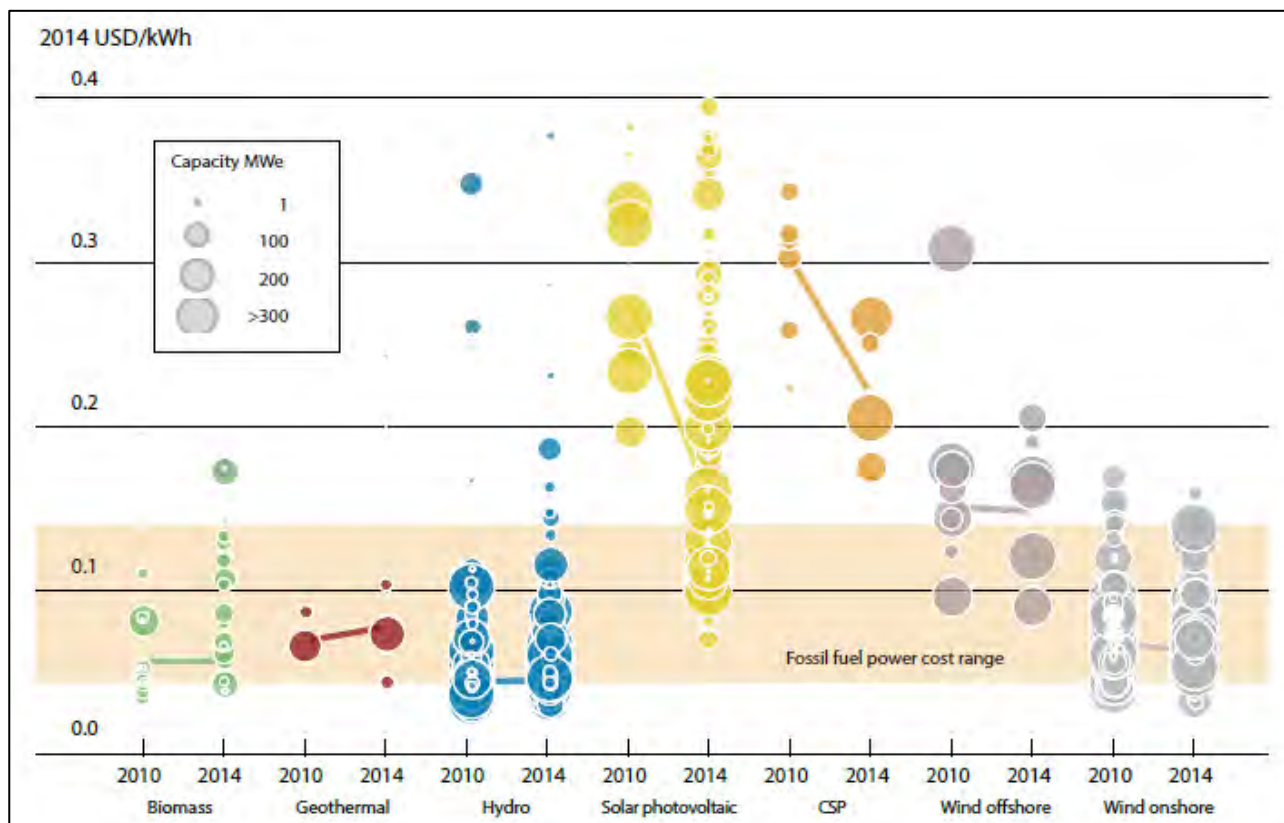
Table 3-4: Size of individual units in microscale and small-scale PoAs using positive lists

Unit size as % of SSC threshold	Type I (kW)	Type II (MWh)	Type III (tCO ₂)
1%	150	600	600
PoAs applying microscale criteria			
Average – 0.022%	3.3	13.3	13.2
Std deviation – 0.054%	8.1	32.4	32.4
PoAs applying small-scale criteria			
Average – 0.23%	34	136	137
Std deviation – 0.34%	51	204	204

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

For renewable power technologies, even if the total capacity of a PoA was over 15 MW, the unit size could not be larger than 5 MW for most technologies (15 MW for solar PV or solar thermal) to qualify for automatic additionality. Given the economies of scale in renewable energy power generation (Pryma 2012), small unit sizes would be expected to have higher capital costs, and would therefore be more likely to face investment barriers than larger scale plants. Project-level analysis by the International Renewable Energy Agency (IRENA) also suggests that smaller renewable energy plants not only have higher costs (i.e. because the smaller dots, representing smaller scale projects, are generally higher up in the figure), but that for solar PV and solar thermal these costs are still considerably higher than for fossil fuels (Figure 3-9). Analysis by EPRI has also shown that solar power at the several MW scale is considerably more expensive than conventional alternatives (EPRI 2012). This suggests that a solar PV (grid connected or off-grid) programme of any total size would not be economically viable if the units were below the small-scale thresholds. However, the challenge with solar technologies is that they are so expensive that carbon revenue is unlikely to close the financial viability gap, so they may be more driven by national policies than carbon markets (Section 3.7).

Figure 3-9: Levelized cost of electricity from renewable technologies, 2010 and 2014



Notes: Size of the diameter of the circle represents the size of the project. The centre of each circle is the value for the cost of each project on the Y axis. The LCOE of a given technology is the ratio of lifetime costs to lifetime electricity generation, both of which are discounted back to a common year using a discount rate that reflects the average cost of capital.

Sources: IRENA (2015)

On the basis of the unit size analysis shown in Table 3-4, the Secretariat prepared a concept note with recommendations to the EB using on unit size, and not total project or CPA size, as the basis for determining microscale additionality (CDM-EB85-AA-A09). The EB agreed to begin to implement an approach of using only a unit size threshold to determine if the size of the project qualifies for microscale (EB85 report, paragraph 42). The other requirements for microscale (e.g. location in an LDC or SUZ, if the unit size is greater than 1% of the SSC threshold) would remain unchanged. This means that the CPAs comprised of technologies that were below the unit size threshold would not be limited in their total size. For example, a CFL PoA in an LDC could have a CPA with 100,000 MWh savings and still apply the microscale additionality guidelines.

3.6.2. Summary of findings

While the PoA rules do allow programmes with a total size greater than the small-scale and microscale thresholds to utilise the automatic additionality provisions for these scales of projects, there is no evidence that this increases the risk of non-additional projects on its own (i.e. the share of projects that could be non-additional). In other words, the PoA rules do not fundamentally change the additionality risks for a given category of project technologies. The PoA process could, of course, increase the overall *scale* of the risk because they were designed to facilitate the large scale dissemination of small, distributed technologies. For example, there are 40 registered 'improved stove' project activities with expected CERs of 1 million tCO₂ per year, but there are 46 registered 'improved stove' PoAs that already have expected CERs of 8.1 million tCO₂ per year.

3.6.3. Recommendations for reform of CDM rules

Reform of the CDM rules related to additionality for particular project types and positive lists will address any concerns about additionality of PoAs.

3.7. Positive lists

The concept of ‘positive lists’ means that specific project types are considered automatically additional. Positive lists are one option to reduce transaction costs and increase the certainty of the CDM system from the perspective of project developers. Similar to standardized baselines, creating a positive list requires an upfront evaluation of technologies and their economic and regulatory environment, independent of the assessment of a particular CDM project proposal, to establish certain objective criteria that, if met, will result in a high likelihood of additionality. Once a positive list is established, a specific CDM project only needs to show that the pre-defined criteria are met, and does not have to apply other tools to justify additionality.

3.7.1. Positive lists in the CDM and impact on CER supply

Positive lists were introduced in the CDM through various routes. As briefly mentioned in Section 3.6, the CDM EB adopted the “Guidelines for demonstrating additionality of micro-scale project activities” in 2010, which were subsequently converted to a methodological tool, which first established automatic additionality for certain project types regardless of the type of methodology used (i.e. small-scale or large scale). Table 3-5 shows the technologies covered under version 7 of that tool, and the criteria they must meet in order to be deemed automatically additional. In addition to total project size (or, in the case of PoAs, the size of an individual CPA), the technologies must meet a further criterion such as location, unit size and/or consumer group.

Table 3-5: Projects considered automatically additional under the tool “Demonstration of additionality of microscale project activities”

<p>1 Based on country (LDCs, SIDSs)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>2 Based on unit size and consumer (households, communities, SMEs) (i.e. any country)</p> <ul style="list-style-type: none"> • Renewable energy of any size as long as unit size is less than 1500 kW • Energy efficiency of any size as long as unit savings are less than 600 MWh per year • Other small-scale CDM projects (Type III) of any size as long as unit savings are less than 600 tCO₂ per year
<p>3 Based on host country designation of special underdeveloped zone (SUZ)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>4 Based on designation of a technology by the host country</p> <ul style="list-style-type: none"> • Grid connected renewable energy specified by DNA, up to 5 MW, which comprises less than 3% of total grid connected capacity
<p>5 Based on other technical criteria</p> <ul style="list-style-type: none"> • Off-grid renewable energy up to 5 MW supplying households/communities (less than 12 hours grid availability per 24 hours is also considered ‘off-grid’)

Notes: LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SME = Small and micro enterprises, DNA = Designated National Authority.

Sources: Tool for “Demonstration of additionality for microscale activities”

In 2011, the “Guidelines on the demonstration of additionality of small scale project activities”, which later were similarly converted to a methodological tool, also included for the first time a list of technologies that would be considered automatically additional for any project meeting the small-scale CDM thresholds. This initially only included a list of grid and off-grid renewable energy technologies (i.e. the first two blocks in Table 3-6), but was expanded in 2012 to include small isolated units serving communities and renewable energy-based rural electrification.

Table 3-6: Technologies considered automatically additional under the tool “Demonstration of additionality of small-scale project activities”

6	Renewable energy (up to 15 MW, grid or off-grid, all end users) <ul style="list-style-type: none"> • Solar PV and solar-thermal electricity generation • Offshore wind • Marine technologies (e.g. wave and tidal) • Building integrated wind turbines or household roof top wind turbines (unit size =< 100 kW)
7	Renewable energy (up to 15 MW, off-grid only) <ul style="list-style-type: none"> • Micro/pico-hydro (unit size =< 100 kW) • Micro/pico-wind turbine (unit size =< 100 kW) • PV-wind hybrid (unit size =< 100 kW) • Geothermal (unit size =< 200 kW) • Biomass gasification/biogas (unit size =<100 kW)
8	Distributed technologies for households/communities/SMEs (off-grid only) <ul style="list-style-type: none"> • Aggregate size up to SSC threshold (15 MW, 60 GWh or 60 ktCO₂ emission reductions) with unit size =< 5 per cent of SSC thresholds (i.e. =< 750 kW, =< 3 GWh/y or 3 ktCO₂e/y)
9	Rural electrification using renewable energy <ul style="list-style-type: none"> • In countries with rural electrification rates less than 20%

Notes: Numbers in left hand column continue from previous table.

Sources: Tool for “Demonstration of additionality of small-scale activities” (version 10.0)

In addition to these tools, which apply across many methodologies, some individual methodologies have provided for automatic additionality for certain project types, often related to regulations. The most widely used is ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0), which was revised in November 2014 to include a two-part positive list for grid connected technologies. The first part is a list of technologies that are considered automatically additional: solar PV, solar thermal, offshore wind, marine wave and marine tidal (i.e. the technologies included in the first part of the small-scale CDM additionality tool, except at larger scale). The second part says that any technology with less than 2% of the total grid-connected capacity or less than 50 MW total capacity in the country is considered automatically additional. Since the revision of ACM0002, ten new project activities have requested and completed registration (no new PoAs have been registered). Of these, only one project has applied the new positive list provisions – a 141 MW solar PV facility in Chile. This is the largest solar facility to be granted automatic additionality.

Another important methodology with automatic additionality provisions includes ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” (version 15.0), which was revised in late 2013 to consider the following technologies automatically additional if, prior to the project activity, landfill gas was only vented and/or flared:

- electricity generation in one or several power plants with a total nameplate capacity that equals or is below 10 MW;
- heat generation for internal or external consumption;
- flaring (assuming no flaring prior to the project).

AM0113 “Distribution of compact fluorescent lamps (CFL) and light-emitting diode (LED) lamps to households” (version 01.0) provides for automatic additionality for any project distributing self-ballasted LED lamps to households. Projects distributing CFLs are only considered automatically additional if they are in a country with “no or only limited lighting efficiency regulations” reported by the UNEP en.lighten initiative’s Efficient Lighting Policy Status Map. AM0086 “Distribution of zero energy water purification systems for safe drinking water” (version 04.0) considers projects automatically additional if less than 60 percent of the population has access to improved drinking water sources or if the project proponents can demonstrate that more than half of the improved drinking water delivered does not actually meet the appropriate health standards. AMS-III.D “Methane recovery in animal manure management systems” (version 19.0) considers projects automatically additional when there is no regulation that requires the collection and destruction of methane from livestock manure. In addition to these, AM0001 “Decomposition of fluorocarbon (HFC-23) waste streams” (version 6.0), the first approved large-scale methodology, essentially uses a positive list approach based on regulation, because any project that does not face a regulatory requirement to abate HFC-23 emissions is considered additional. The same is true for ACM0019 “N₂O abatement from nitric acid production” (version 02.0).

While the positive lists presented above have not been used widely by CDM project activities (e.g. only 121 registered projects), PoAs have utilised the lists in the small-scale and microscale additionality tools (Table 3-2), with a third of CPAs in registered PoAs using these additionality approaches. Whether this growing group of PoAs presents concerns for the additionality depends on the strength of the justification for the original positive lists and for how long this justification is likely to be valid (i.e. how often the lists should be updated).

The criteria used to select the positive lists as well as the validity of these lists are presented in an information note prepared by the Small-scale Working Group in November 2014 called “Criteria for graduation and expansion of positive list of technologies under the small-scale CDM” (CDM-SSCWG46-A23). Table 3-7 summarises all of the positive list approaches, and shows the range of criteria used. The individual methodologies often refer to regulations to determine automatic additionality, or current penetration rates. The small-scale and microscale additionality tools use a mix of end-users, location, cost of service and penetration rates, depending on the specific technology group. This also highlights the similarity between positive lists discussed here and standardized baselines (Section 3.8), which also define a list of automatically additional technologies based on penetration rates and comparative costs.

Table 3-7: Criteria used for determining positive lists

	End-user	Regulation	Location	LCOS	Penetration	Capital cost
1	Microscale based on country (LDCs, SIDSs)					
	Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other up to 20 ktCO ₂					
			x			
2	Microscale based on unit size and consumer (households, communities, SMEs) (i.e. any country)					
	Renewable energy < 5 MW and unit size <1500 kW; Energy efficiency < 20 GWh and unit savings < 600 MWh; Other < 20 ktCO ₂ with unit savings < 600 tCO ₂					
	x					x
3	Microscale based on host country designation of special underdeveloped zone (SUZ)					
	Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other < 20 ktCO ₂					
			x			
4	Microscale based on designation of a technology by the host country					
	Grid connected renewable energy specified by DNA, up to 5 MW, < 3% of capacity					
					x	
5	Microscale based on other technical criteria					
	Off-grid renewables < 5 MW supplying households					
	x					
6	Small-scale renewable energy (up to 15 MW, grid or off-grid, all end users)					
	Solar PV and solar-thermal electricity generation; off-shore wind; marine (e.g. wave and tidal); building integrated wind turbines or household p wind =< 100 kW					
				x		
7	Small-scale renewable energy (up to 15 MW, off grid only)					
	Micro/pico-hydro (unit <= 100 kW); micro/pico-wind (unit <= 100 kW); PV-wind hybrid (unit <= 100 kW); geothermal (unit <= 200 kW); biomass gasification/biogas (unit <= 100 kW)					
						x
8	Small-scale off-grid distributed technologies for communities					
	Unit size =< 5 per cent of SSC thresholds					
	x					
9	Rural electrification using renewable energy					
	In countries with rural electrification rates less than 20%					
10	AM0086 water purification					
	<60% access to improved drinking water and <50% use of point-of-use zero energy water purification					
					x	
11	AM0113 energy efficient lighting					
	CFLs in countries with no or limited regulatory support All self-ballasted LED lamps					
		x			x	
12	ACM1 landfill gas utilisation					
	LFG for electricity or heat where vented or flared, or flaring where previously vented					
					x	x
13	AMS III.D methane and manure management					
	Biogas for power < 5 MW where no regulation requires collections and destruction of methane					
		x				
14	AMS III.C electric and hybrid vehicles					
	Market share of electric/hybrid vehicles < 5%					
					x	

Notes: LCOS = Levelized cost of service, LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SMEs = Small and micro enterprises, DNA = Designated National Authority.

Sources: UNFCCC documents as cited in text

In terms of the duration of validity of the positive lists, the small-scale and microscale additionality tools did not originally include a time limit, although many of the methodologies specify a three-year duration of validity. The EB (EB81, paragraph 72) accepted a Small-Scale Working Group recommendation in late 2014 to set a three-year limit on validity for the small-scale CDM positive lists. In addition, the EB agreed on thresholds for 'levelized cost of service', 'penetration rate', and 'capital cost', as shown in Table 3-8. Note that these new rules only apply to the positive lists under the tool for "Demonstration of additionality of small-scale project activities", and not to microscale activities or any other positive lists.

Table 3-8: Graduation criteria for technologies under the tool for "Demonstration of additionality of small-scale project activities"

	End-user	LCOS	Penetration	Capital cost
Grid connected renewable electricity generation				
All renewable energy technologies in the current positive list		>= 50% higher than all fossil fuels	Global average penetration <3%	
Off-grid renewable electricity generation				
All off-grid renewable technologies in the current positive list				>= 3 times the cost of all fossil fuels
Distributed technologies for households/communities/SMEs				
All distributed technologies eligible under Type I/II/III and providing services of households/communities/SMEs	Assess appropriateness of user groups		Global average penetration rate < 3%	>= 3 times cost of all plausible baseline technologies

Sources: Information note "Criteria for graduation and expansion of positive list of technologies under the small-scale CDM" (CDM-SSCWG46-A23)

3.7.2. Assessment of current positive lists

The positive lists developed under the CDM to date are based on specific criteria such as penetration rate, costs, regulatory environment, and location. While these lists have not been used widely for automatic additionality among CDM project activities, their use among PoAs is widespread and growing. Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. **This review of validity should also be extended to other project types, in particular those covered by the microscale additionality tool or approaches used in relevant methodologies (e.g. ACM0002).**

An important challenge with the current positive lists, however, is that the basis upon which they are established varies widely, without a clear rationale for the choice or level of the indicator (e.g. why penetration might be used for some technologies but levelized cost of service for others). **A consistent approach to determining technology eligibility is needed** to ensure that existing and new positive lists do not pose risks of non-additionality. The criteria and indicators used should have clear justification for how they influence project implementation. For example, while low market penetration or high capital costs could be strong indicators of prohibitive barriers for some technologies, it is not clear how the concept of 'special underdeveloped zones' (SUZ), which may

be defined differently by each DNA according to UNFCCC guidelines, is a reliable indicator of barriers.

As part of the justification of project types and technology choices, **positive lists must address the impact of national policies and measures to support low emissions technologies** (so-called, E- policies). As discussed in Section 3.9 and many of the sections within Chapter 4, national policies may be the primary driving factor for the implementation of certain technologies, rather than their underlying economics, market position or location. In fact, one of the criticisms of allowing renewable technologies to be considered automatically additional is that their costs are so high that carbon revenue alone cannot possibly make them financially viable, and so other incentives and policies are the real determining factor (Lazarus et al. 2012; Spalding-Fecher et al. 2012). This is even truer with smaller scale technologies. For example, in a study in Southern Africa, the levelized cost of roof-top solar PV was 20% more expensive than utility scale solar PV, while small hydropower was 70% more expensive than large scale (Miketa & Merven 2013). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. An example of this would be the REN21 renewable energy global overview and interactive map,³⁷ which provides a comprehensive technology-specific database of the policies in place to support renewables. A positive list that included renewables could therefore be qualified by restricting its applicability to countries that did not have any support policies in place for that technology. Having support policies in place does *not*, on its own, mean that those technologies would not be additional, but only that there is a greater risk of this and so applying a positive list approach in that country would not be appropriate. Projects in those countries could still use the other tools available for demonstrating additionality for small- and large-scale projects – they would only not have access to automatic additionality based on the positive list. As an example, the positive list in the tool for “Demonstration of additionality of small-scale project activities” includes all solar PV and solar thermal technologies in all CDM-eligible countries. According to the REN21 policy database, however, the following countries have support policies³⁸ in place for solar PV: Algeria, Argentina, Brazil, Cape Verde, China, Côte d'Ivoire, Ecuador, Egypt, Gambia, Ghana, India, Jordan, Lebanon, Malaysia, Mauritius, Nepal, Nigeria, Republic of Korea, Senegal, Thailand, Uruguay, Uzbekistan, and Venezuela. For these countries, therefore, it might be more appropriate to require an analysis of barriers to solar PV rather than considering them automatically additional. This approach could be refined based on additional research into publicly available and up-to-date databases of renewable energy policies.

Finally, to maintain environmental integrity of the CDM overall, **positive lists should be accompanied by negative lists**. This is because the introduction of a positive list without any negative list could, by definition, only lower environmental integrity compared to the traditional approaches. Projects that do not fall within the positive list can still apply the traditional approaches. So, the positive list will lead to more ‘false negatives’ passing the test, but will not rule out any projects that are not additional. Overall, environmental integrity is thus lowered (albeit with the positive element of reducing transaction costs). An exception to this could be the few methodologies that deem projects as ineligible if they reach a market penetration threshold above a certain level, because they, in essence, include both a positive and negative list.

³⁷ The interactive map is shown at: <http://www.ren21.net/status-of-renewables/ren21-interactive-map/> . The full database of policies is available at <http://www.ren21.net/wp-content/uploads/2015/09/Downloadable-Consolidatedv1.2.1.xlsx>.

³⁸ Support policies may include, for example, feed-in tariffs, electric utility quota obligation, capital subsidies, tax credits, and net metering, but exclude renewable energy targets not accompanied by other incentives.

3.8. Standardized baselines

Project developers have repeatedly complained about the expensive and time-consuming process for formally registering a project under the CDM. The setting of the baseline for the greenhouse gas emission reductions associated with a project has required project developers to apply project specific methodologies in order to calculate baseline emission levels. The project developers take on significant costs before the approval of their project when collecting the data necessary to set the baseline and demonstrate additionality. In some cases the risks associated with these upfront costs may be too high for developers of smaller projects in poorer countries (Spalding-Fecher & Michaelowa 2013) – impacting the regional distribution of projects under the CDM. Apart from high transaction costs, the project-specific determination of baselines and assessment of additionality has been criticised in the past for being subjective (Schneider 2009). Due to the information asymmetry between project developers and DOEs subjective assumptions may be difficult to verify, which could result in non-additional projects or over-crediting, which both undermine the environmental integrity of the CDM.

The Cancun Agreements in 2010 provided for the use of *standardized baselines* in the CDM to address these limitations with the aim “to reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism, particularly with regard to under-represented project types and regions, and scale up the abatement of greenhouse gas emissions, while ensuring environmental integrity” (UNFCCC 2011c). In contrast to the project-by-project approach to setting baselines and demonstrating additionality, standardized baselines are established for a project type or sector in one or several CDM host countries. Standardized baselines can address any or all of three areas for standardization: demonstrating additionality, determining the baseline scenario or determining baseline emissions. In the latter case, standardization can include emission factors or individual parameters needed to calculate emission reductions.

Standardized baselines require host country approval and are submitted through the DNA of the host Party. They can cover one or several Parties. Once approved, project developers can use a standardized baseline when submitting a project for registration. In 2014, the EB further decided that it is up to the host Parties to decide whether projects must use an approved standardized baseline or whether they may alternatively use a project-specific approach, but noted that the EB could reject standardized baselines if this poses a risk to environmental integrity (CDM-EB78, para 24). In practice, all approved standardized baselines have so far been voluntary, except for a multi-country grid emission factor in the Southern African region.

The CDM allows standardized baselines to be derived either from suitable methodologies, from tools such as the ‘*Tool to calculate the emission factor for an electricity system*’³⁹ or from a generic framework that is applicable to all project types and sectors such as the ‘*Guidelines for the establishment of sector specific standardized baselines*’⁴⁰ adopted by the EB in 2011. Further regulatory documents include a procedure for submission of standardized baselines, a standard on the coverage and vintage of data, and guidelines for quality assurance and quality control.

The ‘*Guidelines for the establishment of sector specific standardized baselines*’ combine elements of market penetration, performance benchmarks, investment and barrier analysis. Under this framework, the standardized baseline results in a positive list of fuels, feedstocks and/or technologies for a given sector. The least emission-intensive fuel/feedstock/technology needed to produce

³⁹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.pdf>.

⁴⁰ https://cdm.unfccc.int/filestorage/4/II/Y/4IY1RB7DMKLPWPGF59XC3UE6JNH8Q2A/eb62_repan08.pdf?t=N2d8bnRoeHN3fDDSYyp3xU9Kx6IMk5Ho1yFw.

a certain percentage of the sector's output (i.e. defined by the CDM EB)⁴¹ is selected as the baseline fuel/feedstock/technology. All fuels/feedstocks/technologies that are associated with lower emission intensities than the baseline technology are candidates for inclusion in a positive list of fuels/feedstocks/technologies that are automatically deemed additional. The DNA of the host country also needs to demonstrate for each of the candidates for the positive list that they are either less economically attractive than the non-candidates or face barriers to entry (Schneider et al. 2012). The baseline technology is also used to determine the baseline against which emission reductions are calculated (Hermwille et al. 2013).

Table 3-9: Approaches for deriving grid emission factors

DNAs could use either the standardized baseline guidelines or the grid emission factor tool to determine the grid emission factor and submit the value as a standardized baseline. The weaknesses of this opportunity to choose between two alternative approaches are explained below:

- 1) **Pick and choose issue:** The two approaches will provide two different values for the grid emission factor. Thus, the DNA could pick and choose between two completely different methodological approaches for determining the grid emission factor. Countries for which the guidelines result in higher values will use that approach, whereas countries for which the tool results in higher values will use that approach. Overall, having two parallel approaches could undermine the environmental integrity compared to the current situation in which only one approach is available.
- 2) **Vintage of data issue:** The standardized baseline guidelines consider all plants, whether they were recently constructed or decades ago. This could result in a situation in which coal power is determined as the baseline fuel, even if no coal power plant has been constructed or been under construction for a decade. In contrast, the grid emission factor tool aims to consider recent developments by observing which plant types were recently added to the system or are under construction or which plants actually operate at the margin.
- 3) **'One size fits all' issue:** The grid emission factor tool uses a methodologically approach that considers the particularities of the electricity system, considering different possible effects of displacing grid electricity (marginal plants not being dispatched/the construction of other power plants avoided or delayed). In contrast, the guidelines do not consider the characteristics of the sector and make generalised assumptions, which have little meaning in the power sector. The guidelines therefore result in less accurate grid emission factors than the grid emission factor tool.

Sources: Own compilation

The environmental impact of standardized baselines will be affected by how stringently the standardized baseline is set for a given project type. The stringency of standardized baselines needs to safeguard the environmental integrity of the CDM whilst also striking the right balance between accuracy and transactions costs in order to ensure that there is an incentive for developing new CDM projects.

The implications of standardized baselines on environmental integrity will also vary depending upon the sector that they are applied to, as the approach relies considerably upon the assumption that the penetration of a fuel/feedstock/technology is negatively correlated with its cost and/or with barriers that impede their deployment (Hermwille et al. 2013). For certain sectors there will undoubtedly be a strong correlation, i.e. energy efficient lighting and efficient electrical appliances.

⁴¹ In its guidance, the EB has defined a preliminary additionality/crediting threshold of 80 % in priority sectors and 90% in other sectors.

However for other sectors, i.e. with multiple products or with strongly varying circumstances among installations, the correlation will be weaker or absent and alternative approaches for setting baselines and demonstrating additionality may be more suitable (Hermwille et al. 2013). Applying the current framework to sectors for which such a correlation is lacking could broaden the positive lists for technologies that are unlikely to be additional. In the power sector, for example, the guidelines do not reflect the particular features of an electricity system. The Methodologies Panel recommended that the EB limits the applicability of the SB standard to sectors other than the power sector (MP65, paragraph 38 and 39). In response, the EB requested the Methodologies Panel to assess the applicability of the proposed framework to different project types (EB81, paragraph 41). However, as of January 2016, the current guidelines are still applicable to all sectors. In 2015, a standardized baseline was finalized for consideration by the EB, which includes grid emission factors for different islands of Cape Verde and applies for some islands the “*Guidelines for the establishment of sector specific standardized baseline*” and for others the grid emission factor tool. The issues arising from the application of the guidelines to the power sector are highlighted in Table 3-9.

The following issues may pose further environmental risks through the implementation of standardized baselines in the future:

- **Mandatory versus voluntary use of standardized baselines:** The current CDM EB framework does not make the use of standardized baselines mandatory (CDM-EB74, para 24). It is the discretion of the DNA to decide whether project participants can select between project-specific or standardized baselines. In this regard, the DNA can make their use voluntary or mandatory. This may have two consequences:
 - Standardized baselines open an alternative route towards positive lists (Section 3.7), while keeping the approach of demonstrating additionality through the current means. By definition, this can only increase the number of false positives. Hence, the likelihood for additionality is lower, compared to a situation in which there would be no standardized baselines.
 - The voluntary use of standardized baselines could lead to project developers picking and choosing between baseline emission factors which could result in over-crediting (Table 3-9, bullet point 1). Indeed, Spalding-Fecher & Michaelowa (2013) argue that the CMP should make standardized baselines mandatory.

The degree of these risks depends on how conservative the standardized baselines are set. The more conservatively that they are set, the lower the risk is. An example of how picking and choosing between project-specific and standardized baselines can undermine environmental integrity is the approved standardized baseline ASB0018 for cook stove projects in Burundi. The approved standardized baseline provides default values for the amount of non-renewable biomass consumed in the baseline (1.5 tonnes per person and year for households in urban areas and 1.1 tonnes per person and year for households in rural areas). However, at the same time, a PoA (9634) is registered in Burundi with project-specific baseline values based on data from a more recent survey. The project-specific baseline is more ambitious (1.21 tonnes per person and year for households in urban areas and 0.83 tonnes per person and year for households in rural areas). Had the standardized baseline been approved prior to the registration of the project, the project could have opted for the less ambitious standardized baseline. At the same time, projects with higher project-specific baseline values could opt for their project-specific baseline and not use the standardized baseline.

- **Quality assurance and quality control (QA/QC) of standardized baselines:** Version 04.0 of the procedure ‘*Development, revision, clarification and update of standardized baselines*’

(CDM-EB84-A10) sets out how a project developer can submit a proposal for a standardized baseline to the CDM EB following first the approval of the relevant DNA. It is necessary for the project developer to provide a list of documents when submitting a standardized baseline proposal, which includes the Form F-CDM-PSB, supporting documents and an Assessment Report of QA/QC. The CDM EB clarified only in 2015 that DOEs not only need to verify whether the required documents were submitted and that the data were collected according to guidelines for quality assurance and quality control but that they also need to check that the standardized baseline has been calculated in accordance with the relevant standards (CDM-EB85-A10). However, this decision still needs to be adequately reflected in the latest version of the ‘*CDM validation and verification standard*’ (CDM-EB82-A14). Moreover, stakeholders expressed concerns that if the requirements for QA/QC are too stringent, it may prevent the approval of standardized baselines from LDCs (Hermwille et al. 2013). Therefore, the QA/QC Assessment Report is currently not compulsory for countries with 10 or fewer registered CDM projects as of 31 December 2010 for the first 3 submissions (CDM-EB84-A10, Para. 18), even though countries can request financial support from the UNFCCC for the development of Assessment Reports. These exemptions from applying the QA/QC guidelines could undermine the environmental integrity of the CDM.

- **Development of country-specific thresholds:** CMP9 requested the EB “*to prioritise the development of top-down thresholds for baseline and additionality for the underrepresented countries in CDM*” (CDM-EB82-AA-A10, Para. 3). Many stakeholders regard the currently approved default thresholds for additionality and baseline as ‘*unattractive*’ and ‘*not suitable*’ for specific national/regional/sectoral circumstances (CDM-EB82-AA-A10). However, the adoption of country-specific thresholds could be a difficult process as such thresholds are a policy choice rather than a methodological choice. It is uncertain whether or not the development of country-specific thresholds would undermine the environmental integrity of the CDM. However, it would likely result in the incomparability of emission reductions from different standardized baselines within the same project type or technology.
- **Exclusion or inclusion of CDM facilities in the peer group to determine standardized baselines:** The development of certain standardized baselines relies upon the performance and actual output from the facilities of a sector of the host country. Some of these facilities may already have registered CDM projects (i.e. referred to as CDM facilities) that would have improved performance due to the incentives provided by the CDM. Given that it is difficult to determine the performance and outputs of these facilities in the absence of the CDM, it is necessary to take a decision on whether to include CDM facilities in the calculation of a standardized baseline or not. Exclusion of CDM facilities could undermine the environmental integrity of the CDM (CDM-EB78-AA-A05). As a default all CDM projects need to be included in the respective cohort unless the DNA can demonstrate that the cost of fuels/feedstocks/technologies exceed those of certain comparable projects (CDM-EB79, para 41).
- **Vintage of standardized baselines and static versus dynamic standardized baselines:** Standardized baselines are often constructed based on plants for which the investment decision was taken many years in the past. If a standardized baseline is static and not frequently updated, it can mean that additionality is established and baselines are determined based on a market situation that is ten or twenty years old (i.e. failing to take into account technological breakthroughs). This could result in significant crediting of BAU (Table 3-9, bullet point 2). The high-level CDM Policy Dialogue has therefore recommended that in order to drive technological change, the standardized baseline framework must ensure “*that the focus of incentives constantly shifts to the next generation of technologies*” (CDM Policy Dialogue 2012, p. 6). As a consequence, the current standardized baseline framework specified interim data vintages and

update frequencies of 3 years respectively (CDM-EB77-A05). For example, sectors associated with slow dynamic developments in the past may allow for a relaxation in the frequency of updates without compromising the environmental integrity of the CDM.

- **Level of disaggregation:** The level of disaggregation is an important factor to consider in the development of a standardized baseline, which can enable a DNA with limited resources to prioritise which mitigation measures to incentivise within a sector. For example, Hermwille et al. (2013) refer to a case study of the rice mill sector in Cambodia where only a small number of large scale rice mills account for approximately 60% of the total output. Given that the remaining output is provided by thousands of small-scale rice mills with very varied use of technologies that are associated with different emission intensities, it was necessary to disaggregate the standardized baseline on the basis of plant size (i.e. focus standardisation on the large-scale mills). The importance of disaggregation of standardized baselines is further demonstrated in the power sector. If a standardized baseline is based upon the entire power sector of a country, it is likely that the use of renewables and possibly of the most efficient fossil fuel technologies would be encouraged. However, if the standardized baseline was disaggregated further to consider fossil fuel consumption only – different mitigation options such as fossil fuel switching would be encouraged instead (Hermwille et al. 2013). The appropriate level of disaggregation depends very much on the project type and the actual circumstances. With the current approach, DNAs can determine the level of disaggregation, though there is no EB guidance on how the appropriate level can be determined. In addition, such guidance would hardly be compatible with the ‘one size fits all’ approach pursued in the standardized baseline guidance.

In light of all of these challenges, the implementation of standardized baselines may not be suitable for all sectors, project types or countries. The development of a standardized baseline can achieve the objective of simplification in certain sectors associated with more homogenous products. However, standardized baselines will be more difficult to apply to sectors associated with a range of products and strongly varied circumstances amongst installations. Therefore, it should be carefully checked for which purposes, sectors, project types and baseline emission sources standardized baselines are appropriate. Applying one single approach to establish standardized baselines for different sectors, project types and locations, as currently pursued under the CDM, is likely to undermine the environmental integrity of the CDM. Standardized baselines should be developed from actual projects and reflect the particular circumstances of the sector, project type and location. Once approved within a country or region, standardized baselines need to be mandatory for all new CDM projects to prevent that more CERs are issued as if the standardized baseline was not established (Schneider et al. 2012).

To ensure that the concept of standardized baselines provides what it was established for, particularly *“to reduce transaction costs, ... while ensuring environmental integrity”* (UNFCCC 2011c), the EB should review the standardized baseline framework. This review should ensure that

- stringent QA/QC procedures are applied to all standardized baselines,
- all CDM facilities without any exemptions are included in the peer group for the standardized baseline,
- DNAs can build their decision on the appropriate disaggregation level on a clear guidance document which aims to determine the level of disaggregation in a way that covers the mitigation activity of the standardized baseline as accurately as possible and includes as few external factors (‘noise’) as possible;
- the practice of using the same methodological approach to establish standardized baselines for all the different sectors, project types and locations is replaced by the development

- of project-specific standards derived from actual projects and reflect the particular circumstances of the sector, project type and location, and last but not least,
- standardized baselines are mandatory for new projects once they are approved for a country.

If these improvements were introduced, standardized baselines could be a valuable tool to improve the environmental integrity of the CDM while lowering transaction costs.

3.9. Consideration of policies and regulations

The consideration of policies and regulations in demonstrating additionality and establishing emissions baseline has been a controversial issue for project-based mechanisms as the CDM. Policies and regulations adopted by the host country can have a significant impact upon future emission pathways. For example, the introduction of air quality regulations for power plants impacts their CO₂ emissions while fossil fuel subsidies reduce the viability of less emission-intensive technologies (Schneider et al. 2014). When setting the baseline and demonstrating additionality there have been concerns raised about both perverse incentives for policy makers (i.e. host countries not implementing policies and measures that reduce emissions so that they can secure greater carbon revenues) and about environmental integrity, by either over-crediting of emission reductions (i.e. inflating the baseline by excluding policies and measures that reduce emissions) or non-additional projects (i.e. registering projects that are economically viable and do not face barriers by allowing the exclusion of subsidies in the investment analysis).

The modalities and procedures for the CDM require that *"a baseline shall be established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector"* (decision 3/CMP.1, para 45(e)). However, in order to avoid the creation of perverse incentives for policy makers, the CDM EB adopted, at its 22nd meeting, the following rules with regard to the consideration of policies in setting baselines:

- **E+ policies:** to not consider policies adopted after 1997 which *"give comparative advantages to more emissions intensive technologies or fuels over less emissions intensive technologies or fuels"* in setting the baseline;
- **E- policies:** to not consider policies adopted after 2001 which *"give comparative advantages to less emissions intensive technologies over more emissions intensive technologies"* in setting the baseline.⁴²

These rules failed, however, to fully address perverse incentives for policy makers, as host countries would continue to have incentives to maintain existing E+ policies such as fossil fuel subsidies. Furthermore, although host countries will not be discouraged from implementing national policies and measures that reduce emissions (E- policies), the rules are likely to result in over-crediting of emission reductions.

Overall, in the case of E- policies it seems difficult to reconcile the two policy objectives: avoiding perverse incentives for policy makers and ensuring environmental integrity. If E- policies were excluded when demonstrating additionality or setting baselines, perverse incentives would be addressed but environmental integrity would be undermined, since projects that are financially viable could claim they are not, and emissions baselines would be inflated. If E- policies were included, environmental integrity would be ensured but perverse incentives not addressed.

⁴² EB 22 report, Annex 3: Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline Scenarios (Version 02), https://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

In 2013, the EB reviewed its E- policy guidelines with a view to balancing these two conflicting policy objectives and *“agreed to pursue an approach by which, for the first seven years from the effective implementation date of the relevant E- policy, the benefit of that E- policy does not need to be considered by project participants in the additionality demonstration through investment analysis”* (CDM-EB73, para. 70). The approach would thus ignore new E- policies but for a limited time period. Initially allowing the exclusion of E- policies could be seen as addressing perverse incentives for policy makers, while ensuring environmental integrity in the longer term. It would also expand the approach of ignoring E- policies from baseline setting to demonstrating additionality. However, the EB has not yet been able to agree on a revision of its E+/- policy guidelines.

Based upon an econometric analysis, Lui (2014) raises questions about the decline of feed-in tariffs in China⁴³ that may imply a gaming to ensure wind projects are not economically attractive for the purpose of demonstrating additionality under the CDM. Schneider et al. (2014) argue that with regards to E- policies it is simply not feasible to achieve both a robust crediting baseline and avoid the creation of perverse incentives at the same time. Striking a balance between the two objectives is therefore required when setting the crediting baseline, which is likely to vary depending upon the sector, project type and type of policy.

Given the contrasting objectives, the decision on whether to include E- policies in the baseline or not and the determination of additionality of a project-based mitigation activity should depend upon the potential risk of either creating perverse incentives or over-crediting. Schneider et al. (2014) recommend that the following approach should be pursued when setting baselines and determining additionality:

- If the **risk of creating perverse incentives** is judged to be considerably larger than the risk of over-crediting, then E- policies should not be considered (for a certain period) in setting the baseline;
- If the **risk of over-crediting** is deemed to be considerably greater than the risk of creating perverse incentives, then E- policies should be considered in setting the baseline.

The extent to which the setting of baseline and determination of additionality for a project-based mitigation activity is more liable to either the risks of perverse incentives or over-crediting depends upon the wider co-benefits associated with a policy other than simply climate change mitigation. For example, the deployment of renewables is associated with multiple co-benefits such as employment opportunities, energy security and air quality improvements. Given the additional benefits associated with such E- policies, it is less likely that these policies would not be adopted as a consequence of changes to an international crediting mechanism. Schneider et al. (2014) and Spalding-Fecher (2013) therefore both argue that the risk of creating perverse incentives (i.e. delaying policies and regulations to secure more CER revenues) may be lower than the risks of setting a less robust baseline (i.e. by not including E- policies in the baseline) that leads to the over-crediting of emission reductions. Spalding-Fecher (2013) also points out that such co-benefits are likely to occur with electricity generation, energy efficiency and agriculture projects.

However, the risk of creating perverse incentives is likely to be greater from mitigation activities such as the capture of HFC-23, which reduce GHG emissions but do not lead to significant co-benefits. In such a case, preventing the creation of perverse incentives (i.e. host country delaying regulation on the capture of HFC-23) could be given priority over additionality and environmental integrity by not considering such E- policies when setting the baseline. Nevertheless, CERs resulting from such projects would be used to offset GHG emissions in other capped systems and, since

⁴³ Spalding-Fecher (2013) discusses the uncertainty within the CDM EB on how such a policy change should be classified under the E+/- policy guidance.

they are not truly additional, result in globally higher emissions. Therefore, it would be more appropriate to support such technologies by other means such as ODA or climate finance or by addressing these mitigation potentials as own contribution under the ADP negotiations.

From a more practical perspective, Spalding-Fecher (2013) emphasises the difficulty of accurately accounting for the effects of E- policies when setting either the baseline or demonstrating additionality. The level of difficulty depends upon the policy type. For example, the impact of direct financial incentives such as mandatory feed-in tariffs can be removed more easily from an emissions baseline than indirect sectoral incentives such as renewable energy portfolio standards or economy-wide policies such as domestic emissions trading schemes. Furthermore, defining the date of policy implementation and the effectiveness of enforcement may sometimes represent additional challenges (Spalding-Fecher 2013). If the guidance provided by the CDM EB – given the difficulty in isolating the impact of multiple (and sometimes conflicting) policies when setting emission baselines or demonstrating additionality – would only relate to direct financial incentives this could lead to the unequal treatment of host countries under the CDM based upon the types of policies implemented (Spalding-Fecher 2013). For example, it would be easier to determine the additionality of a renewable energy project in a host country with direct financial incentives such as feed-in tariffs compared to a host country that adopted a domestic emissions trading scheme. This practical problem could not only undermine the environmental integrity of the CDM but also mean that excluding E+ or E- policies may simply not be practical.

Taking into account the various challenges to strike the right balance between avoiding perverse incentives for policy makers and ensuring environmental integrity, Spalding-Fecher (2013) concludes that the risk of perverse incentives is not as high as previously assumed in many countries and sectors, while the risk of over-crediting is substantial. He therefore suggests that as a general rule all E- policies should be considered in both baseline-setting and additionality determination. Schneider et al. (2014) outline the following options in relation to E- policies:⁴⁴

- No consideration of E- policies: No perverse incentives would be created if both existing and planned E- policies were not considered when setting the crediting baseline. In fact, host countries would be encouraged to introduce further E- policies to further reduce emissions below the baseline. However, the disadvantage of this option would be that the emission baseline would most likely be inflated above BAU.
- Consideration of existing E- policies, exclusion of future E- policies: A more balanced approach could involve the introduction of a cut-off date for excluding future E- policies from being considered in the setting of the crediting baseline. However the setting of a cut-off date is problematic. For example, if the cut-off point is set too early it may inflate the crediting baseline by considering E- policies that have already been adopted. Nevertheless, the option provides a positive incentive for host countries to adopt new E- policies (after the cut-off point) to reduce emissions.
- Consideration of existing and future E- policies: A robust crediting baseline would be established if both existing and future E- policies were considered (either ex-ante or ex-post), however this would most likely create disincentives to introduce E- policies as their introduction could lower the potential for credits. In addition, this option would provide greater uncertainty for investors as to when a crediting baseline would be updated.

In order to prevent the over-crediting of emission reductions, it would be a sensible approach to include current E- policies in the crediting baseline. However, accounting for future E- policies is

⁴⁴ These options are outlined in the context of a sector based crediting mechanism though they also apply to the CDM.

more problematic and warrants further research to ensure that a reasonable balance is achieved between limiting the over-crediting of emission reductions and preventing the creation of perverse incentives. Schneider et al. (2014) and Spalding-Fecher (2013) conclude that the balance should be more in favour of limiting over-crediting in the CDM or future mechanisms as they judge this risk to be greater to undermining environment integrity than from the creation of perverse incentives. Therefore, as a general rule Schneider et al. (2014) recommend that adopted policies and regulations reducing GHG emissions should be included when setting crediting baselines and policies that increase GHG emissions should be discouraged by their exclusion from the crediting baseline where possible.

3.10. Suppressed demand

One of the challenges of applying GHG accounting approaches in poor communities is that the current consumption of many household services (e.g. heating and cooking energy, lighting and potable water) may not reflect the real demand for those services. This could be a result of lack of infrastructure, lack of natural resources or poverty, particularly the high costs of these services relative to household incomes. The situation of 'suppressed demand' creates a problem for setting baselines, because the CDM rules say that the baseline scenario selected for a project should provide the same level of service and quality as the project scenario (Gavaldão et al. 2012; Michaelowa et al. 2014; Spalding-Fecher 2015; Winkler & Thorne 2002). This is clearly not the case if the project scenario provides a much higher service level, owing to low historical consumption. At the same time, the CDM rules state that "the baseline may include a scenario in which future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party" (UNFCCC 2006a para. 46). This section analyzes how the concept of suppressed demand has been implemented in CDM methodologies and what the potential impacts on CER issuance as a result of the revised and new methodologies. For a more detailed conceptual explanation of suppressed demand, as well as background on previous EB decisions and guidance, see Chapter 9 of Spalding-Fecher et al. (2012).

3.10.1. Treatment of suppressed demand in approved methodologies

Table 3-10 below shows the methodologies in which suppressed demand has been explicitly considered, in three different categories. The first group is from a work plan agreed by the EB at their 67th meeting, when the EB requested that the Secretariat and relevant support panels explore how to incorporate suppressed demand. The second group is methodology revisions for which the proponent of the revision motivated the change based on the Suppressed Demand guidance. The final group is new methodologies that were developed after the approvals of the Suppressed Demand guidance and incorporated those ideas, as documented in the UNFCCC Methodology Guidebook. Of the original 10 methodologies in the EB work plan, 5 were revised or replaced, while an additional 8 methodologies fall into the second and third categories.

Note that a group of methodologies not listed here, but that implicitly recognise suppressed demand, are those addressing new large-scale power generation or industrial development. New renewable energy, natural gas or high-efficiency coal power plants are not required to show that they actually replace an existing power plant. Given that most developing countries have shortages in power supply, building a new natural-gas-fired power plant, for example, could potentially increase emissions compared to current levels. However, the accepted principle on baseline development across the CDM is that the baseline is not necessarily the same as historical emissions, but should reflect the most likely development scenario for the sector. Even in countries with chronic power shortages, it would be difficult to argue that there would be *no* capacity increases under the baseline scenario. This means that, even in these cases, CDM projects – if properly justified –

would potentially displace another alternative new plant. The determination of the alternative plant is then the subject of the methodology's baseline scenario analysis.

Table 3-10: Methodologies explicitly addressing suppressed demand or part of EB work plan on suppressed demand

Meth No.	Meth Name	Re-vised?	When	Pipeline ¹⁾	
				Pro-jects	PoAs
From EB67 work plan List of Methodologies					
AM0025	Alternative waste treatment processes	ACM22	EB69	127	5
AM0046	Distribution of efficient light bulbs to households	No		2	0
AM0086	Installation of zero energy water purifier for safe drinking water application	No	EB70	1	0
AM0094	Distribution of biomass based stove and/or heater for household or institution	No	EB70	0	0
ACM0014	Treatment of wastewater	Yes	EB77	47	1
ACM0016	Mass Rapid Transit Projects	No		16	1
AMS I.A	Electricity generation by the user	Yes	EB69	50	17
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	Not necessary	EB70	24	58
AMS II.E	Energy efficiency and fuel switching measures for buildings	No		44	5
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	Yes	EB68	4	14
Additional revisions referring to Suppressed Demand					
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	Yes	EB77	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	Yes	EB70	45	62
AMS III.F	Avoidance of methane emissions through composting	Yes	EB67	103	20
New methodologies where EB noted Suppressed Demand					
ACM0022	Alternative waste treatment processes	New	EB69	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	New	EB73	0	0
AMS I.L	Electrification of rural communities using renewable energy	New	EB66	0	1
AMS III.BB	Electrification of communities through grid extension or new mini-grids	New	EB67	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	New	EB60/62	0	10
Total with revisions or new related to suppressed demand				473	194
Total pipeline				11,990	446²⁾

Notes: ¹⁾ Pipeline is as of 1 January 2014. ²⁾ PoA DD's submitted, which may include multiple methodologies and include 23 PoAs replaced by new versions. Total number of methodology citations in all PoAs submitted is 874.

Sources: Authors' own compilation

While the proportion of project activities influenced by these methodologies is very small, a significant share of PoAs are utilising the revised or new methodologies. In terms of the quantitative impact of the revisions to methodologies to incorporate suppressed demand; however, this may only relate to projects or PoAs entering the pipeline after the revision. While project participants are allowed to update the version of the methodology that they use prior to the renewal of the crediting period, this should not make the emission reduction calculations less conservative. Given that the suppressed demand revisions could increase the baseline significantly, it is not entirely clear whether the EB would approve this revision for existing projects prior to the renewable of the crediting period (when the latest version of the methodology must be used). Because AM00025 was replaced by ACM0022 in order to address suppressed demand, none of the projects or PoAs under AM0025 (which was not used after October 2012) would be able to utilise the new suppressed

demand approach embodied in ACM0022. Table 3-11 below shows the number of PoAs and Projects in the pipeline both before and after the revisions.

Table 3-11: CDM pipeline affected by suppressed demand methodologies

Meth No.	Meth Name	Total pipeline		New pipeline since revision	
		Projects	PoAs	Projects	PoAs
Revised methodologies					
ACM0014	Treatment of wastewater	47	1	0	0
AMS I.A	Electricity generation by the user	50	17	0	13
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	4	14	3	1
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	0	0	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	45	62	2	18
AMS III.F	Avoidance of methane emissions through composting	103	20	7	8
New methodologies that incorporate suppressed demand					
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	24	58	24	58
ACM0022	Alternative waste treatment processes	10	0	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	0	0	0	0
AMS I.L	Electrification of rural communities using renewable energy	0	1	0	1
AMS III.BB	Electrification of communities through grid extension or construction of new mini-grids	0	0	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	0	10	0	10
Total		283	183	46	109

Sources: Authors' own compilation

How the suppressed demand concepts and guidance are implemented varies significantly by methodology. With the exception of AMS III.AR, all of the methodologies use the project activity level as the baseline activity level. Only AMS III.AR defines a quantitative Minimum Service Level that is used to calculate baseline emissions. AMS I.L and AMS III.BB define an MSL, but it is only used to adjust the emissions factor for the baseline, rather than to directly calculate baseline activity levels or emissions. For AMS III.F and ACM0022, the minimum service level is qualitatively defined as having a solid waste disposal site (i.e. rather than considering the quantity of waste processed per household). What the methodologies all do, however, is to define a baseline technology that may have higher emissions than the actual current technology. For example, households may currently only use candles and kerosene hurricane lamps, and therefore have very low lighting services, but the methodologies use a kerosene pressure lamps for the baseline technology, because this can deliver the MSL for lighting services.

For the revised methodologies, the resulting baselines emissions could be substantially higher per household (Annex 8.2, Table 8-1). For example, under ACM0014, baseline methane emissions may still be considered even if the wastewater is currently not treated or stored in a way that would necessarily produce emissions (e.g. lagoons with depth less than 1 m). ACM0022 and AMS III.F have emissions factors that could be double the current practices, while for AMS I.L and AMS

III.BB, the emission factor for very small users (e.g. 50 kWh/yr) is almost 7 times the emissions factor originally used in AMS I.A for these projects.

3.10.2. Impact on CER supply

If current energy service demand is suppressed by lack of income, relatively high energy prices and/or lack of physical access, how quickly might this change without the CDM project? In other words, how long might it take for the current emissions to reach the suppressed baseline emissions? This depends on many factors, including income growth in the host communities and changes in access. Data from the World Bank's World Development Indicators (World Bank 2014), for example, shows that, at a highly aggregated level, per capita incomes in most developing regions have, indeed, increased substantially, but this is slower in low income countries. Electricity consumption per capita, however, has not shown such consistent growth in Africa, largely due to population growth outstripping energy supply growth and electrification programmes (World Bank 2014). This data cannot necessarily be applied to specific sub-regions or project areas, but does show that significant increases in energy consumption are possible in a relatively short time frame. In terms of electrification rates, these have increased relatively rapidly for key countries, rising from 25% or 30% to 60% to 80% in as little as 10 or as many as 30 years (Bazilian et al. 2011). Clearly, the level at which the minimum service level is set will also influence the risk of over-crediting, with lower service levels being more likely to reflect potential consumption in the shorter term without the CDM.

Even if the households were not to reach the minimum service levels in the near term and the emissions factors used in these methodologies is substantially higher than in traditional methodologies, the overall impact on CER generation is likely to be very small. The total CERs projected to 2020 for the methodologies in Table 3-11 after the revisions to those methodologies is approximately 17 million. Even if all of the CERs for those methodologies are considered (i.e. before and after revision), at approximately 112 million, this is still less than 1% of the entire CDM pipeline, and so does not represent a significant impact on emissions.

3.10.3. Additionality concerns

In summary, while the introduction of the concept of suppressed demand in CDM methodologies is expanding, and will have important development impacts, it is unlikely to have a major impact on the overall additionality of CDM projects. In many project areas, it is likely that the communities could reach the Minimum Service Levels during the course of the CDM project life, although this is uncertain and will depend on local circumstances. Creating an open and transparent process of setting minimum service levels, with expert input as well as input from other stakeholders, could also help to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to certain country groups (e.g. LDCs, under-represented countries), in which development needs are highest and the potential for over-crediting it the smallest. Even if the suppressed demand does lead to some over-crediting, the overall impact is very small, particularly if restricted geographically. More importantly, the increased contribution to sustainable development provides a strong justification for this approach to project types that address poverty and development issues.

4. Assessment of specific CDM project types

The relevant literature highlights that the likelihood of CERs representing real, measurable and additional emission reductions varies considerably among project types. Some project types do not generate revenues other than CERs. These projects have a high likelihood of being additional. Other project types are heavily promoted and/or subsidized by governments, generate significant

other revenues, or their economic feasibility is hardly impacted by CER revenues. For these projects, additionality is more questionable.

Other aspects affecting the quality of CERs also vary among project types. Perverse incentives are particularly relevant for projects that generate large CER revenues compared to the cost structure of their main business (e.g. HFC-23 projects). Baselines are particularly challenging to determine in dynamic sectors with high rates of learning and innovation and penetration of new technologies over relatively short periods of time. The length of crediting is critical for project types which are implemented earlier due to the CDM incentives.

For these reasons, this chapter evaluates the ability to deliver real, measurable and additional emissions reductions for specific CDM project types. In the following, we select important project types in Section 4.1 and assess these project types in the subsequent sections.

4.1. Project types selected for evaluation

We select the project types for evaluation mostly based on their potential CER volume in the period of 2013 to 2020 according to the current CDM project portfolio. Focusing on the period of 2013 to 2020 and on the largest CDM project types in terms of potential CER volume allows the best estimation of the quality of the overall CDM project portfolio for future new demand for CERs. Moreover, the project types with the largest market share are most critical for the overall quality of the CDM.

The specific project types selected for evaluation are provided in Table 4-1. The table also shows that these project types cover a potential CER volume of 4.8 billion CERs, which corresponds to 85% of the overall CER supply potential for the period of 2013 to 2020 (Section 2.3). This ensures a large representativeness.

Table 4-1: Project types selected for evaluation

Project type	Potential CER supply 2013 to 2020 [million]	Focus areas analyzed
Wind power	1,397	Additionality, baselines
Hydropower	1,669	Additionality, baselines
Biomass power	162	Additionality, baselines, leakage
HFC-23	375	Perverse incentive, baselines
Adipic acid	257	Perverse incentives (leakage)
Nitric acid	175	Perverse incentives, baselines
Landfill gas	163	Additionality, baselines, perverse incentives
Coal mine methane	170	Additionality, baselines
Waste heat recovery	222	Additionality, baselines
Fossil fuel switch	232	Additionality, baselines
Efficient cook stoves	2.3	Additionality, baselines
Efficient lighting	3.8	Additionality
Total of all selected project types	4,829	
Total of all projects in the CDM portfolio	5,671	

Source: Authors' own compilation and calculations

4.2. HFC-23 abatement from HCFC-22 production

4.2.1. Overview

Hydrofluorocarbon-23 (HFC-23) is a waste gas from the production of hydrochlorofluorocarbon-22 (HCFC-22), which is a GHG and an ozone-depleting substance (ODS) regulated under the Montreal Protocol on Substances that Deplete the Ozone Layer. HCFCs were introduced as an alternative to the highly ozone-depleting chloro-fluorocarbons (CFCs) because of their lower ozone-depleting potential. HCFC-22 is mainly used for two purposes: as a refrigerant in refrigeration and air-conditioning appliances and as a feedstock in the production of polytetrafluoroethylene (PTFE). The production for the refrigeration and air-conditioning industry is regulated under the Montreal Protocol, whereas the production for feedstock purposes is not.

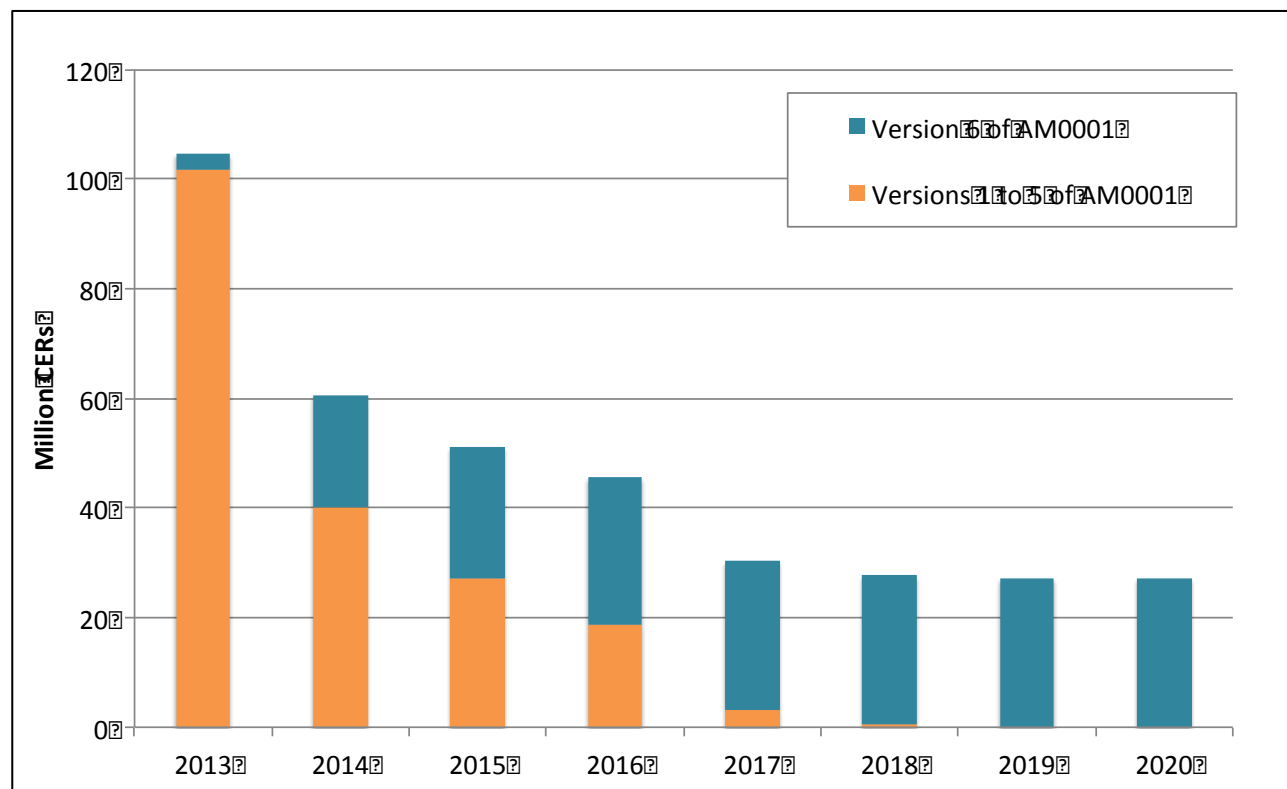
HFC-23 is a potent greenhouse gas; its global warming potential (GWP) is estimated at 14,800 for the second commitment period of the Kyoto Protocol. Emissions of HFC-23 from HCFC-22 production can be abated in two ways: a) by reducing the rate of waste gas generation (by-product rate) through process optimization and b) by capturing and destroying HFC-23 through installation and operation of high temperature incinerators. In the absence of regulations, incentives, or voluntary commitments by the industry, HFC-23 is usually vented to the atmosphere (Schneider & Cames 2014).

4.2.2. Potential CER volume

Under the CDM, 19 HFC-23 projects have been registered. Eleven projects are located in China, five in India; South Korea, Argentina and Mexico each host one project. All projects apply the baseline and monitoring methodology AM0001. In the first commitment period of the Kyoto Protocol, the abatement of HFC-23 has been the project type with the largest CER issuance: 516 million HFC-

23 CERs or 36% were issued of a total of 1.4 billion CERs by the end of 2013. The potential CER supply for the period of 2013 to 2020 is estimated using a bottom-up model based on a detailed evaluation of the information in PDDs and monitoring reports from all 19 projects (Schneider & Cames 2014). In estimating the potential CER supply we differentiate between CERs from the application of versions 1 to 5 and version 6 of the applicable baseline and monitoring methodology AM0001 due to the significant differences between these methodology versions. The potential CER supply for the period of 2013 to 2020 is illustrated in Figure 4-1; it amounts to approx. 375 million CERs for the entire period, with 191 million from the application of version 1 to 5 and 184 million from the application of version 6 of the methodology AM0001.

Figure 4-1: CER supply potential of HFC-23 projects



Sources: Authors' own compilation

4.2.3. Additionality

All versions of the applicable baseline and monitoring methodology AM0001 consider HFC-23 projects to be automatically additional, as long as no regulations to abate HFC-23 are in place in the host country. This rule seems appropriate. Prior to the CDM, none of the plants in developing countries had equipment to destruct destroy HFC-23; HFC-23 generated in the production process was vented to the atmosphere. The same holds for plants that are not eligible for crediting under the CDM because they started commercial operation after 31 December 2001. Plant operators do not have economic incentives to install HFC-23 destruction equipment, as the installation and operation does not reduce costs or generate any significant revenues other than from CERs.⁴⁵ Based on these considerations, we assess that this project type is very likely to be additional.

⁴⁵ Schneider & Cames (2014) report that plant operators could sell HF which is a by-product from flue gas treatment. However, these revenues are likely lower than the costs for HFC-23 destruction.

4.2.4. Baseline emissions

HFC-23 generation from HCFC-22 production depends on two factors: the amount of HCFC-22 production and the ratio between HFC-23 generation and HCFC-22 production, which is often referred to as 'waste generation rate'. The applicable methodology AM0001 determines baseline emissions of HFC-23 based on these two factors, by multiplying the baseline HCFC-22 production with the baseline waste generation rate.⁴⁶ How these two parameters are calculated, has evolved over time.

The approaches changed over time with a view to addressing perverse incentives which are a particular concern for the crediting of HFC-23, due to the low technical abatement costs⁴⁷ and significant profits which can accrue from CER revenues and could exceed the costs of HCFC-22 production (Schneider 2011, UNFCCC 2011b, TEAP 2005). Significant perverse incentives were observed in two JI projects in which plant operators increased the waste generation rate to unprecedented levels once methodological safeguards were abandoned (Schneider & Kollmuss 2015). Perverse incentives can arise from the CDM in the following ways:

- HCFC-22 plants could operate at a higher waste generation rate than they would in the absence of the CER revenues, leading to over-crediting;
- The amount of HCFC-22 produced at CDM plants could be higher than in the absence of the CER revenues. This could lead to over-crediting if
 - HCFC-22 production is displaced at non-CDM plants that have a lower waste generation rate than the baseline rate used at the CDM plants;
 - HCFC-22 production is displaced at plants located in Annex I countries that already are required to abate HFC-23 emissions;
 - HCFC-22 is not produced for use in applications but is vented to the atmosphere;
 - The use of HCFC-22 becomes economically more attractive due to the CDM and is increasingly used compared to other less GHG-intensive alternatives;
 - The base year emissions (2009-2010) under the accelerated phase-out under the 2007 amendment to the Montreal Protocol are higher due to the CDM;
 - The implementation of the accelerated phase-out of HCFC-22 is delayed due to the CDM.
- The HCFC-22 plants could operate longer than they would in the absence of CDM revenues. This could lead to over-crediting under the same circumstances as a higher HCFC-22 production at the plants.

Robustness and conservativeness of the methodology has significantly increased over time. Perverse incentives constitute a major challenge in versions 1 to 5, whereas the conservative approach in version 6 largely avoids and compensates for perverse incentives.

For CERs issued to projects under versions 1 to 5, the amount of over-crediting is uncertain, since it hinges strongly on assumptions on HCFC-22 production levels, HFC-23 waste generation rates and the indirect effects noted above. Munnings et al. (2016) suggest that under-crediting due to conservative baselines may have more than compensated for the potential over-crediting from perverse incentives that these baselines were intended to curb. However, Munnings et al. (2016) make several assumptions that seem rather implausible. For example, they assume that in the absence of the CDM, some plants would have produced more HCFC-22 than they did under the CDM. As a result, we do not find their arguments persuasive.

⁴⁶ Versions 1 to 5 of methodology AM0001 do not explicitly calculate baseline emissions but directly calculate the emission reductions.

⁴⁷ Schneider & Cames (2014), Appendix, provide an overview of technical abatement costs for HFC-23 destruction.

Under version 6, on the other hand, net under-crediting (or net emissions benefit) is very likely since the methodology uses an ambitious default value of 1.0% for the baseline waste generation rate and caps the amount of HCFC-22 production that is eligible for crediting in a more conservative manner (Erickson et al. 2014). However, as of 1 January 2016, no credits have been issued under version 6.

4.2.5. Other issues

Continued low CER prices could jeopardize continued abatement activities at CDM HFC-23 project sites, an unfortunate outcome given the very inexpensive abatement opportunities they provide. At the same time, the failure of the CDM market to ensure continued abatement creates the opportunity for other policies that could yield even greater net emission benefits, especially if no credits are generated that could be also used to increase emissions elsewhere. For example, China recently launched a results-based finance programme that supports HFC-23 abatement in CDM and non-CDM plants (NDRC 2015). This programme helps support HFC-23 abatement across the sector in China. However, continued abatement in other CDM-eligible countries is less certain.

There are also other means to ensure these important abatement opportunities are not lost. Emissions of HFC-23 from HCFC-22 production can be regulated through the Montreal Protocol and for new facilities that have not yet installed GHG abatement, the Protocol's Multilateral Fund (MLF) for GHG abatement can provide financial support (Schneider & Cames 2014).

Note also that continued crediting under the CDM could also create perverse incentives for policy makers not to pursue alternative policies such as these, which address emissions without yielding CERs.

4.2.6. Summary of findings

Past changes to methodologies have now improved the integrity of these projects. If they are operated they are likely to yield more emissions reductions than CERs – i.e. a net mitigation benefit. However, continued low CER prices jeopardize their continued operation in some countries.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed in most recent methodology (version 6). Version 6 could lead to under-crediting (net mitigation benefit)
Other issues	<ul style="list-style-type: none"> Low CER prices jeopardizes continued operation Emissions could be addressed through Montreal Protocol Perverse incentives to avoid domestic regulation

4.2.7. Recommendations for reform of CDM rules

The necessary changes in AM0001 have been implemented in recent years. No changes in CDM rules are needed.

4.3. Adipic acid

4.3.1. Overview

Adipic acid is an organic chemical that is used as a building block in a range of different products, most importantly polyamide, often referred to as 'nylon'. Other applications include the production of polyurethanes and plasticizers. Adipic acid is a globally traded commodity, with more than one-third of the production traded internationally. Nitrous oxide (N₂O) is an unwanted by-product of adipic acid production. The formation of N₂O cannot be avoided; it is the result of using nitric acid

to oxidize cyclohexanone and/or cyclohexanol. Generally, the amount of N₂O generated varies very little over time and among plants.

N₂O in the waste gas stream can be abated in different ways: by catalytic destruction, by thermal decomposition, by using the N₂O for nitric acid production, or by recycling the N₂O as feedstock for adipic acid production (Schneider, L. et al. 2010). These methods typically reach an abatement level of about 90% (IPCC 2006, p. 3.30, Ecofys et al. 2009, p. 44). However, plants implemented under CDM and JI achieved significantly higher abatement levels of approx. 99% in the case of CDM and 92% to 99% in the case of JI, apparently through the strong economic incentives from the CDM and JI (Schneider, L. et al. 2010).

4.3.2. Potential CER volume

Under the CDM, four projects were registered. Two projects are located in China, one is in Brazil and one in South Korea. All four CDM plants had no abatement installed before project implementation and applied either thermal or catalytic abatement. The four implemented CDM plants cover only a part of the adipic acid production in developing countries because the applicable CDM methodology AM0021 is limited to plants that started commercial operation before 2005. Since then, five new plants are known to have started commercial operation in China; none of them abates N₂O emissions (Schneider & Cames 2014). Based on a bottom-up model used by Schneider & Cames (2014), the four CDM projects could generate about 257 million CERs in the period of 2013 to 2020.

4.3.3. Additionality

The applicable methodology AM0021 combines the approaches included in the different approaches to demonstrate additionality. Version 1 establishes three criteria for additionality demonstration: no regulations should require N₂O abatement, the project should not be common practice and it should not be economically viable. Versions 2 and 3 refer to the additionality tool and hence the investment analysis is not mandatory for additionality demonstration, as compared to version 1. Nevertheless, all four registered projects conduct an investment analysis and determine the net present value (NPV). Versions 2 and 3 also require reassessment of additionality during the crediting period if new NO_x regulations were introduced.

N₂O abatement from adipic acid production can be regarded as highly likely to be additional, for several reasons. Firstly, none of the non-Annex I countries in which adipic acid is produced have regulations in place to abate N₂O. Secondly, for thermal or catalytic destruction of N₂O, plant operators have no economic incentives to abate N₂O emissions. The abatement generates steam as a by-product; however, the cost savings or revenues are lower than the investment and operation and maintenance costs. Based on a review of PDDs and literature information, the technical abatement costs are estimated at €0.3/t CO₂e, with a range from €0.1/t CO₂e to €1.2/t CO₂e (Schneider & Cames 2014).

Thirdly, the abatement of N₂O from adipic acid production is not common practice in non-Annex I countries. In Western industrialized countries, N₂O has been abated voluntarily since the 1990s. In non-Annex I countries, only one plant in Singapore had abatement technology installed prior to the CDM (Schneider, L. et al. 2010). None of the plants commissioned after 2004, which are not eligible for crediting under the CDM, installed N₂O abatement technology.

4.3.4. Baseline emissions

Baseline emissions of N₂O are determined by multiplying the amount of adipic acid production eligible for crediting with a baseline emission factor. The methodology further estimates baseline

emissions from steam generated during the catalytic or thermal destruction of N₂O. Baseline emissions from steam generation are very small compared to baseline emissions of N₂O.

The baseline emission factor is determined as the lower value between the actual rate of N₂O formation and a default value of 270 kg N₂O / t adipic acid, which corresponds to the lower end of the uncertainty range of the IPCC default value of 300 kg / t adipic acid (IPCC 2006). This approach is used in all three methodology versions and intends to exclude the possibility of manipulating the production process to increase the rate of N₂O formation. Versions 2 and 3 require the actual N₂O formation rate to be determined in two ways: 1) based on the consumption of nitric acid and the ratio of N₂O to N₂ in the off-gas, and 2) based on direct measurements of N₂O in the off-gas adjusted by a 5% discount factor to account for measurement uncertainty. As a conservative approach, the lower resulting value of the two ways is used to determine the baseline emission factor. Overall, the methodology ensures that the baseline emission factor is determined in a conservative manner. The rate of N₂O formation typically observed is higher than the default value of 270 kg / t adipic acid, which could potentially lead to under-crediting of few percentage points.

The amount of adipic acid production that is eligible for crediting is capped in all three methodology versions with a view to avoiding incentives to expand the production as a result of the CDM. Version 2 and 3 establish the cap as the highest annual production in the three years prior to the implementation of the project activity. Version 1 does not provide a procedure to determine a cap but specifies that the methodology is “only applicable for installed capacity (measured in tons of adipic acid per year) that exists by the end of the year 2004”. There has been controversy about how this requirement is to be interpreted. Following a request for clarification (AM_CLA_0148), the Methodologies Panel recommended using production data from three historical years, similar to Versions 2 and 3. However, the CDM EB concluded that the panels' clarification “provides too extensive interpretation to an older version of methodology” and clarified instead that the cap should be determined as the “validated maximum daily production of adipic acid multiplied by 365 days multiplied by the operational rate”.⁴⁸ This was further interpreted in a way that allowed plants to seek credits beyond their annual design capacity specified in PDDs. All four CDM projects were registered with Version 1 of the methodology. Two projects (0099 and 0116) recently renewed their crediting period, applying Version 3 of the methodology, which lead to caps that are 14.8% and 13.9% lower than the caps applicable in their first crediting period.

While the methodology intended to avoid production shifts through caps on the amount of production that is eligible for crediting, data on adipic acid production, plant utilisation and international trade patterns suggest that carbon leakage, i.e. a shift of production from non-CDM plants to CDM plants, occurred during the economic downturn in 2008 and 2009 (Schneider, L. et al. 2010). Such production shifts do not only lead to distortions in the adipic acid market but can also lead to over-crediting if N₂O is abated in the non-CDM plants. Schneider, L. et al. (2010) estimate that carbon leakage leads to over-crediting of approx. 6.3 MtCO₂e or about 17% of the CERs from adipic acid projects issued in 2008 and approx. 7.2 MtCO₂e or about 21% of the CERs from adipic acid projects in 2009. These effects could thus outweigh the conservative determination of the baseline emission factor.

The lenient interpretation of historical production capacity in version 1 of the methodology considerably contributed to the carbon leakage. However, the more conservative approach for the establishment of the cap on adipic acid production in versions 2 and 3 of the methodology addresses this issue only partially. In a global economic recession, adipic acid production could fall well below historical rates of plant utilisation. Depending on the CER prices, CDM plants operators would then have significant competitive advantage over non-CDM plants, which could lead to similar produc-

⁴⁸ Report of the 48th meeting of the EB, paragraph 24.

tion shifts as observed in 2008 and 2009. As for HCFC-22 production, the underlying issue is that carbon market revenues can have a strong impact on adipic acid production costs. Carbon leakage is unlikely to occur at current market prices for CERs, but could become an issue again if CER prices increased.

4.3.5. Other issues

No other issues were identified.

4.3.6. Summary of findings

Adipic acid projects have a very high likelihood of additionality. The baseline emission factor is determined in a conservative manner that could lead to a few percentage points of under-crediting. The methodology does not include sufficient provisions to address carbon leakage. This could lead to significant over-crediting in times of higher CERs prices and when the adipic acid production capacity significantly exceeds demand.

Additionality	<ul style="list-style-type: none"> • Likely to be additional
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Over-crediting	<ul style="list-style-type: none"> • Most recent methodology could lead to slight under-crediting • Leakage could lead to significant over-crediting in times of higher CER prices
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Other issues	<ul style="list-style-type: none"> • None
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4.3.7. Recommendations for reform of CDM rules

Based on the considerations above, we recommend revising the applicable CDM methodology as follows:

- The provisions for additionality demonstration could be simplified, as this project type can be considered to be very likely additional. We recommend considering this project type as automatically additional, as long as no regulations require N₂O abatement.
- The potential for carbon leakage should be addressed. We recommend introducing a standardized ambitious emission benchmark to determine baseline emissions. Carbon leakage would be avoided most effectively if a consistent emissions benchmark is used for all plants around the world, including plants under ETSSs, and if it is set at or below the abatement level typically achieved in the industry. A standardized global emission benchmark for all adipic acid plants, regardless of policy approach or specific emission trading mechanism, could provide a level playing field for the adipic acid industry and eliminate potential economic distortions. Adipic acid production is particularly amenable to a standardized global benchmark because it is a highly globalized industry, and all plants are very similar in structure and technology (Schneider, L. et al. 2010). We recommend a level at or below 30 kg/t adipic acid, which reflects the abatement level achieved by the large majority of producers world-wide.
- If a standardized ambitious emissions benchmark is introduced, the methodology could be further simplified as measurements and calculations of the rate of N₂O formation would not be necessary.

4.4. Nitric acid

4.4.1. Overview

Nitric acid is mainly used for the production of synthetic fertilizers and explosives. In the industrial production of nitric acid, ammonia (NH₃) is oxidized over precious metal gauzes (primary catalyst) to produce nitrogen monoxide (NO), which then reacts with oxygen and water to form nitric acid. N₂O is an unwanted by-product generated at the primary catalyst. The better a primary catalyst functions, the lower the N₂O emissions. Nitric acid is produced during production campaigns of typically 3-12 months (Kollmuss & Lazarus 2010).

N₂O emissions from nitric acid production can be abated in three ways (Schneider & Cames 2014):

- **Primary abatement** prevents the formation of N₂O at the primary catalyst. According to gauze suppliers, improved gauzes could potentially lead to a 30-40% reduction of N₂O formation (Ecofys et al. 2009).
- **Secondary abatement** removes N₂O through the installation of a secondary N₂O destruction catalyst in the oxidation reactor. The abatement efficiency of the secondary catalyst is often estimated as ranging from 80% to 90%. However, in practice it varies in CDM plants from about 50% to more than 90%. Registered CDM projects achieved an average abatement efficiency of 70% (Kollmuss & Lazarus 2010, Debor et al. 2010).
- **Tertiary abatement** removes N₂O from the tail gas through either thermal or catalytic decomposition. Tertiary abatement can reduce N₂O emissions by more than 90% but involves larger investment and operating costs and more demanding technical requirements than secondary abatement. Registered CDM projects achieved an average abatement efficiency of 86% (Kollmuss & Lazarus 2010, Debor et al. 2010).

Four methodologies have been approved for N₂O abatement from nitric acid production:

- **AM0028** is applicable to tertiary abatement in plants that started commercial operation before 2006. 19 projects used the methodology. In 2013, the methodology was limited to caprolactam production in 2013, and replaced by amending the methodology ACM0019.
- **AM0034** is applicable to secondary abatement in plants that started commercial operation before 2006. 56 projects used the methodology. In 2013, the methodology was withdrawn and replaced by amending the methodology ACM0019.
- **AM0051** is also applicable to secondary abatement in plants that started commercial operation before 2006. The methodology was never used and was withdrawn in 2013. It is therefore not considered in detail in this study.
- **ACM0019** is applicable to both secondary and tertiary abatement and both existing and new plants. 26 projects used the methodology. Since 2013, this is the only valid methodology for nitric acid projects.

Table 4-2 provides an overview of the main features of and differences between the methodologies.

Table 4-2: Overview of methodologies for nitric acid projects

	AM0028	AM0034	AM0051	ACM0019
Projects	19	56	None	26
Technology	Tertiary	Secondary		Secondary and tertiary
Validity	Limited to caprolactam in 2013	Withdrawn in 2013		Valid
Applicability	Plants that started operation before 2006			Existing and new plants
Additionality demonstration	Additionality tool			Automatically additional
Baseline emission factor	Ex-post measurements	Ex-ante measurement campaign	Ex-post measurements	Emission benchmark
Cap on baseline production	Design capacity			No cap
Re-assessment of baseline scenario or additionality	In case of new NO _x regulations			Not applicable

Sources: Authors' own compilation

4.4.2. Potential CER volume

Under the CDM, 97 projects were registered and another four projects were submitted for validation as of January 2014. China is the most important host country with 44 projects. Other important countries are India (5 projects), Uzbekistan (6 projects), South Africa (5 projects), and Brazil, Egypt, Israel and South Korea which host each four projects. Among the 97 registered CDM projects, only 51 have issued CERs as of January 2014. In the current market situation, it is likely that most of the remaining 47 projects have not been implemented. Based on a bottom-up model developed by Schneider & Cames (2014), the 101 published CDM projects could generate approx. 175 million CERs in the period of 2013 to 2020. Potential new projects that have not yet been developed or published are estimated to have a potential of approx. 31 million CERs over the same period.

4.4.3. Additionality

Up to 2011, all three approved methodologies (AM0028, AM0034, AM0051) used the additionality tool to demonstrate additionality. In 2011, ACM0019 was adopted, which deems projects to be automatically additional and employs a dynamic emission benchmark to determine baseline emissions.

N₂O abatement from nitric acid production can be regarded as highly likely to be additional, for similar reasons as for HFC-23 abatement from HCFC-22 production and N₂O abatement from adipic acid production. Non-Annex I countries usually do not have regulations which address N₂O emissions from nitric acid production. Prior to the CDM, secondary or tertiary abatement is not known to have been used in non-Annex I countries and N₂O is usually released to the atmosphere. While plant operators have economic incentives to take primary abatement measures to reduce the rate of N₂O formation, they do not save any costs or generate any revenues – other than car-

bon market revenues – from the installation of secondary or tertiary abatement. Based on a review from PDDs and literature information, the average technical abatement costs are estimated at €0.9/t CO₂e for secondary abatement and at €3.2/t CO₂e for tertiary abatement (Schneider & Cames 2014). For these reasons, in our assessment, the approach in ACM0019 of assuming this project type automatically additional seems reasonable.

4.4.4. Baseline emissions

Baseline emissions are determined by multiplying the amount of nitric acid production with a baseline emission factor. The methodologies AM0028, AM0034 and AM0051 limit the amount of nitric acid production eligible for claiming emission reductions to the design capacity of the plant in 2005; ACM0019 has no such cap. The baseline emissions factor is determined in three different ways in CDM methodologies: through measurement campaigns conducted prior to the installation of the abatement technology (AM0034), through measurements during the crediting period (AM0028 and AM0051), and by using an emissions benchmark (ACM0019).

All three methodologies using measurements (AM0028, AM0034 and AM0051) aim to provide safeguards to avoid perverse incentives to artificially increase the rate of N₂O formation in order to increase CDM revenues (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). In AM0028, the baseline emission factor is capped to the level of previous monitoring periods if project participants do not use a primary catalyst that is common practice in the region or has been used in the nitric acid plant during the last three years and if they cannot justify the use of a different catalyst. In addition, key operating conditions of the plants cannot be changed during project implementation. In AM0034, the methodology requires a new baseline measurement campaign to be conducted if the chemical composition of the primary catalyst is changed after project implementation. While these provisions aimed to avoid perverse incentives to increase the N₂O formation due to the CDM, they provide economic disincentives to plant operators to use primary catalysts that reduce the formation of N₂O, as this would lower their CER revenues and could involve additional costs for conducting a new baseline campaign (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). However, advanced primary catalysts that increase the NO yield and lower the generation of the by-product N₂O are emerging in the industry. They have become widespread in Europe, are gaining market shares in other parts of the world, and have been used in a number of CDM projects prior to their start (UNFCCC 2012b). It is thus possible that some CDM projects applying the AM0034 or AM0028 methodology would, in the absence of the CDM incentives, employ more advanced primary catalysts, in particular over the time frame of three crediting periods, leading to over-crediting (UNFCCC 2012b).

The Methodologies Panel further identified that some plants using the AM0034 methodology had established baseline emission factors which are significantly above the uncertainty range of the IPCC default values and which would result in considerable economic losses for the plant operators (UNFCCC 2012b). The highest reported value from a baseline measurement campaign is 37.0 kg N₂O / t nitric acid, while the highest IPCC default value is 9.0 kg N₂O/t nitric acid, with an uncertainty range of ±40% (IPCC 2006). Such high emission factors indicate that these plants are operated at a high specific ammonia consumption. Plant operators could intentionally reduce the production efficiency during the baseline campaign in order to achieve a higher CDM baseline emission factor (UNFCCC 2012b). Moreover, while inefficient plant operation can be observed in Non-Annex I countries, it seems questionable whether the observed levels of nitrogen loss would continue over the course of three crediting periods. On the other hand, it is important to take into account that the IPCC default emission factors were estimated at times when much less information was available on N₂O formation from nitric acid plants. In particular, continuous measurements over the length of a production campaign, with increasing N₂O emissions towards the end of the

campaign, were not available. The values and their assigned uncertainty should therefore not be outweighed.

To address these two issues, the CDM EB withdrew the AM0034 and AM0051 methodologies and limited the applicability of the AM0028 methodology to caprolactam plants in 2013. At the same time, the EB revised the methodology ACM0019, distinguishing the approach between plants that used AM0028 or AM0034 in their first crediting period and other (mostly newer) plants. For AM0028 and AM0034 plants up to their design capacity, the methodology uses the lower value between the historical baseline emissions during the first crediting period under AM0028 and AM0034 and a default value set at the upper end of the uncertainty range of the IPCC default value and declining by 0.2 kg N₂O/t nitric acid per year to reflect technological innovation in primary catalysts that may reduce emissions over time. This approach caps the baseline emissions particularly for those plants that have established baseline emission factors above the IPCC uncertainty range. It also reduces the maximum amount of baseline emissions that can be claimed over time to account for technological innovations in primary catalysts. For production above the design capacity and other (mostly newer) plants, the methodology uses a more ambitious emissions benchmark set at 3.7 kg N₂O/t nitric acid in 2013 and declining by 0.2 kg N₂O/t nitric acid per year, up to a level of 2.5 kg N₂O/t nitric acid in 2020 which is maintained in subsequent years.

The new approach has several advantages but also some shortcomings:

- Importantly, using default emission benchmarks – whatever the real baseline emissions from a specific plant are – fully avoids perverse incentives for plant operators not to use advanced primary catalysts that reduce the formation of N₂O. Plant operators have incentives to innovate, as this lowers their project emissions and increases the number of CERs issued;
- Using default emission benchmarks further fully avoids the risk that plant operators could intentionally increase the rate of N₂O formation during a baseline campaign in order to maximize CER revenues;
- Using default emission benchmarks can lead to over-crediting in plants that actually have lower N₂O formation rates and to under-crediting in plants that actually have higher N₂O formation rates. Both under- and over-crediting is likely to occur since the N₂O formation rate observed in CDM projects varies by a factor of 10 from 3.5 to 37.0 kg N₂O/t nitric acid, with an average value of 8.6 kg N₂O/t nitric acid (UNFCCC 2012b). Significant over- and under-crediting can have several unintended consequences (Schneider et al. 2014). Plants with a high N₂O formation rate may not be able to reduce their project emissions significantly below the emissions benchmark and may thus not be implemented – although their implementation would be possible with a project-specific baseline. Such ‘lost opportunities’ could increase the global cost of GHG abatement.

The overall impact on environmental integrity depends on the methodology and plant type (Table 4-3). For newer plants, the emission benchmark declining from 3.7 to 2.5 kg N₂O / t nitric acid is rather conservative and will likely lead to under-crediting for most – if not all – plants. For plants that used AM0028 or AM0034 in the first crediting period, the declining project-specific benchmark in ACM0019 is a reasonable baseline on average over all projects in our assessment; projects with higher baseline emission rates than the IPCC range will receive less CERs, while some over-crediting could occur for projects that adopt more advanced catalysts at a faster rate than the decrease of 0.2 kg N₂O / t nitric acid per year foreseen in the methodology. The use of AM0028 and AM0034 could lead to over-crediting in some instances, due to the issues identified above. Considering all plant types and methodology versions together, it seems likely that the approaches for

baseline emissions overall reasonably provide for environmental integrity; the low or moderate levels of over-crediting that could occur under AM0028 and AM0034 could be compensated by significant under-crediting for newer plants applying ACM0019. Over time, the quality of CERs will increase due to the increased phase-in of ACM0019.

Table 4-3: Assessment of environmental integrity of nitric acid projects

Plant type	Methodology	Identified environmental integrity issues	2013-2020 CER potential	Potential for under- or over-crediting
Plants that started operation before 2006: 1 st CP	AM0028 AM0034	<ul style="list-style-type: none"> Perverse incentives not to adopt technologies that reduce the rate of N₂O formation Risk of manipulation of the production process during the baseline campaign 	73 million	Low or moderate over-crediting
Plants that started operation before 2006: 2 nd and 3 rd CP	ACM 0019	<ul style="list-style-type: none"> Under-crediting for plants with higher N₂O formation rates than the IPCC range Over-crediting for plants that adopt advanced primary catalyst technologies at faster rates 	70 million	Neutral / Low over- or under-crediting
Newer plants or plants that did not use AM0028/ AM0034	ACM 0019	<ul style="list-style-type: none"> None 	32 million	Moderate to significant under-crediting

Sources: Authors' own compilation

4.4.5. Other issues

No other issues were identified.

4.4.6. Summary of findings

Nitric acid projects have a very high likelihood of additionality. Baseline emissions can be over- or under-credited; overall, they are likely to reasonably ensure environmental integrity for 2013-2020 CERs, with the average quality of CERs improving over time.

An important lesson learned from this project type is that the potential for technological innovation and perverse incentives was not sufficiently considered when approving the initial methodologies. For sectors that could undergo significant technological innovation, using historic data or measurement campaigns to establish a baseline for up to 21 years is debatable. The more recent ACM0019 methodology accounts for technological innovation by using an emission benchmark that declines over time.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of overall over-crediting
Other issues	<ul style="list-style-type: none"> None

4.4.7. Recommendations for reform of CDM rules

No recommendations.

4.5. Wind power

4.5.1. Overview

CDM wind power projects mainly use four methodologies.⁴⁹ The vast majority of projects (more than 99% of all CDM wind projects) feed electricity into the grid.⁵⁰

According to the UNEP DTU (2014), by the end of 2013, an overall wind power capacity of 111 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (83 GW), India (10 GW), Mexico and Brazil (both 4 GW). The other 36 countries with CDM wind power projects account for 10 GW of installed capacity in total.

Figure 4-2, Figure 4-3 and Figure 4-4 illustrate the development of wind power capacity and the use of the CDM in China, India and Brazil.⁵¹ In China, installation of wind power capacity accelerated from 2005 onwards. A comparison of the total wind power capacity installed and the capacity installed by projects using the CDM⁵² over the 2005 to 2012 period (Figure 4-2) shows that CDM projects accounted for about 90% of the total cumulated installed capacity as of 2012 (about 75 GW). In the case of India (Figure 4-3), installed capacity increased significantly between 2005 and 2012 from 1.4 GW in 2005 to more than 15 GW in 2012. CDM projects accounted for about half (51%) of the total cumulated capacity installed as of 2012. In the case of Brazil (Figure 4-4), the total cumulated installed capacity as of 2012 was much smaller (2.5 GW). The share of CDM projects in cumulative capacity was 43% as of 2012.

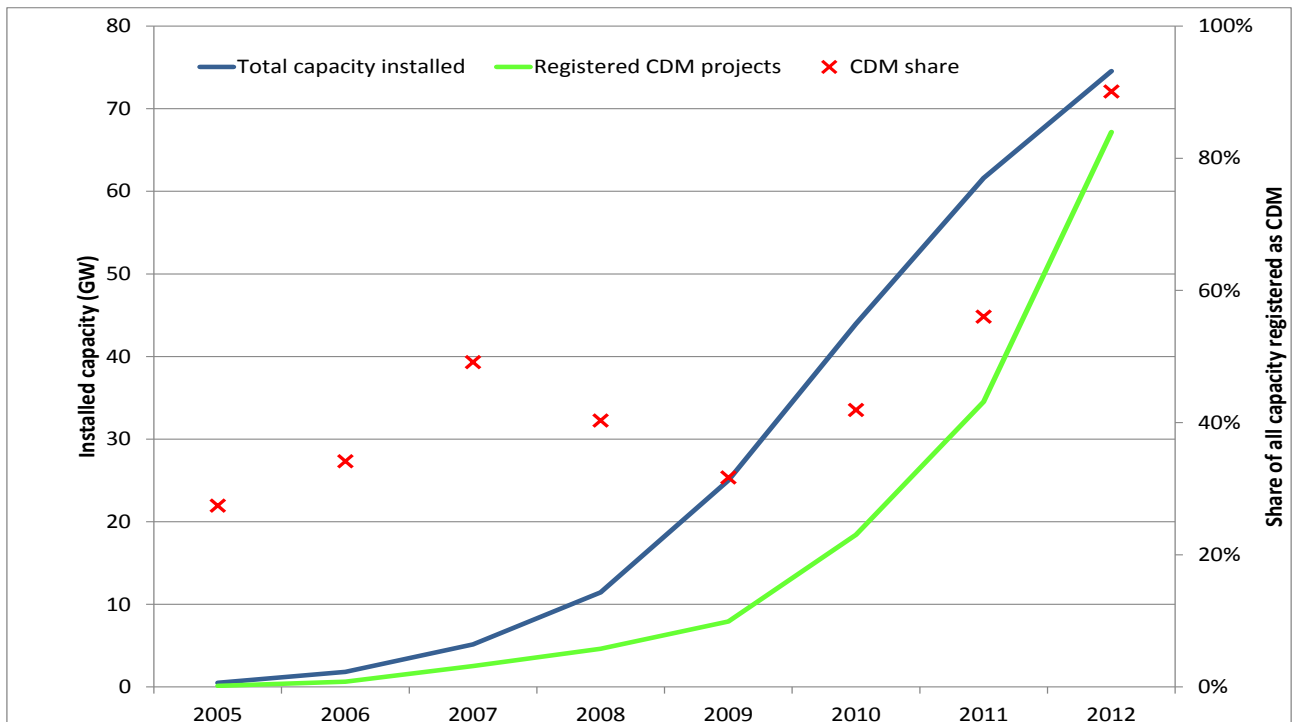
⁴⁹ ACM0002, AMS-I.A, AMS-I.D, AMS-I.F.

⁵⁰ ACM0002 (large scale), AMS-I.D (small scale).

⁵¹ China, India and Brazil are selected for the graphs in order to ensure comparability across chapters on renewable power generation since they are important CDM countries for hydropower and biomass power, too.

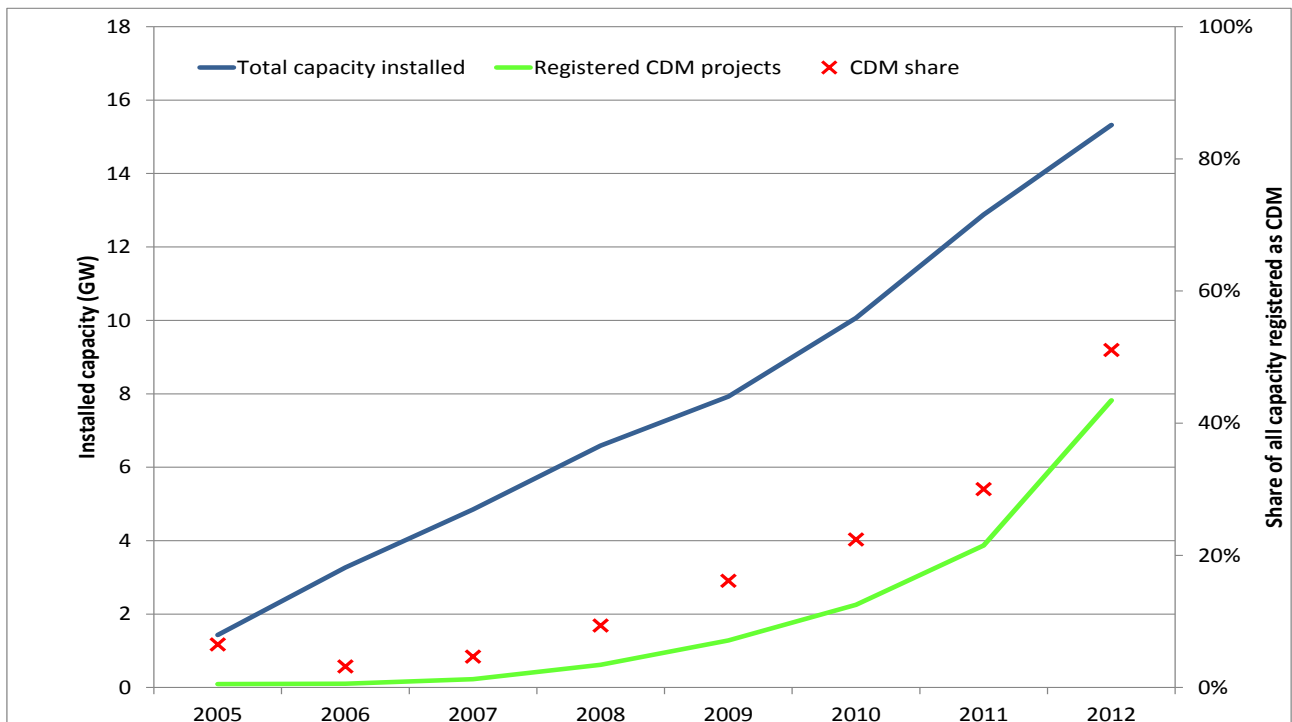
⁵² The total installed capacity between 2005 and 2012 is taken from the World Wind Energy Association statistics (WWEA 2015) and accumulated across the years. The installed capacity of projects using the CDM is taken from UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. Cumulative values were used to illustrate the contribution of the CDM since annual values are misleading due to potential differences between the year of construction and the year in which the crediting period starts. Therefore, cumulative values provide a better picture of the general trend of the CDM share in total capacity installed.

Figure 4-2: Total cumulated wind power capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

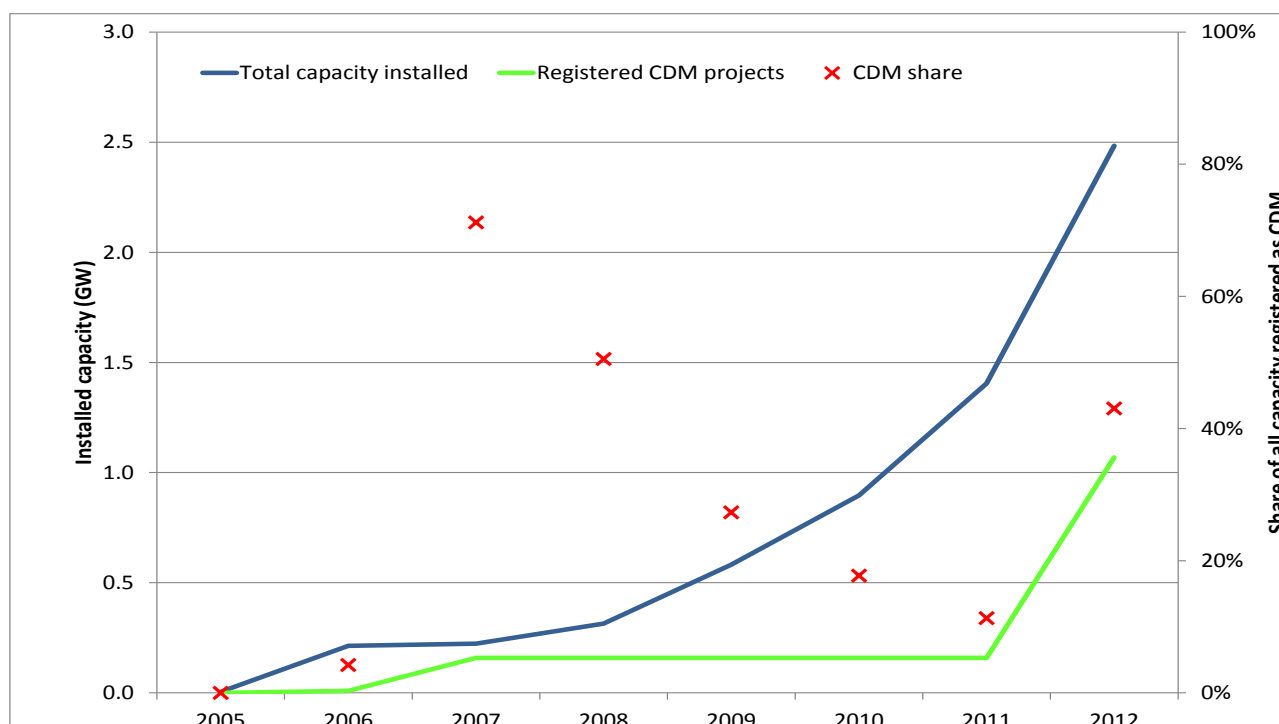
Figure 4-3: Total cumulated wind power capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

Figure 4-4: Total cumulated wind power capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

4.5.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 3.5 billion CERs by the end of their respective crediting periods, of which 1.4 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about one quarter of the total CER issuance potential.

4.5.3. Additionality

Large-scale wind power projects apply the methodology ACM0002 which requires using the “Tool for the demonstration and assessment of additionality” to demonstrate additionality.⁵³ In this tool, the investment analysis is one of the approaches for demonstrating additionality. Most CDM wind power projects use investment analysis. The tool for small-scale projects (“Methodological tool. Demonstration of additionality of small-scale project activities”⁵⁴) requires “an explanation to show that the project activity would not have occurred anyway due [...] to barriers”, among which one of the most important barriers is the so-called ‘investment barrier’, which generally features a similar rationale as for the investment analysis of large-scale projects.

Section 3.2 describes the general criticism associated with the investment analysis and Section 2.4 assesses for different project types the impact of CER revenues on their economic performance. According to these analyzes, for wind power projects, CER revenues lead to an increase in the internal rate of return (IRR) of two to three percentage points. An analysis by the World Bank finds that “the incremental IRR from future carbon revenues in renewable energy projects, taking the World Bank’s projects as an example, is quite low” (Carbon Finance at the World Bank 2010). In

⁵³ Current version 07.0.0 (EB 70, Annex 8).

⁵⁴ Current version 10.0 (EB 83, Annex 14).

this analysis, the incremental IRR for renewable energy projects amounts to 1.7% for a purchase period of 10 years and an assumed CER price of \$10/t. Another analysis finds that “wind, hydro and biomass projects experience only a small increase in profitability through CDM” and that “the change in profitability caused by regional variables is greater than the CDM’s impact for wind, hydro and biomass”⁵⁵ (Schneider, M. et al. 2010). From these analyzes, it can be concluded that the CDM impact in the profitability of wind power plants is generally relatively low and that the ‘signal’ provided by the CDM is usually much smaller than the ‘noise’ of national and regional variations in other parameters.

In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables. Spalding-Fecher et al. (2012) provide an overview of several important support incentives for renewable energy generation in major CDM countries (such as China and India) and find “that national policies on electricity tariffs for renewable power could be a more important driver of the viability of wind, hydropower and biomass projects than the CDM is.” In the case of wind power plants in China, Bogner & Schneider (2011) point out that “the wind power boom in China is mainly driven by favourable policies and not by the CDM” and that “the majority of projects would most likely have been implemented without the CDM”. Liu (2014) elaborates on the links between the CDM and national policy in the case of wind power development in China. He finds that a decreasing national feed-in tariff can increase “CDM-supported installed capacity because more projects may comply with CDM requirements as their financial returns remain below the predefined additionality threshold”, which indicates that there is a clear interference between national policy development and the additionality requirements of the CDM. He also finds that “the reduction of technology costs combined with an increasing local manufacturing capacity has paved the way for a scaled-up deployment of wind capacity” (ibid.), which indicates that other factors than the CDM were important in the significant growth of wind power in China. However, he concludes that the CDM “effect on wind technology diffusion [...] is more than twice as high as that of technology cost and industrial policy” (ibid.). He also finds that “while domestic policies must be the engine for large-scale clean energy investments in developing countries, the international carbon offset policy can help that engine run faster, but only if the engine is running” (ibid.). For India, in comparing wind power projects registered under the CDM with those without such support, Dechezleprêtre et al. (2014) find that, “all other things being equal, CDM wind farms tend to be larger, to benefit from higher feed-in-tariffs, and to be located in windier areas, three factors which increase profitability.” According to this analysis, there is “serious evidence of non-additionality of the CDM” (ibid.). He & Morse (2013) find that “Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs)” and this leads to the conclusion that “IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime”.

Furthermore, investment costs for wind power generators have decreased significantly in recent years, which results in wind power featuring (in many cases) competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013). In addition, IRENA (2015) also shows that specific investments costs for onshore wind power plants are significantly lower in China and India than in OECD and ‘rest of the world’ countries. Similarly, Schmidt (2014) finds that the risk associated with low-carbon investment is higher in some parts of the world than in others. In an analysis for industrialised and low-income countries (using typical values for costs of capital in these countries), he finds that due to the higher cost of capital in low-income countries, levelized costs of electricity for onshore wind power plants could be as much as 46% higher than in low-risk countries. Altogether, the available information indicates that the profitability of wind power

⁵⁵ In this analysis, regional factors are the electricity tariff, the load factor and the discount rate.

plants has generally improved. However, there is also a significant dependence of the profitability on regional circumstances.

Overall, due to the limited impact of CER revenues on the profitability of wind power plants, the widespread introduction of domestic support schemes and the significant decrease of wind power costs, we consider the additionality of wind power projects as generally questionable in the context of the CDM, at least for countries with support schemes, low investment costs for wind power and low investment risks.

4.5.4. Baseline emissions

Baseline emissions of CDM wind power projects feeding electricity into the grid include CO₂ emissions from fossil-fired power plants that are displaced due to the project activity. In most cases, the corresponding baseline CO₂ emission factor is estimated using the “Tool to calculate the emission factor of an electricity system”⁵⁶ (Box 4-1).

Box 4-1: The grid emission factor tool

The grid emission factor is calculated as the “combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM)”⁵⁷. According to the tool, “the operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed CDM project activity. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.”

In the tool, several approaches for estimating the combined margin are presented, depending on the specific conditions of the project and data available. In general, the approach of using a combination of OM and BM, depending on the type of project, is appropriate. It suitably reflects that CDM projects could have short-term impacts on the dispatch of power plants and long-term impacts on the power plants built, and different weights for the OM and the BM can be applied (depending on the crediting period and on whether it relates to a project using intermittent or non-intermittent sources), which also can be considered appropriate. A number of specific issues arise from the tool:

In many cases, so-called low-cost and must-run power plants are not considered in the calculation of the CO₂ grid emission factor, which may lead to higher baseline emissions per amount of electricity produced. Neglecting low-cost/must-run power plants, such as renewables or nuclear power, may generally be considered adequate for the estimation of the operating margin (since low-cost/must-run power plants can be expected to be running irrespective of any other power plant in the system). However, an increasing share of renewables (e.g. wind or solar) in the system may lead to a situation in which renewable power generation is at the margin in some hours, i.e. an additional kilowatt hour of renewable electricity does not displace fossil fuels in that hour. In some countries, for example, wind power plants are switched off when electricity supply exceeds demand in order to ensure a stable electricity system. Furthermore, ‘low-cost’ power plants are not clearly defined and some of them may be dispatchable (such as biomass). Overall, the provision of excluding low-cost/must-run power plants may lead to an overestimation of baseline emissions.⁵⁸

⁵⁶ Current version 04.0 (EB 75, Annex 15).

⁵⁷ AMS-I.D, version 17 (EB 61, Annex 17).

⁵⁸ It has to be noted, however, that in the case the country has a large share of low-cost/must-run power plants (more than 50%), e.g. hydro, the simple adjusted operating margin has to be used. In that case, whenever hydro electricity provides sufficient electricity to cover the load demand in a certain hour, this hour is counted as not emitting. This leads to lower baseline emission factors overall than the simple operating margin. The implicit assumption is that water would be spilled in that hour if additional (i.e. CDM) power

Also, both the operating and the build margin approaches are based on historical production and installation data if the option of determining the grid emission factor at the validation stage (ex-ante) is chosen. The resulting baseline grid emission factor is then kept constant throughout the crediting period and only updated at the renewal of the crediting period. This approach does not reflect the general trend towards an increasing share of less-emitting power sources in the electricity mix of many countries. It is oriented to past power systems (backward-looking perspective) rather than to the actual power systems during the crediting period with a higher penetration of renewables (forward-looking perspective). This is especially problematic in countries with a rapidly changing or expanding electricity system. In countries with a growing share of renewable energy capacities, this approach may lead to an overestimation of baseline emissions. However, due to the long-lived capital stock in the electricity sector, changes of the grid emission factor are only gradual (i.e. take several years) in case the power system as a whole is not expanding fast. An advantage of using historical data is that it relies on observed and objective information, whereas scenarios for the future development of the power system may be prone to uncertainty and use of unrealistic assumptions.⁵⁹ Therefore, the determination of the grid emission factor based on historical data is not considered problematic per se but should be adjusted to account for trends in the sector.⁶⁰ Another option for determining the grid emission factor is the ex-post determination during monitoring. This approach is certainly adequate since it reflects the current state of the power sector.

With regard to the build margin, CDM projects are generally excluded from the estimation of the CO₂ emission factor. CDM projects only need to be gradually included if they comprise a significant share of power plants built in the last ten years. This approach can generally be considered adequate, especially in countries with an already significant share of renewable electricity generation or promotional policies for renewables in place, in which case a neglect of CDM projects in the build margin would not be a plausible representation of what would have happened in the absence of the project. This approach therefore addresses the risk of over-estimating baseline emissions in countries with a large share of CDM projects.

The quality of input data in calculating the grid emission factor is also important. In analysing grid emission factors provided by different DNAs, Michaelowa (2011) finds “that most of the documents provided by the DNAs do not allow an external observer to judge whether the data has been collected correctly” and that “there are clear indications that the grid emission factors, as well as the coal power plant benchmarks, have been overestimated both in China and India.” In some countries, the governments established grid emission factors, and DOEs apparently used the values without validating whether they comply with the methodological requirements under the CDM. In order to address this issue, Michaelowa (2011) recommends, inter alia, an “independent validation of grid EF”. Recently, few grid emission factors are submitted as standardized baselines which ensures independent validation by a DOE or the UNFCCC secretariat.

Furthermore, the tool provides several default values for parameters such as the electric efficiency of power plants. The values provided can be considered quite conservative, i.e. they assume rather high electric efficiencies. For those countries using the default values, this may lead to an under-estimation of baseline emissions.

generation is available. However, some countries do not only have run-of-river hydro power plants (for which case, the assumption of spilling water may be reasonable), but water may also be stored in large reservoirs and thus used at a later stage. In this regard, the estimation of baseline grid emissions for countries with a large share of low-cost/must-run power plants can be considered conservative, i.e. tending to under-estimate baseline emissions. However, it has to be noted that less than 5% of CDM projects used this approach for estimating the grid emission factor.

⁵⁹ E.g. assuming that there would be a significant increase of coal-fired power generation without straightforward evidence.

⁶⁰ For example, trends in a changing composition of the electricity grid or the grid emission factor observed in recent years could be considered and extrapolated for future years. Similar approaches are used in a number of other CDM methodologies.

The overall emissions impact of wind power plants also depends on other factors. Firstly, the upstream emissions from wind power, such as for construction, are relatively low (about 10 g CO₂e/kWh (IPCC 2014)); for most countries they are likely to be lower than upstream emissions from fossil fuel use displaced in grid power plants. Ignoring upstream emissions is therefore a conservative assumption. Secondly, an increasing uptake of wind power plants due to the CDM may lead to decreasing costs for wind power generation, which in turn could contribute to a higher uptake of wind power. This positive spillover effect is, however, difficult to estimate, in particular with regard to any emissions outcome. Thirdly, the length of the crediting period may lead to under-crediting if wind power plants are operated longer than the crediting periods.⁶¹ However, many wind power plants are expected to operate for about 20 years and about three quarter of wind power projects have selected a renewable crediting period of up to 21 years. Further aspects of potential over- and underestimation of baseline emissions are described in (Erickson et al. 2014).

Overall, we conclude that the current approach for estimating emission reductions from CDM wind projects is largely suitable. Methodological assumptions lead to both over- and under-estimation of emission reductions but can be considered appropriate for estimating baseline emissions of CDM wind projects.

4.5.5. Other issues

No other issues were identified.

4.5.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenue has only a limited impact on profitability of wind power plants • Support schemes often exist and are a main driver for wind power development • Investment costs have decreased significantly in recent years, making wind power in some cases competitive with fossil generation (LCOE) • Wind power is already widely used in large CDM countries (e.g. China, India)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; no clear-cut conclusion on whether over- or under-crediting occurs overall
Other issues	<ul style="list-style-type: none"> • None

4.5.7. Recommendations for reform of CDM rules

Due to our finding of an overall questionable additionality of wind power projects, we recommend that this project type is generally no longer eligible for new projects under the CDM. As an exception to this rule, countries with significant technological and cost barriers⁶² may be allowed to further use the CDM for implementing wind power plants.

With regard to the estimation of baseline emissions, we recommend the following:

- The CDM EB should ensure that grid emission factors are always verified by designated operational entities (DOEs);

⁶¹ For a discussion of the effects of the crediting period, refer to Section 3.5.

⁶² Such as transaction costs, e.g. due to the non-availability of technical knowledge in the country, or risk premiums in low-income countries. Least-developed countries could, for instance, be included in the list of eligible countries. Furthermore, the market share of wind power could be used to establish eligibility since it could be considered an indicator for barriers in the country.

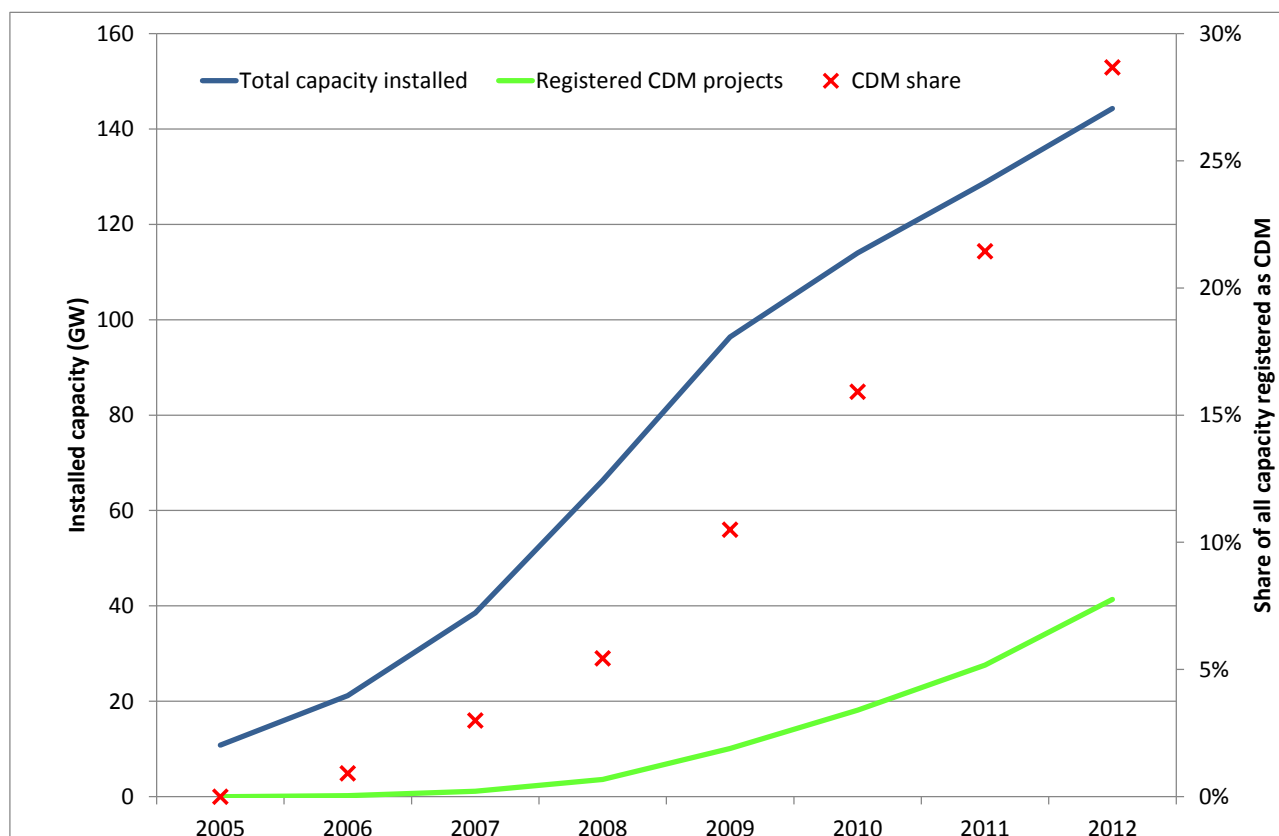
- The provisions for low-cost/must-run plants should be reviewed, including a clear definition of such plants and provisions which ensure that such plants are included in the operating margin if they are at the margin of the dispatch at any time;
- The grid emission factor tool should be revised to reflect trends in the composition of the power sector over time.

4.6. Hydropower

4.6.1. Overview

CDM hydropower projects mainly use two methodologies.⁶³ According to the UNEP DTU (2014), by the end of 2013, an overall hydropower capacity of 92 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (58 GW), Brazil (12 GW), followed by Vietnam and India (6 GW each). The other 44 countries with CDM hydropower projects account for 11 GW of installed capacity in total.

Figure 4-5: Total cumulated hydropower capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

As for wind power, Figure 4-5, Figure 4-6 and Figure 4-7⁶⁴ illustrate the development of hydropower capacity and the use of the CDM in China, India and Brazil. In all three countries, hydropower has played an important role for many decades. Significant capacity has been installed without the CDM. Hydropower may therefore be considered common practice in all three countries.

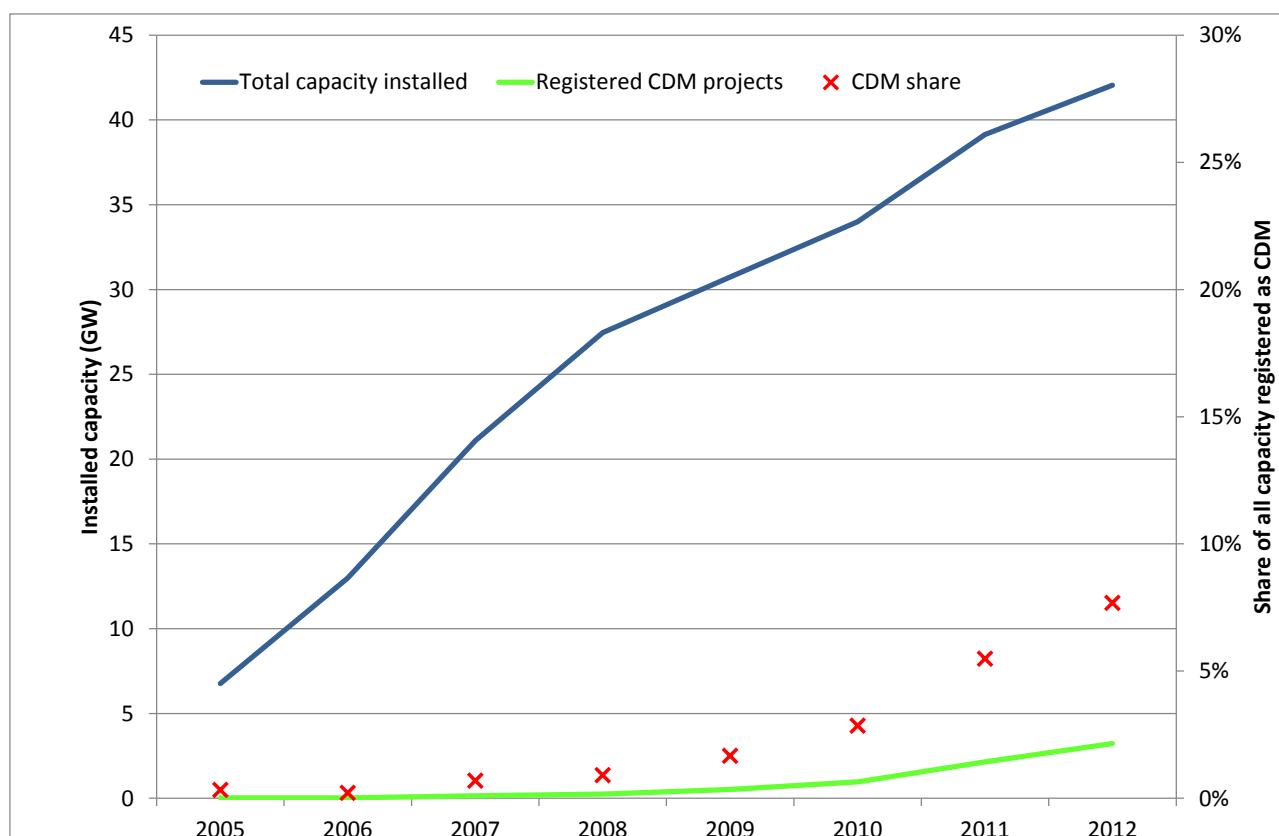
⁶³ ACM0002, AMS-I.D.

⁶⁴ Cf. footnote 51.

In China, the cumulated installed capacity in 1990 amounted to approx. 25 GW. A comparison of total hydro capacity installed and the capacity installed by projects using the CDM⁶⁵ over the 2005-2012 period (Figure 4-5) shows that there were no CDM projects until 2005, even though capacity additions in that year amounted to 11 GW. As of 2012, the share of CDM projects was 29% of total installed capacity.

In the case of India (Figure 4-6), the cumulated installed capacity in 1990 amounted to approx. 19 GW. Almost 7 GW of capacity was added in 2005 alone, with the CDM covering only a negligible share. After the introduction of the CDM, only a small share of hydropower projects used the CDM, with the CDM accounting for about 8% of total cumulated installed capacity⁶⁶ as of 2012.

Figure 4-6: Total cumulated hydropower capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

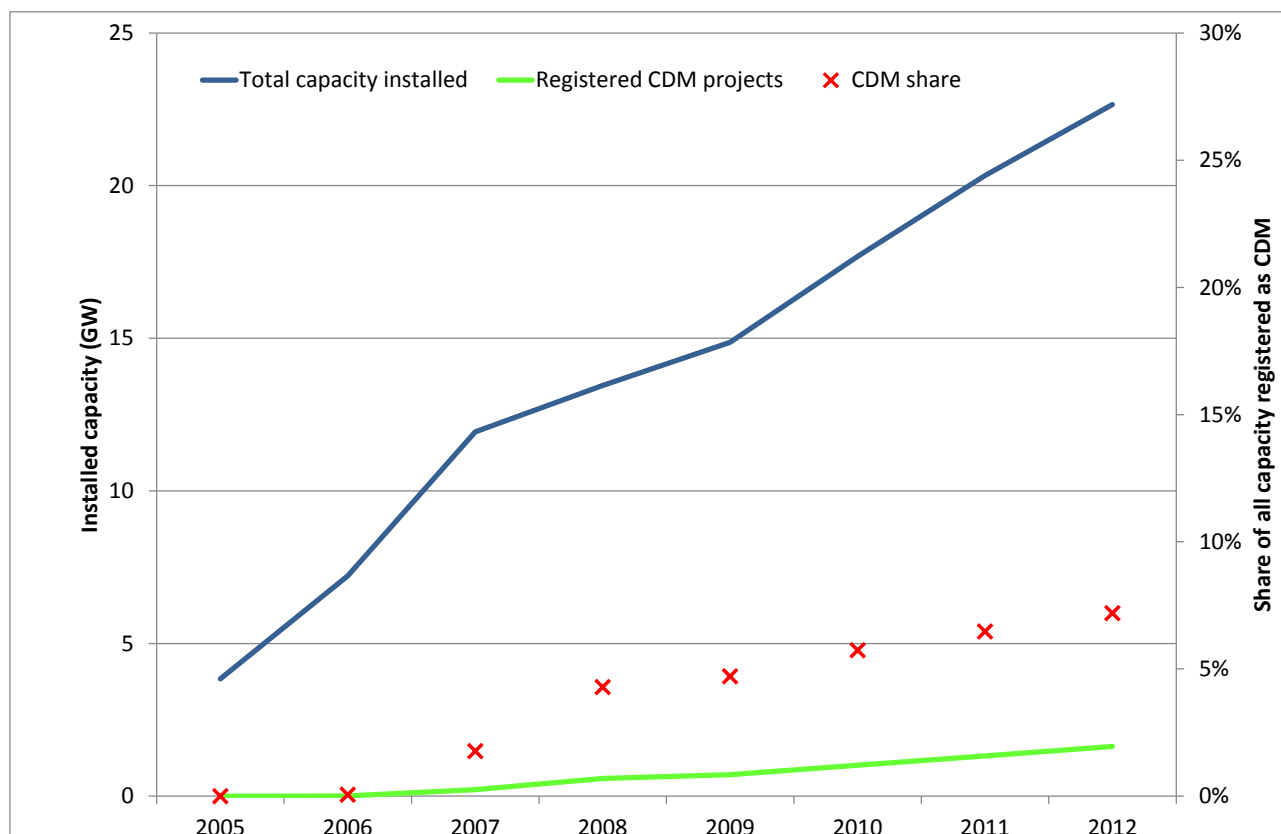
In the case of Brazil (Figure 4-7), the cumulated installed capacity in 1990 amounted to approx. 53 GW. Almost 4 GW of capacity was added in 2005, with no CDM projects being registered in that year. Even after the introduction of the CDM, only a small share of hydropower projects used the CDM (approx. 7% of total cumulated installed capacity⁶⁷ as of 2012).

⁶⁵ The total installed capacity between 2005 and 2012 is taken from the Platts database and accumulated across the years. The installed capacity of projects using the CDM is taken from the UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. See Section 4.5 for the rationale of using cumulative data.

⁶⁶ Between 2005 and 2012.

⁶⁷ Between 2005 and 2012.

Figure 4-7: Total cumulated hydropower capacity installed in Brazil between 2005 and 2012 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

4.6.2. Potential CER volume

According to our own estimates, registered CDM hydropower projects have the potential to issue 4.2 billion CERs by the end of their respective crediting periods, of which 1.7 billion CERs fall in the 2013-2020 period (Table 2-1). CERs from hydropower account for approx. 30% of the total CER issuance potential.

4.6.3. Additionality

Generally, the same methodologies and additionality rules apply as for wind power (Section 4.5.2). Hydropower CDM projects primarily use investment analysis to demonstrate additionality.

The analysis in Section 4.6.1 demonstrates that hydropower plants have been constructed for a long time in many countries, which suggests that the technology may be regarded as common practice in many countries. In many cases, especially large hydropower plants were established without subsidies, which is demonstrated by the uptake of hydropower many years ago (Section 4.6.1). In the case of small hydropower (SHP) plants in China, Bogner & Schneider (2011) find that “apparently, smaller SHP plants face stronger barriers despite the government’s commitment to SHP development” and that “an especially remote location, an inappropriate feed-in tariff or banks that deny loans can be possible barriers”. Therefore, they conclude that “the CDM may have played a certain role for some SHP project developments” (ibid.). However, they argue that “investment in SHP stations between 20 and 50 MW appear more feasible without the CDM” (ibid.). Moreover, according to their analysis “medium and large hydropower has witnessed considerable growth a long time before the CDM even existed, which makes it difficult to justify that new projects

can only be implemented with the help of the CDM. In conclusion, our analysis suggests that the CDM is for most projects not an important factor for investment decisions in the medium and large hydropower plants. It appears likely that most projects would have been implemented in any case, i.e. without the CDM”.

The impact of CER revenues on profitability is, at three to four percentage points, somewhat larger than for wind power (Section 2.4), mostly due to a higher plant utilization than for wind power. However, the increase in profitability due to CDM revenues is still relatively small compared to other project types⁶⁸. Also, in many cases, hydropower generally features competitive leveled costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Overall, due to the fact that hydropower is common practice in many countries, the limited impact of CER revenues on the profitability of hydropower plants and the competitiveness of hydropower with fossil electricity generation in many cases, we consider additionality of hydropower projects as questionable in the context of the CDM, especially for large hydropower.

4.6.4. Baseline emissions

Hydropower projects largely use the same methodological approaches for baseline emissions as wind power plants, and hence the same conclusions apply with regard to different aspects of over- or under-crediting. Few differences should be noted with regard to the emission impacts: Hydropower projects have, on average, somewhat higher upstream emissions for their construction (approx. 20 g CO₂e/kWh related to the “infrastructure & supply chain emissions” according to (IPCC 2014)), which, however, are still lower than typical upstream emissions from fossil use in the baseline. Thus, ignoring upstream emissions is still conservative. More importantly, the lifetime of hydropower can be significantly longer than the maximum crediting period under the CDM (21 years), which adds to the conservatism of the estimation of emission reductions for hydropower plants. In this regard, over the plants' lifetime, overall emission reductions may be rather under-estimated than over-estimated.

4.6.5. Other issues

In addition to baseline emissions, project CH₄ emissions ensuing from hydro reservoirs are considered under the CDM. The ACM0002 methodology uses the power density, which is defined as the installed hydro capacity divided by the reservoir surface, as an indicator of whether CH₄ emissions from reservoirs need to be considered. CDM projects with a power density below 4 W / m² are not eligible and projects with a power density between 4 and 10 W / m² have to estimate methane emissions, using a default emission factor of 90 g CO₂e/kWh. According to (IPCC 2014), methane emissions from “currently commercially available technologies” amount to 88 g CO₂e/kWh, however, the bandwidth is quite large. However, according to (Fearnside 2015), the default emission factor of 90 g CO₂e/kWh refers “only to bubbling and diffusion from the reservoir surface and” is an underestimate “of hydropower impact because these values ignore the main sources of methane release: the turbines and spillways”. Overall, he finds that “tropical hydroelectric dams themselves emit more greenhouse gases than are recognized in CDM procedures”. It can therefore be concluded that the current methodological rules under the CDM may lead to a potential underestimation of methane emissions from hydropower.

⁶⁸ It has to be noted, however, that the range of operating hours and investment costs of hydro power plants depends quite strongly on plant-specific conditions, for which reason the contribution of the CDM to overall profitability may be higher in some cases and lower in others.

4.6.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Common practice in many countries • CERs have only a moderate impact on profitability • In many cases competitive with fossil generation (LCOE)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project, emission reductions are likely to be underestimated
Other issues	<ul style="list-style-type: none"> • Potentially significant methane emissions from reservoirs which may not be fully reflected by CDM methodologies

4.6.7. Recommendations for reform of CDM rules

We recommend excluding large scale hydropower projects from being eligible under the CDM, due to the overall questionable additionality. A similar recommendation is made by (Erickson et al. 2014), who, in an analysis of the net mitigation impact of the CDM conclude “that excluding large scale power supply projects from the CDM could help increase the net mitigation impact of the CDM, as well as steer investment towards projects that are truly dependent on CER revenues”. We recommend that small-scale hydropower projects with significant technological or cost barriers⁶⁹ may be allowed under the CDM.

With regard to the estimation of baseline emissions, our recommendations for wind power plants (Section 4.5.7) also apply here. In addition, the provisions with regard to the estimation of methane emission from hydropower should be revised to address the potentially significant magnitude of these emissions.

4.7. Biomass power

4.7.1. Overview

CDM biomass power projects mainly use four methodologies.⁷⁰ According to the UNEP DTU (2014), by the end of 2013, an overall biomass energy⁷¹ capacity of 8.5 GW was installed by projects using the CDM. The main contributors to this overall capacity are China (3.7 GW) and India (2.1 GW), followed by Brazil (0.9 GW). The other 36 countries with CDM biomass projects account for 1.8 GW of installed capacity in total.

Generally, data availability is not sufficient to judge the magnitude of biomass capacity installed prior to the introduction of the CDM. Moreover, due to inconsistencies in the data, no meaningful comparisons can be made between projects installed with and without the use of the CDM.

4.7.2. Potential CER volume

According to our own estimates, all registered CDM biomass power projects have the potential to issue 0.36 billion CERs by the end of their respective crediting periods, of which 0.16 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from biomass power account for about 3% of the total CER issuance potential.

⁶⁹ The criteria need to be further specified. See also footnote 62.

⁷⁰ ACM0006, AM0015, AMS-I.C, AMS-I.D. It has to be noted, however, that the AM0015 methodology was only used for CDM projects registered in the early phase of the CDM.

⁷¹ Including different energy forms from biogenic sources.

4.7.3. Additionality

For large-scale projects (according to ACM0006), the identification of the baseline scenario and the demonstration of additionality are conducted in parallel.⁷²

With regard to the investment analysis, due to the diversity of project types, no overall conclusions can be drawn. Also, analysis available in the literature is quite limited, in contrast to wind and hydropower. On average, the impact of CER revenues on the profitability of projects is with about eight percentage points considerably larger than for wind or hydropower plants, making additionality claims more plausible (Section 2.4). The profitability of projects without CER revenues is, with an average IRR of approx. 5%, also lower than for wind (approx. 7%) and hydro (approx. 8%). The higher impact of the CDM is mostly due to the claiming of avoided methane emissions in many projects, which significantly improves the profitability of CDM biomass projects.

The investment analysis, which is applied by many projects, involves considerable uncertainty due to the variability of the biomass price, which strongly affects the profitability of biomass plants. In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables, including ones for biomass power generation. In addition, biomass power is not a completely new technology, but is rather based on the technology of thermal power plants in general and has been used extensively in some industries and countries before (e.g. in the sugar cane industry in Brazil), which indicates that the technology has been profitable in the past in some instances. This is underpinned by the fact that biomass power features competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Only a few scholars explicitly deal with the additionality of CDM biomass power projects. Stua (2013) finds that, in the case of China, the national feed-in tariff made “most of the biomass-fuelled power plants [cost-competitive] against [...] coal-fired plants”.

Overall, based on the information presented above, we cannot clearly conclude on the likelihood of the additionality of biomass power plants.

4.7.4. Baseline emissions

As outlined in Section 4.7.2, the identification of the baseline scenario and the demonstration of additionality are conducted in parallel, considering a wealth of different options.

One key requirement in methodologies for using biomass residues is that the biomass residues would not be used in the absence of the project and would be left to decay (sometimes aerobically, sometimes anaerobically also claiming CH₄ baseline emissions). This requirement is appropriate and important due to potential competing uses for the biomass. If the biomass residues were used in the absence of the project for other purposes, there may be no emission reductions, since the diversion of biomass from one use to another due to the CDM may lead to increased emissions elsewhere. If CDM projects only divert the use of biomass residues but do not result in more biomass residues being collected which would otherwise decay, this may also lead to indirect land-use change, i.e. due to the increased use of biomass (residues), previous demand may be covered by drawing on biomass from other areas, thus leading to decreasing carbon stocks there.

Methodologies vary with regard to how they assess that the biomass residues are indeed ‘available in abundance’ and that decay is a likely scenario. In older versions, the abundance of biomass residues had to be monitored annually, while in newer versions this is only checked once at the project start and at the renewal of the crediting period.

⁷² For small-scale biomass projects, the same additionality rules as for wind power apply (Section 4.5.2).

In general terms, there is an increasing demand of biomass for different uses (food, raw materials, energy) worldwide. This means that biomass residues (in many cases) either already have or will likely have a price in the future. As a consequence, the demonstration that biomass residues would otherwise be (completely) left to decay needs to take current market developments into account. For this reason, a regular checking of the abundance of biomass residues through monitoring may be more appropriate than a simple check once at the project start.

Furthermore, in many cases, anaerobic decay of biomass is claimed by project developers. However, this assumption may be contested depending on the circumstances. For instance, if biomass waste is spread on fields, biomass decay is rather aerobic than anaerobic, thus producing little or no methane emissions. In many instances, the amount of methane emissions claimed appears very large; it may be questionable whether truly anaerobic conditions prevail in the typical circumstances in which biomass residues are left to decay. We therefore conclude that the current approach of demonstrating the abundance of biomass residues may lead to a risk of over-crediting as no adequate monitoring of availability of biomass residues is in place. In addition, exaggerated claims of anaerobic decay of biomass may lead to further over-crediting.

With regard to the baseline emissions from displacing power plants in the grid, the same conclusions apply as discussed in Section 4.5.4.

4.7.5. Other issues

No other issues were identified.

4.7.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Significant impact of CER revenues on plant profitability due to claims of methane emission reductions • In many cases competitive with fossil generation (LCOE) • Support schemes exist
Over-crediting	<ul style="list-style-type: none"> • Demonstration that biomass is left to decay or available in abundance is only conducted once at the start of the project activity • Risk of exaggerated claims of anaerobic decay
Other issues	<ul style="list-style-type: none"> • None

4.7.7. Recommendations for reform of CDM rules

Due to our finding that the demonstration of abundance of biomass as well as of the claim that biomass is left to decay (under potentially anaerobic conditions) is key for avoiding any over-crediting of emissions, it is recommended that corresponding provisions in the applicable methodologies are reviewed, with a view to ensuring that this demonstration considers current trends of biomass use and disposal and that any claims for anaerobic conditions of biomass decay are realistic. In particular, the monitoring of biomass abundance should be carried out more frequently (e.g. annually).

4.8. Landfill gas

4.8.1. Overview

Decomposition of solid waste in landfills generates carbon dioxide (CO₂) and methane (CH₄). This landfill gas can be captured and flared or captured and utilised for electricity production or as a fuel. GHG emission reductions are achieved through the destruction of methane, and in the case of

energy production, displacement of a more GHG-intensive energy source. Global estimates suggest that 50 Mt of methane are generated annually from landfills (IPCC 2014).

The composition of landfill gas is usually approx. 50% CO₂ and 50% CH₄ (Hoorweg & Bhada-Tata 2012; US EPA 2013). It varies by climate and waste composition. In general, methane generation increases in wetter versus arid climates and warmer versus cooler climates. Warmer climates increase the growth of methane-producing bacteria (US EPA 2013). Waste composition with a higher percentage of organic material generates more methane and degrades more quickly (US EPA 2013). Waste in lower income countries often includes a higher percentage of organic material than higher income countries (Hoorweg & Bhada-Tata 2012).

4.8.2. Potential CER volume

The potential to capture landfill gas varies by landfill management type. Gas collection rates can be as high as 75% for basic landfills in which waste is compacted and covered and up to 85 - 95% for engineered sanitary landfills whereby landfills are lined or capped to prevent leakage or contamination from the waste (US EPA 2013). Landfill management practices vary by region. While the majority of landfills in developed countries are engineered landfills, in developing countries mitigation opportunities are more limited because the majority of landfills are basic landfills or open dumps (US EPA 2013). In open dumpsites, decomposition is predominantly aerobic; as a result methane generation rates are relatively low and gas recovery rates are limited (~10%) (US EPA 2013). Because there is often a high concentration of food waste and wet condition in developing country sites, waste decays quickly and the methane gas is released quickly. As a result, mitigation activities to capture methane must be implemented on active open dumpsites, since after a lag of even 1-2 years most of the methane will have already been generated⁷³ (US EPA et al. 2012).

There are two primary landfill gas methodologies under the CDM. ACM0001 is the consolidated large-scale methodology and AMS-III.G is the small-scale methodology. As of 1 July 2015, there were 364 registered landfill gas projects. Predominantly these are large-scale projects located in Latin America and Asia/Pacific regions, though there are also projects in Africa, Europe/Central Asia and the Middle East. Of the 364, 149 projects have issued a total of 69 million CERs. As of 1 August 2015, the average issuance success rate amounted to 58% (UNEP DTU 2015a).

4.8.3. Additionality

Prior to 2013, large-scale landfill gas projects assessed additionality according to the CDM “Combined tool to identify the baseline scenario and demonstrate additionality”. This tool, similar to the CDM ‘additionality tool’ requires that projects demonstrate that they are additional based on either an investment or a barrier analysis, complemented by a common practice analysis. Similarly, prior to 2014, small-scale projects applied the general guidelines or tool for small-scale activities. Most projects used investment analysis to demonstrate additionality, predominantly benchmark analysis or simple cost analysis (IGES 2014, similar to earlier results from Spalding-Fecher et al. 2012).

A standardized approach to additionality assessment was incorporated into Version 15 of ACM0001, eligible as of 8 November 2013, and version 9 of AMS-III.G, eligible as of 28 November 2014. This revision established a positive list for additionality of landfill gas projects. All landfill gas projects are automatically considered additional if prior to the implementation of the project they only vented or flared methane, and if under the project activity they either flare the methane, or use methane to generate heat, or use the methane to generate power with a capacity of less than 10 MW. As of 1 May 2014, only one landfill gas project had been registered using this methodology

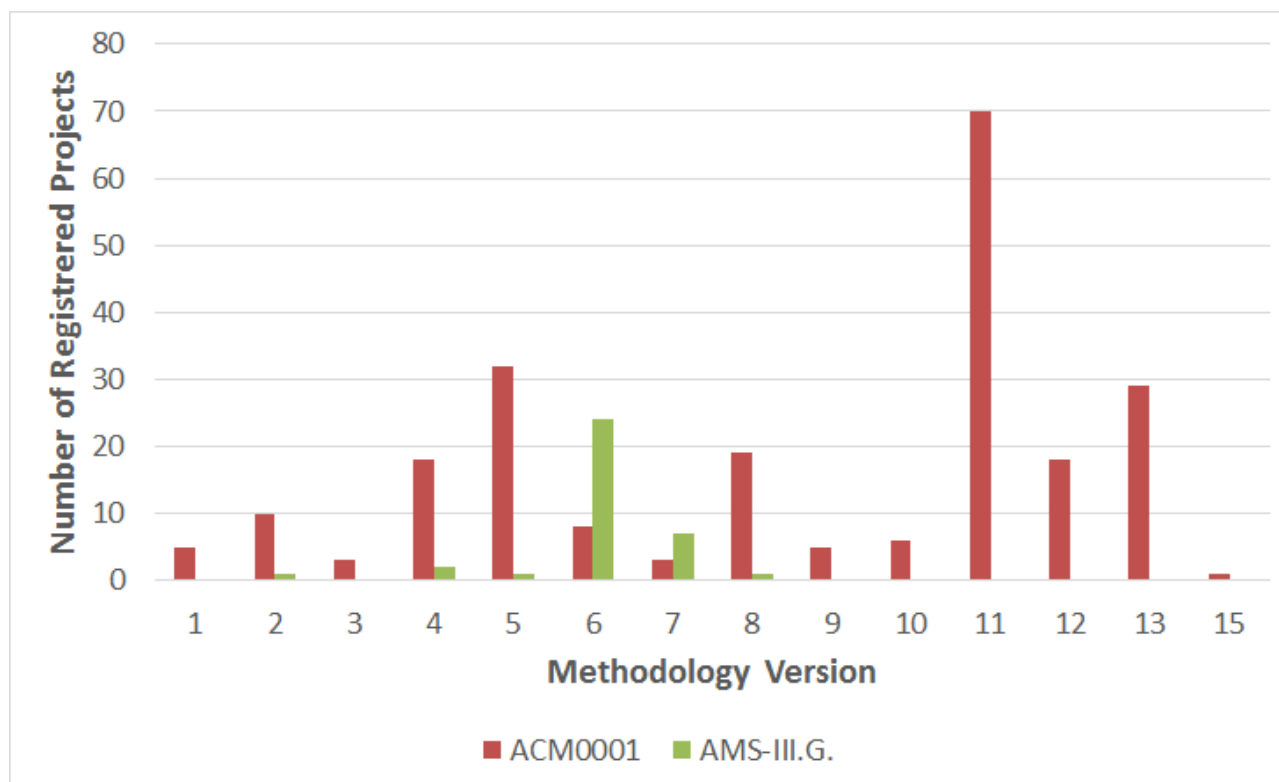
⁷³ While not applicable for the landfill gas methodology (ACM0001), the rapid decay rates may have implications on the applicability of the first order decay model used in the CDM “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site” and included in the avoided landfilling via composting methodologies.

Version 15, as shown in Figure 4-8. The CDM EB will review the validity of these standardized procedures after a three-year time period.

CDM projects can only claim emission reductions for methane capture that exceeds any applicable regulations. In regions in which a regulation is in place but it can be demonstrated that it is not enforced, projects can still claim emission reductions for implementing the regulation. This has raised concerns that enforcement may be discouraged by constituencies receiving CER revenues. One such example is in the Philippines, where regulation has been established requiring gas capture and destruction, but it has not been enforced. Concerns have been raised that CER revenue has led to a pressure to discourage enforcement (Docena 2010).

Projects that capture and flare methane have no independent revenue source (US EPA et al. 2012). Flaring projects are therefore very likely to be additional. For projects using landfill gas for energy generation, additionality seems likely. As shown in Section 2.4, the available data from CDM projects indicates that the IRR is rather low without CER revenues (approx. 2.5-2.8% on average) but increase substantially with CER revenues (to approx. 16.6-18% on average). Indeed, collection and flaring of landfill gas is not common practice in developing countries without carbon finance, though it may be possible to implement projects economically where there are renewable portfolio standards (RPS) or feed-in tariffs, to allow energy production revenue to cover costs and provide capital investment for methane collection systems. For projects that supply heat, electricity, or methane to natural gas pipelines, the price and revenue from energy generation are a primary driver of the economics of the project. With economies of scale, the larger the landfill gas project, the more energy can be generated and the more likely the project is profitable.

Overall there are no substantial concerns with the approach to assess additionality for large- and small-scale landfill gas projects. The primary lingering concern is the potential for CDM projects to discourage the implementation of regulations that require capture and destruction of landfill gas.

Figure 4-8: Number of registered landfill gas projects by methodology

Source: IGES 2014

4.8.4. Baseline emissions

The baseline scenario for ACM0001 and AMS-III.G is assumed to be the atmospheric release of methane, unless capture and flaring is required by regulation or unless capture occurred to some extent prior to the implementation of the project. Baseline emissions are determined based on the amount of methane flared or used under the project activity (less any methane gas that was flared under the baseline). The overall volume of emission reductions generated is based on the baseline emissions minus any combustion efficiency losses and minus any methane that would have been destroyed under the baseline via soil oxidation. ACM0001 considers four different cases for how to account for regulation and existing landfill gas capture systems. These include no regulation/no existing capture system, no regulation with existing capture, regulation without existing capture, and regulation with existing capture. The small-scale methodology uses, in principle, the same approach but is less specific; the baseline emissions must take into account the volume of landfill gas required to be collected by regulation and the presence of pre-existing landfill gas collection and combustion systems. The overall approach of estimating the baseline emissions based on the amount of captured gas seems reasonable. However, there are concerns related to the default assumptions for pre-existing systems and regulations, and the accounting for soil oxidation.

If a regulation requires the collection of landfill gas or if a landfill gas collection system was pre-existing, but the regulation does not specify the amount to be collected or the historical amount collected is not known precisely, then both methodologies assume that 20% of the amount captured under the project scenario would be captured in the baseline. The methodology explains that this default value is based on assumptions that the capture efficiency of the project system is 50% and under the baseline 20%, and that in the baseline the methane was flared using an open flare with an efficiency of 50%. Despite the explanation, it remains unclear how the overall default value

of 20% of project emissions is derived. While a 50% destruction efficiency for an open flare is conservative when considering project emissions, used in the context of baseline emissions it has the potential to actually overestimate the emission reductions. The methodologies implicitly assume that the CDM project captures five times the amount of methane than would be captured under a regulation. This assumption seems rather optimistic and likely leads to a significant over-estimation of emission reductions.

There are two types of soil oxidation that can occur at a landfill. Top-layer soil oxidation refers to soil oxidation under baseline conditions when methane oxidizes as it passes through the top layers of the landfill. The second type of oxidation can occur when additional air is introduced into the landfill due to suction from the LFG capture system under the project scenario.

Early versions of ACM0001 and AMS-III.G did not account for these two effects. This likely led to an overestimation of baseline emissions for projects that were registered up to version 11 of ACM0001 (valid until 25 July 2012) and up to version 7 of AMS-III.G (valid for registrations until 28 May 2013). This shortcoming was recognised and, in principle, addressed from version 12 of ACM0001 and version 8 of AMS-III.G onwards, by introducing a default factor for the amount of methane that would oxidize in the baseline, using 10% for “managed solid waste disposal sites that are covered with oxidizing material such as soil or compost” and 0 “for other types of solid waste disposal sites”.

Concerns have been raised about the default values applied for the soil oxidation factor. Methane oxidation in covered landfills occurs mainly through bacterial degradation, primarily by methanotroph bacteria, resulting in production of carbon dioxide, water, and biomass. The rate of oxidation is influenced by a variety of physical factors, including different soil cover types (Chanton et al. 2009). Methane oxidation generally increases with temperature up to around 40°C and is also influenced by moisture, where either too dry or too wet conditions can inhibit methane oxidation (Chanton et al. 2009; Spokas & Bogner 2011). Soil oxidation further depends on the type of soil cover and the thickness of soil cover. Higher soil oxidation rates occur in landfills that are well managed with a thick soil cover. In a study of landfills with similar operational characteristics in different climate zones of the United States, methane oxidation was lowest in humid subtropical regions and highest in arid regions (Chanton et al. 2011). This research suggests that for poorly managed landfills in humid sub-tropical and tropical regions the soil oxidation rates may be very low.

The IPCC sets default values for landfill cover methane oxidation are typically between 0% and 10% of generated CH₄ (IPCC 2006), possibly derived from one early study of a New Hampshire landfill. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories indicate that:

“The use of the oxidation value of 10% is justified for covered, well-managed solid waste disposal sites to estimate both diffusion through the cap and escape by cracks/fissures. The use of an oxidation value higher than 10%, should be clearly documented, referenced and supported by data relevant to national circumstances.”

This highlights that the 2006 IPCC Guidelines consider a soil oxidation value of 10% as justified only for covered and well-managed sites. However, more recent literature surveys and experimental studies indicate that oxidation rates for covered landfills are higher, amounting on average to approx. 30% (Chanton et al. 2009; Chanton et al. 2011), although the 2009 paper indicates that the data may over-represent warmer conditions when oxidation rates would be higher.

Some stakeholders have raised concerns that the soil oxidation factor was not adjusted upwards in the CDM methodologies when more recent research indicated that an average value of 30% may be more representative (Chanton et al. 2009). However, the higher soil oxidation rates reported by

(Chanton et al. 2009) may not be fully appropriate for the context of developing countries, given that both an intermediate and final cap would have to be in place to a certain engineering standard. In most developing countries, landfills are rarely well managed with a thick soil cover required for this level of soil oxidation. This suggests that the higher soil oxidation rates may not be applicable to the conditions for some CDM projects. Nevertheless, having a default factor for both managed and unmanaged landfills avoids creating a disincentive for covering and managing landfills. The use of the soil oxidation rates as a standard default for all projects runs the risk of underestimating the volume of credits generated in some sub-tropical and tropical regions with unmanaged landfills for which soil oxidation rates under the baseline would have been very low or zero.

4.8.5. Other issues

Stakeholders have commented in public submissions to the UNFCCC with regard to revisions of ACM0001 that different types of perverse incentives can arise from landfill gas projects. Two main perverse incentives can be of concern, which both lead to an over-estimation of emission reductions.

Firstly, project developers can have an incentive to store the waste in a manner that generates more methane. For example, a 'flat' landfill with low methane generation potential could be changed to store waste at a greater height. Moreover, project proponents can have an incentive to maximise methane generation through other means, such as pulling water in the landfill to create anaerobic conditions. On a site visit to a landfill gas project in China in 2005, engineers proudly explained how they had found a way to generate more methane by stacking waste higher in one section of the landfill rather than spreading it evenly across the landfill site. While this is just one anecdotal example, there is reason to believe that some landfill projects may be altering management practices to do so. Based on these observations, in 2012 more recent versions of both the large- (version 13.0) and small-scale methodologies (version 8.0) included an applicability criterion that excludes projects in which the management is changed in order to increase methane generation. However, verifying this requirement may be difficult in practice and it has not been included as an explicit provision for DOEs to assess after the project implementation.

Secondly, there could be perverse incentives for policy makers and private actors not to engage in recycling or other ways of preventing waste generation, as this could lower the potential for CDM landfill gas projects. Similarly, there could also be perverse incentives to continue landfilling instead of introducing other waste treatment methods (incineration, composting).

Public comments received on behalf of waste picker organizations have raised concerns that development of a project limits access of waste pickers who, through the informal economy, contribute significantly to the recycling of materials (Global Alliance for Incenterator Alternatives, GAIA). Project developers who were interviewed acknowledged that sites need to be secured for project installation, to avoid having equipment tampered with or material stolen. For certain projects, including examples in Latin America and Thailand, agreements have been made for waste pickers to pick through waste before it is transferred into the secure site. However, in other cases there has not been any cooperation between the project developers and waste pickers, which has resulted in conflict and loss of livelihoods. There is evidence that the development of landfill gas projects is limiting the access of waste pickers and thereby reducing the reuse and recycling of waste through the informal economy. Given the success of collaborative agreements with waste pickers, this may be a model which new projects should be required to incorporate.

Pursuing landfilling instead of other waste treatment methods, such as recycling, incineration or composting, is likely to result in overall higher GHG emissions, even if the landfill gas is captured, because landfill gas collection systems are not able to capture all of the methane. The CDM may thus provide perverse incentives for policy makers or project owners to continue pursuing a waste

treatment method that is more GHG-intensive. If in the absence of the CDM, other waste treatment methods would be pursued, it would lead to an over-estimation of emission reductions.

Early versions of CDM methodologies did not include any provisions to address this issue. Regarding the potential perverse incentive to reduce recycling, starting with version 12 of ACM0001, an applicability criterion requires that “the implementation of the project activity does not reduce the amount of organic waste that would be recycled in the absence of the project activity”. However, there is no reference to how this should be assessed. Moreover, this applicability condition does not address the broader concern that the CDM provides incentives to continue pursuing landfilling and not composting or waste incineration. In public comments submitted by non-governmental organisations, such as the GAIA, there have been calls for eligibility requirements that would allow projects only on closed landfills in order to prevent the potential for this perverse incentive of reducing recycling and composting. Project developers argued that in developing country contexts, with warmer climates and higher percentage of organics in the waste stream, the capture of methane must take place while the landfill is actively being used, otherwise the methane will have already been released once it is closed. This is in contrast to landfills in more temperate climates, where methane production happens more slowly and where it is more common to develop a project at a closed landfill.

Overall, there is reason to believe that landfill gas projects are contributing to perverse incentives to manage landfills in ways that generate more methane and to reduce reuse and recycling or avoid a shift towards composting or waste incineration. In addition, it appears there are cases in which project participants increase methane production – an issue which may deserve particular attention in the validation and verification auditing processes.

4.8.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured under pre-existing collection systems or regulations are unjustified and have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid sub-tropical and tropical regions with very low soil oxidation rates; nevertheless, requiring the use of a default soil oxidation rate for baseline emissions avoids creating a perverse incentive to avoid covering landfills Potential for perverse incentives for policy makers not to regulate landfills or enforcing regulations in place Perverse incentives for project developers to manage landfills in ways that increase methane generation
Other issues	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG-intensive waste treatment methods, such as composting or incineration Some landfill gas projects exclude waste pickers and informal sector recycling, reducing overall rates of reuse and recycling

4.8.7. Recommendations for reform of CDM rules

We recommend several revisions to the CDM landfill gas methodologies to address the potential over-crediting, in particular the perverse incentives for both project owners and policy makers:

- Instead of applying one value for the soil oxidation factor to all projects, different values could be applied to different regions based on the climatic conditions and practices in that region.

- The approach of the default factors used for estimating methane capture from pre-existing collection system or landfills with regulations should be revisited. Assumptions in the default factor could be revised to be more conservative by assuming that more (rather than less) methane was captured and destroyed.
- Include specific requirements for DOEs to verify that the landfilling practice was not changed with a view to generating more methane.
- To avoid the reduction in recycling by excluding waste pickers access to the site, the methodology could be revised to be more specific about how projects should provide waste pickers with access to solid waste before it is deposited in the secure dumpsite.
- Given the long-term need to transition away from landfilling and increase composting and recycling, there could be a sunset clause considered for CDM landfill projects.

4.9. Coal mine methane

4.9.1. Overview

Methane is stored within coal as part of the coal formation process. During coal mining activities some of the methane is released. The build-up of methane in coal mines creates a potential explosive hazard and efforts before, during, and after mining are taken to reduce the safety risk by releasing methane into the atmosphere. Methane released from coal mines makes up approx. 8% of global anthropogenic methane emissions (Global Methane Initiative 2011). Methane originating in coal seams that is drained prior to mining is known as coal bed methane (CBM). Through a process of pre-mining drainage, this methane can be extracted to reduce the safety risk. During coal mining, methane can be vented from coal mines, which is known as ventilation air methane (VAM). After mining has ceased, methane can be extracted, which is known as post mining or post drainage coal mine methane (CMM). Coal mine methane projects involve installation of control technologies to collect and destroy and/or utilise methane from existing and abandoned mines, instead of releasing it to the atmosphere. Under the ACM0008 methodology of the CDM, capturing methane is eligible from pre-mining via underground boreholes and surface drainage of CBM, during mining from VAM that would normally be vented, as well as post mining from abandoned/decommissioned mines.

4.9.2. Potential CER volume

Of the 84 CMM projects that have been registered under the CDM, all are located in China, except for one project in Mexico. Projects from other countries, including India, Indonesia, Philippines and South Africa have been submitted to the UNFCCC but not registered.⁷⁴ As of 1 May 2014, 34 million CERs have been issued from 37 projects located in China. The total volume of credits expected from the credit start dates up to 2020 is 170 million CERs (Section 2.3).

The best conditions for CMM projects are deep coal mines with high methane concentrations. Under these conditions, methane is concentrated and easy to collect. For geographic and regulatory reasons, coal mines in China have been well suited for CMM projects to date. In India, for example, most coal mines are surface mines, where methane concentrations are lower and it is harder to collect the methane. Another barrier in India is national regulation that divides permits for using coal and gas. This means that coal mines do not have a permit to utilise the methane gas generated and would be unable to authorise a CMM project. A CMM project would require an additional permit process, an added administrative barrier.

⁷⁴ There are two projects under validation from India and one from the Philippines. Projects in Indonesia and South Africa have had their validation terminated or validation replaced.

4.9.3. Additionality

All of the registered CMM projects use the large-scale ACM0008 methodology. The most recent ACM0008 Version 8 requires use of the “Combined tool to identify the baseline scenario and demonstrate additionality” and provides further guidance on the application of the tool in the context of CMM projects. As of May 2014, no projects had been registered under version 8, which was approved in February 2014. The majority of projects are registered under versions 6 and 7. In these prior versions, the CDM additionality tool was applied, and a separate procedure was used to select the baseline scenario. Starting with version 6, the methodology was changed to allow for benchmark analysis as part of investment analysis for projects where no investment would occur in the baseline scenario.

Most CDM CMM projects apply a benchmark analysis to demonstrate additionality, as shown in Table 4-4. Benchmark analysis compares the financial performance of the project, often expressed as IRR, to a relevant benchmark or investment ‘hurdle rate’. In contrast to some other project types, CER revenue for CMM projects does make up a large portion of the return on investment on capital expenditures for projects. According to information from PDDs, the IRR without CER revenue is approx. 2% on average and increases to approx. 28% with CER revenues, the largest increase among all project types (Section 2.4). When we derive a simple indicator that puts the capital investment in relation to the number of CERs generated over ten years, as referenced in Section 2.4 in this report, we find an average ratio of about USD 4 / CER for all CMM projects. These calculations show that CMM projects have a high likelihood of additionality. They support reports from technical experts and project developers that abatement costs for CMM co-generation plants are approximately USD 3 - 5 per tCO₂ during 10 years of operation. Other reports indicate that CMM projects are usually not economically viable; according to United Nations (2010) power generation from CMM only becomes economically viable for coal mines with very large methane sources exceeding 20 m³/t (United Nations 2010).

Table 4-4: Additionality approaches used by CDM CMM project activities

Additionality approach	Number of project	Average Annual CERs (1,000)
Benchmark Analysis	76	33,465
Investment Comparison Analysis	4	1,557
Investment Comparison Analysis and Benchmark Analysis	1	266
Simple Cost Analysis	4	1,883

Sources: IGES 2014

A high likelihood of additionality is also supported by observation of common practice in the sector. Coal mines are very averse to having any combustion on-site. Combustion of any kind increases the potential risk of a methane gas explosion. Venting methane is the safest approach to avoid combustion, and miners and management are very familiar with this approach. Coal mine operators are generally averse to having a methane combustion system onsite as a result in order to avoid the risk of mine closures due to concerns around worker safety. Global Methane Initiative staff reported that in China, prior to the presence of the carbon market, efforts by the Global Methane Initiative were wholly unsuccessful in implementing CMM projects. No pilot projects or sponsored projects were able to get off the ground. Technical barriers were significant and persistent. The equipment used was unable to cope with the difficulties of the coal mine system, including the concentrations of volatile methane and the gas volumes. Only with the revenue from CERs were there sufficient incentives to develop technologies that worked well for these conditions. Now, in

China, it has become common practice for large coal mines to capture methane with revenue from a CDM project. As of 2014, there were still 2 projects in China at the validation stage; however since the technology for developing CMM projects in China is now proven, it can no longer be claimed to be first of its kind or a technology barrier. Although the CMM projects have become common practice, this has only been the case with CDM revenue. Overall, the risk for non-additionality is low for VAM projects.

4.9.4. Baseline emissions

Baseline emissions are calculated as the sum of CO₂ emissions from destruction of methane that would occur in the baseline scenario, emissions from the production of power, heat, or use of gas replaced by the project activity, and release of methane into the atmosphere that is avoided by the project activity. The baseline scenario is selected based on an examination of all the options that are technically feasible and comply with applicable regulations and elimination of all baseline scenario alternatives that face prohibitive investment, technological and/or prevailing practice barriers.

There is some concern that mines may take part in marginally more pre-mining drainage than they would have done without incentives from the CDM; however, the drained methane would likely have been emitted upon mining (and likely would have been emitted through ventilation later on). So these concerns seem limited, given that there are provisions in the methodology that emission reductions may only be credited once mining starts, ensuring that CERs are not issued in cases in which mining may not have occurred under the baseline. Our review has not identified any other concerns related to the determination of baseline emissions.

4.9.5. Other issues

The methodology includes a requirement that methane collection must exceed that which is required by applicable regulations, with the exception of cases in which it can be shown that the regulation is not enforced. A regulation was put in place in China requiring that methane captured from coal mines that exceeds 30% methane concentration must be captured and used. It has been suggested by project proponents that the Chinese government actually put this regulation in place as a result of the success of the CDM, to support the use of CDM financing to capture methane as best practice and to stimulate more CDM project development. However, interpretations vary and it has led to questions around the additionality of projects and whether or not they would have been required by regulation. As a consequence, project developers focused on projects where the methane concentration was below 30%. These projects would be avoided for safety reasons in North America or Europe, because this gets close to the explosive range of methane concentrations of 15-25%. It is better practice and safer to improve the capture rate and increase the concentration of methane, however this could run the risk of exceeding the 30% concentration regulatory requirement in China, and hence not meeting the CDM additionality requirements. This raises the risk of perverse incentives for project developers to diluting methane gas to reduce the concentration below 30% in order to be eligible for the CDM. However, no evidence is available whether this happened.

4.9.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Likely to be additional • CDM revenue makes up a large portion of return on capital investment • Technology for CMM in China is now well demonstrated, no longer technical barriers
Over-crediting	<ul style="list-style-type: none"> • Potential concerns regarding increased mining and/or pre drainage of coal mine methane but no evidence whether or not this occurs
Other issues	<ul style="list-style-type: none"> • Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations

4.9.7. Recommendations for reform of CDM rules

There are no recommendations regarding reforming the CDM rules for CMM projects. Further investigation of China's regulations for methane capture are warranted to ensure that perverse incentives are avoided.

4.10. Waste heat recovery

4.10.1. Overview

Waste heat utilization includes generally energy efficiency measures, where the thermal content of hot waste gases that would be vented in the absence of the CDM project activity is used for heating purposes, replacing fossil fuel use. For example, hot exhaust gases from cement kilns can be used to pre-heat the raw material before entering into the kiln.

A related category of projects is waste gas utilization where the calorific value of waste gases that contain a certain fraction of hydrocarbons or hydrogen that would be flared in the absence of the CDM project activity is used to replace regular fossil fuels. For example, waste gases with a high content of carbon monoxide and hydrogen can be used as fuel for steam production in industry. This second project category has similar features than the 'thermal' recovery of waste gases, but the present chapter focusses on the first category.

4.10.2. Potential CER volume

According to our own estimates, registered CDM projects have the potential to issue 0.35 billion CERs by the end of their respective crediting periods, of which 0.22 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from these projects account for about 2.5% of the total CER issuance potential.

4.10.3. Additionality

The methodologies for waste heat utilization (AM58, AM66, AM95, AM98, ACM12, AMS-II.I., AMS-III.P.AMS-III.Q., AMS-III.BI.) generally use standard CDM additionality tests based on barrier and/or investment analysis.

The general issue with this project type is that the use of waste heat is a standard practice in many integrated industrial facilities, in particular where energy costs represent a larger fraction of production costs such as in cement production, refineries, iron and steel and chemicals. However, the extent of the use of waste heat and energy efficiency may vary significantly even within a country, as energy costs, financial resources and engineering and management skills may differ between sectors and plants. While one steel plant may define its competitive edge in systematically using all waste heat and reducing heat loss along the steelmaking process because of competitive steel markets and relatively high fuel costs, a refinery plant may vent significant amounts of waste heat and experience severe heat losses all over the refinery because its cost of fuel is very low.

In the use of investment analysis for demonstrating additionality for waste heat recovery projects involves several uncertainties: the highest uncertainties are in the assumptions on future fuel prices which show high variability over time (Figure 2-4 to Figure 2-6). In addition, the considerable uncertainties in investment cost for equipment and construction and the often uncertain impact of the considered measure on efficiency makes it difficult to objectively determine the profitability of the measure and the relevant hurdle rate (Section 3.2).

For projects implemented in existing plants, the methodologies require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation. This is an important safeguard to assure at least some degree of additionality.

Some methodologies, such as ACM0012, also allow waste heat recovery projects in greenfield plants. This is very problematic, as it is very difficult to demonstrate that the waste heat utilization would not have been implemented in the absence of the CDM (Section 3.2). The methodology ACM0012 (V.5) provides for two options for demonstration additionality in the case of greenfield plants. Option 1 requires to identify similar plants; the project is deemed as additional “if *more than 80 per cent of the analyzed facilities in the list do not use waste energy, it can be decided that the proposed Greenfield facility also would have wasted the energy in the absence of waste energy recovery CDM project*”. While the methodology tries to be descriptive on how to identify baseline waste energy use, there remain large uncertainties and most importantly, data on the degree of waste energy usage in plants from competitors may be very difficult to obtain. Under option 2, project participants can submit a (hypothetical) *alternative design* without or with a lower level of waste heat recovery and demonstrate using investment analysis that the alternative design would be the baseline scenario for the waste energy generated in the greenfield facility. Given the high uncertainties in price data and hypothetical level of waste heat utilization in the absence of the CDM, this leads to significant risks of non-additionality.

The economic impact of CERs on the profitability of the waste heat recovery project is usually rather small compared to related fuel cost saving. I.e. a change in fuel costs of a few percent may have the same impact as the CER revenues (Sections 2.4 and 3.2).

Overall, the risk for non-additionality of greenfield plants seems higher than for existing plants, where the requirement for a minimum of three years of generation of waste heat prior to the start of operation of the CDM project has to be demonstrated.

4.10.4. Baseline emissions

Baseline emissions are usually derived from the amount of waste heat used in the project case. It is assumed, that this heat would be generated by fossil fuels in the baseline scenario.

However, even though the methodologies for existing facilities require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation, in practice it may be very difficult to rule out that waste heat has not been used in some form in existing facilities before project implementation, which may inflate baseline emissions.

Also, waste heat recovery may lead to a different operation of the plant than in the baseline scenario. For example, if waste heat is used for pre-heating of a product, the plant may be run in such a way that more waste heat is generated to assure a certain temperature level of the pre-heated product, which leads to a higher fuel consumption in the boiler generating the waste heat. Therefore the amount of heat wasted in the baseline may be overestimated. Moreover, baseline usually do not capture any other autonomous energy efficiency improvements that might be implemented in the absence of the project.

In greenfield projects, the emission reduction is based on the difference in emissions in modelling a baseline and project scenario. The models build on many assumptions that are difficult to validate objectively. The results are therefore prone to high uncertainty and may lead to over-crediting.

Lastly, the methodologies do not consider emission reductions from the reduction in upstream emissions (such as from the production of natural gas or coal) which leads to a slight under-crediting, if upstream emissions occur in a non-annex I country.

4.10.5. Other issues

None.

4.10.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are very small compared to cost reduction from fuel savings • Ex-ante estimation of key parameters including investment costs and fuel savings has large uncertainties • Waste heat recovery is common practice in many countries and sectors (though not in all)
Over-crediting	<ul style="list-style-type: none"> • In existing facilities: It is very difficult to rule out that waste heat has not been used in some form before project implementation, which may inflate baseline emissions • In greenfield projects: Modelling of amount of waste heat lost in baseline is subject to very high uncertainties. • Waste heat recovery may lead to a different operation of the plant than in the baseline case, e.g. to assure a certain temperature level of the heat medium or to NCV level of waste gas, therefore the amount of gas wasted in the baseline may be overestimated
Other issues	<ul style="list-style-type: none"> • None

4.10.7. Recommendations for reform of CDM rules

Waste heat recovery is standard practice in many energy intensive industrial sectors, though there exist barriers to the implementation of waste to energy measures. The high uncertainty in additionality demonstration make it less suitable for the CDM, the project type may be taken out of the CDM or restricted to cases with clear additionality demonstration, e.g. of a very low uptake of waste heat recovery can be demonstrated in a specific industrial sector. We recommend that option 1 in Appendix 1 of ACM0012 be maintained as it provides a more objective way of assessing the practice in the sector and country and that option 2 not be used.

4.11. Fossil fuel switch

4.11.1. Overview

Fossil fuel switch includes the switching from a fuel with higher carbon intensity (such as coal or petroleum) to a fossil fuel with lower carbon intensity (such as natural gas) in the generation of heat for industrial processes or in power plants. In this section we do not consider switching from fossil fuels to biomass. Methodologies are for existing installations only (e.g. ACM0009, ACM0011, AMS-III.AH., AMS-III.AN) or for both existing and greenfield installations (AMS-III.B and AMS-III.AG – power only).

4.11.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 0.46 billion CERs by the end of their respective crediting periods, of which 0.23 billion CERs fall in

the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about 3.3% of the total CER issuance potential.

4.11.3. Additionality

Both fossil fuels with higher carbon intensity such as hard coal, lignite or fuel oil and fuels with lower carbon intensity such as natural gas are widely used in stationary installations in energy and manufacturing industries as well as in the buildings sector. In existing facilities, the choice of fuel is often determined by the existing fuel, because fuel changes may be costly, though there are also multi-fuel systems. In greenfield plants, the fuel choice usually depends on the economic viability of each fuel option.

Table 4-5: Examples of differences in characteristics between the use of coal and fuel oil compared to natural gas

Characteristics	Hard coal, lignite (fuel with high carbon intensity)	Natural gas (fuel with lower carbon intensity)	Considered in investment analysis
Initial investment for burner/boilers etc.	Higher	Lower ¹⁾	Yes
Fuel cost per energy unit	Lower	Higher	Yes
Non-fuel operation costs	Higher	Lower	Yes
Flexibility in operation ²⁾	Lower	Higher	No
Means of distribution to end-user	Vehicle-based: by trucks, train i.e. requires access roads or rails	Network based: by distribution lines ³⁾	No
Price building mechanisms	In many countries based on world market price	In many countries price is based on local long term contracts, often taking into account a price index, e.g. based on oil price	No
Dependence on specific supplier	Lower	Higher	No
Compliance with local air quality standards (if any)	More difficult: Coal based furnaces may require expensive exhaust cleaning systems	Less difficult: Natural gas based furnaces have generally lower air pollutant emission levels ⁴⁾	No
Need of space for local fuel storage	Yes	No ⁵⁾	No

Notes: ¹⁾ This is the case if the (higher) investment for distribution lines necessary to connect to the natural gas grid is borne by a different entity, e.g. the natural gas supplier. In case of LNG initial investment costs may be somewhat higher for LNG terminals, local storage facilities etc. ²⁾ E.g. shorter time lag to start-up operation of power plant if dispatching system in a grid requires more power. ³⁾ Or Vehicle based in case of LNG. ⁴⁾ Please note that this may hold true even though local air quality standards may be stricter for natural gas than for coal-based systems. ⁵⁾ Except for LNG.

Sources: Author's own research

The large-scale methodologies ACM0009 and ACM0011 require an investment analysis for demonstrating additionality, a barrier analysis (Section 3.2) is not deemed sufficient.⁷⁵ This makes sense as the economic viability may be seen as one of the key aspects when deciding on a specific fuel. Requiring investment analysis may reduce the risk of non-additionality, because using this

⁷⁵ Though e.g. ACM0009 allows for the additionality to be proven by claiming „prohibitive barriers“ for the project (natural gas) scenario applying step 3 of the additionality tool.

test may be more difficult in the case of very lucrative fuel switches (e.g. if cheap natural gas becomes newly available in a project site).

In general, fuel prices per energy unit are generally lower for coal than for natural gas. This is offset to a certain degree by higher initial investment and non-fuel operation costs for coal furnaces (Table 4-5). However, while the investment analysis takes these cost factors into account, there could be other factors that may lead to the choice of natural gas as a fuel, even though it may be economically somewhat less attractive than lignite or hard coal.

An issue that contributes to the high uncertainty in investment analysis are the assumptions made about future developments of fuel prices. In the investment analysis, the fossil fuel switch methodologies allow to choose between (i) keeping fuel prices at present levels for future years, or (ii) to use future prices that *“have to be substantiated by a public and official publication from a governmental body or an intergovernmental institution”* (ACM0009 V.5, Section 5.2.4).

For small-scale projects, however, the barrier analysis is deemed sufficient, which may considerably increase the risk of non-additionality (Section 3.3). This risk is only somewhat mitigated by some small-scale methodologies requiring that the CDM project involves at least some capital investments⁷⁶, ruling out projects where fuel switch can be carried out without any investment in additional fuel switching equipment, e.g. in natural gas burners. Still, small-scale fuel switching methodologies have the full set of issues that have been identified for barrier analysis (Section 3.3).

In addition, similar to other energy related project types, with fuel switch projects CER revenues are very small compared to typical fluctuations of price differences between fuels (dark-spark spread), which increases the risk of non-additionality.

4.11.4. Baseline emissions

The exploitation, transport, processing and distribution of fossil fuels results in upstream emissions, many of which may originate in non-Annex I countries. In most CDM project types, the amount of fossil fuel used is *reduced* with the project; therefore, it may be assumed that also upstream emissions are reduced. As a conservative simplification, the relevant methodologies usually do not consider upstream emissions. In the case of fossil fuel switch, however, upstream emissions from fossil fuels could either increase or decrease. In general, upstream emissions from natural gas tend to be higher than upstream emissions from lignite, hard coal or fuel oil (depending on source of fuel).

With fuel switch activities the amount of fuel used in terms of energy content remains more or less constant (or may slightly be reduced because of higher efficiency of natural gas burners). Because of the potentially higher upstream emissions of natural gas, switching from coal/oil to natural gas may result in an increase in upstream emissions, the so-called ‘upstream leakage’ emissions. For this reason, CDM methodologies for fossil fuel switch projects consider upstream emissions.

The procedures for estimating upstream emissions are included in the methodological Tool “Upstream leakage emissions associated with fossil fuel use” (V.1, EB69 Annex12). The tool allows project developers to use default values for upstream emissions or to come forward with their own values derived from relevant data. The default values have been substantially revised with the tool (e.g. from the values included in Table 3 of methodology ACM0009 V.4 (EB68 Annex 12)).

For instance, according to the latest version of the tool, default upstream emissions values from natural gas are 2.9 tCO₂/TJ, based on data from the US. This is comparable to the 2.6 tCO₂/TJ

⁷⁶ For example, as in the applicability requirements of small-scale methodology AMS-III.B (V.18): “The methodology is limited to fuel switching measures which require capital investments. Examples of capital investment include creating infrastructure required to use project fuel or retrofitting existing installations.”

(105 tCH₄/PJ; total) default upstream emissions in Western Europe in ACM0009 V.4 (based on IPCC), but is much lower than in e.g. the former values for Eastern Europe and former Soviet Union (23 tCO₂/TJ) or Rest of the World (7.4 tCO₂/TJ).

Also, the revised aggregated default values for natural gas (Table 1 in the tool) of 2.9 appears much lower than the sum of the default values for the different elements in the upstream chain of natural gas (Table 3 in the tool), including exploration and production (3.4 tCO₂/TJ), processing (4 tCO₂/TJ), storage (1.6) and distribution (2.2). The latter are all based on the US Department of Energy's GREET model, which may not necessarily be representative for upstream emissions of natural gas in developing countries.

With this, the revised values become comparable to those from (underground) coal. It is unclear whether this is a reasonable assumption or an artefact because of the origin of the natural gas upstream emissions data. If the values in the upstream tool are not conservative, i.e. provide too low default values for natural gas upstream emissions, this would lead to an increased risk of over-crediting of fuel switch projects.

An additional issue is the assumptions for the default values on the share of upstream emissions that are covered by caps of Annex-I countries – and how effective these caps are in limiting upstream emissions.

Table 4-6: Default emission factors for upstream emissions for different types of fuels reproduced from upstream tool (Version 01.0.0)

Fossil fuel type x	Default emission factor (tCO ₂ e/TJ)	
Natural Gas (NG)	2.9	
Natural Gas Liquids (NGL)	2.2	
Liquefied Natural Gas (LNG)	16.2	
Compressed Natural Gas (CNG)	10	
Light Fuel Oil (Diesel)	16.7	
Heavy Fuel Oil (Bunker or Marine Type)	9.4	
Gasoline	13.5	
Kerosene (household and aviation)	8.5	
LPG (including butane and propane)	8.7	
Coal/lignite (unknown mine location(s) or coal/lignite not 100% sourced from within host country)	Lignite	2.9
	Surface mine, or any other situation	2.8
	Underground (100% source)	10.4
	Lignite	6
	Surface mine, or any other situation	5.8
	Underground (100% source)	21.4

Notes: The detailed table 3 in tool does not seem to provide data for conventional NG upstream emissions.

Sources: EB69, Annex 12, <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-15-v1.pdf>

Table 4-7: Former default emission factors for upstream emissions for different types of fuels

Activity	Unit	Default emission factor	Reference for the underlying emission factor range in Volume 3 of the 1996 Revised IPCC Guidelines
Coal			
Underground mining	t CH ₄ / kt coal	13.4	Equations 1 and 4, p. 1.105 and 1.110
Surface mining	t CH ₄ / kt coal	0.8	Equations 2 and 4, p.1.108 and 1.110
Oil			
Production	t CH ₄ / PJ	2.5	Tables 1-60 to 1-64, p. 1.129 - 1.131
Transport, refining and storage	t CH ₄ / PJ	1.6	Tables 1-60 to 1-64, p. 1.129 - 1.131
Total	t CH ₄ / PJ	4.1	
Natural gas			
<i>USA and Canada</i>			
Production	t CH ₄ / PJ	72	Table 1-60, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	88	Table 1-60, p. 1.129
Total	t CH ₄ / PJ	160	
<i>Eastern Europe and former USSR</i>			
Production	t CH ₄ / PJ	393	Table 1-61, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	528	Table 1-61, p. 1.129
Total	t CH ₄ / PJ	921	
<i>Western Europe</i>			
Production	t CH ₄ / PJ	21	Table 1-62, p. 1.130
Processing, transport and distribution	t CH ₄ / PJ	85	Table 1-62, p. 1.130
Total	t CH ₄ / PJ	105	
<i>Other oil exporting countries / Rest of world</i>			
Production	t CH ₄ / PJ	68	Table 1-63 and 1-64, p. 1.130 and 1.131
Processing, transport and distribution	t CH ₄ / PJ	228	Table 1-63 and 1-64, p. 1.130 and 1.131
Total	t CH ₄ / PJ	296	
Note: The emission factors in this table have been derived from IPCC default Tier 1 emission factors provided in Volume 3 of the 1996 Revised IPCC Guidelines, by calculating the average of the provided default emission factor range.			

Sources: EB68 Annex 12, ACM0009, V.4, Table 3, http://cdm.unfccc.int/filestorage/r/t/4M2I7TA9GRCU5QDB0JLNHK6PY1ZOWE.pdf/eb68_repan12.pdf?t=Z0p8bzJ3YnExfDBVPWpbmgO_k-sMZsZlso1q

4.11.5. Other issues

None.

4.11.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Small-scale methodologies for fuel switching do not require investment analysis but may build only on barrier analysis, which provides a high risk for non-additionality • Even in large scale methodologies, modelling of fuel choice depends not only on prices, but also on availability/reliability, need for diversification, and operational needs (e.g. NG power plants for covering peak demand); this may imply that the investment analysis may not be sufficient to determining additionality • CER revenues are very small compared to typical fluctuations of the price difference between fuels (dark-spark spread)
Over-crediting	<ul style="list-style-type: none"> • Upstream emissions need to be taken into account, but with the revised default values of the tool they may not be addressed in an adequate way anymore
Other issues	<ul style="list-style-type: none"> • None

4.11.7. Recommendations for reform of CDM rules

In sum, the revision of upstream default values as documented in the tool practically eliminates the consideration of upstream emission in a fuel switch e.g. from (underground) coal to natural gas. The assumptions behind the revisions (mostly data from the US may not be representative for the situation with natural gas used in developing countries and require urgent independent analysis and revision.

4.12. Efficient cook stoves

4.12.1. Overview

Under the CDM, there are two methodologies applicable to efficient cook stoves. AMS-II.G⁷⁷ applies to cases where inefficient existing cook stoves are replaced by improved-efficiency cook stoves to reduce the demand for non-renewable biomass. AMS-I.E⁷⁸ applies to cases where a renewable technology, such as biogas or solar cookers, is introduced to displace existing cook stoves using non-renewable biomass. The number of projects has increased quickly since the introduction of these methodologies in 2008/2009. Most notably the introduction of PoAs, enabling multiple project activities to be registered through a single approval process, has lowered the transaction costs and increased scalability for projects like efficient cook stoves.

4.12.2. Potential CER Volume

As of 1 July 2015, a total of 102 cook stove projects have been registered under the CDM, 37 as individual CDM project activities and 65 as PoAs (along with a total of 180 individual CDM Program Activities (CPAs)).

Table 4-8: Number of efficient cook stove single CDM project activities by country

Country	Number of CDM project activities	Annual CERs (1,000)	Avg. CERs per CDM project activity (1,000)
China	1	12	12
India	29	469	16
Lesotho	1	34	34
Malawi	2	71	35
Mozambique	1	192	192
Nepal	1	20	20
Nigeria	1	31	31
Zambia	1	130	130
Total	37	960	

Sources: UNEP DTU 2015a

Project activity under the CDM peaked in 2012 and dropped sharply in 2013. As of 1 July 2015, single CDM cook stove projects are mostly located in the Asia and Pacific regions (Table 4-8), while component project activities developed under PoAs are predominantly located in Africa, as shown in Table 4-9. The annual volume of CERs estimated by project developers from PoA projects is 9.2 million, nearly 10 times the annual volume of CERs projected from single CDM project

⁷⁷ AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass, <https://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLV07LJN8XD1O2RKHEK>.

⁷⁸ AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user, <https://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S>.

activities of 0.96 million. Many of the registered PoAs have only 1 or a few CPAs associated with them (Table 4-9), so there is potential to scale up CPAs in these cases. In Bangladesh and Madagascar, many individual CPAs have already been developed under the one PoA registered in each of these countries (Table 4-9).

Table 4-9: Number of efficient cook stove PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)
Bangladesh	1	543	11	49
Burkina Faso	2	68	1	68
Burundi	2	452	4	113
China	1	10	1	10
Congo DR	3	124	1	124
Côte d'Ivoire	2	160	2	80
El Salvador	2	90	1	90
Ethiopia	3	201	2	121
Ghana	2	377	4	108
Guatemala	1	43	1	43
Haiti	2	68	1	68
Honduras	1	34	1	34
India	5	543	2	302
Kenya	4	319	2	159
Madagascar	1	4,198	59	71
Malawi	6	299	1	257
Mali	1	33	1	33
Mexico	1	40	1	40
Mozambique	1	28	1	28
Myanmar	1	43	1	43
Nepal	4	204	2	136
Nigeria	2	226	4	56
Rwanda	3	229	2	114
Senegal	3	209	1	209
South Africa	1	32	1	32
Tanzania	1	63	1	63
Togo	3	48		144
Uganda	3	265	2	132
Zambia	3	345	3	129
AMS-I.E	7	4,657	9	509
AMS-II.G	57	4,535	2	2,371
AMS-I.E + AMS II.G	1	100	1	100
Total	65	9,292		

Sources: UNEP DTU 2015a

4.12.3. Additionality

Improved cook stove methodologies under the CDM fall under one of two types: improved energy efficiency (AMS-II.G) or fuel switching to renewable energy (AMS-I.E). Under both methodologies projects must apply the CDM “Guidelines on the demonstrating of additionality of SSC project activities” (Methodological Tool: Demonstration of additionality of small-scale project activities. Version 10.0). Following these CDM guidelines, projects using either of these methodologies are on

the positive list of project types and automatically considered additional so long as each unit is no larger than 5% of the small-scale CDM threshold (750 kW installed capacity or 3000MWh energy savings per year or 3,000 metric tons emission reductions per year), and end users are households/communities.

Lambe et al. (2015) reviewed PDDs for cook stove projects in Kenya and India. Although projects are considered automatically additional and were thus not required to document barriers, the study found that several did include a discussion of barriers in the PDDs. The most-cited barrier was household poverty, which makes improved stoves unaffordable. The study found that several PDDs for projects in Kenya include simple cost analysis to assess the ability of households to purchase an efficient cook stove based on their income and their costs for food and fuel; the calculations suggest that households would need to save 22–30% of their remaining income for a year to purchase a stove. This claim was supported in the pricing models the authors found used by projects in rural areas, which nearly exclusively distributed stoves for a free or subsidized price. In an urban setting, the study found that many projects were selling stoves at the retail price with micro-finance options. The study noted that these PDDs suggest that since urban households are already purchasing charcoal, they have an incentive to buy an improved cook stove to reduce their fuel costs. The study authors also found that many projects also cited the lack of access to credit for working capital, low profit margins, high upfront capital costs, lack of sufficient consumer outreach and support for program operations, reduced consumer demand resulting from failure of past efforts, need for ongoing improvement and modifications of stoves to suit user needs as barriers to project implementation.

Lambe et al. (2015) also investigated what contribution offset revenues make to the overall project revenue. The study reviewed claims made in PDDs regarding the use of offset revenue and found that a majority of projects planned to use offset sale revenues to subsidize the price of improved cook stoves, as well as to cover operational costs, including maintenance and replacement of stoves, training of cook stove users, outreach and marketing to households, microcredit systems and distribution. Interviews of market actors affiliated with these projects by the authors found that while some projects were entirely dependent on offset revenue, others admitted that given the uncertainty in revenue from offsets it was advantageous not to depend on carbon revenues.

These conclusions raise substantial concerns about the additionality of improve cook stove projects under the CDM. Carbon revenues are more likely to be a primary financial enabler of projects in rural areas, where revenues are needed to subsidize the price of stoves. In urban areas, where households have a financial incentive to reduce their fuel purchasing costs, business models without carbon financing may be more viable. While these factors may reduce confidence in the additionality of cook stove projects in urban areas, low income urban households are unlikely to be able to afford more efficient and more costly cook stoves with a payback period of more than a few months.

4.12.4. Baseline emissions

In both types of cook stove projects – improved efficiency and fuel substitution – emission reductions are calculated as the product of the amount of woody biomass saved, the fraction that is considered non-renewable biomass, the net calorific value (NCV) of the biomass, and an emission factor for the fuel used. The net calorific value of the non-renewable biomass ($NCV_{biomass}$) is relatively straightforward – it is empirically measurable and a default value from the Intergovernmental Panel on Climate Change (IPCC) exists. However, Lee et al. (2013) concluded that there is uncertainty in the approaches to estimating the other parameters: biomass fuel consumption (B_y), fraction of non-renewable biomass (f_{NRB}), and emission factors for fuel combustion ($EF_{projected_fossilfuel}$). A study by Johnson et al. (2010) assessed the relative contributions of these three variables to the overall uncertainty in

carbon offset estimation for an improved cook stove project in Mexico and found that fuel consumption (B_y) contributed to 28% of the uncertainty, fraction of non-renewable biomass (f_{NRB}) contributed 47%, and emission factors ($EF_{projected_fossilfuel}$) accounted for 25%.

The CDM methodology AMS-II.G presents project developers with three options for quantifying biomass fuel savings from improved stoves: the Kitchen Performance Test (KPT), the Water Boiling Test (WBT), and the Controlled Cooking Test (CCT). The WBT and CCT are laboratory-based methods, whereas the **Kitchen Performance Test** is done in the field, and can thus better represent stove users' actual cooking behaviour. The primary advantage of the **Water Boiling Test** is its simplicity and reduced costs; the laboratory-based method is standardized and replicable. However, the laboratory results on stove performance do not necessarily translate to cooking actual meals in households, and thus the accuracy of this method is frequently called into question (Abeliotis & Pakula 2013; Johnson et al. 2007). Meanwhile, the **Controlled Cooking Test** protocol provides a compromise, better representing local cooking while being conducted in a controlled environment. Berrueta et al. (2008), which evaluated the performance of a stove designed primarily for tortilla-making by using all three tests and found that the WBT "gave little indication of the overall performance of the stove in rural communities", while the CCT was somewhat more predictive of the fuel savings found by the KPT (44-65% for CCT vs. 67% for KPT). There may be options for reducing costs associated with the KPT, such as having local NGOs perform the tests rather than hiring expensive international consultants, as well as opportunities to improve the WBT. In recent years, more comprehensive and appropriate testing methods and performance standards are under development through both ANSI and ISO standardisation organisations. The CDM methodology provides default efficiency values for two traditional stove types – a three-stone fire, or a conventional system with no improved combustion – as well as a default efficiency value for devices with improved combustion air supply or flue gas ventilation. Experts interviewed by Lee et al. (2013) noted that these limited defaults do not cover the range of cook stoves in most countries. The CDM Small-Scale Working Group (CDM SSC WG) considered this in the past, but made the determination not to proceed with developing regional default efficiency values for traditional cook stoves because of the huge variability in values among the available data (UNFCCC 2012a). Lee et al. (2013) conclude that although the KPT is more logistically complicated, and time- and resource-intensive, testing stoves outside of a controlled laboratory setting and using a variety of typical cooking activities appears to be an important factor in ensuring accurate and credible results in the baseline or default analysis. Overall, evidence suggests the Water Boiling Test is not an appropriate tool for assessing baseline fuel consumption and should be removed from the CDM methodology. The methodology should require the use of either the Kitchen or Controlled Cooking Tests. AMS-I.E follows a similar approach for calculating baseline emissions from fuel substitution of cook stoves.

The factor f_{NRB} represents the fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass and is a key variable in all current cook stove offset methodologies

Based on its definition of renewable biomass (UNFCCC 2006b), the EB has identified several indicators of scarcity to help identify non-renewable biomass. Woody biomass is considered non-renewable if at least two of the following indicators are shown to exist:

- A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuelwood suppliers) or alternatively, a trend showing an increase in the distance the fuelwood is transported to the project area;
- Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

- Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;
- Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass (UNFCCC 2011a).

In 2012, the EB issued national default factors for f_{NRB} based on a highly aggregated approach, balancing the mean annual increment in biomass growth (MAI), the annual change in living forest biomass stocks (ΔF) and biomass growth in protected forest areas (UNFCCC 2012a). Under this approach, f_{NRB} values were calculated for nearly 100 countries, based on the total annual national biomass removals minus the portion of demonstrably renewable biomass from growth in protected reserve areas. The large majority (over four-fifths) of default values exceed 80%, with the remainder ranging from 40% to 77%. While Lee et al. (2013) noted that market actors interviewed characterize development of default f_{NRB} values as a ‘huge triumph’, there was also recognition by market actors and researchers interviewed that national-level forest growth and total forest harvest removal data alone do not necessarily capture the impact of fuelwood harvesting on carbon stocks. First, the approach does not distinguish removals for timber harvesting from those for fuelwood. Furthermore, there is no justification or validation of whether the change in national carbon stocks has any correlation to fuelwood harvesting. Second, according to this method, high values of f_{NRB} are calculated for countries with significant deforestation. However, deforestation could occur in different geographical areas and be driven by entirely other factors than fuel wood collection. In practice, renewable biomass may be extracted both from plantations and natural forests that are not under protection. The MAI approach is better suited to assess the fraction of harvested wood products that are renewable, rather than fuelwood. Using the change in carbon stocks due to harvested wood products has the potential to significantly overestimate the fraction of non-renewable biomass. Estimates published by de Miranda Carneiro et al. (2013), based on the use of a spatially-explicit land use model to examine the availability of fuelwood, suggest default values for f_{NRB} of wood-fuel on the order of 20-30%, much lower than the prior estimates. Bailis et al. (2015) estimate that 27–34% of woodfuel harvested was unsustainable, with large geographic variations, and conclude that cookstove methodologies probably overstate the climate benefits.

Under the CDM methodology AMS-II.G and AMS-I.E, the quantification of project emission reductions relies on the factor $EF_{projected_fossilfuel}$, representing the fossil fuel emission factor of “substitution fuels likely to be used by similar users”. Since emission reductions from the LULUCF sector can only be claimed from afforestation and reforestation under the CDM, the use of fossil fuel emission factors for baseline fuels represents something of a workaround. While the short-term emission reductions actually occur from avoiding the depletion of carbon stocks, such as avoiding deforestation, emission reductions are calculated using fossil fuel emission factors. One possible argument for this approach is that kerosene or LPG cook stoves might be used by the households if they had a higher income. In this regard, the consideration of emissions from fossil fuel based cooking devices might be regarded as a suppressed demand baseline. However, the approach combines the efficiency of fuel-wood cook stoves with the CO₂ emission factor of fossil fuels. This approach has been roundly criticized. Johnson et al. (2010) say it has “no scientific basis, given that wood emits approximately double the CO₂ per unit fuel energy compared to LPG or kerosene thus halving possible offsets from non-renewable harvesting of fuel”. One could also argue that it leads to overestimating baseline emissions if one would assume the long-term suppressed demand baseline of using kerosene or LPG cook stoves. By combining the efficiency from inefficient fuel-wood cook stoves with the CO₂ emission factors from fossil fuels, the claimed baseline emissions are higher than if the households would use kerosene or LPG cook stoves. The CDM methodology AMS-II.G. suggests the use of a weighted average value of 81.6 tCO₂/TJ², representing a mix of 50% coal, 25% kerosene, and 25% LPG. However, no justification for this fuel mix provided. Coal is not commonly used as a cooking fuel for households transitioning from traditional to modern biomass.

LPG is the dominant fossil fuel used in households transitioning to modern energy for household cooking. Assuming that households would use coal vs. LPG overestimates the emissions factor. For example, if we compare the emissions factor if the fuel mix was LPG vs. the current emission factor we find that the emissions are overestimated by 23%. For charcoal production, the simplification is stretched even further beyond reality. The methodologies permit calculating wood use by charcoal stoves by multiplying the charcoal volume by six, following the 1996 IPCC accounting guidelines to estimate total biomass consumed (IPCC/OECD/IEA 1996, p. 1.42). Then baseline emissions are estimated by applying the projected fossil fuel use emissions factor, which in effect assumes that the project displaces fossil fuel use for charcoal production, which likely significantly overestimates the baseline emissions (Lee et al. 2013).

4.12.5. Other issues

Improved cook stove projects are dependent on end users to achieve emission reductions: households must actually use the improved cook stoves instead of their traditional stoves. Carbon finance monitoring requirements include checking the efficiency of the stove and confirming at least every two years that the stove is still in use. Additional stove monitoring of the efficiency and usage rate is required annually or biannually. Monitoring requirements furthermore include sampling and surveying as specified in the applicable offset protocol. This has been a significant challenge. Carbon finance project monitoring requirements further specify that projects must either ensure that the improved stoves completely replace traditional stoves, or else the traditional stoves must be monitored and accounted for under the project calculations for emission reductions. Lambe et al. (2014) found in their review of projects in Kenya and India that this presented several challenges. In Kenya, where the predominant mode of traditional cooking is with a three-stone fire, the study found that many PDDs acknowledged that this form of traditional stove cannot really be removed or destroyed. In India, traditional stoves in several regions are known as chulhas. These stoves often have a religious significance and households often build the stoves themselves from locally available materials such as mud, brick, or cement (Lambe & Atteridge 2012). This form and construction makes it difficult to guarantee that a new chulha will not be made following the destruction of the old one. Lambe et al. (2014) found that many projects required households to destroy these existing cook stoves. In some cases, photographic evidence is used to demonstrate that the existing stoves have been destroyed. However, because of the challenges with removing traditional stoves and the barriers to ensuring adoption and sustained use of improved cook stoves, more often a stacking of stoves and fuels occurs where traditional and improved cook stoves are both used for different types of cooking (Ruiz-Mercado et al. 2011). While the methodologies contain monitoring guidance for adjusting the baseline fuel consumption if the traditional stove continues to be used, this adds further uncertainty to quantification of changes in fuel consumption. Use of temperature sensors to monitor usage of traditional and improved cook stoves have shown promising signs of helping to address this issue, but are not yet in widespread use in carbon market projects (Ruiz-Mercado et al. 2011).

There is a broader concern about crediting emission reductions from displacement of non-renewable biomass since the increased carbon storage from changes in carbon stocks may only lead to temporary reductions. The risk of non-permanence of emission reductions is addressed through appropriate accounting approaches for afforestation, reforestation, and carbon capture and storage project activities, but it is not addressed for improved cook stove project types. Under the CDM, there are projects promoting the use of biomass energy to displace fossil fuel, as well as improved cook stove projects aimed at decreasing biomass energy use. In theory, this does not present a conflict, assuming that biomass power projects are based in regions with increasing or stable carbon stocks and improved cook stove projects are located in regions with declining carbon stocks. However, looking at registered CDM projects there are several examples of provinces in which there are both biomass power and cook stove projects. This means that in the same prov-

ince, there are simultaneously CDM projects getting credit for increasing the use of biomass, as well as reducing the use of biomass. For example, in the Henei province in China there are 9 biomass energy projects fuelled by agricultural residues (rice husk and other kinds) as well as 4 improved cook stove projects.

4.12.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs, confidence in additionality may be low in urban settings where households are paying for improved stoves at the retail price
Over-crediting	<ul style="list-style-type: none"> • Uncertainty in some widely used approaches for estimating biomass savings • Significant uncertainty around the fraction of non-renewable biomass values, recent research suggests this parameter may be significantly overestimated. • Emissions intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline. • Emissions factor for suppressed demand use of fossil fuel overestimate emissions; LPG is the appropriate substitute used by similar consumers, including coal and kerosene overestimate emission reductions.
Other issues	<ul style="list-style-type: none"> • Challenges in ensuring adoption and sustained use of improved cook stoves result can lead to over-crediting if traditional stoves continue to be used. • The use of biomass as a renewable energy sources is inconsistently accounted for under the CDM; the same region can have biomass power projects receiving credit for increasing biomass use and improved cook stove projects receiving credit for decreasing biomass use.

4.12.7. Recommendations for reform of CDM rules

We recommend revising the current methodologies as follows:

- Eliminate the use of the Water Boiling Test as a means of determining baseline emissions.
- Reconsider the use of default f_{NRB} factors based on the MAI approach.
- Revise the emission factor for the substitution of non-renewable biomass by similar consumers to one based solely on LPG.
- Explore options for incorporating temperature sensors in monitoring plans to improve reliable assessment of the adoption and sustained use of improved vs. traditional cook stoves in households.
- Review the use of biomass as an energy source under the CDM to ensure consistent accounting across project types and regions. The f_{NRB} should be considered in improved cook stove projects, as well as modern biomass energy projects to confirm that projects are not contributing to loss of carbon stocks. The CDM EB needs to provide justification for how both biomass energy and improved cook stove projects can be approved within a sub-region.

4.13. Efficient lighting

4.13.1. Overview

For energy efficient lighting, we focus our analysis on the replacement of incandescent electrical bulbs with more efficient electric lighting, such as Compact Fluorescent Lamps (CFLs) or Light Emitting Diode (LED) lamps. This includes all projects registered under AM0046⁷⁹ and AMS II.J⁸⁰

⁷⁹ [Distribution of efficient light bulbs to households --- Version 2.0.](#)

⁸⁰ [Demand-side activities for efficient lighting technologies --- Version 6.0.](#)

methodologies as well as projects registered under AMS II.C⁸¹ that are labelled as 'lighting' and 'lighting in service' in UNEP DTU (2014).⁸² This technology category was a late starter in the CDM – in mid-2010 there were only half a dozen registered projects and 3 registered PoAs. Recent growth in PoAs, particularly with larger PoAs, indicates a higher potential in the future – even beyond the current project activity and PoA pipeline. Energy efficient lighting projects are typically implemented by an entity (often public sector or linked to a utility) that distributes energy efficient lamps for free or for a nominal fee, and collects and disposes of the incandescent bulbs that have been displaced.

4.13.2. Potential CER volume

For CDM project activities, the 40 projects registered by the end of 2013 state that they will produce 1.4 million CERs per year. This would be 10.3 million CERs in the period of 2013 to 2020. However, the issuance success for the largest project activity, which is the only project using the large-scale methodology, amounted to only 12% in the first monitoring period. This could be related to the time required for the CFL distribution programme to reach full scale, however, and does not necessarily mean that other projects will have similar issuance rates (or that this rate will not increase over time). Other projects have been much more successful, but are considerably smaller. Project activities are dominated by a stream of small-scale projects in India and a single large-scale project in Ecuador – the only registered large-scale energy efficient lighting project – which account for almost 80% of the expected CERs. More than 80% of the small-scale projects use AMS II.J, which was designed specifically as a simplified approach to energy efficient lighting.

The largest volume of CERs for energy efficient lighting, however, could come from PoAs. Twenty-six PoAs had been registered for energy efficiency lighting by the end of 2013. Just from the CPAs already included in these registered PoAs as of the end of 2013, the volume of CERs is estimated by the project developers at 3.4 million per year, or two and a half times greater than for project activities. This could continue to grow, given that only four PoAs have more than one CPA. For PoAs, the main players are China, India, Mexico and Pakistan, with South Africa also hosting multiple PoAs (Table 4-10). The four PoAs with more than one CPA have large numbers of CPAs (e.g. 9 to 53). For some PoAs, the CPAs are delineated to have very similar emission reductions in each CPA (e.g. in Mexico, India, Bangladesh).

⁸¹ [Demand-side energy efficiency activities for specific technologies --- Version 14.0.](#)

⁸² This excludes one registered PoA under AMS II.C that focuses on street lighting and is labelled as sub-type "Street lighting".

Table 4-10: Number of energy efficient lighting PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)	PoAs with >1 CPA
Bangladesh	1	124	9	14	1
China	14	443	1	32	
India	3	1,555	17	30	1
Kenya	1	31	1	31	
Mexico	1	607	25	24	1
Nigeria	1	29	1	29	
Pakistan	1	557	53	11	1
Senegal	1	4	1	4	
South Africa	3	80	1	27	
AMS-II.C.	6	668	5	22	
AMS-II.J.	20	2,762	6	21	
Total	26	3,431			4

Sources: UNEP DTU 2015b

All of the PoAs for lighting efficiency upgrades have moved to the newer methodology AMS II.J rather than AMS II.C (Table 4-10). No new energy efficient lighting PoAs have entered the pipeline since October 2012, and the new project activity pipeline largely stopped in January 2012, with only one new project activity starting validation in 2013 (in The Gambia).

4.13.3. Additionality

Because only one project activity uses the large-scale methodology, this entire technology area essentially uses SSC methodologies and additionality rules. For SSC projects and PoAs, additionality can be determined through several different routes: All SSC projects (or SSC CPAs within PoAs) must refer to the tool for “Demonstration of additionality of small-scale project activities” (Tool21, ver10.0). This includes the choice of using several different barriers to justify additionality (i.e. investment barrier, technology barrier, prevailing practice barrier, or other barriers). In addition, from July 2012, projects comprised entirely of units below 5% of the small-scale CDM threshold (i.e. 3000 MWh savings for energy efficiency) were considered automatically additional without any further justification. This new ‘positive list’ additionality argument has not been used by CDM project activities but has been used extensively by PoAs, as discussed further below. Most CDM project activities applying the SSC additionality tool cite investment barriers and use simple cost analysis to prove additionality (Table 4-11). This is because the organisations distributing the efficient lamps do not receive the energy savings, so they incur only costs without any revenue (other than a nominal fee from consumers in some cases).⁸³

As mentioned above, since July 2012, the tool for additionality of SSC activities has allowed automatic additionality based on a ‘unit threshold’ described as “project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-

⁸³ The organisations that charge a nominal fee would be receiving less than the wholesale cost of the CFL, so would lose money on each bulb even though there is nominal revenue. In theory, any programme implemented by an electric utility should not be able to use simple cost analysis because the utility has avoided power generation costs (and deferred capital costs) that are a benefit stream to the project. Even where the project is implemented by a utility (e.g. South Africa’s Eskom), this is not addressed because the unit threshold positive list is used to justify additionality.

scale CDM thresholds.” For energy efficiency, this threshold of 3000 MWh is roughly 46,000 CFLs. All projects and PoAs applying SSC methodologies may use this rule to qualify for automatic additionality.

Table 4-11: Additionality approaches used by efficient lighting CDM project activities

Additionality approach	Number of PAs	Total Annual CERs (1,000)
Investment barrier: Benchmark Analysis	2	71
Investment barrier: Investment Comparison Analysis	2	60
Investment barrier: Simple Cost Analysis	33	1.079
Investment barrier: Other	1	18
Positive list	2	44
Total	40	1.272

Sources: Authors' own compilation

Lighting PoAs have also made extensive use of this unit threshold for automatic additionality. A report by the UNFCCC Secretariat in mid-2014 (CDM-EB85-AA-A09) found that 28 of the registered lighting-related PoAs at that time had used either micro-scale or unit thresholds to qualify for automatically additionality. As an example, all 12 of the Chinese PoAs registered in December 2012 used the unit threshold for automatic additionality.

As one of the first ‘top-down’ large-scale methodologies, the EB published an energy efficiency lighting methodology in November 2013, which included a new approach for additionality demonstration:

- In countries with limited or no regulations supporting energy efficient lighting, as evidenced by a UNEP Global Lighting Map⁸⁴ survey of regulations and support for energy efficient lighting, CFLs are automatically additional.⁸⁵
- For other countries (i.e. those with more regulatory support), the “Tool for the demonstration and assessment of additionality” must be used, with an investment analysis and common practice analysis. While the investment analysis may still use simple cost analysis (which would mean that almost all projects would be additional), any country with a higher than 20% penetration of CFLs is not additional under the common practice test.

This new approach essentially restricted CFL CDM projects to countries with limited regulatory support or low market penetration. Given that there are no new projects or PoAs entering the pipeline, however, this more recent methodology has not yet had an impact.

In November 2014, AMS II.J was also revised to only allow for automatic additionality for CFLs when there were limited or no regulations to support energy efficient lighting. However, for countries in which there is significant support for energy efficient lighting, the methodology says that additionality should be demonstrated using the latest version of the “Guidelines on the demonstration of additionality of small-scale project activities”. This difference is critical, however, because any project participant may simply use the unit threshold in the “Guidelines on the demonstration of

⁸⁴ <http://map.enlighten-initiative.org/>.

⁸⁵ Countries coloured red on the map have limited or no support for energy efficient lighting.

additionality of small-scale project activities” to guarantee automatic additionality, whatever the market penetration in the host country.

The main concern with the additionality of energy efficient lighting in the CDM is whether some activities – at least projects involving CFLs and fluorescent tubes – were already common practice at the time of registration and therefore not additional. The use of micro-scale or unit threshold positive lists means that project activities and PoAs do not have to address this common practice issue at all when using the SSC methodologies. In other words, using the SSC methodologies would be a way of circumventing the higher stringency of the new large-scale methodology. Projects could simply define the size of each CPA in a way that they qualify as automatically additional, whatever the regulations and market penetration in the host country. To evaluate the additionality of the existing pipeline, it is useful to consider the two criteria from AM0113 and the revised AMS II.J: regulatory support and market penetration.

According to the ‘en.lighten’ initiative’s Global Lighting Map referenced in the methodologies, regulatory support for efficient lighting is widespread, but varies greatly by country (Figure 4-9). For the countries with the most CDM PoA activity, the level of support is generally strong:

- China has already banned incandescent lighting⁸⁶ and implemented large state subsidy programmes since 2006.⁸⁷
- India does not have a ban on incandescent bulbs, but does have awareness-raising programmes, energy service company initiatives, and consumer financing options.
- Pakistan’s minimum energy performance standards also still allow incandescent bulbs, but the country has awareness-raising programmes, bulk procurement and tax incentives.
- South Africa has announced that incandescent bulbs will be phased out by 2016⁸⁸, and has testing and certification facilities. More importantly, the national utility, Eskom, distributed 30 million free CFLs between 2002 and 2010.⁸⁹
- A regional report for Latin America on the en.lighten initiative’s website notes that a Mexican regulation was passed in December 2010 prohibiting the sale of 100 watt and higher incandescent lamps for the residential sector after December 2011, and similar bans for 75 watt as of December 2012 and 40-60 watt as of December 2013.⁹⁰ The Mexican PoA was registered in July 2009, which preceded the passing of these regulations.
- In terms of their rating on minimum energy performance standards by the Global Lighting map, all of the countries with PoAs except Kenya and Malawi are orange (some/in progress) or green (advanced). This means that, in terms of the new large-scale methodology (AM0113), projects in all of the countries except Kenya and Malawi would not be automatically additional, but require the use of the additionality tool with investment analysis and the common practice threshold of 20%.

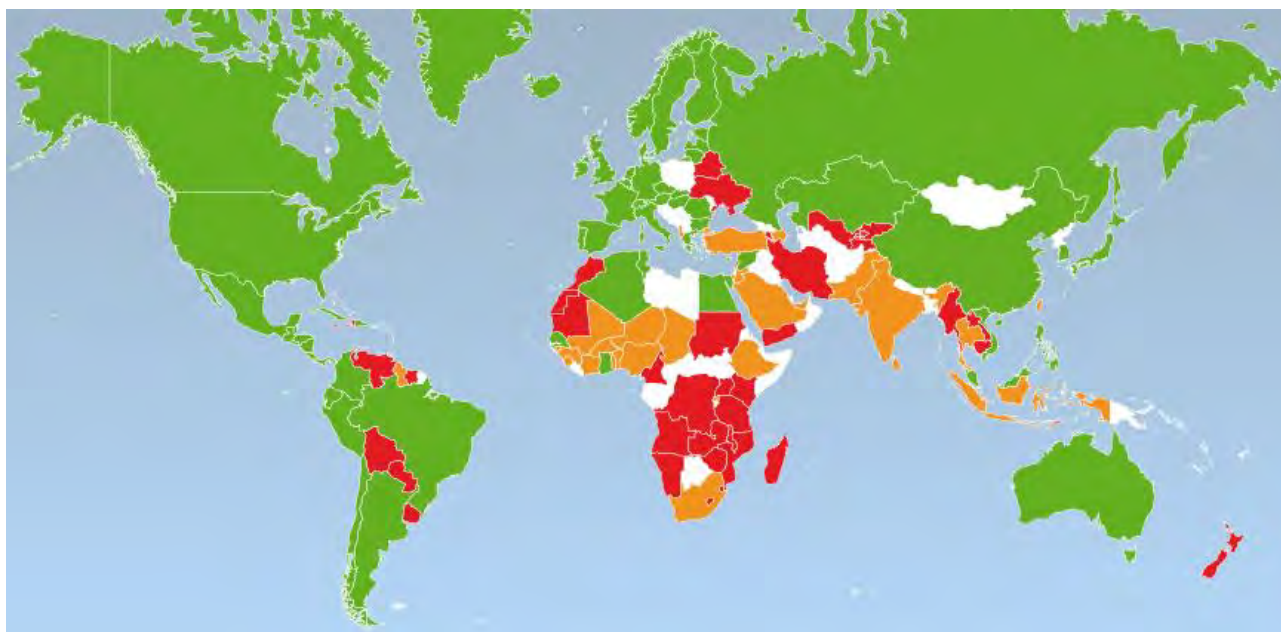
⁸⁶ Imports and sales of 100-watt-and-higher incandescent lamps are banned from 1 October 2012, 60-watt-and-above from 1 October 2014, and 15 watts or higher from 1 October 2016 http://www.chinadaily.com.cn/china/2011-11/04/content_14039321.htm.

⁸⁷ http://www.sdpc.gov.cn/zjgx/t20080508_210093.htm.

⁸⁸ <http://www.thegef.org/gef/content/phasing-out-inefficient-lighting-combat-climate-change-south-africa-announces-national-phase>.

⁸⁹ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

⁹⁰ <http://www.enlighten-initiative.org/portals/0/documents/country-support/regional-workshops/Regional%20Report%20LA%20&%20C%20Final%20Eng..pdf>. The reference is to regulation “NOM- 028 – ENER – 2010 Energy Efficiency of Lamps for General Use”.

Figure 4-9: Minimum energy performance standards for lighting technologies

Notes: Green = Advanced/in place, Orange=In progress, Red=few/limited, white=no information available

Sources: <http://map.enlighten-initiative.org/>

In terms of assessing common practice, the available evidence suggested that CFLs are likely already common practice in most key CDM countries, and LEDs may be so in the next few years, though not in the poorest countries. The main CDM countries have the following market information:

- According to the “Regional Report on the Transition to Efficient Lighting in South Asia”⁹¹ prepared by the Tata Energy Research Institute in 2014, the market share of CFLs in India amounted to 29% in 2012-2013. Three of the four Indian PoAs were registered in late 2012, while one was registered in early 2010. In addition, for the largest PoA – which was registered in 2010 and has 50 CPAs – the PoA DD states that, “[t]he penetration share of incandescent lamps for lighting in commercial and residential sector put together is thus nearly 80% in India.”⁹² The market share for CFLs, therefore, was almost certainly above 20% when the PoAs were registered.
- In China, a 2012 McKinsey & Company report estimates the penetration of LEDs (the more expensive alternative to CFLs) as 12% in 2011, rising to 46% by 2016. The report also notes that, “CFL is still the dominant technology in the residential segment.”⁹³ This means that, at the time of registration of the PoAs, the market share of CFLs was almost certainly above 20%. China does not have any LED PoAs yet. If they were proposed, AMS II.J and AM0113 both consider LED lamps automatically additional in all countries until at least the end of 2016. Given the McKinsey projections presented above, automatic additionality for LEDs in China would not be appropriate.

⁹¹ <http://www.enlighten-initiative.org/Portals/0/documents/country-support/Regional%20Report%20on%20the%20Transition%20to%20Efficient%20Lighting%20in%20South%20Asia.pdf>.

⁹² <http://cdm.unfccc.int/ProgrammeOfActivities/gotoPoA?id=CZ59J1XMR8K4ELUS6WY3BA01VTGQ2F>.

⁹³ http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/lighting_the_way_perspectives_on_global_lighting_market_2012.ashx.

- The large PoA in Mexico states in the PoA DD that CFL penetration in 2007 was already at 20%, while the PoA was registered in June 2009.⁹⁴
- In South Africa, even before the start of the Eskom free CFL distribution programme, the market share of CFLs was estimated at 7% in 2002 (Nkomo 2005). With 30 million CFLs distributed after this time,⁹⁵ in a country with less than 10 million households, the penetration of efficient lighting was almost certainly well above 20% when Eskom registered their CDM project activity and PoAs in 2012.
- For Pakistan, the “Regional Report on the Transition to Efficient Lighting in South Asia” cited above estimates the CFL market share at 8%, but also notes that linear fluorescent lamps make up 32% of the market.
- For Bangladesh, the same report puts the CFL market share at 25%, with linear tube fluorescent lamps at 18%. This market share could be for 2013 and the PoA was registered in May 2011, so there is a reasonable likelihood that the market share of CFLs was 20% at the time of registration.

This information suggests that the largest CDM PoA countries for energy efficient lighting would not pass the common practice test if the large-scale AM0013 methodology were applied, and so these PoAs would not qualify as additional. Bangladesh, China, India, South Africa and Mexico account for almost 80% of the expected CERs from PoAs, and yet these countries were likely above the 20% market share for CFLs when the PoAs were registered.

For off-grid lighting (AMS III.AR), the situation is quite different. Access to electricity in rural households in Sub-Saharan Africa, for example, is less than 10% (IEA et al. 2010; Legros et al. 2009). Between 2010 and 2015, the estimated number of unelectrified households in Africa was estimated to grow from 110 million to 120 million (Dalberg Global Development Adv. 2010). The off-grid solar lamp market is expanding to address the 1.5 billion people who do not (and, in many cases, will not) have access to electricity (IFC 2012). While solar lantern and solar kit prices are decreasing, they still face major barriers in terms of distribution challenge, upfront costs (and lack of consumer financing), and successful business models for scaling up (ESMAP 2013; IFC 2012).

Assessing the economics of energy efficient lighting faces the classic problem of ‘split incentives’ (Spalding-Fecher et al. 2004). From an economic point of view, upgrades to energy efficient electric lighting are unquestionably economically beneficial (i.e. have large positive IRRs) (McKinsey & Company 2009) but the benefits do not accrue to those who pay for the additional costs if the project is funded by outside agencies. The economics of efficient lighting are more likely to be driven by electricity prices than carbon prices. For example, a 15 W CFL replacing a 60W incandescent lamp operated 3.5 hours per day could save 57 kWh per year. With a relatively carbon-intensive grid (e.g. 0.8 tCO₂/MWh), this would be 0.05 tCO₂e savings per year. Electricity prices to the consumer in developing countries vary widely, from \$50/MWh in heavily subsidized economies to more than \$170/MWh in more competitive emerging economies (EIA 2010; Winkler et al. 2011). This means an energy savings of \$2.87 to \$9.77/year. CFL costs have also declined rapidly, with current costs of \$1.50-\$2.50 in many countries (UNEP 2012). This would mean a typical payback period of much less than one year, before any carbon revenue was received. At current CER prices, carbon revenue would be less than two cents per year only, while at \$3-5/CER, revenue would be \$0.15-0.25, or less than 5% of energy savings.

⁹⁴ http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/17BH6AJX524TYQUZF8KGCWV3OIPSE9/view Annex 3.

⁹⁵ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

In summary, CDM rules on additionality of efficient lighting projects vary considerably. Using market penetration and regulatory support as indicators for the likelihood seems a reasonable approach. The large-scale AM0113 methodology uses market penetration and regulatory support as indicators for demonstrating additionality; this approach seems reasonable and reflects the varying circumstances of host countries. AM0046 may provide for a suitable alternative by monitoring the market penetration of CFLs and LEDs in a control group outside the project boundary; however, the complexity and cost of monitoring under this methodology means that only one project has even chosen to utilise it – so the additionality approaches may not be relevant for the overall impact of this project category. In contrast, under small-scale methodologies, including the revised AMS II.J, this project type is, in practice, considered automatically additional, even if the use of CFLs is required by regulations and is widespread. However, for countries with regulations that have phased out incandescent bulbs or large subsidy programmes for CFLs, these existing registered projects are unlikely to be additional. If we take the 20% market share used in AM0113 as the point at which CFL programmes are no longer likely to be additional, then this would apply to most of the current CDM pipeline for energy efficient lighting.

4.13.4. Baseline emissions

In AMS II.J, AM0113 and AMS II.C (when used for lighting) the baseline is simply the use of the existing incandescent lamps – those which are collected and replaced within the project boundary.⁹⁶ Both AMS II.J and AM0113 take similar approaches, where emissions reductions are related to the difference in power between a CFL and baseline bulb, operating hours, lamp failure rates, a ‘net-to-gross’ adjustment, and the grid emissions factor (taking technical losses into account).⁹⁷ As a default, 3.5 operating hours per day are assumed. If project participants want to use operating hours greater than 3.5 per day, they must conduct a once-off survey at the start of the project to justify this. The lamp failure rates are also based on periodic surveys of the first group of bulbs installed, up to the end of their rated life. The methodologies require project participants to explain how they will collect and destroy baseline lamps. For off-grid lighting, an innovative ‘deemed consumption’ approach assigns a standard emissions reduction to each off-grid lighting unit, based on the fossil fuel alternative. The parameters and assumptions are conservative. Overall, the approaches to baseline emissions for efficient lighting are straightforward and conservative, and the improvements over the last two years have also simplified or clarified many of the sampling procedures.

4.13.5. Other issues

At 3-5 hours of use per day, a typical CFL would last anywhere from 3 to 10 years. This means that a crediting period of 10 years is almost certainly too long, unless the CDM project guarantees free replacements throughout the programme or restricts crediting to the measured life. The latter approach has been adopted under the CDM. Emission reductions do not accrue once the lamp failure rate reaches 100%, so if all lamps fail before the end of the crediting period and are not replaced, then no CERs would be issued. These provisions seem appropriate.

⁹⁶ AM46 also includes the possibility of some efficient lighting in the baseline, as a form of “autonomous efficiency improvement”, but this methodology has only been used once and is unlikely to be used in the future.

⁹⁷ AMS II.C is not so specific, because the guidance was for all energy efficiency technologies, but the approach elaborated by the project participant would essentially be the same.

4.13.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Granting automatic additionality under small-scale methodologies to all energy efficient lighting programmes in the past was highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway; the new large-scale AM0113 methodology appropriately addresses these problems but is not mandatory, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes, so it is unlikely that the large-scale methodology will be used. In many countries with lower income or less regulatory support, however, efficient lighting still faces major barriers, even if it is potentially economic beneficial, and so projects may need the support of the CDM to be implemented; these projects currently form a very small part of the project pipeline but could grow in the future.
Over-crediting	<ul style="list-style-type: none"> Over-crediting is unlikely, given the robust monitoring procedures.
Other issues	<ul style="list-style-type: none"> None

4.13.7. Recommendations for reform of CDM rules

AMS II.J should be revised so that CFL programmes in countries with significant regulatory support may use the tool for “Demonstration of additionality of small-scale project activities” but may not use the paragraph referring to automatic additionality based on small unit size.

5. How additional is the CDM?

Based on the detailed analysis of individual project types in the previous chapter, this chapter provides an overall assessment of the environmental integrity of the CDM project portfolio available for the second commitment period of the Kyoto Protocol. Table 5-1 provides an overview of the summary of findings for each of the analyzed project types.

Table 5-1: Evaluation of project types

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
HFC-23 (up to version 5)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives 	<ul style="list-style-type: none"> None 	Medium
HFC-23 (version 6)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed Ambitious baseline could lead to under-crediting (net mitigation benefit) 	<ul style="list-style-type: none"> Low CER prices could jeopardize continued operation Emissions could be addressed through Montreal Protocol 	High
Adipic acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices 	<ul style="list-style-type: none"> None 	Medium
Nitric acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of overall over-crediting 	<ul style="list-style-type: none"> None 	High
Wind power	<ul style="list-style-type: none"> CER revenue has only limited impact on profitability Investment costs decreased significantly in last years In some cases competitive with fossil generation Support schemes Widespread in many countries 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting 	<ul style="list-style-type: none"> None 	Low
Hydro power	<ul style="list-style-type: none"> Common practice in many countries CERs have only moderate impact on profitability Competitive with fossil generation in many cases 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project likely under-crediting 	<ul style="list-style-type: none"> Methane emissions from reservoirs may be important and may not be fully reflected by CDM methodologies 	Low
Biomass power	<ul style="list-style-type: none"> Significant impact of CER revenues on profitability for projects claiming methane avoidance Competitive with fossil generation in many cases Support schemes 	<ul style="list-style-type: none"> Demonstration of biomass decay/abundance of biomass is key Risk of exaggerated claims of anaerobic decay 	<ul style="list-style-type: none"> None 	Medium

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Landfill gas	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured historically have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid subtropical and tropical regions Perverse incentives for project developers to increase methane generation 	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG intensive waste treatment methods 	Medium
Coal mine methane	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Potential concerns regarding increased mining 	<ul style="list-style-type: none"> Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations 	Medium
Waste heat recovery	<ul style="list-style-type: none"> CER revenues small compared to fossil fuel cost savings Future fuel cost savings uncertain Widespread in many countries 	<ul style="list-style-type: none"> Brownfield: risks for inflated baselines Greenfield: modelling uncertain Plant operation under the project different to baseline 	<ul style="list-style-type: none"> None 	Low
Fossil fuel switch	<ul style="list-style-type: none"> Use of barrier analysis allowed for small-scale projects not appropriate Investment analysis insufficient as choice of fuel depends not only on prices CER revenues have a small impact 	<ul style="list-style-type: none"> Default values for upstream emissions not appropriate 	<ul style="list-style-type: none"> None 	Low

Efficient cook stoves	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs • Additionality questionable in urban areas 	<ul style="list-style-type: none"> • Fraction of NRB likely to be overestimated • Water boiling test not appropriate • Emission intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline • Emissions factors used for suppressed demand are unrealistic • Unrealistic assumptions for charcoal use • Over-crediting if traditional stoves continue to be used 	<ul style="list-style-type: none"> • Inconsistent accounting: CDM credits in the same region both reduction and increase of biomass use 	Low
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Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Efficient lighting (AMS II.C AMS II.J)	<ul style="list-style-type: none"> • Shift to EE lighting well underway and/or mandates in most common PoA countries, and PoAs allowed to use SSC additionality 'loophole' 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	Low
Efficient lighting (AM0113, AM0046)	<ul style="list-style-type: none"> • Likely to be additional 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	High

Notes:

1) High/medium/low likelihood of projects being additional under current rules;

2) High/medium/low likelihood of avoiding over-crediting under current rules;

3) High/medium/low likelihood of emission reductions being additional and not over-credited under current rules.

Sources: Authors' own compilation

Overall, the table shows considerable differences between project types. Most energy-related project types (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are unlikely to be additional, irrespectively of whether they involve the increase of renewable energy, efficiency improvements or fossil fuel switch. An important reason that these projects types are unlikely to be additional is that for them the revenue from the CDM is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. In addition, technological progress was much faster than expected, so that investment and generation costs have fallen considerably. Moreover, some project types are, in many instances, economically attractive (e.g. waste heat recovery, fossil fuel switch, hydropower), or supported through policies (e.g. wind power, efficient lighting), or mandatory due to regulations (e.g. efficient lighting). Some of these project types also have a medium likelihood of overestimating emission reductions, mainly due to risks of inflated baselines.

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered likely to be additional as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and thus do not generate revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-

23, perverse incentives were addressed with the adoption of version 6 of AM0001, which uses an ambitious baseline that could lead to a net mitigation benefit. Similarly, concerns with perverse incentives for nitric acid plant operators not to use less GHG-intensive technologies were addressed. With regard to adipic acid projects, the risks of carbon leakage were not addressed.

Methane projects (landfill gas, coal mine methane) also have a high likelihood of being additional. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face issues with regard to baseline emissions and perverse incentives and may thus lead to over-crediting.

Biomass power projects have a medium likelihood of being additional since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects can be additional, particularly if CER revenues for methane avoidance can be claimed. Biomass projects also face other issues, in particular with regard to demonstrating that the biomass used is renewable.

The additionality efficient lighting project using small-scale methodologies is highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The new methodologies address these problems but they are not mandatory and the small-scale methodologies are while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For cook stove projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. In urban areas, however, the additionality of these project types is questionable. Cook stove projects are also likely considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Based on these considerations we can estimate to which extent the CDM is likely to deliver additional emission reductions during the period of 2013 to 2020 (Table 5-2).

Table 5-2: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Our analysis covers three quarters (76%) of the CDM projects and 85% of the potential CER supply during that period. 85% of the covered projects and 73% of the potential CER supply have a low likelihood of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity.

Has the performance of the CDM in terms of additionality improved over time? Several EB decisions have certainly improved the performance, particularly those which introduced ambitious baselines and/or addressed perverse incentives. However, Schneider (2007) estimated, "that additionality is unlikely or questionable for roughly 40% of the registered projects. These projects are expected to generate about 20% of the CERs". Schneider's methodological approach is not identical with the approach applied in this study but is, nevertheless, similar enough for a comparison of the overall results. Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's performance as a whole has anything but improved, despite improvements of a number of CDM standards. There are several reasons for this:

- The main reason is a shift in the project portfolio towards projects with more questionable additionality. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential from these project types is only less than a quarter. This is mainly due the registration of many energy projects between 2011 and 2013, including both fossil and renewable projects, which represent the largest share of CDM projects and of potential CER supply today, many of which are unlikely to be additional. It can therefore be questioned whether the CDM is the appropriate incentive scheme for those project types, or more generally, whether these project types are appropriate for crediting schemes at all.

- A second reason is that the CDM EB not only improved rules but also made simplifications that undermined the integrity. For example, positive lists were introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). Another example is biomass residue projects, for which requirements to demonstrate that the biomass is available in abundance were strongly simplified, making an over-estimation of emission reductions more likely.
- A third reason is that the CDM EB did not take effective steps to exclude project types with a low likelihood of additionality. While positive lists were introduced, project types with more questionable additionality were not excluded from the CDM. The common practice test is not effective as it stands. Standardized baselines can be optionally used as an alternative to project-specific baselines, which provides a further avenue for demonstrating additionality but does not reduce the number of projects wrongly claiming additionality. In conclusion, the improvements to the CDM mainly aimed at simplifying requirements and reducing the number of false negatives (projects that are additional but do not qualify under the CDM) but did not address the false positives (projects that are not additional but qualify under the CDM).

Our analysis of the environmental integrity of the CDM has focused on the quality of CERs in terms of ensuring emission reductions that are additional and not over-credited. The overall environmental outcome of the CDM is, however, also influenced by several overarching and indirect effects:

- **Awareness raising and capacity building:** The CDM has drawn attention to climate change and to options of how it can be mitigated and thus contributed to the issue of climate change being better understood and taken more seriously in many parts of the world. In this way it has helped to pave the way towards the global agreement achieved at COP 21 in Paris in December 2015.
- **Technological innovation:** The CDM has helped to spread and reduce costs of many GHG mitigation technologies such as renewable energy technologies or technologies to avoid methane emissions in many developing countries. This may have helped developing countries to avoid locking in carbon-intensive technologies. The increased application of these technologies has contributed to reducing their total cost, and the CDM has contributed to building the capacity on how these technologies can domestically be applied in many developing countries.
- **Length of crediting periods:** Certain projects may continue their operation beyond their crediting period and will not receive credits for the respective GHG reductions. This effect has been estimated to have a significant potential for under-crediting (Spalding-Fecher et al. 2012). However, over time the respective technologies often become economically viable without support and thus the common practice in many circumstances. The CDM may thus have contributed to advancing an investment, which would anyhow be conducted some years later, so that even the additionality of CERs generated in the late years of a crediting period could be questioned.
- **Rebound effects:** For CDM project developers and host countries, CER revenues are similar to subsidies, which often lower the cost of the product or service provided (e.g. electricity, cement, transportation), thereby inducing greater demand for the product or service. In contrast, carbon taxes or auctioning of allowances under the ETS generally provide incentives to reduce the demand for products or services. Calvin et al. (2015) show that ignoring such system-wide rebound effects in the power sector can lead to significant over-

crediting compared to the actual reductions at system level. The overall mitigation outcome of crediting could be systematically over-estimated, even if projects are fully additional and the direct GHG emission impact of a project is quantified appropriately. This is mainly because credits subsidize the deployment of technologies with lower emissions instead of penalising the use of more emitting technologies and because CDM methodologies draw the boundary around a project and do not consider the wider rebound effects.

- **Perverse policy incentives:** In some instances, the CDM may provide an incentive to governments not to implement domestic policies to address emissions. For example, policy makers may have disincentives to introduce regulations requiring the capture of landfill gas or to further pursue landfilling instead of less GHG-intensive waste treatment methods, since they would otherwise lose revenues from CERs.

All these effects somehow influence the environmental outcome of the CDM, partly for the better and partly for the worse. The overall effect can hardly be determined. However, it is unlikely that these overarching and indirect effects fully compensate for the overall low environmental integrity of many projects and CERs. On the contrary, in a forward-looking perspective, comparing the situation in which the CDM continues to be used with a situation in which this would not be the case, it is rather likely that these overarching effects further undermine the environmental outcome of the CDM overall.

The result of our analysis suggests that the CDM still has fundamental flaws in terms of environmental integrity. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC. In the following chapters we summarise how the existing CDM should be improved (Chapter 6) and what can be learned from the CDM experience for the future of market mechanisms in general (Chapter 7).

6. Summary of recommendations for further reform of the CDM

The recommendations for the further reform of the CDM can be distinguished according to improvements of the general rules and approaches how to determine additionality and to project type-related recommendations.

6.1. General rules and approaches for determining additionality

As mentioned above, for an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. They cannot fully reflect the complexity of investment decisions. Additionality tests always look at part of the full picture and use simplified indicators, such as economic performance or market penetration, to make a judgment on whether or not a project is truly additional. Information asymmetry between project developers and regulators, combined with the economic incentives for project developers to qualify their project as additional, are a major challenge. The key policy question is how confident regulators should be that a project is additional. In other words, how should the number of false positives (projects that qualify as additional but are not) and false negatives (projects that are additional but do not pass the test) be balanced? We assessed the current additionality tests from the perspective that a high degree of confidence is required. The main reason is that the implications of false positives are much more severe than the implications of false negatives. A false positive leads to both an increase in global

GHG emissions and higher global costs of mitigating climate change, whereas a false negative does not affect global GHG emissions but only leads to higher costs of mitigating climate change (Schneider et al. 2014).

In Chapter 3 we thoroughly scrutinised the four main approaches used to determine additionality. Our analysis shows:

- **Prior consideration** is a necessary and important but insufficient step for ensuring additionality of CDM projects. This step works largely as intended (Section 3.1.4).
- The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. It is possible that improvements could further decrease this subjectivity, e.g. by applying more complicated tests to assess the financial performance of the project. However, especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio (Section 3.2.4).
- To reduce the subjectivity of the **barrier analysis**, the '*Guidelines for objective demonstration and assessment of barriers*' require that barriers are monetized to the extent possible and integrated in the investment analysis. As a result of this, the barrier analysis has lost importance as a stand-alone approach of demonstrating additionality. However, barriers which are not monetized remain subjective and often difficult to verify by the DOEs (Section 3.4.4).
- In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis (Section 3.3.4). In this regard, expanding the use of common practice analysis could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality. Moreover, when expanding its use, it is important to reflect that market penetration is not a good proxy for all project types for the likelihood of additionality. The fact that few others have implemented the same project type is only an indication of the actual attractiveness. It should thus be only applied to those project types for which market penetration is a reasonable indicator.

Against this background we recommend that

- the **prior consideration** grace period for notification after the start of a CDM project should be shortened from 180 to 30 days to reduce the risk that projects apply for the CDM having only learned about this option after the start of the project,
- the **common practice analysis** is significantly reformed and receives a more prominent role in additionality determination,
- the **investment analysis** is excluded as an approach for demonstrating additionality for projects types for which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence; while for those project types for which investment analysis would still be eligible, project participants must confirm that all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders, and

- the **barrier analysis** is entirely abolished as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types); barriers which can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

A prerequisite for expanding the use of the common practice analysis is significant improvements of its current shortcomings, most notably with regard to the following issues (Section 3.3.4):

- The project types and sectors covered by the CDM are very different in their technological and market structure. Determining what is deemed to be common practice must take into account these differences. Therefore, the 'one-size-fits-all' approach of determining common practice should be abandoned and be replaced by **sector or project-type specific guidance**, particularly with regard to distinguishing between different and similar technologies (appropriate level of dis-/aggregation) and with regard to the threshold for market penetration, which can have very different implications for the number of projects passing the test, depending on the features of the sectors or project types.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country. However, results of studies on the technological potential depend strongly on their assumptions and may thus vary significantly. The exploitation rate should therefore only be considered one criterion among others in determining whether a technology is common practice; it should not form the only decisive criterion.
- The common practice analysis should at least cover the **entire country**. However, to ensure statistical confidence, the control group needs a minimum absolute number of activities or installations. If the observations in the host country do not exceed that minimum threshold, the scope needs to be extended to other countries (e.g. the neighbouring countries or the entire continent).
- Last but not least, all CDM projects should be included into the common practice analysis as a default, unless a methodology includes different requirements.

In addition to the above-mentioned improvements of general approaches for determining additionality, we recommend further improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period, not merely the validity of the baseline but the validity of the baseline scenario should be assessed for CDM projects that are potentially problematic in this regard. This is the case if the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex such as urban transport systems or data centres should be limited to one single period of 10 years maximum. Moreover, generally abolishing the renewal of crediting periods but allowing a somewhat longer single crediting period for project types which require a continuous stream of CER revenues to continue operation (e.g. landfill gas flaring) may also be considered (Section 3.5.4).
- **Positive Lists:** Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. This review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of national policies and measures to

support low emissions technologies (so-called E- policies). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. A positive list that included renewables, for example, could be qualified by restricting its applicability to countries that did not have any support policies in place for that specific technology. Finally, to maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists (Section 3.7).

- **Programmes of activities:** PoA rules allow that the total project size exceeds the small-scale or micro-scale thresholds while using the automatic additionality provision established for small-scale and micro-scale projects. This may increase the risk of registering non-additional projects. Reform of the CDM rules related to additionality for particular project types (Chapter 4) and positive lists (Section 3.7) will address any concerns about additionality of PoAs (Section 3.6.3). However, as long as these rules are not reformed accordingly, PoA have the potential to boost the number of non-additional project activities and CERs.
- **Standardized baselines:** These were introduced to reduce transaction costs while ensuring environmental integrity. In contrast to the general expectation, they do not increase the environmental integrity of the CDM. On the contrary, as long as they are not mandatory, once established, they lower the environmental integrity because they allow for increasing the number false positive projects. Therefore, their use should be made mandatory. Moreover, all CDM facilities should be included in the peer group used for the establishment of standardized baselines and clearer guidance needs to be provided for DNAs on how to determine the appropriate level for disaggregation. Finally, the practice of using the same methodological approach for the establishment of standardized baselines for all sectors, project types and locations should be abolished (Section 3.8).
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity through over-crediting of emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by their exclusion from the crediting baseline where possible (Section 3.9).
- **Suppressed demand:** In many cases, the Minimum Service Levels may be reached during the lifetime of CDM project. However, even if the suppressed demand does lead to some over-crediting, the overall impact is very small. An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to countries in which development needs are highest and the potential for over-crediting is the smallest, such as LDCs (Section 3.10).

6.2. Project types

We note that even with ‘perfect’ rules for determining additionality as recommended in Section 6.1, many project types have fundamental problems with this determination. Drawing upon our findings for specific project types (Section 4), this section provides recommendations of which project types should remain eligible in the CDM. In doing so, we not only consider the environmental integrity under current rules, but also whether improvements of general or project type-specific rules could be implemented to ensure overall environmental integrity. We also include other considerations, such as whether the emission sources can be addressed more effectively by other policies.

Industrial gas projects: In contrast to conventional wisdom and their perception in the general public, our analysis shows that industrial gas projects provide for a high or medium environmental integrity. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects now provide for a high degree of environmental integrity. They are very likely to be additional because they involve so-called 'end-of-the-pipe' technologies and do not have significant income other than CERs and because revenues from CERs have a large impact on the economic feasibility. Moreover, they partially use emission benchmarks as baselines which underestimate the actual emission reductions. The methodologies for HFC-23 and nitric acid projects have already been improved in the past and do not require further improvements (Sections 4.2.7 and 4.4.7). For **adipic acid**, the situation is different; this project type is also likely to be additional but concerns about carbon leakage due to high CER revenues have never been addressed. Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. A global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate (Section 4.3.7). Industrial gas projects provide for low cost mitigation options. Under current rules, HFC-23 and adipic acid projects may generate large rents for plant operators. These emission sources could therefore also be addressed through domestic policies, such as regulations or by including the emission sources in domestic or regional ETS, and help countries achieve their NDCs under the Paris Agreement. For example, China is introducing a domestic results-based finance policy aiming at incentivising HFC-23 emissions reductions. Parties to the Montreal Protocol also consider regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM. A transition to address these emissions domestically may also be supported by bilateral or multilateral initiatives of (results-based) carbon finance.

Energy-related project types: Our analysis suggests that many energy-related project types provide for a low likelihood of overall environmental integrity, particularly **wind and hydropower** (Sections 4.5.7 and 4.6.7), **fossil fuel switch** (Section 4.11.7) and **supply-side energy efficiency project** types such as **waste heat recovery** (Section 4.10.7). The main reason for this assessment is that CER benefits are often relatively small compared to fuel cost savings, so that the impact of CER revenues on the economic feasibility is marginal (Section 2.4). Many projects are also supported through other policies, such as feed-in tariffs for renewable electricity or emerging ETSs. The costs for renewable power technologies are decreasing rapidly. In our assessment, the potential for addressing additionality concerns through improved tests are rather limited for these project types. Many projects are economically viable and even an improved investment analysis or common practice test may not be suitable to clearly distinguish additional from non-additional projects. We therefore recommend **that these project types should be no longer eligible in principle** under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers (Section 4.5.3). These project types may thus remain eligible in least developed countries.

We recommend that some other energy-related project remain eligible if methodologies are improved. **Biomass power projects** can be competitive with fossil generation technologies under certain but not all circumstances. In cases in which power generation from biomass is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. In these cases, the demonstration of abundance of biomass as well as of the claim that biomass is left to decay is key for avoiding any over-crediting of emissions. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM provided that the corresponding provisions in the applicable methodologies are revised appropriately (Section 4.7.7).

With regard **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, environmental integrity concerns could be addressed if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass (Section 4.12.7), and if approaches for determining the penetration rate of efficient lighting technologies as already established in AM0113 were made mandatory for all new projects and CPAs under these project types and the older methodologies were withdrawn (Section 4.13.7). As CER revenues can have a considerable impact and as barriers persist these projects, we recommend that they should remain eligible, subject to the improvements recommended.

Methane projects: Landfill gas and **coal mine methane** projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and by requesting DOEs to verify that landfilling practices are not changed (Sections 4.8.7 and 4.9.7). For both project types, the CER revenues have a considerable impact on their economic performance. With regard to landfill gas, an important concern is that continued incentives for landfilling could delay the implementation of more sustainable waste management practices, such as recycling or composting. We therefore recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Table 6-1 summarises our recommendations for the specific project types assessed above.

Table 6-1: CDM eligibility of project types

Project type	Environmental integrity under current rules	Environmental integrity if rules were improved	Recommendations
HFC-23	Medium / High	High	Not eligible
Adipic acid	Medium	High	Eligible (with benchmark of 30 kg / t AA)
Nitric acid	High	High	Eligible
Wind power	Low	Low	Not eligible
Hydropower	Low	Low	Not eligible
Biomass power	Medium	Medium / High	Eligible (projects avoiding methane emissions)
Landfill gas	Medium	Medium / High	Eligible (subject to transition arrangements)
Coal mine methane	Medium	Medium / High	Eligible
Waste heat recovery	Low	Low	Not eligible
Fossil fuel switch	Low	Low	Not eligible
Efficient cook stoves	Low	Medium / High	Eligible
Efficient lighting	Low / High	Medium / High	Eligible

Sources: Authors' own compilation

7. Implications for the future role of the CDM and crediting mechanisms

In this section, we consider the implications of our analysis for the future role of the CDM and crediting mechanisms generally. We situate these implications not only in the context of the CDM but also the Paris Agreement and draw general conclusions for the design of international crediting mechanisms under the Paris Agreement as well as crediting policies established at national level.

The CDM has provided many benefits. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer and may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures. The CDM has also helped to build capacity and to raise awareness on climate change. It also created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects have provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of considerable experience, the enduring limitations of GHG crediting mechanisms are apparent.

- Firstly, and most notably, the elusiveness of additionality for all but a limited set of project types is very difficult, if not impossible, to address. Our analysis shows that many CDM project types are unlikely to be additional. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is difficult to address through improvements of rules. Further standardisation can be helpful for reducing transaction costs but has a limited scope, particularly within the CDM, for resolving additionality concerns. The scope for added standardisation is limited by the number of amenable project types and the wide variation of conditions across CDM host countries. Standardisation approaches have been most successful in regional crediting programs such as California or

Australia, where they have focused on a limited number of suitable and largely non-energy project types, such as landfills or coal mines.⁹⁸ The overall integrity of the CDM could only be improved significantly if the mechanism were limited to those project types that have a high likelihood of providing additional emission reductions. In our assessment, this would require excluding most of the current CDM project types and focusing mainly on projects that abate other GHGs than CO₂.

- Secondly, international crediting mechanisms involve an inherent and unsolvable dilemma: either they might create perverse incentives for policy makers in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they credit activities that are not additional because they are implemented due to policies or regulations. This well-known dilemma has been discussed by the CDM EB without a resolution.
- Thirdly, for many project types, the uncertainty of emission reductions is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules.
- A further overarching shortcoming of crediting mechanisms is that they do not make polluters pay but rather subsidize the reduction of emissions. This lowers the cost of the product or service, inducing rebound effects that are not considered under CDM rules and that lead to over-crediting. Most of these shortcomings are inherent to using crediting mechanisms, which questions the effectiveness of international crediting mechanisms as a key policy tool for climate mitigation.

It should be noted that the results of the analysis provided here for the CDM are to a large extent also relevant and valid for other international carbon offset or crediting programs, such as the Japanese Joint Crediting Mechanism (JCM), the Climate Action Reserve (CAR), the Verified Carbon Standard (VCS) or the Gold Standard (GS). The results are also relevant for the mechanisms to be implemented under Article 6 of the Paris Agreement, any mechanism to be used for compliance under the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) and to a certain extent for the Joint implementation (for an overview see Kollmuss et al. 2015a). Even though the programs differ in many aspects, generally speaking, the CDM has been the origin and the role model for these offset programs. In particular, the CDM's approaches to additionality testing and baseline setting have served as the main blueprint for most other programs. With the aim of reducing transaction costs, rules and methodologies for additionality that have been borrowed from the CDM have been simplified, which did not generally strengthen their environmental integrity. Therefore, the issues raised here in the context of the CDM will remain relevant for other international offset programs.

The future role of crediting mechanisms should be revisited in the light of the Paris Agreement. The CDM in its current form will end with the conclusion of the second commitment period of the Kyoto Protocol. Several elements of the CDM could, nevertheless, be used when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. As of 15 December 2015, 187

⁹⁸ <http://wupperinst.org/en/projects/details/wi/p/s/pd/377/>.

countries, covering around 95% of global emissions in 2010 and 98% of global population, have submitted NDCs (CAT 2015). Many mitigation pledges in NDCs cover economy-wide emissions or large parts of the economy. This implies that much of the current CDM project portfolio will fall within the scope of NDCs.

The Paris Agreement requires countries to adjust their reported GHG emissions for international transfers of mitigation outcomes in order to avoid double counting of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond that which they had pledged under their NDCs. Double counting can occur, inter alia, if the same emission reductions are accounted by both the host country – as reflected in its GHG inventory – and the country using these credits towards achieving its mitigation pledge. Avoiding such double counting could imply that host countries will have to add internationally transferred credits to their reported GHG emissions if the emission reductions fall within the scope of their mitigation pledges. This has several important implications.

Firstly, issuing and transferring credits that do not represent additional emission reductions or are under- or over-credited has other implications for global GHG emissions. Under the Kyoto Protocol, non-additional CDM projects or over-crediting increase global GHG emissions, whereas under-crediting from additional projects provides a net mitigation benefit. The implications are different and more complex when the emission reductions fall within the scope of the NDC of the host country: they depend on whether the credited activities are additional, whether they are over- or under-credited, the ambition of the mitigation pledge of the host country, i.e. whether or not it is below BAU emissions, and whether the emission reductions are reflected in the host country's GHG inventory⁹⁹ (Kollmuss et al. 2015b). Compared to the situation in which international transfers of credits would not be allowed, global GHG emissions could not be affected, decrease or increase due to the transfer of credits, depending on the circumstances. For example, if the host country has an ambitious NDC, non-additionality and over-crediting may not necessarily increase global GHG emissions because the country would have to reduce other GHG emissions to compensate for the adjustments to its reported GHG emissions. For the same reasons, under-crediting would not necessarily lead to a global net mitigation benefit. Additionality and over-crediting mainly matter when host countries have weak mitigation pledges above BAU emissions.

A second important implication relates to the incentives for host countries to ensure integrity and participate in international crediting mechanisms. If mitigation pledges are ambitious, host countries might be cautious to 'give away' non-additional credits. To achieve its mitigation pledge, the host country would need to compensate for exports of non-additional credits, by further reducing its emissions. Host countries with ambitious and economy-wide mitigation pledges would thus have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. For those project types with a high likelihood of additionality, the potential for further emission reductions is limited and it is unclear whether host countries would be willing to engage in crediting for this 'low-hanging fruit' mitigation potential. The experience with Joint Implementation showed that most credits originated from countries with 'hot air', i.e. where the emission pledge is less ambitious than BAU emissions, while the potential for crediting was quite limited in countries

⁹⁹ Some emissions reductions may not be reflected in the country-wide GHG inventory, for example, because the country uses simple Tier 1 methods to estimate an emissions source which do not account for the emission reductions achieved through CDM projects or because the reductions occur in a sector that is not covered by the host country's GHG inventory.

with ambitious mitigation targets, also due to overlap with other climate policies (Kollmuss et al. 2015b). In conclusion, this suggests that the future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries, including Japan, Norway and Switzerland, have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries.

A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance, which could indirectly increase global GHG emissions compared to using the available resources more effectively. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. They need to show that their investments *'make a difference'*. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules to assess the additionality of projects considered for funding.

Some countries pursue domestic crediting policies. South Korea allows companies to convert CERs from Korean projects into units eligible under its domestic emissions trading system. The Chinese and California-Quebec ETS allow the use of credits from domestic offsetting projects. Mexico, South Africa and Switzerland are pursuing policies that allow using domestic credits to meet tax or other obligations (see also the paragraph above on other offsetting programs). In these cases, using non-additional credits has no direct implication on global GHG emissions but will increase the country's costs towards achieving its NDC. In the long run, this provides incentives for these countries to limit crediting to project types with a high likelihood of additionality. However, meeting the ambitious long-term climate change mitigation goals of the UNFCCC and the Paris Agreement requires much stronger action and a rapid bridging of the emissions gap (UNEP 2015). It is hard to imagine that such ambitious goals could be achieved on a global level in a timely manner without a sharing of effort or burdens that could encompass some form of transfer of mitigation outcomes and/or results-based climate finance.

Taking into account this context and the findings of our analysis as well as other evaluations, we recommend that policy makers revisit the role of crediting in future climate policy:

- **Moving towards more effective climate policies:** We recommend focusing climate mitigation efforts on forms of carbon pricing that do not rely extensively on credits, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. If well designed, emission trading systems and carbon taxes have several advantages over crediting mechanisms: they do not require additionality to be assessed or hypothetical baselines to be set but rather rely on information on actual emissions for which information asymmetry is more manageable; in principle, they make the polluter pay rather than providing subsidies; and they expose all regulated entities to a carbon price, enabling

up-scaled, sector-wide emission reductions. We recommend that international crediting mechanisms play a limited role after 2020 to address specific emission sources in countries that do not have the capacity to implement broader climate policies. Crediting should not be further pursued as a main tool for GHG mitigation.

- **Fundamental and far-ranging changes to the CDM:** To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting the mechanism to project types that have a high likelihood of delivering additional emission reductions. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches where possible. We also recommend curtailing the length of the crediting periods with no renewal. A larger question is whether the UNFCCC and CDM processes can create the consensus needed to make the fundamental changes needed to improve the integrity of the CDM in significant ways.
- **Purchase of CERs:** We recommend potential buyers of CERs to limit any purchase of CERs to either existing projects that are at risk of stopping GHG abatement ('vulnerable projects') or the few project types that have a high likelihood of ensuring environmental integrity. Continued purchase of CERs should be accompanied with a plan and support to host countries to transition to broader and more effective climate policies that ensure GHG abatement in the long-run. Purchase of CERs could also be used to deliver results-based finance in this context. Further, we recommend pursuing the purchase and cancellation of CERs, as a form of results-based climate finance, rather than using CERs for compliance towards meeting mitigation targets.
- **Mechanisms under Article 6 of the Paris Agreement:** Given the high integrity risks of crediting mechanisms, we recommend that Parties consider provisions that provide strong incentives to the Parties involved to ensure integrity of international transfers of mitigation outcomes. This includes robust accounting provisions, inter alia, to avoid double counting of emission reductions, but should also extend to other elements, such as comprehensive, transparent and ambitious mitigation pledges as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment and other evaluations confirm the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies including international cooperative actions becomes key to bringing down emissions quickly to a pathway consistent with well below 2°C. Our findings suggest that crediting approaches should play a time-limited and niche-specific role, where additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

8. Annex

8.1. Representative samples of CDM projects

8.1.1. Task

The population consists of 7,418 CDM projects which have 4 characteristics (location, technology, size, time), from which representative samples for three additionality approaches (investment analysis, barrier analysis and common practice analysis) should be drawn. One challenge consists of the fact that the additionality approaches are not directly known before the analysis. After some preliminary analyzes, we decided on a two-step approach.

1. Draw a representative sample with regard to all strata of the 4 characteristics of size 300. The additionality approaches are determined for the projects in this sample.
2. Draw sub-samples from the projects belonging to each of the three additionality approaches, which are representative for the strata of the 4 characteristics, as they occur for the projects of each additionality approach. The sub-samples shall consist of 50 projects each, which are to be further divided into one 30-project sample and two 10-project samples. The 30- and 10-project sample should each be representative of the strata and combine to the 50-project sample.

8.1.2. Approach

The challenge consists of the fact that the small sample sizes lead to less than one draw for many strata. In a first step, therefore, a randomised procedure is necessary to identify the strata from which to draw, such that the frequencies of the strata are best preserved from the population to the samples.

Drawing the 300-project sample

1. Randomly select strata from which to draw
 - a) Calculate the target number of draws for each stratum as (stratum frequency) (population size) (sample size). These are decimal numbers and often below.

In order to obtain an integer number of draws for a stratum, discretise its corresponding target number to the enclosing integers, e.g. 2.1 is randomly assigned either 2 or 3, where the probability of the assignment of the higher enclosing integer is weighted with (target number)^(lower enclosing integer). In the example, the probability that 2.1 becomes 3 is therefore weighted with $2.1^2 \approx 0.1$. The number of target numbers assigned to the higher enclosing integer is determined such that the sum of all assigned lower enclosing integer and all assigned higher enclosing integer is as close as possible to the rounded sum of all respective target numbers.

For example, assume 3 target numbers between 2 and 3, namely (2.1, 2.3, 2.9). Their rounded sum is 7. Drawing twice from two strata and three times from one strata yields the targeted 7 total draws. The third strata with the target number 2.9 has the highest chance of being chosen for the three draws.

- b) Strata with 0 frequency in the population have of course 0 frequency in the samples as well.
2. Randomly draw from the strata with the discretised target numbers of the previous steps.

Drawing sub-samples of the 300-project sample with the added additionality approach information

From the 300-project sample, we extract the projects that belong to each additionality approach, yielding three sub-samples. From each of these sub-samples, we draw samples of 50 projects, which are representative with regard to the strata of the 4 characteristics in the respective sub-sample. We employ the same approach as for drawing the 300-project sample (Section 2.1).

These three samples of 50 projects are ordered with respect to the strata of the 4 characteristics. Then we extract two sub-sets of 10 projects, one consisting of the 1st, 6th, 11th, 15th... project, the second consisting of the 3rd, 8th, 13th, 18th... project of the ordered sample. The 30-project sample consists of the remaining projects. This ensures that the strata within the 50-project sample are preserved in the smaller samples as well as possible.

8.1.3. Samples

Investment analysis: 69, 544, 1436, 1906, 2007, 2075, 2229, 2525, 3068, 3490, 3703, 4042, 4317, 4657, 5047, 5659, 5661, 5707, 5757, 6052, 6899, 7073, 7185, 7843, 7974, 8057, 8523, 8615, 8801, 9002

1875, 2315, 3033, 3186, 3799, 4600, 4687, 5843, 7024, 7551, 8903

1795, 2931, 4817, 5555, 6173, 6440, 7540, 8291, 8818, 8821

Barrier analysis: 244, 348, 582, 644, 1053, 1408, 1578, 1738, 2180, 2561, 3174, 3191, 3639, 3739, 3856, 4468, 4478, 4508, 4748, 5099, 5749, 5961, 6012, 6302, 6636, 7242, 7392, 7651, 8680, 9419

534, 831, 937, 1151, 1827, 2098, 4147, 5234, 7595, 8319

544, 2077, 2975, 3393, 4089, 5888, 6246, 7578, 8927, 9100

Common practice analysis: 69, 1227, 1602, 1737, 2007, 2075, 2098, 2109, 2302, 2315, 3068, 3186, 3642, 3670, 3799, 4687, 5006, 5359, 5659, 5843, 6173, 6553, 6899, 7648, 7936, 8125, 8140, 8506, 8636, 9699

588, 2486, 3994, 4317, 6440, 7400, 8093, 8505, 8523, 8879

366, 544, 1661, 1875, 3703, 4042, 4310, 5487, 7494, 8818

8.2. Information on suppressed demand in CDM methodologies

Table 8-1: Information on suppressed demand in CDM methodologies

Meth No.	Definition of baseline technology	Definition of MSL	Definition of baseline activity level
ACM0014	Methane Correction Factor of 0.4 for domestic wastewater	None	Project activity level (i.e. quantity of wastewater treated)
AMS I.A	Allows AMS I.L approach	Allows AMS I.L approach	Project activity level (i.e. quantity of electricity consumed)
AMS III.AR	Fossil fuel powered lamp	3.5 hrs per day x 2 CFL lamps (240 lux)	Deemed savings with fossil fuel lamp to match MSL, with annual growth in kerosene consumption
AMS II.G	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of biomass saved)
AMS III.F	Unmanaged waste disposal with > 5m depth (methane Correction Factor of 0.8)	MSL is having a waste disposal site	Project activity level (i.e. quantity of waste converted to compost)
AMS I.E	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of renewable energy used)
ACM0022	Unmanaged waste disposal with < 5m depth (methane correction factor of 0.4)	MSL is having a waste disposal site	Project activity level, although project proponent may propose another baseline
AMS I.L	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.BB	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.AV	Fossil fuel or non-renewable biomass to boil water (only requires justification if share of total population without access to improved drinking water is > 60%)	No minimum, but sets maximum level of 5.5 litres per person-day for crediting	Project activity level (i.e. quantity of water purified by project), but capped at 5.5 litres per person per day

Sources: Authors' own compilation

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**Measuring Emissions Against an Alternative Future:
Fundamental Flaws in the Structure of the Kyoto Protocol's
Clean Development Mechanism**

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Executive Summary

The Kyoto Protocol's Clean Development Mechanism (CDM) enables industrialized countries to partially meet their emissions reduction targets by reducing emissions in developing countries. An appeal of the CDM is its perceived efficiency as a market mechanism. The CDM theoretically creates value for carbon reductions and allows the market to find the cheapest reductions anywhere in the world. A key challenge to the environmental integrity of the CDM is filtering out business-as-usual, or "non-additional," projects. The CDM should only generate carbon credits from activities beyond business-as-usual. Each business-as-usual project that is allowed to generate carbon credits under the CDM will permit an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway rather than actually reducing emissions. The poor quality of the arguments and evidence used to prove project additionality in CDM application documents, and the resulting large-scale registration of non-additional projects, have been well documented. Proposals for reforming the CDM range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting.

This paper examines the possibility of improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism by studying how the CDM is working in practice in the Indian power sector. It is based on interviews conducted in India during 2004 and 2009 with over 80 CDM and renewable energy professionals involved in CDM project development, including project developers, consultants, validators (hired to audit each project applying for CDM registration), carbon traders, bank employees, government officials, members of the CDM governance panels, and others involved in renewable energy and hydropower development in India. It also draws on analysis of the UNEP Risoe CDM project database, and analysis of documents from 70 CDM projects comprising all of the large (over 15 megawatt) wind, hydro, and biomass projects registered in India since 2007 and the 20 most recently registered hydro projects in China. This paper presents the following findings:

- The majority of CDM projects are "non-additional" and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- The large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

The following is a section-by-section summary of the analysis in this paper on which these findings are based.

Widespread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable

energy development in the country. At least twelve developers and consultants told me that the CDM projects that they proposed would have been built regardless of the CDM. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. Validators, tasked with auditing CDM additionality claims, believe that additionality testing procedures are subjective and can be manipulated, with many “knobs you can turn.” Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions due to the uncertainties associated with CDM registration and carbon credit revenues. Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms” rather than based on the small and uncertain financial benefit from carbon credit sales; and “any project can be registered under the CDM.”

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find. A murmur of agreement went through the audience at a carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in decisions to build projects are being forged and post-dated. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own. Only one of the seventeen large wind CDM projects in India that make their financial assessments publicly available uses and correctly calculates the tax benefits offered to wind power developers by the Indian government.

An accurate project-by-project additionality test is infeasible

The “investment analysis” is the means for demonstrating project additionality that is viewed as having the most potential to accurately test project additionality if it is made more rigorous. The investment analysis presumes that it is possible to accurately predict whether a project would be built based on the sign (positive or negative) of a single number – the difference between the expected financial returns from the proposed CDM project and a benchmark defining the boundary between viability and lack of viability for that project type. If the returns are below the benchmark, the project would not likely be built; above it, it would. One indication that the investment analysis has been inaccurate is that just under half of the 29 Indian projects examined in this analysis that make their financial assessments publicly available calculate financial returns below the benchmark even with carbon credit income. This predicts that the projects would not have been built even with income from carbon credit sales. Yet all of these projects were still built.

The main challenge to implementing an accurate investment analysis is that developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM project is additional, so that when a range of values is possible, the values are suspect. Analysis of financial assessments for wind and biomass projects in India reveals assumptions that can be varied within reasonable ranges to change the expected financial returns

of the projects more than the amount that the returns are above or below the benchmark. Even the best cases for an investment analysis – wind projects in India in which all of the main inputs into the financial assessment are typically documented in formal agreements before project construction starts – still have room to vary assumptions (for example the tariff after the end of the power purchasing agreement) within ranges equivalent to the effect of the carbon credit sales. For the investment analysis to be accurate even at this level, supply and loan agreements would need to be signed before the start of the CDM application process. For most other project types there is even more room for manipulation of cost inputs. For example, assumptions about future biomass prices affect the expected financial returns much more than carbon credits do for biomass projects purchasing biomass from neighboring farms.

Large hydropower in India is inappropriate for additionality testing for several reasons. First, large hydropower development is decided by a government planning process and involves a wide range of considerations that are not easily predicted. Second, the per-kilowatt hour tariff provided to large hydropower producers is calculated periodically on a cost-plus basis to ensure that the producer receives a pre-agreed return on their equity investment. The investment analysis is meaningless in this context. Third, financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs. Affecting most project types is the lack of a single accurate benchmark since project development decisions can be based on multiple factors and project risk assessment is inherently subjective. This analysis suggests that an accurate project-by-project additionality test is infeasible for most projects and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

The CDM has little influence on project development

While additionality testing is not very effective in preventing non-additional projects from registering under the CDM, the need to conduct a test that is inherently imprecise and subjective limits the ability of the CDM to support truly additional projects. The CDM's ability to influence the decisions of developers, lenders and investors is compromised by a combination of the length of time it takes to validate and register a proposed CDM project (seventeen and a half months on average for projects registered over the last two years) and the uncertainties associated with CDM validation and registration and carbon credit issuance.

Developers are not waiting to make sure that their projects are successfully validated or registered under the CDM before deciding whether to build their projects. Three-quarters of all registered CDM projects were operational by the time they were registered as CDM projects. Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. Two of these projects were registered within the last year. Developers do not seem to view a positive validation or CDM registration as helpful in acquiring project financing. Developers of 66 of the 70 projects started the CDM validation process around the time of or after the beginning of project construction.

It is likely that most of these developers did not make their decisions to go forward with their projects based on the expectation of CDM income because of the substantial uncertainties

associated with CDM revenues. Uncertainties include the possibility that the project would not pass validation or be accepted for CDM registration, fluctuating carbon credit prices, and uncertainties about the value carbon credits will have post-2012. A large proportion of the risk, time and complexity of the CDM application process is because of additionality testing.

Beyond additionality, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, the structure of project-based offsetting in a number of other ways contributes to the generation of more credits than actual reductions and limits its influence on emissions. The CDM should result in reductions in emissions in developing countries at least as large as the credits it generates. Therefore, since each CDM project is allowed to produce carbon credits for its full lifetime, defined either as a single 10-year period or 21 years (3 consecutive 7-year periods) without retesting additionality, the CDM should only support projects that would not have been built for 10 or 21 years without the CDM.

Hydropower, wind and other low-carbon electricity generation technologies are generally developed in order of their cost effectiveness. A preferred support mechanism would accelerate the development of all of these plants rather than change the order in which they are built. The CDM as it is currently structured could work in one of two ways. It could support a portfolio of projects that would not otherwise have been built for more than a decade, a portfolio of unattractive projects, enabling less attractive projects to be built before more attractive ones. Alternatively, the CDM could accelerate the building of all plants, generating more credits than the emissions actually avoided. Neither is a good option.

The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated. Therefore, the CDM is unable to support many measures that are needed or are more cost effective for the deployment of technologies and the decarbonization of sectors but for which it is especially difficult to measure emissions reductions, such as policy, research and development, demonstration projects, and information dissemination. A long-standing criticism of the CDM is that it may create perverse incentives for governments not to implement climate-friendly policy in order to maintain a high baseline against which domestic facilities can prove additionality and generate carbon credits.

The large-scale use of offsetting credits hinders global efforts to mitigate climate change

Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in carbon emissions in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, will still result in a 2.0-2.4 degree Celsius temperature increase. The large quantities of offsets being proposed for use by industrialized countries post-2012 would put them far away from these reduction pathways, hindering global mitigation efforts in the coming decades.

Any offsetting mechanism in developing countries, whether it is project- or sector-based, involves measuring emissions against an alternative business-as-usual growth scenario and therefore the quantity of emissions reduced is inherently uncertain. Further, the use of large quantities of offsets in one commitment period makes it harder for industrialized countries to

accept meaningful reductions in the next, since industrialized countries will be more dependent on the uncertain availability of credits through the carbon market to meet deepening targets. If industrialized countries are to use the quantities of offset credits they propose post-2012, the majority of global reductions over the next ten years will occur in developing countries. Industrialized countries are therefore committing either to steeper annual reductions in the future, or to long-term inequalities in emissions between the North and the South. Both options make future cooperation more difficult. Major shifts in high emitting sectors in industrialized countries require time to allow for changes in behavior and in support industries, for experimentation and learning, adapting technologies to diverse local contexts, research, development and deployment. The use of offsets postpones these processes in industrialized countries. We live in a globalized world with a widely shared linear view of development and progress. Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of lifestyles in the global North. In a world dominated by a single vision of progress, the vision of progress that we are striving towards must be sustainable. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

The way forward

Our inability to accurately measure the emissions reduced by individual projects, compounded by the large-scale use of offsetting credits by industrialized countries to meet their reduction commitments, risk substantially undermining the effectiveness of the post-2012 climate change regime and our ability to control global greenhouse gas emissions. Any offsetting mechanism included post-2012 will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

The first point is practically difficult, the third, politically difficult. We have seen little indication that countries will agree to an offsetting mechanism that is small enough and targeted enough, with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. Attention must be refocused on reductions in countries with emissions caps, with non-credited support for mitigation efforts in developing countries.

Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism

Abstract

Proposals for reforming the Clean Development Mechanism (CDM) range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting. Interviews conducted in India during 2004-2009 on how the CDM is working in practice in India's electricity sector, an analysis of the project documents from 70 registered CDM projects in India and China, and analysis of the UNEP Risoe CDM project database together indicate fundamental limitations to improving the outcomes of the CDM within its basic structure as a project-based offsetting mechanism. I find: (1) The majority of CDM projects are "non-additional" (would have gone ahead regardless of support from the CDM) and therefore do not represent real emissions reductions; (2) Due to the subjectivity inherent in project development decisions, a reasonably accurate filter for non-additional projects is infeasible; (3) The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects; (4) Beyond the problems with additionality testing, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions; (5) Taking a step back, the large-scale use of carbon credits generated in developing countries by industrialized countries to meet their emissions targets hinders global efforts to mitigate climate change over the next decades. Both the large-scale use of offsetting to meet industrialized country targets and the continuation of project-based offsetting risk undermining the ability of global climate change agreements to control greenhouse gas emissions.

1. Introduction

Industrialized countries have two sets of obligations under current international climate change agreements: to reduce their own emissions, and to support climate change mitigation and adaptation in developing countries. The Kyoto Protocol's Clean Development Mechanism (CDM) is critical for meeting both sets of obligations. The CDM in principle allows industrialized countries to invest in projects in developing countries that reduce emissions, and use the resulting emissions reduction credits towards their Kyoto Protocol targets. Any project registered under the CDM is able to produce carbon credits, called certified emissions reductions, or CERs, totaling the estimated tons of CO₂-equivalent emissions avoided by the CDM project. The CDM is the most used of the Kyoto Protocol's "flexibility mechanisms," which are meant to lower compliance costs by allowing industrialized countries to partially meet their emissions targets through reductions outside of their own borders. It is also the main instrument under current climate agreements supporting climate change mitigation in developing

countries, currently passing around three billion Euros per year to developers of low-emitting projects in developing countries.¹

A key regulatory challenge of the CDM is calculating the emissions reduced by a single project. This requires comparing the emissions from the project with emissions from a counterfactual scenario of what would likely have happened without the CDM project. The biggest challenge in determining the counterfactual baseline scenario is assessing whether the project itself is in that counterfactual scenario, or in other words, if the proposed CDM project would have gone ahead anyway, without the expected revenues from the CDM. The CDM should only generate credits from activities beyond business-as-usual (BAU), since any carbon credits generated by BAU CDM projects allows an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway, rather than actually reducing emissions. Each project applying for CDM registration must demonstrate their “additionality,” that the project would not likely have gone forward had it not been for the expected CDM income.

Another key regulatory challenge of the CDM relates to the nature of the market it creates. A common appeal of the CDM is that it is a market mechanism meant to create a global market for emissions reductions, lowering the cost of compliance by allowing industrialized countries to reduce emissions wherever in the world it is least expensive to do so. In practice, the CDM does not create a market for emissions reductions. It creates a market for emissions permits, since it is the permit to emit that is the primary interest of most CER buyers, as they seek low cost options of complying with domestic climate regulations. For the most part, neither the buyer nor the seller of CDM credits is primarily concerned with emissions reductions, such that neither have a strong interest in ensuring the environmental benefit represented by the permits sold. In addition, these permits to emit are wholly human created, numbers in databases, such that no extra cost is incurred from producing more permits. CDM project proponents not only have little incentive to protect the environmental integrity of the permits, they have a financial interest to exaggerate the number of carbon credits generated by CDM projects. Therefore, the integrity of this market in terms of emissions reductions relies almost entirely on effective regulation. These features – the buyer is unconcerned with the quality of the underlying physical thing represented by the wholly human-made tradable asset – are also features of many of the financial instruments whose deregulation in the US caused the current global financial crisis, reminding us of the importance of regulation for markets to function. As mentioned above, the market in CDM credits is especially difficult to regulate because it involves calculating emissions reductions against a hypothetical scenario, and most importantly, determining if the project itself is a part of that scenario.

The poor quality of the arguments and evidence used to prove project additionality under the CDM have been well documented (Michaelowa & Purohit 2007, Schneider 2007). Schneider (2007) concludes that “for about 40% of the registered CDM projects additionality is unlikely or questionable.” Wara and Victor (2008) estimate that bona fide emissions reductions compose “only a fraction of the real offsets market,” based on a range of evidence including the high proportions of hydropower, wind and natural gas power plants being built in China that are in the CDM pipeline, despite China’s active promotion of these technologies. Various proposals have been put forward for controlling the number of carbon credits generated by business-as-usual

¹ The CDM projects currently registered under the CDM would produce 319 million tons of CERs a year if they meet the expectations in their PDDs (Fenhann J. 2009. October 1, CDM Pipeline Overview. UNEP Risø Centre. <http://www.cdmpipeline.org/>). Primary CER prices are currently around 10 Euro per CER.

projects. Many of these involve continuing the CDM in its current form, and improving the rigor of its additionality test (some of the ideas put forward by Schneider 2009, and by Wara & Victor 2008).

This paper explores how the CDM is working in practice in the Indian power sector. It examines the proportion of CDM projects that are non-additional, and how effective the CDM is at supporting truly additional projects. It also considers whether it is possible to substantially improve the outcomes of the CDM within its current structure as a project-based offsetting mechanism. This paper also explores how the substantial use of offsets purchased from reductions made in developing countries currently being proposed by most industrialized countries post-2012 might help or hinder global efforts to control greenhouse gases to levels needed over the next forty years.

This paper presents the following findings:

- The majority of CDM projects are “non-additional” and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- Taking a step back, the large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

In what follows, section 2 provides background information on the current state of the CDM and how it works, as well as why our ability to effectively filter out non-additional CDM projects has implications for the success of the global climate change regime. Section 3 describes the methods used in this analysis. Section 4 delves into the analysis with stories from my research interviews indicating widespread skepticism among CDM and renewable energy professionals in India regarding the impacts the CDM is having and describing instances of fraud used to demonstrate project additionality. This is followed by analyses of the feasibility of substantially improving the CDM’s additionality testing procedures (section 5) and how effective the CDM is in supporting truly additional projects (section 6). Stepping away from additionality testing, section 7 presents a number of other ways that the CDM structure leads to the over-generation of credits and compromises the CDM’s ability to reduce emissions. Taking one more step back, section 8 asks if it is helpful or harmful to long-term international cooperation for industrialized countries to use large amounts of offset credits towards their near-term targets. Finally, I discuss alternatives to the current CDM in a post-2012 climate change regime.

2. Background

2.1 How the CDM works

Developers of low-carbon projects in developing countries can submit their projects to the CDM Executive Board (EB) for CDM registration. An application for CDM registration includes a Project Design Document (PDD), a validation report from an independent validator, and a letter of approval from the host country government. The PDD gives a detailed description

of the project, including an estimation of the emissions that it will reduce following an accepted “methodology” for doing the estimation, and evidence that the project is additional. The developer must hire a certified third party auditor, called a validator,² to validate that the project meets all of the requirements of the CDM. After a project is approved by the CDM Executive Board, the developer chooses how often to submit requests for the issuance of CERs. Typical end buyers of CERs are governments of and regulated facilities in countries that have Kyoto Protocol targets. Often the first buyers of CERs from the developer are intermediary companies that trade in carbon credits. The developer can choose to enter into a CER purchasing agreement with a buyer before or after credits are generated. Figure A-1 in the Appendix presents the key steps in the process of registering a project under the CDM and applying for CER issuance.

2.2 The current state of the CDM

As of October 1, 2009 there were a little over 1,800 registered CDM projects, and another 2,800 proposed CDM projects in the validation process. The total number of registered CDM projects is presented by country in Figure 1, and by type in Figure 2. China and India host 60% of all registered CDM projects, with few projects registered in Africa and in many other smaller developing countries. 31% of all registered CDM projects are renewable energy projects and 27% are hydropower projects. Non-CO₂ gas projects make up 4% of all registered CDM projects but are expected to produce 61% of the credits generated through 2012 because of their relatively high potency as greenhouse gases, if all projects were to produce the amount of credits predicted in their PDDs (see Figure 3).

2.3 The *Additionality Tool*

The “Tool for the demonstration and assessment of additionality,”³ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* requires developers to demonstrate the additionality of their proposed CDM project by an investment analysis, a barrier analysis, or a combination of both.

- The investment analysis is based on the idea that that carbon credit revenues improve the financial returns of projects, making losing or marginally profitable projects viable. It assesses the financial returns of the proposed project, most commonly in terms of project or equity internal rate of return (IRR).⁴ A benchmark is defined that represents the threshold financial returns, or hurdle rate, defining whether the project would go forward. If the expected financial returns are below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. It is optional to show that CERs bring the financial returns of the project above the benchmark.
- The barrier analysis describes and presents evidence for the existence of one or several barriers that prevent the proposed CDM project from going forward without the additional income from carbon credit sales.

² A validator is also called a Designated Operational Entity, or DOE.

³ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

⁴ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial returns.

Figure 1: Registered CDM projects by host country

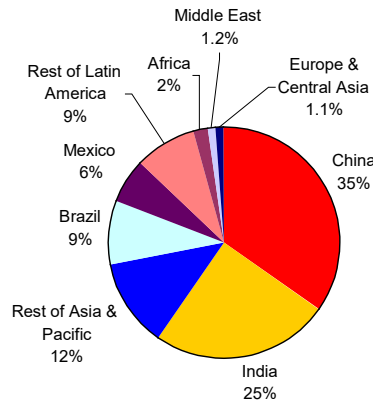


Figure 2: Registered CDM projects by type

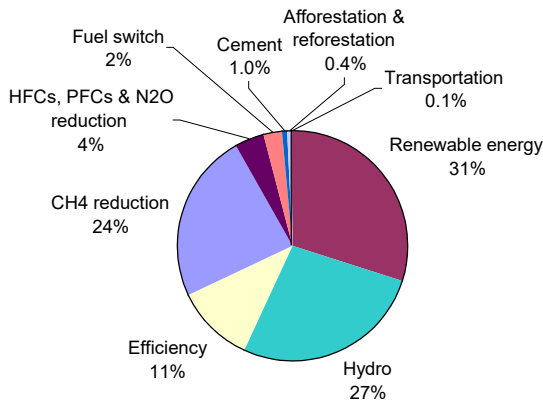
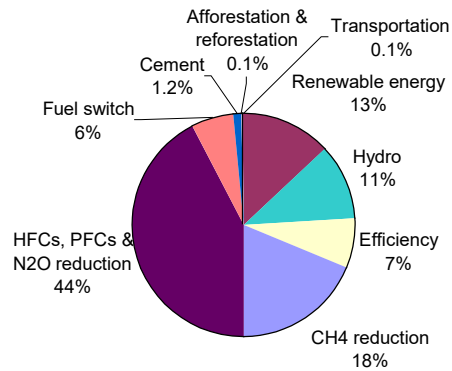


Figure 3: Expected CERs through 2012 from registered CDM projects by type



2.4 Why we should be concerned about additionality

Certainly additionality is a challenge for any climate mitigation program. Estimation of emissions reduced by policies, programs, and projects is often highly inexact in a complex world in which there are multiple influences on behavior and industrial and consumer choices. International funds that pool contributions to support emissions reduction projects in developing countries, the main alternative to crediting mechanisms, could also end up supporting activities that would have happened anyway. There is an important difference between crediting mechanisms and funds in this regard. When a fund supports a BAU project, it fails to reduce emissions through that project; when the CDM supports a BAU project, it also, in effect, weakens an industrialized country target by the amount it claimed to have reduced in the developing country. Secondly, the various risks involved with distributing funds to projects is more transparent. Proponents of project-based offsets commonly assume that emissions

Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

reductions from individual projects can be measured accurately enough. The complex and technical nature of the CDM, and a general trust in the efficiency of market mechanisms, masks the uncertain nature of measuring emissions reductions in an offset program. To have a high likelihood of keeping global temperatures below a two degrees increase, substantial efforts are needed in both industrialized and developing countries. Industrialized countries need to both substantially reduce their own emissions and support mitigation in developing countries. To the extent that CERs are over-credited to CDM projects, the CDM fails in both regards at the same time.

3. Methods

The analysis in this paper is based on over 80 interviews conducted in India during 2004 to 2009, an analysis of project documents from 70 CDM projects registered in India and China, and analysis of the UNEP Risoe CDM project database containing information about all projects currently registered under the CDM and in the application process.⁵ I interviewed individuals involved in CDM project development in various capacities (mostly in India), including project developers, CDM consultants, validators (hired to audit projects applying for CDM registration), carbon traders, employees from banks lending to renewable energy projects, government officials, and members of the CDM governance panels, as well as others involved in renewable energy and hydropower development in India. Some interviews were carried out in the interviewees' offices, and some involved less formal discussions in carbon and climate conferences.

I also analyzed the additionality arguments used to register 70 projects. These projects comprise all of the large (over 15 megawatt (MW)) wind, biomass, and hydro projects registered in India since 2007 and the 20 most recently registered hydro projects in China. The specific analyses performed are described below in the paper sections alongside their results. These four projects types are among the most numerous in the CDM pipeline (see Table 1) and together represent one third of projects (registered and in the validation process). I chose to review only "large" projects since the additionality testing procedures for projects above 15 MW are more rigorous than for "small" projects. I chose to review only projects registered from 2007 because additionality testing was weaker in 2005-6, and has gradually been strengthened with various guidances.

Table 1: Projects analyzed

	Projects analyzed	Total projects in CDM pipeline	
Wind in India	20	320	7%
Biomass in India	16	297	6%
Hydro in India	14	130	3%
Hydro in China	20	819	18%
TOTAL	70	1566	33%

⁵ UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009 <http://www.cdmpipeline.org/>

This paper focuses on CO₂ reduction projects, for which CDM credits are typically one among several project benefits, and improve project financial returns by a relatively small amount. Renewable energy, hydropower, coal and natural gas projects, and many efficiency projects are all CO₂ reductions projects, which compose approximately 72% of all registered CDM projects (see Figure 3). In contrast, CERs are often the sole revenue source from HFC and N₂O reduction projects, making these projects more likely to be additional. However, these industrial gas projects pose other problems documented elsewhere (Wara 2007, Wara & Victor 2008) and discussed in brief with the fourth finding of this paper.

4. Wide-spread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable energy development in the country. Research for this paper started in the summer of 2004 when I was told by managers of three sugar factories in India that their sugar mill cogeneration plants, being proposed as CDM projects, would be or would have been, built without the CDM. Each manager told the arguments they were using to demonstrate that their projects were additional, even though they had told me they were planning to build the projects regardless of CDM funding. They treated the additionality proof as a bureaucratic hoop they had to jump through to access this funding source, a sentiment repeated often in later interviews.

Since those early interviews, at least nine more developers and consultants told me that the CDM projects that they proposed would have been built anyway, without the CDM. It was surprising how easy it was to find developers who would say this, given their interest in defending the additionality claims in their CDM application documents. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. The strongest evidence that a project is non-additional is the admission of developers themselves.

Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms,” not based on the small and uncertain change in IRR from carbon credit sales; “any project can be registered under the CDM.” Validators, tasked with auditing CDM additionality claims, believe that current additionality testing procedures are subjective and can be manipulated. One validator described the many “knobs you can turn” to change the results of the financial analysis. Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions, due to the uncertainties associated with CDM registration and CER revenues. Representatives from three banks that lend to renewable energy projects confirmed that the CDM is having no or very little effect on their lending decisions. At a carbon markets conference in 2007 in Mumbai, a carbon buyer in the audience criticized a panelist for saying that it is possible to prove the additionality of just about any project. The buyer went on to say that he could agree to the panelist’s statement if they were chatting at a bar, but that the panelist should not make such statements in a public forum where he could be quoted.

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM

revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find in project documents and to hear about in the halls of carbon conferences and workshops.

A murmur of agreement went through the audience at the carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in the decision to build proposed CDM projects are being forged and post-dated. One validator proudly told me how he discovered one of these forged documents. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own.

In India, wind power is generally considered a good investment, due in large part to tax benefits offered by the central government. India offers wind power developers the ability to take 80% depreciation for wind project capital costs in the first year of operation along with a 10-year tax holiday. 25 large wind projects totaling 1,600 MW of wind power in India are registered under the CDM. 17 of these use an investment analysis to prove additionality, make the analysis spreadsheet publicly available, and were registered since 2007. The project design documents for each of these 17 projects proves additionality by showing that the project is not financially viable without CER sales revenues. Only one of these projects includes the full tax benefits provided by the government in their financial assessments. This one project uses an unrealistically low estimate of the amount of electricity to be generated by the project.⁶ Only 6 of the other 16 projects justify their failure to account for the full tax benefits offered by the government. They claim that the depreciation benefits are not useful to the developer because of their low profits.⁷ But this claim is not credible for all of these projects.⁸

5. An accurate project-by-project additionality test is infeasible

The poor quality of the *CDM Additionality Tool's* barrier analysis and investment analyses being used to prove project additionality has been well documented (Michaelowa & Purohit 2007, Schneider 2009). These two studies describe how barriers used are highly subjective, not credible, poorly documented, or are so general that they are common to a wide range of CDM and non-CDM projects. Investment analyses leave out or do not document important values affecting the feasibility of the project. Another example of the poor quality of additionality testing is how IRR analyses for wind projects in India commonly leave out or incorrectly calculate the tax benefits provided to these projects described above. Many of these problems could be avoided by stricter standards for additionality arguments and evidence and more rigorous validation requirements. But the question still remains, could additionality testing be made substantially more accurate with stricter standards? That is, are there reasonably accurate and auditable indicators of the decisions of developers, lenders and investors? I

⁶ CDM project titled *22.5 MW grid connected wind farm project by RSMML in Jaisalmer* uses a plant load factor of 16% when the average plant load factor in the state was later determined to be 19% according to a wind project consultant.

⁷ I learned about this problem from Axel Michaelowa.

⁸ For example, the largest of the projects is a 468 mw wind project on three wind sites in Tamil Nadu state in southern India, with 209 separate owners. The investment analyses for this set of projects does not include depreciation benefits. It is very likely that at least some, if not all, of the owners chose to invest in wind in part to avail of the depreciation tax benefits.

examine the ability to test the additionality of wind, biomass and hydropower projects in India. This analysis starts with a brief discussion of the barrier analysis but focuses on the investment analysis, considered to have the higher potential for being accurate, if made more rigorous.

5.1 Barrier analysis

The CDM *Additionality Tool's* barrier analysis presents barriers, often described in terms of risks, which prevent a project from going forward. The CDM can offset those risks by improving the expected returns from the project. The PDDs reviewed that use the barrier analysis, either alone or with the investment analysis, list barriers facing the project, and then as required by the *Additionality Tool*, describe an alternative to the project is not prevented by those barriers.

The most common barriers cited in the reviewed PDDs by project category are: Hydro in India: water flow uncertainty, difficult terrain, small private sector developer new to the power industry; Wind in India: regulatory uncertainty regarding the amount and timing of tariff payments; Biomass in India: technological risks due to little experience in India with the technology, lack of skilled manpower, risk that the electricity utility would lower the tariff; Hydro in China: water flow uncertainty, electricity demand uncertainty during the flooding season, tariff uncertainty, increased investment cost due to new government rehabilitation policies.

It is certainly feasible that any of these risks could be important enough to prevent the developer from going forward with the project without the ability to sell carbon credits. It is also completely feasible that such project risk would not prevent the project from being built. Certainly many projects have been developed with these barriers, but without the help of the CDM.

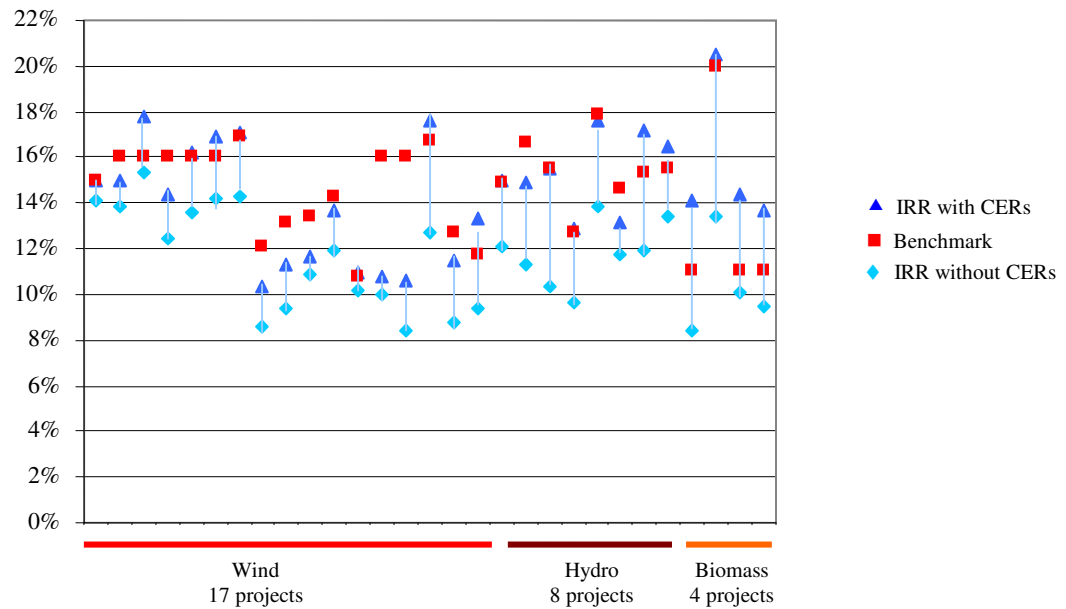
Typically the validator positively validates the project if there is documented evidence that (1) the stated barrier exists and (2) it is significant. They judge if it is feasible that the barrier could have prevented the project from going forward, not that there is a high likelihood that it actually did.

An example might illustrate the subjectivity inherent to the barrier analysis. One of the barriers used to prove the additionality of Patikari Hydro Electric Power Project in India was the difficult terrain where the project is developed posing challenges to project construction. The validation report notes that the validator asked the developer to “provide documentary evidence that these investment barriers are particular to this project activity and not general risks associated with all hydro projects in mountainous regions.” The developer provided a geo-technical report depicting the poor nature of the terrain that might result in the caving in of the tunnel. This report was accepted by the validator as evidence of the existence of this barrier. It is certainly feasible that the risk of tunnel collapse could be important enough to prevent the developer from going forward with the project at its without-CER returns. Or it could be possibly that this risk did not affect the final decision. The validator does not seek to answer that question, for there is little evidence that could document the deliberations of the project developer. Such evidence would be needed for the barrier analysis to be accurate.

5.2 Investment analysis

The investment analysis presumes that it is possible to accurately predict whether a project would be built from the sign (positive or negative) of a single number – the difference between the expected returns from the proposed CDM project and the benchmark. If the returns are below the benchmark, the project would not be built, above it, it would. For illustration, Figure 4 shows the results of the benchmark analysis all of the Indian projects examined for this paper that use the investment analysis to prove additionality and which estimate both with- and without-CER financial returns. Most of the projects analyzed for this paper that use the investment analysis use project or equity IRR as the financial indicator and show with- and without-CER IRRs sitting on either side of the benchmark.

Figure 4: Benchmark investment analysis for all Indian projects analyzed
In chronological order of registration date for each type



It is important to keep in mind that the financial assessment is of a proposed project for which many of the costs and revenues are future projections. The investment analysis indicates additionality only to the extent that developers are unable to choose values to get the desired result – a without-CER result below the benchmark, and a with-CER result above it. That is, it is accurate to the extent that each expected cost and revenue input into the financial returns calculation for the proposed project is a unique and determinable value; and it is accurate to the extent that there is a single benchmark that verifiably tests a decision to go forward with a project. Developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM projects are additional, so when a range of values is possible, the values are suspect.

In India, CERs improve the IRRs of wind projects by 0.8% - 4.9% with most between 1.7% and 2.7%. For hydropower the gain is 3% - 5.2%, and the four biomass projects that use the investment analysis show an increase in IRR of 4.2%, 4.3%, 5.7% and 7.1%. These

investment analyses argue that by improving project IRRs by these amounts, the CDM is able to make non-viable projects viable. Therefore, if a developer is able to vary the assumptions that go into the investment analysis enough to lower the expected IRR or raise the benchmark by these amounts, they can show that some viable projects are non-viable in order to demonstrate that they are additional. The rest of this section examines the extent to which the benchmark and IRR assessments can be manipulated by amounts similar to the expected CDM benefits.

Notable in the above Figure 4 are fourteen projects (just under half) that have with-CER IRRs below the benchmark, some by several percentage points. Yet each of these projects was built. This means that the investment analysis was wrong for each of these projects, since it predicted that these projects would not be built even with CDM revenues. This indicates that something is wrong with the investment analysis or the way it is being performed.

Wind projects

Wind in India is a best case for an accurate investment analysis because of the structure of the industry. As described above, wind power is generally considered a good investment in India in large part because of the tax benefits offered by the central government. As a result of these benefits, a common organizational arrangement for wind development involves an agreement between two sets of actors: a wind manufacturer who identifies and secures a site with good wind resources, and single or multiple investors, most often profitable businesses and wealthy individuals who are relatively unfamiliar with the energy industry but wish to avail of the depreciation tax benefits. The manufacturer typically takes full technical responsibility for the project, signing a supply agreement with the investor for the sale of the wind turbines and land, plant construction, and operations and maintenance.

All of the main costs of the project to the investor are typically well documented in the formal supply agreement prior to construction. In addition, this supply agreement often contains a high-end estimate for the amount of electricity the wind turbine is expected to generate to make the project look attractive to the investor. This high-end figure provides a good conservative choice from the perspective of additionality testing. Also, the tariff for the first ten, thirteen or twenty years of the project is signed into a power purchasing agreement with the utility buying the power. The loan interest rate would be documented in a loan agreement.

An analysis of the seventeen available investment analysis spreadsheets for large registered wind projects in India reveals several undocumented assumption that the developer can include from within a range of reasonable values. Most wind developers sign power purchasing agreements (PPAs) with a state electricity utility for ten or thirteen years, leaving the per kilowatt-hour (kwh) tariff unknown after the end of the PPA period. Most of the seventeen wind investment analyses analyzed here assume that the post-PPA tariff will remain the same after the last year of the PPA. Four assume a substantial drop in the post-PPA tariff. If these projects had instead assumed the post-PPA tariff remained constant after the end of the PPA their IRRs would have been 0.7%, 0.9%, 2.0% and 2.2% higher. Lowering the post-PPA tariffs of the other projects by one rupee per kwh, less than three of the four projects that assume a drop, lowers the IRRs of the projects by 0.5% to 2.2%. Table A-1 in the Appendix describes this analysis in more detail.

Second, one project was validated and registered with a deration rate on the assumed production of electricity. The deration rate represents a decline in the amount of electricity generated by the turbine over time as the turbine ages. Without the deration rate the IRR of this project would have been 0.31% higher.

Third, I describe above how almost all large wind developers in India do not account for the full tax benefits available to them in their CDM investment analysis. Several of the PDDs for these projects explain that the investor is unable to avail of the full depreciation tax benefits because they do not expect to earn enough personal income or profits in other parts of their business to absorb the tax benefits. In some cases this claim too can be difficult to audit because it involves assessing an expectation of future profits in another part of the investor's business or personal income. The ability to take 80% depreciation in the first year of the project changes project IRR by 4-5%.

Together these assumptions can alter expected wind project IRRs by amounts comparable with the 1.7%-2.7% expected effect of CERs, or more in cases with uncertain tax benefits. This analysis indicates that some projects whose expected financial returns are already one or two percentage points above the benchmark could vary these assumptions so to bring the expected financial returns to below the benchmark, and then show that CERs bring the returns back up. The investment analysis would prevent the more viable wind projects in India from registering under the CDM, such as those that are able to take the full tax benefits offered by the government, by requiring cost and revenue values to be taken from the supply, loan, and power purchase agreements, and enforcing the correct application of tax benefits. But this means that in order for the investment analysis to be accurate at this level, the decision to build the project would need to be taken before the start of the CDM application process. That is, the supply, loan and PPA agreements should in place before the PDD is finalized, preventing developers from making sure their project is successfully registered under the CDM before making the decision to build it.

Biomass projects

Developers of biomass cogeneration projects typically manage the projects themselves, rather than contracting out project implementation and operations and maintenance through supply agreements as is commonly done for wind projects. The IRR analysis for biomass projects includes many more undocumented or poorly documented values. Biomass prices in particular have been erratic over the past years due to an absence of a developed supply market (Ghosh et al 2006), rainfall variability year-to-year⁹ and rising demand for biomass from pulp and paper mills and for electricity generation.¹⁰ Assumptions about future biomass prices affect the IRRs of biomass projects that purchase all or part of the biomass used for electricity generation from near-by farms.

I examine the effect of the assumed future price of biomass on the project IRRs of biomass projects in India.¹¹ Three registered and one proposed biomass projects purchase biomass from outside their facilities and make their investment analysis spreadsheets publicly available. These four projects use rice husk purchased on the market to supplement the biomass generated by each facility's own rice or sugar processing, and all are in Uttar Pradesh, the Indian state with the most large biomass CDM projects.

The investment analyses of these four projects forecast that future rice husk prices will be 2650, 1200, 1150 and 700 rupees per metric ton with annual escalation rates of 0%, 4%, 2% and 0% respectively. Increasing biomass prices by 300 rupees and increasing the escalation rate by

⁹ Raised in a number of interviews with developers and consultants of bagasse (sugar cane waste) cogeneration projects.

¹⁰ *ibid.*

¹¹ The idea for doing an analysis of biomass prices comes from Sivan Kartha from the Stockholm Energy Institute.

2%, relatively small changes compared to the variation of prices in these PDDs and those documented in various tariff orders and petitions,¹² decreases project IRR by more than CERs increase it in each of these four projects (see Table A-2 in the Appendix for the details of this analysis). These projects all started construction within a year and a half of one another, and the PDDs were written within a year of one another. So the timing of the project development decision and PDD submission does not explain the large variation in their assumptions about future rice husk prices. Biomass price is only one of many assumptions that can be varied by a developer who wishes to show a lower project IRR in their PDDs.

Hydropower projects

Additionality testing is inappropriate for large hydropower in India for three reasons: the development of hydropower is a government decision, large hydropower developers are guaranteed a specified return on their equity investment making an IRR analysis meaningless, and financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs.

Hydropower development is largely a government decision - The Government of India employs a central decision-making process to determine the development of its rivers, in recognition of rivers as a national resource with multiple competing uses – electricity, irrigation, flood control, fishing, etc. River development is determined through a government planning process involving a range of public and private actors. This planning process identifies potential hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private. The private sector participates in hydropower development mainly by responding to bids put out by state and central state-owned companies.

Additionality testing requires predictable indicators that a project would be built. The investment analysis is appropriate when a project would only be built if its financial returns are above a certain benchmark. The barrier analysis assumes that the building of a project could be predicted by the presence of a prohibitive barrier. Additionality testing is not meant to predict the decision-making of governments involving multiple considerations.

Developers of large hydropower projects in India are guaranteed a certain return on their equity investment - Developers of large hydropower projects (over 25 MW) in India are guaranteed a pre-determined return on their equity investment, typically 14% or 15.5%.¹³ The

¹² Uttar Pradesh's 2009 tariff order for biomass cogeneration projects assumes a 6% annual escalation rate in biomass prices (Uttar Pradesh Electricity Regulatory Commission. 2009. Draft "(Terms and Conditions of supply of power from Captive and Non-conventional Energy Generating Plants) Regulations, 09". , http://www.uperc.org/UPERC%20CNCE%20Order%20%20_Final.pdf and the biomass tariff suggested by the Central Electricity Regulatory Commission uses a 5% annual escalation rate (Central Electricity Regulatory Commission. 2009. (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations. The expected bagasse prices in Uttar Pradesh in these and other tariff orders and petitions vary between 740 and 2300. See also Uttar Pradesh Electricity Regulatory Commission. 2008. *THE MATTER OF: Suo-moto proceeding on procurement of power through competitive bidding and alternative fuel for use of bagasse based co-generation capacity during off-season*. <http://www.uperc.org/Order%20for%20CNCE%20Regulation%202008%20-%201st%20May%202008.pdf>

¹³ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

tariff the developer receives per kwh from electricity sales is calculated on a cost-plus basis and adjusted periodically to ensure that the developer receives the agreed return on equity based on their true costs and revenues. This means that most project costs are “passed through,” returned to the developer through the tariff. Therefore, unlike most electricity generation projects with a fixed tariff, the IRR of large hydropower does not increase if a project generates more electricity or has lower costs, since the tariff will be adjusted to ensure a fixed return on equity. In such a case, is project IRR a good measure for whether or not such a project would be built? Project IRR does vary among large hydropower projects in India, because the costs that determine the tariff differ somewhat from the costs included in the project IRR analysis. Figure 5 presents the differences between the costs that are typically used to calculate the tariff and project IRR.

One key difference between the way the IRR and tariff analyses address cost is that the tariff calculation takes into account loan interest payments whereas project IRR does not. Second, to incentivize efficient plant operation, operations and maintenance (O&M) costs are calculated as 2% of capital costs annually with an annual escalation rate in the tariff calculation, regardless of the actual costs.¹⁴ The IRR would use the actual expected O&M costs. Capital costs are not always fully passed-through, depending on a reasonability check by the appropriate electricity regulatory commission.

Figure 5 – Comparison of cost inputs used in the tariff calculation and the project IRR analysis for large hydropower projects

The tariff calculation is based on:	The IRR analysis is based on:
Interest on loan capital & depreciation	Actual capital expenses at the beginning of the project
Interest on working capital	Interest on working capital
Operations and maintenance expenses at a fixed 2% of capital costs with an annual escalation rate	Actual operations and maintenance expenses
Return on equity, at 15.5% of capital costs	

As a result, large hydropower projects with lower-than-average project IRRs are those that (1) are expected to have a higher ratio of O&M to capital costs such that a portion of the actual O&M costs are not passed through, (2) are judged by regulators to be built or managed inefficiently such that the full capital costs are not passed through,¹⁵ (3) are able to attract *better* loan terms, since loan interest payments are passed through in the tariff calculation, but are not included in project IRR calculations, (4) have longer construction times, which typically is the case with larger projects, projects built under more difficult geological conditions, or projects

¹⁴ For projects commissioned after April 2004

¹⁵ Interviews with hydropower consultants indicate that private hydropower developers that experience costs overruns are typically able to pass through the full actual costs through a higher tariff. Public companies can find it more difficult to get cost overruns passed through in full.

against which there is substantial public protest. Longer construction time lowers IRR because of the way IRR takes into account time. The IRR is the discount rate that could be applied to the project so that the present value of the project is zero, so costs and revenues in the early years of the project affect IRR more than later years. The longer the time between when the investment is made and revenues start to be generated the lower the present value of the project.

Only one of the above four reasons reflects the actual viability of a project and could potentially justify CDM benefits – projects with longer construction times. A high O&M to capital cost ratio and poor project management are not necessarily indicators that a project would not likely be built. *Better* loan terms lower the tariff and therefore also lower the calculated IRR, indicating a lower rather than higher likelihood that a project would be built. Therefore, when the tariff is determined on a cost-plus basis to achieve an agreed return on equity, an IRR analysis is not an appropriate indicator of whether a project would be built.

Investment analyses do not reliably predict project development and actual project costs - In India and throughout the world cost effectiveness has not been a good predictor of the development of large hydropower projects. Large hydropower is often built when it is not the least cost option (e.g. Paranjape & K.J.Joy 1995). Also, a financial assessment of a hydropower is especially difficult given its often large ecological impacts, the multiple competing uses of rivers, and the multiple people who benefit and are harmed by different uses that are difficult to weigh against one another. Further, even a simple financial analysis such as is performed in a CDM investment analysis, ignoring externalities and competing uses of the river, are notoriously inaccurate for large hydropower projects. Of the 81 hydropower projects surveyed for the World Commission on Dams report (World Commission on Dams 2000), the average capital costs were 21% over the predicted costs in real terms, while for some they were much higher. 30% of the projects surveyed by the World Commission on Dams experienced construction delays of a year or more.

For all of these reasons, the CDM's investment analysis does not accurately predict if a proposed large hydropower project would be built.

Is there an objective benchmark that predicts if a project would be built?

Even if the IRR analysis were relatively accurate, the benchmark would also need to reflect whether the project would likely be built for the investment analysis to be accurate. Since the CDM has a relatively small effect on the IRRs of CO₂ reduction projects, typically by 1%-5%, leading to projects being proven additional by even smaller IRR margins, the benchmark has to be reasonably accurate. The latest guidance from the CDM EB on the investment analysis offers four options for determining a benchmark: (1) benchmarks supplied by relevant national authorities (for project and equity IRR), (2) local commercial lending rates (for project IRR), (3) weighted average cost of capital (WACC) (for project IRR), and (4) required/expected returns on equity (for equity IRR).¹⁶ All of these have been used by some of the projects analyzed by this paper. The first option, a government-derived benchmark does not necessarily represent the decision-making of developers, lenders and equity providers. For example, the 16% benchmark commonly used in PDDs for wind projects in India is used by the government to determine promotional tariffs for independent power producers, but are not necessarily the benchmark expectation of investors. The second option, local commercial lending rates, can be too low a

¹⁶ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

benchmark since equity investors generally expect higher returns than the lending rate. WACC, the cost of capital to the developer, is composed of the lending rate for the debt portion, and the returns expected by the equity investors for the equity portion. The fourth option used for equity IRR is simply the expected returns of the equity provider. Of each of these possible benchmarks, the most accurate representations of developer and investor decision-making would be the last two, WACC for project IRR, and the returns expected by equity investors for equity IRR. This is because typically developers will not build a project if the returns are under their WACC and typical equity providers would not invest in a project if the expected returns of the project are under the returns they expect from their investment.

The question then is if the expected returns on equity can be accurately and objectively assessed. The latest CDM guidance on the investment analysis¹⁷ makes the following distinction. A project that could only be carried out by the project proponent, such as the retrofitting of an existing sugar factory or cement plant, would use the WACC specific to the specific company. A project that could be built by many companies, such as a stand-alone wind or small hydropower project, would assess the WACC or expected returns on equity for the whole industry. In the latter case, the expected return on equity would reflect the risk premium associated with the specific type of investment. Both cases have the same challenges. The returns expected by equity investors can be fairly subjective since it involves the assessment of the financial risk associated of the specific project, and an assessment of their other competing investment options at the particular time of the investment. The decision could also be influenced by a range of non-monetary factors or factors that are not easily incorporated into the IRR analysis. For example, it is difficult to assess the financial benefits to a company of the reliability offered by a captive generation unit. Investors might be interested in investing in a project with lower financial returns for a range of reasons, including wanting to invest in a good project in their home community or a community where they want political support, interest in the positive publicity that goes along with doing a green project, or doing business with a relative, etc. The possibility of determining a conservative industry-wide benchmark for expected returns on equity under which projects would most likely not be built for different industries is beyond the scope of this working paper. Challenges associated with this have been raised here.

Allowing the developer to choose among several acceptable benchmarks enables them to choose one that is more advantageous for demonstrating project additionality, rather than one that truly represents the decision that enabled the project to go forward. The Xiaogushan hydropower project (XHP) in China presents a good example of this.¹⁸ The project was registered as a CDM project on the basis of having an IRR under the government defined benchmark of 8% for power projects. However, the Asian Development Bank, in its evaluation of the project, describes the project as the least cost project in the entire province.¹⁹ It also states that the project is financially viable because its financial IRR (FIRR) of 7.5% “is compared against the post-tax company WACC of 4.53%. Since the FIRR is higher than the WACC, the XHP component is financially viable.”²⁰ While the developer argues in the PDD that the project is unviable because the expected IRR is under the government-defined benchmark, the Asian

¹⁷ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

¹⁸ I worked out this example together with independent television news producer and journalist Janet Klein.

¹⁹ Asian Development Bank. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Gansu Clean Energy Development Project*

²⁰ *ibid.*, p 16

Development Bank states that it decided to lend to the project because the IRR is over the WACC of the company.

5.3 Summary and discussion

Even the best case for an investment analysis – wind projects in India – in which all of the main inputs into the financial assessment are documented, there is still some room to vary assumptions within ranges equivalent to the effect of the CERs in some cases. For most other project types there is much more room for manipulation of cost inputs. The choice of the biomass price for biomass projects in India is one example. The hydropower example suggests that it is important to look at the specific conditions under which technologies are developed to determine if the investment analysis is appropriate for that specific technology. For several independent reasons, large hydropower in India is inappropriate for additionality testing. Multiple factors involved in project development decisions and the subjective nature of project risk assessment seem to preclude a single accurate benchmark for most projects that is meaningful within the relatively small improvements carbon credit revenues have on the IRR of CO₂ reduction projects. Both the IRR analysis and the benchmark IRR are adjustable in tandem. In conclusion, an accurate project-by-project additionality test is impractical for CO₂ reduction projects, and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

6. The CDM has little influence on project development: the effects of uncertainty and the long CDM registration process

Even if the CDM is unable to filter out business-as-usual projects, does it at least enable projects to go forward that otherwise would not? This section explores how the combination of uncertainty and the long registration application process compromises the effects the CDM could have on unviable or marginally viable projects (the types of projects the CDM is designed to support).

6.1 Risks associated with CDM registration and CER value

The CDM is anticipated to improve the financial returns, measured in terms of IRR, of the projects analyzed for this paper by 1% to 6% according to their PDDs. The CDM typically does so, not through assured upfront payments directly providing project financing, but as an additional revenue stream through the lifetime of the project. In the small proportion of cases in India when CER buyers do offer upfront payments to the project developer, these payments come at a substantial discount per CER generated by the project, often between 40% to 75% of the spot market price for carbon dioxide projects, almost always signed after the project has been successfully registered, and only for credits to be generated up through 2012. The CER revenue stream involves a number of uncertainties, which diminish the value of the CERs at the time that development, lending and investment decisions are being made:

Validation risk: Validators reported at the end of September 2009 that they cumulatively rejected 581 projects.²¹ This is compared with 2,188 projects that have been submitted for registration with positive validations, putting the risk of a negative validation at approximately 21%. We do not know the total number of projects that received positive validations but which have not yet been submitted for registration, implying the validation risk is lower than 21%. On the other hand, validators regularly decline validation requests when they believe the project will most likely not pass validation, implying a higher validation risk for projects that start construction before contracting a validator.

Registration risk: Approximately 5.5% of all projects submitted for registration were rejected by the CDM Executive Board, and at present another 7% are undergoing a review process after not being accepted upon submission.

CER price risk: Once a project is registered, there is uncertainty regarding the value the carbon credits will have once issued. To give some sense of CER price variability, between January 2007 and October 2009, secondary CER prices fluctuated between a high of 23 Euro in June 2008 to a low of 11.5 Euro in October 2009.²² China is mitigating some portion of the CER price risk by implementing a minimum CER price for primary CERs purchased from CDM projects in China.²³

CER value post-2012: At the time that this paper was written, we still did not know the structure of the post-2012 regime and how CER credits can be used under it. There is much uncertainty about the value these credits will have post-2012.

In late 2006 a bank representative expressed his expectation that over time, as banks become more familiar with the CDM, and as more experience is gained with the registration of different types of CDM projects, that his and other banks would start to take carbon credits into account in their loan appraisals. By 2009, the uncertainties associated with the CDM have increased, rather than decreased. Interviewees in 2009 expressed frustration with the increased complexity and time involved in the CDM application process, their perception that the EB's efforts to strengthen the system has led to frequent changes in the CDM requirements and rules, and that the EB is inconsistent and arbitrary in their decisions to reject and review projects. An increase in the number of rejections and reviews, especially over the last year, has also increased uncertainty and risk.

6.2 What does the timing of project development and the CDM application process indicate about the influence the CDM is having?

In light of this uncertainty, the order in which project developers start project construction and submit their projects for CDM validation and registration provides some insight into the effects the CDM is actually having on project development decisions. The process of submitting a project for registration under the CDM, from the start of validation through registration, was seventeen and a half months on average for all CDM projects registered since

²¹ Data taken from UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009
<http://www.cdmpipeline.org/>

²² CER prices are taken from PointCarbon's CDM & JI Monitor. Secondary CERs are CERs that were already purchased from the project developer, and are being sold for a second time, often to the end user of the credit.

²³ China's CER price floor is 8 Euro. Prices of CERs bought directly from the developer, called primary CERs, are below those of secondary CERs because of their additional risks.

the beginning of 2008.²⁴ It typically takes at least another year before the first credits are issued. Developers must either wait over a year to assure that their projects are successfully registered under the CDM before going forward with the projects, or accept the risk that their projects will not be successfully registered when deciding to go forward with the project. A commonly expressed sentiment among developers was that they cannot put their project on hold for the long CDM review period since it would be too disruptive to the project to do so.

As of October 1, 2009, approximately three-quarters of all registered CDM projects were operational at the time they were successfully registered under the CDM.^{25 26} This means that a higher proportion had started construction before registration. Further, 66 out of the 70 projects I analyzed for this paper started construction before the beginning of the 30-day public comment period, which typically happens in the first few months of the validation process.²⁷ This indicates that many developers start construction, including acquiring project financing, signing a power purchasing agreement with the government electricity utility, etc., before starting the validation process.

This timing indicates that project developers are not treating the CDM as a part of the necessary financing needed to go forward with a project, and are willing to accept the risk that their projects would not receive CDM revenues. This timing also means that developers probably do not see the CDM as important in helping them acquire a loan or attract investment equity, for if they did, many more developers would start the CDM application earlier, so that if they run into trouble attaining a loan or attracting investment, a positive validation or registration under the CDM could give a boost to the perceived viability of the project. This does not necessarily prove that the CDM is not having an effect on project development decisions. Certainly developers, lenders and investors could be taking the expected but uncertain revenues from the CDM into account when evaluating the viability of a project. The timing does indicate that revenues generated through the CDM are at best having a weak effect. This effect could be strengthened if CER revenues were more certain, and/or if the CDM application process were much shorter.

Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. The uncertainty at that time regarding whether the CDM would exist as a working mechanism, or how it would work when it did, makes it extremely unlikely that the

²⁴ Calculated from the Risoe CDM Pipeline database as the difference between the “date of registration” and the “comment start” date. The comment start date is the date when the validator began the 30-day public comment period. The public comment period generally comes within the first few months of the validation process. Prior to the start of validation, the developer must write the PDD, which involves additional time.

²⁵ Using data from the UNEP Risoe CDM pipeline database, as of October 1, 2009, 79% of all registered CDM projects have “Credit start” dates equal to, or earlier than, the “Date of registration.” A review of over one hundred PDDs confirms that almost all projects were commissioned on or before the credit start date, suggesting that it is reasonable to estimate that at least three-quarters of all projects were completed at the time of registration.

²⁶ These projects are expected to produce 56% of CERs through 2012 if all registered CDM projects generate the number of credits predicted in their PDDs. The reason the percentage of credits (56%) is lower than the percentage of projects (79%) is that most of the projects that are expected to generate the most CERs – HFC and N₂O projects – are expected to start generating credits at least several months after their date of registration and so are not included in these percentages.

²⁷ The construction start date was taken from the PDDs. The beginning of the 30-day public comment period is listed in the UNEP Risoe CDM pipeline database as the “comment start” date. Typically the validator puts the PDD up for the public comment period in the first few months of validation.

CDM had much effect on these development decision. Two of these projects were registered within the last year.

The claim that the CDM is having very little effect on project development is also supported by the interview responses mentioned above. Particularly, banks seem not to take CERs into account in their decisions to lend to a project because of the uncertainties associated with CDM registration and CER generation. Consultants and developers commonly describe CER revenues as “cream on the top,” and describe developers as building projects on their own merits, not because of a small and uncertain benefit from CER sales.

6.3 Discussion

A high proportion of the risk, time and cost of the CDM application process is associated with additionality testing. PDD consultants and validators describe that a large portion of the time spent writing the PDD and validating the project are devoted to the additionality section. Additionality is the cause of most reviews and rejections by the EB, and is also the most common reason projects do not pass validation.²⁸

Project-by-project additionality testing adds time and uncertainty to the CDM application process, compromising the ability for CERs to influence project development decisions. Additionality testing is also only effective at filtering out some of the most clearly non-additional projects. Therefore, another more effective and predictable means of targeting projects and activities that actually reduce emissions is necessary.

7. Taking a step back: The fundamental structure of the CDM, in certain other ways, leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, a number of other structural flaws also contribute to the over-generation of credits and weaken the effectiveness of the CDM at supporting projects in real need of support.

Supporting projects in the wrong order - In the power sectors of India, China and other countries, plants are often planned for many years before they are actually built. Hydropower and wind sites are often developed in the order of their attractiveness in terms of resource availability, proximity to demand centers, etc. The Indian government is actively supporting renewable energy and energy efficiency mainly for energy security reasons. From the perspective of most effectively developing these sectors, it makes sense to accelerate the pace at which plants are built, building the most cost effective ones first and supporting current domestic efforts to do so. Instead, the CDM is structured to change the order in which plants are built. Plants that are cost effective are considered “non-additional” while only plants that are less desirable are eligible.

Trade off between project viability and the over-generation of credits - The CDM should result in reductions in emissions in a developing country at least as large as the credits it generates. Once registered, CDM projects are allowed to generate credits for 10 years, if they choose the single credit period option, or 21 years if they choose the 7-year crediting period and renewal

²⁸ Interviews with validators

option. This means that in theory, projects should only register under the CDM if they most likely would not otherwise have been developed for the full crediting period – 10 or 21 years. This would support the development of a portfolio of undesirable projects – the problem mentioned just above. In practice, the PDD requires that projects be tested for additionality at the time of validation only.²⁹ Projects are therefore able to generate credits for 10 or 21 years even if they would have been built within that period, producing more credits than actually emissions avoided by the CDM project.

Improving the profitability of harmful projects - Crediting emissions reductions rather than charging emissions producers such as through a carbon tax could improve the profitability of projects with negative environmental and social impacts. Examples include many large hydropower projects, clean coal, and HFC destruction in HCFC-22 production facilities. HFCs, a potent greenhouse gas (GHG) regulated under the Kyoto Protocol, is a byproduct in the production of HCFC-22, a temporary substitute for CFCs as a refrigerant. Due to the very high global warming potential of HFCs – 11,700 times that of CO₂ – the value of the CERs generated from HFC reduction projects can exceed the profits from the production of HCFC-22 itself, making HCFC-22 production profitable even without selling the HCFC-22 (Wara & Victor 2008). HCFC-22 is an ozone depletor being phased out under the Montreal Protocol, 5% as potent in depleting the ozone layer as CFCs. An international agreement, with financial support to developing countries, would be a more appropriate way to reduce HFC production from HCFC-22 plants than the current CDM process, which overpays the cost of the HFC burning equipment by 47 times (Wara & Victor 2008). Regulations are in place preventing CDM credits from being generated by new HCFC-22 production facilities, or the expansion of existing ones. Still, the CDM creates substantial disincentives for HCFC-22 plant phase out, in direct contradiction with the goals of the Montreal Protocol.

Perverse incentives - One of the early criticisms of the CDM is that it could create perverse incentives for government or the private sector to refrain from implementing policy and taking action to reduce emissions. The need to measure actual emissions against a baseline – a future scenario describing what would likely have happened without the CDM – creates incentives to maintain a high baseline in order to later generate higher amounts of credits per project. Going back to the HCFC-22 example, if a country imposes regulation requiring HCFC-22 production facilities to destroy the HFC gas byproduct, facilities might no longer be able to generate the substantial income from the sale of carbon credits, causing a significant disincentive for such regulation. Of concern is the extent to which the CDM is impeding decarbonization because of perverse incentives that dissuade governments from enacting climate-friendly policies.

Limited in scope - The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated, and excludes project types which may have a higher GHG abatement potential at lower cost, but for which emissions reduction estimations are especially complex or uncertain. The CDM is not structured to support many efforts necessary to decarbonize sectors and affect a large-scale deployment of clean technologies – policies, R&D, demonstration projects, information dissemination, etc, because measuring emissions reductions from these efforts may be difficult or infeasible. The dissemination of technologies, such as

²⁹ This decision was clarified in the report from Executive Board Report 43, from the 43rd meeting of the CDM Executive Board, 22 - 24 October 2008, http://cdm.unfccc.int/EB/043/eb43_repan13.pdf

bagasse cogeneration in India, can be limited by multiple barriers requiring a number of different and parallel support efforts simultaneously and over time, many of which could not be supported through a project-based offsetting mechanism (Haya et al 2009). Efforts to affect sectoral change are often best done in the context of an integrated planning process in which multiple goals and interests are addressed together (Halsnaes et al 2008). Revenues from the generation of carbon credits could be only one part of a much larger set of support efforts for both sectors and specific technologies.

8. The large-scale use of offsetting credits poses challenges to near and long term climate change mitigation

Even if we manage to design an international offsetting mechanism that effectively reduces emissions and accurately credits them, what effects does large scale offsetting have on global efforts to mitigate climate change over the next decades? Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, still corresponds with a 2.0-2.4 degree Celsius temperature increase (Box 13.7 from Gupta et al 2007, Table SPM.6 from Intergovernmental Panel on Climate Change 2007). These scenarios correspond with reductions in developing countries by 15% to 30% below business-as-usual growth projections by 2020 (Höhne & Ellermann 2008). Even deeper reductions would be needed globally if we wish to have a high likelihood, rather than an almost 50% chance, of not exceeding a two degree increase. Further, since these scenarios were published, additional research suggests that climate sensitivity (the increase in radiative forcing resulting from the increase in GHGs in the atmosphere) is higher, and feedback effects even greater than the assumptions used to produce the IPCC scenarios (McMullen & Jabbour 2009).

Industrialized countries are proposing high levels of offsetting post-2012, which if used, would put these countries far away from the 25%-40% reductions by 2020 from the IPCC scenarios. At the time this paper was written, the EU was proposing to cut its emissions by 30% below 1990 levels by 2020 within the context of an international agreement, allowing 68% of those reductions to be met through international offsets.³⁰ If all of these offsets are used, the EU would achieve a less than 17% reduction compared to 1990 levels by 2020. In the US, a prominent draft climate bill, the Waxman-Markey American Clean Energy and Security Act of 2009,³¹ would require the US to cut its emissions to 4% below 1990 levels by 2020. This bill allows up to two billion tons of CO₂ as offsets, equal to 28% of its 2005 emissions, allowing a half to three-quarters of these, depending on the availability of domestic offset credits, to be from international sources. The international portion, if used in full, would allow the US to postpone making any reductions in its emissions from current levels until 2020 to 2024. This postponement would be even longer if some portion of domestic offsets is non-additional.

Two justifications are commonly given for high quantities of offsets. The first is simple market efficiency. Trade in emissions reductions allows industrialized countries to reduce

³⁰ Hanley N. 2009. *EU Climate and Energy Package, December 2008*. Presented at the Energy and Resources Group, University of California, Berkeley. *March 18*. The package recommended 50% of all reductions in the ETS, covering approximately 40% of EU emission, can be met with foreign credits and 80% of reductions in non-ETS sectors can be met with foreign credits.

³¹ <http://www.govtrack.us/congress/bill.xpd?bill=h111-2454>

emissions less expensively than if they were required to reduce them domestically. Second, by providing low cost compliance options, offsets help bring buy-in from domestic industries, making it easier and more likely for industrialized countries to accept deeper targets than they would have otherwise.

However, large-scale access to these potential lower-cost compliance options also introduces risk to present mitigation efforts and would most likely make climate change mitigation more difficult in the future. First, domestic reductions are more certain than international offsets.³² Any country has more knowledge about and control over activities within its own borders than it does for projects and activities which it funds elsewhere. Also, measuring emissions, as is done in a cap-and-trade program, is easier than measuring reductions in an offsetting program, as described in detail above. As such, offsets introduce various uncertainties regarding the amount of emissions reductions they actually represent. Any offsetting in developing countries, whether it is project-based or sector-based, involves measuring emissions against a BAU growth scenario, which is inherently uncertain, and politically difficult to set at a low level.

Second, cap-and-trade weakens incentives for innovation by allowing a larger portion of compliance to be met with existing and low cost technologies (Driesen 2003). Decarbonization to 80-95% below 1990 levels by 2050 in industrialized countries will require major shifts in all high emitting sectors. Transportation, the electricity sector, buildings, and agriculture all involve complex systems. Major shifts in each of these sectors requires time to allow for changes in behavior and in support industries, for experimentation and learning, research, development and deployment, etc.

The high level of offsets allowed could easily place the majority of global reductions up to 2020 in developing rather than industrialized countries. In the context of meeting the global reductions suggested in the IPCC scenarios, if 50% of all Annex 1 reductions are made through offsets (remember that the EU and the US are proposing substantially higher than that as upper limits) and that these offset projects are performed in addition to the suggested 15%-30% decrease from BAU in developing countries, then around 70% of all global reductions through 2020 would likely come from developing countries rather than the high per capita emitters.³³

If industrialized countries postpone domestic reductions as they are proposing through the use of offsets, they are either committing to steeper annual reductions in the future, or to long-term inequalities in emissions in the North and the South. Both options make future cooperation more difficult. In industrialized countries, a gradual migration of infrastructure is likely to be less costly than rapid transitions that could require retiring technology and infrastructure before the end of their lifetime. If the costs of mitigation are expected to be high, there will be more resistance from industry.

In addition, a high future dependence of offset credits from developing countries poses compliance risks on industrialized countries. The further actual domestic emissions are in an industrialized country from their targets for a given commitment period through the help of offset credits, the harder it will be for that country to commit to meaningful reductions in the following period. Large quantities of offsets might make it easier for industrialized countries to

³² Here offsets refer to credited emissions reductions generated by any activity whose emissions are not capped under a cap-and-trade program.

³³ Reductions are defined here as reductions from the Kyoto Protocol caps for industrialized countries, and reductions from BAU in developing countries.

take on deeper commitments now, but could also make it harder for them to accept deeper targets in the future.

We live in a world with a widely shared linear view of development and progress (Norgaard 1994). Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of consumption from the North. The discourse of development used by the World Bank is also used by country governments, and is disseminated through participants in and those affected by World Bank projects. Developing country citizens have learned that they are “backwards” and “underdeveloped” (Escobar 1995, Gupta 1998). Rural electrification has allowed more and more people to view western lifestyles on TV, and TV commercials spreading a culture of consumerism and awareness of not having (Jacobson 2004). Development in India is highly status driven – beyond getting out of poverty is a pursuit of symbols of high status, such as a big car and a new cell phone. In a world dominated by a single vision of “progress” sustainability requires changing the image of what “developed” means. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

Advanced developing countries are being asked to join the global community in accepting obligations to mitigate their emissions below BAU growth projections. Will developing countries commit to controlling the growth in their already low per capita emissions if it is clear that there is relatively little willingness in the industrialized world to reduce their much higher per capita emissions? Developing countries will need to make voluntary reductions before it is fair, given how quickly we need to reduce globally. This can happen only in a regime built on trust and mutual cooperation. Politically, it will be unlikely that developing countries will take calls for global cooperation seriously, if industrialized countries do not take on commitments to curb their own emissions as prescribed by the IPCC.

9. Discussion and conclusions

Industries in industrialized countries are putting pressure on their governments to provide options for controlling costs of compliance with post-2012 emissions limits. The CDM is currently seen as a legitimate way to do so. The CDM also provides a way to engage the private sector in climate change mitigation in developing countries. The private sector is seen as well poised to find efficient and innovative options for reducing emissions, while avoiding some of the concerns over funds – corruption, lack of accountability, conditionality and traditionally donor-weighted decision-making. There is also an interest in taking advantage of existing institutions, rather than disbanding them and starting anew. The CDM was promoted with numerous trainings, workshops and promises, and has attracted many new players and new interest into the clean energy, energy efficiency and other low-emitting industries in India and elsewhere. Admitting the CDM was largely a failure could dampen interest in the next instrument.

Researchers and policy-makers have sought ways to reform the CDM to retain these benefits while improving its environmental integrity. In weighing the pros and cons of various options, we need to honestly assess the possibility of improving the environmental integrity of the CDM as a project-based offsetting mechanism, as well as what we need to do in the next commitment period to be on a path towards a high likelihood of not exceeding a global two degrees temperature increase.

A purpose of this paper is to examine the possibility of substantially improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism. This paper shows that reasonably accurate project-by-project additionality testing is infeasible given the subjectivity involved in project development, investment and lending decisions. The need to do a test that is fundamentally difficult and inaccurate is disabling the CDM from being able to support truly additional projects, because of the complexity, uncertainty and time it adds to the CDM application process. As a result, the majority of CDM projects, and a large majority of CDM CO₂ reduction projects, are non-additional, evidenced by a range of analysis presented in this paper. Beyond additionality, the CDM is structured to either over-credit, or support a portfolio of projects that would otherwise be unviable for 10 or 21 years. Neither are good options. Because of the challenge of measuring emissions reductions from specific projects, the CDM is unable to support many measures needed, and sometimes more cost effective, for the deployment of technologies and decarbonization of sectors, such as policy, research and development, demonstration projects, and information dissemination. The CDM can also have the opposite effect, creating perverse incentives against the implementation of policy and for delaying the implementation of projects so that developers are able to maintain a high baseline against which to prove additionality and generate CERs. Even if the environmental integrity of the mechanism were ensured, large scale offsetting introduces various challenges to global climate change mitigation efforts over the next decades, especially considering the very weak post-2012 targets being proposed by industrialized countries.

Any post-2012 offsetting program will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

This could possibly be accomplished through small, targeted offsetting programs designed to help decarbonize specific sectors and promote specific technologies. Such programs could be custom designed through industrialized-developing country partnerships, at national or sub-national levels, to address what is needed to control emissions and promote technologies in their specific local contexts in line with domestic priorities and the expertise the industrialized country can offer. As opposed to the current CDM, such programs can involve multiple coordinated components, some credited and some not credited, that work together to address the barriers and support needs facing a technology or a sector. These programs would require a commitment to cooperate over many years. Additionality would still be a concern for such a program but would be more easily managed than with the CDM. Under the CDM, developers initiate projects, and the CDM EB and other CDM governance bodies mainly respond when projects and methodologies are submitted to them. As described above, it is very difficult to distinguish additional from non-additional projects individually. In contrast, under the offsetting program suggested here, the administrators of the program actively initiate projects and programs based on analysis as to how their involvement could lower emissions.

Experience so far with the CDM does not bode well for the political feasibility of such an approach. We have seen little indication that countries will agree to an offsetting mechanism that is small enough, targeted enough, and with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. So far offsetting has not been effective and imposes uncertainty on global climate change mitigation efforts. Attention must be refocused on reductions in countries with emissions caps, with non-

credited support for mitigation efforts in developing countries. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

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APPENDIX: Figures and tables

Figure A-1: The CDM Project Pipeline Step-by-Step

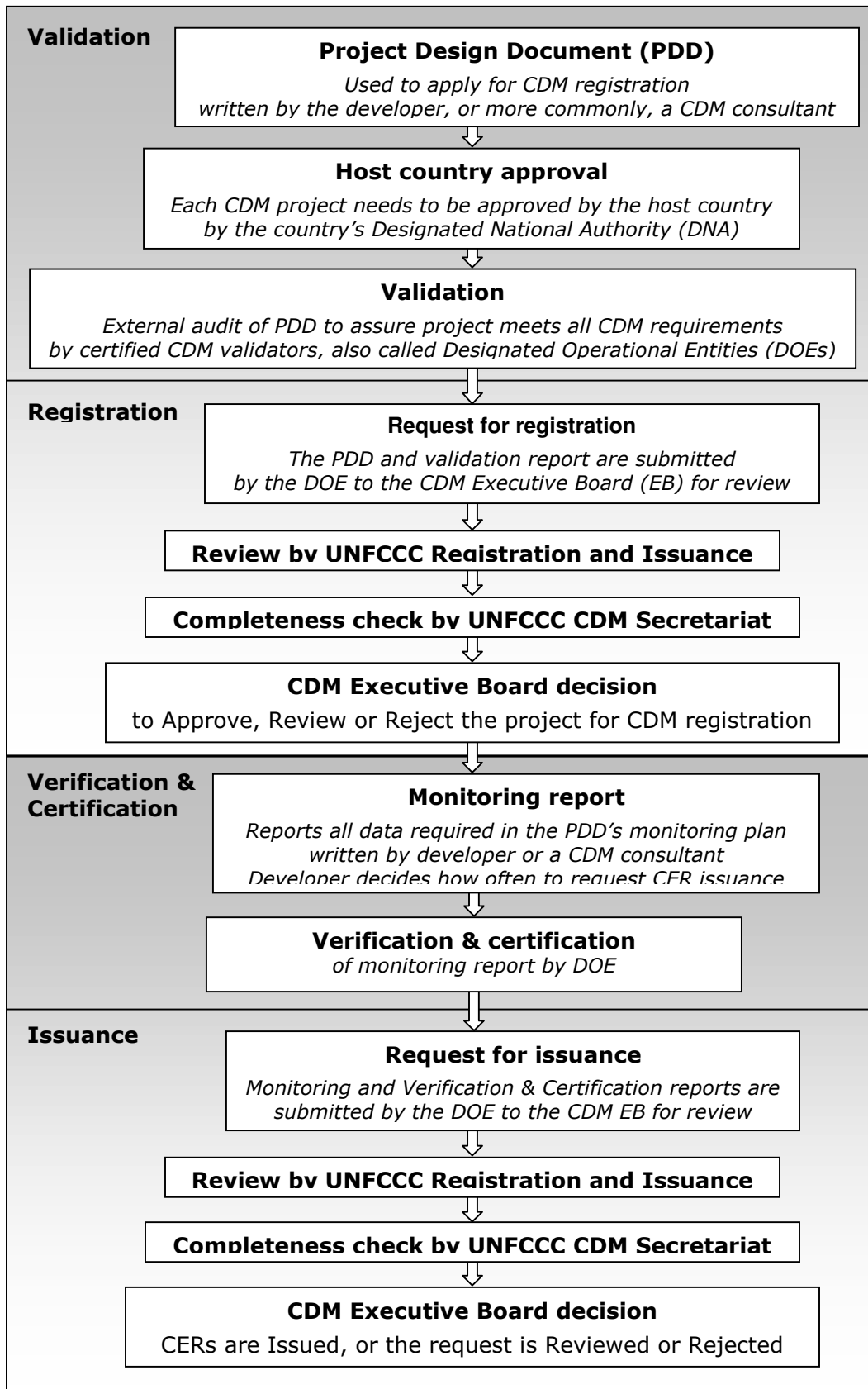


Table A-1 – Effects of the choice of post-PPA tariff and a deration rate on wind project financial returns

Project name	State in India	PPA length (years)	Tariff in year 1 (rp/kwh)	Tariff escalation rate? (rp/yr)	Tariff after end of PPA (rp/kwh)	Tariff escalation rate after end of PPA?	Deration rate?	Change in IRR from	
								Lower tariff 1 rs/kwh after end of PPA or increase to last PPA year ^b	5% deration rate in year 11
Bundled wind energy power projects (2004 policy) in Rajasthan	Rajasthan	13	3.25	0.06 through year 9	3.79 - same as last PPA year	--	--	-0.80%	
22.5 MW grid connected wind farm project by RSMML in Jaisalmer	Rajasthan	10	3.32	0.06	3.92 - same as last PPA year	--	--	-1.12%	
75MW wind power project in Maharashtra by Essel Mining Industries Limited	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.26%	
Wind power project by GFL in Gudhepanchgani	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-0.49%	
40 MW Grid Connected Wind Power Project	Maharashtra	13	3.5	0.15	3.89	2.50%	--	0.71%	
Wind Electricity Generation Project	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.07%	
NSL 27.65 MW Wind Power Project in Karnataka	Karnataka	?? ^a	3.1	--	3.1	--	--	-2.20%	
Tungabhadra wind power project in Karnataka	Karnataka	10	3.4	--	Varies, 1.89 is average	--	--	2.03%	
Enercon Wind Farm (Hindustan) Ltd in Karnataka	Karnataka	10	3.4	--	Varies, 1.82 is average	--	--	2.23%	
29.7 MW Wind Power project in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.52%	
Wind power project by HZL in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.59%	
42.5 MW Wind Power Project by VRL Logistics Ltd. In Karnataka State	Karnataka	10	3.4	--	3.06	--	-5% in year 11	0.90%	-0.31%
24.8 MW Wind power project by Belgaum Wind Farms Private Ltd. in Gadag, Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.46%	
150 MW grid connected Wind Power based electricity generation project in Gujarat	Gujarat	13	3.37	--	3.5	--	--	-0.81%	

^a The PPA length is not mentioned in the CDM project documentation. This analysis assumes a 10 year PPA, the same as the PPAs for the other projects in Karnataka.

^b Values in boldface indicate cases where the developer chose a post-PPA tariff lower than the tariff in the last year of the PPA. For this analysis, the post-PPA tariffs of these projects are brought up to the tariff in the last PPA year, rather than reduced an additional one rupee

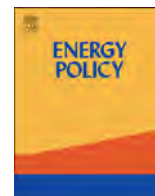
Table A-2 – Effects of biomass price on biomass project financial returns

Project name	CDM Status	PDD Date	Start project construction	Rice husk price in first year Rs./ton	Rice husk price annual escalation rate	Change in IRR or DSCR ^a		
						From CDM	+200 Rs./ton & + 2% esc rate in rice husk prices	+300 Rs./ton & + 2% esc rate in rice husk prices
Rice husk based Co generation project at Dujana unit of KRBL Limited	Registered	Jan-08	Oct-05	2650	0%	0.45	-0.41	-0.53
15 MW Biomass Residue Based Power Project at Ghazipur	Requesting registration	Nov-08	Dec-06	1200	4%	7.86%	<-10%	<-10%
DSCL Sugar Ajbapur Cogeneration Project Phase II	Registered	Feb-07	May-05	1150	2%	7.11%	-7.91%	-10.70%
KM RE project	Registered	Jan-07	Feb-06	700	0%	8.07%	-5.83%	-8.34%

^a DSCR (Debt Service Coverage Ratio) is a common financial metric used by banks to assess loan applications. A DSCR of less than one means that annual project revenues are less than the annual debt service. Here, the first project uses DSCR to measure project viability, and the other three use project IRR.

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Addressing carbon Offsetters' Paradox: Lessons from Chinese wind CDM



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HIGHLIGHTS

- We investigated 143 Chinese wind CDM projects by the eruption of the additionality controversy.
- We examined the application of additionality in the Chinese wind power market.
- We drew implications for the design of effective global carbon offset policy.
- The underlying structural flaws of CDM, the Offsetters' Paradox, was discussed.
- We charted a reform path that can strengthen the credibility of global carbon markets.

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ABSTRACT

The clean development mechanism (CDM) has been a leading international carbon market and a driving force for sustainable development. But the eruption of controversy over offsets from Chinese wind power in 2009 exposed cracks at the core of how carbon credits are verified in the developing economies. The Chinese wind controversy therefore has direct implications for the design and negotiation of any successor to the Kyoto Protocol or future market-based carbon regimes. In order for carbon markets to avoid controversy and function effectively, the lessons from the Chinese wind controversy should be used to implement key reforms in current and future carbon policy design. The paper examines the application of additionality in the Chinese wind power market and draws implications for the design of effective global carbon offset policy. It demonstrates the causes of the wind power controversy, highlights underlying structural flaws, in how additionality is applied in China, the Offsetters' Paradox, and charts a reform path that can strengthen the credibility of global carbon markets.

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1. Introduction

The clean development mechanism (CDM) set by Kyoto Protocol is the leading international carbon market which allows developed countries to meet their mitigation commitments by financing emission reductions in the developing world (UNFCCC, 1997). Project based CDM is seen as an important mechanism to achieve global sustainable development by fostering clean energy development in developing countries and cost-effective reduction of greenhouse gasses in developed countries (Olsen, 2007), and typically allows for nations with emissions commitments to invest in greenhouse gas mitigation projects in host countries without commitments.

International carbon finance has provided a significant boost to Chinese wind development. China's installed wind capacity has been growing at an unprecedented pace, the total installed capacity has reached 75.5 GW as of the end of 2012 (CWEA, 2013). CDM first provided finance for Chinese wind in 2005, and we estimate that about 32% of China's total wind capacity of 25.1 GW has benefited from CDM finance through 2009 (CREIA, 2009).

One of the central criteria used to evaluate CDM projects is "additionality", which is defined as carbon offset payments result in "real" emissions mitigation that "would not have happened otherwise" (UNFCCC, 2006). Controversy over the CDM projects is not new. There have been concerns about the additionality and the economically efficiency of industrial gas projects, for example trifluoromethane (HFC-23), which is inexpensive to cut but received payments via the CDM which may have been many times more valuable than the gas being produced, creating perverse incentives. Scholars have argued that such projects therefore

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undermine the effectiveness of CDM (Wara, 2007). But other types of projects, such as renewable energy projects, are usually viewed as comparatively higher quality with lower risk of “non-additionality” or economic inefficiency.

The questionable additionality of many CDM projects has become a central issue in the CDM discussion (Paulsson, 2009). Haya (2010) examined hydro CDM projects in India, and found that there is no accurate verifiable indicator of whether CO₂ reduction projects would be built without the CDM. Those concerns raise the incentive problems created by asymmetric information, include adverse selection and moral hazard, in the offset markets (Bushnell, 2010). However, the implementation of CDM in China is less discussed, and the impact of how and whether CDM might interface with domestic policy and regulatory regimes is not seen in the existing literature.

However, this issue came to a head when the CDM Executive Board (CDM EB) shocked the carbon market by forcing an unprecedented review of whether Chinese wind projects satisfied UNFCCC additionality requirements and then rejected 10 Chinese wind CDM from registration in 2009 (CDM EB, 2009a, 2009b). CDM investors were shocked as the safest CDM bet became the riskiest; the Chinese stakeholders publicly attacked the UN's oversight of carbon markets and criticized the decision “unfair” and “non-transparent” (10 Chinese Wind Power Project, 2009); and the CDM EB prepared itself for an unprecedented fight over how carbon offsets could be verified in the world's largest CDM market. In 2010, the EB's 52nd meeting saw two of the ten wind projects registered after clarification, but the remaining eight projects were rejected (CDM EB, 2010). We call the controversy along the additionality of Chinese wind CDM project the “Chinese wind controversy” (controversy for short).

Additionality is the concept employed to verify that credits for carbon reductions are not payments for business as usual (BAU) (UNFCCC, 2001). Additionality is at first glance a simple counterfactual, but proving a counterfactual is not easy (Haya, 2010; Schneider, 2009; Sutter and Parreño, 2007; Wara and Victor, 2008). The CDM's “additionality tool” attempts to do this by comparing the financial returns of all possible investments, with the logic that businesses will invest in the projects with the highest projected internal rate of return (IRR) (CDM EB, 2008). Project developers wishing to receive CDM credits must demonstrate that the proposed CDM activity is not the most profitable (has lower IRR) when compared to a BAU investment scenario (which might be a coal plant in China, for example), but that with CDM finance it becomes competitive with the alternative investments. Two conditions are necessary for the IRR comparison to be a credible indicator of additionality: (1) the selected baseline that wind is compared to must represent actual BAU in the relevant market, and (2) IRR must be a credible indicator of behavior and investment patterns in the relevant market. As we will show, there are serious problems meeting either of these conditions for Chinese wind because of the complex structure of China's power market.

At the center of the controversy was the concern that the Chinese government might be manipulating power tariffs in order to guarantee additionality and subsidize domestic renewable energy development with carbon finance. If it were, the credibility of the CDM in its largest market would be crippled. It is important to note that the challenges of CDM project validation in China are relevant in most of the developing world. A solution to the controversy is therefore imperative – not just for CDM investment in China – but for preserving the credibility of offsets as a global mitigation regime. In addition to EU Emission Trading Scheme (ETS), the major carbon offsets buyer, national or sub-national schemes are already in place in Australia, New Zealand, Japan, the U.S., Switzerland and Canada, and are planned in South Korea and Brazil (Promethium Carbon, 2013). China has also opened its pilot carbon trading program in June 2013. The

potential for these programs to allow international credits as offsets in national or sub-national carbon pricing schemes and to meet mitigation targets are under discussion. The lessons and experiences from CDM will be essential in the development of standards and procedures among those emerging carbon policies and ETSs around the world.

Yet despite the best efforts of developers, Designated Operational Entities (DOEs), and the EB to address this problem, a comprehensive solution has so far remained elusive. In trying to decide whether the Chinese government was setting artificial power tariffs to “game” additionality, the EB initially suggested a rule which would compare power tariffs for new projects to the highest historical tariffs. Thus if new tariffs were significantly below historical tariffs, the thinking was that this could be an indication of manipulation. However such approaches are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005, and there exist numerous market-based reasons for altering the tariffs. Thus applying the “additionality tool” to compare power tariffs for new projects to the highest historical tariffs are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005 (CDM EB, 2008; CREIA, 2009; Li and Gao, 2008), making such comparisons obsolete in a rapidly changing market. The wind industry of 2005 looks very little like the wind industry of 2012. But more importantly, focusing so narrowly on the question of historical tariffs risks missing the forest for the trees. One central question and challenge to solve the Chinese wind controversy is how can the CDM reliably separate the impact of domestic regulations and policies from that of international carbon finance?

The paper addresses this essential question, utilizing a detailed analysis of all Chinese wind projects registered through 2009 when this controversy erupted. First, we demonstrate the structural dependency of IRR-based additionality in state-controlled power sectors on host country regulators. This dependency simultaneously gives host countries control of additionality outcomes while preventing additionality verification by the UN, and is a major cause of such problems. Second, we argue that the available evidence does not suggest that China games the CDM. Finally, we argue that the CDM must upgrade its policy to deal with the reality of power markets where additionality is inherently impacted by domestic policy. However, this challenge presents a paradox for climate policy makers that must be weighed carefully.

2. Data and methods

Data used in this paper was extracted and compiled by the authors from the project design documents (PDDs), investment analysis spreadsheets, and validation reports which are used for CDM project registration provided through the UNFCCC CDM official website (<http://cdm.unfccc.int/Projects/projsearch.html>). PDDs are the key documents involved in the validation and registration of CDM project activities submitted by project developers and validated by DOEs. Key project-based data, including the power tariff, investment costs, IRR with and without CDM, and sensitivity analyses, from all registered PDDs was manually entered to a database and adjusted for consistency of currencies, exchange rates over time, and tax policies. The basic statistics of studied wind CDM projects are presented in Table 1. One hundred forty three projects in total were included and analyzed, representing all Chinese wind CDM projects registered through the end of 2009. Sixty seven projects did not provide complete data in their sensitivity analysis in their PDDs, the authors calculated the sensitivities by extrapolating available data on percentage changes of IRR with changes of power tariff and investment costs.

Table 1
Basic statistics of the studied wind CDM projects.

Key variables	Mean	Max	Min	SD	Sensitivity
IRR with CDM	9.04%	11.87%	7.24%	0.0075	
IRR without CDM	6.40%	8.43%	4.24%	0.0070	
Power tariff (RMB/kWh)	0.5443	0.7600	0.3521	0.0973	11.35%
Investment cost (RMB/MW)	9,549,846	18,071,400	2,358,885	1,488,498	12.03%

3. Key findings

3.1. *Additionality is highly dependent on domestic regulation*

If China were manipulating power tariffs to game the CDM, it would only be possible because the current design of additionality gives them that power. The structural dependency of additionality on Chinese regulators can be clearly demonstrated as follows. Additionality for Chinese wind is largely determined by IRR comparisons of CDM projects to the 8% baselines given in the “Internal Notice on New Project Feasibility Assessment” by the [State Power Corporation \(2002\)](#). And our analysis shows that the single largest factor determining Chinese wind project IRR is the power tariff, in fact the data shows that on average, an 11.35% increase of the power tariff will make Chinese wind farms non-additional while China’s average on-grid power tariff had already increased from 0.3175 to 0.3676, 15.78% increase from 2006 to 2009 ([SERC, 2010, 2007](#)). There have been four major phases in the development of the Chinese wind power tariff system. In the first phase (1986–1993), wind power developments were funded by overseas aid funds and the tariff paid was less than 0.3 RMB/kWh, similar to that for coal-fired plants. In the second phase (1994–2003), the tariff was proposed by local governments and approved by the central government. During this period prices ranged from the relatively low price of 0.3 RMB/kWh up to 1.2 RMB/kWh. In the third phase, from 2003 to 2009, tariffs were decided by a concession process. Projects larger than 50 MW or in special wind-rich areas used this system (projects less than 50 MW were still subject to tariffs appointed by local regulatory decree), in which they submitted bids to the NDRC that included a proposed power tariff and the proposed share of domestically manufactured turbines. NDRC then approved the winning projects. The concession system ended in late 2009 when the NDRC established the “regional flag price” system, which set a single wind power price in major regions that functions like a feed-in tariff. These mandated prices are derived from the principle of “cost+reasonable return (with consideration of available wind resources)” ([CREIA, 2009](#); [NDRC, 2009](#)). The power tariff in those stages is highly dependent to China’s National or Local Development and Reform Commission. Thus the current design of the additionality test makes the Chinese government the most important arbiter of additionality – whether it wants to be or not – because IRR-based additionality is by design a function of NDRC power pricing.

This would not be a problem if China had market-based power pricing that could be validated by CDM regulators because power prices, and thus IRRs, would be a function of market pricing rather than regulatory decree. In this case IRRs would be a reliable indicator of project viability. But China’s power sector is not fully market-oriented. Unlike in liberalized power markets where prices are the result of bids and offers subject to some regulatory constraints, Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs). Wind is no exception. NDRC is directly determining wind tariffs based on its judgment of appropriate IRR as is China’s sovereign right. In fact, the official NDRC pricing

policy of “cost+reasonable return with consideration of available wind resources” explicitly indicates that the NDRC is determining the “reasonable return” through the tariff. But NDRC does not specify what the appropriate return is or how it is determined which again is China’s right, but a problem for CDM. In this context it is nearly impossible to know whether China is gaming the process or not. IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime.

Further, where more market-based pricing mechanisms have been tried, outcomes have been distorted by the presence of major SOEs that are not always motivated by market-based incentives. Investment and operations decisions in the power sector can be more sensitive to politics than profit, and politically driven losses are subsidized from the state balance sheet. In 2008 the “Big 5”, the largest SOE power producers including Huaneng, Datang, Huadian, Guodian, and China Power Investment, alone lost 40 billion RMB because raw coal was worth more than tightly capped power prices and generators were forced to run at a loss, which they wrote off as a “policy loss” that the government would make whole ([He and Morse, 2010](#)). Wind investment and pricing has been afflicted by a similar phenomenon. The national “concession system” for establishing wind power prices, which tried bidding by developers to establish tariffs five times from 2003–2009, certainly helped China move some projects closer to a market-based price discovery mechanism. But major SOEs were known to bid below-market prices in order to win projects and meet central government renewable energy quotas. Accordingly, observers have noted that the tariff outcomes of the concession system were artificially depressed and prices were low enough to discourage investment from private, non-SOE investors ([Li and Gao, 2008](#)). These distorted concession prices heavily influenced the setting of current regional feed-in tariffs ([NDRC, 2009](#)).

3.2. *No evidence of manipulation in China’s wind case*

The empirical analysis of power data for all CDM wind projects in China shows no obvious evidence of dramatic changes in pricing policy that might reveal deliberate price manipulation by the NDRC. While the design of current additionality policy creates the opportunity for manipulation without a way of proving it, the available evidence does not directly suggest that the Chinese government is in fact gaming the CDM. [Figs. 1 and 2](#) below show the trend in Chinese power tariffs granted to registered CDM wind projects since the inception of the CDM in China, and most projects were registered until late 2009. Though policies have changed, prices have not dramatically shifted lower. The single tariff granted higher than 1 RMB/kWh is an offshore wind project and therefore received an exceptional tariff. All tariffs discussed here exclude VAT. It should also be noted that the Chinese feed-in tariff for wind is roughly 1.5 times higher than the average tariff for on-grid power; the average price granted to CDM wind projects was 0.5443 RMB/kWh (excluding VAT), and the average on-grid power price was 0.36034 RMB/kWh in 2008 ([SERC, 2009](#)). The average wind tariff (excluding VAT) for the 10 rejected wind projects is 0.5094, compared to 0.5443 of the total average. Those projects locate in Inner Mongolia, Heilongjiang, Liaoning and

Xinjiang, which have the best wind resources thus are granted lower on-gird wind prices set by NDRC (2009). The average IRR without CDM for those projects is 6.39%, IRR with CDM is 9.99%, and CDM would make 3.6% difference.

Table 2 shows the average wind tariff of the projects registered in a year decreased 5.8% from 2006 to 2008, then increased 3.7% in 2009, an overall 2.3% decrease from 2006 to 2009. At the same time, the reported average wind investment cost had grown 6.2% from 2006 to 2009, which is not consistent with what reported in the industry that the wind investment cost started to fall in 2008 due to the localization of manufacture and economy of scale (Li et al., 2010). As the total wind capacity in China has risen, absolute subsidies for Chinese wind projects have increased dramatically. Total subsidies paid by the Chinese government have rocketed from 229.29 million RMB in 2003 to 2379.94 million RMB in 2008 (CREIA, 2009). However, on a per-MW basis, those subsidies have mostly decreased from 0.4 million RMB in 2003 to 0.2 million RMB in 2008, half of that five years ago.

4. Implications for climate policy

We have shown the additionality test dependent on an IRR generated from Chinese power prices. This problem is not limited to Chinese wind – it applies for almost all renewable energy

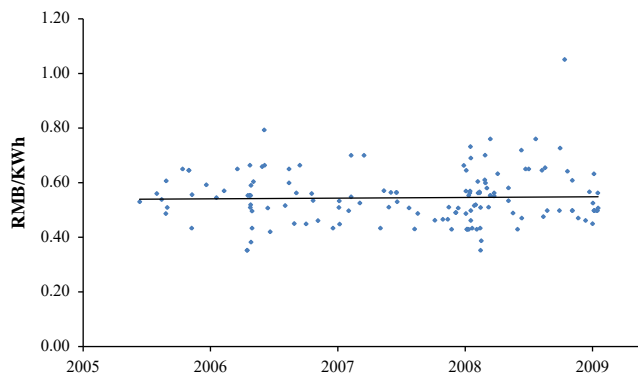


Fig. 1. Wind tariff by registration date for CDM projects.

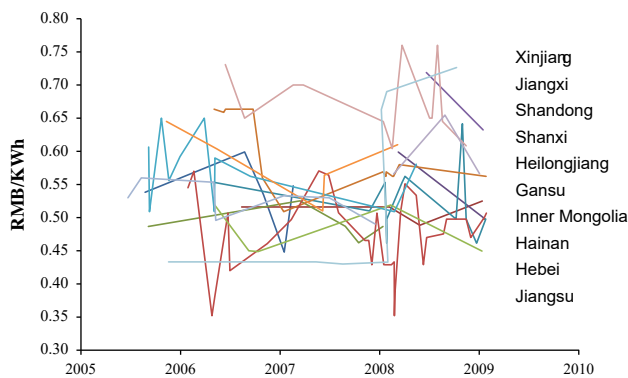


Fig. 2. Wind tariff by province for CDM projects, Note: The provinces are appeared in the order of their 2009 tariffs.

Table 2 Average wind tariff and investment cost of registered wind CDM projects by year.

Year	2006	2007	2008	2009
Average project power tariff (RMB/kWh)	0.5613	0.5355	0.5288	0.5485
Average wind investment cost (million RMB/MW)	8.96	8.81	8.99	9.51

projects in developing countries with state controlled power sectors – and thus could damage the credibility of the CDM (Haya, 2010; Victor, 2011; Wara, 2007). Reform is necessary to use additionality metrics that are less dependent on domestic regulators. Possible reforms in the near term might contemplate using an enhanced barrier analysis that phasing out easy investment projects, interacting with NDRC to better understand domestic pricing policy so to make more transparent and sound observation of the pricing dynamics, or using a more credible baseline that reflect the evolution of China’s changing power sector (He and Morse, 2010). This could be challenging as the projects involve multiple technologies in multiple countries, however, a more transparent, credible baseline will apply immediate improvement to the mechanism. In the long-term, offset policy needs to be agnostic to market structure in developing country power sectors. The thinking on new market mechanisms (NMMs), for example sectoral approaches and program of activities that decouple the host entity from specific activities or policies, mitigates the additionality tests by building a sectoral baseline (Aasrud et al., 2009; IGES, 2013). The NMMs issue allowances based on a sectoral ex-ante, no-lose targets, with penalty for missing target, thus make incentives more compatible.

Even if reforms eliminated the dependency of additionality on domestic power pricing decisions, a more difficult question remains. How should additionality account for the impact of broader changes in domestic policy over time? China’s wind power polices have changed dramatically since 2003, making additionality a moving target (Li and Gao, 2008). “E+/E-” policies were introduced to provide clear rules on how to treat domestic policies impact emissions, “E+” policies increase emissions, “E-” policies reduce them (CDM EB, 2009c). “E+/E-” policies refers to clarifications on the consideration of national and/or sectoral policies and circumstances to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that have impact the host country’s contributions to the ultimate carbon mitigation (CDM EB, 2009c). But they were not designed to accommodate complex issues like Chinese feed-in tariffs where subsidies are embedded within a complicated, state-controlled power pricing regime (Morse et al., 2010; Peng, 2011).

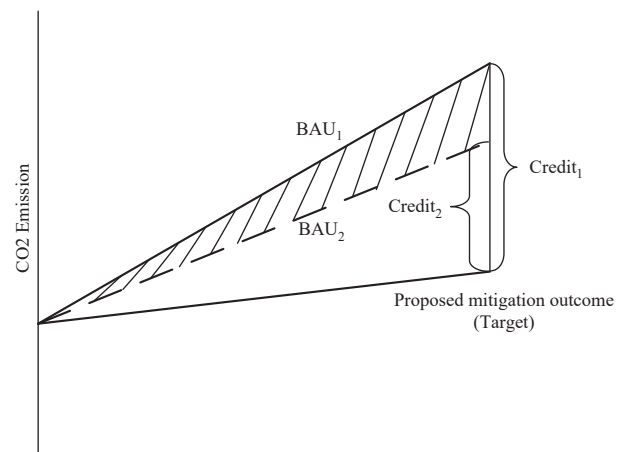


Fig. 3. The Offsetters' Paradox.

Carbon policy must craft rules for the entire CDM that segregate the impact of evolving domestic policy from the impact of carbon finance when judging additionality. Unfortunately, this challenge presents a paradox for policy makers. On one hand, including domestic subsidies in the additionality calculation creates perverse incentives for the host country by making projects less eligible for CDM and therefore discouraging policies that would jeopardize CDM revenues. On the other hand, ignoring these subsidies assures crediting for business as usual projects, which reduces the integrity of global emissions caps (Morse and He, 2010).

This problem applies in nearly any situation where additionality is the central principle because additionality by definition compares a baseline of BAU to a lower emissions trajectory. As shown in Fig. 3, if credits are given for the difference between BAU₁ and target trajectories, any domestic policy that lowers baseline emissions to create BAU₂ reduces carbon payments, and therefore disincentivizes domestic emissions-reducing policies that would shift BAU₁ to BAU₂. Alternatively, if the offset mechanism attempts to solve the perverse incentive problem by crediting against BAU₁ instead of BAU₂ and ignores the domestic mitigation policy, then carbon offsets pay for what would have happened anyway as the shaded area depicts. We call this fundamental tension of additionality the Offsetters' Paradox. Post-CDM offset policy will need to directly confront this problem and decide how to strike an appropriate balance. This will become increasingly important as negotiators push for Nationally Appropriate Mitigation Actions (NAMAs) of developing countries that give domestic policy an even larger role in international climate policy.

5. Conclusion

The analysis presents additionality's dependence on domestic regulators in the near-term and draws an uneasy line between creating perverse incentives and crediting for BAU in the longer-term. The controversy over the additionality of Chinese wind offers key lessons for how the world can design, validate, and implement carbon offsets. This calls into question the integrity of the global carbon cap set under the second commitment period of the Kyoto Protocol. Post-2012 carbon policy should confront these imperfections and seek to reduce them by addressing the type of failures exposed by the Chinese wind controversy. Short-term reforms can immediately make project approval more credible and expeditious. Longer-term, mechanisms that are agnostic to market structure and independent of domestic regulators offer a better chance for avoiding controversy and proving the viability of carbon markets as a sound mitigation regime. Finally, the designs of offset mechanisms and linking of different trading schemes need to directly confront the Offsetters' Paradox because ignoring it will ultimately undermine the ability of the market to function.

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MEASURING THE CLEAN DEVELOPMENT MECHANISM'S PERFORMANCE AND POTENTIAL

Michael Wara^{*}

The Clean Development Mechanism (CDM) of the Kyoto Protocol is the first global attempt to address a global environmental public goods problem with a market-based mechanism. The CDM is a carbon credit market where sellers, located exclusively in developing countries, can generate and certify emissions reductions that can be sold to buyers located in developed countries. Since 2004 it has grown rapidly and is now a critical component of developed-country government and private-firm compliance strategies for the Kyoto Protocol. This Article presents an overview of the development and current shape of the market, then examines two important classes of emission reduction projects within the CDM and argues that they both point to the need for reform of the international climate regime in the post-Kyoto era, albeit in different ways. Potential options for reforming the CDM and an alternative mechanism for financing emissions reductions in developing countries are then presented and discussed.

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INTRODUCTION

Global warming is one of the most difficult and important environmental challenges facing the international community. To date, the most substantial effort to address climate change is the Kyoto Protocol (Protocol).¹ Although not ratified by the United States and only recently by Australia,² the Protocol was signed and ratified by every other large developed country and entered into force on February 16, 2005.³ It is likely the largest and most expensive international effort to combat a global environmental commons problem.

The Protocol is a highly innovative international agreement as it both incorporates and allows for numerous trading mechanisms. These flexibility mechanisms were inserted into the text during the negotiation process at the insistence of the United States, its most prominent nonsignatory.⁴ They are quickly becoming, if they have not already become, the preeminent examples of attempts to address an international environmental problem using market-based approaches.

The United States and the international community are at a critical juncture in the effort to address the problem of climate change. Although the United States declined to join the Protocol, regulations to control carbon dioxide (CO₂) emissions are currently being developed by a coalition of seven

1. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22, available at <http://unfccc.int/resource/docs/cop3/07a01.pdf> [hereinafter Kyoto Protocol].

2. *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, N.Y. TIMES, Dec. 4, 2007, at A8, available at <http://query.nytimes.com/gst/fullpage.html?res=9800E7DF1E3BF937A35751C1A9619C8B63>.

3. United Nations Framework Convention on Climate Change, Kyoto Protocol: Status of Ratification, http://unfccc.int/essential_background/kyoto_protocol/status_of_ratification/items/2613.php (last visited June 5, 2006) [hereinafter Kyoto Protocol Status]. The Kyoto Protocol entered into force on the ninetieth day after at least fifty-five parties to the Convention, including Annex 1 parties accounting for at least 55 percent of total 1990 carbon dioxide emissions ratified the treaty. Kyoto Protocol, *supra* note 1, art. 25 § 1.

4. Daniel Bodansky, *Bonn Voyage: Kyoto's Uncertain Revival*, NAT'L INTEREST, Fall 2001, at 5.

northeastern states,⁵ by California,⁶ and are proposed in multiple bills in the U.S. Senate.⁷ In addition, many U.S. firms will be forced to comply with the Protocol in their international operations. Finally, the Protocol is set to expire at the end of 2012, and negotiations for a future global warming treaty, including market-based components, are therefore underway.⁸

The effort to curb global warming will be difficult and costly. Sustaining necessary political support and expenditure will require that policies implemented to achieve climate stabilization are both environmentally sound and cost effective. This Article aims to contribute to the success of this effort by presenting a critical empirical analysis of the current market for greenhouse gases (GHGs) under the Protocol and suggesting possible reforms. It is highly likely that any future global warming treaty will include market-based solutions; all current examples of climate regulation incorporate market-based mechanisms, and such mechanisms may result potentially in substantial cost savings.⁹ These markets for pollution, if they are to succeed in accomplishing a future treaty's environmental goals, must both incorporate the successes and eliminate the shortcomings of previous efforts. Given the rapid development of the Protocol's GHG markets over the last three years and the incipient negotiations over a future treaty, the time is ripe for an analysis that attempts to identify the successes and the failures of the initial experiments in GHG emissions trading.

The Clean Development Mechanism (CDM), a market-based emissions trading mechanism created under the auspices of the Protocol,¹⁰ certifies GHG emission-reduction credits generated by projects in the developing world that can be sold to emitting developed countries facing compliance obligations under the treaty. Payment for the credit is intended to fund the

5. The coalition includes Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. Memorandum of Understanding From the Regional Greenhouse Gas Initiative *passim* (Dec. 20, 2005), http://www.rggi.org/docs/mou_12_20_05.pdf [hereinafter RGGI Memo].

6. MKT. ADVISORY COMM., CAL. AIR RES. BD., RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA, at iv-v (2007), available at http://www.climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF.

7. The most prominent federal proposal to reduce U.S. greenhouse gases (GHG) emissions, which includes a market for GHG emissions, is America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007).

8. The Bali Action Plan lays out a path for negotiation of a post-Kyoto framework. See United Nations Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali, Indon., Dec. 3–15, 2007, *Decision 1/CP.13: Bali Action Plan*, U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3> [hereinafter *Bali Action Plan*].

9. Kyoto Protocol, *supra* note 1, arts. 6, 12, 18; RGGI Memo, *supra* note 5; America's Climate Security Act of 2007, S. 2191, §§ 2101–2503.

10. Kyoto Protocol, *supra* note 1, art. 12, § 1.

cost of reducing GHG emissions, thereby facilitating developing-country participation in the international climate regime and assisting in the achievement of sustainable development.¹¹ All emissions reductions certified under the CDM are supposed to be voluntary, real, and additional to any that would occur in the absence of the credit system.¹²

The CDM is the first attempt to address a global atmospheric commons problem using a global emissions trading market.¹³ Over the past three years, the CDM has developed the shape that it will likely have during the first commitment period of the Protocol.¹⁴ The goal of this Article is both to describe this broad outline and to use it to inform the design of future treaty architectures and administrative legal regimes¹⁵ aimed at the control of GHG emissions and global warming.

This analysis builds both on legal scholarship that first identified the potential of emissions trading regimes to reduce the costs of providing environmental goods,¹⁶ and on a relatively extensive body of legal scholarship analyzing the results of attempts to design and to implement emissions trading markets. Empirical work on emissions trading markets has focused on the strategic behavior of market participants,¹⁷ the complicated role of the regulator,¹⁸ environmental justice problems caused by emissions trading markets,¹⁹ and the difficulty of monitoring certain air pollutants necessary for

11. *Id.* art. 12, § 2.

12. *Id.* art. 12, § 5.

13. In contrast, the Montreal Protocol utilized a fund contributed to by developed countries to pay for the cost of emissions reductions of ozone-depleting substances in developing countries. See The Montreal Protocol on Substances That Deplete the Ozone Layer art. 10, *opened for signature* Sept. 16, 1987, 1522 U.N.T.S. 28, available at <http://www.unep.org/OZONE/pdfs/Montreal-Protocol2000.pdf> [hereinafter Montreal Protocol].

14. The first commitment period extends from January 1, 2008 to December 31, 2012. Kyoto Protocol, *supra* note 1, art. 3.1.

15. Regarding the emergence of a body of international administrative law, see Benedict Kingsbury et al., *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15 (2005).

16. Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1341–51 (1985).

17. David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 310 (1998); Gary C. Bryner, *Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading*, 17 TUL. ENVTL. L.J. 267, 291 (2004).

18. Lesley K. McAllister, *Beyond Playing “Banker”: The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 312–13 (2007).

19. Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Injustice: Los Angeles’ Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL’Y F. 231, 252 (1999); James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 628–29 (2000).

emissions trading.²⁰ To date, however, these analyses have focused on domestic markets. International markets, because they involve both an international regulator as well as developing-country governments and firms, are likely to present both similar and unique challenges.

The CDM was designed around the insight that the marginal cost of emissions reductions in developing, and especially rapidly developing, countries would be less than those faced by developed nations.²¹ The basis for this insight was that the cost of building more efficient, lower-GHG-emitting industrial and energy facilities in the developing world would be far lower than the cost of prematurely retiring or retrofitting existing developed-world capital stock.²² By means of the CDM, GHG emissions reductions could occur in the developing world that would otherwise have occurred in the developed world at far higher cost.²³ The expectation was that by putting a price on GHG emissions in the developing world and by linking that price to developed-world cap-and-trade markets for CO₂, costs of compliance with the Protocol in the developed world could be significantly reduced. This Article will show that what has in fact occurred is something far different: (1) the CDM has primarily proffered an exchange of CO₂ emissions reductions in the developed world for reductions of various non-CO₂ gases in the developing world; (2) substantial strategic behavior has occurred, aimed at manipulating baselines in order to increase the number of offsets created; and (3) as participation in the energy sectors of developing countries has deepened, the regulatory challenge faced by the CDM Executive Board in determining whether a project's reductions are "additional to any that would occur"²⁴ in its absence has become deeply problematic.

The CDM in its current form is, from an environmental perspective, highly imperfect. It is nonetheless creating both powerful political institutions and stakeholders interested in maintaining the current system or something similar.²⁵ Given the relatively poor performance, at least initially,

20. Drury et al., *supra* note 19, at 280–81; Thomas O. McGarity, *Missing Milestones: A Critical Look at the Clean Air Act's VOC Emissions Reduction Program in Nonattainment Areas*, 18 VA. ENVTL. L.J. 41, 57 (1999).

21. See Michael A. Toman, Richard D. Morganstern & John Anderson, *The Economics of "When" Flexibility in the Design of Greenhouse Gas Abatement Policies 2–3* (Resources for the Future, Discussion Paper No. 99-38-REV, 1999).

22. Prepared Testimony of Janet Yellen, Chair, Council of Economic Advisors Before the House Commerce Committee Energy and Power Subcommittee (Mar. 4, 1998), *reprinted* in FED. NEWS SERVICE, Mar. 4, 1998, at 5.

23. Toman, Morganstern & Anderson, *supra* note 21, at 2–3.

24. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

25. See for example, the membership of the International Emissions Trading Association, a strong CDM supporter which includes many of the largest global financial institutions.

of other markets for atmospheric pollution, the imperfect performance of the CDM is not entirely surprising and should not be a reason to abandon the system. The CDM is failing as a market because its rules, rather than producing real reductions, have accounting loopholes that allow participants to manufacture GHG credits at little or no cost beyond the payment of consultants necessary to surmount the necessary regulatory hurdles. Further, although it is supplying credits to developed signatories of the Protocol at prices less than they would otherwise be, the CDM is an excessive subsidy that represents a massive waste of developed-world resources. It is too late to change the structure of the CDM to address its shortcomings prior to the end of the first commitment period.²⁶ The overarching aim of this Article is to argue that in the period after 2012, both the financial resources devoted to the current CDM architecture and the additional resources likely to be added as developed-world commitments to cut GHGs deepen, might be far more efficaciously allocated in the international effort to stem global warming.

Such reform need not compromise the notable success of the CDM as a political mechanism. The CDM has produced remarkable participation in the developing world. Participation has been most active in countries with relatively high rates of economic growth. In other words, the developing countries whose efforts are most needed to help resolve the global warming problem are the same countries that have been engaged. At the same time, this has created political difficulties within developed countries where the subsidy of nations such as China and India is unpopular and hard to justify given their high rates of growth. Relative levels of developing-world participation and benefit from the CDM have also created tensions among the signatories to the Protocol²⁷ because of the growing perception that the distribution of credit revenues is extremely inequitable; most of the funds flow to a few relatively well-off developing countries.

Two tracks for reform seem possible. One option is to address the current regime's shortcomings while maintaining its basic structure in the post-2012

International Emissions Trading Association, Membership, <http://www.ieta.org/ieta/www/pages/getfile.php?docID=556> (last visited July 15, 2008).

26. The Kyoto Protocol's First Commitment Period, the interval of time during which developed-world parties to the treaty must comply with quantified emissions limits, extends from 2008 to 2012. Kyoto Protocol, *supra* note 1, art. 3.

27. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Bali, Indon., Dec. 3–15, 2007, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol in Its Third Session, Held in Bali From 3 to 15 December 2007*, ¶ 36, at 11, U.N. Doc. FCCC/KP/CMP/2007/9 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cmp3/eng/09.pdf>; see also, United Nations Framework Convention on Climate Change, The Nairobi Framework-Catalyzing the CDM in Africa, http://cdm.unfccc.int/Nairobi_Framework/index.html (last visited Mar. 31, 2008).

climate regime. This would involve strengthening the administrative procedures within the CDM in order to increase the certainty that projects are producing real reductions that are additional to any that would have occurred without the program. This reform would have to be accomplished without increasing transaction costs or project risks to such an extent that participation in the scheme was reduced below a useful level. The second option would discard the market-based approach of the CDM and adopt a fund-based approach best exemplified by the Montreal Protocol's Multilateral Fund.²⁸ While a fund approach would not necessarily solve all of the problems associated with the CDM, and might create new and as yet unforeseen difficulties, it would improve the efficiency of the system and likely increase its environmental effectiveness.

In Part I, I will first briefly introduce the Kyoto Protocol and the Clean Development Mechanism. I will then present in Part II a description of the current state of supply to the CDM market, followed in Part III by a story of the participation of a particular highly specialized industry that produces small quantities of a very potent greenhouse gas. Part IV explains how the underlying structure of the market has incentivized this particular industry to generate large numbers of CDM credits and thus to dominate the first phase of market growth. I will also tell a second story in Part V about the challenges presented by the recent dramatic increase in the level of CDM participation by China's energy sector. Here, the interaction between international regulators and a state-regulated industry is leading to attempts to generate large numbers of credits for behavior that would have occurred even in the absence of the CDM. Finally, in Part VI I will conclude by sketching out two possible futures for international emissions trading between developed and developing countries that incorporate lessons from the unforeseen problems of the first three years of emissions crediting under the CDM.

I. THE KYOTO PROTOCOL AND THE CLEAN DEVELOPMENT MECHANISM

A. The Kyoto Protocol

The international agreements aimed at controlling greenhouse gas emissions are hierarchically structured. The most general and overarching agreement, known as the United Nations Framework Convention on Climate Change (UNFCCC or Convention), adopts as its goal the stabilization

28. Montreal Protocol, *supra* note 13, art. 10, § 3.

of GHG concentrations in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system.²⁹ The UNFCCC has been signed and ratified by 192 countries,³⁰ including all major emitters of greenhouse gases.³¹ Although its goal is ambitious, the UNFCCC contains no provisions that compel action to accomplish it. Rather, it lays out a process through which various protocols containing more specific commitments might be negotiated.³² The first of these protocols was negotiated at Kyoto in 1997.³³ The Kyoto Protocol (Protocol), as it has come to be called, establishes binding caps on emissions for developed nation parties and parties with economies in transition (Annex B parties or Annex B nations).³⁴ These caps are limits on emissions of GHGs during the 2008–2012 period.³⁵ The caps are set as reductions below each party's 1990 emission level³⁶ of six GHGs: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).³⁷ Emission reduction commitments specified by the Protocol are typically 5 to 8 percent below the 1990 emissions baseline, although some parties successfully negotiated a commitment of no reduction, or even an increase

29. United Nations Framework Convention on Climate Change, New York, U.S., May 9, 1992, art. 2, U.N. Doc. FCCC/Informal/84, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> [hereinafter UNFCCC Convention].

30. United Nations Framework Convention on Climate Change, Status of Ratification, http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (last visited July 15, 2008).

31. Compare United Nations Framework Convention on Climate Change, Status of Ratification, available at http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_conv_rat.pdf (last visited Apr. 3, 2006), with UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003 SUBMITTED TO THE U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, KEY GHG DATA 21, 92–94 (2005), available at http://unfccc.int/resource/docs/publications/key_ghg.pdf. I define major emitters of greenhouse gases somewhat arbitrarily as those nations emitting more than 500 million metric tons (Mt) of CO₂ or its equivalent in other GHGs (CO₂) per year. As of their latest reports of GHG emissions to the United Nations Framework Convention on Climate Change (UNFCCC), this list included Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, the Russian Federation, Ukraine, the United Kingdom of Great Britain and Northern Ireland, the United States, and collectively, the European Union. *Id.*

32. UNFCCC Convention, *supra* note 29, at arts. 7, 17.

33. Kyoto Protocol, *supra* note 1, at art. 28.

34. *Id.* art. 3. Note that not all Annex I nations of the UNFCCC adopted commitments as specified in Annex B of the Kyoto Protocol. The most notable of these are the United States and Australia. This Article will use the terminology “Annex B” nation or party to refer to a signatory that did adopt such a commitment. These nations are sometimes referred to as Annex I nations or parties.

35. This period is commonly referred to as the “commitment period” or the “first commitment period.” *Id.*

36. *Id.* art. 3, annex B.

37. *Id.* annex A.

above the baseline.³⁸ Additionally, different levels of economic growth or stagnation since 1990 mean that while some Annex 1 nations face steep cuts, others actually have excess allocations.³⁹

The Protocol includes various flexible mechanisms aimed at reducing the cost of compliance for Annex B parties.⁴⁰ These include provisions allowing parties to trade their allowable emissions (assigned amount units or AAUs)⁴¹ as long as such trading is supplemental to domestic actions.⁴² Also included are provisions allowing Annex B parties to pay for additional emissions reductions within other Annex B parties and then credit them against their own assigned amount units.⁴³ This plan is known as Joint Implementation (JI).⁴⁴ Finally, Annex B parties may pay for emissions reductions within developing (non-Annex B) parties and also credit these against their commitments under the Protocol. The purchasing Annex B nation may then credit these emissions reductions against its assigned amount units. This provision is known as the Clean Development Mechanism (CDM).⁴⁵

The Protocol was ratified by a sufficient number of nations representing a sufficient proportion of global GHG emissions to enter into force,⁴⁶ but it

38. These nations include Australia (108 percent), Iceland (110 percent), New Zealand (100 percent), Norway (101 percent), Russia (100 percent), and Ukraine (100 percent). *Id.* annex B.

39. Compare *id.*, with United Nations Framework Convention on Climate Change, Total Aggregate Greenhouse Gas Emissions of Individual Annex B Parties, 1990–2003, http://ghg.unfccc.int/graphics/graph1_05.gif (last visited Apr. 6, 2006). The Annex B parties with the most headroom are Russia and Ukraine. To date, no nation has purchased assigned amount units (AAU's) from either nation, although there is much discussion of this compliance option. Another nation whose compliance was made far easier by the chosen baseline is Germany. Germany's allocation includes that of the former East Germany, where heavy industry and power demand collapsed after unification. This led to a large decrease in emissions relative to allocation, making the unified Germany's and hence the European Community's compliance challenge much more tractable. See WOLFGANG EICHHAMMER ET AL., GREENHOUSE GAS REDUCTIONS IN GERMANY AND THE UK—COINCIDENCE OR POLICY INDUCED? AN ANALYSIS FOR INTERNATIONAL CLIMATE POLICY 1 (2001), available at <http://publica.fraunhofer.de/eprints/N-6386.pdf>.

40. Lawrence H. Goulder & William A. Pizer, *The Economics of Climate Change*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 10 (Steven Durlauf & Lawrence Blume eds., 2d ed. 2005), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=869644.

41. Indeed, the structure of the agreement is essentially a cap-and-trade system in which AAUs are freely allocated permits to emit that can then be traded between parties via a common registry, administered by the UNFCCC Secretariat. Kyoto Protocol, *supra* note 1, art. 3 ¶ 7.

42. *Id.* art. 17.

43. *Id.* art. 6.

44. Joanna Depledge, *Tracing the Origins of the Kyoto Protocol: An Article by Article Textual History*, 61, 64, delivered to the UNFCCC, U.N. Doc. FCCC/TP/2000/2 (Nov. 25, 2000), available at <http://unfccc.int/resource/docs/tp/tp0200.pdf>.

45. Kyoto Protocol, *supra* note 1, art. 12.

46. *Id.* art. 25 (At least 55 parties to the Protocol representing at least 55 percent of 1990 emissions of GHGs must ratify for the treaty to enter into force.); Kyoto Protocol Status, *supra* note 3.

was not ratified by either the United States or Australia.⁴⁷ It now appears at least possible, if not likely, that one Annex B party, Canada, will either withdraw or fail to comply with the Protocol, while another, Australia, may now join the treaty.⁴⁸ In order to induce a sufficient number of Annex B parties to ratify the treaty, significant concessions were made to particular parties. Notably, the Russian Federation and Ukraine were allowed to join the Protocol with commitments of a zero percent reduction below 1990 levels, although by the time of the negotiations their actual emissions were already far below the 1990 baseline because of the post-Soviet economic contraction.⁴⁹ These nations were able to join the Protocol without fear of facing emissions reductions and with the prospect of future sale of their excess AAU's to countries facing a commitment requiring actual cuts in emissions.⁵⁰

Before and after its entry into force, the Protocol has faced severe criticism: It has been criticized for doing little to combat global warming;⁵¹ for being economically inefficient in requiring nations to reduce emissions too quickly;⁵² for utilizing absolute emissions caps rather than emissions intensity targets or a carbon tax;⁵³ and for not committing the largest developing nations, most notably China and India, to binding emissions

47. *Id.*

48. Both changes are due, of course, to a change in government. In Canada, the election of a conservative government in 2006 led to a reevaluation of Canada's efforts on climate. In Australia, subsequent to the 2007 election, Prime Minister Kevin Rudd's first action was to ratify the Protocol. See, Doug Struck, *Canada Alters Course on Kyoto*, WASH. POST, May 3, 2006, at A16; *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, *supra* note 2.

49. David G. Victor et al., *The Kyoto Protocol Emission Allocations: Windfall Surpluses for Russia and Ukraine*, 49 CLIMATIC CHANGE 263, 264 (2001).

50. ALAIN BERNARD ET AL., MIT JOINT PROGRAM ON THE SCI. & POL'Y OF CLIMATE CHANGE, REPORT NO. 98, RUSSIA'S ROLE IN THE KYOTO PROTOCOL 1-3 (2003), available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt98.pdf.

51. William D. Nordhaus, *Global Warming Economics*, 294 SCIENCE 1283, 1283-84 (2001).

52. Joseph E. Aldy et al., *Thirteen Plus One: A Comparison of Global Climate Policy Architectures*, 3 CLIMATE POL'Y 373, 391 (2003). For the argument that economically efficient greenhouse gas reduction trajectories differ little from business as usual in the short term but substantially in the long term, see Alan Manne & Richard Richels, *On Stabilizing CO₂ Concentrations—Cost-Effective Emission Reduction Strategies*, 2 ENVTL. MODELING & ASSESSMENT 251 (1997).

53. William Pizer, *The Case for Intensity Targets 1-2* (Resources for the Future, Discussion Paper No. 05-02, 2005). The case for setting intensity targets, which limit a country's CO₂ emissions per dollar of GDP, is a consequence of Weitzman's insight that when uncertainty exists as to costs of abatement and the slope of the marginal benefit of abatement curve for an environmental good is relatively flat, a tax rather than a quantity control leads to a superior welfare outcome. See William A. Pizer, *Prices vs. Quantities Revisited: The Case of Climate Change 3-4* (Resources for the Future, Discussion Paper No. 98-02, 1997); Martin L. Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUD. 477 (1974).

reductions.⁵⁴ Finally, its flexible mechanisms also have been criticized as dependent on counterfactuals, namely an emissions baseline, that is either unknowable or politically determined.⁵⁵ Reflecting this criticism, at least thirteen modified treaty architectures have been offered as alternatives or improvements for the post-2012 period.⁵⁶

The most common response to these criticisms is that the Protocol has been, since its negotiation in 1997, the only game in town when it comes to controlling the growth in global GHG emissions and mitigating future harms from global warming. Further, it has spurred the emergence and growth of institutions and capacities that will likely endure beyond its existence, albeit perhaps in altered and improved form. Some of the most notable diplomatic successes of the twentieth century were the result of a long series of negotiations and agreements. Institutions like the GATT and its successor, the WTO, and perhaps most of all, the European Union, that have ultimately delivered tremendous benefits to their members, began with modest and limited agreements. Members were not afraid to tinker with these institutions as they learned by doing. The Protocol has given birth to a whole set of institutions and has fostered capacity development both in the developed and developing world that will prove invaluable in ultimately overcoming the challenges presented by climate change.

This Article's aim is to take a close look at the actual, as opposed to the theoretical, outcome of one of the Protocol's most significant institutional creations—a global market for GHG emission credits. Most or all of the criticisms of the Protocol were made prior to the development of a substantial track record for the CDM and the other flexible mechanisms, so these criticisms were of necessity theoretical in nature. Although to date there has been little use of JI and no sale and purchase of AAUs, there has been an explosion of activity within the CDM that now provides a basis for an empirical critique of the Protocol. This critique aims not to undermine the rationale for the Protocol, but to understand how, in the next phase of the international effort to avoid “dangerous anthropogenic interference”⁵⁷ with the world's climate, trading can accomplish more than it has or is likely to under the Kyoto regime.

54. Prepared testimony of Janet Yellen, *supra* note 22, at 4; Letter From George W. Bush, President of the U.S., to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), <http://www.whitehouse.gov/news/releases/2001/03/20010314.html>. Since developing nations are involved in the Kyoto Protocol through the CDM, this criticism is the extent of their involvement. Kyoto Protocol, *supra* note 1, art. 12.

55. Chi Zhang et al., *Carbon Intensity of Electricity Generation and CDM Baseline: Case Studies of Three Chinese Provinces*, 33 ENERGY POL'Y 451 (2005).

56. Aldy et al., *supra* note 52, at 373.

57. UNFCCC Convention, *supra* note 29.

B. Clean Development Mechanism

1. Structure of the CDM

The CDM is a market-based approach to the problem of global warming. It allows buyers, who may be Annex B parties or firms within Annex B nations, to purchase credits from emission reduction projects carried out in non-Annex B nations. The CDM builds on experience derived from various regional markets for atmospheric pollutants, most notably the United States' experience with emissions trading under the Clean Air Act.⁵⁸ The developing country (non-Annex B) firms that are sellers of Certified Emission Reductions (CERs), the currency of the CDM system, have no limit to the mass of GHGs that they may emit under the Protocol. This absence of a cap on emissions for designated parties necessitates a far more complex design than had been attempted for most previous pollution markets. Adding further complexity to the program is the fact that the CDM is the first atmospheric pollutant trading program that covers multiple gases and allows conversion between them through the medium of its common currency, CERs.

Further, the CDM is a project-based system. It accomplishes its objectives at the microlevel of individual emission reduction projects that are each validated by designated third party verifiers and then registered by the mechanism's governing body, the CDM Executive Board (CDM EB), as eligible for crediting. Each project wishing to participate in the CDM must prepare a Project Design Document (PDD) that explains in detail how its future emissions reductions will be voluntary, real, additional, and will not induce leakage. It must also either utilize a previously approved monitoring methodology that explains in detail how it will monitor emissions reductions made by the project or propose a new methodology. Voluntary emissions reductions are not compelled by national or provincial law or regulation. Real emissions reductions are monitored with sufficient care to ensure that they actually occur. Additional emissions reductions are those that are in addition to any that would have occurred absent the CDM subsidy. Leakage of emissions occurs when emissions reductions that would have occurred from a CDM project absent the CDM subsidy are displaced to another location because of the subsidy.

58. Prepared testimony of Janet Yellen, *supra* note 22, at 12; see also Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109, 151–53 (1989) (detailing the successes and disappointments of the EPA program and suggesting that many of the program's failings stemmed from regulators' need to satisfy multiple constituencies with divergent objectives).

All four of these concepts require that a hypothetical baseline of emissions be defined for each project, and in the case of leakage, the world outside the project. This baseline represents the timeline of emissions that would have occurred absent the subsidy provided by the CDM (and thus absent the emission reduction project). It is an attempt to estimate the counterfactual of typical levels of emissions in a world without CDM. The CDM project baseline is described in terms that vary by project type. Nevertheless, several common variables can be seen in most PDDs.⁵⁹ Project proponents often describe the regulatory baseline, that is, the emissions permitted by local law and regulation.⁶⁰ They also often describe the financial baseline, which is the lack of an adequate return on investment without the benefit of the CDM subsidy.⁶¹ They often describe typical technologies applied by the type of project in the PDD and how the CDM-subsidized project exceeds these local standards.⁶² Finally, they sometimes must describe a sectoral or national baseline for installations of the project type.⁶³ Ultimately, the CDM project proponents must quantify, third party verifiers must check, and the CDM EB must certify the hypothetical emissions that would have occurred in the future without the CDM project subsidy.

Project proponents and environmental regulators do not live in a world without CDM. As will be shown below, they have acted strategically in order to maximize many projects' baselines and so maximize the potential for the generation of CER revenues. The fact that most industries involved in CDM projects are already highly regulated makes this strategy attractive

59. PDDs follow a standardized format that includes a general description of the project, a description of how the baseline for the project is determined, a specification of the duration of the project, an explanation of how the project's emissions reductions will be monitored, a quantitative estimate of the project's emissions reductions, a discussion of any other environmental effects of the project, and finally a synthesis of comments on the project by local stakeholders. CDM Executive Bd., UNFCCC, *Guidelines for Completing the Project Design Document (CDM-PDD), The Proposed New Methodology: Baseline (CDM-NMB) and the Proposed New Methodology: Monitoring (CDM-NMM)* (Version 04, 2005), available at http://cdm.unfccc.int/Reference/Documents/GuideL_Pdd/English/Guidelines_CDM_PDD_NMB_NMM.pdf.

60. See, e.g., CDM PROJECT DESIGN DOCUMENT OF THE REPUBLIC OF NORTH KOREA: HFC DECOMPOSITION PROJECT IN ULSAN 20 (2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/FS_302727382.

61. See, e.g., CDM PROJECT DESIGN DOCUMENT: ZHANGBEI MANJING WINDFARM PROJECT 9-11 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/5X09Y9XLJO28P4KEA4GNSWG275CF5T>.

62. See, e.g., CDM PROJECT DESIGN DOCUMENT: EQUIPAV BAGASSE COGENERATION PROJECT (EBCP) 13-14 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/PL0URYPVKVZOV8TIW2MI8EG1Y3CBM1>.

63. See, e.g., CDM PROJECT DESIGN DOCUMENT: WASTE HEAT BASED 7 MW CAPTIVE POWER PROJECT 35 (2006), available at <http://cdm.unfccc.int/UserManagement/FileStorage/6W0JFJIP40XRP77Y7M83R6UVYCBLL>.

and easy to implement. An environmental regulator faced with the choice of preventing an emission with a costly domestic regulation⁶⁴ or by means of the CDM will have obvious political incentives for selecting the international program over new domestic regulation.⁶⁵

The end product of the CDM process is the issuance by the CDM EB of an emission offset to the project participants. This offset can then be sold to an Annex B nation or a party within one that has obligations under the Protocol. The offset, called a certified emission reduction or CER, assuming that certain CDM facilities are established, may be used by Annex B countries in lieu of emissions reductions within their territories in order to meet their targets under the Protocol.⁶⁶ Private parties that are assigned emissions allowances by their governments may also purchase CERs and use them as permits to emit in excess of their assigned allocations, or as an alternative to purchasing allocations from other participants in their domestic market. The European Union and Japan will likely be the major purchasers of CERs during the first commitment period.⁶⁷

The official public process leading to the production of CERs by a CDM project begins with the submission of a PDD to the CDM EB for a period of public comment. This comment process is a part of a project's validation by an independent Designated Operational Entity (DOE).⁶⁸ The project must also receive approval from its host country's Designated National Authority (DNA), typically the host country's environmental ministry, before being submitted for registration to the CDM EB.⁶⁹ Once registered, a project must submit monitoring reports providing data to show how many CERs have actually been generated during a particular period. These reports must be

64. It is costly both from the perspective of total societal costs and from the perspective of allocation of regulator personnel and funding.

65. The incentive not to regulate created by the CDM led the CDM EB to adopt rules specifying the dates after which a new regulation must be taken into account. CDM Executive Bd., UNFCCC, *Twenty-Second Meeting Report, Annex 3: Clarifications on the Consideration of National and/or Sectoral Policies and Circumstances in Baseline Scenarios* (Version 02, 2005), available at http://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

66. Kyoto Protocol, *supra* note 1, art. 12, § 3(b).

67. POINT CARBON, CARBON 2006: TOWARDS A TRULY GLOBAL MARKET 5 fig.2.1 (2006), available at http://www.pointcarbon.com/wimages/Carbon_2006_final_print.pdf. Canada was also likely to have been an important purchaser of Certified Emission Reductions (CERs), but actions by its recently elected conservative government have made it doubtful that it will comply with the Protocol. See Doug Struck, *Canada Alters Course on Kyoto: Budget Slashes Funding Devoted to Goals of Emissions Pact*, WASH. POST, May 3, 2006, at A16.

68. U.N. ENV'T PROGRAM, LEGAL ISSUES GUIDEBOOK TO THE CLEAN DEVELOPMENT MECHANISM 32-34 (2004), available at <http://cd4cdm.org/Publications/CDM%20Legal%20Issues%20Guidebook.pdf>.

69. *Id.*

both consistent with the monitoring plan spelled out in the project's PDD and verified and certified by a DOE.⁷⁰ At that point, the CDM EB will issue CERs into a project participant's account.⁷¹ These CERs will eventually be transferable to a buyer who establishes an account with the International Transaction Log, a yet to be constructed database of Kyoto Protocol GHG accounts.⁷²

2. Goals of the CDM

The CDM was created for three reasons. First, it aims to accomplish the overarching goals of the Framework Convention. Second, it aims to encourage sustainable development in non-Annex B nations. Third, the CDM is intended to reduce the cost of compliance with the Protocol for Annex B nations.⁷³

The CDM is intended, according to the Protocol, to help in accomplishing the Convention's goal of "prevent[ing] dangerous interference" with the climate system.⁷⁴ It aims to do this by assisting developing countries to reduce their emissions of GHGs. Thus, the CDM is significant, and indeed the only way in which non-Annex B signatories to the Protocol will contribute toward achieving the Protocol's goals. A realistic hope for the CDM is that by providing non-Annex B nations with financial incentives for low-carbon intensity development, they might be nudged, however slightly, onto more climate-friendly trajectories.

The second CDM objective—sustainable development—is left largely undefined by the Protocol or the implementing directives of later conferences of the parties.⁷⁵ To the extent that the provision has teeth, it is given them by the requirement under the CDM that the host country DNA of a project must certify that the project meets the DNA's standards of sustainability.⁷⁶ Although some DNAs have prioritized particular types of projects, they have not rejected other types that would otherwise be capable of producing CERs.⁷⁷

70. *Id.*

71. *Id.*

72. UNFCCC, Subsidiary Body for Sci. & Tech. Advice, Twenty-Second Session, Bonn, F.R.G., May 19–27, 2005, *Checks to Be Performed by the International Transaction Log*, at 3–4, U.N. Doc. FCCC/SBSTA/2005/INF.3 (May 13, 2005), available at http://unfccc.int/files/meetings/unfccc_calendar/pre-sessional/application/pdf/inf03.pdf.

73. Kyoto Protocol, *supra* note 1, art. 12.

74. *Id.* art. 12, § 2.

75. *Id.* art. 12, § 2; U.N. ENV'T PROGRAM, *supra* note 68, at 49.

76. U.N. ENV'T PROGRAM, *supra* note 68, at 49.

77. China's official CDM policy favors renewable energy, energy efficiency, and methane capture projects, but the Chinese DNA has approved numerous other types of projects. See Office of Nat'l Coordination Comm. on Climate Change, *Measures for Operation and Management of Clean*

The third CDM goal—lowering the cost of compliance for Annex B parties—was thought possible for two reasons. First, the majority of new energy capacity to be built up during the First Compliance Period will be located in the developing world where rates of economic growth are highest and energy infrastructure is least developed.⁷⁸ Also, the relative cost of prematurely retiring high-carbon-emission intensity power plants is significantly higher than building new low- or zero-carbon emission energy capacity. Thus, if the CDM could be used to subsidize the substitution of new, clean power capacity in the developing world for the premature retirement of old, dirty power capacity in the developed world, it could substantially lower the cost of treaty compliance. Further, such a substitution would not change the environmental outcome, because the location at which an emission reduction of a particular quantity of CO₂ takes place has no impact on the environmental benefit—lower atmospheric greenhouse gas concentrations.⁷⁹ However, as will be shown in our first story about CDM implementation, a substantial proportion of the emissions reductions generated by the CDM are not of this type and are in reality extremely inefficient in terms of the cost of the subsidy compared to the cost of environmental benefits obtained. Our second story regarding CDM implementation will take a close look at the fraction of emissions reductions created by construction of new electric-generating capacity and will show that it is increasingly difficult to tell which CDM projects are producing emissions reductions additional to those that would have occurred in the baseline, and which are claiming credit for nonadditional, anyway credits.

II. RAPID DEVELOPMENT OF THE CLEAN DEVELOPMENT MECHANISM SINCE 2004

The CDM project pipeline began operation in December of 2003, when the first project was accepted for public comment and validation. In

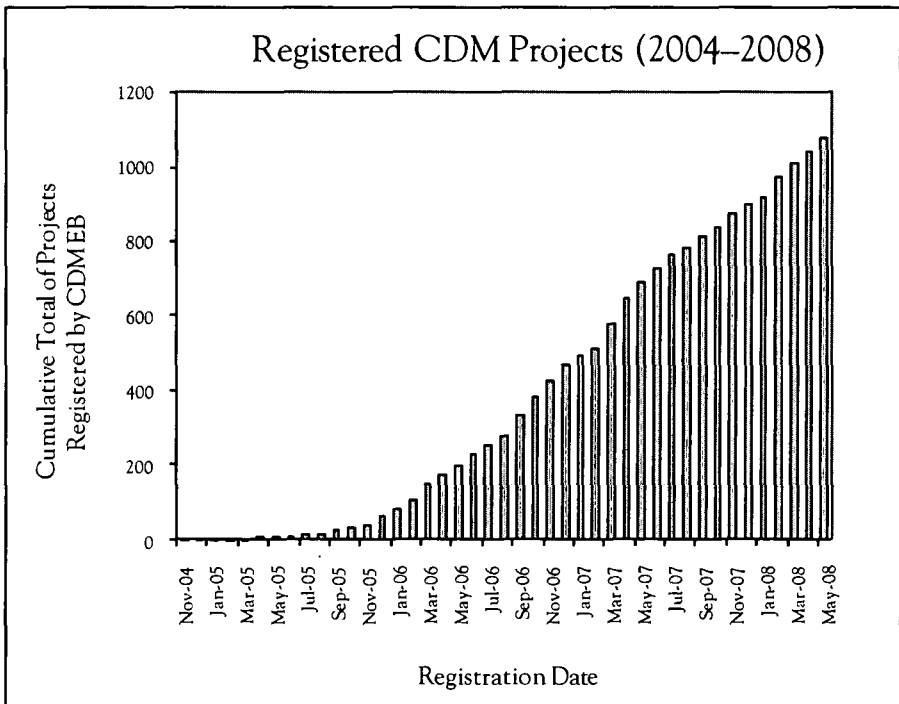
Development Mechanism Projects in China, art. 4 (Nov. 21, 2005), available at <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905>.

78. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2007, at 61 (2007), available at [http://www.eia.doe.gov/oiia/ieo/pdf/0484\(2007\).pdf](http://www.eia.doe.gov/oiia/ieo/pdf/0484(2007).pdf).

79. Because CO₂ is a well-mixed atmospheric gas with a long residence time, the extent to which it causes environmental harm is a function of its concentration in the atmosphere rather than the rate at which it is being added at any one time. William D. Nordhaus, *Life After Kyoto: Alternative Approaches to Global Warming Policies* 6 (Nat'l Bureau of Econ. Research, Working Paper No. 11889, 2005), available at <http://www.nber.org/papers/W11889.pdf>.

November of 2004, the first project was registered by the CDM EB.⁸⁰ Finally, in October 2005, the first CERs were issued to a project participant's account.⁸¹ Since then, there has been extremely rapid growth in the number, type, and total volume of emissions reductions in the CDM pipeline. Figure 1 shows the number of projects completing the registration process by month since the CDM began its activities. Beginning in the second half of 2005, the registration process picked up significant steam so that by the end of 2007, there were 895 projects registered and able to produce CERs for sale in the carbon market.

FIGURE 1: NUMBER OF PROJECTS REGISTERED BY THE CDM EXECUTIVE BOARD SINCE DECEMBER 2003, WHEN PDDs FIRST ENTERED THE CDM PIPELINE⁸²



80. See UNFCCC, Project 0008: Brazil NovaGerar Landfill Gas to Energy Project, <http://cdm.unfccc.int/Projects/DB/DNV-CUK1095236970.6> (last visited Apr. 30, 2008).

81. See UNFCCC, CERs Issued, http://cdm.unfccc.int/Issuance/cers_iss.html (last visited July 15, 2008).

82. Data for Figure 1 comes from UNEP Risø Centre, UNEP Risø CDM/JI Pipelines Database and Analysis, <http://www.cdmpipeline.org/publications/CDMpipeline.xls> (last visited May 2, 2008). As of November 1, 2007, there were 827 projects registered by the CDM EB.

It was not until November of 2005 that the volume of CO₂ reductions deliverable by registered CDM projects to the end of the First Commitment Period began to grow large enough to play a significant role in Protocol compliance for Annex B parties. From the last quarter of 2005 to the present, the potential CDM supply has grown at a breakneck pace. By January 1, 2008, more than 1150 million tons (Mt) CO₂ equivalent (CO₂e)⁸³ had been registered for delivery via the CDM by the end of the first compliance period (see Figure 2).⁸⁴ Another pattern emerging from the project registrations that have occurred is the dominance of large projects in the CDM. As seen in Figure 2, a small number of very large projects dominate the supply of CERs from registered projects. In fact, the 45 largest projects (5 percent of the total number) represent 64 percent of the total supply to the end of the First Commitment Period.⁸⁵

The trend of large projects dominating supply holds for the CDM pipeline as a whole, including projects registered, projects for which registration has been requested, and projects that have entered the validation stage. As of this writing, there are more than 2800 projects in the CDM pipeline that will eventually, if all are registered and deliver reductions as promised in their PDDs, supply more than 2600 Mt CO₂e to the market for Protocol compliance instruments.⁸⁶ This amount represents approximately 2.8 percent of Annex B 1990 GHG emissions for each year of the First Commitment Period.⁸⁷

83. The standard measure of greenhouse gas reduction under the Protocol is 1 ton CO₂e. It is the mass of any one of the six Kyoto gases equal to the 100-year global warming potential (GWP) of one ton of CO₂. GWP is defined as the time integrated radiative forcing from the release of 1 kg of a trace substance to 1 kg of CO₂. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) & TECH. & ECON. ASSESSMENT PANEL, SAFEGUARDING THE OZONE LAYER AND THE GLOBAL CLIMATE SYSTEM: ISSUES RELATED TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS 385 (2005), available at http://www.ipcc.ch/pdf/special-reports/sroc/sroc_full.pdf [hereinafter IPCC].

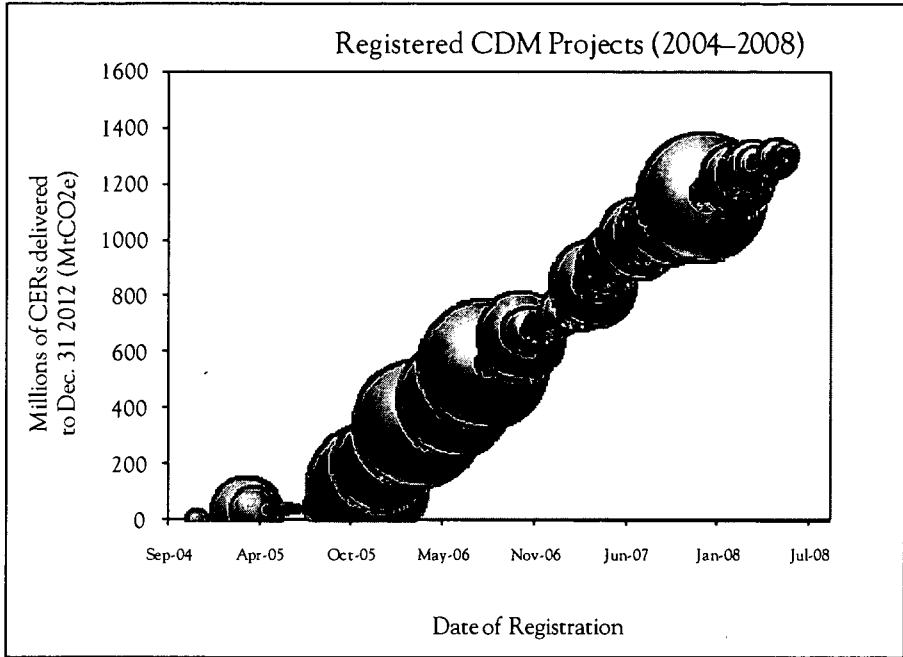
84. See UNEP Risø Centre, *supra* note 82.

85. *Id.*

86. See UNFCCC, CDM Statistics, <http://cdm.unfccc.int/Statistics/index.html> (last visited Jan 7, 2008). I count a project as in the CDM pipeline if it has advanced to the public comment phase of validation. UNFCCC, Validation Projects, <http://cdm.unfccc.int/Projects/Validation> (last visited July 15, 2008).

87. See UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003, *supra* note 31, at 15. Dividing the 2600 Mt CO₂e estimate for production of credits by 5 provides an annual estimate of supply during the First Commitment Period of 520 Mt CO₂e/year. Annex B GHG Emissions in 1990, not including credits for land use, land use change, and forestry, were 18,372 Mt CO₂e. Thus the CDM will provide 520/18,372 or 2.8 percent of Annex B 1990 GHG emissions.

FIGURE 2: PROJECTS REGISTERED IN TERMS OF CER SUPPLY PROJECTED BY END OF FIRST COMMITMENT PERIOD⁸⁸



Projects yet to be registered or yet to even enter the CDM pipeline face a diminishing probability of generating credits as the end of the First Commitment Period draws closer. The flow of projects is likely to diminish over time unless agreement is reached as to the future of the CDM in the post-2012 climate treaty architecture. The shorter the interval before the end of the First Commitment Period, the less money there is to be made from CERs and so the transaction costs associated with registration and monitoring loom larger.⁸⁹ Without certainty about the shape of any future UNFCCC-based trading program or subsidy, financial incentives to invest with post-2012 in mind are absent.⁹⁰ Even for the 2008–2012 market, there is significant

88. Data for Figure 2 comes from UNEP Risø Centre, *supra* note 82. The y-axis shows the total credits promised by December 31, 2012 of CERs to the carbon market from CDM projects; the size of each bubble shows the relative size of the particular project. This figure shows projects registered by November 1, 2007.

89. ERIC HAITES, ESTIMATING THE MARKET POTENTIAL FOR THE CLEAN DEVELOPMENT MECHANISM: REVIEW OF MODELS AND LESSONS LEARNED 63–64 (2004), available at <http://carbonfinance.org/docs/EstimatingMarketPotential.pdf>.

90. *Id.*

demand (and hence price) uncertainty because of the possible competition of CDM with both JI project-based reductions and outright purchases of AAUs from Russia, Ukraine, and the remainder of Eastern Europe.⁹¹ Whether these alternative supplies of AAUs and JI credits are sought out by Annex B parties depends on the costs of domestic compliance, the price of CERs, and other political considerations.⁹²

III. CURRENT SUPPLY OF CERs IN THE CDM PIPELINE BY PROJECT TYPE

The original intent of the CDM was to spur development of low-carbon energy infrastructure in the developing world both through achievement of sustainable development goals and substitution for early retirement of expensive, high-carbon energy infrastructure in the developed world.⁹³ It comes as a surprise, then, to find then that the CDM pipeline bears only a partial relationship to this vision. Instead, the subsidy provided by purchase of CERs to date will largely ensure that high GWP industrial gases such as trifluoromethane (HFC-23) and N₂O as well as CH₄ emitted by landfills and confined-animal-feeding operations (CAFOs) in non-Annex B nations are captured and destroyed. The very large projects dominating the supply of CERs are confined primarily to two relatively obscure industries—adipic acid and chlorodifluoromethane (HCFC-22) production. Adipic acid is the feedstock for the production of nylon-66 and releases abundant N₂O as a production byproduct.⁹⁴ HCFC-22 has two major applications. It is one of two major refrigerants that was phased in to replace the CFC's under the auspices of the Montreal Protocol to Protect on Substances that Deplete the Ozone Layer.⁹⁵ HCFC-22 is also the primary feedstock in the production

91. Russia was granted significant excess AAUs in negotiations leading up to its accession to the Protocol as an inducement to join. SCOTT BARRETT, ENVIRONMENT AND STATECRAFT: THE STRATEGY OF ENVIRONMENTAL TREATY-MAKING 372–73 (2003). This concession, when combined with the post-Soviet economic contraction, leaves Russia with significantly lower actual emissions than its assigned amount under the Protocol. POINT CARBON, *supra* note 67, at 8; Victor et al., *supra* note 49, at 263. Ukraine and the remainder of Eastern Europe also have excess AAUs due to economic contraction. *Id.*

92. See discussion *infra* Part VI.

93. See discussion *infra* Part I.B.2.

94. R.A. Reimer et al., *Adipic Acid Industry—N₂O Abatement: Implementation of Technologies for Abatement of N₂O Emissions Associated With Adipic Acid Manufacture*, in NON-CO₂ GREENHOUSE GASES: SCIENTIFIC UNDERSTANDING, CONTROL AND IMPLEMENTATION 347, 347 (J. van Ham et al. eds., 2000).

95. A. MCCULLOCH, INCINERATION OF HFC-23 WASTE STREAMS FOR ABATEMENT OF EMISSIONS FROM HCFC-22 PRODUCTION: A REVIEW OF SCIENTIFIC, TECHNICAL AND ECONOMIC ASPECTS 2 (2005), available at http://cdm.unfccc.int/methodologies/Background_240305.pdf.

of PTFE,⁹⁶ more commonly known by its Dupont brand name, Teflon. HCFC-22 production inevitably produces HFC-23 as an unwanted byproduct.⁹⁷ These two relatively small industries represent nearly 55 percent of the supply of issued CERs in the CDM to date.⁹⁸

Contrary to ex-ante predictions, CO₂-based projects, including renewable energy, fuel switching from coal to gas, demand side energy efficiency, waste heat capture, and cement process modification account for less than half of the CER supply to 2012. Renewable energy projects alone account for 28 percent. Nineteen HFC-23 capture projects at HCFC-22 production facilities and three projects that capture the N₂O made as a byproduct of adipic acid or nitric acid production account for the third of the pipeline composed of high GWP industrial gas reduction projects. Finally, CH₄-capture and flaring projects, mostly located at large landfills, coal mines, and CAFOs, account for another 19 percent. Moreover, because the HFC-23, N₂O, and to a lesser extent, CH₄, projects are typically of larger size than the renewable energy projects, they are more likely to overcome the transaction costs associated with registration and production of CERs than the smaller hydro, wind, and biomass energy projects that compose the CDM's renewable portfolio.⁹⁹

To date, relatively small numbers of CERs have actually been issued. This slow trickle will likely turn to a flood in the coming years as registered projects begin submitting monitoring reports to the CDM EB. In order for the issuance of a CER to occur, a third-party monitor must audit a CDM project and certify that monitoring of the emissions reductions was adequate to ensure that they actually occurred.¹⁰⁰ Submission of this report to the CDM EB results in the issuance of CERs to that project participant's account.¹⁰¹ The first CERs were issued by the CDM EB in late October 2005.¹⁰² As of January 1, 2008, only 103 million CERs have been issued and deposited into project participant accounts.¹⁰³ The fact that more than half of these issuances are to HFC-23 abatement projects (55 percent) is likely due to the superior financial and logistical capacity of these projects relative to either the CH₄ or renewable-energy projects. The pattern most evident in the early issuances of CERs is the dominance of large over small projects in terms of actually

96. *Id.*

97. *Id.*

98. UNEP Risø Centre, *supra* note 82.

99. HAITES, *supra* note 89, at 45.

100. U.N. ENV'T PROGRAM, *supra* note 68, at 38–39.

101. *Id.* at 39.

102. UNFCCC, *supra* note 81.

103. This amount represents less than 10 percent of CERs promised by registered projects for delivery to 2012. *Id.*

producing emissions reductions. Early issuance shows once again that the barrier represented by transaction costs is more substantial for small CDM projects. As discussed above, the classes of small and large projects are largely coextensive with the CO₂ projects versus the N₂O, HFC-23, and to a lesser extent CH₄ projects.

Contrary to theory and expectation, the CDM market is not a subsidy implemented by means of a market mechanism by which CO₂ reductions that would have taken place in the developed world take place in the developing world. Rather, most CDM funds are paying for the substitution of CO₂ reductions in the developed world for emissions reductions in the developing world of industrial gases and methane. Indeed, the industrial gas emissions that account for one third of CDM reductions do not even occur in the developed world, not because of an absence of adipic acid or HCFC-22 manufacture, but because Annex B industries, after recognizing the threat posed by these emissions and the low cost of abating them, have opted to voluntarily capture and destroy them.¹⁰⁴

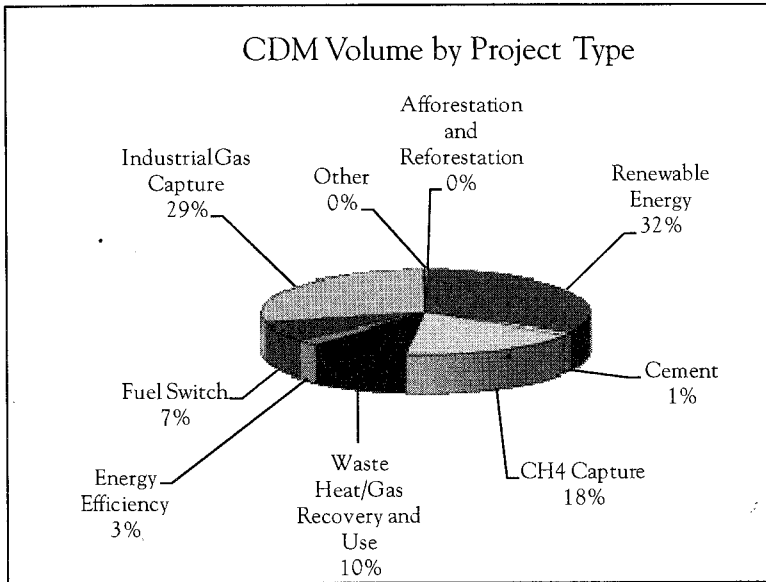
While renewable energy projects do make up 1600 out of 2647 (60 percent) projects in the CDM project pipeline, they account for only 28 percent of the emissions reductions produced. It is important to note that a significant proportion of the CERs generated by biomass power projects are from the CH₄ emissions that are avoided because biomass is burned rather than allowed to biodegrade.¹⁰⁵ Much of the publicity surrounding the CDM has emphasized the number of renewable energy projects sponsored by the CDM while neglecting the relative volume of emissions,¹⁰⁶ hence CERs produced and the relative scale of subsidy provided to various sectors. This emphasis provides a false picture of the true subsidy flows being generated by the international market for carbon (see Figure 3).

104. MCCULLOCH, *supra* note 95, at 18; Reimer et al., *supra* note 94, at 349.

105. Anaerobic digestion of crop residues leads to significant emission of CH₄ that is prevented by collection and use of the waste as a fuel. Many biomass energy projects claim this emission reduction in addition to the fossil-fuel-based energy avoided. See, e.g., CDM PROJECT DESIGN DOCUMENT: CAMIL ITAQUI BIOMASS ELECTRICITY GENERATION PROJECT 7-9 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/7Q7IH03DPAA2EL4SA8AM415CKQ7502>.

106. Compare *infra* fig. 3, with UNFCCC, Registration: Distribution of Registered Project Activities by Scope, <http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html> (last visited May 4, 2006), and The World Bank, Carbon Finance Unit, About World Bank Carbon Finance Unit, <http://carbonfinance.org/Router.cfm?Page=About&ItemID=24668> (last visited May 4, 2006).

FIGURE 3: FRACTION OF CERS SUPPLIED TO 2012 BY PROJECT TYPE FOR ALL PROJECTS CURRENTLY IN THE CDM PIPELINE¹⁰⁷



It is clear that the CDM has induced market participants to produce a large number of emissions reductions in the developing world for sale to those nations with quantified emissions reductions under the Protocol. However, to evaluate whether the CDM as actually realized is a success, more information is required: One must also ask whether Annex B nations get their money's worth. To answer this question, Part IV will examine HFC-23 projects and energy projects in the CDM.

IV. STRATEGIC MANIPULATION OF BASELINES: THE CASE OF HFC-23 ABATEMENT PROJECTS IN THE CDM

A. HFC-23 is a High GWP Byproduct of HCFC-22 Manufacture

Our first story concerns both the strategic behavior on the part of proponents of HFC-23 capture projects, an important class of large projects within the CDM, and the responses of the CDM EB to these attempts to inflate credit issuance. These emission reduction projects are an important component of the emissions market's initial rapid growth. There are

107. Data current as of Dec. 4, 2007. UNEP Risø Centre, *supra* note 82.

nineteen HFC-23 capture projects currently participating in the CDM.¹⁰⁸ These projects consist of the capture and destruction of HFC-23 produced as a byproduct of HCFC-22 manufacture.¹⁰⁹ The primary use of HCFC-22 is as a refrigerant, although its use as a feedstock for fluoroplastics such as PTFE is also significant and growing.¹¹⁰ For every 100 tons of HCFC-22 produced, between 1.5 and 4 tons of HFC-23 are produced.¹¹¹ This group of emission reduction projects have played an important role in shaping the early CDM emissions market and, because of their substantial market share, in determining its environmental performance.

An understanding of the incentives faced by creators of HFC-23 abatement projects must begin with an understanding of the atmospheric chemistry of HFC-23, because this chemistry lies at the heart of what makes them successful CDM projects. HFC-23 is an extremely potent and long-lived greenhouse gas. Its one-hundred-year GWP is 11,700.¹¹² As a consequence of this high GWP and the rules of the CDM, which convert the other six Protocol gases to CO₂e and hence CERs using their GWPs, 1 ton of HFC-23 abated is considered equivalent to 11700 tons of CO₂. In other words, for every kilogram of HCFC-22 produced, between 15 and 30 g of HFC-23 is produced, and potentially captured and destroyed. This 15 to 30 g of HFC-23 is equivalent to 175 to 350 kg of CO₂, or 0.175 to 0.350 CERs.

Although approximately half of HCFC-22 production occurs in the developed world,¹¹³ there are essentially no byproduct emissions of HFC-23 there because major producers have voluntarily adopted measures to capture and destroy it.¹¹⁴ Participation in voluntary abatement programs was substantial but not universal by 2005.¹¹⁵ The situation in the developing world was, prior to CDM, quite different. There, HCFC-22 manufacturers vented all HFC-23 produced to the atmosphere.¹¹⁶ One market analyst predicts that global HCFC-22 production will grow by 6 to 7 percent per year until 2020 and by 16 percent per year in the developing world.¹¹⁷ Thus,

108. This figure is as of Jan. 1, 2008. UNEP Risø Centre, *supra* note 82.

109. CDM Executive Bd., UNFCCC, *Revision to Approved Baseline Methodology AM0001: "Incineration of HFC 23 Waste Streams" 1* (Version 03, 2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/AM0001_version3%20.pdf.

110. MCCULLOCH, *supra* note 95, at 4.

111. *Id.* at 10.

112. *Id.* at 21.

113. *Id.* at 4.

114. *Id.* at 18, 21.

115. IPCC, *supra* note 83, at 409.

116. MCCULLOCH, *supra* note 95, at 4.

117. *Id.*

reducing non-Annex B emissions of HFC-23 should be a goal of any treaty aimed at curbing GHG emissions.

Non-Annex B manufacturers of HCFC-22 have, to a remarkable extent, become participants in the CDM. Developing world production of HCFC-22 in 2005 was approximately 237,000 metric tons.¹¹⁸ Assuming a 3 percent HFC-23 production rate, which has been fairly typical for the 19 HCFC-22 plants participating in the CDM,¹¹⁹ this equates to a production of 83 million CERs per year.¹²⁰ Taken together, the PDDs of the nineteen HCFC-22 plants estimate that they will produce 81.8 million CERs per year. Using these estimates, it would appear that essentially all developing world HCFC-22 production, as of 2005, is currently participating in the CDM. This is a remarkable achievement for the CDM and begs the question of how a financial mechanism was able to achieve near total market penetration in an industry so quickly. An examination of the economics of HCFC-22 abatement and HFC-23 capture explains that the reasons may have as much to do with the perverse incentives created by the carbon market as with an ability to identify low cost emissions reduction opportunities.

B. The Perverse Incentives of HFC-23 Abatement as a CDM Project

The economics of HFC-23 projects create incentives for strategic behavior that, if left unchecked, would undermine the environmental efficacy of the CDM (see Table 1). Consider the 1 kg of HCFC-22 produced by a CDM project that the calculation above showed to be equivalent to 0.35 t CO₂ or 0.35 CERs. At current market prices of €10/CER,¹²¹ the production of 1 kg of HCFC-22 will produce a subsidy of €3.51. The cost of HFC-23 abatement is estimated to be on the order of €0.09/kg HCFC-22.¹²²

118. *Id.*

119. See UNEP Risø Centre, *supra* note 82. The average HFC-23/HCFC-22 ratio of the first 10 plants is 2.99 ± 0.58 (data on file with author).

120. $237,000 \text{ Mt HCFC-22} * 0.03 = 7110 \text{ Mt HFC-23}$; $7110 \text{ Mt HFC-23} * 11700 = 83,187 \text{ Mt CO}_2\text{e}$.

121. Data collected from publicly available reported trades of CERs is used to create this estimate. Note that the pricing of CERs is dependent upon when in the regulatory process they are sold. Most sales occur prior to registration of a project, let alone monitoring, verification, and issuance of promised CERs. These forward contracts for CERs are termed "primary CER" sales. Primary CER prices reflect validation, registration, credit, and country risk. Issued CERs, termed "secondary CERs" trade at approximately 80 percent of EU ETS allowance prices. This price spread is expected to decrease substantially once the interconnections required for trading are established between the CDM registry and the EU ETS registry.

122. MCCULLOCH, *supra* note 95, at 12. This value is derived assuming an 8 percent return on the investment in destruction facilities (€240,000/year) plus €200,000 operating expenses and a

Thus, the net from subsidy minus abatement costs to an HCFC-22 producer is approximately €3.41/kg HCFC-22. This subsidy compares quite favorably with the wholesale price for HCFC-22, which as of the fourth quarter of 2005 was approximately €1.60/kg.¹²³ A developing world producer of HCFC-22 can earn more than twice as much from its CDM subsidy as it can gross from the sale of its primary product. Even when CER prices were only half of their current value, HCFC-22 manufacturers found these calculations to be a compelling incentive to enter the CDM process.¹²⁴ Given these incentives, it is perhaps not a tremendous surprise that participation in the CDM by the non-Annex B based HCFC-22 industry is nearly universal.

TABLE 1: ESTIMATING THE VALUE OF THE CDM SUBSIDY
TO HCFC-22 PRODUCERS

Step 1: Calculate CO ₂ e produced by 1 kg HCFC-22	1 kg HCFC-22 → 0.03 kg HFC-23 0.03 kg HFC-23 * 11700 = 351 kg CO ₂ e = 0.351 t CO ₂ e
Step 2: Estimate gross subsidy	0.351 t CO ₂ e * €10/CER = €3.51 Gross subsidy per kg HCFC-22 = €3.51
Step 3: Estimate the cost per kg HCFC-22 (calculations are for a facility capable of capturing and destroying 200 t HFC-23/year)	€3,000,000 investment at 8% interest + €200,000 per year operating costs = €590,000 per year cost.
Step 5: Calculate the cost per kg HCFC-22	€590,000/200 t HFC-23 = €2950/t HFC-23 €2950/t HFC-23 * 3% HFC-23 = €88.5/t HCFC-22 €88.5/t HCFC-22 * 1 t/1000 kg = €0.09 Cost of subsidy per kg HCFC-22 = €0.09
Step 6: Calculate the net CDM subsidy	€3.51 - €0.09 = €3.42/kg HCFC-22

The perverse incentives created by the economics of HFC-23 capture CDM projects were, from a very early stage, a point of controversy.¹²⁵ The CDM methodology, without which HFC-23 projects could not advance to registration, went through several rounds of revision because of fears that

production rate of 200 t HFC-23 per year, equivalent to 6666 t HCFC-22 per year, and a 3 percent HFC-23 production rate.

123. Telephone Interview With Mack McFarland, Environmental Fellow, DuPont Fluoroproducts (Fall 2005) [hereinafter McFarland Interview].

124. Should primary CER prices fall from their current highs of €10 due to the fall in the value of ETS permits, HFC projects will remain economically attractive.

125. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (June 3, 2004), available at http://cdm.unfccc.int/methodologies/inputam0001/letter_Dupont_03/June04.pdf [hereinafter Jacob].

HCFC-22 manufacturers would produce gas simply to generate CERs, thereby diluting the CDM's currency, at least in terms of its environmental effectiveness.¹²⁶ Recall that a key requirement of CERs is that they be "additional to any that would have occurred in the absence of the project activity."¹²⁷ The economics of HFC-23 projects are a *reductio ad absurdum* of this requirement. It is quite likely that no capture of HFC-23 would occur without the CDM. On the other hand, with the CDM, HCFC-22 factories have very strong incentives to create extra HFC-23 specifically to capture and destroy it. Indeed, merely by capturing what they would have made anyway, a manufacturer can triple revenues and, based on the cost estimates presented above, more than triple profits.

C. Imperfect Regulatory Compromise for HFC-23 Plants in the CDM

To deal with the perverse incentives to overproduce HCFC-22 in order to capture and destroy HFC-23, the CDM EB decided to approve only those projects involving previously existing HCFC-22 production capacity.¹²⁸ New plants or added capacity are not currently allowed into the CDM.¹²⁹ In order to qualify for registration, a plant must have been in operation and able to supply both HCFC-22 and HFC-23 production data for at least three years in the 2000 to 2004 period.¹³⁰ This prerequisite creates the obvious problem of incentivizing the capture and destruction of HFC-23 that is emitted incidental to the 16 percent annual growth of HCFC-22 production predicted to occur in the developing world.¹³¹ The Conference of the Parties has asked for guidance on new plant and added capacity from the Subsidiary Body for Scientific and Technical Advice of the UNFCCC.¹³²

Even with these relatively restrictive rules on eligibility, there is circumstantial evidence and very good reason to suspect that HCFC-22 manufacturers participating in the CDM have behaved strategically to direct a greater share of the subsidy to themselves by artificially inflating their

126. On the concept of tradable emissions permits as a property right, see Hahn & Hester, *supra* note 58, at 110, 117; on the concept of tradable emissions permits as a currency, see David G. Victor et al., *A Madisonian Approach to Climate Policy*, 309 *SCIENCE* 1820 (2005).

127. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

128. CDM Executive Bd., *supra* note 109, at 3.

129. *Id.* at 1.

130. *Id.*

131. MCCULLOCH, *supra* note 95, at 4.

132. *Summary of the Twenty-Second Sessions of the Subsidiary Bodies of the UN Framework Convention on Climate Change: 19–27 May, 2005*, *EARTH NEGOTIATIONS BULL.* (Int'l Inst. For Sustainable Dev., New York, N.Y.), May 30, 2005, at 5, available at <http://www.iisd.ca/download/pdf/enb12770e.pdf>.

base-year production in two ways. First, the fraction of HFC-23 produced by the production of HCFC-22 can be reduced by modification of the conditions under which chemical synthesis occurs. Dupont has consistently produced, in its United States HCFC-22 plant, HFC-23 byproduct percentages as low as 1.3 percent.¹³³ Developing-country manufacturers have not been able to achieve such rates of HFC-23 production, with reported rates between 2 and 4 percent. The economics of HCFC-22 production in the absence of a CDM subsidy dictate that HFC-23 production should be minimized because it is a waste product costing both energy and materials.¹³⁴ For this reason, almost all plants have historically monitored their HFC-23/HCFC-22 ratio in order to optimize productivity of HCFC-22.¹³⁵

Dupont argued in comments presented to the CDM EB that the crediting methodology for HFC-23 projects should be limited to crediting global best practice—the Dupont value. CDM project proponents responded that their plants lacked necessary capacity and could not be expected to perform with the same efficiency as those in the developed world. Presented with these conflicting arguments, the CDM EB forged a crude compromise. The CDM methodology eventually approved for HFC-23 abatement set 3 percent as the maximum percentage of HFC-23 byproduct allowable in the baseline data of a participating plant, a rough average of reported developing world values.¹³⁶ The average of all reported baseline data from the nineteen participating plants is 2.99 percent—very close to the maximum allowable value.¹³⁷ This suggests that even if the project participants were not actually aiming for the 3 percent sweet spot that would minimize their production costs (due to wasted feedstocks) but maximize their CDM subsidy (due to more CERs for a given production rate of HCFC-22), they were certainly not as concerned with minimizing this percentage as developed-world manufacturers who are not eligible for the CDM subsidy. Furthermore, the presence of the CDM and the prospect that crediting may ultimately be allowed for new plants removes any incentive to improve capital stock or process at existing

133. Jacob, *supra* note 125.

134. IPCC, *supra* note 83, at 394, 396.

135. Jacob, *supra* note 125.

136. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (Oct. 2, 2004), available at <http://cdm.unfccc.int/methodologies/inputam0001>.

137. It is important to note that at the time the CDM EB made its decision, it had data only from two HCFC-22 plants. Compare, UNFCCC, AM0001: Incineration of HFC 23 Waste Streams—Version 5.2, <http://cdm.unfccc.int/methodologies/DB/0MKGF12PM6TSNFNJZUESTSKG581HN6/view.html> (last visited May 2, 2008) (showing approval of Version 3 of AM0001 on May 13, 2005), with UNEP Risø Centre, *supra* note 82 (showing the public comment phase of the third HFC-23 project beginning on June 5, 2005).

plants, or to invest extra capital in state of the art facilities. Rather, it encourages construction of inefficient plants in order to create a high baseline and maximize potential for future CDM revenues.

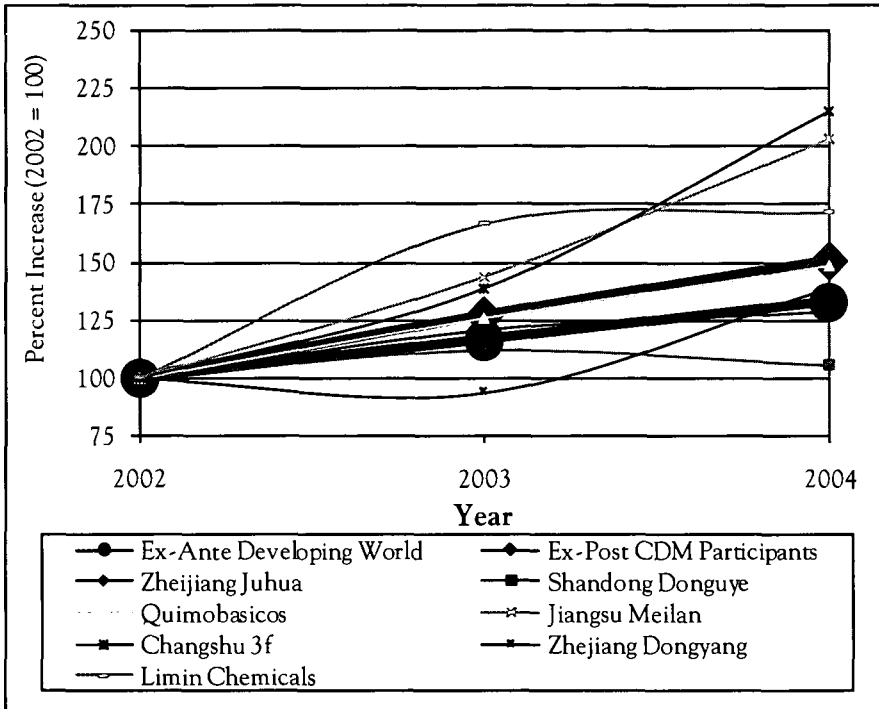
Second, at least some of the HCFC-22 plants participating in the CDM appear to have ramped up production during the baseline period (2000–2004) far beyond expected growth in the sector (15 percent per annum). Figure 4 shows baseline data supplied by plants participating in the program compared with the predicted growth rate for the industry over the 2002–2004 period.¹³⁸ Most plants exceeded the growth rates predicted for the developing-world industry as a whole. The increases in HCFC-22 production among the developing-world manufacturers led to a CDM participant production growth rate of 50 percent rather than 33 percent, as had been predicted ex-ante by market analysts.¹³⁹ Whether these plants increased production because of demand for HCFC-22 or in anticipation of higher CER revenue is impossible to say given existing publicly available information. Nevertheless, circumstantial evidence suggests that, rather than building new plants, HCFC-22 manufacturers elected to add capacity at existing plants during the CDM baseline period in order to take advantage of the CDM subsidy.¹⁴⁰

138. For predicted growth rates, see MCCULLOCH, *supra* note 95, at 4; production data for individual HCFC-22 plants on file with author.

139. *Id.*

140. Adding capacity at some existing plants would have been relatively simple because some developing-world plants are swing plants, able to shift configuration to produce a number of different halocarbon gases. With advance knowledge of the CDM and even a forecast price signal of \$3 to \$5, shifting to near constant HCFC-22 production and away from other halocarbons would have made sense during the baseline period. See TECH. & ECON. ASSESSMENT PANEL, U.N. ENV'T PROGRAM, RESPONSE TO DECISION XVIII/12: REPORT OF THE TASK FORCE OF HCFC ISSUES (WITH PARTICULAR FOCUS ON THE IMPACT OF THE CLEAN DEVELOPMENT MECHANISM) AND EMISSIONS REDUCTION BENEFITS ARISING FROM EARLIER PHASE-OUT AND OTHER PRACTICAL MEASURES 51–55 (2007), available at http://ozone.unep.org/teap/Reports/TEAP_Reports/TEAP-TaskForce-HCFC-aug2007.pdf.

FIGURE 4: PERCENTAGE INCREASES AT HCFC-22 PLANTS REPORTING MULTIPLE YEARS OF BASELINE DATA RELATIVE TO EX-ANTE ANALYST PREDICTIONS FOR THE INTERVAL¹⁴¹



In response to the windfall profits enjoyed by their domestic HCFC-22 producers as a result of the CDM, China has imposed a 65 percent tax on CER revenue generated by HFC-23 projects.¹⁴² Revenues from this fund, currently in excess of \$2 billion, are to be devoted to sustainable development, although none have yet been dispersed. In this way, as had been predicted by the critics of the CDM's baseline concept, Chinese environmental regulators, rather than create regulations that would eliminate a CDM project's eligibility, have acted to extract a substantial portion of the subsidy-derived rent. This tax reduces the CERs income to only 60 percent of that derived from the sale

141. The ex-ante developing world growth rate is 16.5 percent. The ex-post CDM participant growth rate is 25 percent. The thick lines show ex-ante (filled circles) and the average CDM participant (filled diamonds) rates of production growth.

142. Office of Nat'l Coordination Comm. on Climate Change, *supra* note 77, art. 24.

of HCFC-22. However, at prices greater than €15, even with a 65 percent tax, it will again make sense to produce gas solely for CER revenue.¹⁴³

The CDM provides perverse economic incentives to HCFC-22 producers that have led to a large fraction of the CER supply being produced by HFC-23 abatement. Even if some fraction of these reductions are voluntary, real, and additional, they still may not be the best use of Annex B resources for addressing non-Annex B GHG emissions. To abate all developing-world HFC-23 emissions would cost approximately \$31 million per year.¹⁴⁴ Instead, by means of a CDM subsidy, the Annex B nations will likely pay between €250 and €750 million to abate 2005 non-Annex B HFC-23 emissions.¹⁴⁵ This is a remarkably inefficient path to an environmental goal.

The case of HFC-23 capture projects, which currently account for nearly 22 percent of the CERs expected for delivery by 2012, illustrates both the success and some fairly significant problems with the CDM market. On one hand, the CDM was successful in identifying a class of emitters with very low marginal abatement costs and inducing near total sectoral abatement. On the other hand, it appears quite likely that the sector is also gaming the system by modifying its behavior in order to generate extra credits that can then be sold to developed countries with compliance obligations. Because of the inherent information asymmetries, the regulator has had a very difficult time, and indeed has not genuinely tried, dealing with these problems. It is not clear under the current system how it could. At the same time, because of the limitation on eligibility for old plants, the problems associated with HFC-23 for the CDM are to some extent limited. It is worth noting, however, that what saves the CDM from being awash in CDM credits does not help the environment. Recent press reports indicate incredibly high rates of growth in the HCFC-22 market, including the construction of new plants. Until these plants are included in the CDM or some other climate regime, they will emit their HFC-23 byproducts into the atmosphere.¹⁴⁶

143. A €15 CER price, taxed at 65 percent will net €1.60 after abatement costs and tax per kg HCFC-22 produced. The market price for HCFC-22 is approximately €1.60. See McFarland Interview, *supra* note 123.

144. MCCULLOCH, *supra* note 95, at 21.

145. 80 Mt CO₂e * €5 = €400,000,000; 80 Mt CO₂e * €20 = €1,600,000,000.

146. At recent climate negotiations, China has been arguing for and the EU against inclusion of new plants and additional capacity in the CDM. At this point, no agreement has been reached as to how to incorporate them into the CDM. Keith Bradsher, *Use of Air-Conditioning Is Widening the Hole in the Ozone Layer*, N.Y. TIMES, Feb. 23, 2007, at C1.

V. ANYWAY CREDITS IN CHINA'S POWER SECTOR

The most recent development in the CDM is the entry of important components of the Chinese electricity sector into the market. Early CDM power projects were mostly small power plants utilizing run-of-river hydro or biomass combustion technologies, mostly with nameplate capacity below 25 megawatts (MW). Recently, that picture has changed dramatically with the entry of significant numbers of large hydro¹⁴⁷ and natural-gas-fired power projects into the project pipeline. These projects present extremely challenging regulatory decisions to the CDM EB because it must decide which projects would or would not have gone forward without the carbon finance funds. Answering the question of whether projects are additional or would have happened anyway is always challenging, but is made particularly difficult by two factors: The energy sector in China is heavily regulated and primarily owned by the Government or state-owned entities, and participation rates by several elements of the sector is near 100 percent. On one hand, this outcome is to be applauded because modifications to the development path of the non-Annex B energy sector were a key goal for the CDM. However, this emerging result also raises important questions regarding the assumptions underlying the CDM as well as its potential for growth beyond 2012. The following section sheds light on these issues by telling the story of recent attempts by natural-gas-fired power plants to generate credits under the CDM.

A. Natural-Gas-Fired Power in China

Ultimately, if the problem of global climate change is to be effectively addressed, the methods by which electricity is generated both in the developed and the developing world will have to change. Currently, most electricity is generated via large coal-fired generating stations.¹⁴⁸ This is because large coal-fired generating stations are, at present, the lowest cost supplier of electricity, particularly in countries like the United States, China, and India,

147. For a discussion of the participation of large hydro in the CDM that reaches similar conclusions for that sector, see BARBARA NAYA, *FAILED MECHANISM: HOW THE CDM IS SUBSIDIZING HYDRO DEVELOPERS AND HARMING THE KYOTO PROTOCOL 4-5* (2007), available at http://www.internationalrivers.org/files/Failed_Mechanism_3.pdf.

148. ENERGY INFO. ADMIN., *supra* note 78, at 62; Gerard Wynn, *U.N. Talks Will Not Decide on New HFC Incentives*, REUTERS, Dec. 8, 2007, available at <http://www.reuters.com/article/latestCrisis/idUSL08166304>.

where coal supplies are abundant.¹⁴⁹ Thus, developing both short-term and long-term alternatives to coal-fired generation capacity is critical to mitigating the impacts of climate change. In China, where new capacity is being added at an extremely high rate in order to meet surging demand for electricity, short-term alternatives are especially important.¹⁵⁰

One currently available alternative to the large coal-fired generating station that is superior from a GHG emissions perspective is large power plants that utilize combined cycle gas turbines (CCGT) technology. These plants are superior from a climate perspective because they produce substantially less CO₂ per MW hour (MWh) of electricity than typical coal-fired power plants.¹⁵¹ In addition, CCGTs emit substantially lower quantities of particulate matter, soot, sulfur oxides, and nitrogen oxides per unit of power produced than do coal-fired power plants, because the fuel they burn is cleaner and combustion is more complete.¹⁵² This cleaner emission makes them extremely appealing for new baseload generation to developing countries that have severe local air pollution concerns. It is for this reason that California in-state baseload generation, in contrast to the United States as a whole, is largely via CCGT.

Even with these environmental advantages, natural-gas-fired power has struggled to gain a foothold in developing countries because of the different underlying prices of coal and natural gas.¹⁵³ Capital costs and construction times are generally far higher for coal than for natural gas, while the reverse is true for fuel prices. Thus, while a coal plant requires significant upfront investment, it is relatively cheap to operate compared to a CCGT plant, which is cheap to build but costly to operate. Overall, the higher fuel costs

149. These three are also the countries with the greatest current and future impacts on climate, precisely for the reason that they are large and generate most of their electricity using coal-fired power plants. ENERGY INFO. ADMIN., *supra* note 78, at 62.

150. China built 114 GW of new fossil-fuel-fired generating capacity in 2006 and is on track to build 95 GW of new fossil-fuel-fired generating capacity in 2007. For comparison, the UK electricity grid has a capacity of 75 GW, and the California Independent System Operator administers 46.5 GW. Both of these grids were built out over decades. Keith Bradsher, *China's Green Energy Gap*, N.Y. TIMES, Oct. 24, 2007, at C1; Envtl. Energies Tech. Div., Lawrence Berkeley Nat'l Lab., *Current Energy: Supply of and Demand for Electricity for California*, <http://currentenergy.lbl.gov/ca/index.php> (last visited July 15, 2007).

151. On average, a subcritical coal-fired power plant produces CO₂ at a rate of 0.92 metric tons CO₂ per MWh while a CCGT has a carbon intensity of 0.35 metric tons CO₂ per MWh. Mike Jackson et al., *Greenhouse Gas Implications in Large Scale Infrastructure Investments in Developing Countries: Examples From China and India* (Stanford Program on Energy & Sustainable Dev., Working Paper No. 54, 2006), available at http://iis-db.stanford.edu/pubs/21061/China_and_India_Infrastructure_Deals.pdf.

152. ENERGY INFO. ADMIN., *supra* note 78, at 62.

153. *Id.*

of gas swamp the higher capital costs of coal. This outcome is especially true in China where coal's capital costs are relatively lower, and CCGT's relatively higher, than global averages.¹⁵⁴ These economics have made gas and the CCGT simultaneously attractive to foreign investors and unattractive to government-controlled power sectors like China's.

In China, these contrasting environmental and economic dynamics have played out via substantial state control of the power sector in ways that have encouraged construction of new CCGT power plants, and at the same time have created substantial uncertainties for their operation. On one hand, the state intervened to insure construction of the West-East Pipeline, opening up a major supply of new gas for the eastern provinces where demand is greatest.¹⁵⁵ Financial viability of this project was assured by take-or-pay contracts for natural gas between the pipeline and the proposed new CCGT's in the coastal provinces.¹⁵⁶ State-owned enterprises are also in the process of constructing multiple new liquefied natural-gas facilities to serve the coastal provinces.¹⁵⁷ In addition, as part of China's eleventh five-year plan, the National Development and Reform Commission, which sets tariffs on China's two electricity grids,¹⁵⁸ is charged with developing the gas industry in an effort to reduce pollution.¹⁵⁹ Although its high costs might make it seem unattractive, the environmental and energy security benefits of increased utilization of gas-fired power have meant that China plans to build twenty-three CCGT power plants between 2005 and 2009, with a combined nameplate capacity of more than 18 GW.¹⁶⁰

154. In China, because the critical components for coal-fired power plants are produced domestically while those for CCGT must be imported, capital cost for subcritical coal-fired power plants may actually be lower than for CCGT. *Id.*; INT'L GAS UNION, GAS TO POWER-CHINA 15 (2005) (on file with author).

155. People's Republic of China, China Factfile: Key National Projects, http://english.gov.cn/2006-02/08/content_182600.htm (last visited July 15, 2008).

156. This support was critical, because in the absence of a well-developed residential and commercial distribution network and demand for gas, a complete pipeline would have insufficient customers to whom it could sell its gas. INT'L GAS UNION, *supra* note 154, at 5, 9.

157. *See id.* at 5.

158. *Id.* at 16.

159. NAT'L DEV. & REFORM COMM'N, PEOPLE'S REPUBLIC OF CHINA, THE OUTLINE OF THE ELEVENTH FIVE-YEAR PLAN FOR NATIONAL ECONOMIC & SOCIAL DEVELOPMENT OF THE PEOPLE'S REPUBLIC OF CHINA, ch. 3: Optimizing and Upgrading Industrial Infrastructure, http://en.ndrc.gov.cn/hot/t20060529_71334.htm (last visited July 15, 2008).

160. For comparison, the entire California Independent System Operator manages 46.5 GW of nameplate capacity. Compare Envtl. Energies Tech Div., *supra* note 150, with INT'L GAS UNION, *supra* note 154, at 2.

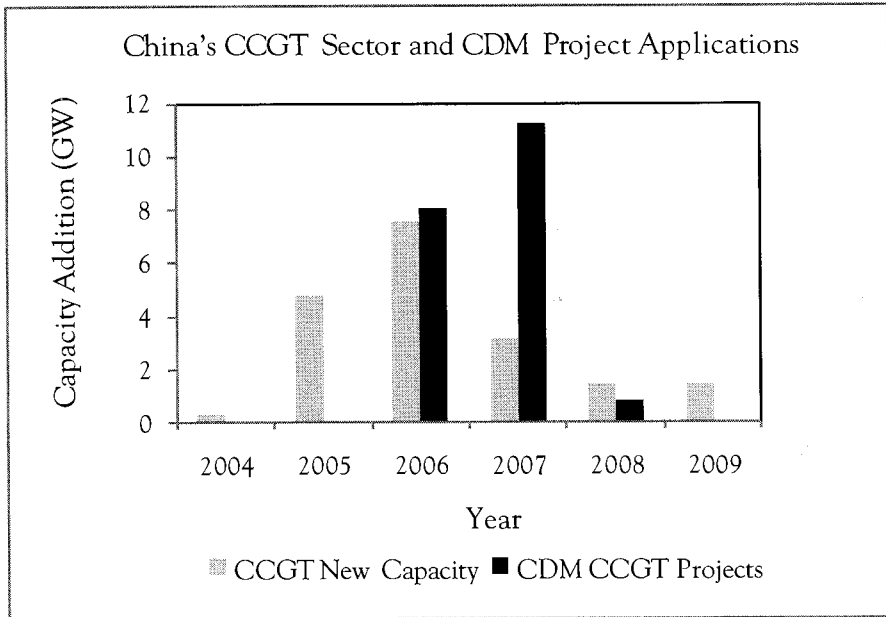
B. Natural-Gas-Fired Power as a CDM Project

Because the primary sources of power to the Chinese electrical grid are subcritical coal-fired power plants and most new builds are either subcritical or supercritical coal,¹⁶¹ construction of a CCGT instead of a coal-fired power plant arguably represents a reduction of GHG emissions. As described in the previous section, the economics in China do not favor the decision to build a CCGT rather than a subcritical coal power plant. Nevertheless, this choice would have clear climate benefits. If such a decision could be influenced by the potential supply of funds from the sale of carbon credits, equal to the difference in GHG emissions between the alternatives, crediting as a CDM project would be possible. Such thinking led to the submission and approval of just such a CDM methodology in mid-2006, called the Baseline Methodology for Grid Connected Electricity Plants Using Natural Gas (AM0029).¹⁶²

161. Subcritical coal-fired power plant boilers operate at temperatures and pressures below the critical point for water—the point at which water no longer turns into steam when heated but instead decreases in density. Supercritical plants operate above this point and as a result achieve significantly higher heat rates and efficiency than is possible for subcritical plants. See World Coal Inst., *Supercritical & Ultra-Supercritical*, <http://www.worldcoal.org/pages/content/index.asp?PageID=421> (last visited Mar. 31, 2008).

162. CDM Executive Bd., UNFCCC, *Approved Baseline Methodology AM0029: "Baseline Methodology for Grid Connected Electricity Generation Plants Using Natural Gas"* (Version 01.1, 2006), available at [http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_KTKZTS1HEG4\)BIETV74WMLZY10061X](http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_KTKZTS1HEG4)BIETV74WMLZY10061X).

FIGURE 5: CONSTRUCTION OF COMBINED CYCLE GAS TURBINE POWER PLANTS IN CHINA AND APPLICATIONS FOR CREDITING UNDER THE CDM BY NAMEPLATE CAPACITY (2004–2009)¹⁶³



By the end of 2007, twenty-four CCGT projects, representing essentially all power plants actually being built (as opposed to planned) in China between 2005 and 2010, had applied under the methodology to claim credit for the difference between their emissions and the baseline established by AM0029 (see Figure 1).¹⁶⁴ All plants built or under construction since 2005 are arguing that they would not have been built but for the CDM. This argument, when presented on a project-by-project basis, sounds plausible. It is only when the comparison between total project applications and the entire natural-gas-fired power sector is made, and the two are found to be roughly equivalent, that it becomes problematic.

163. The total CCGT builds equal 18.4 GW while applications for CDM crediting so far equal 17.6 GW.

164. Planned CCGT power plant builds during the 2004–2009 interval equal 18.37 GW. INT'L GAS UNION, *supra* note 154, at 3. CDM applications to the end of 2007 for crediting of plants entering operation between 2005 and 2008 equal 17.59 GW, UNEP Risø Centre, *supra* note 82.

Of the 24 Chinese CCGT CDM projects currently proposed, six have been registered¹⁶⁵ and a further three have requested registration but the CDM EB has required corrections after review.¹⁶⁶ Registration is automatic eight weeks after it is requested unless a project participant or at least three members of the CDM EB submit a Request for Review (RFR) of the project.¹⁶⁷ An RFR is then considered by the full CDM EB at its next meeting. Decisions on whether to grant review and on the scope of review are then made.¹⁶⁸ To date, all requests for review on Chinese CCGT CDM projects by CDM EB members list concerns about additionality as a reason for the RFR.¹⁶⁹ In other words, the CDM EB members requesting review are concerned that these projects would have been built even in the absence of the CDM, and that any emissions reductions claimed by them would not be in addition to what would have occurred in its absence.

165. Six Chinese CCGT CDM projects have been registered as of July 1, 2008. Five of the six were registered only after Requests for Review by the CDM EB and subsequent corrections. UNFCCC Project 1320: Beijing Taiyanggong CCGT Trigereneration Project [hereinafter UNFCCC Project 1320], <http://cdm.unfccc.int/Projects/DB/SGS-UKL1188570070.22> (last visited Jul. 1, 2008); UNFCCC Project 1343: Xiaoshan Power Plant's NG Power Generation Project of Zhejiang Southeast Electric Power Co., Ltd. [hereinafter UNFCCC Project 1343], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189665775.96> (last visited Jul. 1, 2008); UNFCCC Project 1344: Zhejiang Provincial Energy Group Zhenhai Natural Gas Power Generation Co., Ltd.'s NG Power Generation Project [hereinafter UNFCCC Project 1344], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189684459.76/view> (last visited Jul. 1, 2008); UNFCCC Project 1227: Yuyao Electricity Generation Project Using Natural Gas [hereinafter UNFCCC Project 1227], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1183455647.94> (last visited Jul. 1, 2008); UNFCCC Project 1304: Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant [hereinafter UNFCCC Project 1304], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1187936755.18> (last visited Jul. 1, 2008); UNFCCC Project 1373: Beijing No.3 Thermal Power Plant Gas-Steam Combined Cycle Project Using Natural Gas [hereinafter UNFCCC Project 1373], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1191500853.33> (last visited Jul. 1, 2008).

166. Three projects are currently being revised after the CDM EB required a review of their registration request and corrections. UNFCCC Project 1381: Shanghai Baoshan Grid Connected Natural Gas Combined Cycle Power Plant Project [hereinafter UNFCCC Project 1381], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1192083874.4> (last visited Jul. 1, 2008); UNFCCC Project 1243: Sulige Natural Gas Based Power Generation Project [hereinafter UNFCCC Project 1243], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1184339707.46> (last visited Jul. 1, 2008); UNFCCC Project 1368: Qinghai Ge-ermu Gas Turbine Power Plant Project [hereinafter UNFCCC Project 1368], <http://cdm.unfccc.int/Projects/DB/BVQI1191062063.0> (last visited Jul. 1, 2008).

167. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Montreal, Can., Nov. 28–Dec. 10, 2005, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on Its First Session, Held at Montreal From 28 November to 10 December 2005, Addendum: Part Two: Action Taken by the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol at Its First Session*, 15, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006), available at <http://unfccc.int/resource/docs/2005/cmp/eng/08a01.pdf>.

168. *Id.*

169. UNFCCC, Project 1343, *supra* note 165; UNFCCC, Project 1320, *supra* note 165; United Nations Framework Convention on Climate Change, *supra* note 167, at 14, 16–17.

In its review of these projects, it is not at all clear that the CDM EB will be able to address the fact that, taken together, current applications for crediting under the CDM of natural-gas-fired power in China imply that no CCGT builds would occur in the absence of carbon finance. Because review is on a project-by-project basis and is limited to determination that the project documents are in compliance with the AM0029 methodology, this is likely beyond the scope of review.¹⁷⁰ The AM0029 methodology determines a project's additionality by reference to a financial calculation comparing the costs of CCGT to alternative options, and by an analysis of whether the project is common practice.¹⁷¹ The investment analysis treats projects as if they were operating in a deregulated, competitive, power generation sector, rather than in a state-controlled or partially deregulated power sector. The common practice analysis, in the context of a coal-dominated energy sector such as China's, is easy to overcome. Neither takes into account the relevant national priorities for energy development that have been set by the China. Thus, the review of CCGT projects is likely to find them to be additional to what otherwise would have occurred, not because this is in fact the case, but rather because the review is constrained by the procedures of the CDM from asking the right questions about the projects.

The decisions made regarding these projects are likely to set an important precedent that could have far-reaching consequences for the CDM in light of another recently approved methodology. In the fall of 2007, the CDM EB approved, after significant controversy, a methodology for crediting supercritical and ultra-supercritical coal-fired power plants for emissions reductions relative to a grid primarily composed of subcritical coal-fired plants (ACM0013).¹⁷² This methodology is very similar to AM0029 with regard to its additionality test,¹⁷³ but will apply to a substantially larger number of power plants both in China and the rest of the developing world. In 2006 and 2007, China built more than 200 GW of new fossil-fuel-fired power plants. China has begun telling power companies that they should choose to

170. A request for review must relate to a project's failure to comply with a specific validation requirement. See United Nations Framework Convention on Climate Change, *supra* note 167, at 15, 54, 55. Validation requirements relevant to the additionality determination are defined in terms of compliance with an approved methodology, such as AM0029. *Id.* at 14, 16–17.

171. See CDM Executive Bd., *supra* note 162, at 3.

172. CDM Executive Bd., UNFCCC, *Approved Consolidated Baseline and Monitoring Methodology ACM0013: "Consolidated Baseline and Monitoring Methodology for New Grid Connected Fossil Fuel Fired Power Plants Using a Less GHG Intensive Technology"* (Version 01, 2007), available at http://cdm.unfccc.int/EB/034/eb34_repan02.pdf.

173. Compare CDM Executive Bd., *supra* note 162, at 3, with CDM Executive Bd., *supra* note 172, at 4.

build supercritical rather than subcritical plants because they use 10 percent less coal.¹⁷⁴ As China shifts from subcritical to supercritical and ultra-supercritical coal-fired generation technology, the potential for the generation of large numbers of CERs that do not correspond to any kind of behavioral change appears possible.

The AM0029 methodology and near 100 percent participation of CCGT power plants in China together have placed the CDM EB in an untenable position. On one hand, natural-gas-fired power is a climate friendly alternative to coal, whose development should be encouraged and fostered by the climate regime. Further, a program to encourage developing-country participation in the global climate change regime would strive to achieve 100 percent participation rates within developing country electricity sectors. On the other hand, it appears that the CDM, because it functions at a project rather than a sectoral level, is likely giving credit for activities that would have occurred without it. These “anyway” credits are especially important given that the CDM credit, “anyway” or not, can be sold to Annex B parties in order to reduce the extent to which they cut their own emissions.

VI. REFORM OF THE POST-2012 REGIME

The parties to both the Kyoto Protocol and the UNFCCC are now considering what to do to accomplish the goal of the UNFCCC after the first compliance period ends in 2012.¹⁷⁵ Global carbon trading is likely to play a role in any future architecture. At the same time, the U.S. Senate is considering proposals for an economy-wide cap-and-trade program for GHGs that would allow extensive utilization of international carbon credits.¹⁷⁶ Thus, consideration of how to improve the performance of the CDM is critical from both a domestic and an international perspective.

This description of the current and likely future state of the CDM is meant to point out that, before we assume that expansion of the current offset trading market is the appropriate route for engaging with developing countries, it is worth looking at the empirical evidence from the trading program as it exists now. That evidence, as detailed in the two examples above, suggests that the CDM is leading to widespread strategic behavior. In the case of the HFC-23 projects, the incentives created by the CDM are

174. Bradsher, *supra* note 150.

175. Bali Action Plan, *supra* note 8.

176. For example, the Lieberman-Warner Bill would allow 15 percent of a covered facility's compliance obligation to be met with international allowances or credits. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2501 (2007).

leading to undesirable behavior in the name of claiming credit. HFC-23 projects appear to be creating extra GHGs in order to claim credit for their capture and destruction even as they do capture and destroy some emissions that would have contributed to climate change. In the case of the CCGT projects, the incentives created by the CDM are likely leading to no change in behavior except for widespread claims for credits. Furthermore, procedures for project regulation likely limit the CDM EB from examining the issues most central to whether the projects are producing additional emissions reductions.

In addition, both cases present severe information challenges for the regulator. The rules of the game in the CDM systematically create incentives for project proponents to manipulate the transfer of information to the CDM EB while providing it with essentially no other information-gathering resources. In the case of HFC-23, the CDM creates strong incentives for project proponents to conceal the extent to which process efficiencies might lower their GHG production rate. In the case of the CCGTs, the system creates strong incentives for project proponents to misrepresent the motivations for their choice of power plant technology. Unlike in a natural market, buyers of CDM credits have no incentive to disclose information they have regarding projects. Their incentive, just like the generators of credits, is to facilitate the approval of projects and the issuance of credits. This informational problem is particularly acute because the CDM EB is called upon to make decisions requiring technical expertise across a wide array of both countries and industries.

The CDM set three goals: to produce sustainable development, to help developing countries accomplish the objective of the UNFCCC, and to reduce the costs of compliance for parties with quantitative targets.¹⁷⁷ The evidence presented above points to the possibility that the CDM is accomplishing these goals, but only to a limited extent. In one case, strategic but legal behavior is leading to the creation of extra GHGs in conjunction with emissions that would have occurred in order to generate a mix of additional and anyway credits. In another case, strategic disclosure of information and limitations on the scope of review will potentially lead to wholesale crediting of behavior that would have occurred anyway. Both indicate a need to consider reform, either by improving the CDM or by replacing it with an alternative mechanism for developing-country engagement.

177. Kyoto Protocol, *supra* note 1, art. 12.

A. Reforming the CDM

Limited reforms to the existing CDM structure might improve its ability to detect and deter strategic behavior by participants. Under the current regime, the third party verifiers charged with validating project applications face unavoidable conflicts of interest when it comes to substantive review of project proponents' claims. These DOEs are currently paid by the project proponents and face a competitive business environment.¹⁷⁸ One potential reform measure might be to include the costs of third-party verification in CDM project application fees. The CDM EB would then have adequate resources to contract directly with DOEs, who would have incentives to disclose as much as possible regarding CDM projects to avoid loss of business. Another reform possibility is to clarify that DOEs are responsible for checking not only that a project's additionality analysis is performed consistently with the applicable CDM procedures, but also that key facts and assumptions underlying it are accurate.¹⁷⁹ Standardized accounting procedures might also be specified in order to limit the extent to which creative accounting is used to argue that projects would not have gone forward without the sale of carbon credits.¹⁸⁰ Finally, under the current regime, project proponents must "take[] due account"¹⁸¹ of comments received by the public during the validation process. All of these incremental reforms would likely reduce the extent to which project proponents can game the system, increase the incentives that DOEs have for monitoring strategic behavior, and help to simplify the extremely difficult regulatory choices with which the CDM EB is often faced. These procedures might, to a great extent, help to deal with the HFC-23 case.

Nevertheless, they do not resolve the issue of how to separate additional from nonadditional projects in regulated and state-owned industries like the Chinese energy sector. Ultimately, this issue looms larger than any other because of the emissions associated with the explosive growth in the Chinese and Indian economies. Fully addressing it will likely require transforming the CDM into a system that can deal directly with the actors that matter most in these industries—the government policy makers that set energy development priorities.

178. LAMBERT SCHNEIDER, IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT 56 (2007), available at http://assets.panda.org/downloads/oeko_institut_2007_is_the_cdm_fulfilling_its_environmental_and_sustainable_developme.pdf.

179. *Id.* at 55.

180. *Id.* at 59.

181. United Nations Framework Convention on Climate Change, *supra* note 167.

B. Border Controls for CERs

If agreement on incremental reform proves impossible, but individual Annex B nations still want to improve the quality of the CDM market, they can do so, albeit at the cost of some market fragmentation. Nations are not required to purchase, or to allow private entities within their borders to purchase, CERs for compliance purposes. This is an option that Europe has chosen to adopt and it is one that Europe, or a future U.S. program could utilize to encourage the kind of CDM that all had hoped for, and to discourage the accounting gimmicks and oversubsidization that are present within the current market. The Linking Directive of the European Commission lays out the rules by which CERs may be imported into the EU Emissions Trading Scheme (ETS).¹⁸² It would be easy for the European Commission to modify this directive to enable additional review of CERs before their use is allowed in the EU. Currently, the Linking Directive already specifies special import criteria for CERs created by large hydro projects.¹⁸³ The United States, if it passes climate legislation including a cap-and-trade system with provision for use of international offsets, could also implement additional review of projects. Because the European ETS currently is the largest consumer of these credits, as the United States would be if it were to adopt such legislation, it has significant influence over the market. Were either country to enact CER standards tougher than mandated by the CDM EB, these standards would likely be adopted by all project proponents in order to allow sale of their credits into key markets. To some extent, this might lead to market fragmentation, with separate prices developing for EU- or U.S.-qualified CERs, but fragmentation is already a hallmark of carbon markets.¹⁸⁴

C. An Alternative to the CDM

Ultimately however, without radical reform of the incentive structure facing market proponents, the accounting tricks illustrated by the HFC-23 and CCGT examples are unlikely to be eliminated entirely. At the same time, simply eliminating the CDM without replacing it with an alternative method for engaging developing countries is unwise. It would leave many

182. Council Directive 2004/101 Amending Directive 1003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, in Respect of the Kyoto Protocol's Project Mechanisms, 2004 O.J. (L 338) 18 (EC).

183. CERs derived from hydro projects larger than 20 MW must insure that these dams meet the criteria specified by the World Commission on Dams. *Id.* at 21.

184. And fragmentation is not necessarily a bad thing. It can promote faster learning and evolution of effective trading structures. Victor et al., *supra* note 126, at 1820.

low-cost reduction opportunities on the table, increase costs for developed-nation emitters in the short term, and both delay and increase the cost of eventual acceptance of caps by developing countries.

There is an alternative. The international community has significant experience in compensating developing countries for the reduction of dangerous atmospheric emissions in another context. The Multilateral Fund of the Montreal Protocol has been very successful at accomplishing the phase out of the most harmful ozone depleting substances (ODSs).¹⁸⁵ This fund has operated on the principle that developed nations should pay any additional costs incurred by developing countries in transitioning away from ODSs to new, ozone-friendly chemicals.¹⁸⁶ Under a future climate change protocol, this model could be adopted for the purposes of engaging developing-country sectors that are state-controlled or particularly subject to gaming while still allowing for use of the CDM in some sectors. Alternatively, a climate fund could completely supplant the CDM as the major tool for engagement with developing countries.

A climate fund might have numerous advantages over the CDM. Agreed incremental costs or a reverse auction could generate a marginal cost-abatement curve for applicants to the fund. The climate fund could then invest in projects with the lowest marginal abatement cost until its resources were exhausted. Price setting via a reverse auction would encourage low-cost reduction opportunities to surface without having to pay them substantially more than the costs of abatement, as occurs in the current system. Inframarginal rents would thus be reduced.

Another advantage of this approach is that state-managed sectors, like electric power in China, may be more effectively addressed by direct discussions with governments about priorities and costs rather than through the distorting filter of State Owned Entities. Further, low-cost emissions reduction opportunities such as building standards and avoiding deforestation, which require state intervention and regulation, can be accessed.¹⁸⁷ Finally, transaction costs of emissions reductions would likely be reduced because project proponents would not have to prove that their project would not have gone forward without the sale of carbon credits.

A climate fund approach could also continue to fulfill the function of cost control for Annex B nations that have committed to caps on their GHG

185. RICHARD ELLIOT BENEDICK, *OZONE DIPLOMACY* 265–68 (1998).

186. *Id.* at 254–65.

187. Emissions reductions must be voluntary to qualify under the CDM. Voluntary has been interpreted by the CDM EB to mean not caused by domestic law or regulation. Kyoto Protocol, *supra* note 1, art. 12.

emissions. GHG abatement in the developing world with resulting emissions reductions could be credited to Annex B countries based on their contributions to the fund or an alternative agreed upon metric. In this way, cost control would be at the national level rather than at the firm level as in the EU ETS. A nation participating in the fund could simply reduce the scarcity of permits and hence their price in its cap-and-trade system rather than, as now, allowing covered entities to surrender CDM credits in lieu of domestic tradable permits.

Perhaps the biggest advantage of this type of fund would be that it reduces the incentives of firms and governments to misrepresent their business-as-usual emissions and costs to the regulator. Under the current system, the more a project proponent can inflate its baseline, the more money there is to be made. Under a climate fund in which nations agree on incremental costs or allow a reverse-auction to establish them, firms and regulators would have at least some incentive to report a more accurate estimate of their emissions and costs. In a context in which emission reduction projects are competing for a limited pool of emissions reduction funds and where the odds of receiving payment for an activity increase as the costs of marginal abatement fall, sellers of credits have an incentive to report the lowest costs for emissions reductions that they can reasonably deliver.

The incentives created by this type of system are admittedly imperfect—governments or firms might still attempt to inflate baselines in order to lower marginal costs of abatement. The advantage, though, is that the fund manager would have information from other bidders with similar projects on the costs of abatement. The odds of collusion among governments or individual emitters in order to systematically misrepresent abatement costs or baselines are lower than the odds of such misrepresentation by individuals within the current system.

A climate fund would address many of the defects of the current system. It would allow direct engagement with domestic regulators in developing countries and an honest discussion regarding policy baselines. It would potentially reduce the costs of emissions reductions through a utilization of a reverse auction price-setting mechanism rather than allowing prices to be set by the cost of emissions reductions in developed-country cap-and-trade markets. Finally, it would likely modify the incentives facing project proponents and so lead to a better information transfer to the fund manager than is currently in the CDM. Nonetheless, it would almost certainly have its own problems. No system as complicated as the global carbon market, or a global climate fund, is likely to operate flawlessly or avoid all unintended consequences.

CONCLUSION

Climate change is a long-term problem that requires long-term solutions. Active, broad engagement of both developed and developing countries is absolutely essential for success. The preceding analysis has illustrated that the global carbon market does not live up to its current hype. Too often, market participants behave strategically to generate credits for activities that do not merit them. At the same time, the analysis shows that the incentives produced by the global carbon market do indeed have the potential to induce significant participation on the part of developing nations in the global effort to combat climate change.

The challenge for the international community is to maintain this active participation while honestly facing up to the flaws in the CDM. If it can manage this, a more environmentally effective system is possible. Moving forward, and as developed-world investment in developing-country climate mitigation increases, more effective methods must be developed. Either the CDM needs significant reform, major buyers of CERs should adopt domestic controls that raise crediting standards, or an alternative mechanism such as a carbon fund should be devised to engage the developing world in fighting climate change.



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Co-benefits and additionality of the clean development mechanism: An empirical analysis

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ABSTRACT

The Clean Development Mechanism (CDM) allows industrialized countries to comply with the Kyoto Protocol by using carbon offsets from developing countries. There are two puzzles within this carbon market: additionality (the proposed activity would not have occurred in its absence) and co-benefits (the project has other environmental benefits besides climate mitigation). This paper proposes an econometric approach to evaluate the CDM effect on sulfur dioxide emission reductions and assess its additionality indirectly. Our empirical model is applied to China's emissions at the prefecture level. We found that the CDM does not have a statistically significant effect in lowering sulfur dioxide emissions. This result casts doubt on additionality of these CDM activities, that is, they would have happened anyway.

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1. Introduction

The Clean Development Mechanism (CDM) is a project-based carbon market which enables industrialized countries to reduce costs of compliance with the Kyoto Protocol by implementing climate mitigation projects in developing countries. The CDM has been successful in mobilizing the investment of public and private sectors from both developed and developing countries for reducing greenhouse gas (GHG) emissions. By the year 2009, there were more than 4200 projects in the pipeline that are expected to reduce GHG emissions by more than 2900 million metric tons of carbon dioxide equivalent (CO₂e) by the end of 2012. The CDM emission reduction is not trivial, in that it is around 40% of the U.S. emissions in 2007.¹

The CDM is nonetheless facing mounting criticism, in which the most serious challenge is its environmental integrity [1–3]. Since there are no emission caps for developing countries, the usefulness of the CDM hinges on whether the proposed project would have occurred in its absence. This assessment is known in the literature as additionality. Lack of rigorous criteria to establish additionality, however, may result in some projects receiving an excess of carbon credits. Even worse, some “business-as-usual” (BAU) activities might be wrongly registered as CDM projects. In this case, the credit buyers' increased emissions may not be fully offset by real emission reductions in the CDM activity. This may jeopardize on the effectiveness of the international emission trading system [4].

Another criticism is that the CDM insufficiently promotes sustainable development, although it is stipulated as one of its dual goals in the Kyoto Protocol [5,6]. The CDM is expected to improve environmental quality in host countries because

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¹ Source: The CDM project statistics are from <http://cdm.unfccc.int/index.html>. The U.S. emissions data are from “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007” available at <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

GHG emission reductions may also lower emissions of other pollutants such as sulfur dioxide (SO₂). The so-called co-benefit is one of the major reasons for developing countries to be involved in climate mitigation. However, while there is a price for CO₂, the local pollutants may not be monetized. Since the carbon market is only responsive to price signals, CDM developers have limited interest in generating other benefits besides carbon credits.

Additionality and co-benefits are two puzzles within this carbon market. Little is known empirically about whether the CDM has achieved these two goals. A major barrier for empirical studies is that the GHG emission data is not reported at the subnational level in developing countries. We address this problem by exploiting the connections between GHG and its co-pollutant emission reductions. To our knowledge this is the first paper that simultaneously evaluates additionality and co-benefits. Furthermore, the proposed econometric framework is not just applicable to the CDM. It has the potential to contribute to emerging policy debates about other baseline-and-credit programs such as voluntary carbon markets and energy efficiency credits.

As for the co-benefits of the CDM, we focus on sulfur dioxide (SO₂) emission reductions because of its broad environmental and health impacts.² Emissions of sulfur dioxide and GHGs are closely correlated with fossil-fuel use [8]. A separate analysis of either pollutant may not be able to provide a sufficient analytical framework [9]. More importantly, since GHG data are not widely available, SO₂ abatement may be useful for inferring GHG emission reductions. The rationale is that if fossil-fuel power generation is replaced by renewable energy, both CO₂ and SO₂ emissions will be reduced. If there is no observed change in SO₂ emissions, the efficacy of the CDM to reduce CO₂ would be called into question. Note that our additionality test is conditional on non-zero co-benefits. Therefore, we are not able to assess additionality for those projects that do not reduce sulfur emissions.

The econometric framework is an extension of the literature that investigates the determinants of SO₂ emissions [10–15]. Our model is adapted from, without relying on, the environmental Kuznets curve (EKC). Realizing that the classical polynomial EKC model may be too restrictive [16], we apply a fixed-effect semiparametric model that does not specify the functional form between emissions and income.

Our model augments a typical specification of SO₂ emissions through the inclusion of a policy variable reflecting CDM activities (measured by carbon credits). Identification of the causal effect of a CDM project is achieved through the inclusion of fixed effects, as well as the fact that CDM activities are determined well in advance of current SO₂ emissions because CDM approval is a lengthy process. Project developers have to wait at least one year between public comments and registration. The fixed effects capture resource endowment and industrial base, both of which are critical in the selection of CDM projects. Because resource endowment and industrial base change slowly, they can be regarded as fixed over the sample period. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

In this paper, we estimate the effect of the CDM in reducing SO₂ emissions at China's prefecture level. China is the world's largest GHG and SO₂ emitter. It is also the dominant player on the CDM market. The prefecture is the most disaggregated administrative unit that documents SO₂ emissions consistently, and this unit of analysis provides sufficient cross-sectional and temporal variation. Our econometric model shows no empirical support that the CDM has led to lower SO₂ emissions. This finding casts doubt on additionality—specifically, that these project activities would have happened without the CDM.

2. Background and data

We first briefly discuss some key issues in the Clean Development Mechanism, including the baseline and co-benefits. We then discuss the CDM activities in China. Finally, we present the data set used in our study.

2.1. Key issues in the CDM

The Clean Development Mechanism is the only “flexible mechanism” under the Kyoto Protocol that engages developing countries in climate mitigation.³ Because the marginal abatement costs in developing countries are lower than those of developed ones, the CDM helps the latter to reduce their costs of compliance with emission reduction commitments. Reciprocally, the host countries can benefit from financial assistance, technology transfer, and non-GHG emission reductions.

The CDM employs a baseline-and-credit program. It is distinguished from the cap-and-trade system by the fact that there are no explicit caps for carbon credit suppliers.⁴ Theoretically, these two systems are numerically equivalent if the baseline implies the same level of caps. Since the baseline describes a hypothetical emission scenario that would have occurred without the project, how to construct a baseline becomes the central problem of the CDM. Project developers

² It is worth noting that reducing SO₂ emissions may have an unintended consequence on global warming. Its product sulfate aerosol, a major component of atmospheric brown clouds (ABCs), has a climate cooling effect by reflecting visible solar radiation [7].

³ The other two are emission trading (ET) and joint implementation (JI) among annex I countries. The ET is an allowance-based carbon market while the CDM and the JI are project based.

⁴ According to the principle of “common but differentiated responsibility”, annex I countries (industrialized countries and economies in transition) are subject to quantified emission limitation and reduction commitment while developing countries have no emission caps.

have incentives to overstate BAU emissions to maximize credits. Even worse, some projects that would have occurred otherwise might enter the CDM pipeline and hence additionality requirements are violated.

In order to avoid awarding carbon credits to projects that would have happened anyway, the CDM Executive Board (EB) has set rules to determine additionality.⁵ This overarching additionality framework consists of four steps: (1) identification of alternatives to the project activity, (2) investment analysis to demonstrate the proposed activity is not the most economically or financially attractive, (3) barrier analysis, and (4) common practice analysis. Although official criteria have been designed for assessment purposes, their implementation is highly subjective and often lacks documented evidence to substantiate additionality [17]. Overall, the methodology does not achieve its intended objective of establishing a valid counterfactual.

The CDM is supposed to achieve dual goals: lowering abatement costs and promoting sustainable development. As for the first objective, the certified emission reductions (CERs), being equal to one metric ton of CO₂e, consistently sell at a discount to the European Union Allowances (EUAs).⁶ However, when it comes to the sustainability goal, some argue that its role is largely marginalized [5]. The carbon market cannot optimally allocate resources for non-monetized sustainability. The low-cost emission reduction projects are not necessarily aligned with the sustainability priority in the host countries. Examples include industrial gas projects such as hydrochlorofluorocarbons (HFCs) and nitrous oxide (N₂O). These projects can generate large volumes of CERs at low costs, but they have very little sustainability benefit other than climate change.

The controversial industrial gas projects are gradually being phased out due to the saturation of project opportunities and stringent regulations. Renewable energy and energy efficiency have become the mainstream project types. These projects have strong co-benefits beyond climate mitigation. Fig. 1 shows a breakdown of CDM projects by types. For example, renewable power replacing fossil-fuel power plants will reduce not only GHGs, but also other air pollutants such as sulfur dioxide, nitrogen oxide, and particulates. As long as the CDM activities of these types are additional, we should be able to observe associated co-benefits.

2.2. The CDM in China

China is the biggest supplier on the primary CDM market. It accounts for 35% of registered projects and 59% of expected annual reductions as of 2009. The concentration of the market is mainly due to abundant opportunities for emission reductions. China has risen to become the world's largest GHG emitter since 2007 and the momentum will likely be maintained in the future.⁷ According to Auffhammer and Carson [18], the projected increase in China's emissions out to 2010 is several times larger than the amount reduced in Kyoto Protocol. In addition to total emissions and the size of industrial base, factors that attract foreign direct investment (FDI) also increase the flow of international carbon credit investment. In this regard, economies of scale and the business environment all contribute to China's market share [19].

China's preference for the CDM is aligned with its national strategy in energy and climate change [20]. According to China's National Climate Change Program, energy efficiency and renewable energy supplies are top priorities in climate mitigation [21]. Specifically, industrial and residential energy efficiency, hydro power, coal-bed/mine methane, bio-energy, wind, solar, and geothermal energy are all actively supported. These project types account for the majority of the CDM activities.

Environmental pollution is another incentive for China to be engaged in the CDM. Coal is the dominant fuel source in China's primary energy consumption. According to China's Statistical Yearbooks, its share has varied between 66% and 76% over the last two decades. Emissions of SO₂, NO_x, and particulates from coal consumption have created severe environmental and health problems. It is estimated that SO₂ caused over 213 billion Chinese Yuan (CNY) in health damage in 2003 [22].⁸ Another study finds that acid rain, which is mainly caused by SO₂ emissions from fossil fuel use, causes 30 billion CNY in crop damage and 7 billion CNY in building damage [23]. The expectation that the CDM helps reduce local and regional air pollutants besides GHGs makes participation even more attractive for China.

2.3. The data

In this paper, the unit of analysis is a prefecture. A prefecture, literally translated as a region-level city, is an administrative unit ranking immediately below a province and above a county. It typically includes both urban and rural areas. A prefecture is the most disaggregated level that consistently documents economic and environmental data and information. The economic data are from China's City Statistical Yearbooks (2000–2008). China has 333 prefectures, of which 287 are covered by the Yearbooks. The prefectures that are not included are those with low economic significance. On average a prefecture had a population of 4.27 million, an area of 16,448 square kilometers, and a GDP of 112.5 billion Chinese Yuan (CNY) in 2008. Table 1 reports summary statistics for the variables used in our analysis.

⁵ Source: "Tool for the demonstration and assessment of additionality" by the CDM-EB, available at http://terrappass.pbworks.com/f/Additionality_tool.pdf.

⁶ The prices of CERs and EUAs are available at the European Climate Exchange <http://www.ecx.eu/>. The discount on the primary CDM market is greater than the secondary market. The primary market discount reflects the risks of CER issuance. The secondary market discounts may reflect that CERs are not completely fungible to EUAs.

⁷ Source: "CO₂ Emissions from Fuel Combustion 2009 Highlights" by the International Energy Agency. Available at http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2143.

⁸ 1 U.S. Dollar ≈ 6.8 Chinese Yuan in 2009.

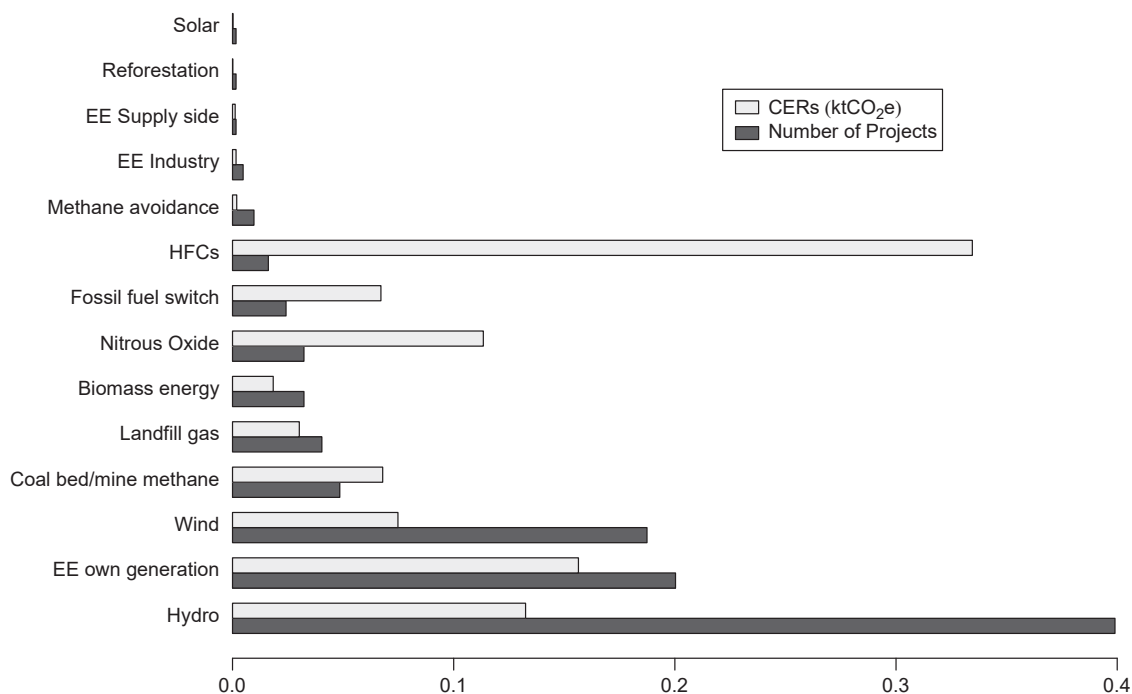


Fig. 1. Shares of CDM projects by types.

Table 1

Summary statistics.

Variable	Definitions	N	Mean	Std dev	Min	Max
SO2P	SO ₂ emitted by power plants (10 ⁵ ton)	831	0.42	0.63	0.00	4.63
SO2T	SO ₂ generated by all industries (10 ⁵ ton)	1711	1.12	1.46	0.00	13.09
SO2E	SO ₂ emitted by all industries (10 ⁵ ton)	1711	0.66	0.72	0.00	7.91
GDPPC	GDP per capita (10 ⁵ CNY)	2239	0.17	0.22	0.02	3.42
POPDEN	Population density (10 ⁻¹ /km ²)	2243	0.42	0.40	0.00	11.56
EE	Industrial output/electricity use (100 CNY/kWh)	2223	0.20	0.48	0.01	21.09
KL	Fixed asset investment/number of employees (10 ⁵ CNY)	2243	0.74	0.62	0.00	7.19
ESPC	Expenditure on education and R&D per capita (10 ³ CNY)	2239	0.24	0.29	0.00	4.96
FDIR	FDI as a ratio of fixed asset investment (10 ⁻²)	2161	0.90	1.53	0.00	32.74
CCO2	Prefecture-level CERs (10 ⁶ ton)	2296	0.55	2.49	0.00	41.64
PCO2	Province-level CERs (10 ⁶ ton)	2296	0.63	1.39	0.00	8.07
GCO2	Grid-level CERs (10 ⁶ ton)	2296	0.23	0.49	0.00	2.83
HYDRO	Hydropower CERs (10 ⁵ ton)	2296	0.09	0.62	0.00	9.07
WIND	Wind energy CERs (10 ⁵ ton)	2296	0.08	0.67	0.00	16.66
ENERGY	Energy efficiency CERs (10 ⁵ ton)	2296	0.20	1.66	0.00	34.95
OTHER	Other CERs (10 ⁵ ton)	2296	0.11	1.19	0.00	41.24

Notes: All monetary values are real values.

We have two sources of data for SO₂ emissions. First, information on SO₂ emissions from power plants is provided by the Institute of Air Pollution Control at the Tsinghua University. The emission data are generated from their internal database of national power plant inventory; this detailed data set has not been used in the economics literature studying SO₂ emissions in China. Although the data are only available in 2000, 2005, and 2007, it covers a period before and after CDM activities, which enables us to identify the CDM effect in a difference-in-difference framework.

Second, the Yearbooks have documented SO₂ emissions from all industries during 2003–2008. Although SO₂ emissions before 2003 were also reported, their measurement was inconsistent with those after 2003 so they are not used. The power and heating industry accounts for about 60% of total emissions. Two industrial SO₂ variables are used in the analysis: the amount of SO₂ generated and the amount of SO₂ released into the atmosphere. The two variables are related by the following equation:

$$\text{SO}_2 \text{ emitted} = \text{SO}_2 \text{ generated} - \text{SO}_2 \text{ removed.}$$

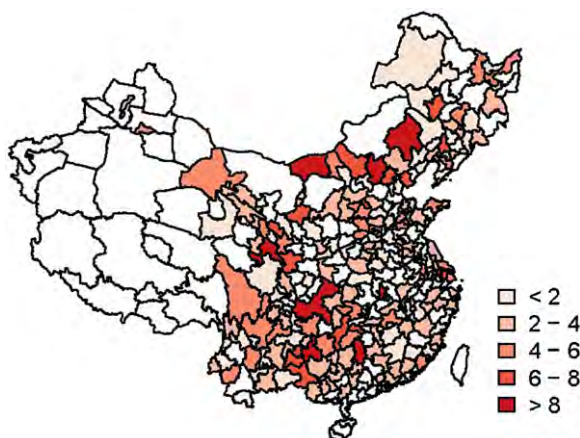


Fig. 2. CDM activities in China by the number of projects.

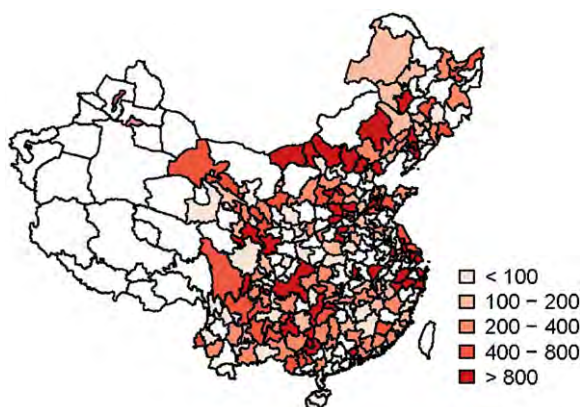


Fig. 3. CDM activities in China by CERs (10^3 ton).

We analyze industrial emissions because the CDM also affects non-power SO_2 emissions, which is the so-called “leakage effect.” Although a CDM project can reduce emissions within the boundary (power sector), it may cause additional emissions elsewhere. For example, the construction and operation of CDM projects may boost local economic activities and increase emissions out of the boundary.

The CDM data are from the United Nations Framework Conference on Climate Change (UNFCCC), which maintains a database that includes project design documents (PDDs) for every registered project. Only the projects in China that were registered before 2008 are used because of the constraint posed by the economic and emission data. The United Nations Environmental Program (UNEP) Risoe Center provides a compiled list of all CDM projects.⁹ The first CDM project in China was a wind farm in the Liaoning Province which started in 2003. The credit start date is used to match the economic data because this is the time when the project starts emission reductions. As of 2008, 191 prefectures in all provinces except Tibet had CDM activities. The locational distributions of the CDM projects are depicted in Figs. 2 and 3.

3. Empirical strategy

The emission reduction of a CDM project is measured by the difference between the baseline emissions and the project’s real emissions. A baseline is a scenario that represents GHG emissions in the absence of the CDM. Let t index time and k index pollutant. Let y denote the project emission, y^* denote the baseline emission, and r denote the emission reduction. A project’s emission reduction is

$$r_{kt} = y_{kt}^* - y_{kt}. \quad (1)$$

Note that the emission reduction is positive only if its emission level is below the baseline. While it is straightforward to monitor a project’s real emissions, it is tricky to determine what the emissions would otherwise be. Different baselines

⁹ Source: <http://www.cdmpipeline.org/>.

may imply significantly different amounts of emission reductions. In this section, we present two approaches that can be used to construct emission baselines.

3.1. Engineering model

Most CDM activities replace fossil-fuel power generations by delivering electricity generated from renewable energy sources. Hence the emissions reduction attributed to a CDM project is the avoided emissions of the displaced power plants/units. Instead of identifying the exact source of displaced generations, a grid-level emission baseline can be used to quantify the emission reduction

$$r_{kt} = e_t f_{kt}^{\text{grid}} - l_{kt}. \quad (2)$$

In this form, e is the net electricity supply by the CDM project (MWh), f_{kt}^{grid} is a grid-level emission factor (ton/MWh), and l is the leakage. The leakage is the increased emissions attributable to CDM activities that occur outside the project boundary. For renewable energy projects, there are no emissions and leakage is often treated as zero.

One method to calculate the emission factor is the operating margin (OM). The OM assumes that it is the electricity from marginal power plants that is displaced. A marginal plant is defined as the power plant on the top of the grid system dispatch order without CDM activities. It is apparent that the OM measures the short-run effect of CDM activities. The CDM Executive Board suggests the operating margin emission factor can be calculated by generation-weighted emissions from all grid-tied power plants excluding low-cost and base-load plants/units.¹⁰

Another method is to use the build margin (BM) emission factor. It assumes that CDM activities delay or cancel the construction of new power plants/units. The BM can be calculated in the same ways as the OM, except that a different sample of power plants is used. In general, the newly built plants are equipped with better technology and thus emit fewer pollutants than existing plants. This implies that the build margin is normally smaller than the operating margin.

In this section, we outline an engineering model that can be used to compute emission factors. This model is based on the simple OM method since it is widely used in CDM project designs. The grid-level emission factor is calculated by

$$f_{kt}^{\text{grid}} = \frac{\sum_{\text{plant}} e_t^{\text{plant}} f_{kt}^{\text{plant}}}{\sum_{\text{plant}} e_t^{\text{plant}}}, \quad (3)$$

where f_{kt}^{plant} is a plant-level emission factor. It is worth noting that not all power plants/units in the grid are included in the calculation. The project developers, following guidelines in host countries, propose how to select the sample. The proposed baseline needs to be validated by independent audits.

If multiple fuels are involved, the plant-level emission factor is then

$$f_{kt}^{\text{plant}} = \frac{\sum_{\text{fuel}} c_t^{\text{fuel}} \nu_t^{\text{fuel}} f_{kt}^{\text{fuel}} (1 - \lambda_{kt})}{e_t^{\text{plant}}}. \quad (4)$$

In this form, c is the amount of fuel consumed (mass or volume unit), ν is the energy content (GJ/mass or volume unit), and λ is the fraction of pollutants removed. Carbon capture and storage (CCS) can remove CO₂ but it is not yet commercialized, so that $\lambda_{\text{CO}_2} = 0$. As for SO₂ emissions, all new and existing coal-fired power plants in China are required to install flue gas desulfurization (FGD) equipment. The average removal rate in 2008 is around 78.7%.¹¹

In calculating emission factors, either the *ex ante* or *ex post* approach is allowed. All CDM projects in China employ *ex ante* information to establish the baseline because it reduces the risks of carbon credit generation. The most recent available information of already built power plants/units is included in the sample group (three years before the submission of PDDs). In addition, the emission factor is generally fixed or adjusted according to a predetermined rate during the project crediting period.

According to Eqs. (2)–(4), it is apparent that there is a connection between CO₂ and SO₂ emission reductions. To simplify this illustration, suppose that a renewable energy project with zero leakage delivers electricity to a grid. The grid's baseline emissions can be characterized by average emission factors f_{SO_2} and f_{CO_2} , as well as average the SO₂ removal rate λ_{SO_2} . The ratio of emission reductions for these two pollutants is then

$$\frac{r_{\text{SO}_2}}{r_{\text{CO}_2}} = \frac{f_{\text{SO}_2} (1 - \lambda_{\text{SO}_2})}{f_{\text{CO}_2}}. \quad (5)$$

In this form, if all parameters are known, we can use CO₂ emission reductions to estimate the abatement of SO₂ emissions.

Note that Eq. (5) is greatly simplified. When the engineering approach is used to estimate SO₂ emission reductions, the emission factors take into account multiple plants and multiple fuels. The emission factors of China's power industry are adapted from Cao and Wang [24] and are reported in Table 2. In this table, the combined margin (CM) is just a simple average of the operating margin and the build margin.

¹⁰ Source: "Tool to calculate the emission factor for an electricity system (October 2009)". Available at <http://cdm.unfccc.int/methodologies/PAmethodologiesapproved.html>.

¹¹ Source: "Emission Reductions of Power Plants in 2008" by the State Electricity Regulatory Commission. Available at www.serc.gov.cn/ywdd/200911/W020091102328545684394.doc.

Table 2

Emission factors for China's power industry.

Grid	CO ₂			SO ₂		
	OM	BM	CM	OM	BM	CM
North	1.007	0.780	0.894	0.009	0.002	0.006
Northeast	1.129	0.724	0.927	0.007	0.002	0.004
East	0.882	0.683	0.783	0.007	0.002	0.005
Central	1.126	0.580	0.853	0.013	0.002	0.008
Northwest	1.025	0.643	0.834	0.010	0.002	0.006
South	0.999	0.577	0.788	0.009	0.002	0.005
Hainan	0.815	0.730	0.773	0.007	0.002	0.005

Notes: Unit: ton/MWh. The CO₂ emission factors are from "Emission Factors of China's Regional Electricity Grid 2009" published by China's National Development and Reform Commission. Available at http://qhs.ndrc.gov.cn/qj/zjz/t20090703_289357.htm. The SO₂ emission factors are from Cao and Wang [24].

3.2. Econometric identification

The engineering approach can be used to quantify co-benefits if CO₂ emission reductions are real (or additional). However, if we only observe carbon credits instead of real emission reductions, this approach is correct only if the carbon credits are issued based on an appropriate baseline. An exaggerated baseline results in overallocated carbon credits and exaggerated co-benefits. To estimate co-benefits without assuming that carbon credits reflect real emission reductions, we propose an econometric approach in this section.

An alternative treatment of Eq. (5) is to regard the emission ratio as a parameter. If CO₂ and SO₂ emission reductions are known, this parameter can be estimated by regression analysis. Let $\sigma \equiv f_{SO_2}(1 - \lambda_{SO_2})/f_{CO_2}$, then Eq. (5) is rewritten as

$$r_{SO_2} = \sigma r_{CO_2}. \quad (6)$$

However, this model is not estimable because emission reductions in CO₂ and SO₂ are not directly observable.

Suppose that a CDM project receives a credit of c_{CO_2} , while the real emission reduction is $r_{CO_2} = \rho c_{CO_2}$, where ρ is an unknown parameter. If the project is awarded more than what it actually reduces, then $\rho < 1$. If $\rho = 1$, then the carbon credit issuance is fair. If $\rho > 1$, it means that the emission baseline is too conservative. According to Eq. (6), the reduction in SO₂ emissions is $\sigma \rho c_{CO_2}$. The relationship between SO₂ emission reductions and carbon credits is

$$r_{SO_2} = \sigma \rho c_{CO_2}. \quad (7)$$

In this form, the empirical challenge is that the SO₂ emission reductions attributed to the CDM activities are not directly observable. According to Eq. (1), SO₂ emission reductions are estimated by the difference between baseline and real emissions. Combining Eqs. (1) and (7) and denoting $\gamma \equiv -\sigma\rho$, we obtain

$$y_{SO_2} = y_{SO_2}^* + \gamma c_{CO_2}. \quad (8)$$

Eq. (8) can be used to evaluate the effectiveness of the CDM on SO₂ emission reductions. It also provides an indirect test for additionality. Based on the engineering model, σ can be estimated and used as the prior information. If $-\gamma < \sigma$ or equivalently $\rho < 1$, it suggests that there is an over-issuance of the carbon credits. Even worse, if $\gamma = 0$, it implies that the CDM activities may not be additional at all. Note that our argument is based on the assertion that $\sigma \neq 0$. Since we have excluded all industrial gas projects that have zero co-benefits, the assumption is true for all other projects. The argument is supported by the environmental engineering studies, for example Aunan et al. [8].

Let i index prefecture ($i = 1 \dots n$) and t index year ($t = 1 \dots T$). The baseline emission $y_{SO_2}^*$ is modeled as

$$E(y_{it}^* | w_{it}, x_{it}, u_i, v_t) = m(w_{it}) + x'_{it}\beta + u_i + v_t.$$

The pollutant subscripts are ignored to reduce notational clutter. According to Eq. (8), the CDM effect is additive and proportional to the project scale, which implies that

$$E(y_{it} | w_{it}, x_{it}, c_{it}, u_i, v_t) = m(w_{it}) + x'_{it}\beta + \gamma c_{it} + u_i + v_t. \quad (9)$$

In this form, w_{it} is income measured by real GDP per capita (GDPPC), $m(\cdot)$ is a flexible function that we define below, and x_{it} includes prefecture- and time-variant control variables other than income. The prefecture fixed effects u_i controls for time invariant unobservables such as resource endowment, industrial base, and institutional capacity. The time effect v_t controls for unobserved trends such as national emission regulations and technological progress as well as year-specific shocks to emissions.

The causality of the regression follows that if the CDM decreases fossil fuel consumption, SO₂ emissions will also be reduced since sulfur emissions result from energy use. A CDM project is determined before the current SO₂ emissions because its approval is a lengthy process. Project developers have to wait at least one year from public comments to registration. In addition, the selection of the CDM projects hinges on resource endowment and industrial base. Hydro, wind, solar, coal-bed methane, and biomass projects depend on the abundance of their respective natural resources. The

remaining energy efficiency projects depend on the industrial base and the energy intensity of the economy. Because resource endowment and the industrial base change slowly, they can be regarded as the fixed effects. Energy intensity can also be controlled for. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

The included explanatory variables are widely used in the empirical studies that investigate the determinants of SO₂ emissions (see [13] for a review). The causal relationship of income and pollution is a concern [15]. The argument that income causes emissions is fully discussed in Antweiler et al. [11]; changes in real income have contemporaneous effect on pollution, but environmental policies that determine pollution level respond to income levels slowly. To further address this issue, we use lagged income to replace current income in the robustness checks as is suggested by the growth literature.

In the set of control variables x_{it} , population density (POPDEN) is a measure of land area per capita. This demographic is a determinant of pollution but it responds to pollution slowly because migration takes time to realize. In addition, residential migration is constrained by the family register system (*hukou*) in China. Energy efficiency (EE) is a measure of real industrial output per kilowatt of electricity use. Pollution is a consequence of energy use and so it hinges on the energy intensity. The capital-to-labor ratio (KL) is defined as a ratio of fixed asset investment to number of employees. The inclusion of KL controls for the factor endowment effect. Both EE and KL enter the model with a quadratic term to account for nonlinearity. Expenditure on education and R&D per capita (ESPC) controls for the knowledge and technology effect. The empirical decomposition of pollution into scale, composition, and technique effects is attributed to Antweiler et al. [11].

We also include FDIR, which a ratio of foreign direct investment (FDI) as a share of fixed asset investment. The endogeneity of this trade variable might be a concern. According to Frankel and Rose [14], geographical variables can be used as instruments for endogenous trade based on trade theory. However, this approach is not applicable to panel data, because these instruments are time invariant. In any case this particular instrumental variable approach is not superior to a panel method that uses individual fixed effects to control for geographical attributes. In addition to the prefecture effects, we use subnational time dummies to control for time-variant unobservables that may be correlated with both FDI and emissions.¹²

3.3. Specification and estimation

The classical environmental Kuznets curve (EKC) model posits an inverted-U relationship between income and pollution [10]. It claims that emissions increase with income at an early development period and then decrease after passing some income thresholds. Although the EKC model has many limitations [12,13,15], it provides a basic structure to predict pollution at the aggregate level. Although our approach does not rely on the EKC framework, it motivates us to specify a nonlinear income–emission relationship.

A prefecture is the unit of analysis in this paper, but the CDM activity does not necessarily replace carbon-intensive generators in the same prefecture. It may replace generators in the same province or even in the same grid. It is therefore important to incorporate the spillover effect in a spatially explicit model. Following the approach proposed by Duflo and Pande [25], we incorporate the effects of the CDM activities in adjacent areas.

With the above two assumptions, our parametric regression is specified as

$$y_{it} = \alpha_1 w_{it} + \alpha_2 w_{it}^2 + \alpha_3 w_{it}^3 + x'_{it} \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}. \quad (10)$$

In this form, c_{it}^c designates prefecture-level carbon credits generated from the CDM activities. c_{it}^p designates carbon credits in the same province excluding c_{it}^c . c_{it}^g designates carbon credits in the same grid excluding c_{it}^p , and α , β , and γ are parameters to be estimated. ε_{it} is an error term which captures deviations between actual and estimated baselines emissions. Under the assumption of strict exogeneity, its mean is zero conditional on the observables and the fixed effects.¹³

Although a cubic term is included to accommodate more curvatures in Eq. (10), the polynomial specification is still very restrictive. Millimet et al. [16] suggest that a semiparametric model is more appropriate because the parametric model is rejected by their specification test. We generalize their model to accommodate CDM activities and other variables. Specifically, we propose a semiparametric partially linear model, in which the conditional mean of SO₂ emissions has an unknown relationship in income and is linear in other variables. The semiparametric model is then

$$y_{it} = m(w_{it}) + x'_{it} \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}, \quad (11)$$

where $m(w_{it})$ is a smooth function that is unknown to the researcher. For simplification, the above model can be written as

$$y_{it} = m(w_{it}) + z'_{it} \pi + u_i + \varepsilon_{it}, \quad (12)$$

where z_{it} includes all time-variant explanatory variables other than income w_{it} . The time effects are lumped into z_{it} as dummy variables. To estimate the above model, we can use the first difference or de-meaning to cancel out fixed effects.

¹² To further address the concern of endogenous FID, we have estimated all models without FDI. These additional robustness checks do not change our results.

¹³ Our identification strategy rests on the timing of the CDM application process in light of the strict exogeneity requirement. If CDM is related to past unobserved determinants of baseline emissions, the results will be biased.

A first difference of Eq. (12) leads to

$$\Delta y_{it} = \Delta m(w_{it}) + \Delta z'_{it} \pi + \Delta \varepsilon_{it}. \quad (13)$$

The profile-kernel method proposed by Henderson et al. [26] is employed to estimate the differenced partially linear panel data model. This approach shows that a consistent estimator of π is given by

$$\hat{\pi} = \left(\sum_{i=1}^n \Delta \ddot{z}_i \Omega^{-1} \Delta \ddot{z}_i \right)^{-1} \left(\sum_{i=1}^n \Delta \ddot{z}_i' \Omega^{-1} \Delta \ddot{y}_i \right). \quad (14)$$

In this form, $\Omega = \text{cov}(\Delta \varepsilon_{it}, \Delta \ddot{z}_{it} = \Delta z_{it} - (\hat{m}_z(w_{it}) - \hat{m}_z(w_{it-1})))$ and $\Delta \ddot{y}_{it} = \Delta y_{it} - (\hat{m}_y(w_{it}) - \hat{m}_y(w_{it-1}))$. $m_z(w)$ (or $m_y(w)$) represents estimates from a nonparametric regression of z (or y) on w alone. This estimator in (14) is \sqrt{n} -consistent, and the asymptotic variance can be estimated by

$$\text{Avar}(\hat{\pi}) = \frac{1}{n} \sum_{i=1}^n \Delta \ddot{z}_i \hat{\Omega}^{-1} \Delta \ddot{z}_i.$$

A consistent estimator of the variance-covariance matrix Ω is

$$\hat{\Omega} = \hat{\sigma}_v^2 (I_{T-1} - e_{T-1} e'_{T-1}).$$

In this form, I is an identity matrix, e is a vector of ones, and $\hat{\sigma}_v^2$ is estimated by

$$\hat{\sigma}_v^2 = \frac{1}{2n(T-1)} \sum_{i=1}^n \sum_{t=2}^T (\Delta \ddot{y}_i - \Delta \ddot{z}_i' \hat{\pi})^2.$$

With a consistent estimate of π , let $\hat{y}_{it} = y_{it} - z_{it}' \hat{\pi}$. With this model (12) can be converted to a nonparametric fixed effect regression

$$\hat{y}_{it} = m(w_{it}) + u_i + \varepsilon_{it}. \quad (15)$$

Multiple methods are available to estimate this model including the series method and the profile-kernel method [27,28]. We utilize the nonparametric iterative kernel estimator proposed by Henderson et al. [26] because it accounts for the variance structure and semiparametric efficiency. The estimation is implemented in Matlab. The code is available upon request.

4. Results and discussion

4.1. Engineering results

First, we estimate the effect of CDM activities in reducing SO₂ emissions by means of the engineering approach. The grid-specific combined margin emission factors are used, which is a simple average of the operating margin and the build margin. The combined margin is shown in Table 2. We report the resulting grid-level emission reductions from the CDM activities in Table 3. The emission data are for 2005, which is the most recent available information. The CO₂ data are also included for comparison. The figures show that the CDM activities are expected to reduce 35.8 million tons of CO₂ annually, which is about 1.6% of total emissions from all grids in 2005. In terms of SO₂ emissions, they are expected to reduce 0.27 million tons annually, or 1.4% of 2005 emissions from all grids. According to the national data, σ is estimated to be 0.0076 ton-SO₂/ton-CO₂, which implies that one ton of CO₂ emission reduction will lower SO₂ emissions by 0.0076 ton at the grid level.

Table 3

Annual emission reductions by hydro and wind CDM activities.

Grid	CO ₂		SO ₂	
	Emissions	Reductions	Emission	Reductions
North	651.753	6.820	5.812	0.039
Northeast	207.338	3.100	1.089	0.012
East	499.415	2.002	4.037	0.011
Central	360.321	7.655	3.938	0.087
Northwest	147.440	7.131	1.365	0.067
South	310.883	9.077	2.543	0.055
Hainan	5.999	0.021	0.048	0.000
All	2183.877	35.805	18.848	0.272

Notes: Unit: million tons/year. The emissions data are for 2005. The reductions data are based on CDM projects registered before 2008. Only small hydro and wind power projects are included.

It is worth noting the engineering estimate does not have an associated standard error. The parameters that we are using, mostly from the literature and official documents, only report the mean values instead of confidence intervals. Another important point is that only small hydro power and wind power projects are included in the analysis, because they have zero emissions. These two project types account for 59% of total registered projects as of 2008. CDM activities other than industrial gas projects can also reduce SO₂ emissions. However, their own emissions need to be taken into account. If other project types are included, the estimated coefficient would be smaller than the current estimate.

The engineering approach assumes that the BAU emissions can be extrapolated from the *ex ante* information. Specifically, the baseline is calculated by using present and past emission factors of existing power plants. This approach reduces risks for project developers because the expected carbon credits are known in the future. However, uncertainties arise in the environmental integrity because the static baseline does not make adjustment for future changes. Most CDM projects use static baselines. Even if a “dynamic” baseline is used, the adjustment is linear and the slope is predetermined [29,30]. In a fast changing economy, this methodology does not perform well. For example, if renewable energy increases exponentially as is observed in some developing countries, the engineering baseline would set the BAU emissions too high and lead to an inflation of carbon credits.

4.2. Econometric results

In this section, we present the results for the econometric models that use *ex post* information to evaluate the CDM's co-benefits on sulfur emissions. We estimate the parametric model (10) and the semiparametric model (11) using the prefecture-level data in China. The CDM effect on power generation is the focus of this study, which determines if the CDM has co-benefits and additionality within the power sector. The semiparametric model is our preferred specification because of its flexibility, while the parametric model is used for comparison purpose. The estimates of central interest are the coefficients for carbon credits at the prefecture level (CCO₂), province level (PCO₂), and grid level (GCO₂). The estimation results are reported in Table 4. A Wald test of model 1.2.1 for the joint significance of the CDM effect results in a *p*-value at 0.99, which rejects the null hypothesis that the CDM reduces SO₂ emissions. A joint test of the parametric model 1.1.1 leads to the same conclusion.

It is interesting to test the econometric estimate against the engineering estimate. If the CDM activities receive a fair amount of carbon credits, both estimates should be close. Since the econometric models are estimated using the prefecture-level data, the CDM effect needs to be aggregated to the grid level to be compared with that of the engineering model.¹⁴ The test results show that we fail to reject the null hypothesis that engineering and econometric estimates are being equal. The fact that we are not able to rule out co-benefits and additionality is at odds with the previous result. This is likely because the data do not provide precise enough estimates to distinguish between two vastly different hypotheses.

Although the treatment effect is insignificant, the sign of the estimate is still interesting. If CDM activities have lowered sulfur dioxide emissions, the coefficients of carbon credits should be negative. However, the estimates for provincial and grid CERs are positive. This may be explained by the fact that fossil-fuel power plants are built to match with renewable power generation. For example, wind power is highly variable in electricity output at different time scales. Additional power plants are needed to stabilize intermittent power supply and safeguard against blackouts. The coal-fired power is often used as a backup because of its availability and reliability. It is possible that the CDM helps ramp up thermal power capacity as it promotes wind farms. In this case, the effect of the CDM activity – a combination of wind and coal-fired power – hinges on the baseline scenario. If the baseline is coal-fired power, the CDM reduces emissions unambiguously. If the baseline is renewable power, the CDM actually increases emissions. If the baseline is a wind–coal combination, the CDM has no effect at all. In all other cases, the CDM has an uncertain effect in emission reductions. Table 7 summarizes the hypothetical effect of the CDM activity under different baseline scenarios.

The econometric results suggest that the CDM activities in China are not effective at reducing SO₂ emissions, and therefore cast doubt on additionality. That is, without the compensation of carbon credits, these projects may still have occurred. There is some evidence to support this hypothesis. As of 2008, the cumulative installed capacity of wind power in China was 12,152.79 MW, of which 11,389.58 MW was installed during 2005–2008.¹⁵ In the same period, the CDM wind farms generated a total capacity of 5154.92 MW. This suggests that about 55% of wind power projects have been built without the assistance of the CDM. During a recent CDM-EB meeting in December 2009, 10 of China's wind power CDM projects were not approved. The decision was made on the grounds that these projects do not meet the additionality requirement.

This is not to say that project developers intentionally manipulate additionality requirements. Rather, it is the current CDM baseline methodology that fails to predict future emissions in a fast changing economy. China's central planners made the same mistake as they set a 2010 wind power target of 5000 MW in the Renewable Energy Planning Report of 2007. In fact, in the same year that the Plan was published, China's total capacity reached 5906 MW. The rapid growth of

¹⁴ The null hypothesis $\gamma_1 + \gamma_2 + \gamma_3 = \sigma$ is tested. The engineering estimate is the grid level reduction in SO₂ from a carbon credit unit. So, we need the econometric estimate of a grid level reduction. If a carbon credit is issued in prefecture *i*, then CCO₂ goes up by one unit and SO₂ changes in *i* by γ_1 . But, then SO₂ changes in each other prefecture in the same province by γ_2 , and in each other prefecture in the grid, but outside the province, by γ_3 .

¹⁵ Source: “China Wind Power Installed Capacity Statistics 2008” by the China wind power Association. Available at www.cwea.org.cn/upload/20090305.pdf.

Table 4Regression results: dependent variable-SO₂ emitted by power plants.

	Parametric models			Semiparametric models		
	1.1.1	1.1.2	1.1.3	1.2.1	1.2.2	1.2.3
GDPPC	2.995*** (0.741)	2.270*** (0.760)	1.424*** (0.763)			
GDPPC ²	-2.910*** (0.825)	-2.305*** (0.849)	-1.785*** (0.828)			
GDPPC ³	0.740*** (0.233)	0.593*** (0.239)	0.491*** (0.232)			
POPDEN	0.139 (0.125)	0.148 (0.143)	0.181 (0.136)	0.178 (0.128)	0.165 (0.121)	0.278** (0.118)
EE	0.625*** (0.237)	0.528*** (0.233)	0.350*** (0.222)	0.618** (0.265)	0.536** (0.252)	0.526** (0.258)
EE ²	-0.384** (0.167)	-0.371** (0.165)	-0.230** (0.157)	-0.340* (0.187)	-0.324* (0.179)	-0.325* (0.180)
K/L	0.281** (0.136)	0.164** (0.136)	0.007** (0.150)	0.394*** (0.097)	0.251* (0.132)	0.642*** (0.127)
(K/L) ²	-0.107* (0.057)	-0.063* (0.058)	-0.015* (0.059)	-0.126*** (0.046)	-0.088 (0.054)	-0.232*** (0.051)
ESPC	-0.084 (0.111)	-0.091 (0.109)	-0.064 (0.113)	-0.019 (0.079)	-0.063 (0.082)	0.070 (0.081)
FDIR	0.001 (0.009)	-0.005 (0.009)	-0.010 (0.010)	0.003 (0.010)	-0.006 (0.009)	-0.007 (0.010)
CCO ₂	0.007 (0.064)	0.014 (0.062)	-0.051 (0.057)	-0.000 (0.072)	0.025 (0.067)	-0.021 (0.063)
PCO ₂	0.005 (0.020)	0.007 (0.027)		0.002 (0.023)	-0.013 (0.030)	
GCO ₂	-0.001 (0.009)			0.002 (0.010)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 758. The SO₂ emission data for power plants are only available for 2000, 2005, and 2007. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

wind power is partially explained by the favorable on-grid power tariff. It also reflects the fact that state-owned power companies have attempted to grab market share without cost considerations [31]. If this is true, it shows that wind power projects are still not the most economically or financially attractive. Under the current additionality criteria, wind projects should still qualify as CDM activities.

Our model sheds some insight on the environmental Kuznets curve. The estimated coefficient is highly significant for all parametric models. The result supports a nonlinear relationship between SO₂ emissions and income. However, the relationship is not an exact inverted U-shape because the coefficient for the cubic term is significantly different from zero. Instead, the pollution-income relationship is better described by an N-shape curve. The semiparametric model does not specify the functional form. The nonparametric estimate of the relationship is depicted in Fig. 4. The solid line is $\hat{m}(w)$ estimated by the iterative kernel method. Two dashed lines outline a 95% confidence interval for each point estimate.

A visual inspection of Fig. 4 shows that there are multiple maxima and minima in the environmental Kuznets curve. This implies that the parametric model is misspecified because the cubic model only has one local maximum and one local minimum. A formal specification test is needed to show that the semiparametric model performs better. This can be implemented by the bootstrapping method proposed by Henderson [26]. However, since different specifications produce the same qualitative results for the policy variables, we leave this specification test for future research.

The econometric model also yields reasonable estimates for other parameters. The coefficient for population density (POPDEN) is positive but it is not statistically significant. It may be a net effect of: (1) fossil-fuel power generation is located close to demand factors such as population centers and (2) pollution is more regulated in population centers because of public health concerns. Energy efficiency (EE) has a significant nonlinear effect on power SO₂ emissions. At first, as the industrial output per kilowatt increases, demand for electricity as well as emissions climb. After some threshold, improving energy efficiency will lower the demand for electricity and hence SO₂ emissions. The capital-to-labor ratio (KL) has a significant nonlinear effect as well. If the capital endowment is low, increasing capital can cause more constructions of power plants and induce more SO₂ emissions. However, if the capital endowment is large enough, an increasing capital-to-labor ratio leads to lower emissions because of investment in capital-intensive cleaner industry or pollution abatement. The investment in education and R&D per capita (ESPC) reduces SO₂ emissions but the effect is not significant. The level of foreign direct investment (FDIR), which is measured as a ratio of FDI to fixed asset investment, has an ambiguous effect on

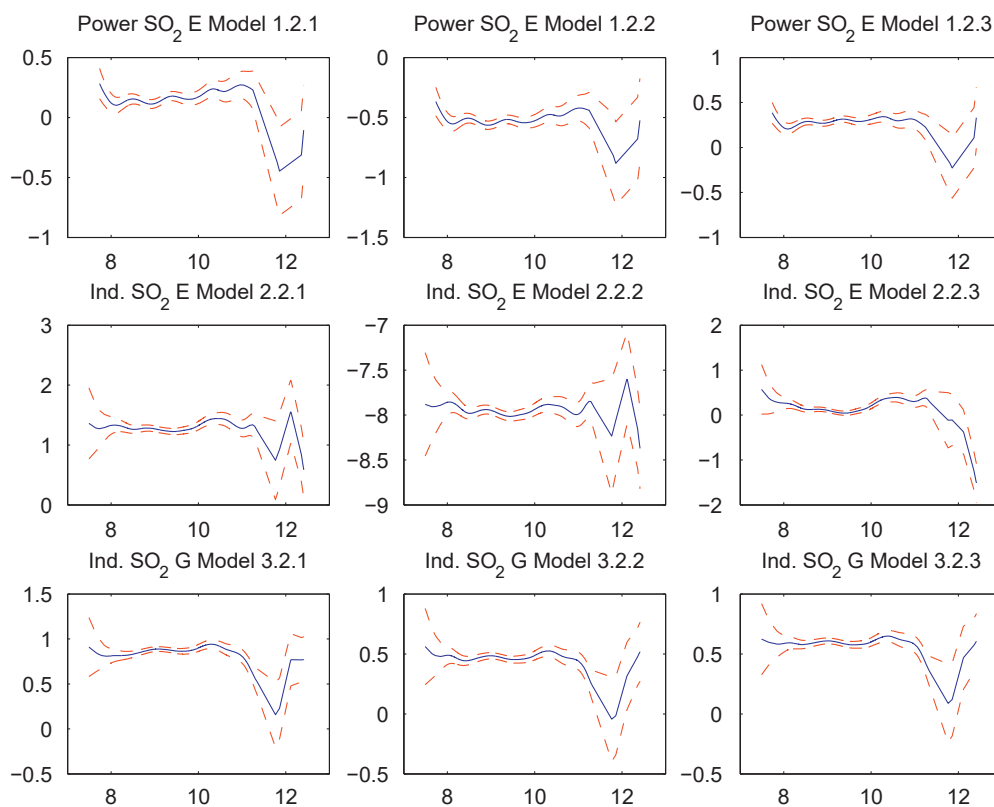


Fig. 4. Nonparametric estimate of the pollution–income relationship $m(w)$.

emissions. Its estimate is statistically insignificant. The insignificant effect of FDI might be due to a complex interaction between the “pollution haven” effect and the “gain from trade” effect [11,32,33].

5. Robustness checks

The first robustness check is concerned with the dependent variable. Besides power generation, we also evaluate the CDM effect on SO_2 emitted (SO2E) and generated (SO2T) by all industries. The CDM effect on all industries is not necessarily the same as that of the power sector because of the spillover or leakage effect. Estimation results for industrial SO_2 emissions are reported in Table 5. The semiparametric specification is still preferred because of its flexibility. For the main specification 2.2.1, the p -value of the Wald test for the joint significance of the CDM effect is 0.21, so that we cannot reject the null hypothesis of no effect at the 90% confidence level. The empirical results do not support the notion that CDM activities reduce total industrial SO_2 emissions.

As for SO_2 generated from all industries, the coefficients for CCO2, PCO2, and GCO2 are positive as is shown in Table 6. The Wald test for model 3.2.1 has a p -value less than 0.01, which means that the null hypothesis of no effect is rejected at the 99% confidence level. This result suggests that the CDM has increased SO_2 generated by all industries. This can be explained by the leakage effect. An increase in pollution induced by CDM activities outside the project boundary could fully offset the effect within the boundary. The magnitude of the CDM effect is the greatest at the prefecture level and the weakest at the grid level. This is sensible, because the leakage effect comes from project construction and operation, and thus the prefecture that hosts the projects undergoes the major impact.

To address the concern that locational and time-varying unobservables may affect CDM projects and SO_2 emissions simultaneously, we include province-by-time and grid-by-time dummies. When subnational time dummies are included, the time effects are not necessary because of multicollinearity. It is also worth noting that provincial CERs are almost absorbed by the province-by-time dummies. Note that PCO2 is defined as the difference between provincial and prefecture CERs. Because provincial CERs are much larger than prefecture CERs, prefectures within the same province have very little variation in PCO2. Including both PCO2 and province-by-time dummies causes the data matrix to be close to singularity. This is also true for the grid-by-time dummies. Therefore, when the grid-by-time dummies are present, the grid CERs are removed for identification purpose; when the province-by-time dummies are present, both grid and provincial CERs have to be removed.

Our empirical results are robust to the inclusion of the subnational time effects. For the emissions from power plants, the CDM effect is still insignificant with additional dummies. Other parameters yield the same qualitative results. A notable

Table 5Regression results: dependent variable-SO₂ emitted by all industries.

	Parametric models			Semiparametric models		
	2.1.1	2.1.2	2.1.3	2.2.1	2.2.2	2.2.3
GDPPC	0.933 (0.803)	0.960 (0.849)	1.133 (0.824)			
GDPPC ²	-1.359* (0.764)	-1.397* (0.801)	-1.492* (0.753)			
GDPPC ³	0.368* (0.199)	0.380* (0.206)	0.402* (0.191)			
POP DEN	-0.167 (0.199)	-0.160 (0.201)	-0.091 (0.182)	-0.009 (0.156)	-0.009 (0.151)	-0.016 (0.142)
EE	0.075 (0.233)	0.044 (0.236)	-0.049 (0.223)	0.083 (0.205)	0.008 (0.206)	-0.060 (0.206)
EE ²	-0.213 (0.163)	-0.176 (0.165)	-0.149 (0.152)	-0.204 (0.145)	-0.152 (0.143)	-0.144 (0.140)
K/L	0.316*** (0.093)	0.290*** (0.095)	0.292*** (0.104)	0.460*** (0.065)	0.342*** (0.080)	0.275*** (0.087)
(K/L) ²	-0.098*** (0.025)	-0.094*** (0.026)	-0.093*** (0.025)	-0.132*** (0.019)	-0.109*** (0.021)	-0.097*** (0.021)
ESPC	-0.051 (0.104)	-0.072 (0.106)	-0.122 (0.104)	-0.054 (0.070)	-0.108 (0.072)	-0.176*** (0.068)
FDIR	-0.035 (0.022)	-0.049 (0.023)	-0.007 (0.025)	-0.047** (0.019)	-0.038** (0.019)	-0.026 (0.022)
CCO ₂	-0.032 (0.038)	-0.035 (0.038)	-0.022 (0.036)	-0.028 (0.034)	-0.031 (0.033)	-0.046 (0.031)
PCO ₂	0.009 (0.012)	0.010 (0.014)		0.007 (0.009)	0.009 (0.012)	
GCO ₂	-0.006 (0.004)			-0.007 (0.004)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1608. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

difference is that the coefficient for population density is now significantly positive. For SO₂ emitted by all industries, there is no significant CDM effect either. However, including provincial time dummies makes the parameter for FDI insignificantly negative and that for ESPC significantly negative. Subnational time dummies do not change the qualitative results for SO₂ generated by all industries. Similar to the previous case, the significance of the FDI effect disappears with subnational dummies, which suggests that locational differences that affect FDI may be time variant [33].

The causality of the pollution–income relationship is another concern. According to the growth theory, lagged income can be used as an instrument for current income [14]. Because the income parameters are not our focus, we adopt the reduced form strategy and use lagged GDP per capita as a regressor. Since the model yields very similar results to the one that uses current income, we do not report the full estimation results here, but they are available upon request.

The last robustness check is to separate out the treatment effect by project types. The CDM is divided into four categories: hydropower (HYDRO), wind energy (WIND), energy efficiency (ENERGY), and other activities (OTHER). Table 1 reports the summary statistics for these variables. Our specification includes province-by-time dummies. The estimation results support our main conclusion. For power plants, none of the parameters for CERs yields significant results. The CDM effect on industrial SO₂ emissions is also insignificant. As for SO₂ generated by all industries, the only significant effect is that the energy efficiency projects increase SO₂ generation. Results for these regressions are also available upon request.

6. Conclusion

Utilizing the relationship that CO₂ and SO₂ are co-pollutants of fossil-fuel combustion, we propose an econometric approach to evaluate the co-benefits of the Clean Development Mechanism and indirectly assess its additionality. Using China's prefecture-level economic and emission data, we find that the CDM does not have a statistically significant effect on SO₂ emissions. Our empirical findings contradict the results predicted by the engineering model. It thus casts doubt on the additionality assumption on which the engineering model is based. These results lend support to the previous conjectures that some CDM activities would have happened anyway.

Nevertheless, our paper is limited by the available data. We only include the registered CDM projects, while there are many more in the pipeline. If all these projects are eventually approved and implemented, it is possible that some non-negligible co-benefits will be observed. At present, the number of projects is relatively small, and the time period is

Table 6
Regression results: dependent variable-SO₂ generated by all industries.

	Parametric models			Semiparametric models		
	3.1.1	3.1.2	3.1.3	3.2.1	3.2.2	3.2.3
GDPPC	5.921*** (1.300)	5.758*** (1.362)	6.367*** (1.436)			
GDPPC ²	-3.128** (1.231)	-3.087** (1.280)	-3.443** (1.311)			
GDPPC ³	0.493 (0.320)	0.496 (0.329)	0.563 (0.332)			
POPDEN	0.574* (0.318)	0.522* (0.319)	0.619* (0.315)	-0.045 (0.301)	-0.135 (0.289)	-0.016 (0.283)
EE	0.010 (0.376)	-0.057 (0.380)	0.024 (0.390)	0.112 (0.402)	-0.172 (0.400)	0.141 (0.414)
EE ²	-0.054 (0.262)	-0.012 (0.264)	-0.051 (0.264)	-0.029 (0.282)	0.072 (0.276)	-0.112 (0.280)
K/L	0.265* (0.155)	0.309* (0.157)	0.091* (0.187)	0.476*** (0.129)	0.282* (0.161)	0.280 (0.182)
(K/L) ²	-0.191*** (0.042)	-0.203*** (0.042)	-0.181*** (0.045)	-0.173*** (0.037)	-0.145*** (0.041)	-0.159*** (0.043)
ESPC	0.114 (0.166)	0.085 (0.169)	0.095 (0.179)	0.488*** (0.135)	0.340** (0.140)	0.460*** (0.137)
FDIR	-0.009 (0.038)	-0.009 (0.039)	-0.021 (0.046)	-0.077** (0.039)	-0.028 (0.040)	-0.031 (0.049)
CCO ₂	0.187*** (0.061)	0.185*** (0.061)	0.134*** (0.063)	0.202*** (0.066)	0.188*** (0.064)	0.190*** (0.062)
PCO ₂	0.043** (0.019)	0.022** (0.023)		0.033* (0.018)	0.023 (0.024)	
GCO ₂	0.015** (0.006)			0.004 (0.005)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1557. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

Table 7
Hypothetical effect of the CDM activity under different baseline scenarios.

Baseline scenario	Effect of the CDM activity (wind+coal)	
	SO ₂ emitted	SO ₂ generated
Wind/other renewable energy	+	+
Wind+coal	0	0
Natural Gas	±	±
Coal	-	-
Other combinations	±	±

Notes: The CDM activity is building a wind farm. A companion coal-fired power plant is built for backup supply. Each baseline scenario generates the same electricity output.

relatively short for the CDM to make a difference. Methodologically, our micro-econometric approach is appealing for further tests of additionality, since project-level information is also available. We leave this for future research.

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Perverse effects of carbon markets on HFC-23 and SF₆ abatement projects in Russia

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Carbon markets are considered a key policy tool to achieve cost-effective climate mitigation^{1,2}. Project-based carbon market mechanisms allow private sector entities to earn tradable emissions reduction credits from mitigation projects. The environmental integrity of project-based mechanisms has been subject to controversial debate and extensive research^{1,3–9}, in particular for projects abating industrial waste gases with a high global warming potential (GWP). For such projects, revenues from credits can significantly exceed abatement costs, creating perverse incentives to increase production or generation of waste gases as a means to increase credit revenues from waste gas abatement^{10–14}. Here we show that all projects abating HFC-23 and SF₆ under the Kyoto Protocol's Joint Implementation mechanism in Russia increased waste gas generation to unprecedented levels once they could generate credits from producing more waste gas. Our results suggest that perverse incentives can substantially undermine the environmental integrity of project-based mechanisms and that adequate regulatory oversight is crucial. Our findings are critical for mechanisms in both national jurisdictions and under international agreements.

The Kyoto Protocol's project-based mechanisms, the Clean Development Mechanism (CDM) for emission reductions projects in developing countries and Joint Implementation (JI) for projects in industrialized countries, provided industrialized countries flexibility in meeting their greenhouse gas (GHG) reduction commitments. Numerous sub-national and national jurisdictions are implementing similar mechanisms around the world, often in combination with emissions trading schemes².

Projects abating waste gases with a high global warming potential (GWP) can generate large volumes of emission reductions at low abatement costs^{1,15}. Under the CDM, the two largest waste gas project types—incineration of hydrofluorocarbon-23 (HFC-23) from hydrochlorofluorocarbon-22 (HCFC-22) production and destruction of nitrous oxide (N₂O) from adipic acid production—account for only 0.3% of the registered projects but generated about half of the 1.5 billion emission reduction credits issued so far¹⁶. For such projects, revenues from credits can significantly exceed GHG abatement costs and, in some instances, the costs of producing the main product^{10,11}. This can create perverse incentives for plant operators to increase production or waste generation beyond levels that would occur in the absence of crediting^{12–14,17}. If more waste gas is generated owing to the incentives from crediting, emission reductions are overestimated; the emissions baseline is inflated compared to the emissions that would actually occur without crediting, and, in consequence, excess credits are issued.

Such perverse incentives can be avoided through appropriate safeguards in methodological standards for the calculation of emission reductions, mainly by capping the amount of production

and waste generation to historically observed levels or conservative benchmarks for the purpose of calculating emission reductions. Under the CDM, safeguards to prevent perverse incentives were gradually introduced and strengthened over time, following observations that the initial safeguards may not have been adequate^{13,14,18}. Whereas the CDM requires using internationally agreed standards and international approval for registering projects and issuing credits, JI allows using a project-specific approach for calculating emission reductions, and either the host countries or the international Joint Implementation Supervisory Committee (JISC) execute regulatory oversight. Under host country oversight, countries can largely establish their own rules for approving projects and issuing credits without international oversight. The host country can determine whether it deems emission reductions as additional. Under international oversight, the JISC oversees project approval and issuance of credits.

This Letter assesses perverse incentives in the context of JI. We evaluate JI projects that incinerate high GWP waste gases, as these project types were particularly vulnerable to perverse incentives under the CDM. Four such projects were registered under JI, all of them under host country oversight. They account for 54 out of the 863 million credits issued to the 604 JI projects registered as of 1 April 2015 (ref. 16). The four projects involve five plants: two hydrochlorofluorocarbon-22 (HCFC-22) and two sulphur hexafluoride (SF₆) production plants in Russia, and one trifluoroacetic acid (TFA) production plant in France. The production of HCFC-22 generates hydrofluorocarbon-23 (HFC-23) as an unwanted waste gas; in the production of SF₆ a waste stream of SF₆ is generated at rectification; and the production of TFA generates various unwanted fluorinated waste gases. The amount of waste gas generated depends on the production level of the main product—HCFC-22, SF₆ and TFA—and the waste generation rate, which is defined as the quantity (mass) of waste gas generated per quantity (mass) of product produced¹⁴. The waste generation rate depends on factors, such as plant design, product purity requirements, and degree of process optimization¹⁹. In the absence of regulations, incentives, or voluntary commitments by the industry, the waste gases are usually vented to the atmosphere. The five registered JI plants capture and incinerate these waste gases (see Supplementary Documentation).

The plant in France aimed to address perverse incentives by capping the emission reductions to the historical emissions of the installation. However, data on historical and monitored production and waste gas generation are not available to assess whether the cap adequately prevented perverse incentives.

Three plants in Russia initially applied caps on the production and waste generation rate to avoid perverse incentives, drawing upon CDM standards. In the second quarter of 2011, the plant operators decided to retroactively change the way emission reductions

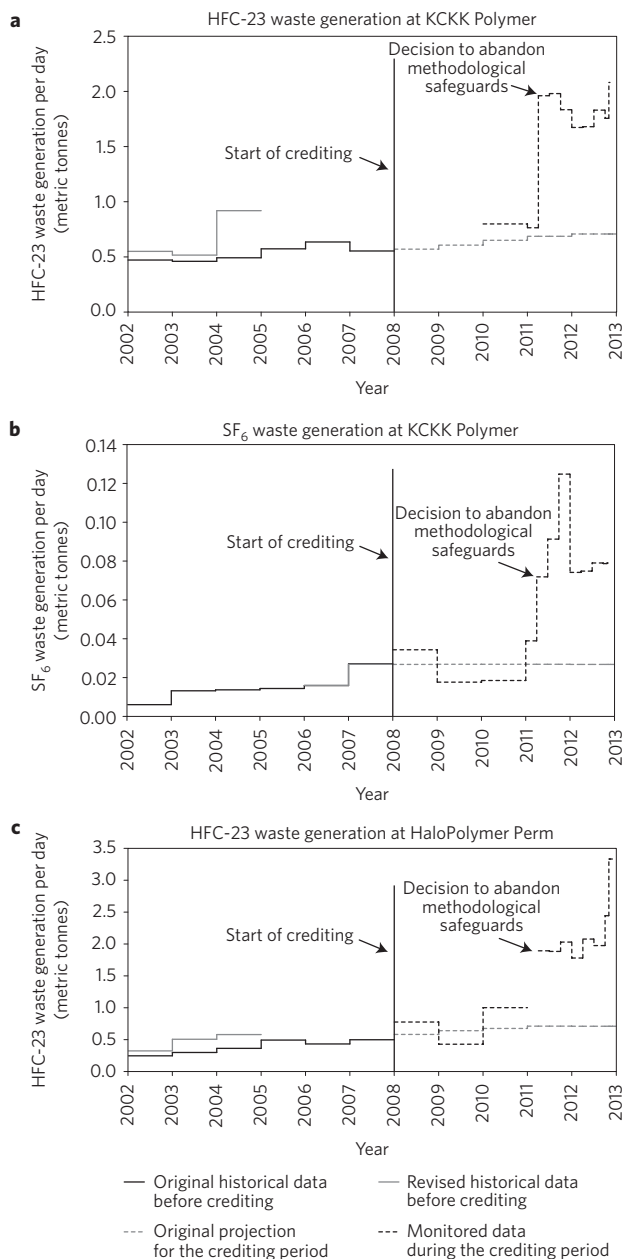


Figure 1 | HFC-23 and SF₆ waste generation at three plants in Russia.

a, HFC-23 waste generation at the KCKK Polymer plant. **b**, SF₆ waste generation at the KCKK Polymer plant. **c**, HFC-23 waste generation at the HaloPolymer Perm plant. Waste generation increased in all three plants beyond previously reported levels when plant operators decided in 2011 to abandon methodological safeguards to prevent perverse incentives.

are calculated as of 1 January 2010, removing the caps and crediting all waste gas destroyed. Moreover, data and information provided in the original project documentation was considered incorrect, or not applicable, and replaced (see Supplementary Information). Figure 1 shows that waste gas generation increased in all three facilities to unprecedented levels compared to both historical and originally projected levels, after abandoning methodological safeguards in 2011.

The project at the fourth plant in Russia was developed and approved in 2011/2012 and claimed credits retroactively as of 1 January 2008. The project did not apply any methodological safeguards to avoid perverse incentives; all waste gas destroyed was credited. For the period 2008 to 2010, for which data on both

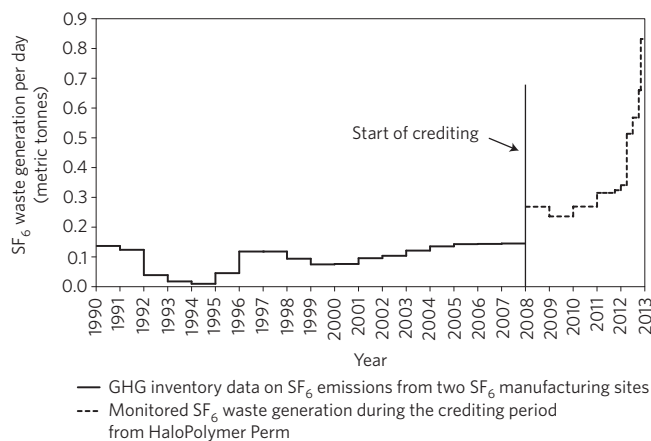


Figure 2 | SF₆ waste generation at the HaloPolymer Perm plant. The GHG inventory data includes emissions from both SF₆ production plants in Russia (KCKK Polymer and HaloPolymer Perm). After the start of crediting, the waste generation from HaloPolymer Perm increased beyond historical emission levels reported in the Russian GHG inventory from both plants.

SF₆ production and SF₆ waste generation are available, the average waste generation rate was 16.9%, which considerably exceeds the default value of 0.2% suggested by the Intergovernmental Panel on Climate Change (IPCC; ref. 20) or the average historical waste generation rate of 2.0% observed at the KCKK Polymer plant. A comparison with GHG inventory data reported by Russia to the United Nations Framework Convention on Climate Change (UNFCCC; ref. 21) shows that waste generation significantly increased with the implementation of the JI project (Fig. 2). Before project implementation, the GHG inventory emissions from SF₆ manufacturing—which cover both SF₆ plants and which may not only include waste gas emissions from SF₆ production but also emissions from handling of SF₆ at the production site, and thus represent the upper end of the possible range—varied between 4 and 53 tonnes of SF₆ over the period 1990 to 2007, whereas after project implementation the plant reported an average annual waste gas generation of 117 tonnes of SF₆.

The abrupt increase occurred in all four plants exactly at the point in time when plant operators could generate (more) credits by producing more waste gas, and higher levels of waste generation were sustained thereafter. The increase in waste generation is mostly attributable to an increase in the waste generation rate, and not in production levels (see Supplementary Information). There was also no reporting of any changes in plant capacity, design, or product specifications which might have affected the waste generation rate. Without credit revenues, plant operators would have economic incentives to reduce rather than increase waste generation^{13,14}.

Absent methodological safeguards to prevent perverse incentives, increasing waste gas generation beyond levels that would occur in the absence of crediting leads to excess issuance of credits. The extent of such over-crediting is uncertain; it depends on how much waste gas the plants would otherwise have generated. We assess the magnitude of over-crediting using three scenarios to estimate the plausible range of waste gas generation that would have occurred in the absence of crediting (see Methods). We conclude that, in the periods where methodological safeguards were not applied, about 28 to 33 million credits were issued in excess, corresponding to 66 to 79% of the credits issued for these periods.

Several lessons can be learned from this analysis. First, although previous research indicated that perverse incentives affected plant operations, the extent and implications were more confined^{13,17,18}. Our results suggest that perverse incentives arising from project-based mechanisms can have rather substantial adverse impacts on environmental integrity, with about two-thirds of the credits

being issued in excess in periods when no safeguards were applied. Second, regulatory oversight by the host country alone may not be sufficient to ensure environmental integrity. Under the Kyoto Protocol, Russia had no incentives to ensure environmental integrity of JI projects; it had an emissions target well above its actual emissions and could issue credits from its emissions budget without repercussions for meeting its target. For the three plants in Fig. 1 the methodological safeguards were removed at a point in time when perverse incentives from HFC-23 CDM projects received wide media and policymaker attention, leading ultimately to a ban of HFC-23 credits under the EU's emissions trading scheme and a revision of the applicable methodological standard under the CDM (refs 14,22). Third, the Accredited Independent Entity (AIE) performing the relevant auditing functions—Bureau Veritas Certification—did not address the perverse incentives. Although AIEs were accredited by the JISC, the projects were implemented under oversight by the host country, in which case the JISC did not assess the performance of auditors or apply any sanctions in cases of non-performance. Finally, we note a lack of transparency, with project information being only partially publicly available.

These lessons are critical for both ongoing international discussions on the review of JI and market-based mechanisms under the new climate agreement, as well as the growing use of domestic carbon markets around the world. Our findings confirm earlier research that project-based mechanisms are exposed to significant risks of over-crediting, for example, due to the information asymmetry between project operators and auditors or regulators^{4,5,7,8}. If crediting mechanisms are further pursued, it is essential that adequate international oversight be executed for any mechanisms involving international transfer of credits, that methodological standards be internationally accepted and include appropriate safeguards to prevent perverse incentives, that mechanisms monitor the performance of auditors and apply effective sanctions in the case of non-performance, and that information on credited activities is transparent and publicly accessible.

Methods

Methods and any associated references are available in the [online version of the paper](#).

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Author contributions

L.S. evaluated the data and analysed the results. L.S. and A.K. wrote the paper.

Additional information

Supplementary information is available in the [online version of the paper](#). Reprints and permissions information is available online at www.nature.com/reprints. Correspondence and requests for materials should be addressed to L.S.

Competing financial interests

L.S. is member of the CDM Executive Board under the Kyoto Protocol.

Methods

Data on production and waste gas generation was gathered from project design documents (PDDs) and monitoring reports, published by the UNFCCC (<http://ji.unfccc.int>) and the Russian Registry of Carbon Units (<http://www.carbonunitsregistry.ru>), and audited by AIEs. The monitoring and verification reports publicly available are incomplete for four out of the five plants: for HFC-23 and SF₆ abatement at KCKK Polymer, the first and second monitoring report covering the years 2008 and 2009 are lacking. For HFC-23 abatement at HaloPolymer Perm, the first, second and fourth monitoring report, covering the years 2008 and 2009 and the period 1 January to 31 March 2011, are lacking, as well as the fourth verification report for the period 1 January to 31 March 2011. Moreover, as of 1 January 2012, HaloPolymer Perm reports only HFC-23 incineration but no longer HFC-23 generation. We conservatively assume that all HFC-23 generated was incinerated. If HFC-23 was partially vented or sold, the actual HFC-23 generation in 2012 would be even higher than presented in Fig. 1. Finally, monitoring reports are not publicly available for the plant in France.

Project-based mechanisms generally calculate emission reductions by comparing an emissions baseline with monitored project emissions and adjusting for any indirect upstream or downstream leakage emissions occurring as a result of the project:

$$ER = BE - PE - LE$$

where ER are the emission reductions, BE are the baseline emissions, PE are the project emissions and LE are the leakage emissions (all expressed as metric tonnes of CO₂ equivalent). Whereas project emissions can in most cases be directly measured, baseline emissions are estimated based on a counterfactual, hypothetical scenario. Baselines often aim to reflect the emissions level that would most likely occur if the project was not implemented, but could also be set at a lower, more conservative level—for example, to address uncertainties or to prevent perverse incentives. Over-crediting, or excess issuance of credits, occurs if the estimated baseline is higher than the emissions level that would occur if the project was not implemented (or if project or leakage emissions are underestimated).

Absent methodological safeguards, the four projects determine baseline emissions as the observed waste gas generation, that is, assuming that the same amount of waste gas would be generated and emitted in the absence of crediting. We estimate the extent of excess issuance of credits as the difference between the claimed baseline emissions (BE_{claimed}) and different assumptions on plausible baseline emission levels (BE_{plausible}):

$$E = BE_{\text{claimed}} - BE_{\text{plausible}}$$

where E are the credits issued in excess, BE_{claimed} are the baseline emissions specified in the monitoring reports of the plants and BE_{plausible} is our estimate of the plausible range of baseline emissions (both expressed in metric tonnes of CO₂ equivalent).

We use three scenarios to reflect the range of plausible baseline emissions (BE_{plausible}). For the three plants in Fig. 1, historical data on waste generation is available. We estimate the magnitude of over-crediting over the period 1 April 2011 to 31 December 2012, when methodological safeguards were not applied, assuming that the three facilities would have produced the same amount of waste gas per day as before the start of crediting, as during the crediting period before their decision to abandon the methodological safeguards, or as originally projected when the project was approved. The credits issued in excess would amount to 19.7, 17.3, or 17.6 million, respectively, corresponding to 69%, 61%, or 62% of the 28.3 million credits issued to the three facilities over that period.

For SF₆ abatement at HaloPolymer Perm in Fig. 2 the magnitude of over-crediting is more uncertain because historical data is not available. We determine plausible baseline emission levels based on the SF₆ production and a range of plausible assumptions on the waste generation rate:

$$BE_{\text{plausible}} = P_{\text{SF}_6} \times w_{\text{SF}_6} \times \text{GWP}_{\text{SF}_6}$$

where P_{SF_6} is the SF₆ production at the plant (in metric tonnes of SF₆), w_{SF_6} is the waste generation rate expressed as metric tonnes of SF₆ waste gas generated per metric tonnes of SF₆ produced, and GWP_{SF_6} is the global warming potential of SF₆ valid for the first commitment period under the Kyoto Protocol (metric tonnes of CO₂ equivalent per metric tonnes of SF₆). We estimate the magnitude of over-crediting for the period 2008 to 2012 when methodological safeguards were not applied. For the period 2008 to 2010 we use the SF₆ production data reported by the plant. For 2011 and 2012, SF₆ production data is not reported; we conservatively assume that the plant would operate at its maximum production capacity. We use three scenarios to estimate the plausible range of the waste generation rate, assuming that the plant would have operated at a waste generation rate of 0.2%, as suggested by the IPCC, 2.0%, as observed before crediting at the KCKK Polymer SF₆ production plant, or 3.8%, as approximated based on SF₆ emissions data reported in the Russian GHG inventory (see Supplementary Information). The credits issued in excess would amount to 13.5, 11.9, or 10.2 million, respectively, corresponding to 99%, 87%, or 75% of the credits issued over that period.

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
 FOURTH APPELLATE DISTRICT, DIVISION ONE

SIERRA CLUB,
 Petitioners and Respondents,
 v.
COUNTY OF SAN DIEGO,
 Defendant and Appellant.

Case No. D075478

San Diego County Superior Court, Case Nos. 37-2018-00014081-CU-TT-CTL, 37-2018-00013324-CU-TT-CTL, No. 37-2012-00101054-CU-TT-CTL

The Honorable Timothy Taylor, Judge

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INTRODUCTION

The California Attorney General respectfully submits this brief as amicus curiae in support of Petitioners and Respondents Sierra Club¹ and Golden Door Properties (collectively, Respondents) pursuant to Rule 8.200(c)(7) of the California Rules of Court. This brief is submitted in the Attorney General's independent capacity and not on behalf of any State agency or entity.

At issue in this case is San Diego County's (County) revised Climate Action Plan (CAP), which was adopted to mitigate greenhouse gas (GHG) emissions from the County's 2011 General Plan Update, and the CAP's accompanying Supplemental Environmental Impact Statement (SEIR). The Attorney General has long advocated the use of local climate action plans, or other GHG reduction plans, to address GHG emissions. Such plans allow cities and counties to analyze impacts and identify mitigation opportunities at the programmatic level that may be lost on project-by-project review.² The County's decision in 2011 to address mitigation of GHG emissions from future development through a CAP was an important step in the right direction from a legal, policy, and environmental standpoint. However, the County's CAP cannot provide adequate

¹ Sierra Club files with Respondents Center for Biological Diversity, Cleveland National Forest Foundation, Climate Action Campaign, Endangered Habitats League, Environmental Center of San Diego, and Preserve Wild Santee.

² See, e.g., AR 11:8602-8610 (Attorney General's Comment Letter on San Diego County General Plan Update Draft Environmental Impact Report (August 31, 2009)); Attorney General's Comment Letter on Tulare County General Plan and Recirculated Draft Environmental Impact Report (May 27, 2010); Attorney General's Comment Letter on City of Pleasanton's Proposed General Plan Update and Final Environmental Impact Report (May 8, 2009), available at <https://oag.ca.gov/environment/ceqa/letters>.

mitigation as required by the California Environmental Quality Act (CEQA). Instead, its heavy, unfettered use of offsets allows status quo development to continue, locking the County into increased local emissions that work against the State’s long-term GHG reduction targets.

This amicus brief supplements the Respondents’ briefs by explaining why reducing vehicle use, referred to as vehicle miles traveled (VMT), is crucial to achieving the State’s climate objectives. Reducing VMT requires cities and counties to engage in forward-thinking and innovative land use planning. The County’s failure to meaningfully address VMT in the CAP will interfere with the region’s ability to achieve needed infrastructure changes consistent with long-term climate objectives, and ultimately prevents the CAP from serving as legally adequate mitigation. Moreover, the lack of limits, standards or other criteria for the CAP’s use of offsets, allows developers to avoid making crucial onsite reductions and instituting measures to reduce vehicle use, rendering the CAP unenforceable.

Further, the SEIR for the CAP hides the inconsistencies with State and regional climate objectives from the public by failing to disclose or analyze these conflicts, in violation of CEQA. The County also violates CEQA by not considering compact growth alternatives that reduce VMT, and by failing to analyze impacts of increased VMT on air quality or environmental justice communities. This amicus brief aims to provide guidance on how the County and other local entities can create GHG reduction plans that reduce VMT, adopt enforceable programmatic mitigation for land use development, and as the California Supreme Court requires, do their part to ensure that their CEQA analysis “stays in step” with State climate objectives. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 3 Cal.5th 497, 519 [hereafter *SANDAG*].)

STATEMENT OF INTEREST

The Attorney General, as the State’s chief law enforcement officer, has a duty to ensure that the State’s laws are appropriately enforced and a duty under the Government Code to protect the environment and natural resources of California. (Cal. Const., art. V, § 13; Gov. Code, §§ 12600-12612; *D’Amico v. Bd. of Medical Exam’rs* (1974) 11 Cal.3d 1, 14-15.) The Attorney General has a particular interest in ensuring the proper interpretation of CEQA and of the regulations implementing CEQA (Cal. Code Regs., tit. 14, § 15000 et seq. [CEQA Guidelines]). The Attorney General also has a unique role with respect to actions concerning pollution and adverse environmental effects that could affect the public or the natural resources of the State. (Gov. Code, §§ 12600-12612.) Government Code section 12600 specifically provides that “[i]t is in the public interest to provide the people of the State of California *through the Attorney General* with adequate remedy to protect the natural resources of the State of California from pollution, impairment, or destruction.” (Emphasis added.)

The California Attorney General has actively participated in CEQA litigation regarding GHG emissions and climate change impacts at the local level. In 2006, the Attorney General’s Office submitted its first comment letter arguing that climate change is an environmental impact that must be addressed under CEQA. Ultimately, the Attorney General’s position was codified in 2007 with the passage of Senate Bill 97 (Pub. Resources Code, § 21083.05) and is reflected in CEQA’s implementing regulations (CEQA Guidelines § 15064.4). In submitting this amicus brief, the Attorney General furthers its efforts to ensure that CEQA is enforced in a way that discloses impacts from land use development plans and projects, and ensures the consistency with State laws and policies.

ARGUMENT

I. THE COUNTY’S CLIMATE ACTION PLAN IS INADEQUATE MITIGATION FOR GHG IMPACTS ANTICIPATED UNDER THE COUNTY’S GENERAL PLAN UPDATE

The CAP, by incorporating mitigation measure GHG-1 (referred to in this brief as the Offset Provision, or Provision),³ allows future development requesting a general plan amendment in the County to mitigate emissions largely through the purchase of carbon offsets. Carbon offsets represent discrete GHG reduction events that take place offsite of a proposed development, and, in many cases, outside of the County entirely. While offsets can be a positive part of a robust and comprehensive GHG emissions plan, the Offset Provision relies almost exclusively on offsets to the exclusion of long-term, carbon-efficient planning. The Provision does not, for example, require or incentivize developers to locate projects in already dense, urban areas to limit residents’ daily vehicle trips.

As a consequence, and as discussed in detail in the Respondents’ briefs, the CAP will foreseeably increase vehicle use in the County, creating inconsistencies with Senate Bill 375 (SB 375), a State law designed to reduce vehicle-related GHG emissions through smart growth land use planning and transportation design. (Gov. Code §§ 65080 et seq.; see also *Sierra Club Br.* at 62-70; *Golden Door Br.* at 75-82.)⁴ The CAP

³ The County insists that the Offset Provision is not a part of the CAP but a part of the SEIR for the CAP. (*County Reply Br.* at 21.) However, given that the Offset Provision is discussed in the CAP, is a mitigation measure adopted to reduce the CAP’s impacts below the threshold of significance, and that CEQA mandates that agencies consider “the whole of an action,” this brief considers the CAP and the Offset Provision to be part of the same action under CEQA. (CEQA Guidelines § 15003, subd. (h); see also AR 1340:58761.)

⁴ Since the approval of the CAP, several new general plan amendment projects using offsets to mitigate GHG emissions have been approved. (CT 10:2385-87; CT 13:3300; see also *Sierra Club Br.* at 18; (continued...))

will also conflict with the sustainable communities strategy developed by the regional transportation planning body, the San Diego Association of Governments (SANDAG) to comply with SB 375's targets (hereafter SANDAG Plan). (Sierra Club Br. at 62-70; Golden Door Br. at 75-82.)

Ultimately, the CAP in its current form will perpetuate current sprawling development patterns, which will impede the ability of the region and State to reach their long-term climate objectives. This is particularly concerning because of the crucial role of local governments in obtaining important VMT reductions. Moreover, the County cannot avoid implementing necessary compact land use development designed to reduce vehicle use entirely by adopting the Offset Provision, which in addition to increasing VMT, requires no meaningful standards or criteria to ensure enforceable GHG reductions. Thus, the CAP is inadequate mitigation for the impacts of the 2011 General Plan Update.

A. Sustainable, Long-Term GHG Reductions Cannot Be Achieved Without Addressing Vehicle Miles Traveled

The County asserts that so long as GHG reductions are being achieved somewhere, by some means, for some period of time, the CAP serves its mitigative purpose. (County Opening Br. at 48 [hereafter County Br].) Not only is this position incorrect, it reveals a deep misunderstanding of the importance of VMT reductions to meeting not only the goals in relevant

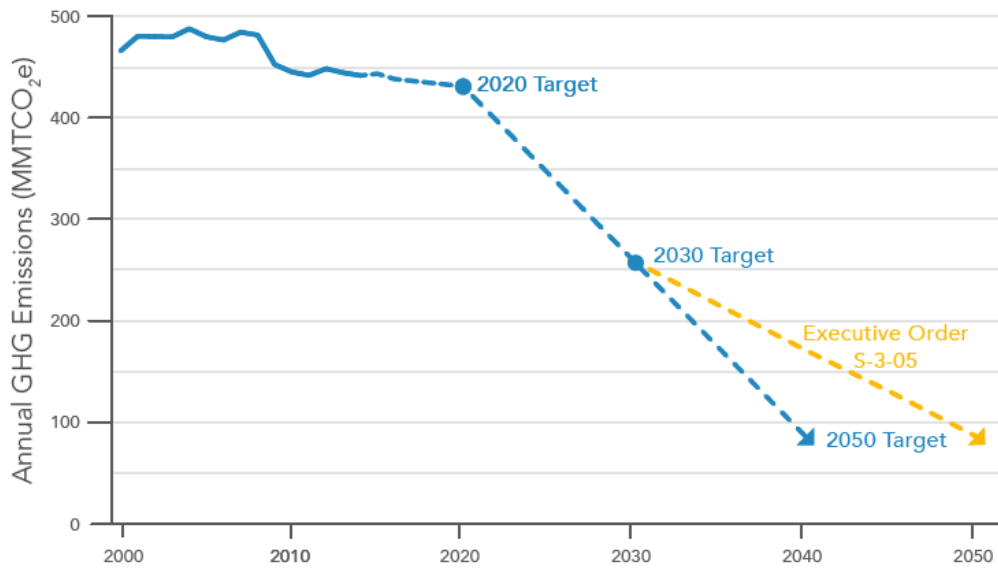
(...continued)

Golden Door Br. at 50-51.) All are large-scale housing projects located well outside of urban centers that will increase VMT. For example, the Harmony Grove Village South project, which was recently approved by the County, will increase vehicle miles traveled by 11.5 million miles annually. (CT 10:2451 [Harmony Grove Village South Draft Final Environmental Impact Report (May 2018) p. 2.7-17].) Similarly, the Newland Sierra project will increase vehicle use by 294,804 miles *daily*. (CT 15:3918; see also Newland Sierra Final Environmental Impact Report (June 2018) p. 2.7-38].)

State and regional programs and plans, but also California’s larger climate objectives. Without significant VMT reductions across the State, California simply will not be able to achieve its GHG reduction targets.

A review of California’s climate laws reveals that reducing vehicle use is a crucial element of California’s policy and regulatory framework to reduce the State’s GHG emissions and the consequences of extreme changes in climate. California took the lead in reducing GHG emissions by enacting the Global Warming Solutions Act of 2006, also known as AB 32, which set the State’s original target of reducing GHG emissions to 1990 levels by 2020. (Health & Saf. Code, §§ 38500 et seq.) In 2016, California passed Senate Bill 32 (SB 32), which set a target of reducing GHG emissions 40 percent below 1990 levels by 2030. (*Id.* at § 38566.) Looking further to the future, Executive Order S-3-05 sets a goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. (Governor’s Exec. Order No. S-3-05 (June 1, 2005).)

As required by AB 32, the California Air Resources Board (Air Resources Board) developed the Scoping Plan, which outlines a framework of GHG reduction strategies and a path for the State to meet AB 32’s 2020 targets, and, as updated in 2017, SB 32’s 2030 targets. (Health & Saf. Code, § 38561; AR 1026:55038 [Air Resources Board, 2017 Scoping Plan (2017) p. ES 3, hereafter Scoping Plan].) The Scoping Plan emphasized that the State’s reduction “targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in line with California’s role in stabilizing global warming below dangerous thresholds.” (*Ibid.*) Represented graphically, our climate challenge is significant:

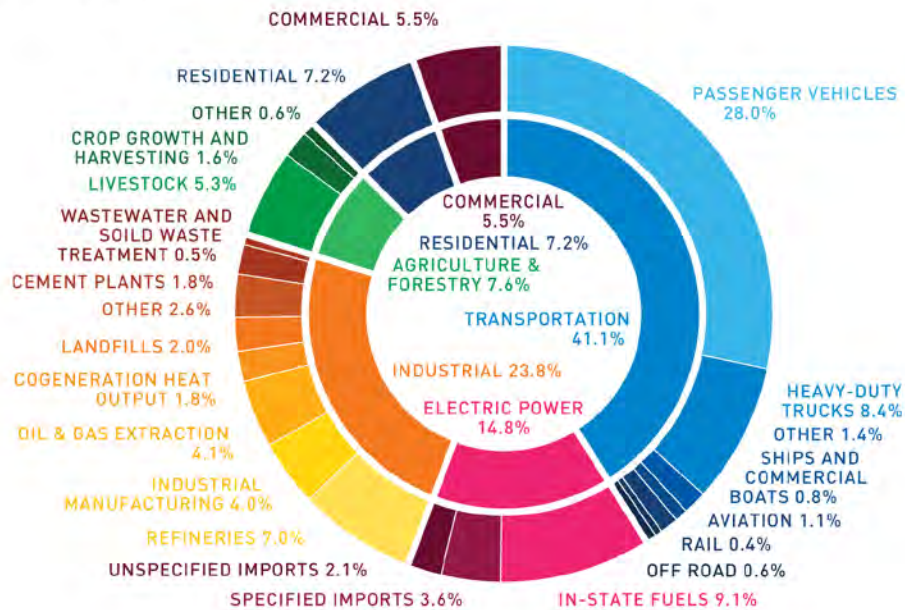


(*Id.* at 55071 [Scoping Plan at p. 18, fig. 5, “Plotting California’s Path Forward”].)

Within this significant undertaking to reduce GHGs, emissions from transportation represent a particular challenge. Transportation is the largest source of GHG emissions in the State, totaling almost half of statewide GHG emissions. (AR 1026:55063 [Scoping Plan at p. 10].)

Figure 2. Greenhouse Gas Emissions by Source

CALIFORNIA, 2017



(Next 10, California Green Innovation Index (2019),⁵ p. 7 [data source: Air Resources Board, California Greenhouse Gas Inventory – By Sector and Activity (2019)].)

In light of these significant transportation emissions, the Scoping Plan specifically noted that reductions in VMT are necessary to achieving California’s 2030 targets and “must be a part of any strategy evaluated in the [Scoping] Plan.” (AR 1026:55128 [Scoping Plan at p. 75].) In fact, the Air Resources Board has emphasized that “California *cannot* meet its climate goals without curbing growth in single-occupancy vehicle activity.” (Air Resources Board, 2018 Progress Report, California’s Sustainable Communities and Climate Protection Act (2018) p. 28, hereafter Progress Report [emphasis added].)⁶

⁵ Available at <https://www.next10.org/publications/2019-gii>.

⁶ Available at <https://ww2.arb.ca.gov/resources/documents/tracking-progress>.

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Implementation of SB 375 is a primary strategy identified in the Scoping Plan to reduce GHG emissions from the transportation sector. (AR 1026:55154 [Scoping Plan at p. 101].) SB 375 aims to achieve GHG reduction goals specifically by reducing regional GHG emissions from light duty vehicles through coordinated land use transportation planning. (Gov. Code, § 65080 subd., (b)(2)(B)(vii).) Under SB 375, regional planning organizations develop plans to achieve the GHG reduction targets set by the Air Resources Board. (*Id.* at § 65080.) These regional plans, or sustainable communities strategies, integrate “land use, transportation, and housing planning” to reduce emissions from driving, curtail traffic, preserve natural resources, reduce air pollution, and expand clean transportation options. (Progress Report at p. 16.) In order to meet the intent of SB 375, these regional plans should achieve their emissions targets “predominantly through strategies that reduce [VMT].” (AR 22:20413 [Air Resources Board, Final Staff Report on the Proposed Update to the SB 375 GHG Emissions Reduction Targets (Oct. 2017) p. 19].)

SANDAG’s sustainable communities strategy was created to be consistent with this intent. The SANDAG Plan specifies that GHG reductions are to be achieved through land use planning methods that are designed to reduce vehicle miles traveled, including “using land in ways that make developments more compact, conserving open space, and investing in a transportation system that provides people with alternatives to driving alone.” (AR 430:39941.) Indeed, one of the “five building blocks” of the SANDAG Plan is to implement “policies and other measures designed to reduce the number of miles that people travel in their vehicles.” (*Id.* at 39870.) Thus, the County’s assertion that the SANDAG Plan does not require reductions in VMT is directly contradicted by the plain language of the document.

Moreover, the SANDAG Plan emphasizes that achieving GHG reductions through more compact development designed to reduce vehicle use is important for numerous reasons. Specifically, the SANDAG Plan discusses how smart growth land development decreases air pollution, preserves open space and agricultural land, improves water quality, and promotes healthier lifestyle choices, among other benefits. (AR 430:39934-35; see also AR 1026:55117, 55127 [Scoping Plan at pp. 64, 74] [noting that compact development that reduces VMT also demands less energy per capita, preserves natural and working lands, uses less water per capita and encourages physical activity].)

Thus, VMT reduction is an integral part of California’s climate laws and policies, as well as the SANDAG Plan. The CAP’s Offset Provision allows the County and future development projects to avoid consideration of whether the proposed project is properly located, sufficiently dense, and adequately supported by existing infrastructure, services, and public transportation. (See *Golden Door Br.* at 76-81; *Sierra Club Br.* at 62-70.) In this way, the CAP allows VMT-inefficient projects to continue to be built, locking the County into emissions for decades to come.

B. Local Governments Have an Essential Role to Play in Meeting the State’s Climate Objectives, Including Reducing Vehicle Miles Traveled

By failing to place any meaningful limitations or criteria for offsets, and by not requiring developers to make reductions in VMT, the County is effectively abdicating its land-use planning role. But local governments are necessary partners in reducing GHG emissions from land use and transportation. As the California Supreme Court has recognized, “[l]ocal governments ... bear the primary burden of evaluating a land use project’s impact on greenhouse gas emissions.” (*Ctr. for Biological Diversity v. Cal. Dep’t of Fish and Wildlife* (2016) 62 Cal.4th 204, 230.) The Scoping Plan

also emphasizes that local governments are critical players in achieving the State’s climate stabilization goals. (AR 1026:55150 [Scoping Plan at p. 97]; see also *id.* at 55072, 55115, 55125, 55140, 55144, 55150-55155 [pp. 19, 62, 72, 87, 91, 97-102].) In particular, the Scoping Plan relies on local governments to achieve reductions from land use planning and transportation, and states that local governments “can develop land use plans with more efficient development patterns that bring people and destinations closer together in more mixed-use, compact communities that facilitate walking, biking, and use of transit.” (*Id.* at 55150 [Scoping Plan at p. 97].) Because of this unique position, local government actions to combat severe changes in climate can in many cases be more effective, less costly and provide more environmental and economic co-benefits than regulating at the State level. (*Ibid.*)

In recognition of the important role that local jurisdictions have in GHG reductions and land use planning, many local jurisdictions have developed program-level GHG emissions reduction plans, such as CAPs. These plans outline city-, county- or regional-level frameworks that detail the specific actions a local agency will implement to reduce GHG emissions to a specified emissions level that is consistent with the State’s long-term climate objectives. (Governor’s Office of Planning and Research, General Plan Guidelines (2017) p. 226-229.)⁷ CAPs, when done correctly, provide a comprehensive approach to reducing GHG impacts on the local level and allow the local government to disclose, analyze, and mitigate impacts that may not be sufficiently analyzed and mitigated if projects are only reviewed one at a time. (*Id.* at 223.)

⁷ Available at http://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf.

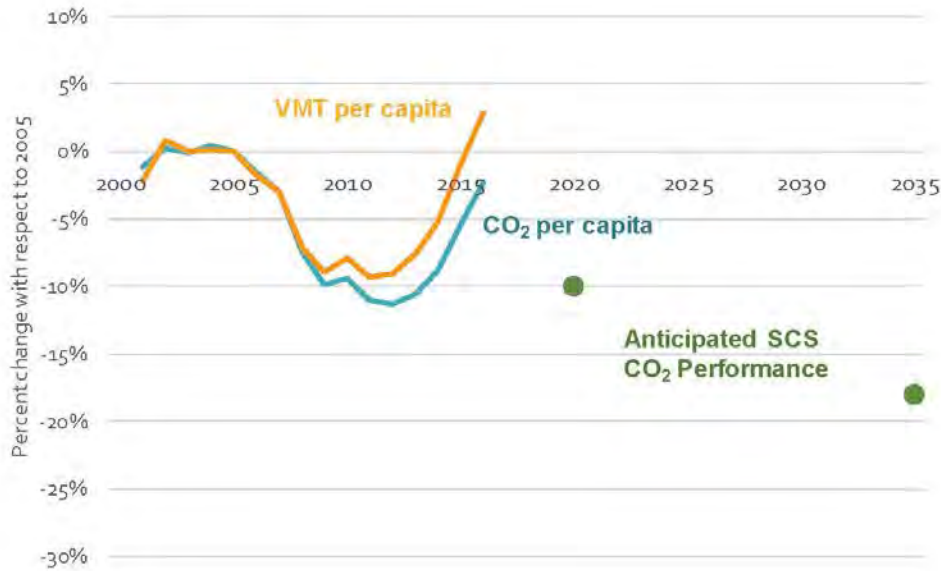
One of the key benefits of a properly prepared CAP is its ability to integrate GHG reductions with land use development plans. (General Plan Guidelines at pp. 222-224.) For example, by developing a CAP alongside a region’s general plan, a jurisdiction can consider methods of GHG reduction not available on a project-by-project-basis, such as zoning for compact development to decrease reliance on vehicles. (*Ibid.*) Moreover, the CEQA Guidelines allow well-designed CAPs that are consistent with State and regional climate goals to “streamline” future projects – meaning that future projects that comply with the CAP can appropriately reduce their GHG emissions to less than significant. (CEQA Guidelines § 15183.5, subd. (b).) This can allow local entities to more easily approve needed development, such as additional housing, or low-income housing, in existing, compact communities that reduce VMT.⁸ Thus, well designed CAPs provide excellent opportunities to achieve long term GHG reductions through dense development and can complement regional sustainable communities strategies’ and SB 375’s VMT reduction goals.

SB 375, too, relies on local planning innovation and leadership. The goals of regional sustainable communities strategies, including the SANDAG Plan, cannot be achieved if the County and other local entities operate with no regard for the compact growth principles. Recent data on compliance with SB 375 reflect this important point. In November 2018, the Air Resources Board released its 2018 Progress Report pursuant to SB 150,⁹ a State law that requires the preparation of a report every four years analyzing the progress made under SB 375. (Progress Report at p. 3.) The

⁸ The County claims that Petitioners are attempting to prevent all development in San Diego County. (County Reply Br. at 9-10.) However, had the County developed an adequate CAP, it could have actually *facilitated* dense development.

⁹ Gov. Code § 65080, subd. (b)(2)(J)(iv).

Progress Report found that despite the preparation of sustainable community strategies designed to comply with SB 375 by all the regional planning organizations, actual GHG emissions and VMT per capita have not declined, and California is not on track to meet its SB 375 targets. (*Id.* at 22.) In fact, VMT per capita and carbon dioxide emissions per capita are increasing¹⁰:



Source: CDTFA, U.S.EIA, U.S. EPA, CARB

(*Id.* at 23.)

The wide gap between the actual, measured VMT per capita and the targets of the sustainable community strategies reflects, among other things, that the regional plans are “not being implemented as envisioned.” (Progress Report at p. 24.) Further, the Progress Report warns that continued growth of urban sprawl could create barriers to achieving the compact land use patterns outlined in the regional plans. (*Id.* at 52.) The

¹⁰ CO2 and VMT in the chart calculated based on California Department of Tax and Fee Administration gasoline fuel sales data.

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Air Resources Board advised that “structural changes and additional work by all levels of government are still necessary to achieve State climate goals and other expected benefits.” (*Id.* at 7.) This includes the County.

Thus, neither the State nor the San Diego region can achieve their climate goals if local entities, such as the County, persist in expanding urban sprawl, and consequently VMT. The County cannot disregard VMT reductions in the CAP without creating potentially significant and long-lasting impacts on the region’s ability to comply with the SANDAG Plan, SB 375 and consequently, California’s 2050 goals. These foreseeable conflicts with State and regional laws and plans prevent the CAP from adequately mitigating the impacts of the General Plan Update.

C. Offsets Are Not a Substitute for Efficient, Long-Term Land-Use Planning and Carbon-Efficient Project Design

GHG offsets can be a valuable and useful tool for achieving additional reductions that cannot be attained through onsite or VMT reduction measures alone. (AR 1026:55155 [Scoping Plan at p. 102].) For example, where a properly sited project has agreed to implement all feasible design changes and on-site mitigation, but will still have significant GHG emissions, it may be appropriate to consider the purchase of rigorously quantified and verified offsets to further reduce the project’s impacts. But in the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. These disadvantages, combined with the lack of any adequate criteria to ensure enforceability of the offsets purchased in this case, conspire to make the CAP ineffective and unreliable as a mitigation measure for the General Plan Update.

The Offset Provision provides only vague pronouncements and little accountability.¹¹ It does not require any minimum amount of reductions to be made onsite before a project applicant can turn to offsets. (AR 38:22771.) In fact, the only standard that the Offset Provision requires is the satisfaction of the County and the Director of Planning and Development Services (PDS) that onsite reductions were considered first before turning to offsets. (*Ibid.*) Without any measurable guidance or standard for what “feasible” onsite reductions are, it is unclear how much onsite reduction will actually be required of future general plan amendment projects. What is clear, however, is that the County has recently approved developments using mitigation measures nearly identical to the Offset Provision that achieve onsite reductions for a very small portion of overall emissions. For example, the approved Newland Sierra project mitigates a staggering 82 percent of its emissions with offsets. (AR 22:18678.)

The Offset Provision also states that if offsets are used, the project “shall first pursue offset programs locally within unincorporated areas of the County of San Diego to the extent such carbon offset credits are available and financially feasible, as reasonably determined by the Director of PDS.” (AR 38:22772.) Again, the County provides no detail as to what “financially feasible” means, nor what criteria the Director of PDS will use to make its determination. Further, the evidence in the record shows that there are few carbon credits available within the County, meaning that most offset purchases

¹¹ Like all mitigation under CEQA, any mitigation measure that utilizes offsets must be enforceable. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments.” (CEQA Guidelines § 15126.4, subd. (a)(1)(D).) “The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded.” (*Lincoln Place Tenants Assn. v. City of Los Angeles* (2007) 130 Cal.App.4th 1491, 1508 [citing Pub. Resources Code, § 21002.1].)

will inevitably occur outside of the County. (AR 38:23110-11.) Once all “available and financially feasible” in-County offsets have been considered, the Offset Provision allows projects to turn to out-of-county offsets. (*Id.* at 22771.) While the Provision requires that developers should prioritize in-state and in-country offsets (again without minimum amounts of reduction achieved by in-state or in-country offsets), it ultimately permits projects to purchase international offsets as well, unrestricted by any geographic boundaries. (*Ibid.*) This lack of meaningful criteria or limitations renders the Offset Provision unenforceable.

Moreover, the County’s attempts to justify the Offset Provision lack merit. The County asserts that the CAP’s allowance of offsets is no different than the use of offsets by the Air Resources Board’s Cap and Trade program.¹² (County Br. at 32-33.) This is untrue. Unlike the Offset Provision, offsets used in the Air Resources Board’s Cap and Trade Program are subject to detailed compliance protocols that were developed pursuant to the State’s public rulemaking process. (Cal. Code Regs., tit. 17, § 95972.) Further, and of critical importance, these requirements only allow offsets to comprise a maximum of 8% of any compliance entity’s compliance obligation.¹³ (*Id.* at § 95854, subd. (b).)

The County further argues that the Offset provision is no different than the use of offsets for the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, which the Scoping

¹² The County also concludes that because the Air Resources Board did not comment on the EIR, that the Board does not find the Offset Provision problematic. (County Br. at 49.) However, the County has provided no evidence to support this conclusion.

¹³ With the passage of Assembly Bill 398 in 2017, this maximum percentage has been further reduced to 4% of emissions from 2021-2025 and 6% for emissions from 2026-2030. (Assem. Bill No. 398 (2017-2018 Reg. Sess.) § 4(c)(E)(i).)

Plan identified as an example of a development project that will help the State meet its climate goals. (County Br. at 33 citing AR 1026:55154-55155 [Scoping Plan at pp. 101-2].) This is also untrue. The Newhall Ranch development required more than 50% of offsets to be local and limited international offset purchases to 20%. (AR 22:19785, 19796.) Moreover, offsets were only permitted after very extensive onsite reductions and measures to reduce VMT were implemented. (*Id.* at 19645-56.) Thus, the County cannot rely on the Newhall Ranch development to justify the shortcomings of the Offset Provision.

Crucially, what regional and State plans to reduce VMT require, and what the County cannot achieve through offsets, is long-term structural change. While the Offset Provision results in the purchase of GHG reductions for a 30-year lifespan, building in structural urban sprawl throughout the County will create GHG emissions far beyond 2050. (AR 38:22770, 24183.) Under the Offset Provision, rather than achieving the low-carbon 2050 that California’s climate laws and plans envision, the San Diego Region will see a sharp *increase* in GHG emissions around 2050, when recently approved projects’ 30-year offsets will expire. (AR 1026:55128; see also CT 15:3907, CT 10:2458 [reflecting that both the Newland Sierra and Harmony Grove Village South projects purchased offsets for a 30 year period].)

In order to truly be able to reach its 2050 goals, California, and particularly the local governments who manage land use throughout the State, must make the hard infrastructure changes needed to create dense communities that are not heavily reliant on vehicle use for travel. Despite this, the CAP ignores VMT reductions in favor of providing an easy solution for developers that kicks the can down the road and saddles a future generation of Californians with the costs of climate change. The County attempts to characterize the Offset Provision as an “additional burden”

on developers seeking a general plan amendment. (County Reply Br. at 10.) In reality however, it is an attempt to provide a backdoor for developers to purchase CEQA compliance while avoiding the difficult work that achieving our 2050 goals will require. As a result, the CAP's Offset Provision cannot deliver the same level of reliable, verifiable, substantial, and long-term GHG emissions reductions that active planning by the County, and smart project design by developers, can. Moreover, the County cannot assert consistency with SB 375 and the SANDAG Plan while the Offset Provision stands in its current form.

For these reasons, the CAP cannot serve as adequate mitigation for the General Plan Update.

II. THE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE CLIMATE ACTION PLAN FAILS AS AN INFORMATIONAL DOCUMENT UNDER CEQA

“The fundamental purpose of an EIR [pursuant to CEQA] is ‘to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment.’” (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 [citing Pub. Resources Code, § 21061].) An EIR serves as “‘an environmental alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.” (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392 [citation omitted].) In conducting an EIR for broader planning documents, the California Supreme Court has emphasized that planning agencies “must ensure that CEQA analysis stays in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG, supra*, 3 Cal.5th at p. 519.)

Here, where the CAP will create foreseeable VMT increases that will lock in emissions in the County long into the future, the County is obligated to disclose these environmental changes to the public. Instead, the SEIR provides no analysis of the CAP's foreseeable conflicts with regional and State plans calling for land use planning decisions that reduce VMT, nor the air quality and environmental justice impacts that will also follow from increased VMT. This prevents the public and other agencies from adequately understanding how the CAP could impact future land use development, public health, and communities in the region. Moreover, the SEIR does not consider any alternatives that would reduce VMT in the region, and thus minimize the significant impacts created by the Offset Provision. For these reasons, the SEIR violates CEQA.

A. The County Did Not Adequately Evaluate Conflicts with the SANDAG Plan and SB 375

Despite the Offset Provision's inconsistency with the SANDAG Plan and SB 375, the SEIR offers no analysis of these conflicts. This directly contravenes CEQA's requirements. The CEQA Guidelines require that EIRs "shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans... [including] regional transportation plans." (CEQA Guidelines § 15125, subd. (d).) Further, "[i]f a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed" (*Id.* at § 15126.4, subd. (a)(1)(d).) While such impacts can be discussed "in less detail than the significant effects of the project as proposed," the impacts of mitigation measures cannot be ignored. (*Ibid.*) In addition, any inconsistency with the SANDAG Plan or SB 375 would strongly suggest that the CAP will work against the State's overarching environmental objective: to reduce statewide emissions of GHGs by 2050 to a level that is consistent with

climate stabilization (80 percent below 1990 levels). (AR 1026:55152 [Scoping Plan at p. 99].)

In contrast to CEQA’s mandates, the SEIR does not even acknowledge that the Offset Provision will foreseeably result in increased VMT, let alone provide a complete analysis of its consistency with the SANDAG Plan. (County Br. at 46-49; AR 38:22773-4.) Instead, the County argues that it need not evaluate its consistency with the SANDAG Plan because the County is “not required to make its ‘land use policies and regulations, including its general plan ... consistent with the [SANDAG Plan] or an alternative planning strategy.’” (County Br. at 47, citing Gov. Code, § 65080, subd. (b)(2)(J).) However, this explanation is irrelevant to whether the County has complied with CEQA. CEQA is a document of public disclosure and accountability, meant to provide the public, along with other government agencies, information on how the County’s actions may impact the environment, and other land use plans. (See *Ctr. for Biological Diversity v. Cnty. of San Bernardino* (2010) 185 Cal.App.4th 866, 882.) Here, the Offset Provision will foreseeably impact the ability of the region to meet its VMT reduction goals under the SANDAG Plan – an impact that could have regional environmental consequences long into the future. CEQA requires that the SEIR must discuss and analyze those impacts, even if, as the County argues, it does not have to make its General Plan Update consistent with the SANDAG Plan. It must, under CEQA, disclose and discuss the inconsistency.

The County’s other attempts to justify its lack of analysis are similarly unavailing. First, the County states that the SANDAG Plan does not require reductions in VMT, and that reducing GHG emissions with offsets is consistent with the SANDAG Plan and SB 375. (County’s Br. at 48.) However, as discussed above, SB 375 and the SANDAG Plan both require GHG reductions through land use changes designed to reduce VMT, and so

the County cannot achieve consistency with the goals of these laws and plans with a CAP that increases VMT. Second, the County claims that other provisions of the CAP and the General Plan Update will reduce VMT, and so it need not discuss any increases caused by the Offset Provision. (*Id.* at 46-47; AR 1340:58773-78, 58780-88.) However, the County fails to explain how the CAP measures it discusses, none of which prevent or reduce VMT from new residential development projects in unincorporated land, will prevent the increases in VMT caused by the Offset Provision. Moreover, the County does not address how provisions in the General Plan Update will minimize VMT increases caused by general plan *amendments*, which, by definition, do not conform to the General Plan's requirements.

Finally, the County argues that consistency with SB 375 and the SANDAG Plan will be considered by future GPA projects and that the development of future general plan amendments is too speculative to be analyzed now. (County's Br. at 48, 50.) However, the environmental review of future projects does not relieve the County of its requirement evaluate the Offset Provision's consistency with the SANDAG Plan and SB 375 under CEQA. (CEQA Guidelines § 15125, subd. (d).) Further, CEQA requires that the County consider the impacts of *foreseeable* general plan amendment projects. (Pub. Resources Code, § 21065.) At the time the SEIR was drafted, the County identified numerous pending general plan amendment projects, many of which had published climate changes analyses as part of draft or final EIRs, and analyzing their foreseeable use of offsets would have required no speculation. (AR 38:22490-92.)

Thus, the SEIR's failure to disclose and analyze the inconsistency of the Offset Provision with SB 375 and the SANDAG Plan (and thereby with the State's long-term climate objectives) violates CEQA.

B. The County Did Not Analyze Air Quality or Environmental Justice Impacts from Increased VMT

Transportation is a major source of air pollution statewide and can produce impacts such as “smog forming and toxic air pollutants. (AR 55100, 55127 [Scoping Plan at pp. 47, 74].) As the Scoping Plan acknowledges, “[a]ir pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease and early death.” (*Id.* at 55127 [Scoping Plan at p. 74].) In particular, these adverse health outcomes disproportionately impact “vulnerable populations such as children, low income communities and communities of color,” referred to in this brief as environmental justice communities.¹⁴ (*Ibid.*) By increasing vehicle use, the CAP will foreseeably increase tailpipe emissions that contribute to poor air quality and disproportionate health impacts on environmental justice communities in the County. Yet, the County offers no analysis in the SEIR of these impacts, and consequently prevents the public from understanding the full environmental consequences of the CAP. “A sufficient discussion of significant impacts requires not merely a determination of whether an impact is significant, but some effort to explain the nature and magnitude of the impact.” (*Sierra Club v. City of Fresno* (2018) 6 Cal. 5th 502, 519.) The County’s lack of analysis violates CEQA.

C. The County Did Not Adequately Consider Alternatives that Would Prioritize Density

CEQA requires that lead agencies consider “a range of reasonable alternatives to the project.” (CEQA Guidelines § 15126.6, subd. (a).) “[T]he discussion of alternatives shall focus on alternatives to the project or

¹⁴ The Government Code defines “environmental justice” as the “fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws regulations and policies.” (Gov. Code, § 6540.12, subd. (e).)

its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.” (*Id.* at § 15126.6, subd. (b); see also *Ctr. for Biological Diversity v. Cnty. of San Bernardino, supra*, 185 Cal.App.4th. at p. 882-83.) Here, despite extensive evidence presented in comments on the SEIR that the Offset Provision would create significant increases in VMT and conflict with the regional SANDAG Plan and SB 375, the County did not even consider an alternative that would limit sprawl and prioritize development in dense, urban areas. (See AR 38:22953-23034; see also AR 22:18424-25, 18440-41.)

The County asserts that it is not required to consider “every imaginable project alternative.” (County’s Br. at 52 [citing *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 354].) However, consideration of an alternative that would reduce VMT and prevent urban sprawl that could impact the whole region is patently reasonable and already envisioned by the SANDAG Plan. (See CEQA Guidelines § 15126, subd. (f) [“The range of alternatives required in an EIR is governed by a ‘rule of reason’ ... alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.”].) Moreover, this appellate district has recently found that a plan to reduce GHG emissions which failed to include an alternative that would “significantly reduce total [VMT]” was inadequate. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 17 Cal.App.5th 413, 436 [noting that “the state’s efforts to reduce greenhouse gas emissions from on road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced.”].) The County’s failure to consider an alternative that would prioritize density and other

carbon-efficient development strategies results in inadequate environmental review.

Thus, for these reasons, the SEIR violates CEQA.

CONCLUSION

The Superior Court's judgment should be affirmed.

Dated: October 29, 2019

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Per California Rule of Court § 8.204(c), I certify that this brief uses a
13 point Times New Roman font and contains 6,844 words.

Dated: October 29, 2019

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PROOF OF ELECTRONIC SERVICE (Court of Appeal)

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Case Name: SIERRA CLUB, et al. v. COUNTY OF SAN DIEGO
Court of Appeal Case Number: D075478
Superior Court Case Number: 37-2018-00014081-CU-TT-CTL

- 1. At the time of service I was at least 18 years of age.
2. a. My [] residence [x] business address is (specify): Office of the Attorney General, 1515 Clay Street, 20th Floor, P. O. Box 70550, Oakland, CA 94612-0550
b. My electronic service address is (specify): debra.baldwin@doj.ca.gov
3. I electronically served the following documents (exact titles): AMICUS BRIEF OF THE CALIFORNIA ATTORNEY GENERAL IN SUPPORT OF PETITIONERS AND RESPONDENTS
4. I electronically served the documents listed in 3. as follows:
a. Name of person served: On behalf of (name or names of parties represented, if person served is an attorney):
b. Electronic service address of person served:
c. On (date): October 29, 2019
[x] The documents listed in 3. were served electronically on the persons and in the manner described in an attachment (write "APP-009E, Item 4" at the top of the page).

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: October 29, 2019

DEBRA BALDWIN
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[Signature]
(SIGNATURE OF PERSON COMPLETING THIS FORM)

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APP-009E – Item 4**Sierra Club, et al. v. County of San Diego****Fourth Appellate District, Division 1****Case No. D075478****Appeal From the Superior Court of San Diego****Case Nos. 37-2018-00014081-CU-TT-CTL****37-2018-00013324-CU-TT-CTL****37-2012-00101054-CU-TT-CTL**

On October 29, 2019, based on a court order or an agreement of the parties to accept service by electronic transmission through TrueFiling, I caused the foregoing document described as:

**AMICUS BRIEF OF THE CALIFORNIA ATTORNEY GENERAL IN SUPPORT OF
PETITIONERS AND RESPONDENTS**

in this action to be sent to the persons at the electronic addresses listed below.

<p>Judge Timothy B. Taylor Superior Court of San Diego County Department C-72 330 West Broadway San Diego, CA 92101</p> <p><i>(Via U.S. Mail only)</i></p>	<p>Attorneys for Plaintiff & Respondents <u>Sierra Club, et al.</u> Jan Chatten-Brown Josh Chatten-Brown CHATTEN-BROWN, CARSTENS & MINTER LLP 302 Washington Street, #710 San Diego, CA 92103</p> <p>E-mail: jrcb@cbcearthlaw.com jcb@cbcearthlaw.com</p>
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This page last reviewed February 15, 2018

Offset Project Registries

Background

The Cap-and-Trade Regulation allows ARB to approve Offset Project Registries to help administer parts of the Compliance Offset Program. Offset Project Registries must meet specific regulatory criteria to be approved under the Regulation. Offset Project Registries will help facilitate the listing, reporting, and verification of offset projects developed using the Compliance Offset Protocols, and issue registry offset credits. Registry offset credits **cannot** be used for compliance with the Cap-and-Trade Program. Registry offset credits must be converted to ARB offset credits to be eligible for use in the Cap-and-Trade Program.

List of ARB Approved Offset Project Registries

All offset projects developed under an ARB Compliance Offset Protocol must be listed with an ARB approved Offset Project Registry. Offset Project Registries will help facilitate the listing, reporting, and verification of compliance offset projects, and issue registry offset credits. A list of approved Offset Project Registries can be found below.

- [American Carbon Registry \(ACR\)](#)
- [Climate Action Reserve \(CAR\)](#)
- [Verra](#) (formerly Verified Carbon Standard)

Guidance and Frequently Asked Questions (FAQs) for Offset Project Registries

ARB has developed guidance for Offset Project Registries. This guidance is intended to help Offset Project Registries and other offset program participants understand the role of the Offset Project Registries and how they interact with ARB and Offset Project Operators. In addition, ARB will develop Frequently Asked Questions (FAQs) that will be continuously updated as answers to specific questions are established. FAQs will be developed for general issues around Offset Project Registries.

- ***(Coming Soon!) Guidance for Approved Offset Project Registries***
- ***(Coming Soon!) FAQs on Offset Project Registry Related Issues***


Forms Made Available by Offset Project Registries

ARB has developed forms for use in the Compliance Offset Program. These forms may be used by program participants for submitting information related to listing, reporting, verification, and issuance of ARB offset credits. ARB will make all forms available on the [Compliance Offset Program Forms web page](#). In addition, each approved Offset Project Registry will make all forms available on its own public web page.

Application for Potential Offset Project Registries

Offset Project Registries must be approved by ARB to perform registry services under ARB's Compliance Offset Program. To become approved, potential Offset Project Registries must submit an

application and meet the requirements for education and experience as defined in section 95986 of the Regulation.

- The application below must be completed and submitted to ARB to begin the Offset Project Registry application process. If the applicant satisfies all the requirements of the regulation, they will be notified of the dates and times of approved ARB Compliance Offset Program and Compliance Offset Protocol training classes. Upon successful completion of training classes by Registry Staff the Executive Officer may approve the Offset Project Registry. Submission of this form and checking the appropriate box in Part IV will also suffice for applying to be an Early Action Offset Program.
- [Application for Offset Project Registry Approval](#) 

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MISSION STATEMENT

Our mission is to provide a trusted source of high quality California-based greenhouse gas credits to keep investments, jobs, and benefits in-state, through an Exchange with integrity, transparency, low transaction costs and exceptional customer service.

CORE VALUES AND OPERATING PRINCIPLES

Quality California Credits: Participating air districts will only quantify credits for projects in California that follow protocols approved by the CAPCOA Board. Properly trained or certified air district staff or individuals that are CARB- certified, if applicable, will provide third-party verification of credit projects.

Collaboration: Participating air districts will work together to create and maintain an Exchange bulletin board that lists all available credits registered under respective air districts.

Integrity: The Exchange services will be provided with the utmost integrity so our customers can be confident that the credits they are providing, purchasing, or using are of the highest quality possible.

Security: The Exchange will be built with stringent measures to ensure that projects and trades are tracked carefully so credits are accurately issued and are used (or retired) only one time.

Transparency: Information on all aspects of the Exchange will be fully disclosed and easy to obtain to foster trust and respect.

Low Transaction Costs: The Exchange will seek to keep transaction and other costs as low as possible.

Excellent Customer Service: The Exchange, through its local air district network, will provide outstanding customer service to be responsive to customers needs and suggestions.

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Welcome to the CAPCOA GHG Rx. This site provides information on GHG credit projects within participating air districts. Credits available under the Exchange may be used to mitigate GHG emissions for CEQA or NEPA purposes or other applicable uses.

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Project ID	<input type="text" value="Choose"/>	Project Name	<input type="text" value="Choose"/>
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Hydropower in the CDM:

Examining Additionality and Criteria for Sustainability

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Executive Summary

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies. Hydropower makes up 30% of all carbon offsets projects registered under the Kyoto Protocol's Clean Development Mechanism (CDM) – just over 1000 projects as of 1 September 2011, the most of any project type. Hydropower also often has negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. This means that effective criteria to ensure that accepted CDM hydropower projects generate new and additional emissions reductions and do not cause substantial social and environmental harm is critical. Otherwise, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual projects that do not represent real emissions reductions, and risks transferring costs of climate change mitigation from polluters in the North to poor communities in the South.

This paper examines means for filtering CDM projects that have high likelihoods of generating real and new (additional) emissions reductions, and of avoiding substantial adverse social and environmental impacts. We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects, and on the Least Developed Countries (LDCs) which are the only host countries from which the European Union (EU) will accept CDM carbon credits for projects registered post-2012. We also evaluate the EU's assessment of compliance with World Commission on Dams (WCD) guidelines, a requirement for all large hydropower projects that wish to sell carbon credits into the European Emissions Trading Scheme.

ADDITIONALITY

The CDM requires each approved project to be 'additional': that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country.

Most large and small hydropower project proponents use the *Additionality Tool's investment analysis* to prove additionality, generally viewed as having the most potential to be accurate if performed well. The investment analysis is used to show that a project is not financially viable without additional funding available through the sale of carbon credits. The CDM's *Additionality Tool* also requires a common practice assessment as a credibility check; if a technology type is common practice, the proposed CDM project is not eligible for CDM crediting unless it can be shown to be "essentially distinct" from other similar projects in the same region.

Our analysis of factors that influence hydropower development decisions suggest the following conclusions:

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

2

Large hydropower should be excluded from the CDM in all countries because it is common practice, unlikely to be additional and additionality testing is inaccurate.

Large hydropower is a conventional technology that is being built in large quantities worldwide without carbon credits and should be considered common practice. China and India, the two countries with most hydropower CDM projects, have aggressive targets for building out their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal.

Furthermore, additionality testing is inherently inaccurate for large hydropower. First, financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. In China, India, the LDCs and other countries, the government plays a dominant role in deciding how much and which hydropower projects are built; additionality testing is not meant to predict the planning processes of governments that take into account many factors other than those directly related to cost. The interest in building large hydropower in China, India and other countries supersedes the relatively small effect CDM carbon credits have on hydropower project financial return. Second, uncertainty in investment analysis inputs – particularly in the viability benchmark, expected capital costs, and cost and production risk – allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developers, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test in those areas. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower projects to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size, location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for project types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. At present, by allowing the boundaries of the assessment to be defined narrowly, and “essentially distinct” to be defined broadly, practically any project can be shown to not be common practice. Projects under construction and projects in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM

project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

SUSTAINABILITY CRITERIA

Hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. The World Commission on Dams (WCD), established in 1998 in response to growing public scrutiny of large dams, developed a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.

To address concerns that hydropower projects can have serious environmental and social impacts the EU requires all credits from CDM hydropower projects larger than 20 Megawatts (MW) sold in the EU Emissions Trading Scheme to meet World Commission on Dams environmental and social standards, but similar standards are not required by the CDM itself.

Shortcomings in the EU’s assessment of WCD compliance

While the EU took a laudable step to operationalize the WCD guidelines, the current rules in many instances do not go far enough. Below we outline the shortcomings we find in the EU’s assessment of WCD compliance.

Inherent conflicts of interest in WCD compliance evaluations. The WCD requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. In our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation. We recommend:

- The Designated National Authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

Weak guidelines for and evaluation of stakeholder involvement. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior

and informed consent'. But the EU guidelines do not require mutual agreement of key issues such as compensation packages with all recognized adversely affected people; they had merely to be planned 'in consultation' with affected people. Furthermore, the proof of 'free, prior and informed consent' from indigenous or tribal peoples is not required. We recommend:

- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

Uneven access to compliance reports. Member States are required to provide publicly accessible information on projects that have been approved. We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. We recommend:

- EU member states should be required to provide online access to compliance reports and other relevant project information.

Only large hydropower projects must comply with WCD guidelines. Categorizing hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. We recommend:

- All hydropower projects, large and small, should be required to meet WCD criteria.

CONCLUSION

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on those communities that most vulnerable to the impacts of climate change. Excluding large and some small hydropower projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate change mitigation goals.

¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

Barbara Haya² and Payal Parekh³

Abstract

This paper examines the effectiveness of additionality and sustainability criteria being applied to hydropower projects applying for carbon crediting under the Kyoto Protocol's Clean Development Mechanism (CDM). We examine the conditions under which hydropower development decisions are commonly made, with a focus on China and India where the majority of CDM hydropower projects are hosted. We find that the CDM is having little effect on large hydropower development, and that the basic conditions needed for an accurate additionality assessment are not met. In particular, non-financial factors such as energy security heavily influence decisions to build large hydropower, and uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they actually are. Further, large hydropower and some small hydropower are being built in large quantities worldwide, are heavily supported by governments, and therefore should be considered common practice and ineligible for CDM crediting. We recommend that large hydropower be excluded from the CDM, and that small hydropower be accepted only in places where it is not already being built. The second part of this paper examines the European Union's (EU's) assessment of compliance of hydropower projects with World Commission on Dams (WCD) guidelines. We identify several shortcomings including auditor conflicts of interest, weak guidance for the assessment of public consultations, lack of documented acceptance of projects by project-affected persons, and insufficient access to compliance reports by the general public. We provide concrete recommendations to strengthen the EU's assessment of WCD compliance.

1 INTRODUCTION

The Kyoto Protocol's Clean Development Mechanism (CDM) allows industrialized countries (Annex 1) to partially meet their Kyoto Protocol commitments by reducing emissions in developing countries (non-Annex 1) and using the resulting emissions reduction credits towards their Kyoto targets. The CDM plays a pivotal role in the international climate change regime helping emitters in industrialized countries lower their costs of compliance and providing funds for renewable energy, energy efficiency and other emissions reducing activities in developing countries. An appeal of the CDM is efficiency – the CDM is designed to create a more global market for emissions reductions, allowing regulated emitters to reduce emissions wherever in the world it is least expensive to do so. However, critics of the CDM have

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challenged the program's efficiency claims, arguing that large numbers of CDM projects are generating credits that do not represent real additional emissions reductions (He & Morse 2010, Lazarus & Chandler 2011, Michaelowa & Purohit 2007, Schneider 2009, Wara & Victor 2008) and do not contribute to sustainable development (Boyd et al. 2009, Schneider 2007).

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies (Kumar et al. 2011). Hydropower makes up 30% of all registered CDM projects, just over 1000 projects (CDM/UNEP Risoe 1. Sept. 2011), the most of any project type. This means that the criteria applied to proposed CDM projects to ensure that accepted projects generate new and additional emissions reductions must be accurate and effective. If they are not, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual development of a conventional technology.

In addition, hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. To address this, the European Union (EU) requires all credits from CDM hydropower projects sold in the EU Emissions Trading Scheme (EU-ETS) to meet World Commission on Dams (WCD) environmental and social standards, but similar standards are not required by the CDM itself.

The analysis in this paper centers around a practical policy question – how to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts? We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects (CDM/UNEP Risoe 1. Sept. 2011), and on the Least Developed Countries (LDCs) which are the only host countries from which the EU will accept CDM carbon credits (Certified Emissions Reductions – CERs) for projects registered post-2012. We focus the assessment of sustainability criteria on the World Commission on Dams guidelines and the EU's assessment of WCD compliance.

Section 2 provides background information on different types of hydropower and a summary of the hydropower projects in the CDM. Section 3 examines the additionality of large and small hydropower projects, and the accuracy of additionality testing in the case of hydropower. Section 4 describes the common social and environmental impacts of hydropower projects of different sizes and types. Section 5 discusses World Commission on Dams (WCD) guidelines created to minimize adverse impacts from dams and the EU's assessment of WCD compliance. Section 6 presents our conclusions and recommendations.

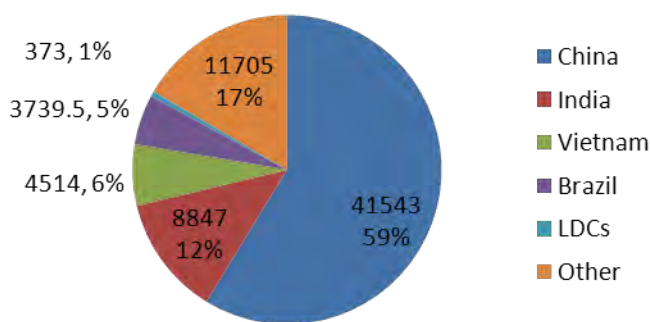
2 ABOUT HYDROPOWER AND CDM HYDROPOWER PROJECTS

There are over 37,000 large dams listed in the World Register of Dams, a database maintained by the International Commission on Large Dams (ICOLD), which defines a large dam as one with a height of at least 15 m from the foundation. No reliable data exist for the number of small dams worldwide (Anisfield 2010). Dams are built primarily for irrigation purposes. Hydropower, domestic and industrial use, and flood control (in descending order of use) are the other main reasons for building dams. During the 1990s, the majority of financial investments in dams were for hydropower projects (WCD 2000).

Currently hydropower is the largest source of non-fossil fuel electricity globally. In 2008 hydropower accounted for 16% of electricity supply worldwide with an installed capacity of 926 Gigawatts (GW), producing 3,551 billion kilowatt hours per year (Kumar et al 2011). Its growth is expected to continue in part due to its low carbon emissions.

China, Brazil and India are the 1st, 2nd and 6th largest hydroelectricity producer countries with installed capacities of 200, 84 and 38 GW, respectively (IJHD 2010). Hydropower constitutes 15.5 and 17.5% of the domestic grid in China and India, while it accounts for 84% of Brazil’s domestic electricity production (IJHD 2010). We highlight these three countries, because they represent over 75% of the hydropower projects in the CDM pipeline (Figure 1).

Figure 1: Total Installed Capacity (MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011).

2.1 SIZE CLASSIFICATIONS

While dams of all purposes are usually classified as large or small based on dam wall height, hydropower dams are usually classified by installed capacity (megawatts - MW). Hydropower dams can vary tremendously in size. In the CDM for example, the smallest project is 0.1 MW (Bhutan) whereas the largest is 1200 MW (Brazil). There is no consensus for setting the size threshold (Egré and Milewski 2002). For example, Sweden classifies a hydropower plant as large if its installed capacity exceeds 1.5 MW (European Small Hydro Association 2010), while in Canada and China the cut-off is 50 MW (Natural Resources Canada 2009, Ministry of Water Resources – China 2002). Defining hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). This is because hydropower is site specific (Kumar et al 2011, McCully 2001) and definitions of categories by government agencies are chosen to match local energy and resource management needs (Kumar et al 2011).

The CDM considers all renewable energy including hydropower projects with an output capacity up to 15 MW (or appropriate equivalent) small (Decision 17/CP.7, paragraph 6(c)). The EU Linking Directive on the other hand, considers hydropower with an installed capacity greater than 20 MW large (Directive 2004/101/EC, article 11a (6)).

2.2 RUN-OF-RIVER VERSUS RESERVOIR HYDROPOWER PLANTS

The two main types of hydropower are run-of-river (RoR) and reservoir (Figure 2 and Figure 3). Depending on the hydrology and topography of the watershed, both types can be large or small (Kumar et al 2011).

A reservoir hydropower plant stores water behind a dam for times when river flow is low, resulting in power generation that is more stable and less variable than RoR plants (Figure 3). Often the reservoir is an artificial lake located in an inundated river valley. In mountainous regions, existing high latitude lakes are sometimes turned into (larger) reservoirs. Reservoir hydropower plants can have major environmental and social impacts due to the flooding of land for the reservoir.

Figure 2: Schematic diagram of a Run-of-River hydropower plant

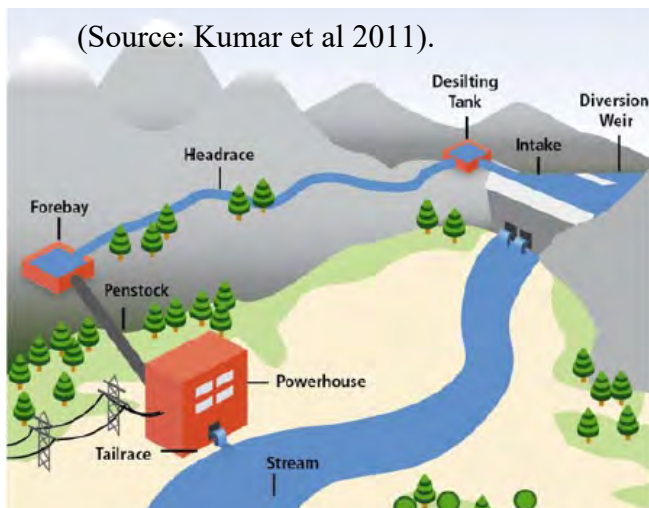
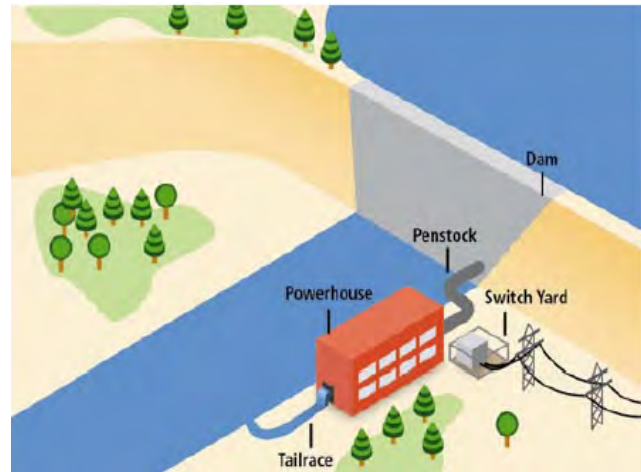


Figure 3: Schematic diagram of a reservoir hydropower plant

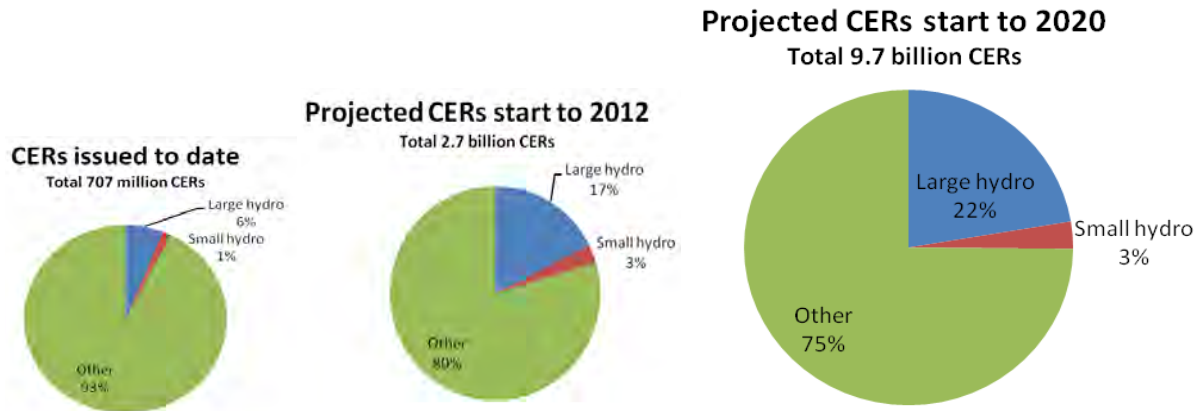


A RoR plant primarily draws energy from the available flow of the river (Kumar et al 2011), taking advantage of the natural elevation drop of a river. Therefore it is suitable for streams or rivers that have a minimum flow all year round or those that are regulated by a larger dam and reservoir upstream (Raghunath 2009). Water is diverted into a penstock or pipe and channeled to the turbine and then returned to the river (Figure 2). The elevation difference between the intake and the powerhouse provides the kinetic energy needed to power the turbine and produce electricity. The longer the diversion, the higher the environmental impacts can be. Power generation tends to be variable at RoR plants, depending on the extent of storage and the natural fluctuations in seasonal flow (Kumar et al 2011). RoR plants have either no storage or short-term storage; such reservoirs are usually smaller than those of reservoir hydro power plants. Yet RoR reservoirs can be quite large and there is no maximum size specified for RoR reservoirs above which they would be considered a reservoir hydro power plant. RoR dams can be ten to twenty meters high and can have gates to allow for water storage (McCully 2001). Impacts of RoR and reservoir hydropower plants are discussed in more detail in Section 4.

2.3 HYDROPOWER IN THE CDM

Hydropower is the most prevalent project type in the CDM pipeline (under validation and registered) comprising 26% of all projects. Hydropower accounts for 7% of CERs issued to date; it is expected to generate 20% of all CERs by 2012 and 25% by 2020 (CDM/UNEP Risoe August 1st 2011, see Figure 4). Hydro projects can register under the CDM either as small scale projects (<15 MW) or as large scale projects (>15 MW).⁴ While there are more small hydro projects (≤ 15 MW) in the CDM pipeline, larger projects account for over 80% of CERs from hydropower generated by 2012 and for over 85 % in 2020 (Figure 4; CDM/UNEP Risoe 1. August 2011).

Figure 4: Percentage of CERs from large and small hydropower in 2011, 2012 and 2020



Although hydropower is the most prevalent project type in the CDM, they are located in a small number of countries. Almost 90% of all hydro projects in the CDM pipeline are located in China, India, Vietnam and Brazil, countries considered emerging economies. Three of the four countries (China, India, and Brazil) are ranked within the top ten hydroelectric producing countries globally (IJHD 2010). China is expected to generate the most credits from small and large hydro (Figure 5, Figure 6, Figure 7, Figure 8). In contrast, less than 1% of registered projects are hosted in Least Developed Countries (LDCs).

⁴ Large hydro projects primarily (99%) use methodology ACM0024, which was developed for grid-connected electricity generation from renewable sources. All small hydro projects use the AMS-I.D.4 methodology, which was developed for grid-connected renewable electricity generation for small projects. Some small scale projects use AMS-I.A.4 or AMS-I.F.4 in conjunction with AMS-I.D, which account for electricity generation by the user; and captive use and mini-grid, respectively.

Figure 5:
Number of Registered Small Hydro (15 MW or less) by Country

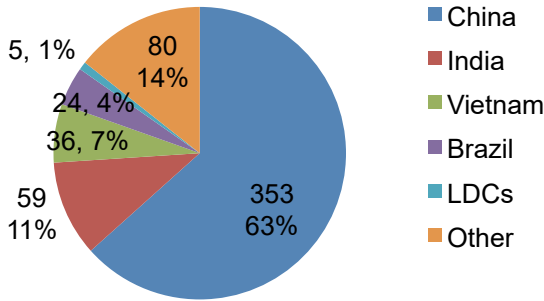


Figure 6:
Number of Registered Large Hydro Projects (> 15 MW) by Country

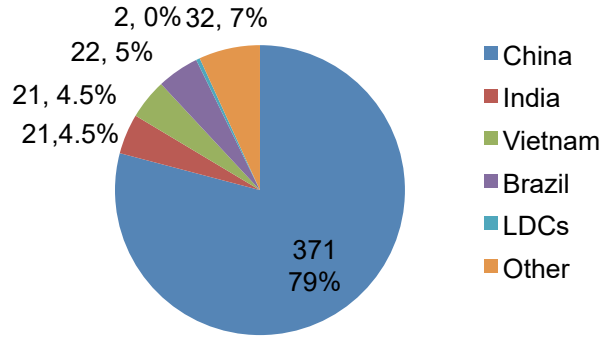


Figure 7:
Small Hydro Projects (15 MW or less) in the CDM Pipeline by Country

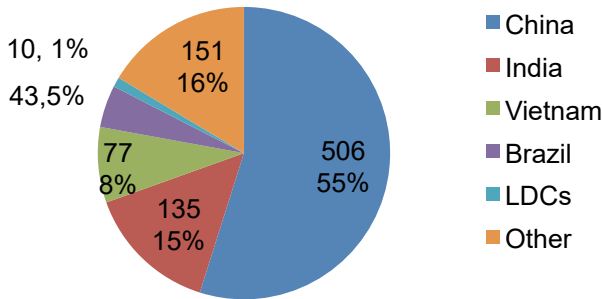
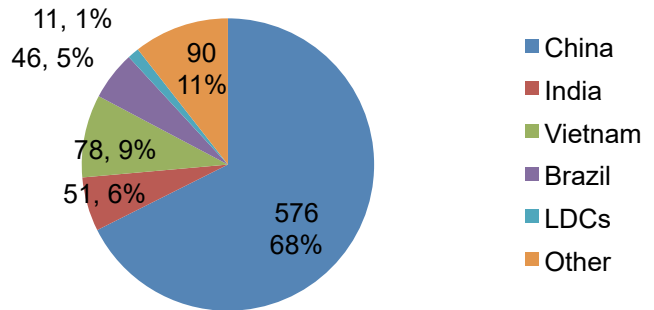


Figure 8:
Large Hydro Projects (> 15 MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011; Rejected and Withdrawn projects are not included).

3 EVALUATING THE ADDITIONALITY OF HYDROPOWER CDM PROJECTS

The CDM requires that a project prove that it is ‘additional’: that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country. Verifying that an activity is additional is difficult because it involves assessing the considerations of a project developer under a counterfactual scenario in which there was no CDM.

The “Tool for the demonstration and assessment of additionality,”⁵ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* has three basic steps. The project proponent must:

- identify alternatives to the project activity.
- conduct an investment analysis and/or a barrier analysis to prove the project would not otherwise proceed.
 - The investment analysis demonstrates that a project is not financially attractive without CER revenues.
 - The barrier analysis documents barriers that would prevent the project from going forward without the additional support from CER sales.
- undertake a common practice analysis as a “credibility check” to filter out project activities that are already commonly implemented.

In order to probe whether additionality testing is able to effectively filter out non-additional hydropower projects if performed more rigorously, we examine whether the conditions under which hydropower development decisions are being made are conducive for additionality testing.

Most large and small hydropower project proponents use the investment analysis to prove additionality, either alone or in combination with the barrier analysis. Most attention placed on improving project-by-project additionality testing focuses on improving the accuracy of the investment analysis, viewed as having the most potential to be accurate if performed well.

Two conditions are necessary for the investment analysis to be accurate: (1) Financial return must be a good predictor of whether a project will be built. And (2) an investment analysis must accurately and verifiably reflect the real financial considerations of key project decision-makers. We explore whether these two conditions are true for hydropower, and then examine whether large and small hydropower meet the CDM’s requirement that projects not be common practice.

⁵ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

3.1 IS FINANCIAL RETURN A GOOD PREDICTOR OF HYDROPOWER DEVELOPMENT?

In this section, we examine how large hydropower development decisions are being made with a focus on China, India and the LDCs to assess whether financial return is a good predictor of hydropower development and the likely influence of the CDM on hydropower development decisions.

3.1.1 Large hydropower in China

China's *Middle and Long Term Development Plan for Renewable Energy* calls for a doubling of China's hydropower capacity from around 150 GW to 300 GW between 2007 and 2020 (NDRC 2007). This hydropower expansion, in the country that already has the world's largest hydropower capacity, is unprecedented in its scale. Much of this growth is expected to come from the large and largely untapped hydropower capacity in the southwest of the country.⁶ Plans include a series of large back-to-back reservoirs along western rivers such as the Lancang and the Nu as a part of China's Great Western Development campaign. Much of the electricity from these dams will be brought to meet electricity demand in population and industrial centers in China's east (Magee & McDonald 2009).

China is heavily promoting hydropower and renewable energy as a way to decrease its reliance on coal. The high proportion of coal on China's grid (78% in 2009) is of concern because of increasing coal prices, growing reliance on imports and air quality impacts (Kahrl et al 2011). China has identified hydropower as the most important replacement of coal in terms of its percentage of power on the grid (ibid). There is also strong interest in hydropower development at the provincial and local government levels because of its potential to support local economic growth (ibid) and to ensure adequate electricity supply to attract industry.^{7 8}

Government in China plays a large role in determining how much and which hydropower is developed. The central government sets national goals for the sector as a whole, most importantly through its five-year plans. The government controls the amount of hydropower that is built by setting the tariffs for hydropower projects, which are set by China's National Development and Reform Commission (NDRC) on a project-by-project basis (Kahrl et al 2011). Despite steps China has taken towards introducing competition into its power sector through a series of reforms, the tariff-setting process maintains a top-down approach to carrying out policy objectives (ibid). The Chinese government also supports hydropower development by providing access to low-interest loans (Bogner & Schneider 2011).

Further, China's hydropower sector is predominantly state-owned. China's large hydropower development (defined in China as greater than 250 MW) is allocated to "the big five" – the five large state-owned companies that were created when China's monopoly state-

⁶ Shanghai Daily, (January 6, 2011). *China Ready for Flood of Hydropower*. (<http://business.globaltimes.cn/industries/2011-01/609534.html>, accessed 3 November 2011)

⁷ Interview with Kristen McDonald, on 9 October 2011

⁸ In the last five-year plan, China did not meet its goal for hydropower approvals, but this was due to tensions within the government between the Premier and the Ministry of Water on the one hand which rejected projects based on their expected environmental impacts, and the local governments and hydropower developers on the other which wish to build these projects (Magee & McDonald 2009), considerations that would not be influenced by the CDM. Hydropower in the CDM: Examining Additionality and Criteria for Sustainability 8

owned power company was broken up in 2002. Medium hydropower, defined as between 50 and 250 MW, is typically built by companies owned by some combination of subsidiaries of the big five, municipalities, and banks and private investors.⁹ These hydropower developers sell their power to the two state-owned grids, or less frequently to municipalities.¹⁰ Most banks in China are state-owned (Naughton 2007). Sinohydro, China's national hydropower developer, built around 65% of China's hydropower capacity.¹¹ State-owned enterprises in China generally do not lack capital resources or access to debt financing on good terms and receive various other forms of government support.¹²

Within this context, it seems highly unlikely that the CDM can lead to additional hydropower development in China. The government has a strong interest in supporting large scale hydropower development and has the means to effectively carry those goals forward. China's interest in building large hydropower supersedes the relatively small effect CERs have on hydropower project return. The investment analysis with its sole focus on financial return measured against a clear viability benchmark is not predictive of how large and medium hydropower development decisions are being made in China, given the range of consideration being made by government in China at all levels of decision-making.

3.1.2 Large hydropower in India

India is also expanding its power sector very quickly to meet soaring power demand and chronic power shortfalls. It anticipates quadrupling its electricity supply between 2005 and 2030, a tremendous undertaking. It intends to do so through pursuing all fuel options (Planning Commission of the Government of India 2006). India's Eleventh Five Year Plan called for 16.5 GW of hydropower to be built between 2007 and 2012 (Planning Commission of the Government of India 2008). The Central Electricity Authority recommends that 30 GW be pursued during the twelfth five year plan between 2012 and 2017 (Central Electricity Authority 2008).¹³

Hydropower is viewed as an attractive source of power because it is a domestic resource without the energy security concerns of coal and natural gas, a serious concern for India since it expects imports of coal and natural gas to increase in the future (Planning Commission of the Government of India 2006). Hydropower is also considered the best option for providing peak power (Planning Commission of the Government of India 2006).

In India, river development is determined through a government planning process involving a team of public and private actors. This planning process identifies potential large hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private (Central Electricity Authority 2008). These plans follow India's five-year planning cycle. The private sector is involved in hydropower development by participating in the planning process, and by responding to bid requests put out by national- and state-owned power companies.

⁹ Interview with Kristen McDonald, on 9 October 2011

¹⁰ *ibid*

¹¹ <http://www.hydrochina.com.cn/English/pages/aboutus/brief.jsp>, accessed 17 October 2011

¹² Interview with Kristen McDonald, on 9 October 2011, and noted in a number of CDM application documents for hydropower projects in China that are built by privately owned hydropower developers.

¹³ With the expectation that 25 GW is feasibly attainable.

Additionality testing is not meant to predict the planning decisions of governments, which consider a wide range of factors in their planning process beyond those directly related to cost. In the case of Indian hydropower, the planning commission takes into account energy security concerns, displacement of people, the need for peak power, and the competing uses of rivers for irrigation and flood control, all concerns that are not easily monetized and integrated into an investment analysis with a reliable benchmark (Central Electricity Authority 2008).

The Indian government has mapped out its hydropower resources by river basin, ranking the attractiveness of potential hydropower sites (Central Electricity Authority 2008). This ranking contributes to the decision of which plants will be built in what order. When hydropower sites are mapped out and ranked for future development, the most influence the CDM might have on planning decisions is to accelerate the pace at which some hydropower facilities are being built, not whether they are built at all, perhaps justifying only a few years of credits for some projects if the acceleration effect is discernible. This would be true for many countries in addition to India and China that have assessed potential hydropower sites with the intention of expanding their hydropower capacity.

The effect of CDM revenues on India's planning process is not clearly apparent. Neither India's 11th Five Year Plan nor its 12th Hydropower Plan mention the CDM or carbon credits as a factor in its decisions to support and develop hydropower and renewable energy (Central Electricity Authority 2008, Planning Commission of the Government of India 2008: Chapter 10-Energy). The few times the CDM is mentioned, it is only mentioned to highlight India's contribution to global climate change mitigation efforts, rather than as a factor helping India develop its hydropower resources (Planning Commission of the Government of India 2006).

The CDM is also unlikely to have much influence on private sector involvement in hydropower development in India. The tariff paid to hydropower developers per kilowatt hour produced is calculated on a cost-plus basis for each hydropower facility and is adjusted periodically to ensure that the developer receives a pre-agreed return on equity based on their true costs and power output. This return on equity investment is typically 14% or 15.5%.¹⁴ This means that most project costs are "passed through," since they are returned to the developer through the tariff. Therefore hydropower developers take little of the risk that there will be cost overruns during construction, or that less power will be produced than expected. As a result, the financial return to a large hydropower developer varies only minimally between projects. When the tariff is determined on a cost-plus basis per project, a financial return analysis has little meaning, and is not an appropriate indicator of whether a project would be built. Since tariffs are set to guarantee each developer a pre-determined return on their equity investment, the investment analysis is not meaningful in distinguishing the feasibility of individual hydropower projects.

3.1.3 Hydropower in general, with a focus on the Least Developed Countries (LDCs)

¹⁴ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

Of the twelve hydropower projects above 10 MW in the CDM pipeline (both registered and in the validation stage) in LDC countries, all but two document direct government involvement in the project in their CDM application documents (project design documents – PDDs).¹⁵

As our description of hydropower decision-making in China and India show, decisions to build hydropower are complex and political, and involve a range of considerations beyond those directly influencing cost. Large hydropower is often treated in a similar manner to mining; rivers are an exploitable resource that the government can use as political currency, giving the right to build a facility to public and private entities.

Government involvement, including through international, bi-lateral lending agreements and loan guarantees, is also common with hydropower development due to its nature as an infrastructure project, large upfront capital requirements, and high levels of uncertainty and risk associated with its construction costs and electricity output. Lending decisions can be based on political rather than purely financial grounds. For example, Chinese banks provide loans to Chinese hydropower development in Africa often as a part of much larger agreements for trade and investment between itself and the African country (Bosshard 2008).

Almost half of all hydropower plants with dams greater than 15 meters in height worldwide are considered multipurpose.¹⁶ These dams can be used for irrigation, flood control and/or other services in addition to electricity generation. Quantifying the benefits of these other uses, such as by attributing a portion of project capital costs to these other purposes, is far from straightforward. Benefits from other project uses are not commonly quantified in investment analyses for CDM hydropower projects. This means that hydropower CDM projects that serve multiple purposes can appear to be less cost effective than they actually are if benefits from other uses are left out of the investment analysis or are given a low value.

The influence of non-financial factors in hydropower development decisions is evidenced by the fact that large hydropower projects are typically more costly than predicted, sometimes by more than double (World Commission on Dams 2000: chapter 2), yet decisions to build large hydropower projects are repeatedly approved by governments as well as international and bi-lateral finance institutions based on low cost estimates.

Certainly cost affects the decision to build a large hydropower project, but given the relatively small effect of CERs on project return and the range of influences on project development beyond cost factors, the effect of CERs is in the noise and is not predictive of project development.

3.1.4 Small hydropower

Small-scale hydropower facilities, with their smaller electricity output and financial requirements, typically draw less political interest, involve different decision-making processes

¹⁵ Six are built directly by government developers, one was built by private developers responding to requests for proposals from the government, and one project mentions a government loan guarantee. One was a part of a larger economic, cultural and technical science cooperative agreement between the governments of Lao and Vietnam, and another involved an agreement to sell electricity from the project in Myanmar into the Chinese grid.

¹⁶ International Commission on Large Dams (ICOLD), Register of Dams, General Synthesis (http://www.icold-cigb.org/GB/World_register/general_synthesis.asp, accessed 3 November 2011)

and government support, and are more likely to be initiated by private sector actors compared to large hydropower. In some countries, like India and China, small hydropower formally involves different tariff-setting and planning processes. With regard to additionality testing, small-scale hydropower shares some features of large hydropower and some emerging technologies like wind, depending on location and size.

Many of the factors that make large hydropower a political decision are less important with small hydropower, including the importance for meeting electricity demand, potential for corruption, scale of the financial risk, and involvement of international lending institutions.

Both India and China actively support the development of small hydropower, defined as less than 25 MW in India, and less than 50 MW in China. Already in 2009 China had 55 GW of hydropower capacity, the most in the world. China's 2007 Renewable Energy Plan defined a goal of expanding China's small hydropower capacity to 75 GW by 2020. China is promoting small hydropower with a combination of tax benefits and dedicated and low interest loans, technical training and preferential tariffs (Jiandong 2009). Instead of defining the tariff for each project individually as is done with large hydropower, provinces should define preferential tariffs that are paid to private developers that choose to build small hydropower projects. China has a strong interest in supporting small hydropower, considered the best means for extending electrification to 100% of households, a priority goal of the government (Jiandong 2009). About one-third of China's counties rely on small-scale hydropower as their main power generation source (International Energy Agency 2007).

India also has goals to provide full rural electrification (Planning Commission of the Government of India 2006); small hydropower is viewed as an important way to provide electricity access to remote areas.¹⁷ India's 12th five year plan includes a goal of increasing its small hydropower capacity from just under three GW at the beginning of 2011 to around six GW in 2017.¹⁸ The Government of India has instructed the states to set preferential tariffs for small hydropower tariffs (Central Electricity Regulatory Commission 2009) and offers financial incentives including capital subsidies (Ministry of New and Renewable Energy 2009).

In both India and China, the preferential tariffs set at the state and province level mean that any approved hydropower project will receive that tariff, regardless of its costs.¹⁹ In this context, as opposed to cost-plus tariff determinations for large hydropower in both countries, the CDM could improve the financial returns of a project and could potentially spur more development. Still, the challenges with assessing the additionality of small hydropower are not unlike those of large hydropower. By setting goals for small hydropower development, defining promotional tariffs, and creating incentives the Chinese and Indian governments are substantially affecting the amount of small hydropower built. He and Morse (2010) describe how, by setting the tariff for wind, the Chinese government in effect decides what wind projects are additional and not additional. The same argument applies to small hydropower in both India and China. If the government does not see enough small hydropower being built, it can raise the incentives, or

¹⁷ From the Government of India, Ministry of New and Renewable Resources web site, <http://www.mnre.gov.in/>, accessed 19 October 2011

¹⁸ *ibid*

¹⁹ In practice this is not always the case. Tariffs for many of the small hydropower projects registered under the CDM in both China and India are set in the same way as they are for large hydropower.

if it sees that small hydropower is being built quickly, it can lower its incentives and invest those funds elsewhere.

This discussion suggests that the CDM is more appropriate for small hydropower in countries where the government is investing fewer financial resources to incentivize the development of small hydropower and where small hydropower would not be considered common practice (discussed below in Section 3.3). Ensuring small hydropower projects accepted for crediting have high likelihoods of being additional will also depend on the accuracy of the investment analysis for this technology (discussed in the next section).

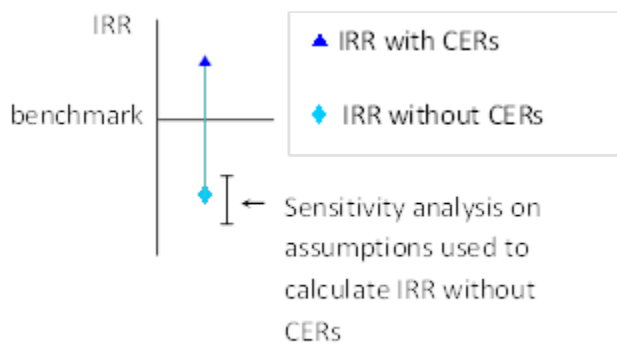
3.2 IS THE INVESTMENT ANALYSIS ACCURATE AND VERIFIABLE FOR HYDROPOWER PROJECTS?

In this section we assess the accuracy and verifiability of the inputs that go into the investment analysis. We first provide a more detailed description of the investment analysis, and then assess the level of uncertainty in two major investment analysis inputs – the benchmark and project capital costs.

3.2.1 The Additionality Tool's investment analysis

The investment analysis is used to show that a project is not financially viable without carbon credits. A benchmark is determined that represents the threshold financial return, or hurdle rate, defining whether the project would likely go forward. For renewable energy and hydropower projects, the benchmark is most commonly defined in terms of project or equity internal rate of return (IRR).²⁰ If the expected financial return of the project is below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. The financial assessment is tested with a sensitivity analysis of the most important cost and revenue inputs. It is optional to show that CERs bring the financial return of the project above the benchmark. Figure 1 illustrates the investment analysis for a project that is additional and uses IRR as the metric used to assess project financial return.

Figure 9: The Investment Analysis



3.2.2 Examination of the benchmark

Hydropower developers have used all four options recommended by the CDM Executive Board in their latest guidance on the investment analysis²¹ to determine the viability benchmark in their CDM application document. These four options are: (1) Local commercial

²⁰ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial return.

²¹ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

lending rates (for project IRR), (2) weighted average cost of capital (WACC)²² (for project IRR), (3) required/expected return on equity (for equity IRR), and (4) benchmarks supplied by relevant national authorities if the validator can validate their applicability (for both project and equity IRR).²³ Chinese hydropower developers almost exclusively use the fourth option, benchmarks supplied by the government. In India, most use the second option – the weighted average cost of capital (WACC).

Calculation of WACC typically involves a combination of two values – the cost of debt, and the expected return on equity investment, which is estimated with a market analysis. Following CDM Executive Board guidance in 2008 (CDM Executive Board 2009), hydropower projects registered in India in the last two years commonly calculate the expected return on equity using the Capital Asset Pricing Model (CAPM). CAPM estimates the equity return required by investors from a project as a risk free rate (e.g. government securities), plus a risk premium that takes into account the higher expected IRR needed to counterbalance the risk associated with the particular project type. CAPM uses the following formula based on historical return on equity:

$$\text{investor expected return} = \text{risk free rate} + (\text{market rate} - \text{risk free rate}) * \text{beta}$$

where government securities are typically used for the risk free rate, the market rate is the rate of return from the stock market generally, and beta captures the correlation between the fluctuation of the value of stocks in the specific industry of the project being analyzed and the stock market generally. For example, the milk industry should have a low beta, since purchases remain relatively steady regardless of the state of the economy, but luxury goods have high betas, since their purchase rates increase and decrease according to the state of the economy. In other words, beta indicates if hydropower investments are more risky or less risky than the stock market in general.

The risk free rate is fairly straightforward – this is the rate of return on investments that have very low risk, such as government bonds. The market rate and beta are both less straightforward, and values have differed considerably among the CDM applications of similar projects in a single country.

The CAPM model, while considered one of the most reliable ways of determining expected return on investment, is very dependent on assumptions used. We provide a simple example to illustrate this. Bhilangana III, a 24 MW hydropower project in India registered under the CDM in 2011, defines their viability benchmark using WACC. The interest rate on their debt is taken as the prime lending rate from the Reserve Bank of India as 9.62% at the time the development decisions was made. The CAPM model is used to estimate the expected investment return.

We examine just one of the inputs into the CAPM model – the market rate, which is the expected return of the stock market. The developers of Bhilangana III calculate the market rate as the average annual percentage increase on stock market values of the top 500 companies on

²² Weighted Average Cost of Capital (WACC) is the cost of capital to the project developers, normally combining two components: the costs of a loan (loan interest rates) and the costs of equity (return on equity required by an equity investor).

²³ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

the Bombay stock exchange (BSE 500) between February 1999 and February 2006. The choice of end date is the month that the investment decision was made. They chose the beginning date, February 1999, as the year of inception of BSE 500. The benchmark derived is 13.18%. If instead, February 2000 had been the first year with available BSE 500 data, the market rate would have been 3% lower, generating a benchmark WACC as 10.11%. The IRR of the project without carbon credits is calculated as 10.49%. The IRR of the project would have been above the benchmark and the project would not have been considered non-additional if the market return calculation started in February 2000 instead of February 1999, an arbitrary choice.

Other hydropower projects registered in India around the same time calculate benchmarks that range from 11.0% to 15.8% using the same method, by choosing different CAPM model parameters.

3.2.3 Examination of IRR analysis

We start this discussion with wind power development in India – a best case technology for an accurate IRR analysis – and then draw a comparison with hydropower. Wind power in India is a best case for an accurate IRR analysis because almost all investment analysis inputs are recorded in legal agreements before construction starts. Wind development in India involves a supply agreement between a wind developer and an investor whereby all of the major costs are agreed in formal documents before construction starts. In addition, most states in India publish their wind power tariffs paid to the project owner per kilowatt hour produced that would apply to all new wind development. Even so, for the majority of large wind projects registered in India, the choice of assumption about one cost input that is not pre-determined in the majority of cases – the tariff after the end of the first power purchasing agreement – can affect expected project financial return by around the same amount as expected increase by carbon credits (Haya under preparation). This means that wind power developers have some leeway to choose investment analysis inputs that could show that a feasible wind project is infeasible.

An investment analysis for a hydropower project involves much more uncertainty than for a wind project. For one, from the perspective of the project investor, the costs contained in wind project supply agreement are the actual costs that will be paid to the wind manufacturer. For a hydropower project, the capital costs documented in documents cited in the CDM project applications (Detailed Project Reports, feasibility studies, techno-economic clearance report, loan agreements, etc.) are best estimates. Actual costs can be less or more than what is written in these documents. Cost predictions for a single project often vary between project documents for a single project as cost estimates are revised over time. Hydropower is notorious for large cost overruns, but also in some instances has been less expensive than predicted (World Commission on Dams 2000). In addition, the perceived risk of cost overruns or project underperformance certainly influence project development decisions, but is not recorded in a citable document.

Further, as discussed above, there are many benefits of hydropower that are not easily quantified in an investment analysis, but when not quantified lead to a project appearing less cost effective than it actually is. Such benefits include energy security, the flexibility of being able to be used for base load and for peak load, and other uses for multi-purpose dams.

The investment analysis is accurate to the extent that developers report the same cost and revenue assumptions and benchmark in their CDM applications as they use in their internal decision-making. Uncertainty in investment analysis inputs enables a range of possible values,

from which the project proponent could choose strategically to show the project is less viable than it may actually be. This analysis of ranges of acceptable benchmarks and capital cost estimates shows that in the case of hydropower there is substantial room to choose assumptions.

3.2.4 More evidence that the IRR analysis is not filtering out non-additional projects

The timing of the start of project construction of CDM hydropower projects provide additional evidence that many non-additional hydropower projects are currently registered under the CDM. The *starting date of the project activity* documented in each PDD gives the date when project construction started or otherwise when “real action of a project activity begins/has begun” (CDM Executive Board 2008). Starting dates for 16% of all registered hydropower projects (180 projects) were prior to when the Kyoto Protocol entered into force on February 16, 2005.²⁴ Of these, 60% were registered in 2007 or later. The starting dates of 89% of all registered hydro projects were before the start of the validation process (start of the public comment period) indicating that certainty about a positive validation or registration was not needed for the decision to build the project to be made.²⁵

3.3 WHEN SHOULD HYDROPOWER BE CONSIDERED COMMON PRACTICE?

The *Additionality Tool's* common practice assessment provides a “credibility check” on the investment and barrier analyses. The common practice assessment requires discussion of activities that are in operation and are similar to the proposed CDM project in terms of location, technology and scale. As per the *Additionality Tool*, if similar activities are “widely observed and commonly carried out,” the developer must explain “essential distinctions” between the proposed project and other similar activities in terms of financial attractiveness or the presence of barriers. Projects in the CDM pipeline are excluded from the comparison.

3.3.1 Is hydropower common practice?

Worldwide hydropower is a conventional technology. Around 8,700 hydropower projects with dams at least 15 meters in height²⁶ and an uncounted number of smaller dams produce 16% of global electricity supply (Kumar et al 2011). As discussed above, hydropower is common practice in China and India. In Vietnam, with the third largest number of hydropower CDM projects, 36% of the country’s electricity production is from hydropower.²⁷ In Brazil, the country with the fourth largest number of proposed and registered CDM projects, 84% of the country’s electricity generation is from hydropower.²⁸ Hydropower is a mature technology, which has played an important part in electricity generation since the beginning of electricity generation.

The extent to which small and micro hydropower is common practice is less clear than for large hydropower and would need to be assessed for different size classes for each country,

²⁴ The starting dates for all registered CDM projects and projects in the validation stage are listed in IGES Institute for Global Environmental Strategies (IGES). 2011. IGES CDM Project Database. Japan: 1 September 2011

²⁵ The start of the public comment period is listed in the same database.

²⁶ Listed in the World Register of Dams, a database maintained by International Commission on Large Dams (ICOLD)

²⁷ International Energy Agency website http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=VN, accessed 21 October 2011

²⁸ US Energy Information Administration website <http://www.eia.gov/countries/cab.cfm?fips=BR>, accessed 21 October 2011

and if appropriate for different states or provinces. As mentioned above, small hydropower is defined differently in different countries, and typically attracts less government interest and government involvement than large hydropower. But small hydropower is already common practice in some countries. For example, China's small hydropower should be considered common practice due to the capacity that already exists in the country, and China's plans to continue to build small hydropower as the main way to meet China's rural electrification goals.

3.3.1 How common practice is being assessed

In China, 739 hydropower projects in China passed the common practice assessment and were successfully registered under the CDM. Many of them passed the test by defining "similar" projects narrowly, and then describing how the proposed CDM project faces more hardship in at least one way compared to each of the projects that are still considered similar to it. For example, Longjiang 240 MW Hydropower Project in Yunnan Province (CDM ref #4859) in China's southwest noted eleven medium-sized hydropower projects (50-300 MW) that started construction in the province after 2002 (when structural changes were made to China's electric power sector) and were in operation by 2008 (narrowly defined assessment boundaries). Of these eleven projects, seven projects are excluded from the analysis because they are in the CDM pipeline, registered under a voluntary offsets program, or sold power to a different grid within China. The following essential distinctions are then described between the proposed CDM project and the four remaining "similar" projects: the proposed CDM project expected lower financial return compared to one project, was offered a lower tariff compared to two projects, and expected a higher cost per kilowatt compared to the last similar project. Other reasons commonly used by Chinese hydropower project developers to describe their projects as distinct include that the expected capacity factor is lower than for other projects, and that the project developer is a private sector developer while most hydropower is built by state owned enterprises with preferential treatment from the government. Each of these distinctions may indeed be factually true for a particular comparison between two projects. However, if a project is considered distinct if it less attractive than a similar project in only one way among many, it can always prove that it is distinct. By allowing "similar" to be defined so narrowly, and "essentially distinct" so broadly, practically any project can show it is not common practice, even if it is sitting in a sea of hydropower development.

It is important to mention one more problem with the way common practice assessments are carried out. If additionality testing were perfectly accurate, it would be appropriate to leave out other similar projects that are in the CDM pipeline from the common practice analysis. In China, well over half of all hydropower projects that came on line in 2007 are in the CDM pipeline (Bogner & Schneider 2011). If some of these projects are in fact non-additional, which we are arguing could easily be the case for a large proportion of them, then they would be incorrectly excluded from the common practice analysis and the effectiveness of the common practice test as a credibility check would be compromised.

Our assessment of how the common practice test is being applied to hydropower projects in China indicates that the common practice assessment is not being used in a meaningful way. The boundaries defining what projects are "similar" to the proposed CDM project must be judged conservatively in the conditions of the particular sector and technology. A change in the structure of a sector, such as the breakup of the national Chinese power company in 2002, should not mean that projects built after 2002 are dissimilar from those built before 2002, since

hydropower development was supported before and after the change in the sector. Projects under construction and other projects in the CDM pipeline should be included in the common practice assessment. If a technology is deemed common practice, then projects using that technology should be considered common practice without the ability to show that they are “essentially distinct” which has been shown to be easy to do and therefore not meaningful.

3.4 DISCUSSION

In examining the additionality of large hydropower CDM projects we find three main reasons why large hydropower does not meet the CDM’s additionality requirements:

- Financial return is not a good predictor of whether a project will be built because non-financial factors have a large influence on the decision to develop large hydropower projects.
- Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are. These first two points mean that the investment analysis is inappropriate and inaccurate for large hydropower.
- Large hydropower is a well-established technology that is heavily promoted by governments and therefore does not meet the requirement that CDM projects should not be common practice.

Small hydropower typically benefits from less political backing and is thus more likely to involve private developers for whom financial return is more predictive of the development decision. However, the investment analysis is unreliable for small hydropower for the same reason as for large hydropower – because of uncertainty in input values. In some countries small hydropower is already being built at substantial rates and therefore should not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be identified that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernable for those projects types to continue to be eligible for crediting.

4 SOCIAL AND ENVIRONMENTAL IMPACTS OF HYDROPOWER

4.1 ENVIRONMENTAL IMPACTS

Dams, interbasin transfers and diversion of water for irrigation purposes have resulted in the fragmentation of 60% of the world’s rivers (Revenga et al. 2000). In the following sections we summarize the main environmental impacts of hydropower plants.

4.1.1 Impacts by size and type of hydropower plant

It is difficult to correlate the damage caused by dams to their size or type, as the impacts depend on local conditions. Generally small dams for non-energy purposes are considered to be less environmentally damaging than large dams and hydropower dams, but there have been

fewer studies documenting the impacts of smaller dams (Kibler 2011) and run-of-river dams. Gleick (1992) found that small hydropower facilities in the United States (< 25 MW) tended to exert greater ecological cost per unit of electricity produced compared to larger projects. A comparison of small and large hydropower projects on the Nu River in China also found that small projects more adversely impacted habitats, water quality and hydrology on per megawatt basis, relative to large dams (Kibler 2011).

Also, small hydropower projects are subjected to fewer regulations and less scrutiny in many countries. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011) and therefore are subjected to fewer additional checks (Kibler 2011). Small projects are permitted as individual projects, therefore cumulative impacts of multiple dams within a watershed are not considered. While large projects in India are granted clearance from the central government and required to carry out an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006). Projects between 25 and 50 MW require clearance from the environmental entity of the state that the project is located in, while projects smaller than 25 MW do not require any permits (MOEF 2006).

Run-of-river hydropower plants are generally less damaging than reservoir power plants, because it is not necessary to flood large areas upstream of the project for storage. Yet in some cases run of river impacts can also be severe due to river diversion over long stretches of the river. Also there is no standard defining the maximum storage size allowed for a RoR plant. Thus there have been cases of developers taking advantage of this ambiguity to misclassify their project as RoR so that it appears more environmentally benign (McCully 2001).

4.1.2 Impact of reservoirs

Dams have major impacts on the physical, chemical and geomorphological properties of a river (McCully 2001, WCD 2000). Environmental impacts of dams have largely been negative (WCD 2000). Worldwide, at least 400,000 square kilometers have been flooded by reservoirs (McCully, 2001). Impacts of hydro power projects extend to the construction of the support infrastructure including the construction of roads and power lines (Egré and Milewski 2002). Other secondary impacts include clearing of land upstream by communities that have been displaced (WCD 2000, McCully 2001). Such clearing can lead to further loss of biodiversity and increases in erosion.

Large dams with reservoirs significantly alter the timing, amount and pattern of riverflow. This changes erosion patterns and the quantity and type of sediments transported by the river (WCD 2000, McCully 2001, Kumar et al 2011). Sedimentation rate is primarily related to the ratio of the size of the river to the flux of sediments (McCully 2001, Kumar et al 2011). The trapping of sediments behind the dam is a major problem (WCD 2000, McCully 2001, Kumar et al 2011). Every year it is estimated that 0.5 to 1% of reservoir storage capacity is lost due to sedimentation (Mahmood 1987). Trapping of sediments at the dam also has downstream impacts by reducing the flux of sediments downstream which can lead to the gradual loss of soil fertility in floodplain soils.

Dams can also lead to changes in temperature and chemistry of the water in the reservoir and downstream. These changes often create more favorable conditions for non-native species (Thomas 1998). For example, aquatic weeds such as water hyacinths and orange fern have

become problematic in tropical and African reservoirs (WCD 2000, McCully 2001). A rise in temperature and accumulation of nutrients in the reservoir can cause algal blooms (WCD 2000 McCully, 2001), which in turn can lead to anoxic conditions during decomposition. Increases in certain types of bacteria in reservoirs can lead to the release of mercury from sediments and lead to the bio-accumulation of mercury in fish, a common problem in reservoirs (WCD 2000, McCully 2001).

4.1.3 Impact of river diversion

While both RoR and reservoir types of hydropower dams may divert water, this is always the case with RoR plants, since they seek to increase kinetic energy with an increased head. The length of diversion can range from a few meters or less to kilometers (km). For example, the Teesta V RoR dam in northeastern India diverts water for a 23 km long stretch of the river (Neeraj et al 2010). Eventually the diverted water is returned to the river. There have been fewer studies documenting the impacts of RoR and diversion projects. Nevertheless impacts can be significant. Often downstream flows are reduced considerably or even completely eliminated during certain periods of time with sudden intervals of high flows (Englund and Malmqvist 1996, Kibler 2011). Such drastic variability in water flow impacts the structure of aquatic ecosystems often leading to a loss of biodiversity (Englund and Malmqvist 1996, Kibler 2011). A decrease in fish populations has been observed in dewatered reaches below diversions (Amodovar and Nicola 1999, Kubecka et al 1997, Anderson et al 2006). After long periods of little to no flow some species may not be able to recover and go extinct (Kibler 2011). Also, under normal conditions, increased sediment transport from low to intermediate flows provides a warning to aquatic organisms that high flows may follow. Abrupt changes from low to high flows obliterate this cue, making it difficult for organisms to respond to impending environmental changes (Kibler 2011).

4.1.4 Impact on fisheries

Dams and river diversion can impact freshwater, as well as marine fisheries. Estuarine and marine fisheries are dependent on estuaries and rivers as spawning grounds and the transport of nutrients from the river to the sea. For example, the productivity in Mediterranean coastal waters is lower due to the reduction of nutrients transported to sea because of the construction of the Aswan dam (Aleem 1972, Drinkwater and Frank 1994).

Migratory fish are especially vulnerable to the impacts of dam construction. Dams can prevent migrating fish such as salmon and eel to reach their spawn grounds (WCD 2000). A survey of 125 dams by the WCD reported that blocking the passage of migratory fish species has been identified as a major reason for freshwater species extinction in North America. Lower catch is a common side effect of dams and has been reported worldwide (WCD 2000). There have been cases where fishery production below a dam has increased due to controlled discharge of the sediments. For example at Tucurui Dam in Brazil there have been an increase in the productivity of the fishery, but there are fewer number of species found (WCD 2000).

4.1.5 Impacts of multiple dams

Few studies have analyzed the cumulative impacts of multiple dams on a particular river, but the WCD (2010) has documented some. Placing 24 dams on the Orange-Vaal River in South Africa has led to changes in temperature on almost two-thirds of the river (2,300 km), which

affects the habitat of flora and fauna. Cumulative impacts of multiple small dams is especially important, since multiple small dams are often built on one river and its tributaries to increase power output. An analysis of proposed small (< 15 MW) hydropower projects on the Salmon River in the United States found that the combined effect of the dams proposed on that river could exceed those associated with the sum of the effects of each single project on their own (Irving and Bain 1993). Further studies are needed to increase our understanding of the interplay between multiple small dams.

4.1.6 Greenhouse gas emissions from reservoirs

Freshwater reservoirs can emit substantial amounts of the greenhouse gases methane and carbon dioxide as organic matter submerged in a reservoir decays under anaerobic and aerobic conditions, respectively (St. Louis et al. 2000, Fearnside 2004, Giles 2006).

From the limited number of measurements, GHG emissions from hydropower reservoirs in boreal and temperate region are low relative to the emissions from fossil fuel power plants, but higher relative to lifecycle emissions from wind and solar power (Mäkinen and Khan 2010). Tropical reservoirs with high levels of organic matter and shallow reservoirs have higher emission levels (Soumis et al. 2005). A recent compilation of greenhouse gas emissions from reservoirs found a correlation between the age of the reservoir and latitude (Barros et al. 2011). Younger reservoirs and those in low latitudes are the highest emitters. For example, one study of four Brazilian dams in the Amazon, showed that the GHG emissions factor of the electricity produced by those hydropower dams exceed those from a coal-fired power plant (Fearnside 2004, Kemenes et al. 2007).

To account for these GHG emissions the CDM Executive Board uses a threshold criterion to determine the eligibility of hydroelectric plants for CDM projects. Table 1 below summarizes the thresholds.

Table 1: How GHG emissions from hydropower projects are treated under the CDM

(Source: Mäkinen and Khan 2010).

Power Density (W/m ²)	CDM Rules
< 4	Excluded from using currently approved methodologies
4-10	Allowed to use approved methodologies, but project emissions must be included at 90 g CO ₂ eq/kilowatt hour
> 10	Allowed to use approved methodologies and project emissions can be neglected.

Projects with low power densities (< 4 Wm²) are not explicitly excluded from the CDM, but developers of such projects would need to create a new methodology and gain approval in order to apply for registration under the CDM. We tested the thresholds on a number of tropical hydropower reservoirs and found that they are effective at preventing projects with high greenhouse gas emissions from entering the CDM pipeline and can also account for emissions from hydropower reservoirs with power densities lying in the middle range.

4.2 SOCIAL IMPACTS

Similar to other large infrastructure projects, dams have both negative and positive social impacts. The benefits of hydropower include electricity from a local resource that has negligible

GHG emissions in most cases, delivery of peak power, and the avoidance of the health and environmental impacts associated with fossil fuels, especially coal. Multipurpose dams can also reliably deliver water and flood control as well as other ancillary services. On the other hand, displacement, loss of livelihood, poorer health and loss of cultural heritage²⁹ are some of the worst impacts (WCD 2000, McCully 2001, Kumar et al 2011). Often groups that bear the social and environmental costs of dams are not the ones who reap the benefits. Poor, vulnerable groups such as rural populations, subsistence farmers, indigenous communities and ethnic minorities often bear a disproportionate share of the negative impacts, while the main beneficiaries are urban dwellers, commercial farmers and industries (WCD 2000).³⁰

4.2.1 Displacement

It is estimated that 40-80 million people have been physically displaced by dams worldwide (WCD, 2000). In India and China alone, 26-58 million people have been displaced between 1950-1990 due to dam projects (Fernandes and Paranjpye 1997). These figures do not include displacement from other factors such as construction of canals, powerhouses or project infrastructure. In-depth case studies of eight large dams on four continents by the WCD (2000) found that in each case the expected number of displaced persons was initially underestimated by 2,000 – 40,000 people. Among dams funded by the World Bank, 47% more people were displaced than initially estimated (WCD 2000). The WCD case studies show that downstream communities, landless peasants and indigenous people are often not counted as project-affected and therefore often do not receive compensation. The impacts for down-stream communities are often only clear after the dam comes into operation and often impacts worsen over time. (WCD 2000). Resettlement has mostly been involuntary and there has been little meaningful participation of those affected in the resettlement and rehabilitation process (Cernea 1999, Bartholeme et al. 2000, Scudder 2005). In the most extreme cases, violence has been employed to force eviction.³¹

Compensation usually only occurs once as a cash payment or in the form of an asset such as housing and/or land (Bartolome and Danklmeier 1999, WCD 2000b). Lands provided for resettlement are often resource-depleted and environmentally degraded areas (WCD 2000). The focus of resettlement programs is on physical relocation, rather than economic and social development (Cernea 2000, WCD 2000b). In China, almost half (46%) of those displaced are living in extreme poverty (Driver 2000). In India, 75% of people displaced by dams have not been rehabilitated³² (Cernea 2000). The larger the number of people displaced from a project, the less likely that resettlement will be adequate due to lack of enough suitable land (WCD 2000).

²⁹ The socio-cultural impacts of displacement by large dams on communities has been poorly documented because socio-cultural impacts are intangible, making them difficult to monetize (McCully 2001, Koenig and Diarra 2000, Pandey 1998). Displacement often results in the loss of sacred land and common property resources (Casparly 2007). A study of a village displaced by the Rengali Dam in eastern India found a breakdown in family and community structures (Behura and Nayak 1993). Alienation and marginalization are major risks for displaced communities (Cernea 1999).

³⁰ For example, although indigenous people are 8% of India's population, they comprise 60% of those displaced by dams there (WCD 2000a). Almost all of the large dams in the Philippines that have been built or proposed are on the land of indigenous people (WCD 2000a).

³¹ For example: Over 350 Maya Achi people were killed during the forced eviction at the Chixoy Dam Site in Guatemala (Stewart et al. 1996). Over 1,000 people of the Ngobe tribe have been forcibly removed from their homes due to construction of Changuinola Dam in Panama (UN 2009).

³² Rehabilitation refers to economic, social and psychological adjustment after displacement.

4.2.2 Health impacts

Impacts on human health from large dams include an increase in vector-borne diseases in tropical regions, lower water quality and food insecurity (WCD 2000). The edge of tropical reservoirs and irrigation canals provide ideal conditions for disease-vectors such as insects and snails. McCully (2001) has documented numerous examples of the spread of schistosomiasis³³ after the construction of dams. Increases in transmission of malaria due to the construction of reservoirs and irrigation canals in malaria-prone areas have also been reported (World Bank 1999). Other health impacts include the release of toxins by cyanobacteria³⁴ due to rapid eutrophication in new dams and the bioaccumulation of mercury in fish, which is released from soil by bacteria decomposing organic matter in the reservoir (WCD 2000).

4.3 CONCLUSION

While hydropower dams can produce power with low GHG emissions and can in the case of multi-purpose dams also deliver flood and irrigation control, the adverse social and environmental costs can be substantial, as we have described above. Such negative impacts are not compatible with the promotion of sustainable development, one of the core objectives of the CDM. Evidence indicates that on the whole the CDM has not effectively fulfilled its sustainability objective (Boyd et al. 2009, Schneider 2007). This seems to hold true for hydropower projects as well. There is much anecdotal evidence that some hydro projects have been registered under the CDM despite their significant negative impacts. Table 2 gives a few examples of such projects.

The increase in opposition to large dams in developing countries by projected-affected persons and their supporters has led to the development of frameworks and standards to analyze and minimize project impacts that are dam specific, most notably the World Commission on Dams (WCD) criteria and guidelines. In the next section we discuss how the EU has used the WCD criteria to screen hydro projects that sell CERs into the EU-ETS. We also include a discussion of how the EU's process could be improved to increase the effectiveness of the screening.

³³ Schistosomiasis or bilharzia, is a parasitic disease caused by trematode flatworms. Schistosomiasis causes damage to the bladder, kidneys, liver, spleen and intestines.

³⁴ Humans are affected with a range of symptoms including skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage.

Table 2: A selection of registered hydropower projects with considerable adverse impacts**Allain Duhangan Dam (192 MW), India, Approved May 2007**

The project has suffered from inadequate rehabilitation of affected villages and environmental violations. The Office of the Compliance Advisor/Ombudsman of the International Finance Corporation (2005) verified that the project developer had not ensured enough irrigation and drinking water for affected villages. The project was also temporarily halted and fined for violations of Indian forest conservation law due to illegal felling of trees, dumping of waste and road construction.³⁵

Bhilangana (22 MW), India, Approved January 2007

Affected villagers never consented to the project and actively opposed the project.³⁶ Villagers opposed to the project were jailed multiple times and 29 people were arrested in November 2006 were forced to sign a document stating that they would stop resisting the project.³⁷ Significant physical abuse by the police was reported.³⁸

Jorethang Loop (96 MW), India, Approved February 2008

A survey of the affected villages by an Indian NGO after the public hearing found that many villagers were not informed about the meeting (McCully 2008). Requests by villagers and NGOs of project documents including the environmental impact assessment were ignored by the project developer (McCully 2008).

Xiaoxi (135 MW), China, Approved December 2008

A field report commissioned by International Rivers³⁹ documented problems include the forced eviction of 7,500 people, a failure to restore pre-eviction incomes, arbitrary and inadequate compensation for resettlers, a lack of legal recourse for those who suffered losses, and a non-independent EIA process marred by conflict of interest.

El Chaparral (65 MW), El Salvador, Approved March 2010

The public consultation process has been criticized as being neither open nor transparent. Adverse impacts include the displacement of 10,000 families in three municipalities, habitat loss of endangered flora and flooding of archaeological artifacts. The dam has divided and destabilized the community between those in favor and those opposed.⁴⁰

Barro Blanco (29 MW), Panama, Approved January 2011

Although the dam site is in an area recognized by the Panamanian government as collective property of the Ngobe indigenous people, only members of non-indigenous population were consulted. The project developer has also been accused of human rights abuses. An investigation by the European Investment Bank into human rights abuses at the dam site resulted in the project developer retracting their loan request and only then applied for registration under the CDM.⁴¹

³⁵ <http://www.internationalrivers.org/en/blog/payal-parekh/cdm-changing-lives-worse>
Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

5 ASSESSING THE EUROPEAN UNION'S SCREENING CRITERIA FOR HYDROPOWER

In order to minimize the negative impacts of hydropower effective screening criteria are needed. Yet assessing and mitigating the social and environmental impacts of hydropower projects is difficult and complex at best. Deciding whether the benefits of constructing a hydropower plant outweigh the costs requires multiple factors to be considered and weighed. Many of the impacts such as loss of traditional ecological knowledge or biodiversity are difficult to monetize and compare against one another (Koenig and Diarra 2000, Pandey et al. 1998). A cost-benefit approach is also problematic in cases when those that bear the social and environmental costs of a dam are not the same as those who benefit. As shown in the previous section, neither size (installed capacity) nor type are effective predictors of environmental and social impacts of hydropower dams. Additionally, empirical data from which to draw robust relationships is sparse (Poff and Hart 2002). Therefore classifying environmental and ecological impacts of dams based objective criteria such as dam size or type is difficult because impacts are influenced by the interactions among natural processes, dam characteristics and management practices (Poff and Hart 2002).

In the following sections we discuss efforts that have been made to develop such screening criteria. We summarize the World Commission on Dams criteria and discuss how they have been implemented in the European Union. In our analysis on the effectiveness of such criteria we also highlight the Gold Standard stakeholder process and discuss how the evaluation and verification processes could be improved to strengthen the effectiveness of such screening criteria.

5.1 WORLD COMMISSION ON DAMS CRITERIA

In 1998 the International Union for the Conservation of Nature (IUCN) and the World Bank established the World Commission on Dams (WCD) in response to growing public scrutiny of large dams. The mandate given to the Commission was to

- *review the development effectiveness of large dams and assess alternatives for water resources and energy development; and*
- *develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.*

Dams and Development (WCD, 2000), the report of the commission includes a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among

³⁶ SANDRP Comments on Bhilangana PDD, see <http://www.internationalrivers.org/global-warming/carbon-trading-cdm/sandrp-comments-bhilangana-hydro-project-uttaranchal-india>

³⁷ Asian Human Rights Commission, available at <http://www.humanrights.asia/news/urgent-appeals/UP-164-2005>

³⁸ Ibid.

³⁹ <http://www.internationalrivers.org/en/node/3006>

⁴⁰ CESTA Letter to CDM Board on El Chaparral Hydroelectric Project, see <http://www.internationalrivers.org/en/am%C3%A9rica-latina/cesta-letter-cdm-board-el-chaparral-hydroelectric-project-el-salvador>

⁴¹ Letter to the CDM Executive Board, see <http://www.internationalrivers.org/node/6215>

stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.⁴²

The WCD criteria go beyond a simple Environmental Impact Assessment (EIA), as it creates a process meant to address the complex set of considerations involved in dam development decisions. These include the recognition that most dams have negative impacts, and that the distribution of costs and benefits among different sectors of society is often unequal. Seven strategic priorities based on principles of equity, efficiency, participatory decision-making, sustainability and accountability were defined. They are:

1. **Gaining Public Acceptance:** There must be public acceptance of the project by affected people. Indigenous and tribal communities should give free, prior and informed consent.
2. **Comprehensive Options Assessment:** All possible options for water and energy resource management should be considered. Social and environmental aspects should be weighted equally as financial and economic factors.
3. **Addressing Existing Dams and Hydroelectric Projects:** New projects should be considered only after existing projects are at maximal efficiency.
4. **Sustaining Rivers and Livelihoods:** Location of a new dam should be chosen so as to minimize adverse environmental and social impacts.
5. **Recognizing Entitlements and Sharing Benefits:** Projected affected persons must be adequately resettled and rehabilitated and mitigation strategies should be implemented to sustain ecosystems and livelihoods.
6. **Ensuring Compliance:** Compliance by the developer of regulations, guidelines and agreements must be ensured.
7. **Sharing rivers for peace, development and security:** There should be cooperation and agreement for dam construction on transboundary rivers.

The WCD developed a decision-making process with five stages in order to fulfill the priorities. They are 1. Needs assessment; 2. Selection of alternatives; 3. Project preparation; 4. Implementation of project; 5. Operation of project. A further set of 26 guidelines outlines how to assess options, plan and implement dams projects in order to fulfill identified criteria for each stage of decision-making.

This short summary of WCD substance and process criteria make it clear that WCD requirements are extensive and complex. In the next section we discuss how the EU has used these criteria for their requirements for large CDM hydro project that wish to sell their CERs into the EU-ETS.

5.2 THE EUROPEAN UNION'S WCD CRITERIA TO ASSESS CDM HYDRO PROJECTS

⁴² The World Commission on Dams was a multi-stakeholder body that established the most comprehensive guidelines for dam building. The twelve members of the Commission were drawn from industry, government, academia and civil society. The Commission created a 68 member Stakeholder Forum with participants on various sides of the dam debate that served as an advisory group to the Commission. To gather information and data for the assessment, the WCD organized four regional consultations, performed case studies of eight large dams on five continents, commissioned country studies of China and India, undertook 17 thematic reviews of a wide range issues from environmental to institutional issues and conducted a global survey of 125 dams in 56 countries to "cross-check" the findings of individual studies.

The EU-ETS, launched in 2005, covers about 50% of the EU's CO₂ emissions and is currently the largest cap-and-trade system in the world and also the largest buyer of CERs.⁴³ The EU has placed several restrictions on what types of CERs can be used in the EU-ETS. To address concerns that hydropower projects can have serious environmental and social impacts, the EU added additional requirements for projects larger than 20 MW:

[...] Member States shall, when approving such project activities, ensure that relevant international criteria and guidelines, including those contained in the World Commission on Dams November 2000 Report "Dams and Development A New Framework for Decision-Making", will be respected during the development of such project activities. (Article 11b(6) of the Linking Directive)

The issue of how and if to restrict the use of credits from CDM hydro projects was contentious and the opinions between Member States varied considerably.⁴⁴ The final document was approved in 2004 and requires WCD criteria to be met for hydropower plants that are larger than 20 MW.

The language of Article 11b(6) of the linking directive is vague. For example, the text states that Member States are obliged to comply with 'relevant' international criteria and guidelines, 'including' those contained in the WCD. Up until 2008 there was no harmonized approach in the EU and the requirements for large hydro projects were interpreted differently by each Member State and implemented with varying degrees of rigor. This raised doubts about the environmental and social integrity of CERs entering the ETS and led to uncertainty and fragmentation in the European CER market. Many carbon exchanges excluded CERs from large hydro for fear that individual EU member states may refuse to accept them. In other words, "there was a danger that mutual recognition by Member States of national project approval decisions might break down" (Scott, 2011).

While the WCD evaluation and criteria are very comprehensive (the report is several hundred pages long), they do not include an evaluation process that could be used to assess WCD compliance ex-post. In 2008, the EU launched an effort to do exactly that: operationalize and harmonize the WCD criteria for the evaluation of large CDM hydropower projects. The European Commission launched an ad-hoc process of 'voluntary coordination' of Member State regulation of large hydro projects. In late 2008, all 27 Member states adopted uniform guidelines on the application of the linking directive's hydropower requirements (EU, 2008a), and a common compliance report template (EU, 2008b). All EU Member States agreed to use these harmonized criteria as of 1 July 2009:

⁴³ The EU-ETS is linked to the CDM via its 'linking directive' (Directive 2004/101/EC). This makes it possible for installations covered under the EU-ETS to use a certain proportion of CERs to meet their emission reduction obligations. In the 2nd and 3rd trading periods (2008-2020), up to half of the EU-ETS emission reductions can be met by using CERs and credits from Joint Implementation (JI). About 277 million CERs have been surrendered in the EU-ETS to date. 2% of those credits have come from large hydro projects (Sandbag, personal communication). Total demand for CERs in the EU-ETS until 2020 is estimated to be around 2.7 billion. In the sectors not covered under the ETS, such as agriculture and transportation, it is the EU member states that can choose to purchase CERs to achieve compliance with European emission reduction obligations.

⁴⁴ Germany, the Netherlands, Sweden and Belgium pushed for the inclusion of WCD requirements whereas Spain, France, Portugal, Italy, Greece, Austria, Finland and Estonia were opposed. There was also controversy about the threshold (10 MW or 20 MW) and a particularly fierce debate was held over whether compliance with WCD standards should be mandatory or whether Member States should simply be required to take them into account. For a more detailed history on the negotiations around the linking directive, see Hægstad Flåm, 2007.

Once a project activity has received a Letter of Approval (LoA) from an investor country upon the submission and positive assessment of a validated Article 11b(6) Compliance Report, all Member States agree to accept CERs/ERUs from this project for use in their national registries under the EU ETS. (EU WCD guidelines, 2008)

This means that in addition to the CDM application materials required by the UNFCCC, project developers are required to submit an Article 11b(6) Compliance Report to the Designated National Authority (DNA) of the Member State. The Compliance Report must be validated by a Designated Operational Entity (DOE).

The *Guidelines on a common understanding of Article 11b (6) of Directive 2003/87/EC as amended by Directive 2004/101/EC*, as the guidelines are officially called, include nine pages of guidelines including background information on the linking directive and the WCD spells out the procedural and content requirements needed for compliance.

The template of the compliance report, called *Compliance Report Assessing Application Of Article 11 B (6) Of Emissions Trading Directive To Hydroelectric Project Activities Exceeding 20 MW* is 17 pages long and includes specific questions on the seven strategic priorities of the WCD to evaluate compliance, these include:

Section 1: Description of the project, includes questions on dam height, total submerged area, number of displaced inhabitants and information on related infrastructure being build (e.g. access roads).

Section 2: Assessment of compliance with the WCD criteria:

- 1. Gaining public acceptance**, includes questions on the number of people affected by the project, how stakeholders were identified, informed and involved in the in the decision-making process, and how compensation and benefit agreements correspond with the identified needs and rights of the stakeholders negatively affected upstream and downstream due to the project. It also includes a question on how transparency was ensured.
- 2. Comprehensive options assessment**, includes questions about the needs for hydropower, potential alternatives and reasons for project choice and site selection.
- 3. Addressing existing dams/hydroelectric projects**, includes questions on national monitoring requirements for social and environmental issues and questions about how social and environmental issues of existing dams have been resolved.
- 4. Sustaining rivers and livelihoods**, includes questions about impact assessment (environmental and social) and cumulative impacts.
- 5. Recognizing entitlements and sharing benefits**, includes questions about mitigation, resettlement and development plans and compensation packages.
- 6. Ensuring compliance**, includes questions about complying with relevant laws, regulations, agreements (including resettlement and compensation agreements) and about the legal nature of the compensation agreements.
- 7. Sharing rivers for peace, development and security**, includes questions about trans-boundary impacts

The EU took a laudable and important step in developing these two documents to operationalize the WCD guidelines. It is a difficult and complex task to come up with guidance and requirements that capture the criteria in a meaningful and yet implementable way. Although

the harmonization effort has led to a more uniform application of the WCD guidelines, it did not succeed in fully capturing the criteria set out in the WCD. The shortcomings of the implementation documents can probably at least partially be explained by the process that was used to develop the current guidelines and template. The process that led to the adoption of the EU's WCD guidelines and compliance report template was informal and notably lacked transparency and public consultation.⁴⁵ For example, neither the European Parliament nor direct representatives of dam-affected peoples were involved (Scott 2011).

In order to avoid or minimize harm of such complex projects as hydropower, the WCD requires that planning and implementation processes be based on effective and fair stakeholder involvement, participatory decision-making and accountability. The EU evaluation is a one-time, ex-post check to make sure that the process was carried out in a satisfactory manner. Ensuring WCD requirements have been met ex-post is difficult given the complexity of the processes, and the subjectivity involved with assessing whether the WCD strategic principles were met in a meaningful way. In the following section we suggest concrete improvements in EU's assessment of WCD compliance.

5.3 DISCUSSION OF THE EU WCD EVALUATION REQUIREMENTS

5.3.1 Independent evaluation of WCD criteria is needed

The WCD report requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment (Scott 2011, Herz and Schneider 2008). This process is also used under the UNFCCC for the validation and verification of CDM projects. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. The lack of independence of these auditors has been criticized as one of the fundamental flaws of the CDM process (see for example, Schneider 2009 and Schneider and Mohr 2010). In informal conversations with the authors, project developers freely admitted that it is quite simple to get a WCD validation from a DOE. Also in our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation.

The independence of the verifier is especially important if the assessment being made involves subjective judgments, as does the WCD evaluation. For example, while the WCD requires stakeholder participation at all stages of project development, evaluating the quality of that involvement can be quite subjective. The public consultation requirement can be deemed fulfilled even if community members were not properly informed of the impacts of the projects or given the opportunity to meaningfully express their opinions, or if opinions received are ignored when project design decision are made.

⁴⁵ There were no formal rules of procedure and no minutes of the various meetings were kept. The main actors included the European Commission and representatives from the Member States. A number of stakeholders were invited to participate, yet aside from 2 NGOs (International Rivers and WWF) these stakeholders were limited to carbon market participants, (project developers and consultants).

Recommendations on improving independent verification

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future verifier hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Verifier performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

5.3.2 Improving stakeholder involvement and evaluation of stakeholder involvement

Public consultations are difficult to conduct effectively even when those conducting them have the best of intentions of creating a participatory and informed decision-making process. Consultations are especially difficult to conduct effectively when there are power imbalances among members of the affected communities. Those who are more powerful often can more forcefully or effectively express their opinions (Mosse 1995, Rosenberg 2001) and the consultation leader must work to ensure a range of voices are heard.

Sound and thorough stakeholder involvement is especially important for hydro projects with their potential to cause serious harm to local ecosystems and communities. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior and informed consent’ (WCD 2000). The EU compliance report template asks project developers to report on a variety of issues involving the participation of stakeholders in the decision-making process, but it falls short of requiring that project developers demonstrate the acceptance of key decisions by them. The template for example asks: *Were compensation and benefit agreements planned in consultation with affected groups?* And: *Were the affected people satisfied with the compensation packages?* But the template does not require that compensation packages had to be mutually agreed with all recognized adversely affected people, but had merely to be planned ‘in consultation’ with affected people. Furthermore, the report template does not require proof of ‘free, prior and informed consent’ from indigenous or tribal peoples.

The stakeholder process under the UNFCCC has long been criticized for being inadequate. To address and potentially improve guidance and requirements for stakeholder involvement, the CDM Executive Board recently launched a public call for inputs on how stakeholder consultations could be improved. Nevertheless the CDM Executive Board has continued registering projects that were implicated in creating significant harm; for example the Board recently registered a project that has been linked with serious human rights abuses (Bajo Aguan #3197⁴⁶) and several other projects that have been criticized for inadequate stakeholder

⁴⁶ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1260202521.42/view> Also see: <http://www.fian.org/news/press-releases/united-nations-under-pressure-to-denounce-human-rights-abuses-in-carbon-offsetting-scheme>

consultations in the face of stiff local opposition to the project (for example Barro Blanco #3237,⁴⁷ and Rampur hydro-electric project #4568⁴⁸).

It seems that the EU should be legally required to guarantee transparency and public participation: The EU has ratified the UN/ECE Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). The Aarhus Convention is a multilateral environmental agreement that grants the public rights regarding access to information, public participation in decision making and access to justice.⁴⁹ Yet the EU's harmonized procedures for approval of hydro projects do not specify clear mechanisms for the public to participate in credit application decisions, as required by the Aarhus Convention.

Recommendations on improving stakeholder involvement

More detailed requirements on how to conduct and verify stakeholder consultations and how to resolve contentious issues are especially important because WCD compliance assessments involve subjective judgments. The guidelines for carrying out and auditing stakeholder consultations prepared by the Gold Standard⁵⁰ (GS) could serve as a template for examining whether stakeholder involvement has been adequate. The GS guidelines require two stakeholder consultations. The first meeting is similar to what the UNFCCC requires, but much more guidance for organizing the meeting and content to be covered during the meeting is provided by GS. The second meeting is an opportunity for stakeholders to give feedback on how their comments were incorporated. The developer is required to submit a report detailing the outcome of the stakeholder consultations. The Gold Standard furthermore requires a "No Harm" assessment, guided by the UNDP Millennium Development Goals. Human rights, labor standards, environmental protection, and anti-corruption are assessed. The project developer is required to assess the risk of breaching 11 safeguarding principles and identify mitigation measures. For example, respect of rights of indigenous people and no involuntary settlement are principles listed under for the human rights category.

- Verifiers should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.

⁴⁷ <http://cdm.unfccc.int/Projects/DB/AENOR1261468057.59/view> Also see unsolicited letter by CDM Watch to the CDM Executive Board: http://www.cdm-watch.org/wordpress/wp-content/uploads/2011/02/Unsolicited-letter_Barro-Blanco-PA-3237_March-2011.pdf.

⁴⁸ <http://cdm.unfccc.int/Projects/DB/BVQI1299859361.8/view> For more information see: <http://www.internationalrivers.org/node/1428>

⁴⁹ Article 1 of the Convention states:

In order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being, each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention.

Access to information: any citizen should have the right to get a wide and easy access to environmental information. Public authorities must provide all the information required and collect and disseminate them and in a timely and transparent manner.

Public participation in decision making: the public must be informed over all the relevant projects and it has to have the chance to participate during the decision-making and legislative process.

Access to justice: the public has the right to judicial or administrative recourse procedures in case a Party violates or fails to adhere to environmental law and the convention's principles. (Rodenhoff 2003).

- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

5.3.3 Improving access to compliance reports

According to the guidance document, ‘Members States are to provide publicly accessible information on projects that have been approved as fulfilling the requirements of Article 11(b)(6) as well as indicating the entities accepted to carry out a validation of the Compliance Report in each Member State.’

We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,⁵¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. Sweden for example stated “The principle of public access does not mean that all documents are available online, but made available on request.” (e-mail communication with Swedish Energy Agency).

Recommendations on access to compliance reports

The lack of web-access to the compliance reports makes it difficult for stakeholders in host countries to get information needed to evaluate if a project has been sufficiently assessed. This could easily be remedied by requiring DNAs to make all the compliance reports available online.

- The transparency rules should be further harmonized: Member states should be required to provide online access to compliance reports and other relevant project information.

5.3.4 Requiring all hydropower projects comply with WCD criteria

Currently only hydropower projects over 20 MW are required by the EU to meet WCD standards. As discussed earlier, the distinction based on size of installed capacity is not adequate to filter out projects that cause substantial environmental and social harm. Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011), resulting in fewer checks. While large projects in India are granted clearance from the Central Government and required an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006).

Recommendation on extending criteria

- Small hydropower projects providing credits to the EU should also comply with WCD requirements and procedures.

⁵¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

6 CONCLUSIONS

This paper evaluated the additionality of hydropower projects in the CDM and sustainability criteria applied to these projects. Hydropower makes up 30% of all registered CDM projects and is expected to deliver close to a quarter of all CERs by 2020 (UNEP Risoe CDM/JI Pipeline Analysis and Database, 1 September 2011). Our analysis shows that the CDM's *Additionality Tool* is not effective at filtering out non-additional hydropower projects. We also find weaknesses in the EU's assessment of compliance with WCD guidelines. In the following conclusions we summarize the policy changes we recommend in order to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts.

Large hydropower should be excluded from the CDM in all countries because it is unlikely to be additional and additionality testing is ineffective. Hydropower is already a conventional technology that is being built in large quantities worldwide without carbon credits. India and China, the two countries with most hydropower CDM projects, have aggressive targets for utilizing their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal. The interest in building large hydropower in both countries supersedes the relatively small effect CERs have on hydropower project financial return.

Furthermore additionality testing through the assessment of financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developer, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – because of uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for those projects types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. Projects under construction and projects

in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

Large and small CDM hydropower projects seeking to sell their CERs in the European Union should fulfill World Commission on Dams (WCD) sustainability criteria. Since hydropower projects of all sizes and types can have substantial, and sometimes severe, negative social and environmental impacts, all hydropower projects should be evaluated for their social and environmental impacts. Further, small hydropower is usually subject to fewer regulations and scrutiny than large hydropower. It would therefore be prudent that the EU’s WCD criteria be expanded to include hydropower projects below 20 MW.

The EU’s assessment of WCD compliance should be further strengthened. The EU’s efforts to operationalize the WCD guidelines are commendable but current rules and procedures do not fully capture the criteria set out in the WCD. Shortcomings include auditor conflicts of interest, weak guidance for the assessment of public consultations, and insufficient access to compliance reports by the general public. The current EU WCD requirements could be strengthened as follows:

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.
- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.
- EU member states should be required to provide online access to compliance reports and other relevant project information.
- All hydropower projects, large and small, should be required to meet WCD criteria.

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on communities most vulnerable to the impacts of climate change. Excluding large and some small hydropower

projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate mitigation goals.

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Agrarian livelihoods under siege: Carbon forestry, tenure constraints and the rise of capitalist forest enclosures in Ghana

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ABSTRACT

Drawing on theoretical insights from agrarian political economy, and based on empirical research in the High Forest Zone of Ghana using in-depth interviews and participant observation, this paper examined the context-specific but often less highlighted impacts of REDD+-based carbon forest development activities on local agrarian livelihoods. We find that although REDD+ intends to align local communities to benefit financially for contributions to carbon forestry, its uptake in the Ghanaian context has created entry points for the displacement of smallholder farmers through unregulated profit-driven and restrictive plantation-style carbon forest activities. This yields landless smallholder farmers whose labour is craftily integrated into a capitalist carbon forestry regime as tree planters, with many others striving to reproduce themselves through exploitative sharecropping arrangements and corrupt 'backdoor' land deals. We emphasize that, 'more than carbon' accumulation engendered by REDD+ is fast moving beyond land grabs to a more complex dimension in which the labour and financial resources of marginalized groups are further appropriated by forest investors, and their relatively powerful counterparts in what we term *intimate exploitation*. Given the ongoing plight of smallholder farmers, particularly the multitude of 'hungry' migrant farmers who seek 'salvation' in the High Forest Zone, it is obvious that REDD+ is pushed at the expense of ensuring food security. To sustainably address current land-related agricultural production bottlenecks and empower local communities to directly benefit from REDD+, we recommend that rather than centralizing both carbon rights and land rights in the hands of the state and a few private investors, community forestlands should be returned to local people under community-led forest management approaches. Local control of both land and carbon stocks will promote sustainable coexistence of smallholder agriculture and carbon forestry.

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1. Introduction

The Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks (REDD+) initiative emerged to strategically align local communities in developing countries to benefit³ financially for contributions to climate change mitigation through community reforestation and enhancement of carbon stocks (Hiraldo & Tanner, 2011; Leach & Scoones, 2013; Lemaitre, 2011; Lyons & Westoby, 2014; Sunderlin

et al., 2014). Based on claims of robust economic returns and the promise of a 'new salvation' for biodiversity conservation and climate change mitigation, private sector investment in carbon forestry⁴ under the REDD+ has grown in importance across sub-Saharan Africa (SSA) over the last decade (Asiyanbi, Arhin, & Isyaku, 2017; Leach & Scoones, 2013). Designed purposely to support developing countries' REDD+ efforts, the Forest Investment Programme (FIP) is one of the three funding windows of the Climate Investment Fund (CIF). It provides scaled-up financing in the form of grants and low interest loans to developing countries through partner multilateral development banks (MDBs) to implement reforms outlined in national REDD+ plans (World Bank, 2015).

Ghana was selected as a pilot country for the FIP in 2010 with a grant of USD 50 million to support national REDD+ activities. Through coordination between government and the private sector,

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E-mail addresses: mkansang@uwo.ca (M.M. Kansanga), iluginaa@uwo.ca (I. Luginaah).¹ ORCID: 0000-0001-8566-396X.² ORCID: 0000-0001-7858-3048.³ Benefits broadly denote the direct or indirect incentives and payments that derive from actions associated with reducing emissions from deforestation and forest degradation.⁴ The process of 'conserving and enhancing forest carbon stocks, and trading these values in emerging carbon markets' (Leach & Scoones, 2013)

Ghana's REDD+ strategy focuses on rehabilitating degraded natural forests, supporting off-reserve forest plantation development and promoting climate-smart agriculture especially in cocoa growing areas in the High Forest Zone. Through the Dedicated Grant Mechanism (DGM) of the FIP, a National Executing Agency provides demand-driven grants to organizations for carbon forestry activities (World Bank, 2015). The strategy aims to stimulate private sector investment in carbon forest plantation development in both on-reserve and off-reserve areas in the High Forest Zone (Ministry of Lands and Natural Resources, 2014). Critical to the implementation of REDD+ in the Ghanaian context, however, are the crucial questions of how to adequately reconcile the interests of project financiers with those of forest communities and ultimately, how local communities can be aligned to benefit from carbon forestry.

Despite the promise that stimulating private sector investment in forest plantation development and carbon financing will yield sustainable benefits to local farming communities and enhance carbon stocks, the outcome of close to a decade implementation of REDD+ in Ghana is arguably the reverse (see Asiyambi et al., 2017; Saeed, McDermott, & Boyd, 2018). In this paper, we analyse the political economy of REDD+ in Ghana by examining how private sector entry into the carbon forest development trajectory has influenced local farming livelihoods. Drawing on the experiences of smallholder farmers in the High Forest Zone where forest community lands are massively targeted for carbon forest plantation development, we interrogate how corporate penetration in the carbon forestry sector has engendered 'new' agricultural land access and labour relations that are detrimental to smallholder agriculture. This analysis contributes to the broader debate on the rise of transnational corporations (TNCs) in global resource management and agriculture, and the resultant 'depeasantization' of rural populations (Makki, 2012; Weis, 2007). From our choice of methodology, we contribute to the literature by 'telling the smallholder story, the smallholder way'.

Against the universalized claim that REDD+ will improve land tenure security in local farming communities in developing countries (Corbera, Martin, Springate-Baginski, & Villaseñor, 2017; Harvey, Dickson, & Kormos, 2010), the materialization of these benefits is heavily dependent on an array of contextual factors including the underlying power relations that structure access and control over forest resources among diverse actors, local land tenure dynamics, and the effectiveness of REDD+ implementation and regulatory frameworks (Asiyambi, 2016; Sanders, da Silva Hyldmo, Ford, Larson, & Keenan, 2017). Indeed, Peskett, Schreckenber and Brown (2011) argue that using carbon financing for REDD+ in developing countries introduces new actors, interest and rules in the forest sector, with the potential to alter existing forest management practices in ways that have potential adverse implications on the livelihoods of weaker groups. With the increased involvement of the private sector in carbon forest plantation development in local communities in the Ghanaian context, coupled with the fact that these activities are profit-driven and rely mainly on external donor support, it is possible that existing agricultural land access arrangements and labour relations could be reconfigured in ways that adversely affect agrarian livelihoods. In the context of competing land uses from urbanization, mining and grazing in the forest sector, these ambiguities may be further reinforced (see Armah, Luginaah, Yengoh, Taabazuing, & Yawson, 2014; Kleemann et al., 2017; Kuusaana & Bukari, 2015; Owusu-Nimo, Mantey, Nyarko, Appiah-Effah, & Aubynn, 2018; Taabazuing, Luginaah, Djietror, & Otiso, 2012). Yet, the basic requirement to ensure a coexistence of farming activities and carbon forest development as stipulated in the national REDD+ implementation framework remains unenforced by the state and is largely at the discretion of private investors. Little attention has

been paid to the property rights the state devolves to private actors in the management of community forest resources.

Given that the High Forest Zone has relatively favourable climatic and edaphic conditions, and serves as a haven for many food insecure smallholder farmers from impoverished parts of the country, these tenure complexities could exacerbate food insecurity. In a regional analysis of the impact of REDD+ on food security, Tabeau, van Meijl, Overmars, and Stehfest (2017) finds that, SSA is the most adversely affected region. Compared to Central and South America (with 16.2% and 12.4% decreases in land use and agricultural output respectively) and China (with 7.1% and 1.3% decreases in land use and agricultural output respectively), reductions in land use and food production were more pronounced in SSA (19.9% and 18.1% respectively) (Tableau et al., 2017). Despite the fact that these regional statistics offer a general picture of the negative impacts of REDD+ on food production, a rigorous context-specific analysis of the lived experiences of smallholder farmers⁵ is crucial. In the Ghanaian context for instance, Asiyambi et al. (2017) give a hint on the local level inclusion-exclusion politics that characterize REDD+, and call for in-depth context-specific analysis of the experiences of forest-based communities.

Although a number of studies have recently explored forest management in Ghana (see Acheampong, Insaiddoo, & Ros-Tonen, 2016; Foli, Ros-Tonen, Reed, & Sunderland, 2017; Murray, Agyare, Dearden, & Rollins, 2018; Ros-Tonen, Derkyi, & Insaiddoo, 2014; Teye, 2013), little research attention has been paid to REDD+ despite the uptake of carbon forestry activities in farming communities in the High Forest Zone since 2010. Furthermore, while REDD+ is currently piloted in other countries in sub-Saharan African (SSA) where livelihoods are generally dependent on land-based resources, existing studies on its implementation have mostly focused on understanding its design, institutional frameworks of governance and benefit sharing arrangements (see Andersson et al., 2018; Asiyambi et al., 2017; Leach & Scoones, 2013; Saeed, McDermott, & Boyd, 2017; Saeed et al., 2018; Sills et al., 2017). Invariably, there are no studies that examine the distributional impacts of the uptake of carbon forestry on local livelihoods activities and food security. It is to this salient gap in the literature that this study contributes.

What we explore in this paper are opportunities for knowledge sharing, inclusiveness and sustainability towards finding a common ground for the reconciliation of environmental conservation and agricultural production in forest communities across the developing world. While this paper does not suggest a blueprint for carbon forestry, it takes a preliminary stance at stimulating the discussion on the distributional impacts of REDD+ on farming communities with the goal of broadening the scope of options policymakers and local communities can draw upon to ensure sustainable coexistence of food production and carbon forestry. This analysis further demonstrates the continuous relevance of the agrarian question in the developing world and highlights the critical need to reconcile the increasingly neglected food security concerns of local farming communities with ongoing environmental conservation objectives. This connects to the clarion call by Asiyambi (2016, p. 146) for researchers to, "also engage with more-than-carbon accumulations justified by carbon".

In this paper, we argue that beyond 'green colonialism' and the widespread land grabs engendered by carbon forestry across different geographical contexts (see Asiyambi, 2016; Barbier & Tesfaw, 2013; Ickowitz, Sills, & de Sassi, 2017; Lund, Sungusia, Mabele, & Scheba, 2017; Phelps, Webb, & Agrawal, 2010; Saeed et al., 2018; Sunderlin et al., 2014), neoliberal accumulation under

⁵ Small-scale farmers who cultivate for consumption and sell surplus for income (Chamberlin, 2008). Production is largely based on simple tools and inputs (Kansanga, 2017).

the REDD+ is rapidly moving into non-carbon frontiers in the Ghanaian context whereby the labour and financial resources of displaced local farmers are further appropriated through corrupt 'backdoor' land deals and exploitative labour relations. In the context of these challenges, we make several recommendations for restructuring the current carbon forest development approach.

2. Background

2.1. Forest resource management in Ghana

Prior to state-led forest management in Ghana, community forestlands were administered through customary law. Chiefs who are the custodians of the land held forestlands in trust for the people who possessed user rights (Owubah, Le Master, Bowker, & Lee, 2001; Teye, 2005). As timber became a major source of revenue in the colonial era, concessions of stool lands⁶ were zoned as forest reserves under the Forest Ordinance of 1927 and controlled by the colonial government (Owubah et al., 2001). Post-independence governments maintained this top-down state-led community forest management approach. Over the years, a number of policies were enacted to regulate forest resource use including the Forest Commission Act of 1960; Forest Concessions Act of 1962; Land Administration Act of 1984; Control and Prevention of Bushfires Law of 1990; Forest and Wildlife Policy of 1994; and the Forest and Plantation Development Act of 2000. These policies supported a concessional forest governance approach in which forest timber rights are vested in the president in trust for local communities (Owubah et al., 2001). To harvest timber under this system, a stumpage fee determined based on the standing value of the timber concession is paid to the GFC after which a Timber Utilization Contract is reached with the logger (Ministry of Lands and Natural Resources, 2014). Concerns over the unfair benefit sharing and the lack of access to forest lands by local communities led to the evolution of integrated community forest management schemes. For instance, as part of the Voluntary Partnership Agreement (VPA) under the European Union's Forest Law Enforcement Governance and Trade (FLEGT) program, the timber rights allocation procedure was revised to make it open to all citizens. However, the processing cost of putting in a bid still excluded many actors at the local level. To enhance the sustainable flow of benefits to local communities, Community Resource Management Areas (CREMAs) were created in 2000 as integrated forest governance avenues through which local knowledge systems and community needs can be brought to bear on decision making on forest resource conservation and utilization (Murray et al., 2018).

These co-management efforts were later consolidated under the Modified Taungya Scheme (MTS) in 2002 – a collaborative reforestation initiative between the GFC and local farmer groups in forest communities aimed at ensuring coexistence of local livelihood activities and reforestation projects (Ros-Tonen et al., 2014). Under this scheme, farmers were given degraded portions of forestlands to cultivate while taking care of trees planted by the GFC until the trees close canopy (usually after three years). The benefit sharing framework of the MTS allocated 40% of timber revenue to the Forestry Commission, 40% to each gang of farmers, 15% to traditional landowners, and 5% to the forest-adjacent community (Acheampong et al., 2016). The MTS did not result in tenure security after all – a situation which made aggrieved farmers to deliberately retard tree growth in order to prolong their tenure (Acheampong et al., 2016; Ros-Tonen et al., 2014). Since the last decade, the Land Use, Land-Use Change and Forestry (LULUCF) sec-

tor in the High Forest Zone became a net emitter of greenhouse gases – a development that justified the need for intense forest conservation (Kansanga, Atuoye, & Luginaah, 2017).

Against this background, Ghana as a party to the United Nations Framework Convention on Climate Change (UNFCCC), subscribed to REDD+ in order to mitigate deforestation through plantation development in both on-reserve and off-reserve lands (Ochieng, Visseren-Hamakers, & Nketiah, 2013). Initially, Ghana's REDD+ strategy embraced a 'learning from the ground up' approach in which about seven pilots were implemented to provide lessons for scaling up. Following the failure⁷ of these pilots, Ghana's REDD+ strategy has since shifted to, "the implementation of large scale, sub-national programmes that follow ecological boundaries (jurisdictions) and are defined by major commodities and drivers of deforestation and degradation" (Government of Ghana, 2015, p. 25). Although other REDD+ activities are planned for later implementation in the savannah zones, Ghana's REDD+ strategy currently focuses on enhancing carbon stocks in the High Forest Zone.

Ghana's REDD+ activities are implemented in two major phases. The first phase involved policy reforms and institutional strengthening aimed at advancing the design and implementation of policy reforms to create the necessary institutional capacity for sustainable carbon forest development. The second phase, which is the core of Ghana's REDD+ agenda is currently implemented through three major forest investment projects (World Bank, 2015). Project 1 aims at enhancing natural forests in agroforest landscapes in forest corridors in the High Forest Zone. Project 2 focuses on securing and enhancing trees in agroforestry and cocoa cultivation areas in the High Forest Zone with emphasis on the Brong-Ahafo and Western Regions. While extending forest conservation into target off-reserve community lands, this project is supposed to provide incentives for farmers on 'admitted farms'⁸ especially for the production of climate-smart cocoa. Project 3 focuses on, "enhancing carbon stocks through facilitation of plantation investment in severely degraded landscapes" towards linking several Forest Reserves in the High Forest Zone (World Bank, 2015, p. 12). It also aims to build private sector engagement in the REDD+ process. Unlike project 2 where provision is made for 'admitted farms' in off-reserve areas, project 1 and 3 have no such provision for farmers, especially migrant smallholder farmers who were already farming on these forestlands while taking care of trees planted by the GFC under collaborative forest landscape restoration projects.

Key stakeholders in the implementation of the REDD+ in Ghana include MDBs, the Ministry of Lands and Natural Resources (MLNR), the GFC (which hosts Ghana's National REDD+ Secretariat), the Ghana Cocoa Board (COCOBOD), the Ghana Investment Promotion Centre (GIPC), Local government units (Districts and Unit Committees), private forest investors, Civil Society Organizations (CSOs), local community members and traditional leaders (see Fig. 1) (Saeed et al., 2018; World Bank, 2015). MDBs under the direction of the World Bank provide overall funding for the REDD+ in the form of low interest loans and grants. The MLNR is the lead implementing agency and is responsible for overall management and coordination of carbon forestry activities at the country level, and reporting to the UNFCCC on behalf of the government of Ghana. The GFC hosts the National REDD+ Secretariat. It is the implementation arm of MLNR and coordinates carbon forestry activities in forest communities. COCOBOD has the mandate of

⁷ According to the Ghana Forestry Commission (2017, p. 35) these pilots failed due to the lack of technical expertise and financial backing. Moreover critical concerns such as tree tenure reforms, required national level policy decisions that were beyond the scope of the pilots.

⁸ Refers to farms that were already on community lands before they were rezoned as forest conservation reserves. Per Ghana's REDD+ implementation arrangements, owners of these admitted farms are entitled to continue to farm in these areas while project activities continue.

⁶ Local community lands administered through traditional customary practices under the leadership of the chief. In southern Ghana, chiefs are enstooled and sit on stools. The stool is a symbol of traditional authority.

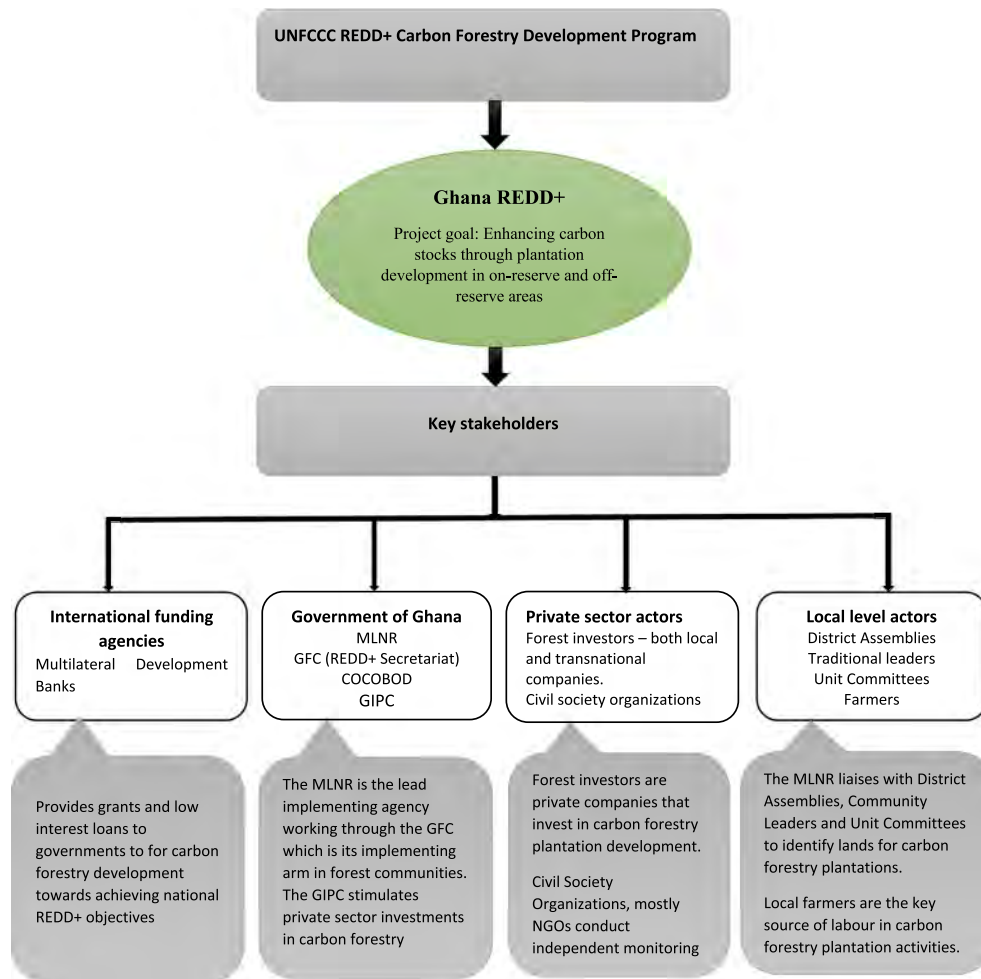


Fig. 1. Key stakeholders in the implementation of REDD+ in Ghana. Source: Adopted and modified from the Ghana REDD+ Strategy Report, 2015.

providing incentives and technical assistance to local farmers to support climate-smart crop production (particularly cocoa). The GIPC is responsible for creating incentives to stimulate private sector investment in carbon forest plantation development. It also spearheads the development of Public Private Partnerships (PPP) for the forest sector under REDD+. District Assemblies collaborate with local communities and traditional leaders to identify suitable degraded lands in forest communities for plantation development. Local farmers offer labour for day-to-day conservation activities. CSOs, mostly NGOs, are expected to engage in independent project monitoring and evaluation.

Currently, private sector involvement in forest plantation development includes the role of private investors as developers and owners of forests plantations; providers of technical services for tree development and buyers of timber (Ghana Forestry Commission, 2017; Saeed et al., 2018; World Bank, 2015). It is important to mention that private sector involvement in forest management in Ghana is not a novelty. In the past, private companies⁹ have been contracted by the state to offer secondary services to the GFC in previous state-led reforestation initiatives including the supply of seedlings and forest valuation. In recent times under the REDD+ however, their role in direct forest development has increased tremendously. For instance, between 2002 and 2010, 280 private forest investors were operating in 12 forest districts in the

country following the Expanded Plantation Programme that extended forest conservation activities from on-reserve areas to off-reserve community lands (Insaïdoo, Ros-Tonen, Hoogenbosch, & Acheampong, 2012; Ros-Tonen et al., 2014). In the last ten years the GFC has released forestlands to a number of private forest investors, majority of whom are transnational corporations for plantation development in the High Forest Zone. Some of these companies include Portal Limited, FORM Ghana Limited, Mere Plantations Limited, Ecotech Services Limited, Zoil Services Limited, Kwadkoff Company Limited, Logwood Industries Limited and GroTeak Afforestation Limited.

Although benefit sharing plans under the REDD+ in the Ghanaian context are yet to be finalized as of the time of writing this paper (see also Saeed et al., 2018), the National REDD+ strategy outlines three broad benefits to be generated through carbon forestry on which any benefit sharing framework will likely be based. The first entails up-front indirect benefits including enhanced access to agricultural inputs, technical services and credits to support climate smart farming in forest areas. The second category include performance-based indirect benefits such as corporate social responsibility initiatives in forest communities. Direct performance-based benefits are the third category identified in the Government's REDD+ strategy report. These benefits include cash payments to local community CREMA funds for protection of designated off-reserve forest areas and the volume of climate-smart cocoa produced (Fox, 2017).

⁹ The category private is herein used to refer to large scale companies of both national and international origin involved in carbon forestry development in Ghana.

A number of salient issues underpin this potential benefit structure, especially when considering how local people can participate to improve their livelihoods. First, it is rather ironic that performance-based benefits to local communities are not determined based on the market value of the amount of carbon dioxide emissions local people's contributions to REDD+ initiatives are able to reduce. Rather these benefits are based on the amount of climate-smart cocoa produced by farmers. Secondly, access to the carbon markets under the REDD+ is restricted to government and so-called organized and financially capable investors. This limits the options available to local people to directly engage in carbon markets. Even among local farmers, cocoa farmers are prioritized while smallholders, particularly migrants, who produce food crops have no clearly stipulated direct benefits from carbon forest revenue. What is more pressing is that, with the current desire to extend carbon forest development into off-reserve forest community lands on which local farmers depend, coupled with the fact that restrictive plantation forestry has become the dominant carbon forest development approach (Leach & Scoones, 2013), the reproduction of local livelihoods may be grossly impacted.

2.2. Research sites

This study draws on the experiences of smallholder farmers from agrarian communities in the Bosomoa-Kintampo and Offinso forest districts (see Fig. 2). These forest districts are located in the High Forest Zone of Ghana which falls within the West African Biodiversity Hotspot. Some of the largest forest reserves in Ghana including the Bosomkese, Bosomoa, Afram Headwaters, and Afransu-Brohoma Forest Reserves are found in these study areas.



Fig. 2. Map showing the two forest districts of the study. Source: Author's construct, 2018.

The Bosomoa and Afram Headwaters Reserves for instance each span about 20,000 ha, comprising both natural and plantation forest. The High Forest Zone is the major food crop-producing zone in Ghana and attracts farmers from other regions.

The socioeconomic structure of the study context raises some salient concerns that make our analysis crucial. With increasing pressure on smallholder agriculture from climate change in recent times, the High Forest Zone in general is a key safety net for smallholder farmers from various poverty-stricken and relatively drier parts of the country, especially the three northern regions (see Kuire, Mkandawire, Luginaah, & Arku, 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017; Rademacher-Schulz, Schraven, & Mahama, 2014; Van der Geest, 2011). Also, smallholder farming is a fundamental part of the organization of social life in local communities in the High Forest Zone. As a result, local livelihoods are heavily dependent on community forest lands.

3. Theoretical framework

Theoretically, this paper illuminates the socioeconomic and political situatedness of the impacts of REDD+ on local agrarian livelihoods in Ghana. Specifically, it examines the nature and extent to which smallholder farming livelihoods are shaped and reshaped in the struggle for agricultural land following carbon forest development. Theoretical developments on land grabbing in the Ghanaian context have for some time now focused on large-scale agricultural land deals involving transnational corporations in the middle belt and savannah zones (see Aha & Ayitey, 2017; Boamah, 2014; Boamah & Overå, 2016; Choi, 2018) with little attention paid to the forest zone despite the ongoing leasing of community lands to private investors for carbon forest plantations. To adequately understand the outcomes of such local forest community land deals which often involve varied actors and interests, there is the need to situate particular land struggles within the broader agrarian political economies of land access and control (Hall, Hirsch, & Li, 2011; Montefrio, 2017; Peluso & Lund, 2011).

Despite the centrality of the concept of access to research on natural resource governance and utilization in forest communities (Faye & Ribot, 2017; Kansanga, Andersen, Atuoye, & Mason-Renton, 2018; Larson, Cronkleton, Barry, & Pacheco, 2008; Osborne, 2011), it has been defined differently in the literature. That notwithstanding, Ribot and Peluso's (2003) conceptualization of access as 'the ability to derive benefits from things' is useful to our analysis and gives a broader conceptual base for understanding how carbon forest development activities may be shaping smallholder farmers' access to forestland in Ghana. Ribot and Peluso's (2003) definition connects directly to the agrarian question and allows for a broader interrogation of the fate of smallholder farmers in a neoliberal natural resource management regime as capital rapidly moves into local agrarian spaces (Osborne, 2011; Watts, 1989).

In their concept of 'powers of exclusion', Hall et al. (2011) identified four powers (regulation, market, force and legitimation) that interact to shape land access relations. They argued that, instead of counter-posing 'exclusion' to 'inclusion' in understanding natural resource access and utilization at the theoretical level as already highlighted in the forest belt of Ghana by Asiyambi et al. (2017), emphasis should be placed on who is excluded, how, why, and with what consequences. Proceeding on this theoretical tangent, we consider the opposite of 'exclusion' not to be 'inclusion' but 'access'. This position is based on the realization that including local people in REDD+ processes does not necessarily guarantee them access and control over forest resources and carbon revenue. We therefore proceed on a broader theoretical lens grounded on the understanding that carbon forestry development not only occurs

through a governmentality which shapes livelihoods in a given context, but also influences the broader relations that make such social reproduction possible (Paprocki, 2016).

Moore (2013) draws attention to a critical dimension of the agrarian question that is directly relevant to the analysis in this paper. Moore (2013) argues that capitalism, owing to its inability to accumulate further through agriculture, has shifted its frontiers to other resources in the ecological sphere – particularly investment in forest as exemplified by the increased desire by transnational corporations to invest in carbon forestry in tropical areas of the developing world. Within the ecological sphere, ‘capitalism’ strives to redefine existing structural provisions in human-environment interaction such as customary tenure practices in order to create entry points that engender new political economies (Makki, 2012; Moore, 2017). These premeditated changes to the socioeconomic structure then provide strategic positional spaces for natural resource appropriation and the eventual crafty separation of local people from land-based resources in what Tobias and Richmond (2014) term environmental dispossession. This swift movement of capital from international into national and local agrarian frontiers is largely grounded on the desire to build neoliberal natural resource management and agricultural production regimes with value chains that facilitate accumulation (Bernstein, 2014; Myers et al., 2018; White, Borrás Jr, Hall, Scoones, & Wolford, 2012). Critics have argued that by privatizing and globalizing market economies, national sovereignty and state capacity are weakened as transnational capital moves into national spaces (Lyons & Westoby, 2014; Sassen, 2013). Lyons and Westoby (2014) observe that, ‘there is then a positive feedback cycle in which such investments lead to an increased debt regime’ thereby pushing weakened states to further disassemble national frontiers and legitimize foreign investment in local spheres including agriculture and forestry.

According to Tobias and Richmond (2014) separation of local communities from natural resources eventually sets in; directly through physical separation from land, and indirectly through processes of acculturation and assimilation. Drawing on the concept of ‘powers of exclusion’ (Hall et al., 2011) and environmental dispossession (Tobias & Richmond, 2014), our analysis interrogates how the uptake of REDD+ in the Ghanaian context produces new avenues for the displacement and exploitation of smallholder farmers. In particular, we highlight the mediating role of two powers of exclusion: ‘regulation’ and ‘market’ in shaping smallholder farmers’ access to farmland.

4. Methodology

As observed by Jacobs (2017), the complexities in the struggle over land-based resources cannot be resolved entirely on theoretical grounds since class struggle is not just an element in theory, but also a subject of empirical enquiry. This study is based on a five-month qualitative research conducted from May 2016 to September 2016 in the Bosomoa-Kintampo and Offinso forest districts in the High Forest Zone of Ghana using participant observation and in-depth interviews. We conducted in-depth interviews with 46 local farmers, 4 traditional leaders, and 4 local-level government representatives to uncover the experiences of farming communities with the uptake of REDD+. Participant farmers were sampled through a preliminary visit to the forest to obtain a first-hand experience of ongoing carbon forest activities. This approach helped us to locate farmers who were directly affected by carbon forest development.

We sampled participants to reflect the diverse socioeconomic backgrounds of farmers in the study context. Our sample included two broad categories: migrant and native farmers, majority of

whom were males. Female farmers mostly cultivated on lands within the immediate environs of the community. Male farmers were mostly those who went deeper into the forest to establish farms. Moreover, because family farming is the common farming arrangement in the study area, men who are culturally ascribed family heads mostly cultivated with their wives and were at the forefront of acquiring land. As a result, women were mostly removed from these agricultural land deals. There were however two cases where migrant women who initially settled with their husbands and farmed in the forest under the MTS continued to farm there after the demise of their spouses.

In terms of socioeconomic characteristics of sampled farmers, migrant farmers were mostly from resource-poor areas of the country especially the northern sector. Since they have no right of ownership over customary lands, they mostly farm under sharecropping arrangements with native farmers. Previous state-led integrated forest management schemes which allowed farmers to cultivate while taking care of trees planted by the GFC, further attracted most of these farmers to the forest belt. Most of these migrant farmers, in the attempt to maximize time on the farm and avoid the extra financial burden of renting homes in the community erected temporary structures close to their farms in the forest where they stayed and farmed with their nuclear families and only occasionally coming to town, mostly on market days. Native smallholder farmers on the other hand had relatively better socioeconomic status compared to migrant farmers. Unlike most migrant farmers who lived in deep hideouts in the forest, all native smallholder farmers lived in the town and were therefore able to engage in extra socioeconomic activities such as petty trading to supplement farm income. Following the extension of carbon forestry activities into off-reserve lands, some of these native farmers who previously owned lands in these areas before their re-designation for forest plantation development benefited from the ‘admitted farms’ provision and became forest caretakers¹⁰ for private companies. Most native farmers were therefore able to still engage in some form of cultivation albeit relatively minimal since production mostly has to conform to the permissible crop range of forest developers. Farmers in this category also served as ‘middlemen’ who helped migrant farmers to get temporal farming space under sharecropping arrangements. Educational attainment was low among both category of farmers for which reason interviews were conducted in the local dialect (Twi).

Data from interviews were complemented with secondary data from relevant academic literature, and government policy documents including Ghana’s REDD+ Proposal by the MLNR, and the 2016 – 2035 National REDD+ Strategy Report by the GFC. Direct quotations from the interview transcripts are used to substantiate key themes, contextualize responses, and maintain participants’ voices.

5. Findings and discussion

5.1. Growing trees in place of food? Agrarian displacements through REDD+

Contrary to the underlying requirement that REDD+ should be executed in partnership with local communities particularly to foster mutual benefits for all stakeholders, we find that local farming communities are rather being distanced from forestlands that they ‘must’ depend on for survival. Private forest investors have become the main developers of carbon forest plantations and are displacing

¹⁰ Forest caretakers are mostly community-level representatives/liasons who take care of forest concessions for private companies. These are mostly native farmers and are usually allowed to farm on portions of the forest while taking care of the trees.

local farmers on technical grounds of ownership through their largely unregulated and profit-driven plantation development activities. Central to this complexity over access to forestland are conflicts over meaning about customary and formal land tenure arrangements between farmers and forest investors. While local farmers still see themselves as legitimate co-managers of forest as was previously done under state-led integrated forest management initiatives, private investors regard themselves as 'new' owners of forestlands with the right to make new rules on forest development and resource utilization. These new rules have not only displaced local farmers, but technically frames them as 'illegal intruders' on private forest lands.

Our findings indicate that private forest developers involved in the rehabilitation of degraded forestlands evicted local farmers who were cultivating the land under previous state-led integrated forest management to allow for fresh forest plantation development. We argue that the rhetoric of 'painting' carbon forest development as a pathway to consolidating tenure security is a mere façade at the practical level. This strategic displacement of smallholder farmers by private forest developers is what [Asiyanbi et al. \(2017\)](#) term 'carbonised exclusion'. In the Ghanaian context these displacements were spontaneous and mostly without sufficient prior communication from the GFC or private forest developers. This eventually produced a landless class of smallholder farmers whose labour has been craftily integrated into a corporatized forest management system as forest caretakers and tree planters. Meanwhile, due to the limited nature of such jobs, the majority who do not get forest jobs constantly strive to reproduce themselves through unfulfilling 'backdoor' temporary land access transactions and sharecropping arrangements. A farmer expressed frustration at this displacement saying:

Since these lands [referring to forest concessions] were given to the companies and we were banned from farming there, I have since moved my farm from one hideout to another through the seasons. (Interview, 10 May 2016)

Even the few influential native smallholder farmers who were able to formally negotiate access to private company forest concessions to cultivate while taking care of trees had a different but equally challenging story. One native smallholder farmer observed:

When I finally got permission to use this land I am cultivating now, I was told the company would clear the land and supply seedlings. However, the company later complained of faulty chainsaws and instructed us to cut the trees ourselves which most of us did with our personal resources. Recently, we were asked to suspend all farming activities until after the national elections [referring to the December 2016 presidential and parliamentary elections]. (Interview, 10 May 2016)

Some displaced farmers who were unable to negotiate access to company lands through these backdoor mechanisms were left with no option but to return to portions of the forest that were already rehabilitated through the MTS. Meanwhile, cultivating in these deep hideouts in the forest comes with a key risk of having their crops destroyed during routine forest tours by the taskforce¹¹ of the GFC. A migrant farmer who lamented over his constant inability to renegotiate access to land said:

Four years ago, we were asked to stop farming on a portion of the forest the GFC allocated to us under the taungya Scheme since a new company had taken over the reforestation process. In my case, attempts at renegotiating access to land

under the management of the new company failed. As I speak, there is no other land to go to apart from parts of the forest already rehabilitated by the GFC. [...] This has been the only resort for most of us. Yet, the GFC taskforce keeps destroying our farms (Interview, 16 May 2016)

Despite the general difficulty in renegotiating access and the fact that women were mostly not involved in these land struggles in deeper areas of the forest, the predicament of a 49-year-old widow speaks to a gendered dimension in the gender-differentiated capacity of displaced farmers to renegotiate temporary access to agricultural land through backdoor means:

Since I relocated here with my husband, we lived and farmed in the forest until the company people [referring to a forest investors] came. Even so, my husband was mostly able to obtain a small parcel of land in the forest to sustain us until his demise. [...] Ever since, I have continuously struggled through the seasons to get a meaningful piece of land to cultivate. My children and I are still living in this bush here in the hope of getting some capital in order to go and settle in town (Interview, 12 May 2016).

In spite of the promise of efficiency in forest conservation with private sector involvement, local farmers adjudged private sector forest development activities as relatively more problematic. Most farmers held the opinion that previous state-led initiatives were arguably less restrictive even though they were not entirely immune to problems. The narrative of a 51-year-old displaced migrant farmer contrasts his experiences with the state-led MTS and the current carbon forest plantation development under REDD+. Highlighting how the latter is deepening the plight of smallholder farmers, he observed:

When I came into this community 15 years ago, I obtained land to farm under the taungya scheme while caring for trees planted by the GFC. We farmed under this arrangement for several years until it was rumoured four years ago that some concession of the forest was given to a private company called Mere Plantations Limited. The company asked us to stop farming on the land, cleared the land and started a forest plantation [...]. It is sad that several years since our eviction, more than half of the land still lies vacant with no trees planted. (Interview 11 August 2016)

[Phelps et al. \(2010\)](#) have argued that in the face of challenging capital requirements in forest development, developing country governments tend to revert decentralized forest regimes to meet the conditions of external forest development funding agencies. Eventually the frontiers of forest regulation shift in favour of investors who now make new rules to favour their profit-oriented activities ([Benjaminsen & Bryceson, 2012](#); [Ribot, Agrawal, & Larson, 2006](#)). It is this exclusionary potential of the shift in the mandate for resource 'regulation' [Hall et al. \(2011\)](#) call attention to in their concept of 'powers of exclusion'.

Building on the observation of [Lund et al. \(2017\)](#), we argue that a 'carbon Green Revolution' is underway in the forest belt of Ghana – an agenda whose tenets and underlying politics are geared towards producing forest and greening forest landscapes at the expense local farming livelihoods. The main vehicle for this agenda is the private sector, whose involvement in carbon forest development has not only deepened the agricultural land access challenges that arose in previous state-led reforestation initiatives but created new and more complex ones. Through the REDD+, private capital has now moved into forest landscapes in the ecological sphere and forestlands that were previously under state control have been privatized for carbon forest plantation development activities. By means of these crafty displacements described by [Benjaminsen &](#)

¹¹ These are trained forest guards of the GFC who ensure compliance to forest regulations at the local level. They conduct forest patrols to detect illegal activities and arrest perpetrators (see also [Hansen, 2011](#)).

Bryceson (2012) as 'green grabbing', non-capitalist agrarian forest spaces in the Ghanaian context are being opened-up for capitalist accumulation.

In contrast to the Mexican context where Osborne (2011) finds that smallholder farmers continue to have formal land rights following the uptake of REDD+ and can grow their own carbon-sequestering trees as a source of income, in Ghana, local farmers' rights to forestland under REDD+ are not guaranteed. Even usufruct rights to forestland previously granted by the GFC under state-led reforestation schemes have been truncated and redefined in ways that give private forest investors the 'ultimate' power to make decisions over forest resources with the government now playing a mere passive monitoring role. Beyond the theoretical imagery of perfect integration of local communities and their farming livelihoods contained in policy documents of REDD+, lies in practice, the very traits of capitalism which Marx (1978) describes as preoccupied with creating and expanding capital in ways that engender social relations of production centred on turning people (labour) and the environment into resources. In this emerging carbon green revolution, private sector investment in plantation forestry is giving rise to 'neoliberal forest enclosures' in farming communities which are used to further extend the contours of accumulation into non-carbon spheres.

5.2. Land access ambiguities as avenues for exploitation of smallholder farmers

This paper argues that beyond the widespread land grabs and green grabs engendered by carbon forestry across different geographical contexts (see Asiyambi et al., 2017; Barbier & Tesfaw, 2013; Bumpus & Liverman, 2011; Saeed et al., 2018; Teye, 2013), accumulation under REDD+ in the Ghanaian context has assumed a more complex dimension in which the labour and financial resources of displaced smallholder farmers are further appropriated under exploitative labour relations and backdoor land deals. By displacing local farmers and altering existing land access and labour relations, a conducive atmosphere is further created for accumulation. This resonates with Osborne's (2011) observation that such 'crafty' alterations of the socioeconomic and political context of resource access and control further acts as enclosure mechanisms that constrain the reproduction of rural agrarian livelihoods and determine local farmers' continuous availability and willingness to succumb to exploitative demands in the quest to survive.

Indeed, a growing body of literature highlight various tenure complexities that underscore carbon forestry development in tropical countries (de Aquino, Aasrud, & Guimarães, 2011; Holland et al., 2014; Ickowitz et al., 2017; Phelps et al., 2010; Sunderlin et al., 2014). Unique to the Ghanaian context, the unanticipated halt on smallholder farming that characterized the designation of off-reserve local community lands for carbon forestry, produced uncertainties and new exploitation mechanisms in forest communities. Left at the mercy of private investors, most displaced farmers are sometimes compelled to work through 'middlemen' to negotiate temporary access to forestland. A critical appraisal of these backdoor mechanisms that underlie smallholder farmers' struggle for forestland reveal the crucial but less highlighted mechanism we conceptualize as '*hierarchical corruption*'. This involves a chain of corrupt transactions whereby farmers are compelled to offer inducements to obtain agricultural land 'illegally' either directly from local forest caretakers or on sharecropping basis from other influential natives who also have to 'oil the lips'¹² of forest officials to obtain temporary user rights. Consistent with the obser-

vation of Nel (2015) in the Ugandan context, there is eventually a "blurring of the lines between legality and illegality" where the negative impacts of the 'new carbon rules' are felt disproportionately by relatively less powerful smaller farmers who in this context, bear the burden of pushing through illegal means to gain temporary access to land at exorbitant prices. Lamenting on the exploitation and differential access possibilities that characterize the backdoor land access system, a displaced farmer observed:

These days, to get even temporary access to farmland in the forest you have to pass through an influential person using money. Land in fertile portions of the forest under these companies can be rented as high as 1500 Ghana Cedis [Equivalent to about 350 USD] per hectare for a planting season. [Sighs]. We are really suffering. It is only the rich among us with good connections [referring to networks] who get access to private company concessions. (Interview 4 June 2016)

Further highlighting the frustration and exploitation associated with the current struggles over accessing farmland, another smallholder farmer observed:

My main frustration with the involvement of these private companies is that the very land we were asked to vacate to allow for tree planting is now rented out to their 'favourites' under fraudulent arrangements for farming activities [...] I do not see any special attention being given to tree planting. (Interview 26 July 2016)

Because the lands are transacted on illegal grounds, and paid for by farmers, enhancement of carbon stocks which is the ultimate purpose for the implementation of the REDD+ is rather neglected by farmers who struggle to meet the financial conditions of these illegal leases at the end of each planting season. Even with these informal payments, local farmers are not guaranteed a secure tenure. Farmers alleged that occasionally, investors destroy their farms when they are spotted. A displaced farmer who expressed worry about the uncertainty and insecurity associated with farming on such backdoor basis said:

Even though I paid to farm here this season, I am always afraid of my farm being destroyed if spotted by the GFC taskforce. [Farmer asks rhetorically] how can we produce enough to feed to even think of expanding our farms under this situation? (Interview 12 August 2016)

While we argue that restrictive and 'market-driven' carbon forest plantation development is the foremost and major catalyst for the displacement and eventual exploitation of smallholder farmers in the Ghanaian context, we also draw on Hall et al. (2011) idea of intimate exclusion to highlight that local farmers themselves are agents of exclusion and exploitation under REDD+. In the next section, we demonstrate how relatively richer native farmers deepen the exploitation of poorer migrant smallholders in what can best be described as '*intimate exploitation*'.

5.3. From exclusion to 'intimate exploitation'

Akin to the observation of Holmes & Cavanagh (2016), we argue that neoliberal forest conservation under REDD+ has widened existing inequalities and levelled a disproportionate land access burden on migrant smallholder farmers. There is no doubt that migrant farming has become a key strategy in tackling food insecurity in Ghana (Kuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). Contextualizing the political economy of the study context for instance, it is evident that the local farming population is a microcosm of the national population with smallholder farmers congregating from different parts of the country in search of

¹² A local term used to describe the act of paying inducement to obtain a favour.

fertile lands and better rainfall patterns (Kansanga et al., 2017; Kuuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). That notwithstanding, migrant smallholder farmers who in most cases are escaping the shackles of poverty from resource-poor source regions end up in 'new poverties' of extreme labour and financial exploitation. Relatively wealthier native farmers by virtue of their financial 'muscle' and social networks are able to negotiate access either by being forest caretakers or through backdoor land deals and in turn appropriate the labour of displaced migrant farmers under exploitative sharecropping arrangements. Thus, we argue that these 'new' land and labour relations under the REDD+, tend to favour 'some' but disadvantage 'many'. A migrant farmer recounts his experience:

For the past two years, I have been struggling to access farmland. Just to keep myself in active farming life, I took to share cropping with a native who helped me with this land. Because now it is not only the native landowners we share the farm produce with, but also the local forest caretakers, we end up making losses. (Interview, 10 May 2016)

While under conventional sharecropping practice in southern Ghana two-thirds of the annual farm produce goes to the landowner and the remaining one-third to the farmer, migrant farmers are getting even lesser of the farm produce in the already unfair produce distribution system following the uptake of REDD+. Unlike the conventional sharecropping practice where farm produce is shared between just the farmer and the landowner, current produce sharing arrangements feature 'new actors' mostly middle men and forest guards who work to shelter the farming activities of migrant smallholder farmers in strategic hideouts in the forest. Although there is no generally agreed system of sharing produce under these 'new' sharecropping arrangements that have evolved, most migrant farmers pointed to the fact that they mostly have to settle all other middle men from their one-third share of the total produce after sharing with the key individual from whom they obtained the land. As observed earlier, this exploitation is deepening largely because, the REDD+ in its design, prioritized some smallholder farmers especially cocoa farmers, most of whom either benefited from the 'admitted farms' provision under the REDD+ or are relatively well networked and able to negotiate access to forestlands at the expense of relatively poor food crop growing migrant farmers. Because migrant farmers have no customarily recognized rights to land compared to native smallholder farmers, they often do not grow cash crops like cocoa and therefore did not benefit from the 'admitted farms' provision and the incentives for small-scale cocoa farmers under the REDD+. Another displaced migrant farmer highlights the unprofitable nature of the new labour relations that underscore farming in forest communities saying:

'Since I lost my land, I have been working as a tree planter with a private plantation development company. I also cultivate on a sharecropping basis with a native of a neighbouring community [...]. Despite this current busy hustle, compared to my life prior to displacement, I can hardly make any profit to take care of family needs these days. (Interview, 2 September 2016)

From the above account, it is evident that, the REDD+ has reshaped existing power relations between migrant and native smallholder farmers, which further acts as an avenue for the exploitation of the former by the latter. Rowe (2015) calls attention to the potential adverse impacts of such unbalanced power relations at the local level arguing that all stakeholders may not have equal access to positions of influence in their struggle to leverage benefits or minimize negative impacts from REDD+.

Whereas a formidable alliance by smallholder farmers would be a potential pathway for seeking redress, the differential manoeuvring prospects available to native and migrant farmers have worked against the formation of any such meaningful community-level smallholder farmer movement. A migrant farmer expressed frustration at the futility in repeated efforts to seek redress from the government. He said:

Even in the midst of this suffering, we are not able to form any strong group to get our voices heard by the government. The influential community members who could join us to make this possible are rather benefitting from this situation. [...] The GFC is aware we are suffering like this, yet they are reluctant in intervening (Interview, 2 September 2016).

This farmer's account recalls Asiyanbi's (2016) description of 'tacit evasion of tenure ambiguities' in which efforts to recognize the tenure rights of local people to forest resources especially in migrant-dominated areas has often been evaded by stakeholders. These dynamics are further contextualized in the next subsection.

5.4. Strategic relegation of local communities and emerging unfair benefit sharing approaches

Following Nel (2015), we argue while the state plays a crucial role in the privatization of forest development under the REDD+, there is a 'tacit reluctance' in ensuring the proper integration of farmers into ongoing carbon forestry activities and the materialization of the widely touted positive gains REDD+ 'promises' local communities. The government through the MLNR and GFC is expected to exercise overall regulatory responsibility in the carbon forest development process. In reality however, like smallholder farmers, local community leaders complained about the passive role of the GFC. In the current REDD+ funding arrangement in Ghana, forest investors are given grants and low-interest loans from the FIP for plantation development (see Ministry of Lands and Natural Resources 2014). Because this funding is not comprehensive, and where investors use their own resources, they tend to maintain absolute control over forest concessions with little room for integration of local farming activities. This is consistent with the observation by Sikor, He, and Lestrelin (2017) that such shifts in natural resource governance often engender new regulatory mechanisms that entrench the control of project financiers and eventually skew benefit sharing arrangements in their favour.

As indicated earlier, although the benefit sharing framework for REDD+ has not been finalized, the government of Ghana has already laid out some broad category of benefits to local communities. These include direct benefits from payments to community CREMA funds and provision of inputs to cocoa farmers, and indirect benefits in the form of corporate social responsibility projects. It is rather ironic that carbon forestry activities under the REDD+ have been ongoing for close to a decade and yet no concrete benefit scheme has been concluded by the government. This reluctance has left local communities in uncertainty as to what they are entitled to and from who to make such claims. While the carbon benefit sharing framework is pending, Insaideo et al. (2012) allude to existing benefit sharing arrangements that have characterized the activities of large scale forest investors in off-reserve areas in the High Forest Zone in which 90 percent of total revenue from timber goes to the investor and six percent, two percent and two percent to the landowner, GFC and the adjacent community respectively. Compared to previous state-led landscape reforestation projects such as the MTS in which 40 percent and 10 percent of timber revenue went to farmers and the local communities respectively, it becomes evident that private sector entry has

shaped, and may continue to shape benefit sharing systems to the detriment of local farming communities. A member of the local Unit Committee¹³ described existing unfair timber benefit sharing arrangements saying:

Revenue allocation from forest resources is one of the biggest problems we have had with stakeholders for some years now. It is sad that even today things have even become worse for us. With this new system, our share of timber revenue has decreased. People now resort to other unsustainable backdoor strategies to derive their share from forest resources. (Interview, 12 August 2016)

Traditional leaders lamented about the complex chain of procedures involved in accessing timber revenue and the lack of clarity in terms of which institutions to direct such revenue claims in recent times. A traditional leader said:

Now, even the little timber revenue we are entitled to in recent times is often denied us. Tracing it becomes difficult as we are often tossed up and down in bureaucratic arrangements. We do not even know whether to approach the GFC or private forest companies for benefits. (Interview, 20 August 2016)

Consistent with Hall et al. (2011) typology of 'powers of exclusion', we argue that, the emerging relegation of local communities in forest management is largely due to two powers of exclusion: legitimation and market. By legitimizing itself over community forest resources through statutory provisions that allow the acquisition of community forest lands, the state, in turn leases some of these lands to private investors to develop forest plantations thereby opening community forest resource spaces to capitalist accumulation. Local people end up having no opportunity to plant their own carbon trees and engage meaningfully in the carbon market and more critically, reproduce themselves as smallholders. While researchers and policy makers are still fascinated about the 'hungry farmer paradox' in SSA including Ghana, we stress that under the prevailing carbon forestry regime, the food insecurity situation will worsen if these tenure ambiguities are not promptly addressed.

6. Conclusions and recommendations

The political economy of REDD+ in the Ghanaian context exhibits a set of complex processes, namely displacement, exploitation and corruption. These processes work interactively to distort traditional agricultural land and labour relations in local forest communities. Carbon forest plantation development facilitated corporate control over forest community lands and reinforced the marginalization and exploitation of migrant smallholder farmers in the High Forest Zone. REDD+ activities facilitated the crafty appropriation of the labour and financial resources of migrant farmers under unfair sharecropping arrangements and backdoor land deals by their native counterparts who act as middlemen. The politics of the implementation of the 'admitted farms' provision which provides for the integration of local farming activities into ongoing REDD+ projects, favoured native farmers who possess customarily recognized user rights to community lands to the neglect of migrant farmers who have no stake over community lands. These migrants, most of whom 'escaped' to the forest belt in search of better farming conditions are rather caught up in 'new webs' of poverty and food insecurity as they struggle to reproduce themselves.

These complex political economy dynamics especially the dispossession and exclusion of relatively poorer migrant farmers in

the Ghanaian case, points to the fact that even in the context of general resource access constraints under REDD+, the magnitude of adverse impacts may not be the same for all actors at the local level. The ongoing *hierarchical corruption* and *intimate exploitation* of non-native farmers in the Ghanaian context add a salient extension to Hall et al. (2011) typology of intimate exclusion. Beyond exclusion lies an opportunity for intimate exploitation whereby even among the same category of farmers, relatively powerful groups such as native farmers, tend to deepen the exploitation of their migrant counterparts.

This paper calls for an alternative forest management regime that reconciles local farming activities and forest conservation in a manner that guarantees local people's rights to land and forest resources. We recommend a radical restructuring of the current carbon forest regime away from viewing forest landscapes as 'global resources' to viewing them as 'territories' (McCall, 2016) in order to properly situate and legitimize the entitlements of forest communities. Rather than centralizing community forest lands and carbon rights in the hands of the state and a few forest investors, we call for a Community Forest Management approach (see Agrawal & Angelsen, 2009) in which local communities will lead the implementation of forest conservation activities. Returning forest lands to local communities has the potential to resolve most of the adverse outcomes of REDD+. As demonstrated in our findings, the increased exploitation of food insecure migrant farmers is connected to the widespread displacement and eventual change in conventional labour relations between native and migrant farmers.

We make this recommendation on the premise that apart from the so-called direct and indirect benefits promised local communities under the REDD+, local food production is a fundamental priority that should never be neglected for conservation gains. Indeed, there is mounting evidence that local people, through indigenous knowledge systems, can lead carbon forestry activities in ways that sustainably integrate local livelihood activities and forest conservation. Community-led carbon forestry will therefore promote food security and ensure that local people benefit directly from carbon revenue. While we make this seemingly radical recommendation, we are cognizant of the fact that solutions to the current complexities from the uptake of REDD+ are not forthright. That notwithstanding, a good starting point for repossessing customary lands especially in off-reserve areas, will require rigorous community action and advocacy at the grassroots level to seek redress.

In SSA in particular where the diverse land administration systems feature a range of actors including states, transnational corporations, and unique tenure arrangements, it is very crucial for the design and implementation of REDD+ projects to go beyond the universalized expectation that local people will always benefit from carbon forest investments. Stakeholders must therefore hold context very important and understand existing land tenure dynamics in order to align carbon forestry goals with local community needs. Considering the longstanding 'tacit evasion' of tenure ambiguities in local communities by the government of Ghana following the uptake of REDD+, we recommend that the UNFCCC in vetting carbon forestry applications from countries should clarify in detail the prevailing land tenure dynamics, and require governments to make the necessary provisions in cases where local people's rights to forest are not guaranteed. Indeed, environmental conservation and food security are both central to the Sustainable Development Goals, hence the need to pursue them in a coordinated manner. It is important for stakeholders to recognize that a 'hungry' and 'poor' population will not support sustainable environmental conservation and climate change mitigation. Notwithstanding these policy recommendations, political ecologists must actively engage the aggressively changing nature of accumulation engendered by REDD+.

¹³ Local Unit Committees are part of the decentralized governance system in Ghana. Members are elected from the local community to facilitate local level development.

7. Conflicts of interest

None.

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The REDD menace: Resurgent protectionism in Tanzania's mangrove forests

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ABSTRACT

Reduced Emissions from Deforestation and Degradation (REDD+) is being proclaimed as “a new direction in forest conservation” (Anglesen, 2009: 125). This financial incentives-based climate change mitigation strategy proposed by the UNEP, World Bank, GEF and environmental NGOs seeks to integrate forests into carbon sequestration schemes. Its proponents view REDD+ as part of an adaptive strategy to counter the effects of global climate change. This paper combines the theoretical approaches of market environmentalism and environmental narratives to examine the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania to make mangrove forests amenable to markets. Through a case study of a “REDD-readiness” climate change mitigation and adaptation project, we demonstrate how a shift in resource control and management from local to global actors builds upon narratives of environmental change (forest loss) that have little factual basis in environmental histories. We argue that the proponents of REDD+ (Tanzanian state, aid donors, environmental NGOs) underestimate the agency of forest-reliant communities who have played a major role in the making of the delta landscape and who will certainly resist the injustices they are facing as a result of this shift from community-based resource management to fortress conservation.

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1. Introduction

Reduced Emissions from Deforestation and Degradation (REDD+) is a financial incentives-based climate change mitigation initiative designed to compensate national governments and subnational actors in return for demonstrable reductions in carbon emissions from deforestation and degradation and enhancements of terrestrial carbon stocks (Agrawal et al., 2011). This paper examines this “new direction” (Anglesen, 2009) in carbon forestry by analyzing the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania, to be amenable to markets. We investigate the environmental narratives that inform a case study of World Wide Fund for Nature (WWF) and Tanzanian

state carbon forestry projects¹. These narratives portray local resource users, the Warufiji, in negative terms as recent migrants who are destroying the mangrove forests. This mistaken view forms the basis of a resurgent protectionism which aims to expel the

¹ The Rufiji Delta is listed as a WWF Tanzania REDD readiness site for REDD pilot projects, <http://www.reddtz.org/images/110310/a%20map%20showing%20pilot%20areas%20for%20redd%20activities.pdf> (Accessed on 30 November 2011). For a map showing approximate location of REDD related civil society actors (e.g. WWF) in the Rufiji Delta, Tanzania, see United Republic of Tanzania, October 2010, National REDD Information and Communication Strategy 2010-2012, (p. 46), [http://www.reddtz.org/images/Indepthstudy/redd information and communication strategy.pdf](http://www.reddtz.org/images/Indepthstudy/redd%20information%20and%20communication%20strategy.pdf) (Accessed on 30 November 2011). The TZ-REDD Newsletter (Issue 5, September 2011, pg. 14) states “WWF has conducted awareness-raising campaigns on the REDD project in Mbeya, Iringa, and Rufiji Districts” see <http://www.tnrf.org/files/REDDNewsletter5.pdf> (Accessed on 30 November 2011). For the contract between the Norwegian Ministry of Foreign Affairs and the WWF Tanzania Country Office that is “one of nine REDD+ pilot projects undertaken by NGOs under the Tanzania-Norway partnership” with reference to the Rufiji Delta, see http://www.norway.go.tz/PageFiles/253880/WWF_contract.pdf (Accessed 30 November 2011). Information on WWF’s “Building Mangrove Resilience” project in the Rufiji Delta can be found at <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed on 30 November 2011).

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Warufiji from lands they have occupied for millennia (Havnevik, 1993; Chami and Mswema, 1997).

Carbon forestry management plans have so far assumed that “forest” is a clearly understood category (Noordwijk and Minang, 2009). We argue that current forest definitions within the context of REDD+ do not take into consideration the environmental history or the agency of forest-reliant communities in the making of forested landscapes. We seek to demonstrate how the Rufiji Delta is a socio-natural landscape shaped by past and present resource management practices, a “forest” definition that complicates the prevailing narratives that inform carbon forestry management.

At the center of our critique is the framing of the “environmental problem” in which the Warufiji are depicted by foresters, environmentalists, and donors as poor stewards of the mangrove forests. We argue that this representation builds upon a “misreading” of the human–environmental history of the Rufiji Delta (e.g. Fairhead and Leach, 1996; Forsyth and Walker, 2008). Our counter-narrative provides an alternative environmental history that presents the Warufiji in a very different light. It also highlights the politics of environmental knowledge in which carbon forestry is presented as a “sustainable” alternative to indigenous resource management practices which are demeaned as “destructive” and “illegal”. We suggest that a major consequence of this ahistorical framing is a paradigmatic shift in natural resource conservation from community-based natural resource management (CBNRM) to fortress conservation, a shift that has been aptly called “resurgent protectionism” (Adams, 2009; Forsyth and Walker, 2008; Wilshusen et al., 2002). The protectionist conservation paradigm views human use of nature as inimical to biodiversity conservation and by extension to carbon storage. This normative view contrasts with more recent approaches that assume that human–environmental interactions can produce sustainably utilized environments (Zimmerer, 2006; Bassett, 2010).

Climate change mitigation plans for the Rufiji Delta currently focus on the anticipated impacts of climate change (sea-level rise) for a particular biophysical exposure unit (mangrove forests) that needs to be offset by adaptation and mitigation strategies to enhance the resilience of that biophysical unit (mangrove reforestation) (O'Brien et al., 2007). Within the context of the Tanzanian state and WWF's climate change “adaptation strategy” (Cook, 2009), mangrove reforestation reduces the ability of Rufiji farmers to cultivate rice for subsistence needs and thus poses a direct threat to their livelihoods. Indeed, after the forests are made more “valuable” for the carbon market (“REDD ready”), the Tanzanian state plans to relocate villagers out of the delta². Although current REDD+ policy frameworks do not explicitly seek to exclude people from living in forests or utilizing forest resources, the proposed eviction plan for the Warufiji is one portentous example of how human rights may be subservient to the monitoring and verification requirements of carbon forestry. The removal of the Warufiji³ “simplifies” the mangrove forests in order to make levels of carbon sequestration “legible” for carbon markets (Scott, 1998). We illustrate how this shift from a CBNRM to an ecosystem-centered vulnerability approach for forest conservation supersedes priorities that seek to balance livelihood

and environmental concerns. In the ecosystem-centered vulnerability approach, the concern with sustainable livelihoods and social vulnerability are of secondary importance.

Our goal in writing this paper is to draw attention to the potential for “lose–lose” scenarios of climate change mitigation and adaptation projects that fail to integrate environmental justice concerns with conservation priorities. This is important as the success of carbon forestry hinges on the compliance of local populations to new power relations implicit in REDD+ policies. We argue that forest-reliant communities will resist these policies to the extent that they undermine local livelihoods and are viewed as unjust. Local resentment and resistance will increase to the extent that carbon forestry projects marginalize those communities that live in proximity to and depend on key resource areas. Resource users in developing countries throughout the world are beginning to organize and demand access to land and their right to a decent livelihood (Perfecto and Vandermeer, 2008). The Warufiji are no exception. They have a history of fiercely resisting claims on their resources and labor by outsiders. By highlighting the environmental historical role of the Warufiji in the making of the delta landscape, we provide insights into the opportunity for local resource users to contribute to the creation of an agricultural and forestry matrix that is socially just and politically stable and that has the potential to conserve biodiversity in the long run (Perfecto and Vandermeer, 2008).

This paper discusses the implications of market-oriented conservation approaches that may threaten equity-oriented projects and the environmental justice dimensions to climate change despite its “rights-based and participatory approaches” (Anglesen, 2009). REDD+ threatens to shift control and management of natural resources from local to national and global actors. REDD+ may also have an unintended consequence of undermining decentralized forest management in Tanzania and elsewhere (Phelps et al., 2010). Our counter-narrative seeks to provide insights into natural resource management alternatives that are more socially just, desirable, and feasible. These alternatives are desirable because they have the potential to address conservation goals and feasible because the environmental history of the Northern Rufiji Delta illuminates the possibilities for sustainably utilized environments.

2. Theoretical approach

The remaking of human–environmental relations for REDD+ in the Rufiji Delta is an ambitious project that involves conceptualizing forest use in ways that are amenable to carbon markets. It entails a significant turnaround in conservation thinking where ecosystem health is prioritized over multiple land-use policies in which local communities assume some resource management authority. Before showing how this “new direction in forest conservation” (Anglesen, 2009) is unfolding in the Rufiji Delta, we introduce two key concepts that inform our theoretical approach: market environmentalism and environmental narratives.

2.1. Market environmentalism

Market environmentalism is the recognition that “nature” (as transformed into raw materials or resources) can be a key constraint on or opportunity for the location and organization of economic activity (Jonas and Bridge, 2003). Production processes based on the use of natural resources pose both obstacles and opportunities for capital and reveal the contradictory political-economic dynamics that shape everyday landscapes through which nature is produced, consumed, and regulated (Henderson, 1998; Jonas and Bridge, 2003). In its production and commodification, nature is enclosed, measured, and given market value (Lovell et al., 2009). This increasing incorporation of ecological conditions into global circuits of capital accumulation via

² Eviction plans are discussed in the “Report of the Meeting of the Division of Forestry and Bee-Keeping with Councillors, Executive Officers of the Wards and Villages in the Wards of Salale, Mtunda, Maparoni, and Ruaruke in Rufiji District” held in Nyamisati on 3 November 2009 (Personal communication, January 2010). See also “Government Issues Eviction Order to Forest Invaders” *Bilham Kimati in the Tanzania Daily News*, 29 January 2011.

³ For an update see, “Villagers Evicted from Mangrove Site” Finnigan Wa Simbeye, *Tanzania Daily News* 30 October 2011, <http://dailynews.co.tz/home/?n=25016&cat=home> (Accessed on 30 November 2011) and “WWF Fears Backlash on Rufiji Delta Mangrove Forest Initiative” Finnigan Wa Simbeye, *Tanzania Daily News* 14 November 2011, <http://www.dailynews.co.tz/business/?n=25497&cat=business> (Accessed on 30 November 2011).

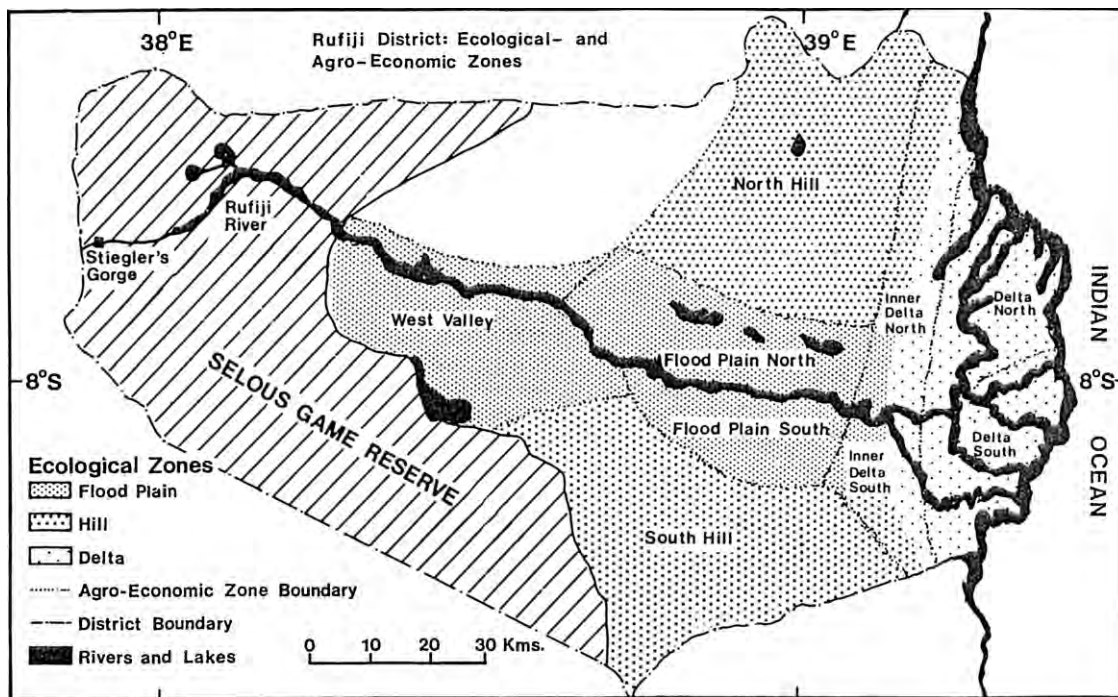


Fig. 1. Ecological and Agro-Economic Zones of the Rufiji District, Tanzania.
Source: Havnevik (1993). Used with permission of the author.

production and commodification has been referred to as “green capitalism” (Prudham, 2009: 1596). An example of green capitalism is the creation of markets for environmental services which effectively turn ecological processes and products into commodities that can be sold. Within this process the important question is not what a commodity is, but rather, what kind of characteristics do things take on when they *become* commodities (Castree, 2003: 277).

Green capitalism approaches view nature and society as conceptually distinct in the context of conservation (McAfee and Shapiro, 2010). It then reconnects them by subsuming ecology within the market economy (McAfee and Shapiro, 2010). The “splitting” of complex ecosystems simplifies them into legally definable and economically tradable property rights (Castree, 2003). This is particularly true for carbon markets. Carbon markets are one of a line of conversions of parts of nature into tradable commodities, including water, biodiversity, fish, and wetlands (Bumpus and Liverman, 2008).

For carbon to be exchanged and generate revenue, carbon reduction must be turned into a tradable commodity (Bumpus and Liverman, 2008). Offsets are generally commodified into saleable units through development of specific emission–reduction projects, the outputs of which can be quantified, owned and traded. Examples include the management of forests specifically to sequester carbon (Bumpus and Liverman, 2008). Complex forest ecosystems must be simplified into discrete processes and objects in order to define, standardize, and universally agree on their carbon content (Boyd, 2009). In the process, a fictitious commodity (Polanyi, 1944) is created in the form of “carbon credits” that are generated from emission reductions and international investments in emission reduction projects (Liverman, 2009).

In the course of “selling nature to save it” (McAfee, 1999), elite political and economic actors wield considerable power in negotiating prices and regulating market participation (Liverman, 2004). Many indigenous groups in the global south criticize carbon sequestration projects for their simplified portrayal of terrestrial systems and lack of information on the socio-economic, political, and institutional implications of carbon sequestration (Boyd,

2009). One concern is that carbon trading will allow the global North to maintain high levels of resource consumption by paying southern communities a pittance for offsetting carbon emissions generated by inefficient industries (Liverman, 2009).

2.2. Environmental narratives

The analysis of environmental narratives is a useful approach to examine the ways environmental issues are framed by showing how and why environmental problems are defined the way they are (Taylor and Buttel, 1992). An environmental narrative is a simplified explanation of cause and effect relationships that assigns roles to different actors who are implicated (or not) in an environmental problem. They are stories that simultaneously simplify and stabilize complex and uncertain processes such as “deforestation causes biodiversity loss” (Forsyth and Walker, 2008). Narratives influence the questions asked, the knowledge produced, and the policies and responses that are prioritized (Forsyth, 2003; O’Brien et al., 2007). They also reveal much about the politics of environmental knowledge (Boyd, 2009; Forsyth and Walker, 2008). The knowledge that informs environmental narratives is always conditioned by values, power relations, and institutional histories and commitments. Knowledge production is highly selective in terms of who participates in problem definition and policy making (Scoones, 2009; Forsyth and Walker, 2008). Like all narratives, environmental narratives shape popular perceptions and appeal to policy makers seeking simple solutions (Forsyth and Walker, 2008). It is important, therefore, to consider the broader contexts of legibility and simplification, as well as the political economic conditions that give form and meaning to narratives (Scott, 1998; Watts, 2002).

The case study of the Rufiji Delta contributes to a growing body of literature that illustrates how powerful political interests have embraced the neoliberal project of market environmentalism and employ environmental narratives to design an international response to climate change (Liverman, 2009). As states and international environmental NGOs act on these narratives, these stories transmute into “received ideas” (Leach and Mearns, 1996) and have real effects for local resource users. Mangrove carbon

forestry projects in the Rufiji Delta illustrate these dynamics. Environmental narratives that label human activities as “unnatural” and that portray landscapes in ahistorical terms as pristine or “Edenic” in which nature is emptied of humanity but filled with wildlife and vegetation are used to vilify local subsistence level resource users as mangrove “destroyers” and “invaders” (Neumann, 1998; West et al., 2006). In the following sections, we argue that the Tanzanian state and WWF’s portrayal of human–environmental relations represents a misreading of the environmental history of the Rufiji Delta. In contrast, we offer an historical account that portrays both the landscape and people in a very different light.

3. Rufiji Delta, Tanzania case study

The Rufiji Delta contains the largest continuous block of estuarine mangrove forest in Africa, and is of considerable economic and conservation importance (Bryceson, 2002). Our focus is on carbon forestry projects in the northern Rufiji Delta islands, referred to as the Rufiji Delta North (Fig. 1). Observations and semi-structured interviews in Rufiji Delta villages (mainly Mshinzi and Mchele⁴), with the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT), and WWF Tanzania representatives during doctoral dissertation fieldwork from 2008 to 2009, as well as continual communications with villagers through 2010, inform the case study.

3.1. Mangrove forest governance

All of Tanzania’s mangrove forests have protected status. The Forest Ordinance of 1957 allowed for the creation of forest reserves by government decree after considering any objections by interested parties to this de jure transfer of rights from local communities to the state (United Republic of Tanzania, 1994). The FBD of the MNRT is currently responsible for mangrove forest management. The Tanzanian state has repeatedly used its authority over mangrove forests to exert control over Rufiji Delta communities and resources. For example, on September 2, 1987, the Forestry Division declared a ban on the cutting of all mangroves in the northern Rufiji Delta (Semesi, 1992). To enforce this ban, the state trained and posted forest officers to the area. The 1998 National Forestry Policy was replaced by the 2002 Tanzania Forest Act which forbids any person, without a license or other lawful authority, to cut, burn, or damage mangrove trees in the forest reserve area. This includes a ban on the expansion or opening of new rice farms (Semesi, 1991). Further, the Mangrove Management Plan established in 1991 designates the majority of the north Rufiji Delta mangroves as “total protection zones” which legally restricts forest access to scientific uses and protective functions only (Semesi, 1991). These restrictions remain in force today.

In addition to employing forest guards to enforce its policies, the Tanzanian state established agreements with forest communities to jointly manage the forest reserves. In 1998, the FBD initiated a joint management agreement (JMA) with villages in the Rufiji Delta North Mangrove Forest Reserve (Akida and Blomley, 2006). Communities are divided into villages, which are managed by elected village councils (Blomley et al., 2010). The 2002 Forest Act recognizes two different types of participatory forest management (PFM) (Blomley et al., 2010). The first is community-based forest management (CBFM) that enables village-level communities to establish village, group or private forest reserves on village land in which communities are both forest owners and managers. The second type is joint forest management (JFM) which takes place on reserved forest land that is owned and managed by

the national or district-level governments (typically managed by the FBD). With the state and potentially other forest owners, village-level elected councils and environmental council representatives can sign joint management agreements (JMAs) for sharing the costs and benefits and responsibilities of forest management. Under this arrangement, village-level elected councils are “co-managers” of forests otherwise owned by the district or national governments. In theory, village governments have primary protection and management responsibility of the forest. The Forest Act of 2002, however, does not explicitly state how benefits of forest management under JMA are to be equitably shared with participating communities (Blomley and Iddi, 2009).

In Tanzania, research shows that there are few tangible benefits to villages participating in JMAs, especially in areas of high conservation value (e.g. Vihemäki, 2009 citing Kajembe et al., 2005; Blomley and Ramadhani, 2006). The paradox of the JMA project in the Rufiji Delta is that JMAs are presented as promoting “community participation” with Warufiji villagers, while at the same time the FBD prosecutes these same forest users for planting rice (Bryceson et al., 2005). For example, many Rufiji farmers were restricted from accessing JMA areas to grow rice because of mangrove reforestation policies. Rufiji villagers argue that this restriction has created conflicts and deprived them of their livelihoods (e.g. Bryceson et al., 2005; Akida and Blomley, 2006). Villagers also stated that the FBD now bears the sole responsibility of distributing licenses for logging mangrove poles. Villagers complain that their role as co-managers of forests is not taken seriously:

“We still have no say in how our forests are managed. The foresters still come here, fine us, and put us in jail if we are caught cutting mangroves for our rice fields. (JMA) agreements did not change things for us because we are still restricted from using the forests” (Personal communication, October 2010).

Despite their presence within the delta for over 2000 years, the existence of ancestral burial grounds, and villages that have been formally registered (NEMC, 1997), the Warufiji’s land rights remain highly uncertain. According to the Forest Ordinance of 1957, the Warufiji are regarded as “squatters” as they are occupying land declared as Forest Reserves (NEMC, 1997). Land tenure insecurity in Tanzania is further compounded by the National Land Policy (1995) which explicitly states that the President owns all land in Tanzania in trust for present and future generations and that the state can dispossess customary owners for “public interest” because land is “public property” (Shivji, 2006). Within forest reserves, the Director of the FBD recently stated that villages were registered “illegally and that directives have already been issued for the Commissioner of Lands and respective district councils to de-register the villages according to the Forest Act Cap 323 as revised in 2002” (Rugonzibwa, 2009).

3.2. REDD ready in Rufiji: climate change programs and proposals

The Rufiji Delta mangrove forests have attracted international attention for their conservation importance. The International Union for the Conservation of Nature (IUCN) designated the forests as part of the Rufiji-Mafia-Kilwa Ramsar wetland site in 2004 (IUCN, 2004). At the same time, WWF initiated the Rufiji-Mafia-Kilwa Seascape Program (RUMAKI) (WWF Tanzania, No Date). The RUMAKI Program aimed to address the “fundamental links between environment and poverty and between biodiversity conservation and sustainable livelihood development.”⁵ Initial

⁴ To protect our research subjects, we have changed the names of individuals and communities discussed in this paper.

⁵ See WWF Rumaki, Kilwa, Rufiji Seascape Programme Tanzania Factsheet, July 2004–June 2009, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011).

program goals included the “improved socio-economic well-being of coastal communities through sustainable, participatory, and equitable use and protection of their marine and coastal natural resources.”⁶

WWF recently shifted its emphasis in the Rufiji Delta from conservation-with-development to conserving ecosystem health, in which the human development component is significantly diminished.⁷ With funding from the Global Environmental Facility and the United Nations Environment Program, WWF has created a climate adaptation project called “Coastal Resilience to Climate Change” (Cook, 2009). For this project, WWF is working directly with the FBD (Cook, 2009).

This WWF mangrove conservation program is premised on the urgent need to improve the management and protection of mangroves, which are described as “the most critically threatened ecosystem in the world” (Cook, 2009). The program aims to “protect mangrove forests from the impacts of climate change, particularly sea level rise” (Cook, 2009). Project goals are to assess the vulnerability of mangroves to climate change impacts, and to develop and promote adaptation strategies that respond to these impacts (Cook, 2009). Adaptation strategies include reforestation with “climate smart” mangrove species (Cook, 2009). Project documents declare that one of the main “threats” to the mangroves is rice farming by local people (Cook, 2009).

To prepare for climate change, WWF is working directly with FBD officials at national and district levels to “replant and restore mangrove habitats degraded by illegal rice farming” in the Rufiji Delta North (Cook, 2009). District level WWF “adaptation coordinators” oversee and enforce mangrove reforestation in the Rufiji Delta North (Personal communication, FBD, January 2010). The FBD has been involved in mangrove reforestation in the Rufiji Delta since the establishment of the Mangrove Management Plan (Semesi, 1991). Some villagers describe the mangrove planting scheme as a long standing “tug of war” between themselves and the FBD. Renewed interest by WWF in the Rufiji Delta has intensified mangrove reforestation as a climate change adaptation strategy (Cook, 2009). The “Building Mangrove Resilience” reforestation project includes villages within the Delta North (Fig. 1). Many Rufiji Delta rice farmers stated they are resisting this mangrove reforestation project, particularly in their rice farms, by planting mangrove seedlings upside down or not planting them at all. Some villagers stated that they refused to plant mangroves because they were not given the choice. Villagers declared “tulilazimishwa” in Kiswahili, which translates to “we were forced or obliged” English (Awde, 2000) to plant mangroves. The consensus in one village, Mshinzi, is a formal “rejection” against the mangrove planting project. In another village, Mchele, the village leadership agreed to the project and a small number of villagers participate. The majority, however, are against the project. This reluctant group stated they would consider participating in mangrove planting project as long as they are able to continue rice cultivation, but most refuse to comply.

One villager stated, “How can they [WWF adaptation coordinators and the FBD] tell us to stop planting rice? We are hungry because they have taken away our daily bread.” WWF is aware of the Warufiji’s resistance to previous mangrove reforestation efforts as illustrated in a quote by a Warufiji rice farmer in a 2002 WWF publication, “We are really surprised by this government, we do not know what they are thinking about us.

We are required to plant mangroves in our paddy farms; will they send us food in the future?” (Wood et al., 2000: 320). Directly prior to the 2010 national Tanzanian elections, villagers from Mshinzi stated that mangrove reforestation strategies suddenly changed and they were given the choice to plant mangroves (Personal communication, October 2010). Meetings were held in Mshinzi village and elders warned that the handing out of small funds for planting mangroves was a “common tactic prior to elections” and “after the elections, things will change, and they [the FBD and WWF adaptation coordinators] will be against us [the villagers]” in terms of impeding villagers from farming rice. The village government and environmental council in Mshinzi stated that their decision to object to the project was superseded by higher authorities at the district level. The JMA co-management agreement exemplifies what Chhatre (2008) calls weak political “articulation” reflected in a lack of devolved power for decision making to representative and accountable local actors (Agrawal and Ribot, 1999).

In contrast to the WWF RUMAKI program’s emphasis on poverty alleviation through CBNRM, new carbon forestry management plans are threatening to deepen poverty through dispossession. The Rufiji Delta is listed as one of six WWF Tanzania REDD readiness sites for REDD Pilot Projects.⁸ REDD+ strategies for Tanzania list the “enhancement of state reserve lands” as a way to reverse the “drivers” (e.g. cultivation) of forest deforestation and degradation.⁹ This is exemplified by the FBD’s plans to begin a process of relocating rice farmers out of the delta.¹⁰ The Director of the FBD made a statement in September 2009 that villagers residing in Tabora and Rukwa regions of coastal Tanzania will be evicted for invasions of forest reserves (Rugonzibwa, 2009). The Deputy Minister of MNRT also stated that “eviction exercises will later spread to the rest of the forest reserves countrywide and all settlers in forest reserves would be moved as stipulated by the law” (Rugonzibwa, 2009). Current plans are for farmers to plant trees in areas previously used for rice cultivation until they are relocated out of the delta (Personal communication, January 2010). This will result in evictions of more than 18,000 Rufiji Delta North village residents (Fig. 1).

In order to minimize the political fallout over the controversial eviction plans, the timing of relocations was on hold until the conclusion of the national elections in October 2010¹¹ (Personal communication, December 2009). In the meantime, the FBD and WWF adaptation coordinators organized meetings with villagers in the northern Rufiji Delta to “sensitize” them to the relocation project (Personal communication, January 2010). The FBD informed villagers of “what the consequences will be and how severe they will be” (Personal communication, December 2009). In response to the “sensitizing campaigns,” village elders stated that they were trying to find documentation of their formal objections to the designation of the mangrove forests as Forest Reserves in 1957. Although village elders state that they “were not listened to at that time and there was no outcome,” such documentation is needed to mount a legal case in Tanzanian courts against planned evictions.

We argue that the objective of WWF’s carbon forestry projects¹² and the Tanzanian government’s eviction plans are to make the Rufiji Delta “REDD ready” (Tanzanian REDD Initiative, 2010). The

⁸ See footnote 1, “WWF Tanzania’s REDD Pilot Projects Sites” and related documents.

⁹ Tanzania’s National REDD Strategy Development: Supporting REDD Readiness in Tanzania, November 2009, http://www.reddtz.org/component/option,com_docman/task,doc_download/gid,22/Itemid,18/. (Accessed on 30 November 2011).

¹⁰ See footnote 2, “Report of the Meeting” and “Government Issues Eviction Order to Forest Invaders.” For an update, see footnote 3 “Finnigan Wa Simbeye Tanzania Daily News.”

¹¹ In January 2011, the FBD issued a two-week eviction order to all “invaders of reserved forests countrywide” including the Rufiji Delta (Kimati, 2011). For an update, see footnote 3 “Finnigan Wa Simbeye.”

¹² See footnote 1 carbon forestry programs.

⁶ See footnote 5, “WWF Rufiji, Mafia, Kilwa Seascape Programme.”

⁷ Compare the WWF RUMAKI Seascape project, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011), with the WWF “Building Mangrove Resilience” project, <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed 30 November 2011).

main donor for REDD+ in Tanzania is Norway which has committed Nkr 500 million towards the formulation and implementation of a national REDD+ strategy in Tanzania over the next five years. The FBD of the MNRT, with technical support from the Institute of Resource Assessment (IRA), is responsible for coordinating aspects of REDD+ and REDD-readiness activities (Tanzanian REDD Initiative, 2010). The role of WWF in Tanzanian REDD+ projects is outlined in REDD+ project documents, which state that “WWF can have a key role to play in supporting the implementation of the [REDD] strategy”¹³ and “existing NGOs, may be in charge of overseeing the fair distribution of REDD+ funds through village level bodies in Tanzania” (Chiesa et al., 2009: 7). The threat of evictions and loss of access to important resources for livelihood security is another example of how international conservation interests can either directly or indirectly legitimate the state’s use of “force” in resource management and contributes to the disenfranchisement of the Warufiji’s resource claims (Peluso, 1993).

Tanzania is often heralded as the vanguard for local democratic forest resource management, due mostly to its decentralized state institutions (Blomley et al., 2010). Accordingly, Tanzanian REDD+ policies are currently being designed on existing forest management strategies such as joint forest management agreements (JMAs) (Burgess et al., 2010). However, we show how devolved decision-making in policy discourses do not necessarily lead to justice and equity in terms of resource access and actual local-level decision-making. Critiques of decentralized resource governance in Tanzania, particularly within the wildlife sector, are numerous and well documented by a number of scholars (Neumann and Schroeder, 1999; Igoe and Croucher, 2007; Igoe and Brockington, 1999; Goldman, 2003). This case provides a cautionary note for any REDD+ project modeled after a decentralized forestry scheme that is not decentralized in practice. It is a serious shortcoming in the context of REDD+ programs in Tanzania and elsewhere (Thomas and Twyman, 2005).

It is difficult to reconcile Tanzania REDD’s participatory and benefit sharing goals (United Republic of Tanzania, 2010; Tanzanian REDD Initiative, 2010) with the rhetoric, practices, and plans of the Tanzanian state. Indicative of the contradiction between REDD+ policy and Tanzanian forest management is the statement made by the Director of Forestry and Beekeeping Department in November 2009, “I am here to make sure that forests are protected and therefore I will not wait to see these forests turning into deserts and we will do all we can, including the use of force, because for such a serious matter as this one, we do not need negotiations” (Saiboko, 2009).

If REDD+ programs genuinely seek to apply “rights-based and participatory approaches” in practice, then forest-reliant communities’ calls for land tenure security and the development of compliance procedures and accountability mechanisms for its activities in Tanzania must be addressed (Griffiths, 2009). These same communities have been unable to benefit from payment for ecosystem services, such as Clean Development Mechanisms, because their land rights are not legally recognized (Blomley et al., 2010; Yanda, 2009). Therefore, the ambiguity around land tenure in forest reserves in Tanzania such as the Rufiji Delta legitimates concerns over scaling up REDD+ before land tenure is clarified (Sunderlin et al., 2009). In order for villagers to receive compensation directly from REDD+, the “legal quagmire” (Homewood, 2006 citing Shivji, 1994) of land tenure in Tanzania, particularly within Forest Reserves, must be addressed.

3.3. Environmentalists’ narrative of the Rufiji Delta

The conceptualization of carbon forestry projects in the Rufiji Delta builds upon a narrative of environmental change that is shared by international conservation organizations, the Tanzanian state, and aid donors. In this section, we present the common elements that frame this narrative. In the following section we offer an alternative reading of environmental history. Both the narrative and counternarrative demonstrate the centrality of politics and political economy in the framing of environmental problems and solutions.

The environmental narrative used by WWF and the Tanzanian state to support their carbon forestry activities pivots around the problem of adaptation to climate change (Cook, 2009; Wagner and Sallem-Mtui, 2010). The narrative has two major parts. The first is future oriented and predicts that a main consequence of global climate change will be a rise in sea level. The second part underscores the importance of maintaining the integrity of mangrove forests as both a bulwark against rising sea levels as well as to preserve biodiversity. The main problem in preserving the forests and its biodiversity is the presence of people who are viewed as “invaders” and “destroyers” of mangrove forests. Biodiversity loss is attributed primarily to illegal rice cultivation (Cook, 2009).

WWF project documents indicate sea level rise as the main climate change threat to mangrove forests in the Rufiji Delta (Cook, 2009; Wagner and Sallem-Mtui, 2010). The 2007 Intergovernmental Panel on Climate Change (IPCC) estimates a rise in sea level of 18–59 cm by the year 2100 (IPCC, 2007). The impact of sea level rise in the Rufiji Delta could be the loss of coastal habitats as a result of flooding and erosion, and the loss of biological productivity (Ngusaru et al., 2001; Wagner and Sallem-Mtui, 2010). Since mangrove forests are widely viewed as buffering the coasts from higher seas and storms, their preservation is a top climate adaptation priority.

The narrative of causality also paints a picture of relatively recent immigration and forest degradation in the north delta area. “In the past,” the people of the Rufiji Delta cultivated rice in the Rufiji valley flood plain (Ngusaru et al., 2001). After the “devastation” that occurred from a massive flood in 1968,¹⁴ when the Rufiji river level rose by ten feet, President Nyerere ordered the relocation of flood plain communities to the northern part of the delta. This resettlement program was known as the villagization campaign “Operation Rufiji.” The displaced farmers purportedly began clearing mangrove forests to “adapt rice farming in new areas in response to this rather adverse situation” thus causing a new and major threat to the mangrove forest in the Rufiji Delta North (Ngusaru et al., 2001: 10; Wagner and Sallem-Mtui, 2010: 7). The abrupt shift in the main course of the Rufiji River towards the northern part of the delta is also believed to have changed the patterns of erosion, deposition, and salt penetration.

The less saline conditions that were enabled by the aforementioned “northward shift of the Rufiji River flow” allowed farmers to expand rice cultivation into new areas in the Rufiji Delta North (Wood et al., 2000). In addition, the IUCN (2004) reports that the technique for the “environmentally unfriendly” and “illegal practice” of large scale cutting of mangroves for rice farming is said to hinder natural regeneration of mangrove forests due to alterations of the soil microclimate and the lack of seed-bearing trees as seed sources. The FBD Director expressed concern at a Southern African Development Community (SDAC) meeting on

¹³ See footnote 1, “United Republic of Tanzania, October 2010,” p. 19.

¹⁴ Others argue 1978 marks the time period when the main flow of the Rufiji River was directed northward towards the Delta North (Wagner and Sallem-Mtui, 2010: 35). Also refer to “Report of the Meeting” (footnote 2).

REDD in Arusha, Tanzania stating, “the rapid annihilation of the country’s green cover is now going out of control” (Nkwame, 2010). In REDD+ project documents, the Rufiji Delta North is cited as having one of the highest cultivation rates, making it the “main driver” of mangrove deforestation and degradation.¹⁵

The extent of deforestation is reported in a land cover change study by Wang et al. (2003). The authors found a 1769 ha decline in mangrove forest cover in the Rufiji Delta between 1990 (49,799 ha) and 2000 (48,030 ha). Using satellite images, this study attributes “agricultural practices” as the principle cause of mangrove forest loss. The study is cited in Tanzanian REDD+ documents to chart trends in mangrove destruction (Kilahama et al., 2009). This quantitative measure justifies urgency to both protect and reclaim the mangrove forest to the natural state that purportedly characterized the Rufiji Delta prior to the expansion of rice cultivation. The politics that stem from this narrative are the strict protectionist measures, including evictions that currently define Tanzanian forestry policy for the Rufiji Delta. The take home message of the narrative is that rice farming must be stopped and mangrove trees planted if the mangroves are going to provide the critical ecosystem services needed in the context of rising sea-levels and the development of carbon markets.

3.4. An environmental historical and scientific lens of the Rufiji Delta

The environmental narrative that informs Tanzanian REDD project documents and REDD-readiness activities is flawed in three fundamental ways. First, it inaccurately describes the history of movement and settlement of people in the Rufiji Delta North. The narrative paints a picture of a relatively recent immigration of people, but archival records show the delta to be a socio-natural landscape in which farming and intensive logging were widespread since at least the nineteenth century. The area was yielding at least two rice harvests per year and mangrove poles were traded within local, regional, and international circuits. Second, the environmental science and environmental history that informs the narratives are exceedingly shallow. They do not take into account the patchy nature of the Rufiji Delta landscape that is derived in part from the fluvial geomorphology and in part from human use. This patchiness is described by 19th century explorers, colonial foresters, and contemporary environmental historians. Lastly, the threat of sea-level rise for coastal Tanzania is uncertain.

The claim that contemporary rice farmers in the Rufiji Delta North are recent immigrants that date from the villagization campaigns in 1968–1974 is historically and geographically inaccurate. The area where the villagers were planned to be relocated was not in the northern part of the delta, but further inland on higher and infertile escarpments referred to by Havnevik (1993) as North Hill (Fig. 1). Delta residents refused to comply with the government orders to move away from the fertile flood plain they had cultivated for generations (Sandberg, 1974; Sandberg, 2010). Rather than being recent immigrants, the Warufiji have populated the delta for centuries.

The Warufiji’s refusal to leave the area during villagization is consistent with a long history of resistance to outside influences. The British consul to Mozambique, James Elton, visited the Rufiji Delta North in the late-1870s. In Elton’s account of his travels, he stated that the “Rufiji sell but few slaves to the Arabs, who do not care to meddle with them” (Elton, 1879: 100). The most dramatic example of the Warufiji’s resistance to external claims on their labor and resources was their resistance to the forced cotton cultivation policies of the German Colonial Government in 1902. The brutality of forced cultivation and its effects on rural livelihoods led to the largest peasant uprising in colonial Africa

known as the Maji Maji rebellion (1905–1907) in which over 75,000 Africans were killed. Sunseri (2003, 2005, 2009) argues that the Maji Maji rebellion was sparked by the Warufiji’s refusal to recognize the colonial state’s claims to forest resources and their resistance to wage labor as wood cutters and tree planters for German colonial foresters. The Warufiji were also considered by President Nyerere to be the most supportive against the British in the struggle for Independence (Hyden, 1980). In 1996–1997, the Warufiji resisted attempts of foreign investors to build the world’s largest industrial prawn farm in the delta. This history of delta resistance is tremendously important for what we might anticipate if the proposed evictions take place.

In contrast to environmentalists’ portraits of an “Edenic” landscape prior to the 1970s, late 19th century explorers encountered a working landscape in the Rufiji Delta. The history of the region is intimately tied to the development of the coastal Swahili culture based on nearly two thousand years of trading connections between Zanzibari, Somali, Arab, Persian, and Indian traders and the coast (Havnevik, 1993; Chami and Msemwa, 1997). After 1730, the Omani engaged in extensive trading along the East African coast for mangrove poles. James Elton documented extensive settlements and trade during his travels along the Rufiji River in 1879. In the Rufiji Delta North, he described villages as “well built and populous near mangrove creeks in order for the large important trade for copal, ivory, wax, woods, and grain” (Elton, 1879: 91). In 1881, William Beardall was commissioned by the Sultan of Zanzibar to collect information of the country and people of the Rufiji Delta (Beardall, 1881). He described the Rufiji Delta North as “avenues of mangrove trees with inhabitants beginning to get in their second crop of rice” (641). In 1901, the German Captain Prussing also navigated through the same area and described loading places for wood and very suitable land for rice growing (Anonymous, 1901). In 1938, a British colonial forester stated that the area supported native villages, Indian and Arab shops, and some “good agriculture” (Grant, 1938).

Coastal traders highly valued mangrove poles from the Rufiji Delta. In the late 19th century, Rufiji was the main source of the mangrove trade for the Red Sea and Arabia (Sunseri, 2009). In 1899, the Sultan of Zanzibar had the right to exploit the Rufiji Delta for mangrove poles free of charge, despite the area being under control of the German Forest Department. At this time, fleets of Arab and Persian dhows that could load up to two hundred mangrove poles landed in the Rufiji Delta to load wood. Eighty to ninety percent of all wood exported from German East Africa originated in the Rufiji Delta (Schabel, 1990). In a five-month period from 1902 to 1903, the colonial government consumed approximately 280,000 logs of varying lengths for its steam engines (Sunseri, 2009). To maintain these forest resources, silviculture became a common practice. The German Forestry Department planted mangrove species for which demand was greatest. Merchants also prized the bark used for tanning and making resins (Barker, 1936). By the end of German rule, up to 78 percent of all mangroves in German East Africa were leased to bark exploiters (Sunseri, 2009). Mangrove forest exploitation accelerated considerably in the 1940s under British rule. In 1948, a mangrove concession was considered to be a “gold mine” (Havnevik, 1993).

A second theme in the environmental narrative of mangrove forest destruction is centered on flooding. A massive flood is believed to have caused an abrupt change in the Rufiji river course northward bringing freshwater to areas that were previously too saline to cultivate. This component of the narrative neglects the historical accounts of rice cultivation as well as the dynamic ecosystems of river deltas. All river deltas continuously change their flow patterns and courses at differing scales in time and space (Sandberg, 2010). Furthermore, fluctuations and variability in

¹⁵ See footnote 9 “Tanzania’s National REDD Strategy Development.”

flooding has occurred throughout the Rufiji river delta's history with new patterns of flooding every year, particularly during the long rains, that bring fresh water to places that were previously too saline (Marsland, 1938; Havnevik, 1993). Despite a continuous change in the patterns and courses of the Rufiji river delta, all of its river mouths tend to turn northwards as they reach the coast due to the overall net northward long-shore drift.

The Warufiji's complex shifting rice cultivation practices rely on this historical seasonal variability. They combine mangrove silviculture with rice paddy farming by abandoning rice paddy fields when they become too saline due to seasonal changes (small temporal scale) or river course changes (long temporal scale). Thus, Warufiji rice farmers plant and farm rice seasonally in relation to their predictions for salinity changes. It also makes it impossible for the Warufiji to grow rice everywhere at all seasons. Moreover, the closer to the mouth of the Rufiji River the greater the exposure is to salt water intrusion which reduces the area suitable for growing rice. The Warufiji also allow the mangroves to regenerate naturally while preparing new rice fields in less saline areas. Mangroves have a great propensity to regenerate themselves (Primavera, 2009). Natural regeneration of mangrove forests also contributes to higher biodiversity than silviculture, which often involves the planting of just a few species.

This extensive use of the Rufiji Delta North for farming, fishing, logging, and forestry demonstrates that the mangrove forests were a highly utilized environment that could hardly be described as "Edenic." Furthermore, the restrictions placed on mangrove forest land use by the FBD demonstrates how current land use in the Rufiji Delta North is not nearly as extensive as it was during the 18th and 19th centuries and even earlier. This environmental history illustrates how (1) it is problematic to suggest that a single major flood event would cause such an abrupt change in the course and direction of rivers in the Rufiji Delta to allow penetration of freshwater into an entire area it previously did not reach; and (2) Warufiji land use (e.g. rice cultivation) patterns take a mosaic form that mirrored the flooding, silting, and shifting river pattern.

In light of this mosaic land cover pattern, it is difficult to imagine the extent of environmental degradation projected by Wang et al. (2003). Mangrove vegetation is quite patchy, especially across multiple intersecting gradients of elevation, water and salinity levels, soil types, and wave exposure. These gradients affect the species composition, size, and growth patterns of mangrove trees on scales that are much finer than the satellite imagery resolution of 15 m and 30 m used by Wang et al. (2003). It is difficult to define the outer boundaries of a mangrove, and impossible to delineate the variations within a mangrove forest. One indicator of the difficulty in measuring land cover change in Tanzanian mangrove forests is the contradictory data. The World Mangrove Atlas (Spalding et al., 1997; Spalding et al., 2010), indicates that total mangrove forest cover in Tanzania has increased from 1155 km² in 1993 to 1286 km² in 2010.

The anticipated impacts of climate change, particularly sea-level rise, are considered to make conditions even more precarious for mangroves and heighten the urgent need to improve their management and protection (Cook, 2009). Using recent data from the University of Hawaii Sea Level Center, Benjaminsen et al. (2008) show that sea level in Tanzania is not rising. In fact, it appears to be falling. Mean sea level fall in the southern Indian Ocean are also corroborated by Wenzel and Schroter (2010), Woodroffe and Horton (2005), and Woodworth et al., 2007. Falling rates of sea-level are attributed to the rise of the coastline from thousands of years of tectonic plate movements associated with the East African Rift Valley (Benjaminsen et al., 2008). Therefore, at present, the Tanzanian coastline does not appear to be threatened by sea-level rise. Assumptions to the contrary do not take into consideration tectonic plate movements.

The long-standing practice of shifting rice cultivation combined with natural regeneration may have positive implications for biodiversity by creating minor perturbations and small changes and openings within environments as well as new niches for a wider variety of plant and animal species. These subsistence rice farming systems have also been recognized for at least two centuries in the Rufiji Delta and demonstrate that Delta North is an agroecological landscape. Thus, the question arises is what will happen to this complex and relatively stable socio-ecological system when carbon foresters and conservationists supplant the Warufiji in the Rufiji Delta North?

4. Revisioning REDD through an environmental justice lens

This paper has focused on the politically charged issues of environmental justice in the Rufiji Delta of Tanzania in the context of WWF and Tanzanian state carbon forestry programs to make the Rufiji Delta North "REDD ready." We have shown how in the case study of the Rufiji Delta, carbon forestry activities unfolding in anticipation of REDD+ are redolent with environmental injustices that threaten the livelihoods of the Warufiji. Our findings are four-fold. First, this case study validates the social and environmental justice concerns within the global climate change mitigation and adaptation literature associated with carbon forestry (Griffiths, 2009; Sikor et al., 2010). It shows how carbon forestry initiatives are redefining socio-natural relations in ways that threaten access to, control, and management of natural resources. In the process of making the Rufiji Delta "REDD ready" for carbon forestry markets, resource control and management appear to be shifting from local people in the Rufiji Delta to global actors.

Second, the study also demonstrates the ways this local to global shift in resource control and management are legitimated by narratives of environmental change (forest loss; rising sea levels) that have little basis in environmental history. Along with Sunseri (2009), we have demonstrated how the depiction of the Warufiji as invaders and destroyers of mangroves and forest loss as recent and abrupt, "erases the history of these forests as peopled spaces" (184). This misreading of the Rufiji landscape persists because it is central to the framing of environmental problems in ways that allow national and global actors to intervene in the landscape and livelihoods of the Warufiji. When this narrative is placed in the context of rising sea levels, it suggests an urgent need for intervention. In contrast, to this environmental crisis narrative, our case study suggests that the mangrove forests of the Rufiji can be reasonably described as sustainably utilized environments particularly when compared to historical forest use (e.g. timber extraction during pre-colonial and German colonialism). This re-reading of landscape and history reveals the injustices in current interpretations and recommends a conservation-with-development approach that supports existing practices of the Warufiji rather than their forcible removal from the forest.

Our third finding is that the Warufiji are resisting efforts to make the Rufiji Delta North "REDD ready" on the grounds that these efforts will increase their vulnerability and displacement. The Warufiji have a long history of resisting the claims on their labor and resources by outsiders. This begs the question in the formulation of REDD+ strategies, what incentives do REDD+ programs actually provide in order to change a history of resistance? The core issue at stake is the Warufiji's historical rights to land and water resources which national land laws and forest acts sometimes respect and sometimes reject. This is particularly relevant to the ability of REDD+ programs to constrain deforestation without seriously compromising food and livelihood security (Grieg-Gran, 2010).

Lastly, our case study legitimates concerns posed by Phelps et al. (2010), "does REDD+ threaten to recentralize forest

governance?" REDD+ sees decentralization of forest resource management as the key to empowering local communities. However, the Rufiji Delta case study reveals that the Warufiji have very limited representation with accountability and reduced access to significant material resources (Ribot et al., 2008). WWF, on the other hand, gains power by aligning itself with the Forestry and Beekeeping Division, while resisting downward accountability (Poteete and Ribot, 2011). Thus, resistance may be the only means for many Warufiji to defend themselves against the menace of REDD+, if it is implemented based on current carbon forestry governance in the Rufiji Delta. In order for REDD+ to result in both sustainable forestry and poverty reduction, the historical exclusion of forest-reliant communities from land ownership must be addressed. Equitable distribution in the form of securing the Warufiji's land tenure rights to resources is of primary concern. To carbon traders, however, an uninhabited forest greatly simplifies the logistical tasks of monitoring and paying for ecosystem services. The case study of the Rufiji Delta suggests that this "new direction in forest conservation" (Anglesen, 2009) may be overwhelmingly opposed by the people who stand to lose the most from such climate mitigation schemes.

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Virtual nature, violent accumulation: The ‘spectacular failure’ of carbon offsetting at a Ugandan National Park



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ABSTRACT

In East Africa, financially strained governments increasingly experiment with voluntary, market-based carbon offset schemes for enhancing the public management of protected areas. Often, conservationists and governments portray these as ‘triple-win’ solutions for climate change mitigation, biodiversity preservation, and local socioeconomic development. Examining such rhetoric, this paper analyses the rise and decline of an integrated carbon offset and conservation initiative at Mount Elgon National Park in eastern Uganda, involving a partnership between the Uganda Wildlife Authority (UWA) and a Dutch NGO, Face the Future. In doing so, the paper reveals the ways in which the uncompensated dispossession of local residents was a necessary precondition for the project’s implementation. Although external auditors expected the project to sequester 3.73 million tons of carbon dioxide equivalent (tCO₂e) between 1994 and 2034, conflicts forced the scheme to cease reforestation in 2003. Noting this rapid decline, we problematize the ways in which Face the Future and other carbon market intermediaries represented their activities via project documents and websites, obscuring the violence that was necessary for the project’s implementation. In so doing, we argue that the maintenance of a ‘triple win’ spectacle is *itself* integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capacity of carbon market brokers to accumulate exchange value by attracting ‘green’ investors. Consequently, what we term a ‘spectacular failure’ manifests in at least two ways: first, in the unravelling of the heavily mediated spectacle of harmonious, profitable conservation, and, second, in the deleterious nature of the consequences that accrue to local communities and ecosystems alike.

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Introduction

Upon visiting greenseat.nl, the homepage of a Dutch organization that markets carbon offset services to airline, train, and bus passengers, one is immediately greeted with an imperative to ‘travel greener now!’ On this website, and at the mere click of a mouse button, consumers ostensibly pay for both a clear environmental conscience and a healthier atmosphere. At present, GreenSeat markets carbon offsets derived from ‘voluntary’ clean energy projects, such as those involving solar and wind power. Between 1993 and 2003, however, the organization allegedly sold offsets sourced from tree plantations sponsored by a Dutch NGO – now known as ‘Face the Future’ – at Mount Elgon National Park in Uganda (Checker, 2009; Faris, 2007; Lang and Byakola, 2006; Sullivan, 2011).¹ Today,

by contrast, one cannot find mention of this initiative in the websites or organizational literature of either GreenSeat or Face the Future. Similarly, recent studies of conservation at Mount Elgon make little or no mention of the project and its relationship to the history of forest governance in the region (Norgrove and Hulme, 2006; Petursson et al., 2011; Petursson et al., 2013a,b; Sassen and Sheil, 2013; Sassen et al., 2013).² What happened? Examining the disappearance of this project from global ecosystem service markets, this paper analyses the rise and decline of Face the Future’s scheme at Mount Elgon; the problematic ways in which it represented its operations via the internet; and the violence that was simultaneously experienced by local people.

Such an inquiry is warranted, we claim, given that similar attempts to link Ugandan protected areas to a global “economy of repair” (Fairhead et al., 2012, 242) through carbon markets have decidedly exhibited what MacDonald (2013) – following the philosophers Peter Sloterdijk and Slavoj Žižek – terms “cynical

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¹ ‘Face the Future’ was originally known as the Forest Absorbing Carbon Emissions (FACE) Foundation (see also Lang and Byakola (2006) and <http://www.face-thefuture.com>).

² Sassen et al. (2013, 260) note the existence of the UWA-FACE project in a summary table of the last one hundred years of conservation governance at Mount Elgon, but do not further examine or explain its disappearance.

reason”, or strategic attachment to a disingenuous set of rhetorical claims. Differently put, although brokers of the voluntary carbon market frame these initiatives as a ‘triple-win’ for biodiversity conservation, climate change mitigation, and socioeconomic development (National Forestry Authority [NFA], 2011; Uganda Wildlife Authority [UWA], 2011), a growing body of evidence documents the deleterious consequences of forest conservation for local populations in both Uganda and elsewhere in East Africa (Benjaminsen and Bryceson, 2012; Benjaminsen et al., 2013; Beymer-Farris and Bassett, 2012; Brockington, 2002; Gardner, 2012; Igoe and Croucher, 2007; Nel and Hill, 2013; Neumann, 1998; Norgrove and Hulme, 2006). Likewise, NGOs and activists have published controversial accounts of the dispossession of rural populations for Ugandan carbon offset forestry projects in particular (Friends of the Earth, 2012; Lang and Byakola, 2006; Nel and Sharife, 2012), including the notable case of more than 20,000 people allegedly evicted for a project managed by a British firm, the New Forests Company (Carrere, 2009; Oxfam International, 2011). In such instances, it would appear that these exploitative attempts to pursue carbon offset forestry in Uganda are emblematic of both ‘green grabbing’ processes (Fairhead et al., 2012) and the ‘global land grab’ more broadly (e.g. Borras et al., 2011).

The primary objective of this paper, however, is not *only* to present an empirical account of green grabbing. Additionally, we focus on what Corson et al. (2013, 5) term “grabbing green”, or on the various “inter-relations, systemics, logics, and mechanisms” that both UWA and Face the Future have utilized to pursue their respective agendas under a global environmentalist mandate, and how these mechanisms ultimately unravelled. Indeed, these organizations’ representation of carbon offset forestry as a ‘triple win’ is no simple task, as it necessarily entails the enrolment and stabilization of a vast network of actors, technologies, expertise, and institutions. In other words, these projects denote the need for “socially necessary abstractions” (Robertson, 2012, 389), or the conceptual output of processes of measurement and representation that allow certain aspects of ecosystems to be isolated, standardized, and circulated through markets. Crucially, the production of these abstractions is a profoundly *virtual* process, or an attempt “to make the world around us look like and conform to an abstract model of it” (MacDonald and Corson, 2012, 160). Such virtualism has characterized efforts to conserve biodiversity at least since the colonial era (West et al., 2006), in which fundamentally Western or ‘modern’ (Latour, 1993) conceptions of the distinction between nonhuman ‘nature’ and human ‘society’ were territorialized in the form of protected areas (Adams and Hutton, 2007). Yet, new technologies add a novel dimension to these already virtual processes, best encapsulated perhaps by the term “Nature 2.0” (Büscher, 2013). Through conservation websites and blogs, social media platforms like Facebook, Twitter, and Youtube, and the integration of conservation finance into everyday consumptive practices (Igoe, 2013), consumers increasingly experience nature itself as a spectacle, or as a series of consumable images and representations (Sullivan, 2013).³ In many ways, conservation has thus become ‘spectacularized’, generating profits through what we might term ‘spectacular accumulation’ (Igoe, 2010, 378; Tsing, 2000, 139), as it increasingly relies upon an array of mediating technologies to link capital with the often-distant places that it is now meant to conserve.

In relation to the synthesis of carbon offsetting and more conventional forms of biodiversity conservation, spectacular

accumulation operates through representations of the presumed global commensurability of greenhouse gas emissions (Bumpus and Liverman, 2011; Fairhead et al., 2012). That is, through a series of abstractions that allow one tonne of carbon dioxide equivalent (tCO₂e) emitted by industry in the Global North to be rendered as precisely equivalent to another sequestered by forests (or via an alternative scheme) in various ‘frontier’ (Tsing, 2005, 59) regions of the Global South. This point should not be misunderstood as a methodological critique – we do not question that forests at least temporarily sequester carbon dioxide in the amounts estimated by project managers, although many analysts have raised salient technical issues related to carbon leakage and permanence (Ascui and Lovell, 2011; Bachram, 2004; Galik and Jackson, 2009; Lovell and Liverman, 2010). Rather, we contribute to this rapidly growing literature by arguing that spectacularization constitutes a *necessary* component of the production of a carbon offset. As we will see, the maintenance of a ‘triple win’ spectacle is itself integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capability of carbon market brokers to generate exchange value by attracting ‘green’ investors. Consequently, when these projects fail to maintain a coherent triple-win representation, what we term a ‘spectacular failure’ manifests in two interrelated ways: first, in the unravelling of the heavily mediatized imagery of harmonious, profitable conservation, and, second, in the extent of the deleterious consequences that accrue to local communities and ecosystems alike.

This argument is supported in five sections. First, we examine recent approaches to the political ecology of carbon offsetting, and draw particular attention to the ways in which these processes necessarily involve spectacular forms of accumulation. Second, we highlight the ways in which the violent and uncompensated dispossession of local residents was a necessary precondition for the UWA-FACE project’s implementation, effectively constituting a process of interrelated accumulation and *naturalization* by dispossession. Third, we identify a number of antinomies between the ‘triple-win’ rhetoric that characterized the FACE Foundation’s literature with UWA’s struggles to contain local resistance and legal challenges to conservation in the area. Fourth, we specifically examine the ‘spectacular failure’ of the UWA-FACE project at Mount Elgon, and present findings regarding the impacts of these activities on both forest plantations and local communities. Finally, we conclude with a discussion of the implications of these events for other proposed schemes to trade in carbon offsets over voluntary markets in East Africa and elsewhere.

Virtual nature, or: Why carbon forests have spectacular social lives

Much recent work in political ecology has critically engaged with the production of ostensibly ‘socio-natural’ commodities (Arsel and Büscher, 2012; Büscher and Arsel, 2012; Büscher et al., 2014; Fletcher, 2012; Peluso, 2012; Roth and Dressler, 2012), and especially so within the politicized context of global environmental change (McAfee, 2012; Peet et al., 2011). Following influential conceptualizations by Castree (e.g. 2003b, 2008) and McCarthy and Prudham (2004), these inquiries increasingly share an interest with the ways in which new ‘green’ markets result in both the reproduction of old-, and the generation of new-, inequalities, dispossessions, or restrictions of access to natural resources (Büscher et al., 2012; Fairhead et al., 2012). Interestingly, then, rather than constituting a radical limit for capital accumulation (O’Connor, 1988), this literature interrogates the ways in which the environment frequently now provides a new frontier for the generation of surplus value (Sullivan, 2013), and/or a

³ See, for example, the new website launched by the Uganda Wildlife Authority with assistance from USAID’s Sustainable Tourism in the Albertine Rift (STAR) programme, featuring built-in connectivity for a variety of social media platforms, as well as endorsements from TripAdvisor, CNNTravel, National Geographic, and Lonely Planet (<http://ugandawildlife.org/>).

'spatial-environmental fix' for the resolution of intertwined economic and ecological crises elsewhere in the capitalist system (Harvey, 2003; Smith, 2007). Consequently, these concerns further compound related discussions about both climate and environmental justice, which seek to prevent the mitigation of largely Northern-induced processes of global environmental change at the expense of vulnerable communities in the developing world (Agarwal and Narain, 1991; Beymer-Farris and Bassett, 2012; Marino and Ribot, 2012).

To understand the complex ways in which these concerns intersect with the production of carbon offsets, however, we must first examine the basic character of these commodities, which is simultaneously both 'social' and 'natural'. For example, Bumpus (2011, 616) notes four distinct, yet simultaneous, 'types' or dimensions of existence for each individual carbon offset:

"the carbon that continues to be emitted by the offset buyer (type 1); the carbon that would have been emitted if it had not been displaced by the project activity (type 2); the lower emissions as a result of the project activity (type 3); and the tCO₂e (type 4) that is produced by the difference in emissions as a result of the project activity and baseline."

Here, we see that a carbon offset is primarily relational or 'hybrid' (Castree, 2003a), as it necessarily problematizes the conceptual nature-society distinction that Bruno Latour (1993, 29) terms the 'modern constitution'. In the case of reforestation projects, for example, tCO₂e have a material existence in the sense that it is possible to measure the amount of carbon dioxide that is stored in a given portion of forest (Ascuí and Lovell, 2011). However, a given tCO₂e stored in forests is not, clearly, the very same tCO₂e that was released elsewhere in the world. Consequently, in contrast to the biophysical sequestration of carbon dioxide, the *production of a carbon offset* is co-dependent on the (often transnational) construction of relationships between those who emit, those who sequester, and the ecosystems and technologies enrolled by both. If one of these components functions as required, but another falters, the carbon offset unravels as an entity and ceases to exist.

Such co-dependency forces proponents of carbon offsetting to constantly engage in acts of "translation" in order to keep these relationships functioning smoothly (Mosse, 2005, 9). Project managers must constantly employ measurement, certification, and accounting technologies in order to assure the consumers of carbon offsets that they are, in fact, purchasing something that exists (Ascuí and Lovell, 2011; Lovell and MacKenzie, 2011). Yet, for offsetting arrangements that involve afforestation or reforestation, carbon is 'uncooperative' in the sense that it is significantly more difficult to measure and quantify than with other technologies (Bumpus, 2011). This is particularly true in contrast with, for example, the destruction of industrial gases like nitrous oxide and hydrofluorocarbon-23, which is an inherently more controllable and measurable process (Lovell and Liverman, 2010, 258). In particular, forestry projects are specifically afflicted by the twin problems of 'leakage' and 'permanence'; whereas 'leakage' refers to the possibility that deforestation activities will simply be displaced outside the project area, 'permanence' refers to the omnipresent risk of stored carbon being released through fire, disease, pests, human encroachment, or a variety of other contingencies (Galik and Jackson, 2009; Wunder, 2008). Thus, for Bumpus and Liverman (2011, 210), a carbon offset is best conceived as being created through a process of "hemming in" that involves the use of monitoring procedures, baseline calculations, guarantees of

additionality, and robust offset methodologies. When these components become more loosely coupled, the offset's own existence becomes less certain. Consequently, we again see how the existence of a carbon offset is inseparable from the collective functioning of biophysical systems, mediating technologies, and the 'social work' of monitoring, evaluation, auditing, and disseminating results to prospective consumers through interactive websites, applications, and blogs.

We note, moreover, that it is precisely in relation to the latter task that the business of carbon offsetting necessarily proceeds through practices of spectacular accumulation. Here, we do not draw a simple distinction between 'actual' empirical realities and falsely spectacular representations of these by conservationists and their financiers. Rather, following Igoe's (2010, 376) reading of Debord (1967) and Tsing (2000, 2005), spectacles are "not different and separate from the conditions that they portray, they are produced by them and, in turn, define and reproduce them." As such, we instead encounter a virtual relationship between the biophysical world and instrumental representations of it, wherein the spectacle of 'pristine' carbon-sequestering landscapes enables the generation of resources to both create new enclosures and more effectively govern existing ones. In other words, financial transfers for carbon offsetting must be "imagined" or "conjured" before they can be actualized, creating a situation in which, as Tsing (2000, 118) puts it, "[t]he more spectacular the conjuring, the more possible an investment frenzy."

Hence, although conservationists' attempts to produce such an 'investment frenzy' have rendered a commodified version of African 'nature' more visible to international audiences than ever before, this spectacular set of images and representations is thoroughly fetishized. Of course, for Marx (1995 [1867], 47), commodity fetishism refers to the ways in which capitalist production masks the social relations implicated in the production of a particular good or service, where "the relation of the producers to the sum total of their own labour is presented to them as a social relation, existing not between themselves, but between the products of their labour." In other words, fetishism occurs when commodities are consumed "without reference to the relationships and contexts from which they were produced" (Igoe, 2010, 378). In the case of markets for ecosystem services, therefore, fetishization obscures the ways in which both legal and extra-legal violence and dispossession are often necessary to implement the land use changes required for the production of carbon offsets and similar commodities (Peluso and Lund, 2011; Springer, 2013).

When the political-ecological relations of exploitative carbon offsetting initiatives are rendered visible, however, what we will term a 'spectacular failure' ensues. This entails, first, the unravelling of the heavily mediatized imagery of harmonious, profitable conservation often presented in websites and project documents. Yet, such failures are also 'spectacular' in an additional sense; that is, in the extent to which they reveal an enormous gap between 'representation' and 'execution' in project activities, and the ways in which this gap entails deleterious consequences for local communities and ecosystems alike. Subsequent portions of this paper provide an empirical discussion of such a 'spectacular failure' by analysing a voluntary carbon offset and conservation scheme at Mount Elgon National Park (MENP), known as the Uganda Wildlife Authority-Forest Absorbing Carbon Emissions (UWA-FACE) project. In doing so, we seek to problematize the ways in which the UWA-FACE project represented the political-ecological relations that governed the project's sequestration of carbon dioxide to prospective consumers of the resulting carbon credits.

Naturalization by dispossession? The commodification of carbon sequestration at Mount Elgon, Uganda⁴

In 1992, a Dutch NGO – the Forest Absorbing Carbon Emissions (FACE) Foundation⁵ – approached the Ugandan Ministry of Trade, Tourism, and Industry (MoTTI) with a proposition to reforest degraded sections of the Mount Elgon Forest Park.^{6,7} The FACE Foundation knew that many of Uganda's protected areas were severely degraded during the tumultuous post-independence period, and during the civil war that eventually brought current President Yoweri Museveni to power in 1986. At Mount Elgon, this damage was particularly substantial, as approximately 25,000 ha of the reserve's forest cover were lost during this time (Norgrove and Hulme, 2006; White, 2002). Since Uganda's economy also suffered greatly during this period, few internal revenues were available for the rehabilitation of national parks and forest reserves. Indeed, the World Bank notably ranked Uganda as the worst performing economy in Sub-Saharan Africa for the period between 1961 and 1989 (Norgrove, 2002, 70–71), and the implications for the government's capacity were understandably substantial.

As a result, the MoTTI favorably received the FACE Foundation's interest in Mount Elgon. According to the original contract between these two parties (FACE Foundation, 1992), FACE agreed to cover the costs of reforestation, including those incurred for labor and procurement. In return, the MoTTI and its subsidiary, Uganda National Parks (UNP),⁸ were required to relinquish the rights to market the carbon dioxide stored in the new forest compartments, and to guarantee the security of these new plantations for a period of 99 years. Further, the contract stipulated that these compartments would sequester a minimum of “5500 kg CO₂ per hectare per year” (FACE Foundation, 1992, 7). As noted earlier, carbon credits generated by this scheme were also allegedly marketed via a Dutch organization known as GreenSeat – which sells voluntary carbon offsets to airline, bus, and rail passengers – and its parent organization, the Climate Neutral Group (Checker, 2009, 46; Lang and Byakola, 2006, 9; Sullivan, 2011, 336). As such, prospective consumers were ostensibly invited to “travel greener” by purchasing carbon credits from the FACE Foundation's plantations at Mount Elgon (GreenSeat, 2012).

Presumably unbeknownst to many potential consumers, however, the Dutch Electricity Generating Board (known as ‘N.V. Sep’) originally established the FACE Foundation in 1990 (FACE Foundation, 2000, 2001a). Officially, N.V. Sep's objective was to ensure that the foundation would “provide enough CO₂ credits from afforestation and reforestation projects to offset the CO₂ emissions from a new coal fired power station” in the Netherlands

(Société Générale de Surveillance [SGS] Agrocontrol, 2001, 4).⁹ Although the FACE Foundation formally “decoupled” from N.V. Sep in 2000 (FACE Foundation, 2001a), European electricity firms apparently continued to constitute a large portion of the FACE Foundation's clientele (FACE Foundation, 2000, 2001a). Unsurprisingly, the organization generally downplays this connection with coal-fired electricity generation, and asserts that its main objective “is to establish and protect forests [...] sustainably and responsibly, in suitable areas, wherever in the world, and by so doing to contribute to reducing the amount of CO₂ in the atmosphere” (FACE Foundation, 2001a, 2). Thus, although the organization is ‘non-profit’ in a strictly technical sense, the foundation is only thinly separated from the for-profit apparatus of N.V. Sep and its other clients, who increasingly seek to reduce environmental criticisms of their operations without changing the core of their business practices, perhaps also increasing their competitiveness over firms that are not so ‘environmentally savvy’ in the process.

In the early 1990s, this type of contract was virtually unprecedented in sub-Saharan Africa. Indeed, the world's first voluntary carbon offset arrangement was implemented only a few years prior in 1989, in an agreement signed between the AES Corporation (a US electricity firm) and an agroforestry project in Guatemala managed by CARE International (Bumpus and Liverman, 2008, 133). Also a pioneer, the FACE Foundation had established a carbon offset forestry projects in Ecuador in 1990 (Bumpus, 2004), and perceived Uganda's newfound political stability as a potentially feasible entry-point for expanding their operations to East Africa. Given that the UNFCCC itself was only established after the Rio Earth Summit in 1992, and the Kyoto Protocol even later in 1997, these activities long preceded the ‘compliance’ carbon offset schemes initiated under the framework of the UNFCCC and its Clean Development Mechanism (CDM). As the ensuing discussion aims to show, however, the ‘triple-win’ spectacle of the FACE Foundation's project was undermined by the manner in which its activities were ultimately implemented. Specifically, the violent evictions that characterized this process of (re)naturalization on Mount Elgon suggest that one might accurately describe these events as a form of “primitive accumulation” (Corson and MacDonald, 2012; Kelly, 2011), or environmentally-justified “accumulation by dispossession” (Benjaminsen and Bryceson, 2012; Fairhead et al., 2012). This holds both in relation to the outright enclosure of land and resources, and the alteration of conservation institutions in ways that restricted local access to livelihood-supporting resources such as water, fuelwood, and non-timber forest products – all the while creating new sources of income for UWA and the FACE Foundation.

Accumulation by dispossession, selective history, and the (re)production of ‘nature’ at Mount Elgon

Within a year of the original MoTTI-FACE Foundation contract being signed in November 1992, the Ugandan government resolved to upgrade Mount Elgon to national park status, and to remove ‘encroachers’ from within its boundaries (Gosalamang et al., 2008; Norgrove and Hulme, 2006; White, 2002). Although it is difficult to retrospectively open up the strategic ‘black box’ surrounding this decision (Mosse, 2005, 20), one should note the correlation between financial incentives provided by both the FACE

⁴ Empirical findings in this section are the result of fieldwork conducted by the first author during September–December 2009 and July–December 2011, consisting of 53 semi-structured interviews, content analyses of project documents, and five focus group discussions with UWA-FACE plantation-adjacent communities. First, data on the establishment of UWA-FACE forest compartments at Mount Elgon, their distribution around the protected area, and local encroachment were gathered through semi-structured interviews with employees of the Uganda Wildlife Authority and other Ugandan environmental management agencies, as well as through content analyses of official documents, accounts, and project records.

⁵ The FACE Foundation has since rebranded itself as ‘Face the Future’.

⁶ According to Lang and Byakola (2006, 59), this initial series of negotiations was brokered by one Jan Bettlem, a Dutch national then working as a Technical Advisor for IUCN in Uganda.

⁷ Mount Elgon Forest Reserve was re-designated as a Forest Park in 1991, and as a National Park in 1992–3.

⁸ Uganda National Parks later merged with the Game Department to form the Uganda Wildlife Authority (UWA) in 1996, in accordance with the 1996 Uganda Wildlife Statute.

⁹ In March 2008, the Dutch television programme ‘Zembla’ aired a documentary on Dutch coal-fired electricity and carbon offsetting at Mount Elgon, entitled ‘Het CO₂ Alibi [The CO₂ Alibi]’ (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>). The programme generated significant public controversy in the Netherlands, which in turn paralleled international debates following the publication of a widely-read report by Chris Lang and Timothy Byakola (2006) for the World Rainforest Movement.

Foundation and other donors, such as USAID's (1991) US\$ 30 million National Action Plan for the Environment (NAPE),¹⁰ and the Government of Norway's support to the Mount Elgon Conservation and Development Programme (MECDP), which was first implemented in conjunction with IUCN in 1988 (White and Hinchley, 2001). Indeed, among scholars of conservation and natural resource management in East Africa, substantial debates exist regarding whether such decisions are generally 'organic', or undertaken largely at the behest of international pressures from NGOs and donors (Gibson, 1999; Gosalamang et al., 2008). The reality is complex, and, we assert, arises in response to varying combinations of the interests of political elites, NGOs, multilateral and bilateral donors, and the financial incentives provided by these actors.

In contrast to the multiplicity of these interests, however, the process of upgrading the Mount Elgon Forest Park to a National Park in 1993 was singularly violent. Beginning in 1993, the 25,000 ha of degraded parkland targeted for reforestation by the FACE Foundation were cleared of 'encroachers' by paramilitary UNP rangers and National Resistance Army¹¹ soldiers (Norgrove, 2002; Norgrove and Hulme, 2006; White, 2002). These evictions were reportedly characterized by widespread violence and human rights abuses, and may have involved little or no prior warning at many locations (Himmelfarb, 2012; Hurinet Uganda, 2011; Lang and Byakola, 2006; Norgrove, 2002; Norgrove and Hulme, 2006; Vangen, 2009). While the Ugandan Constitution and relevant land-use legislation afford the right to the state to seize land when it is deemed to be in the national interest (Government of Uganda, 1995; Hunt, 2004; Okuku, 2006), they also stipulate that both due warning and compensation must be provided to evictees. Official records of the evictions were not kept, however, and estimates now vary regarding the exact number of people displaced. For instance, Checker (2009, 45) – reviewing empirical work by Himmelfarb (2006, 16) – claims that the project resulted in the eviction of 6000 people. This figure is also cited by Sullivan (2011, 336). However, Himmelfarb's fieldwork was limited only to a specific portion of the northern edge of Mount Elgon National Park, known as the Benet Resettlement Area, which is located in two of the least populated of the eight districts that currently border the protected area (Uganda Communications Commission [UCC], 2010). Indeed, estimates of human displacement from the national park as a whole tend to be much higher: Vangen (2009, 135) roughly estimates that the overall figure could exceed 150,000 persons. Likewise, Sean White (2002, 2–3) – then IUCN's Chief Technical Advisor for the Mount Elgon region – estimates that the 25,000 ha of encroached forest could have fed as many as 84,000 households, or approximately 580,000 people at current household sizes. Regardless of the exact extent of the evictions, communities were not provided with official compensation either for the loss of land and property, nor for injuries sustained as a result of the evictions (Gosalamang et al., 2008, 44). Finally, one should note that while the bulk of these activities occurred in 1993, lower intensity paramilitary evictions continued over the next decade, and especially when the 1993 boundary was re-gazetted in 2002–3 with financial assistance from the World Bank's Protected Areas Management for Sustainable Use (PAMSU) programme (Cavanagh, 2012; Norgrove and Hulme, 2006; White, 2002). Such paramilitary activities continue to prevent access to land, cultural sites, and forest resources in territory that was formerly occupied by communities.

¹⁰ With this programme, USAID played a crucial role in both financing and conceptualizing Uganda's initiative to regain control over its protected areas. In the original grant document, USAID (1991) emphasizes the need to clearly demarcate the boundaries of reserves, remove existing encroachers, and involve nongovernmental organizations in the management of protected areas.

¹¹ The National Resistance Army was renamed the Uganda People's Defence Forces (UPDF) in 1995, and is Uganda's official military force.

Conversely, the Ugandan government and UNP¹² claim that these evictions were perfectly legal, and that allegations of abuse remain unproven. For UNP, especially, inhabitants of the Mount Elgon Forest Park were perceived as 'squatters' or 'encroachers', who simply and illegally appropriated public land for their own private use (NFA, 2011; UWA, 2009a, 2011). However, this position is complicated by our archival research on Mount Elgon's management history. First, as noted in the original working plan for the Mount Elgon Forest Reserve (Webster, 1954, 6),

“[r]ather unwillingly, the [Forest] Department agreed to a field investigation early in 1940 by an administrative officer and a forest officer. As a result of their recommendations, the [park boundary] line was adjusted in twenty places between Bulago and Bumbo [parishes]. These excisions amounting to about six square miles, were not surveyed nor was the gazetted area or the reserve altered. In addition to the excisions, licenses were issued to about 70 families who were allowed to remain and cultivate in the reserve. These licenses were issued for life and, if the original licensee died, the license could be transferred to one of the sons.”

In addition to such excisions, the 1962 *Public Land Act* and 1969 *Public Lands Act* likewise complicated the overarching tenure situation, as both were often interpreted as affording farmers the right to deforest unoccupied public land for agricultural purposes without prior consent from the government or other authorities (Mugambwa, 2007; Petracco and Pender, 2009, 6). Later, land tenure relations were further destabilized by Idi Amin's 1975 Land Reform Decree, which claimed all land in Uganda as state property (Hunt, 2004, 176; Okuku, 2006, 10–11). In some instances, farmers were encouraged to appropriate land as they pleased, the logic being that this would reduce the dependence of rural populations on the state and mitigate the effects of its increasingly dysfunctional management of the national economy. Simultaneously, Amin's government also simply distributed portions of protected areas to supporters when such actions were deemed politically expedient (Turyahabwe and Banana, 2008, 650). Further, as noted by Norgrove and Hulme (2006, 1098), settlement of the forest reserve also occurred during Milton Obote's second regime, during which allegedly corrupt Forest Department officials sold illegitimate land titles to farmers at Mount Elgon. Today, however, many conservationists systematically ignore these inconvenient pieces of Uganda's land tenure history, and instead strategically adopt a legalistic, uncritical, and ahistorical perspective on communities living within protected areas (see, for example, NFA, 2011 or UWA, 2011). Here, we perhaps see what both Peluso and Lund (2011, 674–676) and Springer (2013, 533) describe as 'law's violence', or the ways in which the law itself can be utilized as a tool of dispossession, especially when it overwrites traditional and customary forms of land possession and use.

In light of such violence, one can observe “conservation practice as primitive accumulation” (Kelly, 2011) at Mount Elgon in two distinct forms: (i) in the uncompensated expropriation of land and physical assets; and (ii) in the expropriation of rights of access to common property resources. Indeed, whereas the former component is well documented in the social scientific literature on conservation at Mount Elgon, researchers have frequently analyzed the latter only in the economic sense, as a lost asset for park-adjacent household economies. In a political-economic sense, however, the expropriation of rights to common property also entails the proletarianization of subsistence farmers, or the heightened exposure of their household's demand for basic commodities

¹² UNP and the Game Department merged to form the Uganda Wildlife Authority (UWA) in 1996. Here, we refer to actions undertaken by UNP, as they occurred prior to the passing of the 1996 Uganda Wildlife Statute.

(such as food, fuelwood, herbs, other non-timber forest products) to market forces. Differently put, whereas households would otherwise acquire these inputs by accessing commonly-owned stocks in forest locations, the expropriation of these access rights forces households to acquire such resources through market transactions, and further embeds them within the cash-based economy. In addition, while one could object to the status of conservation enclosure as primitive accumulation on the grounds that it involves the creation of public rather than private property (Kelly, 2011, 687), evictions at Mount Elgon enabled the generation of exchange value through the sale of both carbon offsets and ecotourism experiences. Differently put, while seized land and forests were not privatized, they were certainly commodified and marketized (Castree, 2008). Further, although the expropriated land was converted from customary to public property, the benefit stream resulting therefrom was appropriated by a variety of state, nongovernmental, and private actors.¹³ In essence, then, this constitutes a process of both accumulation and *naturalization* by dispossession, in which the removal of smallholding farmers enabled the production of a 'pristine' landscape for both tourists and brokers of the then-emerging carbon market, such as the FACE Foundation.

Indeed, 'degraded' areas of the forest reserve had not been merely stripped of forest cover. In many cases, communities had established permanent human settlements within the reserve's boundaries, including homesteads, schools, trading centers, and basic health facilities (Himmelfarb, 2012). In the process of evictions, UNP and NRA personnel razed these structures (Norgrove and Hulme, 2006; Vangen, 2009), and it is conceivable that their ruins were still present when reforestation activities began in 1994. Yet, the FACE Foundation continues to deny that its organization's activities have had any impact on land use conflicts at Mount Elgon. For example, when the first author contacted one of the organization's Netherlands-based executives in an attempt to record the FACE Foundation's perspective, he curtly responded as follows:

"If you are doing fieldwork I suggest you contact UWA. [...] We do not have a role in the conflict, but were only involved in a reforestation project" (FACE Foundation executive, email communication, 11.09.2011).

Unsurprisingly, evicted populations resent the violent nature of this process, and do not relish enduring attempts to obscure the relationship between the region's history of uncompensated eviction and existing carbon offset projects. In further developing this discussion, the next section examines the ways in which UWA and the FACE Foundation selectively ignored such inconvenient aspects of the region's resource management history, instead focusing rather disingenuously on the 'benefits' that were said to accrue to local populations.

Maintaining a 'triple-win' spectacle

Despite the exceedingly violent and ongoing nature of this process of naturalization by dispossession, UWA and the FACE Foundation continued to represent their activities as an unreservedly 'triple-win' case of integrated conservation and carbon offsetting. For instance, nearly a decade after large-scale evictions took place on Mount Elgon, the FACE Foundation's 2001 annual report declared that the

"involvement of the owners and local population are crucial factors to the success of projects. Because these parties have a

social and economic interest in maintaining the forest, Face pays much attention to the project region's social-economic context when selecting its locations [...] Besides the sequestration of CO₂, the forest offers other benefits to the local environment, including social and economic development such as employment" (FACE Foundation, 2001a, 2).

In addition, a project brochure describes UWA-FACE's activities at Mount Elgon National Park and related initiative at Kibale National Park thusly:

"The government has re-enforced the integrity of the national parks in the early 1990s. Since 1994 a large number of local tree species are being planted by the projects to rehabilitate the forests and their habitats for plants and animals, therewith enhancing biodiversity. The projects collaborate with IUCN, which supports conservation and sustainable development programs with the adjacent farmer communities [...] The FACE Foundation owns the CO₂ credits, while the forest and all other proceeds belong to UWA" (FACE Foundation, n.d.-a).

Moreover, concerning its rationale for choosing Mount Elgon as a project area, another FACE Foundation annual report simply notes that "one quarter of the area of the national park is damaged. The areas that will not recover naturally in the short term are being replanted by UWA-Face" (FACE Foundation, 2000, 12). Indeed, neither these brochures and annual reports – nor the contracts signed between UWA and FACE (FACE Foundation, 1992, 2001b) – make any mention of the violent and fiercely contested removal of settled agrarian communities from the areas slated for reforestation. Only passing mention of the disputed park boundary can be found in another early, undated project brochure, which somewhat cryptically notes that between "1988 and 1992 the boundary of the forest reserve was resurveyed and planted with eucalyptus trees. Agricultural encroachments were for the greater part terminated, while a sustainable development programme was initiative to improve the local livelihoods" (FACE Foundation, n.d.-b).

Yet, documents produced by the Uganda Wildlife Authority suggest that the scale and character of these evictions may have been well-known to the FACE Foundation. In a retrospective overview of project activities, for example, UWA (2011) argues that the project was necessary precisely as a consequence of agricultural encroachment and settlement of the protected area, and that conflicts arising as a result of evictions posed perhaps the greatest challenge to reforestation activities. "There are conflicts/disagreement about the ownership of land along the Park boundary", the report's authors write, resulting in a "feeling among some of the local communities that they have lost property [...] people feel they have the right to cultivate crops and as such they have sued the government for grabbing their ancestral land" (UWA, 2011, 4).

Here, UWA refers to a series of lawsuits targeting Mount Elgon National Park and the Ugandan Attorney General that were launched by communities in the Manafwa, Sironko, and Kapchorwa districts in the early 2000s. In the latter case, ActionAid and an NGO known as the Uganda Land Alliance supported local communities, which resulted in a favorable consent judgment – delivered in 2005 – that recognized the community as the "historical and indigenous" inhabitants of the Mount Elgon forest (see Cultural Survival, 2005; Okwaare and Hargreaves, 2009). Lawsuits launched by two groups of farmers in Manafwa district and one in Sironko district have also been ongoing for nearly a decade, and court injunctions were granted in the mid-2000s to prevent further evictions and destruction of community property by UWA.

Given that the plaintiffs in each of these cases formally named UWA and its personnel at Mount Elgon as respondents, relevant staff members have been required to attend relevant court proceedings, as the first author witnessed during fieldwork in 2011.

¹³ For a discussion of the ways in which primitive accumulation through conservation often involves the appropriation of benefit streams from land and natural resources rather than the appropriation of those resources *as such*, see also Benjaminsen and Bryceson (2012).

Consequently, UWA retains a detailed understanding of the nature of these conflicts, and their potential impacts on UWA-FACE reforestation activities in the corresponding sections of Sironko and Manafwa districts. And yet, these grievances have not been identified as challenges in sections of relevant annual reports and general management plans that relate to the governance of the UWA-FACE project (see [FACE Foundation, 2000, 2001a,b](#); [UWA, 2000, 2009a,b](#)). In short, the violence entailed in evictions from land slated for reforestation, the launching of lawsuits against UWA, and related conflicts are facts of material significance that appear to have been simply excluded from FACE Foundation documents, thereby preventing prospective consumers and donors from fully appreciating the controversial status of forest conservation at Mount Elgon. Further problematizing these omissions, the next section proposes several related mechanisms that eventually led to the collapse of the project's ability to conceal such conflicts, and thus also to internationally market its carbon offsets to consumers.

Uncooperative carbon, unruly people: Dissecting the 'spectacular failure' of the UWA-FACE project

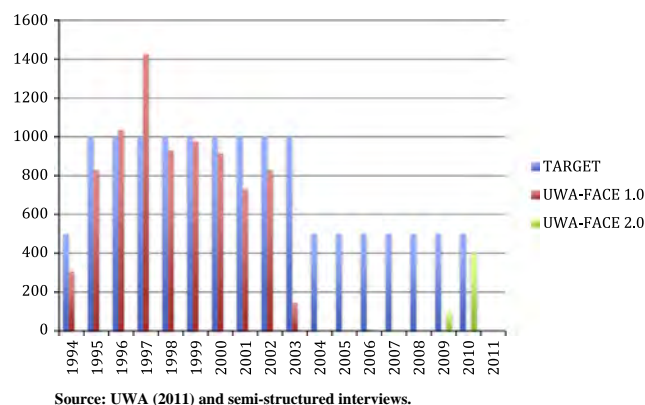
Beginning in 1995, the UWA-FACE¹⁴ project established reforestation targets of 1000 ha per year ([Fig. 1](#)). Generally, these were either achieved or exceeded until the year 2000, after which reforestation activities began to decline. By 2004, UWA-FACE restoration had almost entirely ceased, despite reformulated management targets of 500 ha per year.

Essentially, the decline of the UWA-FACE project began when its managers sought certification from the Forest Stewardship Council (FSC) for its carbon offset operations at Mount Elgon National Park in 2000. By the late 1990s, consumers had already grown sceptical of both the environmental and social benefits of carbon offsetting, and the FACE Foundation felt that such doubts could be allayed if they opened their operations to a rigorous audit. Accordingly, as part of the FSC certification process, the UWA-FACE project was subjected to a series of independent examinations by the Société Générale de Surveillance (SGS) Agrocontrol (and later by SGS Qualifor), one of the world's largest and most respected inspection firms.

In a 2001 appraisal, the assessors concluded – based on the plantations established at the time – that the project would sequester 3.73 million tonnes of carbon dioxide over the first certification period, which was deemed to last until 2034 ([SGS Agrocontrol, 2001, 36–45](#)). Of these, 1.62 million credits were set aside as a 'risk buffer', so that the remaining "2.11 million *virtually risk free* GHG credits...[could be] delivered between 1996 and 2034" – at which time plantations were due for re-inspection ([SGS Agrocontrol, 2001, 9, emphasis added](#)).

Yet, as interceding years have shown, the claim that these credits were "virtually risk free" was highly problematic. Indeed, the SGS auditors themselves originally raised a number of substantive concerns about the future security of UWA-FACE plantations, which led them to propose two "corrective actions" – one major and one minor – before the FSC could grant certification ([SGS Agrocontrol, 2001, 57–58](#)). These concerns revolved around the 'major' lack of a preexisting social impact assessment for UWA-FACE activities, and the 'minor' lack of a robust environmental impact assessment of the project's ability to guarantee the sequestration of carbon dioxide. Regarding the social impacts of the project, the assessors noted, simply, that UWA-FACE's "[s]ocial impact assessment is not adequate. Negative social impacts have not been identified and steps have not been taken to reduce those negative impacts" ([SGS Agrocontrol, 2001, 55](#)). Essentially, it was clear to

¹⁴ After UNP and the Game Department merged to become UWA in 1996, the FACE Foundation's project at Mount Elgon became known as the 'UWA-FACE project' in policy documents ([UWA, 2009b](#); [FACE Foundation, 2001b](#)).



Source: UWA (2011) and semi-structured interviews.

Fig. 1. Actual UWA-FACE reforestation vs. management targets (in hectares).

the assessors that neither UWA nor FACE had seriously considered the implications of widespread local resistance to the project for both the consumers of carbon offsets and their actual climate change mitigation effects.

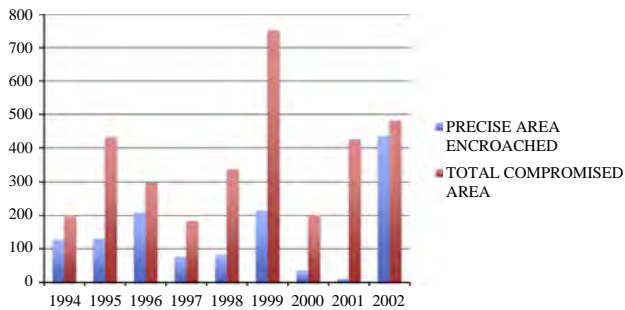
In particular, the auditors raised concerns about "political and social instability", or the ability of both UWA and FACE to protect their new plantations from local encroachment for the proposed period of 99 years. As the report's authors observed,

"[t]he political situation in the land surrounding Mt. Elgon is quite tense. There is a very high population density and land for cultivation is in very short supply. The decision to evict encroachers from the National Park has only served to increase the pressure on land outside the park. There is no doubt that local politicians can gain significant support by successfully arguing for a re-alignment of the park boundaries to afford their constituents access to more land" ([SGS Agrocontrol, 2001, 40](#)).

As noted by [Lang and Byakola \(2006, 27\)](#), it would have been virtually impossible to predict, in the early 1900s, the sort of land use regime that would prevail at Mount Elgon in the year 2000. Population dynamics have undergone massive changes, and the region has witnessed incredibly tumultuous political, economic, and social upheavals since the beginning of the 20th century. Among these were the rise and fall of British colonialism; several periods of civil war and recurring *coups d'état*; state-led programmes of political and ethnic cleansing; bio-political crises (such as the HIV/AIDS pandemic); and chronic environmental-social shocks, such as recurring drought and ensuing famines ([Bunker, 1991](#); [Mamdani, 1976](#)). From this perspective, it is arguably both naïve and potentially misleading to offer guarantees to prospective consumers regarding the future sanctity of forest plantations – in a contested region, nonetheless – until the year 2034, much less 2093.

As hindsight now demonstrates, these concerns were well-founded. From the outset of the project, agricultural encroachment and subsequent deforestation constituted omnipresent problems for UWA-FACE's plantations. Project records show that, even in the 1990s, up to 450 ha per year were compromised by community encroachment ([Fig. 2](#)). By 2004, these reforestation targets had become obviously unsustainable, and were beginning to intermingle with allegations of human rights abuse directed at UWA employees.¹⁵ Further, as noted in the previous section, portions of the land

¹⁵ Here, perhaps the most notable are reports and analysis by [Byakola and Lang \(2006\)](#), [Lang and Byakola \(2006\)](#), [Faris \(2007\)](#), [Honigsbaum \(2007\)](#), and [Checker \(2009\)](#). A highly critical TV programme about the UWA-FACE project was aired by the Dutch programme 'Zembla' in 2008 (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>), and a documentary film on alleged human rights abuses at Mount Elgon – entitled *Cry from the Ranges* – was released by Hurinet-Uganda in 2009 (available at <http://www.youtube.com/watch?v=OLDTRS09exY>).



Source: UWA (2011) and semi-structured interviews.

Fig. 2. Encroachment into UWA-FACE plantations, 1994–2002.

slated for reforestation had become subject to lawsuits from a number of local communities, and High Court injunctions had made reforestation legally impossible in a number of areas (Hurinet-Uganda, 2011; Okwaare and Hargreaves, 2009).

From a carbon offset marketing perspective, physical encroachment is also compounded by the problem of 'de facto encroachment', or the manner in which carbon offsets become difficult to 'translate' when entire forest compartments are compromised by partial deforestation. For example, while communities physically encroached upon 1137 ha of the UWA-FACE project's approximately 7500 ha of new plantations by the end of 2002, the total area compromised by such encroachment – when measured in compartments that were compromised – amounted to 3308 ha, or approximately 44% of the total reforested area. When encroachment exceeds the allowance of a predetermined 'buffer zone' – which in this case was also 44% of total sequestration capacity (SGS Agrocontrol, 2001) – the amount of carbon sequestered in said compartments may need to be recalculated. Otherwise, the danger arises of issuing carbon credits for environmental services that were not in fact provided. Indeed, when market transactions are involved, to do otherwise would effectively risk engaging in a form of fraud (Bachram, 2004).

In addition, the technical crisis of calculating carbon sequestration is further compounded by the crisis of legitimacy that arises from persistent encroachment. Arguably, the 'spectacle' involved in the construction of a market for carbon offsets relies on the ability of individual projects to maintain 'triple-win' representations of their activities. Consequently, incentives exist for 'distancing' evidence of encroachment from consumers (Kosoy and Corbera, 2010), as such extensive deforestation rightfully poses critical questions of leakage and permanence (Galik and Jackson, 2009), as well as concerns about the human rights and socio-economic wellbeing of adjacent populations. Consequently, one might hypothesize that, rather than retaining equal status, the use value of available tCO₂e offsets quickly declines in relation to increases in experiences with both social contestation and the intentional deforestation of the project area.

Differently put, a significant portion of a carbon offset's use value is ethical or moral in nature. When consumers purchase carbon offsets, they seek not just a reduction in their carbon footprint, but also the right to advertise their membership in a socially and environmentally responsible community. When offsets derive from contested sources, therefore, use value to the consumer proportionally declines. In this sense, the 'conjuring trick' (Tsing, 2000, 118) of carbon offsetting is the production and reproduction of a triple-win representation that purports to simultaneously conserve forests, mitigate climate change, and benefit local people. Individual use value aside, the performance of this spectacle is likewise necessary for the generation of exchange value, given that it is necessary to attract both economic investors and political

supporters. Essentially, then, carbon offsetting reflects what both Tsing (2000) and Igoe (2010) term an 'economy of appearances', insofar as its functioning depends of the circulation of virtual representations rather than simply on the production and sale of tangible goods or services.

Further, when this economy of appearances begins to unravel, we encounter what we have termed a 'spectacular failure'. For example, as a result of the aforementioned contestations and allegations of human rights abuse, no additional trees were planted by the UWA-FACE project between 2004 and 2008. FACE and its financiers were presumably (and understandably) frustrated by the arguable failure of their investment, and UWA was highly cognizant of the negative press being attracted by the scheme. Truly, the manner in which the UWA-FACE project came to a halt during this period is indicative of how vulnerable such initiatives are to the judgments of both the international media and civil society. As one UWA warden explained the decline of the project:

"Their image has been tarnished, so carbon credit operations have halted. You know, it is because of the conflicts and the human rights people crying out, most of them on the internet" (UWA warden, interview 28.07.2011).

Again, since carbon credits enable organizations and individuals to claim 'carbon neutral' status, their primary benefit from the consumer's point of view is that they confer what can be described as 'normative capital', or the right to advertise one's presumably robust ethics. If one overarching lesson from the project's decline can be drawn, therefore, it is this: If the ethical basis on which these carbon credits are 'produced' is challenged – in other words, if they are de-fetishized, de-spectacularized, and have their exploitative political-ecological relations of production exposed – both their use-value for the consumer and exchange value for 'green' investors rapidly decline. To avoid this, above all else, a stable 'translation' (Mosse, 2005) of the social, political, and ecological relations involved in the offset project must be maintained among all actors involved.

Conclusion

This article has critically examined the rise and decline of an integrated carbon offset and conservation scheme at Mount Elgon National Park in eastern Uganda. While the UWA-FACE project advertised itself as a 'triple win' for climate change mitigation, biodiversity conservation, and local development (FACE Foundation, 2001a; UWA, 2009b), a political-ecological and historical analysis of the project suggests that such rhetoric is decidedly selective. The main findings of this analysis are three-fold: First, the original forest restoration agreement, signed between the FACE Foundation and the Ugandan government in 1992, was closely followed by one of the largest-scale forest eviction campaigns in Uganda's post-colonial history. Local people were evicted from the same 25,000 ha of degraded forest that were slated for UWA-FACE rehabilitation, and have not been compensated for the loss of land, property, and livelihoods that accrued as a result, despite potentially valid legal claims to their property. From this perspective, one can therefore perceive the uncompensated dispossession of local people as a simultaneous process of both accumulation and *naturalization* by dispossession, which essentially subsidized the participation of the UWA-FACE project in global carbon offset markets.

Second, in addition to its socially controversial nature, the project was likewise unable to achieve its carbon sequestration objectives. Indeed, only approximately 8000 of 25,000 planned hectares were reforested before the project was forced to cease its operations. By 2004, up to 44% of the project's newly

established forest compartments had been compromised from a carbon offset perspective, and project activities stalled as a result (UWA, 2011). Such levels of encroachment exceeded the 'risk buffer' established by the project's carbon sequestration auditors (SGS Agrocontrol, 2001), resulting in a high degree of uncertainty regarding the quantity of environmental services rendered. It does not appear that public records were made available by either UWA or FACE about carbon credits exchanged through this scheme prior to 2004, however, and it is thus nearly impossible to retroactively verify whether carbon credits were issued for actually existing environmental services.

Third, these findings present a number of second-order implications for similar forest-based carbon offset schemes in East Africa. Of particular interest is the ways in which brokers of the carbon offset market can attempt to conceal deleterious project effects by maintaining a conceptual and geographical disconnection between offset consumers and actual sites of carbon sequestration. In the Mount Elgon case, such efforts are visible in attempts to disassociate the UWA-FACE project from the violent eviction process that was necessary for its establishment. In effect, such disconnection at least temporarily enabled the FACE Foundation and its collaborators to maintain stable 'translations' of offset commodities to consumers and donors, especially in project documents and over the Internet, which obscured the above-discussed social and ecological controversies involved in the project's implementation.

More broadly, and although a now-expansive body of literature interrogates the oppressive nature of both colonial and early post-colonial conservation in Africa (for a review, see Adams and Hutton, 2007), the violence that marks emerging forms of 'green grabbing' remains largely hidden from the international public sphere. Instead, spectacular 'win-win' or 'triple-win' representations of environmental management and land acquisition dominate conventional academic, donor, and policy-based discourses on the subject (Benjaminsen and Svarstad, 2010; Igoe, 2010; Sullivan, 2013). Thus, the rhetoric of integrated conservation and carbon offsetting is always 'future positive' (Mosse, 2005, 1), in that it inexorably advocates for the technical refinement and improvement of projects, as opposed to acknowledging the often-contentious politics implicated in their actual implementation. As noted by Büscher et al. (2012, 16, emphasis original),

"conservation thus becomes an essential contribution to neoliberalism's most profound contradiction: the ability of its proponents to produce and favor discourses that are seemingly free of contradictions [...] A major part of neoliberalism's attractiveness and pervasiveness lies precisely in this ability to hybridize and stimulate consensus-oriented discourses, despite their increasingly contradictory realities."

Indeed, precisely despite evidence of the dispossession and impoverishment of rural populations, organizations such as Face the Future continue to enjoy sterling reputations among Western publics, and are generally presumed to secure environmental management outcomes that conform to their official, allegedly socially responsible rhetoric. Not least, this is evident in the IUCN's (2012) decision to offset the carbon footprint from its 2012 World Conservation Congress in Jeju, South Korea, by purchasing carbon credits from Face the Future's plantations in Indonesia. 'People benefit from the project too,' the IUCN's (2012) press release declared, 'as it creates employment based on forest restoration [...] [i]n short, the project provides a model of how carbon finance can deliver climate change mitigation, while enhancing biodiversity and supporting local livelihoods.' As we have argued, however, the use of these glossy triple-win representations of conservation constitutes a form of 'spectacular accumulation,' given that it generates substantial revenues for government agencies, firms,

and NGOs, but silences a wide range of dissenting voices that cannot be translated into an advertisement for a decidedly neoliberal version of 'nature'. Accordingly, these findings suggest the need for further critical examinations of attempts to link protected areas to a global "economy of repair" (Fairhead et al., 2012) through markets for ecosystem services, which are capable of identifying other cases of 'spectacular failure' in the production and circulation of carbon offsets and other socio-natural commodities.

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May 14, 2020

Julia Descoteaux
 City of Moreno Valley
 14177 Frederick Street
 Moreno Valley, California 92552

Via e-mail: alberta@moval.org

Re: Comments to the Draft Recirculated Revised Final Environmental Impact Report (SCH #2012021045) World Logistics Center.

Dear Ms. Descoteaux,

We would like to object to the limited time given for review of extraordinarily large set of documents and reports. Although some were previously available the comprehensive review is challenging. That said, and at this time, we have two major concerns of note related to the forgoing of certain Development Impact Fees (DIF) outlined in the Development Agreement and the extraordinary diminished changes to the mitigation measures for Noise impacts.

First: Development Agreement

Neither in Development Agreement nor anywhere else in any project documents did I find a breakdown cost analysis to justify the developer not paying DIF for arterial streets, traffic signals, interchange improvements, and fire facilities. A cost analysis and fair share factor must be provided to evaluate all impacts to the listed exempted items. Impact to the SR-60 and WLC Parkway are almost exclusively attributed to this projects development yet the developer is not required to pay fees for the cost of this improvement. Construction of all project related streets (internally) are the full responsibility of the developer and would not qualify for any form of credit. Project impacts that go beyond the project site would be relatively high nearest the project and can be calculated for a fair share cost that could give the developer credit if 100% of the improvement is made by the developer. Otherwise the DIF would be used to make the outside improvements. The following is the text from the Development Agreement defining the benefit being given the developer without analysis for just compensation verses DIF cost coverage.

Finding: Sections 4.8 and 4.9 of the Development Agreement require the developer of the Project to construct or pay for all necessary traffic improvements and a fire station, all as needed, as a result of the development of the Project. In return, section 1.5, 4.8, and 4.9 of the Development Agreement exempts the Project from the payment of development impact fees ordinarily imposed under Municipal Code sections 3.42.030, 040, and 060. These exemptions shall remain in effect only as long as the Development Agreement is in effect. If the Development Agreement is approved but does not become effective or if it is approved

and does become effective and is terminated for any reason, the requirements that the Project pay development impact fees under Municipal Code sections 3.42.030, .040, .050, and .060 shall become effective.

DA Sections:

1.5 “Development Impact Fee,” “Development Impact Fees” or “DIF” means for purposes of this Agreement only those fees imposed pursuant to Moreno Valley Municipal Code Sections 3.42.070 (police facilities), 3.42.080 (City hall facilities), 3.42.090 (corporate yard facilities) and 3.42.100 (maintenance equipment). The term “Development Impact Fees” (or “DIF”) does not include those fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals), 3.42.050 (interchange improvements) and 3.42.060 (fire facilities).

4.8 Payment of, and Reimbursement for, the Cost of Improvements Paid for by HF Which Are in Excess of HF’s Fair Share. HF shall satisfy the requirements imposed by Mitigation Measure 4.15.7.4.A, as set forth in the EIR, to ensure that all of the Development’s impacts on the City’s circulation system, including, but not limited to, improvements to arterial streets, traffic signals and interchanges, are mitigated. Because HF will be responsible for paying for or constructing all circulation-related improvements, it shall not pay the fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals) and 3.42.050 (interchange improvements). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.9 Provision of a “turnkey” Fire Station. HF shall, at its own cost, provide a fully constructed, fully equipped fire station and fire station site, including fire trucks, as specified by the City’s Fire Chief. The fire station’s furniture and fixtures shall be reasonably comparable to those of the most recently completed fire station within the City. The fire station, equipment and trucks shall be provided as and when directed by the Fire Chief. Because HF will be responsible for the provision of the fire station, fire station site, equipment, and trucks, it shall not pay the fee imposed by Moreno Valley Municipal Code Section 3.42. 060 (fire facilities). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

Second: Noise Impact Evaluations

When the original FEIR was approved it use the “**Noise Assessment for the WLCSP**” to establish mitigation measures that would be necessary to limit construction impacts to those residents in the surrounding homes. It noted that work within the project area may be done on a 24 hour 7 days per week schedule which goes beyond the Moreno Valley Municipal Code’s (MVMC Section 8.14.040 Miscellaneous standards and regulations.) listed hours of 7 a.m. to 7 p.m. The Noise Assessment defined construction limits so as to limit noise impacts on the surrounding residences outside the standard construction hours and clearly outlined the high level of noise that could be expected both during daytime and nighttime hours beyond the

allowed decibel levels defined by the MVMC. Thus the study included “**Mitigation Measure N-2. No Nighttime Grading Within 2,800 Feet of Residences South of the Freeway**” was issued. It goes on to allow closer nighttime construction at 1,580 feet after the installation of an appropriate sound barrier. These would appear to be realistic mitigations but it would appear the developer might have found this to be somewhat restrictive and excessive so a different noise analysis firm was selected to prepare a new study.

The new “**Noise and Vibration Technical Report Assessment**” proposed a substantially different evaluation and lesser mitigations to the noise impacts. It states that “No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends, and a 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity.”

The mitigation requirement for a sound barrier is similar to the original MM however the active setback is now moved forward by 2,000 feet or three and a half times closer. Additionally, the MM includes options that would eliminate the need install the on-site sound barrier if a vote by those affected fails to garner 50% favorable votes or 100% favorable votes for a sound barrier placed on private property. These two provisions were never a consideration in the original noise analysis nor do they seem to be fair to the community due to the percentages needed based on the full text of the MM. It appears that this clause in MM **4.12.6.2A** is of a greater benefit to the developer than to the surrounding residents.

Noise Study and MM

“**Noise Assessment for the WLCSP**” (Mestre Greve Associates) original dated January 2013, revised September 2014. (This document is still referenced in the 12-2019 Draft Recirculated Revised Sections of the Final Environmental Impact Report)

“**Noise and Vibration Technical Report Assessment** (ESA)”, July 2018 which was not in the original 2014 DEIR for WLC) Since both studies are cited in the Draft REIR how is it that the more stringent mitigation measures are not utilized?

In the 2018 edition of the Draft REIR it used the “**Noise and Vibration Technical Report**”, and its mitigation measures now replace those of the “**Noise Assessment for the WLCSP**” that where much more favorable to the community and surrounding homeowners.

Noise Assessment for the WLCSP

Pgs. 27 - 30

2.2.1 On-Site Construction

Work within the project site will consist of mass grading, fine grading, building construction, utilities installation, interchange improvements, paving and curbing, and landscaping. Work within the project area may be done on a 24 hour 7 days per week schedule. Construction activities would occur at varying locations on-site, but may last for an extended period of time. For instance, grading activities for each phase are anticipated to last one year. However, the

grading may be concentrated in one area for a while and then move on to another area, and so on. In other words, grading noise will not impact one area for an entire year. Building construction will occur from time to time over a nine year period lasting from 2013 through 2021.

Residences within the Specific Plan area. Three pockets of homes are located within the Specific Plan area, and construction noise will be an issue for occupants of these residences. While these areas are to be designated for Light Logistics development under the proposed Specific Plan, they may remain in residential use indefinitely. Future Light Logistics uses would not be sensitive to noise, but as long as these sites remain in residential use, they will need to be considered as noise sensitive uses. These homes may be located adjacent to areas where intense construction activities could occur. These homes may experience worst-case unmitigated peak construction noise levels (Lmax) up to 97 dBA. The average noise levels are typically 5 to 15 dB lower than the peak noise levels. Average noise levels (Leq) at 50 feet from the residence could be in the range of 82 to 92 dBA during most phases of construction.

The City of Moreno Valley Municipal Code does not include any exemptions for construction noise. Therefore, construction would be subject to the limitations of 60 dBA during the daytime and 55 dBA at the nighttime measured at occupied residential locations. Exceeding these limits would result in a significant noise impact. Based on information in the previous paragraph these noise levels would regularly be exceeded during the daytime and nighttime hours at residences within the Specific Plan area. Based on an Leq noise level of 90 dBA at 50 feet, an observer would need to be 1580 feet from the construction to experience a noise level of 60 dBA (Leq), or 2,800 feet for a noise level of 55 dBA (Leq). A residence within 1,580 feet during active construction during the daytime would be impacted, or within 2,800 feet during the nighttime would be impacted. Mitigation is discussed in Section 3.1.1.

Residences Adjacent to the Specific Plan area. Residences are located adjacent to the project in the areas along Redlands Boulevard, Merwin Street, Bay Avenue, Cactus Avenue, and Gilman Springs Road. The potential for noise impacts will be similar to those impacts for residents within the Specific Plan area. Specifically, a receptor would need to be more than 1,580 feet from the construction to experience a noise level less than 60 dBA (Leq), or more than 2,800 feet for a noise level less than 55 dBA (Leq). A residence within 1,580 feet during active construction during the daytime would be impacted, or within 2,800 feet during the nighttime would be impacted. Mitigation is discussed in Section 3.1.1.

Mitigation Measures from “Noise Assessment for the WLCSP”
Pgs. 50 – 51

The following mitigation measures are identified for significant construction noise impacts:

N-1. No Construction Vehicles on Redlands Boulevard South of Fir Avenue. No construction vehicles of any type for on-site construction shall be permitted on Redlands Boulevard south of Fern Avenue. The prohibition for construction traffic should occur for all phases of the proposed project.

N-2. No Nighttime Grading Within 2800 Feet of Residences South of the Freeway.

Construction grading shall not be allowed within 2,800 feet of residences south of SR-60 between 8 p.m. and 7 a.m. Prior to the issuance of a grading permit, the developer shall submit a Noise Reduction Compliance Plan (NRCP) to the City as part of the grading permit submittal showing the limits of nighttime construction based on the currently occupied residential dwellings. The limits of nighttime grading shall be shown on the NRCP and grading plan submitted to the City. The limits of construction allowed at night shall be staked or posted on site, and contractors will be provided with a copy of the plan showing the limits of nighttime construction.

With the implementation of this mitigation measure the loudest noise level that would be experienced at any developed residential parcel would be less than 55 dBA (Leq) during the nighttime and these levels would be consistent with the limits established in the City's Noise Ordinance.

If grading is to occur at night within 2,800 feet of residences south of SR-60, then construction of a 12 foot temporary sound barrier will be required. A temporary barrier will reduce noise levels by approximately 10 dB. If an appropriate temporary sound barrier is constructed, then the buffer area can be reduced from 2,800 feet to 1,580 feet. The temporary sound barrier may be used. If sound blankets are used the curtains must have a Sound Transmission Class (STC) rating of 27. Examples of acceptable blankets can be found at the following websites; www.enoisecontrol.com/outdoor-sound-blankets.html and www.acousticalsurfaces.com/curtan_stop/curt_absorb.htm?d=12. Other blankets are acceptable as long as they have the required STC rating. Many unrated blankets are available, but their acoustic performance is generally unacceptable.

Noise measurements of construction activities often reveal that the construction noise levels are less than predicted. At the discretion of the builder, a Registered Professional Engineer can be hired to measure construction noise. Noise measurements over a three hour period on two consecutive nights can be used to modify the required buffer area. A Registered Professional Engineer with an expertise in acoustics shall prepare a report documenting the noise measurements and recommending a specific buffer distance. Once the report is submitted to and approved by the City, the buffer distance may be reduced to the distance recommended in the report.

N-3. Install temporary sound barrier. Construction within 1,580 feet of residential areas south of the freeway has the potential to exceed the daytime Moreno Valley Noise Ordinance criteria of 60 dBA (Leq). Any construction within 1,580 feet of a residence should be shielded from the residence with a 12 foot temporary sound barrier. A sound barrier will reduce the noise levels by about 10 dB. Residences within 500 feet may still be exposed to noise levels greater than 60 dBA (Leq), but the noise levels for residences greater than 500 feet from the construction area will experience noise levels consistent with the City's ordinance.

N-4. Require Residential Grade Mufflers. The grading contractor shall be required to certify that all equipment to be used will have residential grade mufflers or better on their equipment. All stationary construction equipment shall be placed so that emitted noise is directed away from noise sensitive receptors nearest the site. Additionally, stationary construction equipment if

standardly fitted with an acoustic cover by the manufacturer shall have the acoustic cover in place during operation.

N-5. Locate Material Stockpiles 1,200 Feet from Residences South of the Freeway.

Material stockpiles shall be located at least 1,200 feet from the residences. Remotely locating the stockpiles reduces the noise at the residences from equipment traveling to and from the stockpiles, and the noise that is sometimes associated with stacking materials. With these measures in place the impacts from on-site construction will be reduced to an extent. Nighttime impacts from on-site construction will be eliminated. However, daytime impacts to residents within 500 feet of construction will remain significant.

Noise and Vibration Technical Report Assessment (Replacement Mitigation Measures as found in the revised MMRP)

4.12.6.1A Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City's daytime and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures: • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers' standards.

- Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project. No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends.
- A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity. The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.
- Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request.

☒ Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51).

4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City's approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development:

Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the Revised Sections of the FEIR remain valid. These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the Revised Sections of the FEIR and shall be used to impose building-specific mitigation on the individually proposed buildings.

Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the World Logistics Center site, the Applicant shall implement the mitigation identified in the Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.). Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants. If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a *no* vote. At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.

Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement.

It is hoped that the Planning Commission will actively review and amend these documents prior to forwarding them to the City Council for consideration. Should you or others have any questions regarding our comments please address them to Tom Thornsley at tomthornsley@hotmail.com .

Sincerely,

Tom Thornsley

Tom Thornsley
with Residents for a Livable Moreno Valley

Zoom Info: Works Logistic Center 7 pm Planning Commission Meeting Thursday May 14, 2020

Please keep the Zoom information found below available to use for a call on the World Logistic Center's (WLC) 7 pm Thursday Planning Commission meeting — it is the 2nd item on the agenda. Use your commuter to connect through the website or a fully charged telephone to call one of the two numbers found below. When prompted, enter the Meeting ID and later the Password. Your connection will be kept on mute as while connected to the meeting. Those on a computer can request to speak and those calling in will be asked using the telephone number. Everyone is allowed up to 3 minutes to speak your thoughts. The meeting should be available on cable channel 3. You can also email planner Julia Descoteaux (juliad@moval.org) with your thoughts for the Planning Commissioners. Do not be afraid to comment on those things that bother you most and offer suggestions on how they should be fixed.

The more active participation the better.

Join Zoom Meeting

<https://moval.zoom.us/j/94671746310>

Meeting ID: 946 7174 6310

Password: 294031

One tap mobile

+1 669) 219--2599, Password/ID: 94671746310# (San Jose)

+1 669) 900--6833, Password/ID: 94671746310# (San Jose)

Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study

Xiao Wu, Rachel C Nethery, M Benjamin Sabath, Danielle Braun, Francesca Dominici

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Abstract

Objectives: United States government scientists estimate that COVID-19 may kill tens of thousands of Americans. Many of the pre-existing conditions that increase the risk of death in those with COVID-19 are the same diseases that are affected by long-term exposure to air pollution. We investigated whether long-term average exposure to fine particulate matter (PM_{2.5}) is associated with an increased risk of COVID-19 death in the United States.

Design: A nationwide, cross-sectional study using county-level data.

Data sources: COVID-19 death counts were collected for more than 3,000 counties in the United States (representing 98% of the population) up to April 22, 2020 from Johns Hopkins University, Center for Systems Science and Engineering Coronavirus Resource Center.

Main outcome measures: We fit negative binomial mixed models using county-level COVID-19 deaths as the outcome and county-level long-term average of PM_{2.5} as the exposure. In the main analysis, we adjusted by 20 potential confounding factors including population size, age distribution, population density, time since the beginning of the outbreak, time since state's issuance of stay-at-home order, hospital beds, number of individuals tested, weather, and socioeconomic and behavioral variables such as obesity and smoking. We included a random intercept by state to account for potential correlation in counties within the same state. We conducted more than 68 additional sensitivity analyses.

Results: We found that an increase of only 1 $\mu\text{g}/\text{m}^3$ in PM_{2.5} is associated with an 8% increase in the COVID-19 death rate (95% confidence interval [CI]: 2%, 15%). The results were statistically significant and robust to secondary and sensitivity analyses.

Conclusions: A small increase in long-term exposure to PM_{2.5} leads to a large increase in the COVID-19 death rate. Despite the inherent limitations of the ecological study design, our results

underscore the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis. The data and code are publicly available so our analyses can be updated routinely.

Summary Box

What is already known on this topic

1. Long-term exposure to PM_{2.5} is linked to many of the comorbidities that have been associated with poor prognosis and death in COVID-19 patients, including cardiovascular and lung disease.
2. PM_{2.5} exposure is associated with increased risk of severe outcomes in patients with certain infectious respiratory diseases, including influenza, pneumonia, and SARS.
3. Air pollution exposure is known to cause inflammation and cellular damage, and evidence suggests that it may suppress early immune response to infection.

What this study adds

1. This is the first nationwide study of the relationship between historical exposure to air pollution exposure and COVID-19 death rate, relying on data from more than 3,000 counties in the United States. The results suggest that long-term exposure to PM_{2.5} is associated with higher COVID-19 mortality rates, after adjustment for a wide range of socioeconomic, demographic, weather, behavioral, epidemic stage, and healthcare-related confounders.
2. This study relies entirely on publicly available data and fully reproducible, public code to facilitate continued investigation of these relationships by the broader scientific community as the COVID-19 outbreak evolves and more data become available.

A small increase in long-term PM_{2.5} exposure was associated with a substantial increase in the county's COVID-19 mortality rate up to April 22, 2020.

Introduction

The scale of the COVID-19 public health emergency is unmatched in our lifetime and will have grave social and economic consequences. The suddenness and global scope of this pandemic has raised urgent questions that require coordinated investigation in order to slow the disease's devastation. A critically important public health objective is to identify key modifiable environmental factors that may contribute to the severity of the health outcomes (e.g., ICU hospitalization and death) among individuals with COVID-19. Data from China and Italy show that a majority of COVID-19 deaths occurred in adults aged ≥ 60 years¹ and in persons with serious underlying health conditions.²⁻⁴ Early age-stratified COVID-19 death rates in the United States, reported by the Centers for Disease Control and Prevention (CDC),⁵ also suggest that persons aged ≥ 65 are at highest risk. Additional factors associated with severe disease include male sex and the presence of comorbidities including hypertension, obesity, diabetes mellitus, cardiovascular disease, and chronic lung disease.^{6 7} Severe COVID-19 infection is characterized by a high inflammatory burden, and it can cause viral pneumonia with additional extrapulmonary manifestations and complications including acute respiratory distress syndrome (ARDS),⁸⁻¹³ which has a mortality rate ranging from 27% to 45%.¹⁴ Studies have also documented high rates of heart damage,^{11 15} cardiac arrhythmias,¹² and blood clots¹⁶ in COVID-19 patients. Patients with severe disease can suffer respiratory failure and failure of other vital systems, leading to death.

Although the epidemiology of COVID-19 is evolving, there is a large overlap between causes of death in COVID-19 patients and the conditions caused and/or exacerbated by long-term exposure to fine particulate matter (PM_{2.5}). PM_{2.5} contains microscopic solids or liquid droplets small enough that they can be inhaled and cause serious health problems. The Global Burden of Disease

Study identified air pollution as a risk factor for total and cardiovascular disease mortality, and it is believed to have contributed to nearly 5 million premature deaths worldwide in 2017 alone.¹⁷ On Thursday, March 26, 2020 the US EPA announced a sweeping relaxation of environmental rules in response to the coronavirus pandemic, allowing power plants, factories and other facilities to determine for themselves if they are able to meet legal requirements on reporting air and water pollution. The association between PM_{2.5} and health, including both infectious and chronic respiratory diseases, cardiovascular diseases, neurocognitive disease, and pregnancy outcomes in the United States and worldwide is well established.¹⁸⁻²⁴ A recent study by our group also documented a statistically significant association between long-term exposures to PM_{2.5} and ozone and risk of ARDS among older adults in the United States.²⁵ Numerous scientific studies reviewed by the United States Environmental Protection Agency (US EPA) have linked PM_{2.5} to a variety of health concerns including premature death in people with heart or lung disease, non-fatal heart attacks, irregular heartbeats, aggravated asthma, decreased lung function, and increased respiratory symptoms such as inflammation, airway irritations, coughing, or difficulty breathing.²⁶

We hypothesize that because long-term exposure to PM_{2.5} adversely affects the respiratory and cardiovascular systems and increases mortality risk,²⁷⁻²⁹ it also exacerbates the severity of COVID-19 infection symptoms and worsens the prognosis of COVID-19 patients. In this study, we quantified the impact of long-term PM_{2.5} exposure on COVID-19 mortality rates in United States counties. Our study includes 3,087 counties in the United States, covering 98% of the population. We leveraged our previous efforts that focused on estimating the long-term effects of PM_{2.5} on mortality among 60 million United States' Medicare enrollees.^{20 30 31} We used a well-tested research data platform that gathers, harmonizes, and links nationwide air pollution data, census

data, and other potential confounding variables with health outcome data. We augmented this platform with newly collected COVID-19 data from authoritative data sources.³² All data sources used in these analyses, along with fully reproducible code, are publicly available to facilitate continued investigation of these relationships as the COVID-19 outbreak evolves and more data become available.

Methods

Table 1 summarizes our data sources and their provenance, including links where the raw data can be extracted directly.

COVID-19 deaths

We obtained COVID-19 death counts for each county in the United States from Johns Hopkins University, Center for Systems Science and Engineering Coronavirus Resource Center.³² This source provides the most comprehensive county-level COVID-19 data to date reported by the CDC and state health departments, including the number of new and cumulative deaths and confirmed cases reported in each county across the United States, updated daily. We collected the cumulative number of deaths for each county up to and including April 22, 2020. County-level COVID-19 mortality rates were defined for our analyses as the ratio of COVID-19 deaths to county level population size. While individual-level data would have allowed a more rigorous statistical analyses, individual-level data on COVID-19 death is currently not available.

Exposure to air pollution

We calculated county-level long-term exposure to PM_{2.5} (averaged from 2000 to 2016) from an established exposure prediction model.³³ The PM_{2.5} exposure levels were estimated monthly at 0.01° × 0.01° grid resolution across the entire continental United States by combining satellite, modeled, and monitored PM_{2.5} data in a geographically weighted regression. These estimates have been extensively cross-validated.³³ We aggregated these levels spatially by averaging the values for all grid points within a zip code and then averaging across zip codes within a county. We obtained temporally averaged PM_{2.5} values (2000–2016) at the county level by averaging estimated PM_{2.5} values within a given county. We computed the average 2016 PM_{2.5} exposure analogously for each county to use in sensitivity analyses.

Potential confounders

In the main analysis, we considered the following 19 county-level variables and one state-level variable as potential confounders (see also Table 2): days since first COVID-19 case reported (a proxy for epidemic stage), population density, percent of population ≥65 years of age, percent of the population 45-64 years of age, percent of the population 15-44 years of age, percent living in poverty, median household income, percent black, percent Hispanic, percent of the adult population with less than a high school education, median house value, percent of owner-occupied housing, percent obese, percent current smokers, number of hospital beds per unit population, and average daily temperature and relative humidity for summer (June-September) and winter (December-February) for each county, and days since issuance of stay-at-home order for each state. Note that publicly available daily COVID-19 case counts at the county level were only available starting March 22, 2020, so that the measure of days since first COVID-19 case reported

was truncated by this date. Additional detail on the creation of all variables used in the analysis is available in the Supplementary Materials.

Statistical methods

We fit a negative binomial mixed model³⁴⁻³⁶ using COVID-19 deaths as the outcome and PM_{2.5} as the exposure of interest to estimate the association between COVID-19 mortality rate and long-term PM_{2.5} exposure, adjusted by covariates. The model included a population size offset and was adjusted for all the potential confounders listed above. We also included a random intercept by state to account for potential correlation in counties within the same state, due to similar socio-cultural, behavioral, and healthcare system features and similar COVID-19 response and testing policies. Additional modeling details are provided in the Supplementary Materials. We report mortality rate ratios (MRR), i.e., exponentiated parameter estimates from the negative binomial model, and 95% CI. The MRR for PM_{2.5} can be interpreted as the relative increase in the COVID-19 mortality rate associated with a 1 $\mu\text{g}/\text{m}^3$ increase in long-term average PM_{2.5} exposure. We carried out all analyses in R statistical software and performed model fitting using the lme4 package.^{37 38}

Quantifying unmeasured confounding bias

Because this study is observational and the contributing factors to COVID-19 spread and severity remain largely unknown at this early stage of the pandemic, unmeasured confounding is a concern in our analyses. The E-value is a commonly used metric to evaluate the potential impact of unmeasured confounding on results from an observational study.³⁹ For a pre-specified exposure variable of interest (long-term exposure to PM_{2.5}), the E-value quantifies the minimum strength of

association that an unmeasured confounder must have, with both the outcome (COVID-19 mortality rate) and exposure (long-term exposure to PM_{2.5}) conditional to all of the potential confounders included in the regression model, to explain away the estimated exposure-outcome relationship. We report the E-value for the MRR estimate for PM_{2.5} under the main model with 20 potential confounders.

Secondary analyses

In addition to the main analysis, we conducted six secondary analyses to assess the robustness of our results to the confounder set used, outliers, and the model form specification.

First, because the New York metropolitan area has experienced the most severe COVID-19 outbreak in the United States to date, we anticipated that it would strongly influence our analysis. As a result, we repeated the analysis excluding the counties comprising the New York metropolitan area, as defined by the Census Bureau.

Second, although in our main analysis we adjusted for days since first COVID-19 case reported to capture the size of an outbreak in a given county, this measure is imprecise. To further investigate the potential for residual confounding bias (i.e., if counties with high PM_{2.5} exposure also tend to have large outbreaks relative to the population size, then their death rates per unit population could appear differentially elevated, inducing a spurious correlation with PM_{2.5}), we also conducted analyses excluding counties with fewer than 10 confirmed COVID-19 cases.

Third, we omitted an anticipated strong confounder, days since first COVID-19 case reported, from the model. Fourth, we additionally adjusted our models for the number of tests performed at the state level (see Table 1 for data source) to evaluate how state-level differences in testing policies might impact our results. Fifth, we additionally adjusted our models for county-level estimated percentage of people with COVID-19 symptoms (see Table 1 for data source) to evaluate how the size of the outbreak in each county might impacts our results. Sixth, we introduced PM_{2.5} into our models as a categorical variable, categorized at the empirical quintiles, to assess the sensitivity of our results to the assumption of a linear effect of PM_{2.5} on COVID-19 mortality rates.

Sensitivity analyses

We conducted 68 sensitivity analyses to assess the robustness of our results to data and modeling choices. First, we repeated all the analyses using alternative methods to estimate exposure to PM_{2.5}.³¹ Second, we fit the models, modifying the adjustment for confounders, such as using a log transformation or categorized versions of some of the covariates. Third, because our study relies on observational data, our results could be sensitive to modeling choices (e.g., distributional assumptions or assumptions of linearity). We evaluated sensitivity to such choices by considering alternative model specifications and by fitting models stratified by county urban-rural status. Additional detail about the sensitivity analyses and the results are provided in the Supplementary Materials.

Results

Our study utilized data from 3,087 counties, of which 1,799 (58.3%) had reported zero COVID-19 deaths at the time of this analysis. Table 2 describes the data used in our analyses. All COVID-

19 death counts (a total of 45,817 deaths) are cumulative up to April 22, 2020. Figure 1 illustrates the spatial variation of long-term average exposure to PM_{2.5} and COVID-19 death rates (per 1 million population) by county. Visual inspection suggests higher COVID-19 death rates in the Mid-Atlantic, upper Midwest, and Gulf Coast regions. These spatial patterns in COVID-19 death rates generally mimic patterns in both high population density and high PM_{2.5} exposure areas. In the Supplementary Materials, we provide additional data diagnostics that justify the use of the negative binomial model for our analyses.

In Table 3, we report the estimated regression coefficients for each of the covariates included in our main analysis, including PM_{2.5}. We found that the estimated MRR for PM_{2.5} is 1.08 (1.02, 1.15). That is, we found that an increase of only 1 $\mu\text{g}/\text{m}^3$ in long-term average PM_{2.5} is associated with a statistically significant 8% increase in the COVID-19 death rate. Importantly, we also found that population density, days since first COVID-19 case reported, rate of hospital beds, median household income, percent with less than a high school education, and percent Black are important predictors of COVID-19 death rate. Our results are consistent with previously reported findings that Black Americans are at higher risk of COVID-19 mortality than other groups,⁴⁰ we found a 45% (32%, 60%) increase in COVID-19 mortality rate associated with a 1-standard deviation (per 14.2%) increase in percent Black residents.

For our main analysis, the E-value for the estimated MRR for PM_{2.5} was 1.37. That is, in order for an unmeasured confounder to fully account for the estimated effect of PM_{2.5} on the COVID-19 mortality rate, it would have to be associated with both long-term PM_{2.5} exposure and COVID-19 mortality by a risk ratio of at least 1.37-fold each, through pathways independent of all covariates

already included in the model. If we were to include such a confounder in our models, along with all other confounders considered, the estimated MRR for PM_{2.5} mortality would become 1 (the null value). To get a sense of the magnitude of the required confounding effect, we also computed the E-value for some of our key measured confounders for comparison. The E-values for days since first COVID-19 case reported (1.16), the weather variables (1.02), number of hospital beds (1.04) and the behavioral risk factors (1.02) were significantly smaller than the reported E-values for the required unmeasured confounder. This suggests that any unmeasured confounder would need to have a confounding effect substantially larger than any of our observed confounders in order to explain away the relationship between PM_{2.5} and COVID-19 mortality rate.

In Figure 2, we report the MRR and 95% CI for PM_{2.5} from all secondary analyses. In these analyses, we separately (a) omitted New York metropolitan area; (b) excluded counties with fewer than 10 confirmed COVID-19 cases; (c) omitted time since first reported COVID-19 case from the model; (d) additionally adjusted the model for number of tests performed; (e) additionally adjusted the model for estimated percentage of people with COVID-19 symptoms; and (f) treated PM_{2.5} as a categorical variable. The results of these analyses were consistent with the main analysis. For the analysis of the PM_{2.5} categorized into quintiles, the MRR for the k^{th} can be interpreted as the increase in COVID-19 mortality rate associated with a change from the first quintile to the k^{th} quintile in long-term PM_{2.5} exposure. The MRR estimates from this model monotonically increased as PM_{2.5} increased, supporting the assumption of a linear relationship between PM_{2.5} and COVID-19 mortality rates. The results of all sensitivity analyses are provided in the Supplementary Materials.

Discussion

This is the first nationwide study in the United States to estimate the relationship between long-term exposure to PM_{2.5} and COVID-19 death rates. The results indicate that long-term exposure to air pollution increases vulnerability to the most severe COVID-19 outcomes. We found statistically significant evidence that an increase of 1 $\mu\text{g}/\text{m}^3$ in long-term PM_{2.5} exposure is associated with an 8% increase in the COVID-19 mortality rate. Our results were adjusted for a large set of socioeconomic, demographic, weather, behavioral, epidemic stage, social isolation measures, and healthcare-related confounders and demonstrated robustness across a wide range of sensitivity analyses.

In our previous study²⁰ of 60 million Americans older than 65 years of age, we found that a 1 $\mu\text{g}/\text{m}^3$ in long-term PM_{2.5} exposure is associated with a 0.73% increase in the rate of all-cause mortality. Therefore, the same small increase in long-term exposure to PM_{2.5} led to an increase in the COVID-19 death rate of a magnitude 11 times that estimated for all-cause mortality.

Our results are consistent with previous findings that air pollution exposure increases severe outcomes during infectious disease outbreaks. Ciencewicki and Jaspers¹⁹ provide a review of the epidemiologic and experimental literature linking air pollution to infectious disease. During the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS), a type of coronavirus closely related to COVID-19, Cui et al⁴¹ reported that locations in China with a moderate or high long-term air pollution index (API) had SARS case fatality rates 126% and 71% higher, respectively, than locations with low API. Long-term particulate matter exposure has been associated with hospitalizations for pneumonia in the well-controlled quasi-experimental conditions provided by

the closing of the Utah Valley Steel Mill,⁴² and a link between long-term PM_{2.5} exposure and pneumonia and influenza deaths was reported in a well-validated cohort study.²⁸ Several studies have reported associations between short-term PM_{2.5} exposure and poor infectious disease outcomes,^{43 44} including higher hospitalization rates or increased medical encounters for influenza, pneumonia, and acute lower respiratory infections. In these studies and in the literature on the association between air pollution and chronic disease outcomes, relationships with long-term pollution exposure tend to be stronger than relationships with short-term exposure,^{20 45 46} and the large effect estimate in our study is consistent with this trend.

Relationships have also been detected between pollution exposures and severe outcomes in the context of past pandemics. Studies found particulate matter exposure to be associated with the mortality during the H1N1 influenza pandemic in 2009.^{47 48} Recent studies have even used historic data to show a relationship between air pollution from coal burning and mortality in the 1918 Spanish influenza pandemic.^{49 50}

Although our study design cannot provide insight into the mechanisms underlying the relationship between PM_{2.5} and COVID-19 mortality, prior studies have shed light on the potential biological mechanisms that may explain the relationship between air pollution and viral outcomes.¹⁹ PM_{2.5} exposure is known to be associated with many of the cardiovascular and respiratory comorbidities that dramatically increase the risk of death in COVID-19 patients. We hypothesize that the effects captured here are largely mediated by these comorbidities and pre-existing PM-related inflammation and cellular damage,^{46 51} as suggested by a recent commentary.⁵² Experimental studies^{19 53-56} also suggest that exposure to pollution can suppress early immune responses to the

infection, leading to later increases in inflammation and worse prognosis, which may also explain our findings. Some studies⁵⁷⁻⁵⁹ have suggested that air pollution can also proliferate the transmission of infectious disease. If COVID-19 spread is indeed impacted by air pollution levels, which is not yet known, some of the effects detected in our study could be mediated by this factor as well.

This analysis provides a timely characterization of the relationship between historical exposure to air pollution and COVID-19 deaths in the United States. Research on how modifiable factors may exacerbate COVID-19 symptoms and increase mortality risk is essential to guide policies and behaviors to minimize fatality related to the outbreak. Our analysis relies on up-to-date population-level COVID-19 data and well-validated air pollution exposure measures.

Strengths of this analysis include adjusting for a wide range of potential confounders and a demonstrated robustness of results to different model choices. Moreover, the analyses rely exclusively on data and code that are publicly available. This provides a platform for the scientific community to continue updating and expanding these analyses as the pandemic evolves and data accumulate.

It is important to acknowledge that this study has limitations, mainly due to the fact that this is an ecological study with data available at the county level and that this is a cross-sectional study. High quality, nationwide individual-level COVID-19 outcome data are unavailable at this time and for the foreseeable future, thus necessitating the use of an ecologic study design for these analyses. Due to the potential for ecologic bias, our results should be interpreted in the context of

this design and should not be used to make individual-level inferential statements. Also, unmeasured confounding bias is a threat to the validity of our conclusions. Unfortunately, in the midst of a pandemic it is not feasible to design a study and collect the data at the ideal level of spatial and temporal resolution to minimize all sources of bias. Yet, conditional on the data available, we have endeavored to adjust for confounding bias by all of the most important factors, including population density, time since the beginning of the outbreak, social isolation measures, behavior, weather, age structure, ethnicity, access to health care, and socio-economic factors. We also conducted 68 additional analyses to assess the robustness of the results to many modelling choices. Furthermore, we computed the E-value to demonstrate that the confounding effect of any unmeasured confounder would need to be much stronger than that of any of our observed confounders in order to explain away the relationship between PM_{2.5} exposure and COVID-19 mortality rate. The calculation of the E-value provided reassurance that the presence of a strong unmeasured confounder is unlikely; however, this possibility cannot be ruled out completely.

The inability to accurately quantify the number of COVID-19 cases due to limited testing capacity presents another potential limitation. We instead used total population size as the denominator for our mortality rates, and we additionally adjusted our models for numerous anticipated proxies of outbreak size, including time since first reported COVID-19 case, time since stay-at-home order was issued, and population density.

To conduct the most rigorous possible studies of air pollution and health using ecologic data, it is critical to utilize areal units that minimize within-area exposure variability and maximize between-area exposure variability.^{60 61} We anticipated that our use of counties satisfies this criterion,

because counties generally represent meaningful boundaries between urban, suburban, and rural areas. These population density-related delineations also often correspond to steep gradients in air pollution levels, thus maximizing across-unit exposure variability while minimizing within-unit variability. We also note that the use of long-term county-level exposure data in our study likely led to some degree of exposure misclassification. However, previous literature has found that using sub-county scale PM_{2.5} exposure in studies of mortality tends to either have no impact or to increase the strength of the associations between PM_{2.5} and mortality from various causes.⁶²

Because of the many limitations, this study also provides justification for expanded follow-up investigations as more and higher-quality COVID-19 data become available. Such studies would include validation of our findings with other data sources and study types, as well as studies of biological mechanisms, impacts of PM_{2.5} exposure timing, and relationships between PM_{2.5} and other COVID-19 outcomes such as hospitalization. The results of this study also underscore the importance of continuing to enforce existing air pollution regulations. Based on our results, we anticipate a failure to do so could potentially increase the long-term COVID-19 death toll and hospitalizations, as well as further burden our healthcare system with other PM_{2.5}-related death and disease that would draw resources away from COVID-19 patients.

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Table 1: Publicly available data sources used in the analysis

	Source	Data
Outcome: COVID-19 Deaths	Johns Hopkins University the Center for Systems Science and Engineering (JHU-CSSE) Coronavirus Resource Center (https://coronavirus.jhu.edu/)	County-level COVID-19 death count up to and including April 22, 2020
Exposure: PM _{2.5} concentrations	Atmospheric Composition Analysis Group (https://sites.wustl.edu/acag/)	0.01° × 0.01° grid resolution PM _{2.5} prediction, averaged across the period 2000–2016 and averaged across grid cells in each county
Confounders for main analysis	US Census/American Community Survey (https://www.census.gov/programs-surveys/acs/data.html)	County-level socioeconomic and demographic variables for 2012–2016
	Robert Wood Johnson Foundation County Health Rankings (https://www.countyhealthrankings.org/)	County-level behavioral risk factor variables for 2020
	JHU-CSSE Coronavirus Resource Center	Time since first reported COVID-19 case
	Raifman et al, Boston University School of Public Health, COVID-19 United States state policy database (www.tinyurl.com/statepolicies)	Time since issuance of stay-at-home order
	Homeland Infrastructure Foundation-Level Data (HIFLD) (https://hifld-geoplatform.opendata.arcgis.com/datasets/hospitals)	County-level number of hospital beds in 2019
	Gridmet via Google Earth engine (https://developers.google.com/earth-engine/datasets/catalog/IDAHO_EPSCOR_GRIDMET)	4 km × 4 km temperature and relative humidity predictions, summer and winter averaged across the period 2000–2016 and averaged across grid cells in each county

Additional confounders for secondary analyses

The COVID tracking project (<https://covidtracking.com/>)

State level number of COVID-19 tests performed up to and including April 22, 2020

Carnegie Mellon University
Delphi Research Center
(<https://covid-survey.dataforgood.fb.com/>)

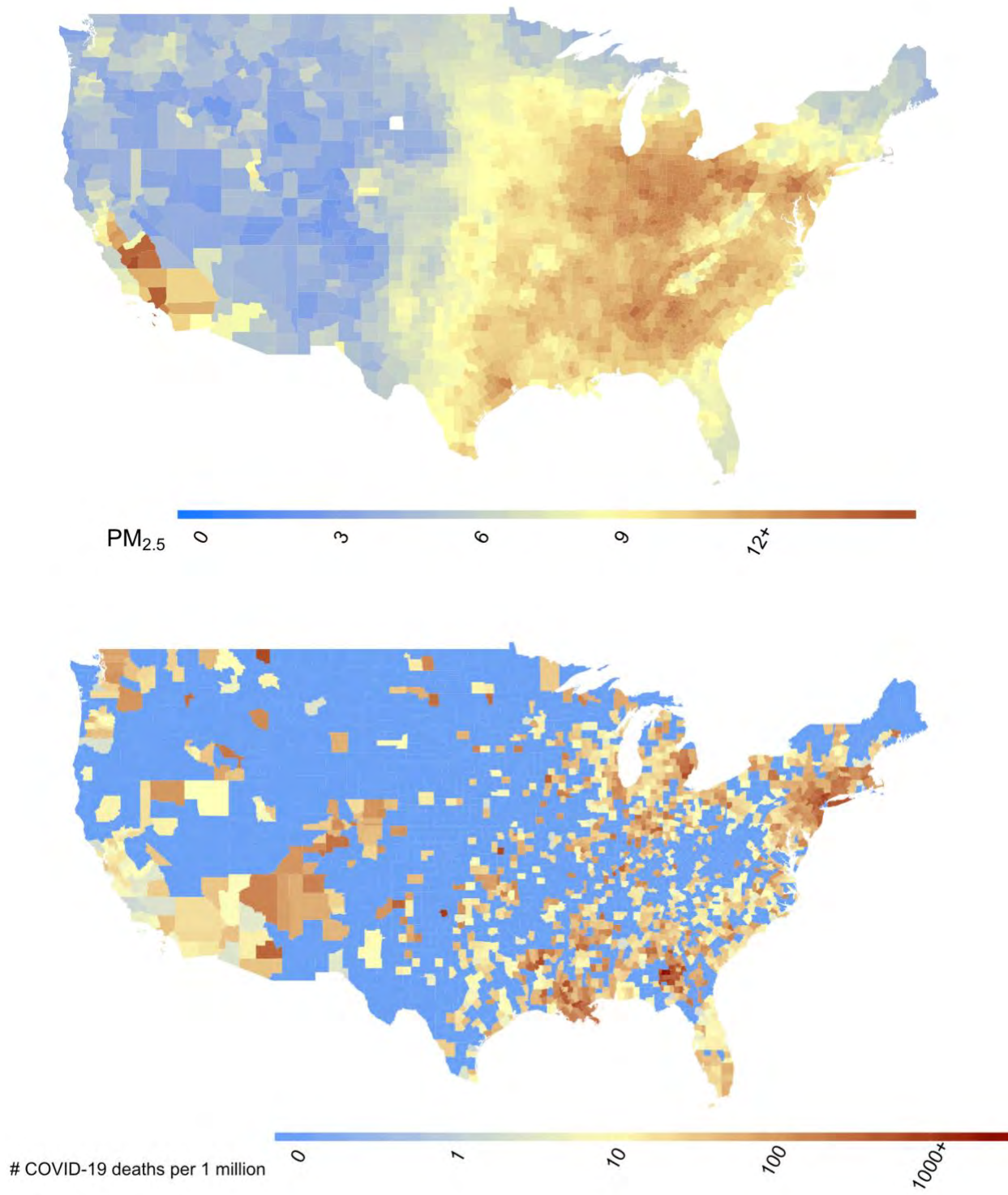
Estimated percentage of people with COVID-19 symptoms, based on survey data

Table 2: Characteristics of the study cohort up to and including April 22, 2020, mean (standard deviation)

	Total 3,087 counties	PM _{2.5} <8 µg/m ³ 1,217 counties	PM _{2.5} ≥8 µg/m ³ 1,870 counties
COVID-19 death rate (per 100,000)	3.4 (10.6)	1.6 (5.7)	4.7 (12.7)
Average PM _{2.5} (µg/m ³)	8.4 (2.5)	5.7 (1.4)	10.1 (1.2)
Rate of hospital beds (per 100,000)	242 (391.9)	300 (515.2)	204.2 (278)
Days since first case	23.6 (10.7)	19 (12.6)	26.5 (7.9)
Days since stay-at-home order	18.3 (12.4)	16.7 (13.6)	19.2 (11.4)
% Smokers	17.4 (3.5)	15.8 (3.1)	18.5 (3.4)
% Obese	32.9 (5.4)	31.2 (5.1)	34 (5.3)
% In poverty	10.5 (5.7)	9.7 (5.7)	11.1 (5.6)
% Less than high school education	21.2 (10.4)	16.5 (8.7)	24.2 (10.3)
% Owner-occupied housing	74.2 (8.8)	76 (7.7)	73.1 (9.3)
% Hispanic	7.6 (12.3)	9.7 (13.7)	6.3 (11.1)
% Black	8.2 (14.2)	1 (1.8)	12.9 (16.5)
% ≥65 years of age	16 (4.1)	17.4 (4.5)	15 (3.4)
% 45-64 years of age	26.4 (3)	26.9 (3.8)	26.1 (2.4)
% 15-44 years of age	37.6 (6.5)	35.2 (8.2)	39.2 (4.5)
Population density (person/sq. mi.)	406.7 (1732.6)	132.6 (430.7)	585.1 (2180.6)
Median household income (\$1,000)	49 (13.1)	50.5 (10.9)	48 (14.3)
Median house value (\$1,000)	136 (89.4)	140.4 (87.3)	133.1 (90.6)
Average summer temperature (°F)	86 (5.7)	83.7 (6.7)	87.4 (4.4)
Average winter temperature (°F)	45.1 (11.9)	39.4 (11.5)	48.7 (10.7)
Average summer relative humidity (%)	89 (9.6)	83.2 (11.5)	92.8 (5.5)
Average winter relative humidity (%)	87.5 (4.8)	87.9 (5.6)	87.2 (4.1)

Table 3: Mortality rate ratios (MRR), 95% confidence intervals (CI), and P-values for all variables in the main analysis.

	MRR	95% CI	P-value
PM _{2.5} ($\mu\text{g}/\text{m}^3$)	1.08	(1.02, 1.15)	0.01
Population density (Q2)	0.86	(0.60, 1.23)	0.40
Population density (Q3)	0.58	(0.40, 0.82)	0.00
Population density (Q4)	0.47	(0.33, 0.68)	0.00
Population density (Q5)	0.52	(0.35, 0.77)	0.00
% Poverty	1.02	(0.93, 1.13)	0.65
log(Median house value)	1.17	(0.99, 1.39)	0.06
log(Median household income)	1.28	(1.09, 1.51)	0.00
% Owner-occupied housing	1.12	(1.02, 1.23)	0.18
% Less than high school education	1.36	(1.21, 1.52)	0.00
% Black	1.45	(1.32, 1.60)	0.00
% Hispanic	1.00	(0.89, 1.12)	0.99
% ≥ 65 years of age	1.15	(0.99, 1.33)	0.07
% 15-44 years of age	0.93	(0.74, 1.17)	0.54
% 45-64 years of age	0.96	(0.83, 1.12)	0.62
Days since stay-at-home order	1.28	(0.97, 1.70)	0.08
Days since first case	2.96	(2.50, 3.51)	0.00
Rate of hospital beds	1.12	(1.02, 1.23)	0.01
% Obese	0.94	(0.86, 1.02)	0.14
% Smokers	1.08	(0.92, 1.26)	0.36
Average summer temperature ($^{\circ}\text{F}$)	0.96	(0.79, 1.16)	0.68
Average winter temperature ($^{\circ}\text{F}$)	1.18	(0.90, 1.53)	0.22
Average summer relative humidity (%)	0.84	(0.71, 1.01)	0.07
Average winter relative humidity (%)	1.00	(0.89, 1.13)	0.99



Attachment: Appeal of PEN18-0050 Revised Final EIR (PAA20-0002) A. Martinez (4074 : World Logistics Center)

Fig 1: Maps show (a) county-level 17-year long-term average of PM_{2.5} concentrations (2000–

2016) in the United States in $\mu\text{g}/\text{m}^3$, and **(b)** county-level number of COVID-19 deaths per 1 million population in the United States up to and including April 22, 2020.

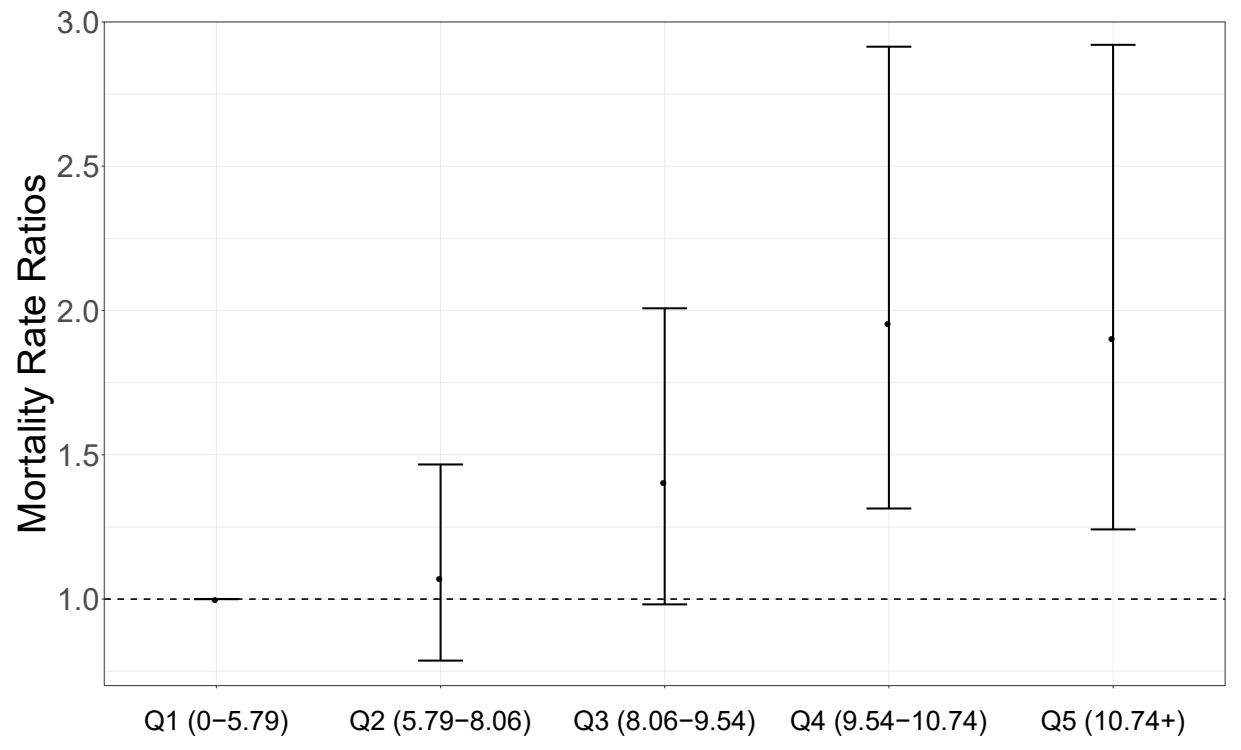
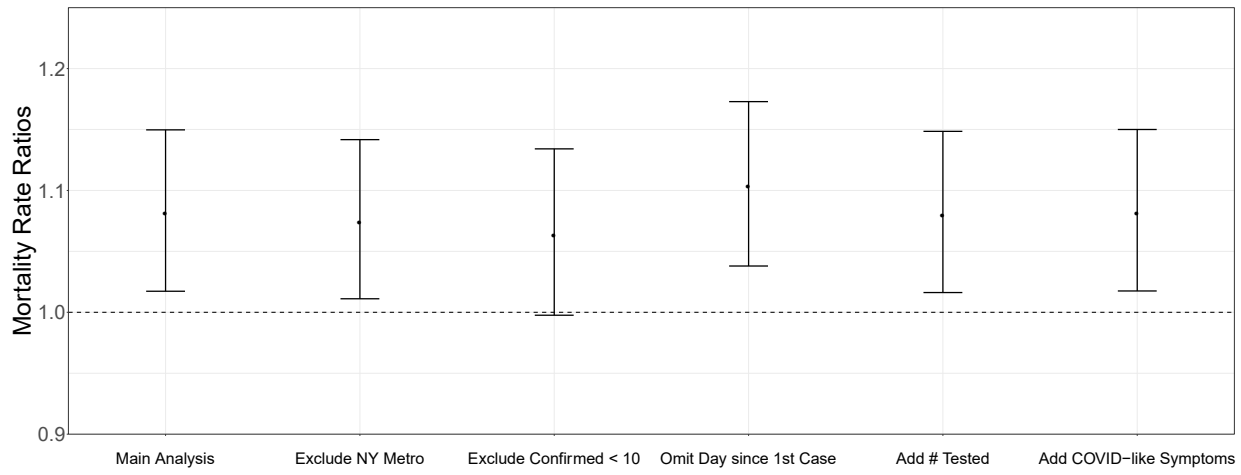


Fig 2: Mortality Risk Ratios (MRR) and 95% confidence intervals. **Upper panel,** MRR can be interpreted as percentage increase in the COVID-19 death rate associated with a 1 $\mu\text{g}/\text{m}^3$ increase in long-term average PM_{2.5} exposure. The MRR from the main analysis was adjusted for 20 potential confounders. In addition to the main analysis, results are shown for secondary analyses (a) excluding the counties in New York metropolitan area, (b) excluding counties with fewer than

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10 confirmed COVID-19 cases, (c) omitting time since first reported COVID-19 case from the model, (d) adding state-level number of tests performed to the model, (e) adding county-level estimated percentage of people with COVID-19 symptoms to the model, and (f) using PM_{2.5} exposure categorized at quintiles. All COVID-19 death counts are cumulative counts up to and including April 22, 2020. **Lower panel**, MRR can be interpreted as the percentage increase in the COVID-19 death rate associated with each empirical quintile of long-term average PM_{2.5} exposure compared to the baseline quintile (Q1).

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Incidence of COVID-19 and Connections with Air Pollution Exposure

Evidence from the Netherlands

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WORLD BANK GROUP

Fragility, Conflict and Violence Global Theme
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Abstract

The fast spread of severe acute respiratory syndrome coronavirus 2 has resulted in the emergence of several hot-spots around the world. Several of these are located in areas associated with high levels of air pollution. This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands. The results show that atmospheric particulate matter with diameter less than 2.5 is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. The estimates suggest that expected COVID-19 cases increase by nearly 100 percent when pollution concentrations increase by 20 percent. The association

between air pollution and case incidence is robust in the presence of data on health-related preconditions, proxies for symptom severity, and demographic control variables. The results are obtained with ground-measurements and satellite-derived measures of atmospheric particulate matter as well as COVID-19 data from alternative dates. The findings call for further investigation into the association between air pollution and SARS-CoV-2 infection risk. If particulate matter plays a significant role in COVID-19 incidence, it has strong implications for the mitigation strategies required to prevent spreading.

This paper is a product of the Fragility, Conflict and Violence Global Theme. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The author may be contacted at bandree@worldbank.org.

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Incidence of COVID-19 and Connections with Air Pollution Exposure: Evidence from the Netherlands

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Highlights

Background: Research on viral respiratory infections has found that infection risks increase following exposure to high concentrations of particulate matter. Several hot-spots of Severe Acute Respiratory Syndrome Coronavirus 2 infections are in areas associated with high levels of air pollution.

Approach: This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands using data on confirmed cases and hospital admissions coded by residence, along with local PM_{2.5}, PM₁₀, population density, demographics and health-related pre-conditions. The analysis utilizes different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment.

Results: PM_{2.5} is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. Taking the WHO guideline of 10mcg/m³ as a baseline, the estimates suggest that expected COVID-19 cases increase by nearly 100% when pollution concentrations increase by 20%.

Conclusion: The findings call for further investigation into the association between air pollution on SARS-CoV-2 infection risk. If particulate matter plays a significant role in the incidence of COVID-19 disease, it has strong implications for the mitigation strategies required to prevent spreading, particularly in areas that have high levels of pollution.

Keywords: COVID-19, SARS-CoV-2, Coronavirus, Air Pollution, Particulate Matter.

JEL Codes: O13, F64, Q51, Q52, Q53

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1. Introduction

In 2019, confirmed infections with a new novel human coronavirus (SARS-CoV-2) emerged in Wuhan, in the Hubei Province in China. The virus rapidly spread to other parts of China and by early 2020 it had emerged in many other countries around the world. The World Health Organization (WHO) declared a global pandemic on March 11 2020, as confirmed cases topped 118,000 in more than 110 countries and territories around the world with sustained community spread.

Epidemiologists have started to investigate possible environmental factors that accelerate the spread of SARS-CoV-2 within communities (Sajadi et al., 2020; Bhattacharjee, 2020). A recent paper by van Doremalen et al. (2020) analyzed the aerosol and surface stability of SARS-CoV-2 and compared it with SARS-CoV-1, the most closely related human coronavirus (Wu et al., 2020a). The study found that SARS-CoV-2 can survive up to three days on some surfaces, like plastic and steel, and that aerosol transmission is plausible since the virus can remain viable and infectious in the air for hours. These findings echo those of Chen et al. (2004) on environmental contamination with SARS-CoV-1, and are consistent with evidence for aerosol distribution of SARS-CoV-2 found by Guo et al. (2020), but are inconsistent with the current WHO stance that SARS-CoV-2 is not transported by air. However, the possibility of airborne transmission would call for different mitigation efforts to prevent spreading and is thus an important area of study.

The risk of infection of some airborne viruses has been shown to increase in the presence of ambient fine particles that can stay in the air for long periods, travel far distances, and penetrate deeply into lungs.¹ One highly contagious airborne disease is caused by the measles virus. Previous studies on disease outbreaks have highlighted that the incidence of measles in China increased 1-3 days after short-term exposure to high concentrations of PM₁₀ and SO₂ Chen et al. (2017b); Peng et al. (2020). In another study, ambient fine particles were found to contribute to the relative risk of influenza transmission in Chinese cities (Chen et al., 2017a) with the most significant effect occurring within a period of 2-3 days.

If air pollution plays a similar role in the incidence of SARS-CoV-2, there should be a positive relationship between confirmed COVID-19 cases and particulate matter concentrations. China ranks among the worst globally in terms of PM_{2.5} concentrations and, within China, the Hubei province is among the more heavily polluted areas (van Donkelaar et al., 2016). The most heavily hit Italian region is the Lombardy area in the northern Po valley, which is among the regions with the worst air quality in Europe. Preliminary findings from Italian researchers started pointing towards a correlation between days of exceeding the limits for PM₁₀ and the number of hospital admissions from COVID-19 (Setti et al., 2020; Onufrio, 2020).

Increased air pollution could just reflect the presence of anthropogenic activity which instead explains the patterns. However, that does not explain why COVID-19 cases are not increasing rapidly in every densely populated area.

1. Over the years, numerous studies have related hospitalization numbers, case numbers, and relative risk of respiratory viral infections and influenza-like illnesses to short-term air pollution exposure, mostly at city level, using a variety of data sets and methods. See (Ciencewicki and Jaspers, 2007) for an early review, see (Xu et al., 2013; Liang et al., 2014; Su et al., 2019) on influenza-like illnesses, and (Silva et al., 2014; Huang et al., 2016; Feng et al., 2016; Li et al., 2018) on viral respiratory infections.

To investigate this further, the current paper looks at confirmed cases and COVID-19 related hospital admissions in 355 municipalities in the Netherlands and uses regression techniques to investigate correlations between COVID-19 case data and particulate matter concentrations, controlling for a variety of demographic characteristics and data on health related pre-conditions. The analysis finds that $PM_{2.5}$ is a highly significant predictor of both the number of confirmed COVID-19 cases and the number of related hospital admissions per 100,000 inhabitants.

The analysis suggests that the association between air pollution and case incidence is robust to proxies for worse respiratory health and symptom severity. The findings are also robust to other important control variables and different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment. Results are obtained with ground-measurements and satellite-derived $PM_{2.5}$. Analyzing COVID-19 data from alternative dates resulted in similar conclusions.

The remainder of this paper is organized as follows. Section 2 visually inspects several available confirmed case maps and discusses the spatial distribution. Section 3 introduces the data used for analysis. Section 4 presents regression results and discusses several of the estimates. Section 5 concludes.

2. Spatial Distribution of COVID-19: Country Examples

Suggestive evidence that the spatial distribution of COVID-19 cases is not purely random and might be related to environmental factors can be found by exploring several maps of confirmed cases. A few easily accessible fine resolution maps are presented below, in particular for the Netherlands, Germany, Spain and Italy. The data for the Netherlands is taken from the Dutch National Institute for Public Health and Environment (RIVM).² The data for Germany is from the Robert Koch Institute.³ The data for Italy can be viewed via a live dashboard,⁴ and the raw data is well organized and available on a github page.⁵ The Spanish data was taken from this link.⁶

A number of features of the spatial distributions are striking. First, there is a strong spatial correlation visible in all four countries, which is to be expected for a virus that spreads by human contact. It is intriguing, however, that the highest case density in the Netherlands is in Brabant, the southeastern part of the country, while major cities like Amsterdam and Rotterdam are in the west part of the country where the case density is lower. While Brabant is not the most populous province, it accounts for the highest contribution to nation-wide industrial GDP. Within the province, the sub-region Zuidoost-Noord-Brabant produces the highest contribution to industrial GDP.⁷ This area approximately spans the COVID-19 case cluster that can be seen on the map.

2. <https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente>.

3. <https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>.

4. <http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1>

5. <https://github.com/pcm-dpc/COVID-19/tree/master/dati-province>

6. <https://www.rtve.es/noticias/20200323/mapa-del-coronavirus-espana/2004681.shtml>

7. <https://www.cbs.nl/nl-nl/nieuws/2018/31/belang-industrie-voor-de-regio>

INCIDENCE OF COVID-19 AND CONNECTIONS WITH AIR POLLUTION EXPOSURE

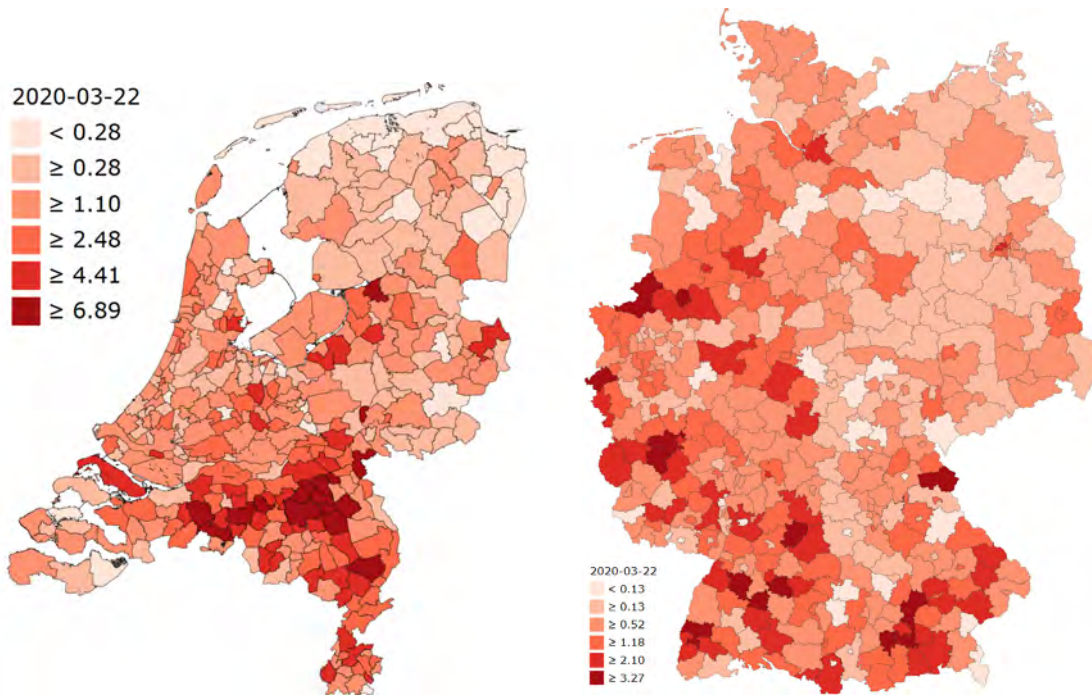


Figure 1: Distribution of COVID-19 in the Netherlands and Germany. Confirmed cases per 10,000 inhabitants.

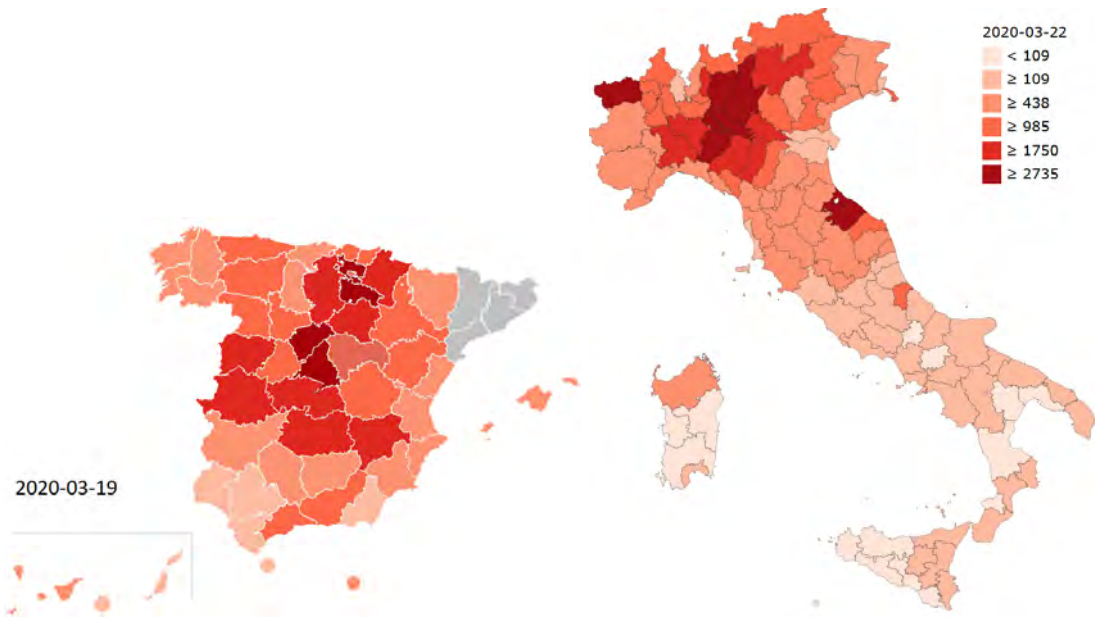


Figure 2: Distribution of COVID-19 in Spain and Italy. Confirmed cases per 1,000,000 inhabitants.

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In Germany, two areas stand out. First, the western part of the country, near the border with the Netherlands, Belgium, and Luxembourg, has an increased case density. This area (North Rhine-Westphalia, Rheinland-Pfalz and Baden-Württemberg) contains the major industrial regions including the Ruhr area. Second, a cluster of cases can be seen in the south-eastern part of the country near Munich where major automobile industry is found. These areas are also the most populous of the country, which makes it difficult to draw any immediate conclusions about a relationship with air quality.

In Spain, confirmed cases have the highest case density in the capital, Madrid, with an extension into neighboring Sergovia. A second cluster can be also seen northeast of Madrid. Interestingly, Spain's population density is high along the eastern coast where the case density is lower. This suggests that case incidence in the country does not simply follow population densities, but that other factors play a role.

Finally, in Italy, confirmed cases have the highest case density in the northern part of the country, Lombardy in particular. Without a doubt, Lombardy and the Po valley as a whole has one of the highest concentrations of air pollutants of Europe. Moreover, the case density does not seem to trend strongly with Italy's population distribution. For example, Italy's population density is generally high along its coast, and cities like Rome and Naples do not stand out in the map.

Taken together, the maps suggest that that COVID-19 incidence clusters spatially and that environmental factors beyond population density may play a role. The analysis in the remainder of the paper confronts the relatively granular Dutch case data with possible predictors that include population density, air pollution, demographic characteristics and health related controls.

3. Data

The COVID-19 data is taken from the RIVM.⁸ The first data snapshot includes all confirmed cases as of March 22 (a total of 4,004 with known residence out of 4,157 confirmed cases). A second snapshot of confirmed cases was taken on March 30 and includes 11,258 cases with known residence out of 11,750 confirmed cases. The confirmed COVID-19 hospital admissions are taken from the same source approximately 1 week after the first data snapshot (31 March, a total of 4,562 with known residence out of 4,712 admissions from a total of 12,595 confirmed cases). While some cases are reported immediately, a share of the cases follows a typical delay of up to 1-2 days after the actual case or hospitalization confirmation. Both the confirmed cases, as well as confirmed hospital admissions, are coded by residence (not by hospital addresses).

On March 31, approximately 37% of confirmed cases were also hospital admissions, highlighting that case detection is likely biased toward more severe cases.⁹ Within one week, the number of hospital admissions exceeded the confirmed cases of the previous week, indicating that the time between confirmation and hospitalization likely spans only a few days. Cases are reported to the RIVM by the Municipal Health Service (GGD). The GGD is organized as collaboration between municipalities to provide base level public health service

8. <https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente>

9. For example, early estimates based on Chinese cases indicated that the hospitalization rate of elderly, the most vulnerable population, was only 18.4% (Verity et al., 2020).

in accordance with country-level legislation on public health. The 355 municipalities are grouped into 25 GGD areas, each covering a population of approximately 600,000 inhabitants. The GGD borders are visible in figure 5 which visualizes the hospital admissions.

The data is combined with demographic statistics (2019) obtained from the Dutch Central Bureau of Statistics.¹⁰ The data contains the official population headcount at district level, as well as a number of relevant household characteristics. A number of surveyed health statistics (2016) have been obtained as well from the RIVM (maps can be viewed in the source link).¹¹ The data is based on a survey of 457,000 people and includes the share of population in each district with a documented long-term illness (illnesses over 6 months), the prevalence of overweight and obesity, alcohol abuse, smoking and noise due to traffic. Hence the data controls for the presence of possible pre-conditions that make certain populations more vulnerable.

A variety of air pollution data sets exist. For the main analysis, annual average particulate matter concentrations from the RIVM are used to capture long-term exposure (2017, published September 2019).¹² The data is used by the government for official monitoring in accordance with EU guidelines on air quality monitoring and has a resolution of 25 meter grids. These high-resolution grids are produced by spatial interpolation of ground-measurements. For this analysis, the grids have been averaged to the municipality level. The spatial distribution of pollution has remained relatively stable in recent years. The intensity of air pollution has gradually gone down since 2013, though the difference between the 2017 and 2015 data is relatively small. This suggests that the spatial variation of the 2017 data is still relevant to analyze the role of long-term pollution exposure in the current situation. The temporal lag in the pollution data also ensures that there is no endogeneity due to feedback between case incidence and changes in pollution levels that follow lock-down policies.

To test whether the main findings of the analysis generalize to other pollution data sets, a second analysis presented in the appendix uses the coarser grids from the global PM_{2.5} data set of van Donkelaar et al. (2016). The main conclusions of the analysis do not change when this alternative pollution data set is used, and since this data is mainly satellite-derived, it may be used in other countries where detailed PM_{2.5} measurements are not easily available. Figure 6 visualizes the spatial distribution of the main PM_{2.5} and PM₁₀ statistics. Table 3 summarizes the full set of covariates used in the analysis.

4. Results

The analysis is organized into two main investigations and a set of robustness analyses. First, section 4.1 analyzes the confirmed cases per 100,000 inhabitants using linear models that account for possible spatial autocorrelation and residual dependence. Section 4.2 analyzes the data nonlinearly, allowing parameter estimates to vary across locations and levels in the data. Additional results are included in the appendix, section 6.2. In particular, the robustness of the results is diagnosed by using alternative measures of incidence, a different source of pollution data, and alternative distributional assumptions.

10. <https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/geografische-data/wijk-en-buurtkaart-2019>

11. <https://www.rivm.nl/media/smapi/langdurigeziekte.html>

12. <https://www.atlasleefomgeving.nl/kaarten>

4.1 Linear analysis of March 22 cases per 100,000 inhabitants

To analyze the relationship between spatial variation in particulate matter concentrations and COVID-19 incidence, a number of regressions are estimated that control for possible spatial autocorrelation (Anselin, 1988).¹³ Importantly, the spread of SARS-CoV-2 manifests itself in hot-spots that result from contact with infective subjects from areas that are in close proximity, and it can show strong geographical patterns that are not structurally related to air pollution levels. The fact that the infection started at different times in different areas together with the exponential and geographical nature of case spread, may lead to spurious associations between the spatial distribution of case hot-spots and pollution levels, particularly if the initial cases occurred in polluted regions by mere chance and then spread to nearby regions.¹⁴

To account for the issue, spatial models include neighboring values of the dependent variable and/or residuals as additional variables. These spatial averages control for the clustering that results from geographical spillovers.¹⁵ These models can be understood as spatial equivalents to the models that are commonly used to analyze time series in which observed values are in part explained by recent observations. While the household composition and population density terms capture more dense social links, the spatial regression components capture the likelihood of contact with infective subjects. In particular, within a hot-spot, neighboring areas have high numbers of cases per 100,000 inhabitants, and the spatial regression terms capture the increased likelihood of having contact with infective subjects within the region. The important empirical question that these models thus seek to answer is whether pollution and case incidence are associated after controlling for the geographical relationships in disease spread.

First, Model 1 estimates a linear regression using all 22 covariates and possible confounders of interest that are summarized in table 3. These include population density, gender, age groups, marital status and household composition, the share of migrants, as well as several population health indicators. Particularly the health indicators are important because PM_{2.5} is known to affect population health. This may result in important pre-conditions that lead to more severe COVID-19 disease. Pre-conditions captured by the data include the share of population with a long-term illness (including asthma), the share of people that smoke and admit to guidelines on alcohol use, the share of people diagnosed with obesity or overweight, as well as variables on populations exposed to traffic noise.

13. The treatment of spatial autocorrelation and spatial residual correlation took a firm position in quantitative geography after the contributions by Cliff and Ord (1969, 1972). Spatial econometrics as a subfield of econometrics was rapidly developed as a means to analyze sub-country data in regional econometric models (Anselin, 2010). Good introductory books exist, apart from the one referenced in the main text (LeSage and Pace, 2009) is one other. The (Q)MLE is worked out, for example, in (Lee, 2004). The field is still actively developed, with recent advances focusing on time series dynamics and non-linearity (Beenstock and Felsenstein, 2019; Andrée, 2020).
14. The first case was detected on February 27 in Loon op Zand in Brabant, but that same night a case was also confirmed in Amsterdam. Within 4 days, 10 cases had been confirmed in 6 cities across 4 provinces with multiple sources of infection, it took till March 23 for lockdown policies to be announced, giving ample time for spread from multiple points, see <https://nos.nl/artikel/2325309-beatrixziekenhuis-gorinchem-gesloten-om-coronavirus-tien-patienten-in-nl.html>
15. While the spatial autoregressive models only include the rate of infective subjects in neighboring areas as regressors, the models in fact allow for feedback and spillovers to more distant observations as each area is also a second-order neighbor of itself. See the literature on spatial models cited earlier.

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It is well known that models with a high number of variables can over-fit data sets that contain only a modest number of observations. Model 2 estimates the same linear regression but uses step-wise variable selection following the AIC, Model 3 uses the selected variables in a spatial error model that controls for spatial dependence in the residuals (λ parameter), Model 4 estimates a spatial autoregressive model that allows for dependence on neighboring observations (ρ parameter), Model 5 allows for unique spatial autocorrelation and spatial residual correlation parameters. For compactness, table 1 only lists Model 1 estimates for variables selected by the AIC, even though all regressors are included. Finally, PM_{10} correlates (.95) strongly with $PM_{2.5}$ and the AIC favored $PM_{2.5}$. Replacing it with PM_{10} in the regressions below led to a small deterioration in measures of fit, indicating that $PM_{2.5}$ is a statistically preferred predictor, although the main conclusions do not depend on this. For simplicity, the focus remains on the $PM_{2.5}$ data.

Table 1: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5b
(Intercept)	-359.58 (218.20)	-402.51*** (80.61)	-202.58*** (76.06)	-200.63*** (64.11)	-207.50*** (74.59)	-185.43*** (71.75)
Population density	-6.28** (2.58)	-6.54*** (2.38)	-0.03 (2.05)	-1.10 (1.87)	-0.48 (2.06)	-0.48 (1.94)
Share 25 to 44	3.55 (2.17)	2.62* (1.34)	-0.80 (1.05)	0.47 (1.05)	-0.37 (1.07)	-.41 (1.02)
Share above 65	5.58* (2.26)	4.22*** (1.27)	2.12** (1.03)	2.14* (1.00)	2.08** (1.05)	1.07* (1.00)
Share unmarried	4.94*** (1.33)	4.78*** (0.97)	4.01*** (0.96)	3.28*** (0.78)	3.83*** (0.94)	3.59*** (0.89)
Share single household	-4.02*** (1.47)	-2.17*** (0.57)	-1.62*** (0.49)	-1.50*** (0.45)	-1.59*** (0.49)	-1.70*** (0.46)
Share non-western immigrants	-1.32** (0.57)	-1.23** (0.48)	-0.57 (0.43)	-0.78** (0.38)	-0.77* (0.42)	-0.58 (0.40)
Share of water surface	17.58 (11.18)	16.11 (10.28)	11.30 (9.62)	13.56* (8.07)	13.53 (9.21)	11.53* (8.71)
Share with long-term illness	1.10 (1.00)	1.19 (0.76)	0.41 (0.92)	0.72 (0.60)	0.64 (0.79)	0.97 (0.74)
Case severity						-0.065*** (.01)
Mean $PM_{2.5}$	10.17** (4.66)	10.84*** (1.48)	6.21*** (2.82)	3.52*** (1.22)	4.91** (2.44)	4.47*** (2.31)
λ			0.71*** (0.26)		0.42* (0.26)	0.39 (0.25)
ρ				0.68*** (0.25)	0.43 (0.25)	0.50** (0.21)
R2	0.24	0.22	0.52	0.51	0.50	0.55
AICc	3414.85	3391.40	3274.36	3274.12	3269.31	3237.91

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In the non-spatial regressions, the correlation with population density is negative and significant, suggesting that the case density is on average lower in densely populated areas. This could reflect mis-specified scaling. However, in the models that control for spatial clustering, population density is not significant. This suggests that, after controlling for spatial clustering, the spatial variation in case density is not related to population density patterns. Instead, the share of unmarried and the share of single households, which relate to the number of households in a given population and the type of social networks that they

have, are significant regressors. The estimates suggest that instead of the total number of people a person can have contact with within an area (population density), infection risk is determined by the number of people a person is likely to interact with (determined by marital status and household type), together with the average share of infected inhabitants in the wider region (spatial components). This is a plausible result. To simplify the multi-dimensional relationship between case densities and social interaction, regressing single household shares on unmarried population shares shows that on average, a 1% increase in the first is associated with a 0.74 % increase in the latter, suggesting that on average the case densities increase when there are more households in an area.

Importantly, across all regression specifications, the coefficient for $PM_{2.5}$ is positive and highly significant in the presence of controls, and also in the specifications that control for spatial residual trends and the rate of infective subjects in nearby areas. Combined, the regressions thus provide strong evidence that $PM_{2.5}$ plays a role in COVID-19 case incidence that cannot be attributed to demographics or health pre-conditions. In particular, the estimate of 10.84 in Model (2) suggests that, on average, cases per 100,000 inhabitants grow by approximately $21.68 \sim 22$ when concentrations increase from $10\text{mcg}/\text{m}^3$ to $12\text{mcg}/\text{m}^3$. This corresponds to slightly less than a 100% increase given that the average municipal case density in the data is $24.79 \sim 25$ per 100,000 inhabitants. Note that the direct elasticity is lower in the spatial models (3-5), but the net impacts need to be multiplied by spatial spillover effects. Spatial spillovers ρ and spatial correlation in the residuals λ are both significant and have a positive sign highlighting that spatial spillovers further add to local effects. For example, evaluating the prediction difference of the spatial autoregressive model (4) at $PM_{2.5}$ levels of $10\text{mcg}/\text{m}^3$ and $12\text{mcg}/\text{m}^3$, suggests a very similar increase in case incidence of $22.08 \sim 22$ per equal number of inhabitants.

Across the regression specifications, it is found that the health indicators have no significant linear relationship with confirmed case incidence. Only the share of population with a long-term illness was kept in the model with the lowest AIC, but its effect is not significant in any of the regression specifications. Going from Model 1 to Model 2, it can be seen that the parameter estimate for $PM_{2.5}$ varies little after dropping the majority of health data controls, suggesting that the association between case incidence and pollution is not heavily impacted by adding or removing available data on possible pre-conditions. It is however important to ensure that the association between case incidence and pollution concentrations is not in fact driven by worse respiratory health in polluted areas. If worse respiratory health and aggravated symptoms in polluted areas are the main channels of action, higher COVID-19 case hospitalization rates should also be expected in these locations. For this reason, the percentage of the confirmed cases that resulted in hospital admission one week later (March 22 cases / March 31 hospital admissions times 100) was calculated as proxy for case severity. In 29 areas with no confirmed cases where hospitalizations occurred within a week, a value of 100 is assigned. In 9 areas where none of the confirmed cases resulted in hospitalization, a value of 0 is assigned.¹⁶ Model 5b adds this additional proxy

16. The proxy is not perfect due to the low data density. Using instead the percentage of March 30 cases that resulted in March 31 hospitalization leads to only 4 replacements of both types (100/0). Re-estimating Model 5b with this recalculated proxy did not result in measurable change relative to Model 5. Using instead the March 30 confirmed cases as dependent variable in the same regression specification did not find the severity proxy to be significant and found $PM_{2.5}$ to remain significant at the highest level.

variable and finds that it is highly significant. The overall model fit improves as indicated by the AICc and R2. The estimate for PM_{2.5} remains relatively unchanged and significant. While one would expect that case severity contributes to higher cases, as increased symptom severity may lead to higher case detection, the result suggests otherwise. One explanation is that high hospital admission occurred in areas with a weak case detection policy. In particular, if the disease goes unnoticed for long, the number of terminally ill patients can grow because they do not receive appropriate treatment in time. In this case, low case numbers can coincide with high hospital admission numbers. To investigate further whether the proxy captures a valuable signal related to symptom severity, appendix section 6.2.5 provides additional results that try to explain the case severity proxy using the other available predictors. These additional results find that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates. This is in line with earlier identified risk groups (Ruan, 2020), suggesting that the proxy does capture a relevant case severity signal.

Taken together, the evidence suggests a significant positive relationship between case density and PM_{2.5} concentrations. However, there are still some limitations to the basic regression results presented here. The standard linear regression model may not be perfectly suitable for modeling the number of cases per 100,000 inhabitants due to the non-negative nature of the data and a right skew in the case density distribution. Strong violations of the correct-specification assumption can result in biased estimates, for instance because the models assess linearity on an additive scale while the phenomenon is multiplicative. Instead of assessing the data on the original scale as a multiplicative error model with a changing variance function, this issue is often addressed by rewriting the model as an additive error model on the log-scale with constant variance. This is appropriate as long as the log transformation is appropriate to normalize the data. To assess whether the simple estimations presented here are prone to a strong bias, section 6.2.2 investigates the residual distribution and re-analyzes the data using a log-type power transformation from a family of functions that allows for zeros. The results highlight that when the data is appropriately scaled and multiple diagnostics confirm that the Normality assumption is in fact valid, PM_{2.5} is still a highly significant positive predictor of case densities. Earlier studies on the role of ambient fine particles in the transmission risk of airborne disease have instead relied on Poisson-type regressions using count data. While these regressions are not entirely appropriate as they do not account for the highly significant geographical relationships in the data, section 6.2.1 presents Poisson-type results that allow for over-dispersion to show that the main conclusions are also robust to this specification choice.

4.2 Nonlinear analysis of March 22 cases per 100,000 inhabitants

Instead of working on a transformed scale to address some of the highlighted issues, it is also possible to tackle the problem nonlinearly on the original scale. This might also lead to interesting results on important thresholds in the data. In particular, one might expect particulate matter to only contribute to COVID-19 incidence after concentrations surpass a certain critical threshold, or expect pollution dependencies to vary with unobserved weather variables including humidity and temperature (Chen et al., 2017b,a; Peng et al., 2020). In a recent study, Sajadi et al. (2020) have already shown that there could be a relationship

between COVID-19 incidence and climatic conditions. Some COVID-19 related climatic zones are mapped by the Copernicus Earth Observation Programme, see (Copernicus Climate Change Service, 2020), and these put all but a select few municipalities analyzed in this study in the same zone. For this reason, one should expect that if the relationship between pollution and COVID-19 incidence varies regionally, it does so with a reasonable smoothness.

Additional results below are obtained using non-parametric penalized kernel regression following (Hainmueller and Hazlett, 2014; Andrée et al., 2019). The estimates provide observation-level marginal coefficients that allow for nonlinearity conditional on levels in the data. Longitude and latitude have been added as additional controls, which allows the model to capture spatial trends in line with a spatial residual component. However, this time it also allows the model's parameters to vary across spatial gradients in unobserved components, such as related to weather. The model nests a linear model, specifically, higher levels of regularization result in linearized relationships. Evidence that the relationship with air pollution is nonlinear is strengthened by using Model (2) and re-estimating it after applying a third-order Taylor approximation to the $PM_{2.5}$ measurements. Calculating an auxiliary test statistic for the significance of the second and third terms overwhelmingly supports nonlinearity, a Likelihood Ratio obtains a p -value below 0.001 (statistic of 15.18 on 2 degrees of freedom).

The fit of the nonparametric model is tuned using standard cross-validation procedures and out-of-sample prediction performance was estimated using 10-fold, repeated twice, cross-validation. To keep the flexibility of the models at a manageable level given the small number of observations, only a few predictors are used. In particular, the significant predictors from the final model (5) are taken, the share of unmarried is dropped as the model can now estimate nonlinear dependence on the share of single households, the share of long-term illness and population density are added back in because they remain of particular interest. The share of non-Western immigrants was dropped because it was insignificant and dropping it did not negatively impact the cross-validation results. Finally, the share of population in the 25 to 44 years group was dropped because estimating nonlinearly on only the share of population above 65 resulted in better fit.

Table 2: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Avg.	Pr(Avg. > 0)	q.25	q.50	q.75
Population density	-3.75	0.24	-8.40	-1.84	1.62
Share above 65	-0.41	0.44	-1.55	0.00	1.42
Share of single households	-1.57	0.00	-2.56	-1.01	0.19
Share with long-term illness	0.39	0.59	-1.70	-0.06	1.94
Mean $PM_{2.5}$	5.98	0.02	-1.24	3.16	11.45

Insample R2: 0.50, CV R2 0.35, Longitude and Latitude used as additional controls.

Table 2 presents the estimation results. In it, Avg. takes the average across all the marginal coefficients and q.25-q.75 give the quantiles as an indication of parameter heterogeneity. To understand the shape of the nonlinearity, figure 3 plots conditional expectations across the range of values in the covariates. The values are produced by fixing all covariates,

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except the one of interest, at mean values, and plotting the model predictions and their standard errors across the .025th percentile to the .975th percentile values of inputs.

The averages of parameter estimates resemble the results from those obtained with linear regression methods. In particular, the average slope of population density is again negative but not significant, while the increased share of single households provides a stronger signal for increased case densities, particularly in the inner range of values that have denser data coverage (see figure 3). The age group control shows that elderly are more at risk. The estimated relationship with the share of population that has a long-term illness highlights an important threshold. Fewer COVID-19 cases are expected only in areas with very low values for this indicator.

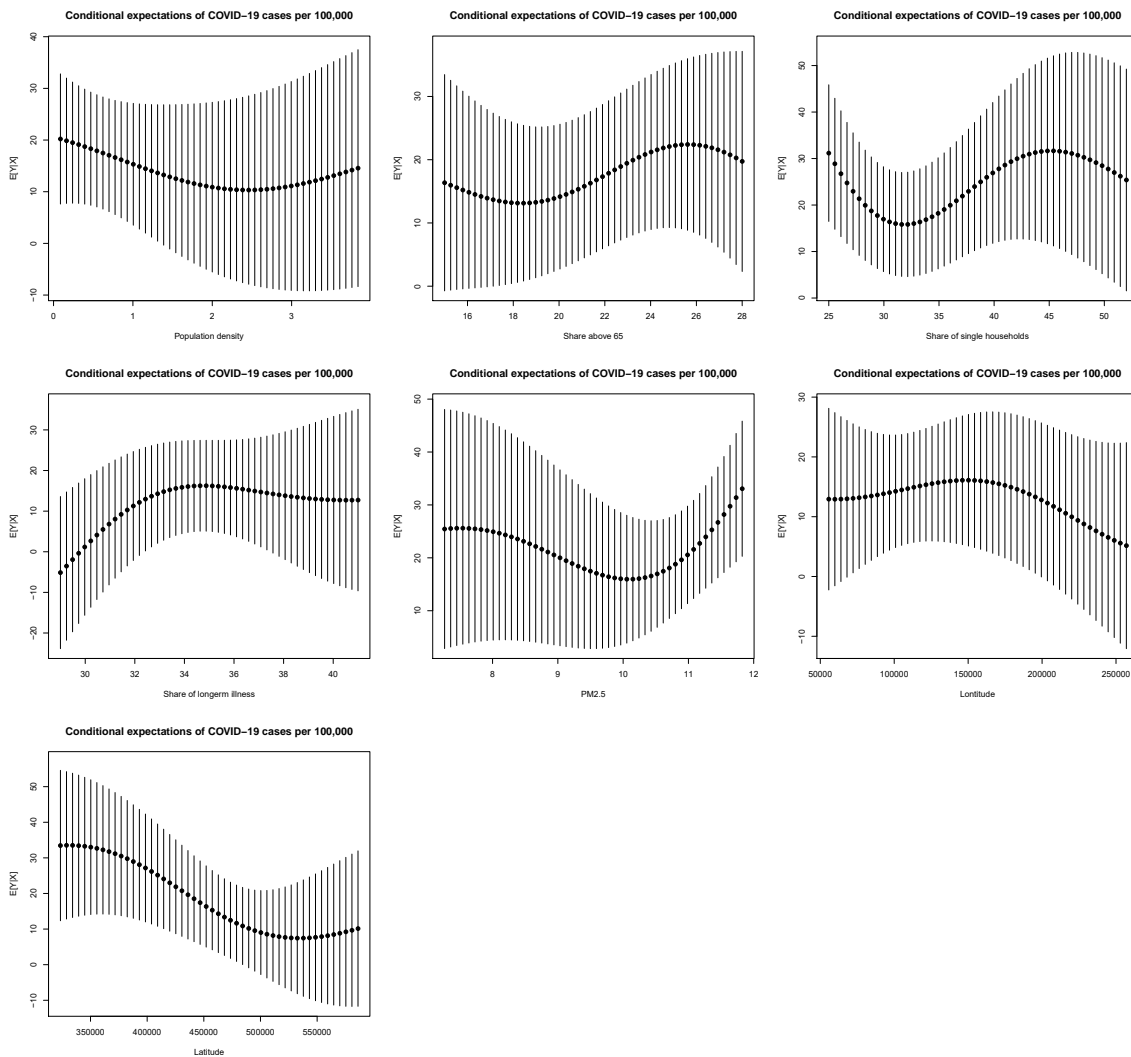


Figure 3: Conditional expectation plots for COVID-19 cases per 100,000 inhabitants.

Importantly, after addressing nonlinearity and spatial heterogeneity in parameter estimates, the average slope of $PM_{2.5}$ remains positive and highly significant. The ranges in the quantiles highlight that there is substantial parameter heterogeneity. The nonlinear estimates suggest that at low levels of $PM_{2.5}$, changes in particulate matter concentrations are not associated with significant changes in case incidence. However, after the mean annual concentrations cross the WHO guidelines of $10\text{mcg}/\text{m}^3$, the standard errors tighten and the number of expected cases increases sharply. At $12\text{mcg}/\text{m}^3$, the expected cases per 100,000 inhabitants are approximately double the numbers expected at $10\text{mcg}/\text{m}^3$.

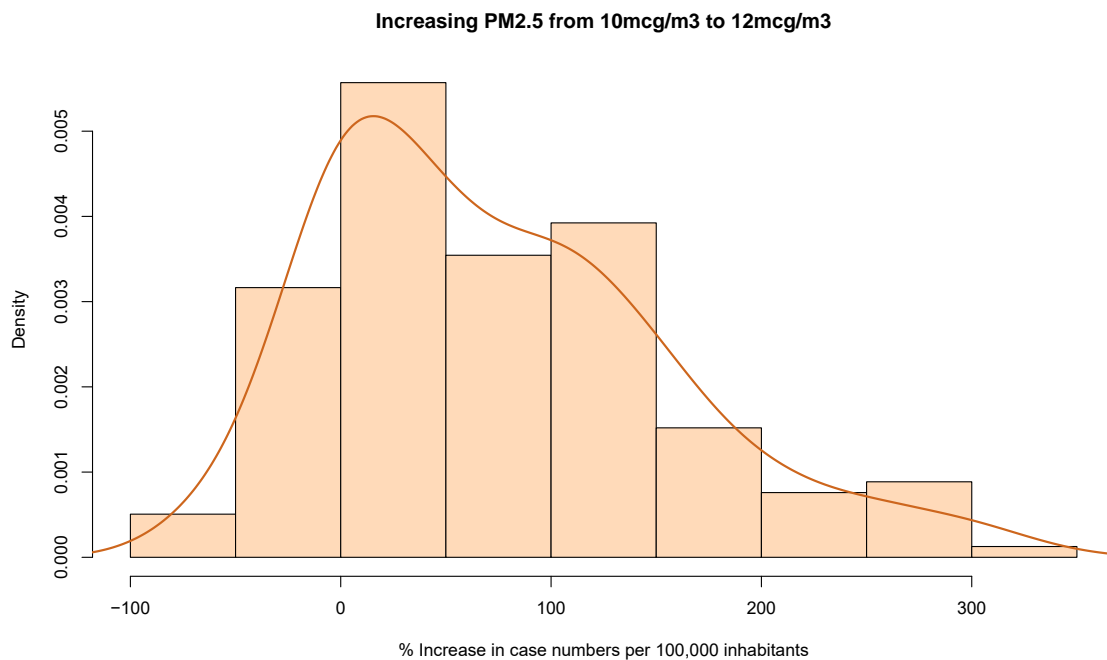


Figure 4: Prediction difference when increasing pollution concentrations (N=158).

More indication of impacts is approximated by calculating the prediction difference when $PM_{2.5}$ moves from $10\text{mcg}/\text{m}^3$ to $12\text{mcg}/\text{m}^3$, leaving all other covariates at observed values. This is performed for all areas that have at least already $9\text{mcg}/\text{m}^3$ and case numbers within the 25% to 75% quantile range (between 8.3 and 31.7 cases per 100,000). The prediction difference is standardized based on the current actual case numbers and multiplied by 100, thus expressed as a percentage increase with respect to current case numbers. The results in figure 4 highlight the effect heterogeneity, suggesting that the modeled pollution association varies strongly depending on other covariates. Numerical integration under the kernel density suggests 80% of events result in positive increases in case incidence, and of these events the estimated average increase in cases per 100,000 inhabitants is 95% when particulate matter concentrations increase from $10\text{mcg}/\text{m}^3$ to $12\text{mcg}/\text{m}^3$.

5. Conclusion

Research on viral respiratory infections, measles and influenza outbreaks has found that infection risks increase following exposure to high concentrations of particulate matter. This paper investigated the relationship between COVID-19 incidence and exposure to particulate matter in 355 municipalities in the Netherlands. Regression analysis was performed using confirmed cases per 100,000 inhabitants, confirmed COVID-19 related hospital admissions per 100,000 inhabitants, and confirmed case counts as dependent variables.

The study finds that $PM_{2.5}$ is a highly significant predictor of all three indicators of COVID-19 incidence. The findings are robust to outlier treatment and power transforms to normalize data, and are stable across alternative regression specifications that allow for spatial dependence or nonlinearity, and remain significant in the presence of demographic and health controls. Estimates suggest that when annual concentrations cross above the WHO guidelines of $10\mu\text{cg}/\text{m}^3$, the number of expected cases per 100,000 inhabitants doubles as annual concentrations reach $12\mu\text{cg}/\text{m}^3$ all else constant.

While the analysis found that these results are robust to various methodological considerations, it is important to note that testing for SARS-CoV-2 is performed using convenience sampling, which may well vary by area and in time. This may induce biases in the results if the sampling rate is indirectly correlated with pollution levels. However, it is difficult to perceive why sampling should structurally be related to pollution concentrations. Moreover, in light of the rich body of literature on the association between pollution exposure and respiratory tract infection risk, and the plausible parameter estimates with respect to many of the other variables, convenience sampling does not seem to be a more plausible explanation for the results than the findings of the study itself. Moreover, another new study by Wu et al. (2020b) has found evidence for a higher number of confirmed fatal COVID-19 cases per 100,000 inhabitants in the United States, which seems to corroborate the findings on increased hospital admissions and cases per 100,000 inhabitants.

The findings call for further investigation. In particular, the air pollution link should be investigated in multiple countries and for wider ranges of $PM_{2.5}$ concentrations. If the relationship extrapolates to higher concentrations, the implications for developing countries may be severe. In particular, developing countries are highly polluted compared to the levels observed in this study (Andrée et al., 2019) and are already identified as risk areas for COVID-19 spread (Gilbert et al., 2020; Nkengasong and Mankoula, 2020; Martinez-Alvarez et al., 2020). Even though this study was not able to find strong evidence for an impact of $PM_{2.5}$ on case severity, at the high levels of $PM_{2.5}$ in developing countries, more severe impacts on respiratory health may interact with case fatality of SARS-CoV-2. The possible association between pollution and symptom severity will thus be important to revisit, particularly because regional variation in case fatality of closely related SARS-CoV-1 has been associated with air pollution exposure (Cui et al., 2003).

Finally, as more data on COVID-19 spread becomes available, stronger results on the specific effects of short-term air pollution exposure may be estimated. If fine particulate matter plays a significant role in SARS-CoV-2 infection risk, it has strong implications for the mitigation strategies required to prevent spreading.

6. Appendix

6.1 Data descriptives

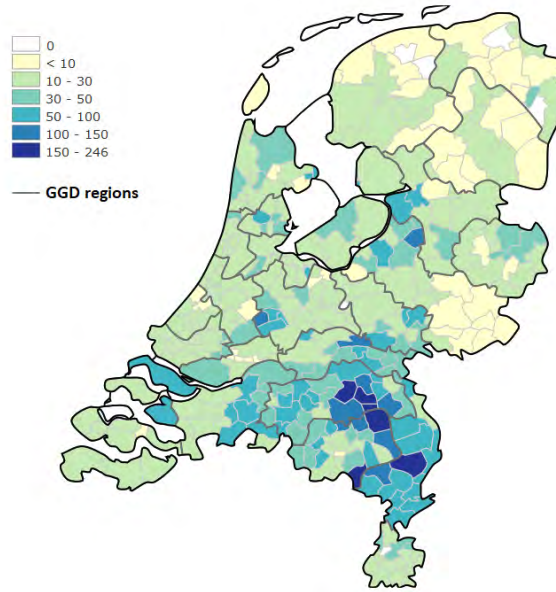


Figure 5: Hospital admissions per 100,000 inhabitants on March 31.

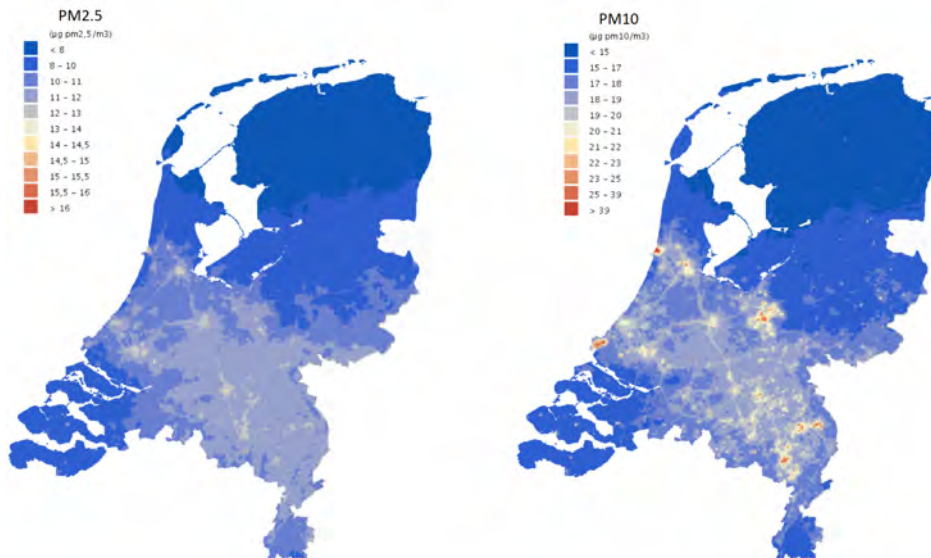


Figure 6: Particulate matter concentrations (2017).

Table 3: Data descriptives.

Variable	mean	sd	median	min	max
March 22 confirmed cases per 100,000	24.79	31.62	16.00	0.00	349.50
March 30 confirmed cases per 100,000	70.84	63.77	54.20	0.00	565.70
March 31 hospital admissions per 100,000	29.36	30.81	20.50	0.00	237.20
March 22 confirmed case counts	11.41	21.66	6.00	0.00	188.00
March 22 case hospitalization rate	141.15	102.67	107.05	0.00	804.92
March 30 case hospitalization rate	41.39	19.23	41.05	0.00	100.00
Population density (thousands per sqkm)	0.88	1.04	0.46	0.02	6.52
Share of male population	0.51	0.01	0.50	0.47	0.57
Share from 14 to 24	11.72	1.65	12.00	9.00	23.00
Share from 25 to 44	21.96	2.84	22.00	14.00	36.00
Share from 45 to 64	29.32	2.22	30.00	19.00	34.00
Share above 65	21.24	3.29	21.00	9.00	32.00
Share of unmarried	44.53	4.19	44.00	37.00	65.00
Share of single households	32.76	6.32	31.00	20.00	60.00
Share of households without children	32.02	3.56	32.00	20.00	40.00
Average household size	2.26	0.18	2.30	1.70	3.30
Share of western immigrants	8.61	4.46	8.00	2.00	47.00
Share of non-western immigrants	7.43	5.93	5.00	1.00	39.00
Share of water surface	0.11	0.17	0.04	0.00	0.94
Share with long-term illness	34.11	2.91	34.00	27.00	45.00
Share of overweight	51.01	3.68	51.00	37.00	61.00
Share exposed to noise above 50kmh	3.03	1.38	3.00	0.00	8.00
Share exposed to noise below 50kmh	4.84	2.00	5.00	1.00	13.00
Share with obesity	14.46	2.17	14.00	9.00	22.00
Share of non-heavy drinkers	39.94	4.87	40.00	30.00	58.00
Share of smokers	19.64	2.72	19.00	14.00	31.00
Mean PM _{2.5}	10.22	1.33	10.69	6.95	12.04
Mean PM ₁₀	17.28	1.61	17.74	13.60	21.09
Mean Van Donkelaar PM _{2.5}	14.60	1.77	15.01	10.15	18.05

6.2 Additional analysis results

This section presents a number of additional estimations. In particular, section 6.2.1 presents Poisson-type regressions that use case counts as dependent variables in line with earlier studies on the relationship between air pollution and viral spread, the influence of possible outlier observations or the discussed distributional issues is investigated in section 6.2.2, in section 6.2.3 the main analysis is re-estimated using confirmed cases from March 30 to show that the conclusions are not dependent on the date of the case snapshot, the main analysis is also repeated using confirmed hospital admissions from March 31 in section 6.2.4 to provide further evidence that the conclusions are not dependent on measurement error in the confirmed cases. Section 6.2.5 investigates correlations between covariates and the case hospitalization rates used to proxy for symptom severity. Finally, additional analysis in section 6.2.6 re-estimates the main analysis using alternative satellite-derived PM_{2.5}.

6.2.1 POISSON-TYPE REGRESSIONS FOR CASE INCIDENCE

In table 4, the case counts are used in regression instead of case density. Model 8 estimates a standard Poisson regression. Model 9 estimates a Poisson regression with stepwise selection following the AIC. Model 10 presents the same model, allowing for over-dispersion. Finally, Model 11 allows for a zero-inflated Negative Binomial distribution and model 12 performs step-wise AIC under the Negative Binomial.

Table 4: Dependent Variable: Confirmed COVID-19 cases.

Variable	Model 8	Model 9	Model 10	Model 11	Model 12
(Intercept)	-13.75*** (2.23)	-13.75*** (1.64)	-13.75*** (5.12)	-9.89** (4.86)	-4.14 (2.72)
Population density	-0.35*** (0.02)	-0.35*** (0.02)	-0.35*** (0.08)	-0.30*** (0.08)	-0.29*** (0.07)
Share of male population	-22.38*** (1.90)	-23.12*** (1.85)	-23.12*** (5.77)	-16.07*** (4.96)	-13.29*** (4.41)
Share 14 to 24	0.07*** (0.02)	0.07*** (0.01)	0.07 (0.04)	0.04 (0.05)	
Share 25 to 44	0.16*** (0.02)	0.16*** (0.02)	0.16*** (0.05)	0.17*** (0.05)	0.15*** (0.04)
Share above 65	0.13*** (0.02)	0.13*** (0.02)	0.13** (0.05)	0.09* (0.05)	0.05* (0.03)
Share of unmarried	0.14*** (0.01)	0.14*** (0.01)	0.14*** (0.04)	0.11*** (0.04)	0.10*** (0.02)
Share of household without children	0.06*** (0.02)	0.06*** (0.01)	0.06 (0.04)	0.04 (0.04)	
Average household size	2.75*** (0.44)	2.58*** (0.25)	2.58*** (0.77)	1.04 (0.68)	
Share of western immigrants	0.03*** (0.01)	0.03*** (0.01)	0.03 (0.02)	0.00 (0.02)	
Share of non-western immigrants	0.03*** (0.00)	0.03*** (0.00)	0.03** (0.01)	0.02 (0.02)	
Share enduring noise above 50km	0.03* (0.02)	0.04*** (0.01)	0.04 (0.04)	0.01 (0.04)	
Share of obese	0.06** (0.02)	0.05*** (0.02)	0.05 (0.05)	-0.03 (0.04)	
Share of non-drinkers	-0.05*** (0.01)	-0.05*** (0.01)	-0.05** (0.02)	0.00 (0.01)	
Share of smokers	0.11*** (0.01)	0.12*** (0.01)	0.12*** (0.04)	0.06 (0.04)	
Mean PM _{2.5}	0.52*** (0.05)	0.47*** (0.02)	0.47*** (0.06)	0.45*** (0.05)	0.44*** (0.04)
R2	0.59	0.59	0.59	0.47	0.47
AICc	3995.20	3983.77	3983.77	2242.19	2227.05

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The residuals are checked for spatial autocorrelation, and significant residual clustering was still found. Spatial autocorrelation is not easily addressed in count data with standard regression implementations, hence the results are simply from a mis-specified model. For this reason, the models that relax distributional assumptions (10-12) should provide improved indications of significance, with Model 10 being proffered. The main results of the paper presented in section 4 take spatial processes explicitly into account and are in turn preferred over Model 12.

A few results using the count data echo the main findings. In particular, the slope of population density is negative, indicating that the more populous areas in the Netherlands

are more likely to have lower case numbers on average rather than higher. Several of the health indicators are significant, but only in the standard Poisson regression. Allowing for over-dispersion or estimating under the Negative Binomial distribution finds no significant relationship suggesting that these relationships are less robust. In all specifications, the impact of $PM_{2.5}$ remains highly stable and significant. This provides further evidence that confirmed COVID-19 cases are higher in polluted areas and that these conclusions do not depend on using count or Normal estimation techniques.

6.2.2 DISTRIBUTIONAL MIS-SPECIFICATION AND OUTLIER ANALYSIS

Since only a modest amount of observations has been used in the analysis, it is important to diagnose whether the estimation result could be heavily impacted by outlier observations. One way to diagnose this is to inspect a Q-Q plot, which compares the standardized residuals to theoretical quantities from the Normal distribution.

Figure 7 highlights that the Normality assumption is not entirely satisfied. Both Model 2 and Model 5 residuals contain outliers, particularly in the right tail of the distribution. In both models, the residuals follow a very similar pattern and the three major outliers that are prevalent on both specifications are Boekel, Uden and Bernheze which are all in the COVID-19 cluster in the province of Brabant. Outliers can be influential in a regression, though they do not necessarily have to be, while other points that lie within a normal range of the model can be influential without being an outlier per se. The impact of outlier observations depends also on the data density in the region around the data point. The Q-Q plots do not inform about whether the identified outlier observations are actually influential in the regression. Figure 8 calculates Cook's distance, a multivariate measure of influence, and identifies influential data points by evaluating the impact of individual observations on the regression results with respect to the covariates of interest through a leave-one-out procedure.

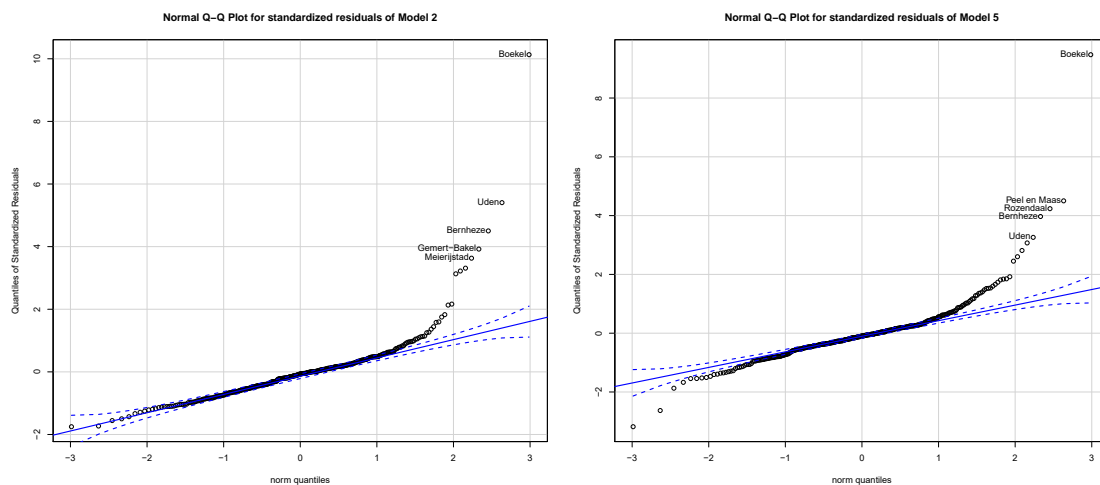


Figure 7: Comparison of residuals to theoretical quantities.

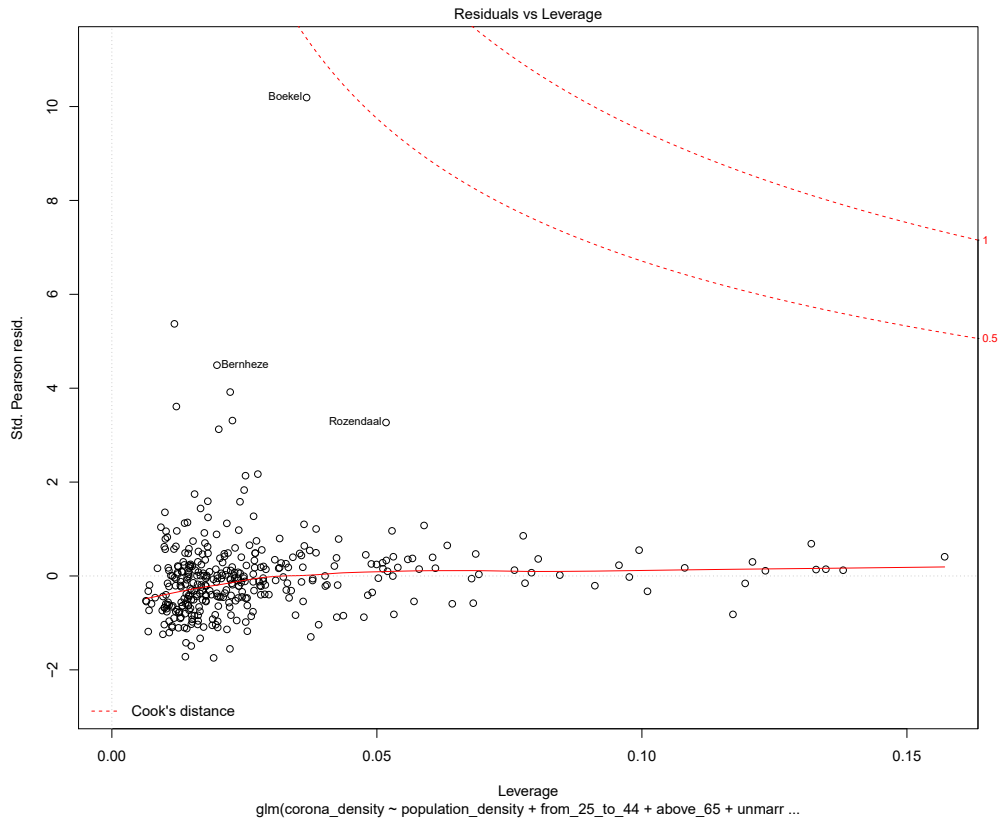


Figure 8: Residuals versus Leverage plot using Cook's distance.

Figure 8 highlights that Boekel and Bernheze are relatively influential, but not critically. This is reassuring, nevertheless it is important due to the small sample nature of the applications to evaluate whether the identified mild violations have a drastic impact on the estimation results. Two regressions are performed to analyze this. First, Model 5c replaces the dependent values of the 8 observations that have visibly the largest residuals in the Q-Q plot with predicted values from Model 5 and re-estimates the specification. This allows comparing directly how the parameter estimates change when these outlier observations are replaced with values that lie closer to the normal range of the data. It is important to note that if these observations are not outliers in an additive sense, but simply reflect the nature of the data-generating process, then these new estimates have in fact an increased bias resulting from further mis-specification. To evaluate whether outliers can be addressed through model-specification, Model 5d first normalizes the data using a power transformation (Johnson) by finding the transformation that minimizes the p -value of a Shapiro test for Normality, and then re-estimates Model 5's specification on the more Gaussian data. These parameter values cannot be directly compared to the parameter values of Model 5 because the new relationship is nonlinear (logarithmic-type). Nevertheless, Model 5d informs whether the significance of relationships remains intact when the Normality violations are neutralized.

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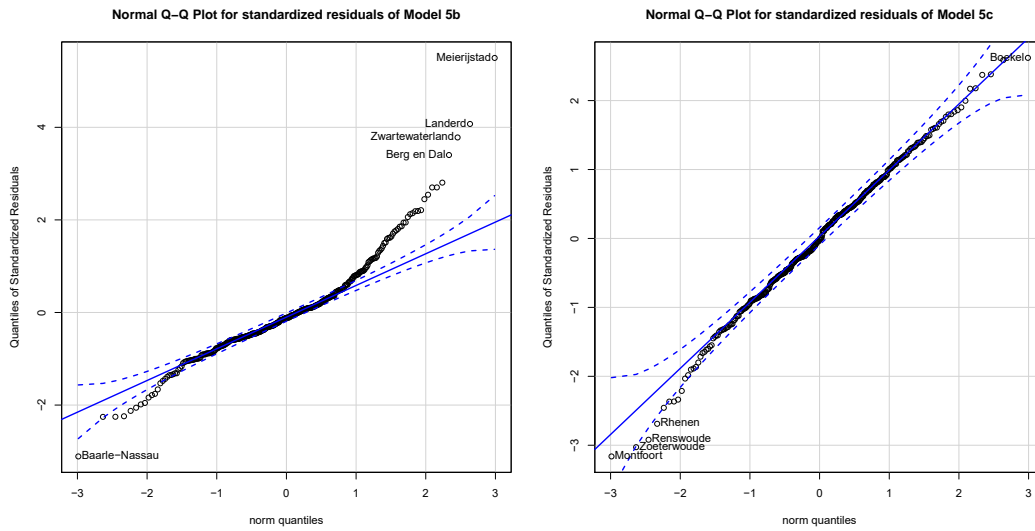


Figure 9: Comparison of residuals to theoretical quantities.

Table 5: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 5c	Model 5d
(Intercept)	-91.40** (43.93)	-10.75*** (2.41)
Population density	-0.83 (1.27)	-0.16** (0.07)
Share from 25 to 44	-0.16 (0.73)	0.05 (0.04)
Share above 65	0.67 (0.68)	0.10** (0.04)
Share of unmarried	1.61*** (0.52)	0.10*** (0.03)
Share of single households	-0.56* (0.30)	-0.05*** (0.02)
Share of non-western immigrants	-0.55** (0.25)	-0.02 (0.01)
Share of water surface	9.33* (5.31)	0.68** (0.31)
Share with long-term illness	0.29 (0.37)	0.01 (0.02)
Mean PM _{2.5}	2.67*** (0.89)	0.45*** (0.04)
λ	-0.22 (0.16)	-0.05 (0.19)
ρ	0.73 (0.07)	-0.06 (0.17)
R2	0.54	0.31

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Inspecting the new Q-Q plots in figure 9 highlights that Model 5c is still prone to distributional mis-specification. This also suggests that the outliers whose values are now replaced with values closer to the normal range of the data are not necessarily outliers in an additive sense, but simply reflect the exponential nature of the data. From that regard, Model 5d is preferred, as it applies a suitable exponential transformation that clearly neutralizes any outlier or non-Gaussian behavior. In both models, the relationship with $PM_{2.5}$ remains significant and positive hence the conclusion is that the main findings of the analysis are not sensitive to outliers.

6.2.3 RE-ESTIMATION USING MARCH 30 CONFIRMED CASES PER 100,000 INHABITANTS

Model 5e, in table 6 below, re-estimates the step-wise AIC regression and then uses the covariates in the same specification as Model 5 using confirmed cases from March 30. This is to evaluate whether the relationship with $PM_{2.5}$ is robust to using data from a different date. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 30 is approximately .90. It is clear from the estimation results that using the newer data does not alter the main conclusions. In particular, similar covariates are preferred by the AIC and the parameter estimate for $PM_{2.5}$ increased in value and remains significant at the highest level.

Table 6: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants using March 30 cases.

Variable	Model 5e
(Intercept)	-374.01***
Population density	119.87 (3.54)
Share from 25 to 44	3.12 (1.99)
Share above 65	4.79*** (1.89)
Share of unmarried	5.03*** (1.45)
Share of single households	-2.72*** (0.83)
Share of non-western immigrants	-1.70** (0.70)
Share with long-term illness	1.14 (1.04)
Mean $PM_{2.5}$	6.39*** 2.42
λ	-0.11 0.16
ρ	0.71 0.08
R2	0.56
AICc	3736.24

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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6.2.4 RE-ESTIMATION USING MARCH 31 CONFIRMED HOSPITAL ADMISSIONS PER 100,000 INHABITANTS

Model 5f in table 7 below, re-estimates Model 2 then uses the covariates in the same specification as Model 5 using confirmed hospital admissions from March 31. This is to evaluate whether the relationship with $PM_{2.5}$ is robust to possible measurement error in the confirmed cases. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 31 hospital admissions is approximately .80, the correlation using March 30 confirmed cases is .88. It is clear from the estimation results that using confirmed admissions instead of cases does not alter the main conclusions. In particular, the parameter estimate for $PM_{2.5}$ remains highly significant.

Table 7: Dependent Variable: Confirmed COVID-19 hospital admissions per 100,000 inhabitants.

Variable	Model 5f
(Intercept)	-256.68*** (82.20)
Population density	-2.48 (1.82)
Share from 14 to 24	1.55 (1.24)
Share from 25 to 44	2.25* (1.20)
Share from 45 to 64	0.40 (0.84)
Share above 65	3.18*** (1.15)
Share of unmarried	2.63*** (0.74)
Share of single households	-1.90*** (0.48)
Share of non-western immigrants	-0.47 (0.36)
Share of water surface	14.89** (7.49)
Share with long-term illness	0.88 (0.55)
Mean $PM_{2.5}$	3.74*** (1.33)
λ	-0.10 (0.17)
ρ	0.68*** (0.09)
R2	0.54
AICc	3242.22

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.2.5 LINEAR ANALYSIS OF CASE HOSPITALIZATION RATES

The main results provided evidence for increased COVID-19 incidence in areas where populations are more exposed to air pollution. However, it is possible that the estimated association between $PM_{2.5}$ concentrations and COVID-19 incidence can be attributed to worse respiratory health in polluted areas, which then leads to more severe symptoms and higher case detection. The analysis tried to control for this using health data and the percentage of confirmed cases that resulted in hospitalization as controls. This did not impact the results. A second way to further test this theory is by analyzing the association between $PM_{2.5}$ and the case hospitalization rate because worse respiratory health would lead to more severe COVID-19 disease (Ruan, 2020). The suspect correlation is investigated below using step-wise AIC variable selection keeping $PM_{2.5}$ in the variable set, followed by the full spatial specification. Model 6 uses March 31 confirmed COVID-19 hospital admissions as a percentage of March 22 confirmed COVID-19 cases, model 7 uses March 30 confirmed cases. The analysis finds that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates which follows earlier identified risk groups (Ruan, 2020).

Table 8: Dependent Variable: Confirmed COVID-19 related hospital admissions as a percentage of COVID-19 cases.

Variable	Model 6	Model 7
(Intercept)	-587.36* (296.95)	-93.71*** (35.24)
Population density		-2.08* (1.26)
Share of male population	935.03** (487.40)	
Share 45 to 64	9.17*** (3.82)	1.05* (0.51)
Share of unmarried		0.57* (0.33)
Share of households without children	-7.74*** (2.58)	
Average household size		7.70 (5.51)
Share of western immigrants	-1.83 (1.96)	
Share of non-western immigrants		0.46* (0.25)
Share of water surface		14.25** (5.62)
Share of overweight	8.74*** (1.92)	0.57** (0.25)
Share exposed to noise above 50kmh	-10.16** (4.22)	
Mean $PM_{2.5}$	-6.70 7.79	0.40 0.63
λ	0.46* 0.13	-0.40** 0.17
ρ	-0.60*** 0.16	0.61*** 0.10
R2	0.20	0.26
AICc	3938.38	3019.20
N	355	355

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.2.6 RE-ESTIMATION USING SATELLITE-DERIVED PM_{2.5}

This section evaluates whether the relationship with PM_{2.5} generalizes to measurements from a different source. Table 9 compares the municipality-level data. Both measurements trend in the same direction but the levels according to the RIVM are roughly one-third below those of van Donkelaar.

Table 9: Comparison of PM_{2.5} statistics: RIVM 2017 vs van Donkelaar 2016.

Variable	Mean	Min	q.25	q.50	q.75	Max
RIVM 2017	10.22	6.95	9.43	10.69	11.23	12.04
van Donkelaar 2016	14.60	10.15	13.44	15.01	16.01	18.05

Correlation: 0.70

Model 5g in table 10, estimates step-wise AIC with the new pollution data and uses the selected covariates in the specification of Model 5. Model 5h uses the same controls as Model 5, and Model 5i applies the Yeo-Johnson power transform. The analysis makes use of the confirmed cases from March 22. It is clear from the estimation results that the use of satellite-derived PM_{2.5} results in similar conclusions. The parameter estimate for PM_{2.5} remains significant in the presence of controls and is significant at the highest level when the dependent variable is first normalized.

Table 10: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 5g	Model 5h	Model 5i
(Intercept)	-127.26* (74.02)	-213.60*** (72.86)	-11.17*** (2.46)
Population density		0.90 (1.93)	-0.04 (0.07)
Share from 25 to 44		-0.50 (1.07)	0.026 (0.04)
Share above 65	2.38*** (0.91)	2.21** (1.06)	0.10*** (0.04)
Share of unmarried	3.50*** (1.02)	4.14*** (0.96)	0.14*** (0.03)
Share of single households	-1.76*** (0.46)	-1.78*** (0.50)	-0.07*** (0.02)
Share of non-western immigrants	-0.53 (0.34)	-0.71* (0.41)	-0.02 (0.01)
Share of water surface	2.47 (8.71)	2.22 (8.75)	-0.79*** (0.28)
Share of overweight	-1.32 (0.91)		
Share with obesity	1.60 (1.53)		
Share with long-term illness		0.68 (0.78)	0.01 (0.02)
Mean PM _{2.5}	2.75** (1.28)	3.13** (1.29)	0.28*** (0.03)
λ	0.41* (0.24)	0.40* (0.24)	0.10 (0.19)
ρ	0.45** (0.22)	0.46* (0.22)	-0.16 (0.19)
R2	0.50	0.50	0.30
AICc	3265.34	3268.53	920.81
N	355	355	355

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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**CENTER FOR BIOLOGICAL DIVERSITY
 CENTER FOR COMMUNITY ACTION & ENVIRONMENTAL JUSTICE
 COALITION FOR CLEAN AIR
 SAN BERNARDINO VALLEY AUDUBON SOCIETY
 SIERRA CLUB**

May 26, 2020

Via Email

Honorable Mayor and Members of the City Council
 City of Moreno Valley
 14177 Frederick St.
 Moreno Valley, CA 92552
planningemail@moval.org

Re: Appeal of Planning Commission Approval of Tentative Parcel Map and Certification of Final Revised Environmental Impact Report for World Logistics Center Project (Case Nos. PEN18-0050 and PEN20-0017)

Dear Honorable Mayor and Members of the City Council:

On behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, we write to appeal two decisions of the City of Moreno Valley Planning Commission (“Planning Commission”) related to the World Logistics Center Project (“WLC” or “Project”): (1) Resolution No. 2020-20 and associated exhibits (certifying a Revised Final Environmental Impact Report and adopting a Mitigation Monitoring and Reporting Program and Statement of Overriding Considerations for the Project); and (2) Resolution No. 2020-21 and associated exhibits (approving Tentative Parcel Map 37457 and associated conditions of approval). These items went to the Planning Commission on the evening of Thursday, May 14, 2020, but were ultimately approved on May 15, 2020. The Planning Commission approved the two items despite significant public opposition and documented non-compliance with the requirements of the California Environmental Quality Act (“CEQA”).

This letter serves as the formal appeal of the Planning Commission’s approvals pursuant to Chapter 9.02, Chapter 9.14, and/or other applicable provisions of the Moreno Valley Municipal Code. For the reasons set forth below, the approvals fail to meet the requirements of CEQA and other applicable law. Specifically, the Revised Final Environmental Impact Report (“Revised FEIR”) does not comply with CEQA. As a result, the City cannot make the findings required for approval of a tentative parcel map pursuant to Chapter 9.14 of the municipal code. In addition, the above-referenced organizations and others have previously described the legal failings of the Planning Commission’s determinations in written and oral comments submitted prior to or at the

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

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Planning Commission's public hearing on the two approvals. In particular, Appellants specifically incorporate by reference the following letters filed in response to the 2019 Revised Final EIR:

- Letter from Ileene Anderson to Planning Commissioners (May 13, 2020) (Exhibit 1);
- Letter from Scott Wilson to Julia Descoteaux (May 13, 2020) (Exhibit 2);
- Letter from Heather Leslie and Richard Corey to Julia Descoteaux (May 14, 2020) (Exhibit 3);
- Letter from Adrian Martinez to Julia Descoteaux (May 14, 2020) (Exhibit 4);
- Letter from Tom Thornsley to Julia Descoteaux (May 14, 2020) (Exhibit 5);
- Karen Jakpor letter regarding particulates increasing COVID 19 infections with cited sources; and
- Lindsay Robinson letter raising concerns and conflicts of interest for PC members and new road improvements.

These comments and their attachments also set forth reasons for these appeals and are therefore incorporated by reference in their entirety. In addition, we seek to bring the following studies to the City Council's attention:

- Wu, Xiao, et al., Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study, Department of Biostatistics, Harvard (Exhibit 6); and
- Andrée, Pieter Johannes, Incidence of COVID-19 and connections with air pollution exposure, Policy Research Working Paper 9221, April 2020, World Bank Group (Exhibit 7).

These studies provide new evidence of the harms of COVID-19 to communities exposed to elevated levels of air pollution.

Accordingly, we respectfully request that the City Council reverse, reject and/or overrule the Planning Commission's approvals and remand both determinations back to the Planning Commission with directions to undertake a lawful environmental review.

I. BACKGROUND OF THE PROJECT

The immense proposed WLC would harm the region's environment. The Project would occupy 40.6 million square feet, dramatically changing the City and committing a significant portion of its total land area to warehouses, distribution centers, and associated facilities. The Project has a host of impacts ranging from degradation of biological resources to impairing air quality to localized impacts that will harm adjacent community members.

Moreover, the Project's impacts would reach far beyond the City. The Project could add more than 14,000 new diesel truck trips per day to freeways linking the City to seaports more than 80 miles away in Los Angeles and Long Beach. In all, the Project will generate thousands of daily vehicle trips, according to the final EIR's traffic analysis.

1. The Project Approval Process.

Highland Fairview filed its Project application with the City in April 2012. On February 26, 2012, the City issued a Notice of Preparation of an EIR. Subsequently, on February 5, 2013, the City released a draft EIR, which found numerous "significant" and "unavoidable" environmental impacts, for a 60-day public comment period. Over a hundred residents, environmental groups, and government agencies submitted comments. In May 2015, the City released the final EIR, containing substantial changes from the draft EIR.

On August 19, 2015, after the City's Planning Commission approved Highland Fairview's proposal, the City Council adopted *Resolution No. 2015-56* certifying the final EIR, adopting a statement of overriding considerations without employing the many feasible mitigation measures put forth by agency and other commenters, and approving a mitigation monitoring program. The City also issued other approvals in reliance on the EIR, including: (1) *Resolution No. 2015-57*, approving general plan amendments; (2) *Resolution No. 2015-58*, approving a tentative parcel map for financing purposes; (3) *Resolution No. 2015-59*, requesting that Riverside County Local Agency Formation Commission ("LAFCO") begin proceedings to allow the City to annex an 85-acre site within the Project area; and (4) *Resolution No. CSD 2015-29*, requiring the City's Community Services District to initiate LAFCO proceedings for the expansion of the District's boundaries to include the annexed 85-acre site. Subsequently, on August 25, 2015, the City Council passed *Ordinance No. 900*, adopting the WLC Specific Plan and other zoning modifications, and *Ordinance No. 901*, approving a development agreement between the City and Highland Fairview.

The City filed a Notice of Determination on August 26, 2015, summarizing the approvals and environmental review. Subsequently, in September 2015, community, labor, environmental, and governmental entities filed seven lawsuits challenging the City's failure to comply with CEQA. To date, the City and Highland Fairview have settled three of the lawsuits, and one case has been dismissed.

On June 7, 2018, the San Bernardino Superior Court entered judgement in favor of the groups challenging the original CEQA document based on an opinion entered on February 8, 2018. On June 14, 2018, the Superior Court issued a Peremptory Writ of Mandate. An appeal and a cross appeal have been filed in this case, but no final determination of the issues have been made.

A. Highland Fairview’s Ballot Initiatives and Related Litigation.

In response to the many CEQA lawsuits, Highland Fairview subsidized an effort to secure enough petition signatures to qualify three initiative measures for the ballot. (*Center for Community Action & Environmental Justice v. City of Moreno Valley* (2018) 26 Cal.App.5th 689, 694-97 (hereafter *Center for Community Action & Environmental Justice*.) By repealing and reapproving some of the City’s August 25, 2015, approvals through the initiative process, the measures were intended to reapprove the Project without any CEQA review. (See *Tuolumne Jobs & Small Business Alliance v. Superior Court* (2014) 59 Cal.4th 1029, 1036-39 [CEQA review not required prior to legislative body’s decision to adopt initiative measure or submit it to voters].)

First, the Land Use Initiative (also known as the “Moreno Valley Jobs Initiative”) repealed the Project’s land use entitlements, Ordinance 900, and Resolutions 2015-57 and 2015-59. It then re-amended the general plan and zoning map, re-repealed the Moreno Highlands Specific Plan, and re-adopted the WLC Specific Plan, and included the mitigation-monitoring program as “conditions of development.” Second, the Development Agreement Initiative (also called the “Moreno Valley Workforce Training Initiative”) repealed the Project’s development agreement, and then adopted a “new” development agreement substantially similar to the original agreement adopted by Ordinance 901. And third, the WLC Land Benefit Initiative repealed Resolution No. CSD 2015-29, which called for the expansion of the Community Service District boundary to accommodate the Project.

On November 16, 2015, the City Clerk determined that each measure had sufficient signatures. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 696.) On November 24, 2015, the City Council voted to adopt the three initiatives outright instead of allowing a vote by the electorate. (*Ibid.*; Elec. Code, § 9215.)

2. Land Use and Development Agreement Initiative Litigation.

In response, several petitioners in the pending CEQA actions filed lawsuits challenging the validity of the Land Use and Development Agreement initiatives. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 694-96.) In September 2016, the Superior Court entered judgment in favor of the City and Highland Fairview. Appellants Center for Community Action and Environmental Justice and other organizations appealed the Superior Court’s decision on the Development Agreement Initiative on the ground that a development agreement cannot be adopted by initiative.

On August 23, 2018, the Court of Appeals ruled in favor of Appellants in a published opinion. The City and the developer filed a petition for review with the Supreme Court, which denied review. (*Center for Community Action & Environmental Justice v. City of Moreno Valley*, review den. Nov. 28, 2018, S251674.) The Development Agreement Initiative provided that in the event of a successful legal

challenge, the original Ordinance No. 901 approving a development agreement between the City and Highland Fairview would be reinstated.

The initiatives did not repeal Resolution No. 2015-56, which among other approvals certified the final EIR. Nor did the initiatives repeal Resolution No. 2015-58, which approved a tentative parcel map for financing purposes. These approvals, along with the revived Ordinance No. 901, remain subject to CEQA notwithstanding the initiative measures.

3. The Subsequent EIRs.

In July of 2018, the City released a revised final EIR for the Project. In December of 2019, the City released a new revised final EIR for the Project. On May 14, 2020, the Planning Commission decided several items related to this project, including certification of the Revised Final EIR. The Planning Commission made a decision on the Revised FEIR on May 15, 2020.

The following points outline the major deficiencies regarding the Board's environmental determination:

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project's Significant Climate Impacts.

The City's review of this Project's climate and greenhouse gas ("GHG") emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a revised final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA's requirements.

a. Legal Standards

The City's determinations regarding the significance of greenhouse gas ("GHG") emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency's use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the Revised FEIR continues

to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the Revised FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO₂e”) per year, the same quantitative evidentiary standard controls.

CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (See Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

regulatory requirements. (See CARB, *California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring and measurement requirements that can be ... enforced by ARB.” (*Id.*, p. 4.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 7-8.)

b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (Revised FEIR 1a at 755-56.) As a threshold matter, the difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet, MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency” and surplus or “additional.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency or documentation whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.

The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.

First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (Revised FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”].) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review whatsoever of whether those credits or the protocols they were generated under satisfy the measure’s stated criteria, and without any ability even to question whether the credit is adequate.

Second, CARB “approval” of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is “approved by CARB” does not establish that voluntary market carbon credits sold by that

³ Notably, despite MM 4.7.7.1’s suggestion to the contrary, the “GHG RX” registry has *not* been approved by CARB to list Cap-and-Trade compliance offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The “GHG Rx” program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)

registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB’s procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1’s reference to “approved” registries reflects a misinterpretation of CARB’s regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure’s reliance on CARB “approval” is legally erroneous. As a result, a registry’s “CARB-approved” status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure’s purported criteria, or the significance of the Project’s impacts after mitigation.

Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB’s regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB’s compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism (“CDM”) methodologies.⁴ Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting “any methodology developed under the [CDM] ... for projects and programs registering with VCS).

ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project's GHG emissions (whether those measures are denominated "offsets" or "carbon credits"), it must meet CEQA's requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards "the mitigation *will* achieve." (CEQA Guidelines § 15126.4(a)(1)(B).) The measure's list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries' processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by "presuming" otherwise. Nor is there any evidence the City's Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, "[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place." *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (Revised FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA's prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on "forecasted" emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA's requirement that mitigation be in place before impacts occur.

iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third party who may list offset credits for sale. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between a carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased....” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (Revised FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the Revised FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the Revised FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to

meet its long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

vi. The Revised FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The Revised FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The Revised FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the Revised FEIR of any evidentiary support.

c. The Revised FEIR Must Be Recirculated for Full Public Review and Comment.

The Revised FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The Revised FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the Revised FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the Revised FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

Recirculation is required here for at least two reasons. First, the Revised FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the Revised FEIR only a few days before the Planning Commission hearing, the City has thwarted

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the Revised FEIR's new analysis reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised Sections of the Final Environmental Impact Report measured only "Total Uncapped" Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though "Total Capped" emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The Revised FEIR, in contrast, at least conditionally considers all Project emissions—both "capped" and "uncapped"—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The Revised FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after, avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The Revised FEIR must be recirculated.

III. The Revised FEIR's Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques of the GHG analysis reflected in prior comments. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project.

Importantly, CARB, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the "[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground."⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:

Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): "Project-related greenhouse gas emissions resulting from

⁶ Letter from CARB to Moreno Valley, September 7, 2018, available at https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

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sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

Response 44.37

The Agency declines to make any changes in response to this comment. The decision in *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (“AIR v. Kern”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated by referencing CARB’s letter on the WLC.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at*

http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

⁸ *Id.*

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, both CARB (the agency responsible for implementation of AB 32 and the Cap-and-Trade Program) and the Natural Resources Agency (the agency responsible for drafting the CEQA Guidelines the Revised FEIR relies upon for authority) agree that the City cannot rely on Cap-and-Trade to dismiss the significance of all transportation and energy emissions.

Instead of recognizing that both CARB and the Natural Resources Agency disagree with its approach, the Revised FEIR continues to rely on outdated decisions in other projects by the South Coast AQMD and the San Joaquin Valley APCD--two agencies that have no jurisdiction over the GHG emissions from this Project and deserve no deference on this issue.

But, even if these agencies' positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised FEIR includes new attachments A and B, which are the specific South Coast AQMD documents the Revised FEIR claims support the use of Cap-and-Trade to discount energy emissions under CEQA. Initially, neither document allows transportation emissions – the vast majority of GHG emissions associated with the WLC – to be discarded from a significance determination.

Moreover, both of these documents are from 2014. Since that time, the South Coast AQMD has produced several other CEQA documents. In fact, in the most recent document from 2020, the agency does not appear to contend that energy-related and transportation emissions are insignificant for CEQA purposes because they are purportedly “covered” under the Cap-and-Trade program. *See* South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>.

In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. Analysis of Important Mitigation Measures has been Curtailed by the Revised FEIR's Failure to Analyze Impacts

Mitigation of a project's significant impacts is one of the “most important” functions of CEQA. *See Sierra Club v. Gilroy City Council*, 222 Cal.App.3d 30, 41 (1990). If the EIR is the heart of CEQA, then mitigation is its teeth. *See Env'tl. Council of*

⁹ *Id.*

Sacramento v. City of Sacramento, 142 Cal.App.4th 108 at 1039. Under CEQA, feasible mitigation measures must be adopted that will avoid or substantially lessen significant environmental effects. Pub. Res. Code § 21002. CEQA is clear that “[m]itigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding agreements.” CEQA Guidelines § 15126.5(a)(2).

The Revised Final EIR fails to meaningfully analyze requirements that would mitigate the harmful greenhouse gas and air quality impacts from this project, including requirements for use of trucks cleaner than the current commitment of trucks meeting 2010 emission standards – a standard that would allow trucks 10 years or older to enter the project in perpetuity. Several zero-emissions models are either available and/or will be increasingly available as this project is built. Moreover, CARB will adopt a vehicle sales standard in June to require manufacturers to produce zero-emission trucks in California across a range of truck classes. The Revised FEIR fails to provide sufficient evidence refuting requirements for use of zero-emission trucks is feasible.

The Revised Final EIR similarly fails to adequately consider mitigation measures requiring zero-emissions forklifts and yard dogs (e.g. yard hostlers). There are many zero-emissions models, and the Revised Final EIR should require the use of this technology for all onsite vehicles that fall into these categories.

In addition, the project fails to commit to feasible technologies to reduce the impacts of the buildings, including increased solar to cover more than just the office energy of the buildings and all-electric buildings to prevent the need for combustion for appliances. These and other technologies identified by several commenters are feasible and should be implemented to mitigate the significant Nitrogen Oxide and other criteria pollutant emissions, in addition to the significant GHG emissions.

Because the WLC project fails to include all feasible mitigation, the document should be recirculated.

V. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Biological Impacts.

The Revised FEIR’s biological resources sections include glaring gaps and inconsistent language in contravention of the CEQA’s requirements. For example, section 15130 of the CEQA Guidelines require an EIR to analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. A cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts. CEQA Guidelines § 15355. And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, supra, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho*

Cordova (2007) 40 Cal. 4th 412, 428.) Here the Revised FEIR failed to provide a cumulative analysis of the Project's impact on biological resources. Nearby projects, including the Village of Lakeview housing development that will also impact the southern portion of the San Jacinto Wildlife Area are not included in the Revised FEIR's analysis, in violation of CEQA. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721. (Absent meaningful cumulative analysis there would be no control of development and "piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment").)

The Revised FEIR also claims, without providing substantial evidence, "250-foot development setback is adequate for a project-SJWA buffer separation and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity." (RFEIR at pg. 4.4-97, emphasis original.) However, as numerous commenters raised, negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems. These negative edge effects were not fully analyzed nor mitigated in the Revised FEIR.

Additionally, while truck and vehicle traffic will increase on Gilman Springs Road and all roads adjacent to the San Jacinto Wildlife Area for both construction and operation, the Revised FEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife "roadkill". The Revised FEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states "these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road" (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the Revised FEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, "the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project's impact on the environment, the agency's approval of the proposed project followed meaningful consideration of alternatives and mitigation measures." (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA's and the County's responsibility to analyze, avoid, minimize and mitigate the impacts from this project; it is the developer's responsibility as the applicant, and the City's responsibility as the lead agency.

Because the biological impacts section is faulty, the document should be recirculated.

VI. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Noise Impacts.

The Revised Final EIR has significantly weakened mitigation measures designed to protect the public from noise pollution. When the original final EIR was approved it used the “**Noise Assessment for the WLCSP**” to establish mitigation measures that would be necessary to limit construction impacts to those residents in the surrounding homes. It noted that work within the project area may be done on a 24 hour, 7 days per week schedule, which goes beyond the Moreno Valley Municipal Code’s (MVMC Section 8.14.040 Miscellaneous standards and regulations) listed hours of 7 a.m. to 7 p.m. The Noise Assessment defined construction limits so as to limit noise impacts on the surrounding residences outside the standard construction hours and clearly outlined the high level of noise that could be expected both during daytime and nighttime hours beyond the allowed decibel levels defined by the MVMC. Thus the study included “**Mitigation Measure N-2. No Nighttime Grading Within 2,800 Feet of Residences South of the Freeway.**” It goes on to allow closer nighttime construction at 1,580 feet after the installation of an appropriate sound barrier.

The new “**Noise and Vibration Technical Report Assessment**” proposed a substantially different evaluation and lesser mitigation for the noise impacts. It states that “No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends, and a 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity.”

The mitigation requirement for a sound barrier is similar to the original MM, but the active setback is now moved forward by 2,000 feet, three and a half times closer. Additionally, the MM includes options that would eliminate the need to install the on-site sound barrier if a vote by those affected fails to garner 50% favorable votes or 100% favorable votes for a sound barrier placed on private property.¹⁰ These two provisions were never a consideration in the original noise analysis nor do they seem to be fair to the community due to the speculative nature of whether a sound barrier will be used or not. In addition, the developer’s ownership of properties in those locations subject to the noise impacts are entitled to a vote on sound barrier installations. Those property holdings collectively could prevent any opportunity for a favorable vote to occur. While the clause in MM **4.12.6.2A** may be a greater benefit to the developer than to the surrounding

¹⁰ Allowing a vote on whether or not sound barriers will be installed also raises serious constitutional questions concerning the City’s ability to delegate its basic land use authority to private property owners. (See, e.g., *Vaquero Energy, Inc. v. County of Kern* (2019) 42 Cal.App.5th 312, 328-334 [discussing federal and state case law].)

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residents, it poses a vague and unclear mitigation measures and makes it impossible to assess the efficacy at blocking noise impacts.

The EIRs for this Project have included multiple noise studies, including the following:

“**Noise Assessment for the WLCSP**” (Mestre Greve Associates) original dated January 2013, revised September 2014. (This document is still referenced in the 12-2019 Draft Recirculated Revised Sections of the Final Environmental Impact Report); and

“**Noise and Vibration Technical Report Assessment** (ESA)”, July 2018 which was not in the original 2014 DEIR for WLC.

Both studies have been cited for noise impacts, but the Revised FEIR has taken away significant mitigation measures designed to protect residents from noise pollution. The May 14, 2020 letter from Tom Thornsley attached as Exhibit 5 provides several examples of mitigation measures either being vague and speculative and/or less effective than prior mitigation measures. This failure to articulate and mitigate the noise impacts from the WLC project violates CEQA. This violation of CEQA means the noise analysis needs to be improved to provide effective and feasible mitigation.

VII. The Failure to Provide Spanish Translation of the Environmental Impact Report and Oral Comments at the Hearing Violates State Law.

The Final EIR should have been translated into Spanish for better review by the public. Moreover, there was at least once instance where a speaker at the Planning Commission spoke Spanish during oral testimony, and there was no translation provided to the Planning Commissioners. This failure to provide translation undermined the informational purposes of CEQA and otherwise fell short of the requirements of state law.

VIII. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Agricultural Impacts.

The Revised Final EIR fails to adequately address and mitigate the agricultural impacts related to this Project. In particular, the Revised FEIR continues to fail to acknowledge the significant agricultural impacts. In fact, the Revised FEIR improperly defers mitigation of agricultural impacts until future plans are produced related to the development of Parcels 10 and 12. This deferral of mitigation for agricultural impacts is not permitted under CEQA.

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IX. The Final EIR for this Project Makes it Impossible for the Public and Decision-Makers to Be Adequately Informed.

The current EIR for the project is a complex web with two revised versions of the EIR having been completed since the Superior Court struck down the entire EIR. Overall, the document was amended in significant ways up to two weeks before the Planning Commission meeting. The many versions of the document and reliance on information from an invalidated EIR from 2014, in addition to the two subsequent versions, have rendered the EIR's overall analysis incomprehensible. The public and decision-makers have not been provided with sufficient information to participate meaningfully in the process or proceed with rational decision-making.

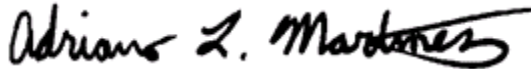
X. Conclusion

The above referenced organizations have attached several of the relevant letters and attachments filed related to this appeal. We respectfully request that this information be incorporated into the record for this appeal.

For the reasons stated in the incorporated prior comments and in this letter, (1) the Revised FEIR fails to comply with CEQA, and (2) the City cannot make the required findings to approve the tentative parcel map and other actions reliant upon the Revised Final EIR. Accordingly, the Planning Commission's decisions on its approvals must be reversed, rejected and/or overruled.

Thank you for your consideration of this appeal.

Sincerely,



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Protecting and restoring natural ecosystems and imperiled species through science, education, policy, and environmental law

submitted via email

May 13, 2020

Planning Commissioners
City of Moreno Valley
City Hall Council Chamber
14177 Frederick Street
Moreno Valley, CA 92553
ashleya@moval.org

RE: Deny Public Hearing Item #2 - Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, Revised Final Environmental Impact Report, a Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary.

Dear Planning Commissioners,

These comments are submitted on behalf of the Center for Biological Diversity’s (the “Center”) members, staff and supporters, regarding the Revised Final Environmental Impact Report (“RFEIR”) for the World Logistics Center. The Center has reviewed the RFEIR and provides comments on primarily the biological issues. At this point, we urge the Planning Commission to reject the project and instead require the issues we raise below be addressed in a renewed CEQA process. The Center has closely monitored this project for many years and remains concerned about the RFEIR inadequate analysis and mitigation of the project’s impacts to sensitive species and habitats. The current RFEIR fails to adequately preserve southern California’s, and specifically western Riverside County’s incredible biodiversity. Troublingly, extensive conservation investments by State, County and local agencies remain imperiled by inconsistent language and inadequate impact analysis in the current RFEIR.

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 1.7 million members and online activists throughout California and the United States. The Center has worked for many years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life for people in western Riverside County.

I. The RFEIR Fails to Provide a Cumulative Impacts Analysis

The RFEIR simply fails to provide a cumulative impact analysis to biological resources (at page 4.4-118 to 119). While Table 1.1-1: World Logistics Center Project Environmental Impact Summary provides a section on Cumulative Biological Impacts (at pg. 1-26) it does not

actually provide an analysis, but instead references proposed project mitigation measures. In accordance with CEQA (CEQA Guidelines Section 15130 *et seq.*) an EIR must analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. According to CEQA, a cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts (CEQA Guidelines Section 15355). And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, supra, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 428 [hereinafter *Vineyard*].)

Therefore, to comply with CEQA, a cumulative scenario needs to be developed that identifies and evaluates past, present, and reasonably foreseeable future projects within the cumulative study area that would be constructed or commence operation during the timeframe of activity associated with the proposed project. For example, but not limited to, the Villages of Lakeview housing development will also impact the southern portion of the San Jacinto Wildlife Area (“SJWA”). The lack of a cumulative impact analysis to biological resources violates CEQA. The purpose of analyzing cumulative environmental impacts is to assess adverse environmental change “as a whole greater than the sum of its parts.” (*Environmental Protection Information Center v. Johnson* (1985) 170 Cal.App.3d 604, 625.) Absent meaningful cumulative analysis there would be no control of development and “piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment.” (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721.)

II. The RFEIR Fails to Provide an Adequate Development Setback for the SJWA

The RFEIR still proposes only a 250-foot wide development setback from the southernmost property line along the SJWA boundary with a 150-foot area for truck traffic and other activities other than actual buildings (at pg. 4.4-97). Negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems (Environmental Law Institute 2003). The RFEIR states “250-foot development setback is adequate for a project-SJWA **bufferseparation** and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity” (at pg. 4.4-97, emphasis original), but the RFEIR does not provide the literature and studies to support this assertion.

The SJWA is a core area under the Western Riverside Multi-Species Habitat Conservation Plan (“WR HCP”), serves as a mitigation site for a prior project’s impacts and is a regionally important wildlife area. Therefore, a larger development setback needs to be incorporated to prevent negative edge effects from occurring to the project’s southernmost property line along the SJWA boundary. While down lighting as required in the RFEIR will help minimize light pollution, the other negative edge effects – increased traffic, noise, pollutants, invasive weeds and increased fire frequency - have not been adequately addressed.

For example, Mitigation Measure 4.4.6.3J requires “A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas” (at pg. 4.4-118), but absent that plan being available, the plan’s adequacy is unclear. In this case, the fuels to be manage are actually wildlife habitat. The RFEIR should require a comprehensive Fire Management Plan to protect not only the development where fire ignitions are more likely to occur but also requirements to prevent the fires from escaping onto the SJWA, as well as actions to implement if indeed fire originating on the development spreads to the SJWA.

III. The RFEIR Proposes Inconsistent Mitigation Measures

Despite the inadequate 250-foot development setback along the boundary with the SJWA, the RFEIR proposes inconsistent information as to where impact-mitigating fences/walls are to be constructed. First, MM 4.4.6.1A states “All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area” (at pg. 1-16). MM 4.4.6.1A also states “all truck activity areas adjacent to the 250- foot buffer area along the southern property line shall be enclosed by minimum 11-foot tall solid walls” (at pg. 1-17). The purpose of the mitigation measure is to reduce impacts to the SJWA. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 180.) Therefore, in order to minimize negative edge effect impacts, a solid wall, not a chain link fence, needs to be constructed. Secondly, the RFEIR states that “Warehousing will have a minimum 11-foot solid wall along the SJWA boundary” (at pg. 4.4-60) and “the Specific Plan requires solid walls along the property line.” (at pg. 4.4-97). However, having a wall at the boundary of the 250-foot development setback with the SJWA defeats the setback’s impact minimization purpose. The wall needs to be placed at the northern edge of the development setback nearest the development in order to help minimize the edge effect impacts.

IV. The RFEIR Fails to Provide All Required Plans

The RFEIR does not provide even a draft of all of the required plans in order for the decision-makers and the public to be able to evaluate the adequacy of the avoidance, minimization and mitigation. In addition to the Fuel Management Plans, other missing plans include but are not limited to:

- Traffic Control Plan (at pg. 1-10)
- Landscape plan for the 250-foot setback area (at pg. 1-17 and 1-23)
- Compensatory Mitigation Plan (at pg. 1-18)
- Burrowing owl Relocation plan (at pg. 1-22) and,
- Biological Resource Management Plan (BRMP) to prescribe how the 250-foot setback area is maintained (at pg. 1-23)

These plans are all key parts to evaluating the effectiveness of the proposed mitigation measures and should be included as part of the RFEIR.

V. The RFEIR Fails to Address Traffic Impacts to Wildlife on Gilman Springs Road including through the SJWA

While truck and vehicle traffic will increase on Gilman Springs Road for both construction and operation, the RFEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife “roadkill”. The RFEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states “these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the RFEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, “the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project’s impact on the environment, the agency’s approval of the proposed project followed meaningful consideration of alternatives and mitigation measures.” (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA’s and the County’s responsibility to analyze, avoid, minimize and mitigate the impacts from this project, it the developer and the City’s responsibility as the lead agency.

VI. CONCLUSION

Thank you for the opportunity to comment on the RFEIR for the World Logistics Center. Because of the numerous inaccuracies, short-comings and confusion in the RFEIR, we request that the Planning Commission deny recommending certification of the RFEIR, and the Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, the Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary. Rather than allowing this project to move forward with inadequate and incomplete environmental review, the City should send the RFEIR back t for revisions to address the failures identified above.

Please keep the Center to your notice list for all future updates to the Project and do not hesitate to contact the Center with any questions at the number or email listed below.

Sincerely,



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GAVIN NEWSOM, Governor
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1.A.g

May 13, 2020
 Sent via email

Ms. Julia Descoteaux
 Associate Planner
 City of Moreno Valley
 14177 Frederick Street
 PO Box 88005
 Moreno Valley, CA 92552-0805
juliad@moval.org

Subject: Revised Final Environmental Impact Report
 City of Moreno Valley, World Logistics Center Project
 State Clearinghouse No. 2012021045

Dear Ms. Descoteaux:

The California Department of Fish and Wildlife (CDFW) received the Revised Final Environmental Impact Report (RFEIR) on May 5, 2020 from the City of Moreno Valley (City) for the World Logistics Center Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.¹

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code. CDFW is concerned with the adequacy of the City's assessment of impacts to the San Jacinto Wildlife Area (Wildlife Area; SJWA), and with the adequacy and enforceability of mitigation measures for biological resources. CDFW's concerns related to the SJWA and recommended edits to the City's mitigation measures to improve specificity and enforceability are identified and discussed below.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA

¹ CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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Guidelines § 15386, subd. (a.) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW previously provided comments on the Draft EIR on April 8, 2013, on the Final EIR June 11, 2015, and on the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Determination of Biologically Equivalent or Superior Preservation (DBESP) on December 19, 2014.

CDFW Comments and Recommendations

CDFW's comments and recommendations on the Project are summarized below.

Impacts to rare, listed, and sensitive species

Mitigation Measures (MM) 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E identify the preparation of translocation plans for rare and listed plant species (MM 4.4.6.2A), burrowing owl (MM4.4.6.4D), and Los Angeles pocket mouse (MM 4.4.6.4E).

Sensitive Plant Species

MM 4.4.6.2A provides mitigation measures for impacts to sensitive plant species:

Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant's discretion, an impact

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fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

CDFW is concerned that City's "Planning Official" is not sufficiently qualified to review and approve a translocation plan for rare plant species. Further, thread-leaved brodiaea is a state endangered and federally threatened species and CDFW should review this proposal. To ensure that this proposal is implemented in compliance of rules and regulations related to state and/or federally listed plant species CDFW recommends that the City revise mitigation measure (MM) 4.4.6.2A and condition the measure to include the following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.2A Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, **the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review and approval** ~~they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A.~~ Alternatively, at the applicant's discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

Burrowing Owl

MM 4.4.6.4D provides mitigation measures for impacts to burrowing owl:

If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife. A relocation plan may be required by California Department of Fish and Wildlife if active and/or passive relocation is necessary. The relocation plan will outline the basic process and provides options for avoidance and mitigation. Artificial burrows - may be constructed within the buffer area south of the World Logistics Center

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Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.

A relocation plan may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated to the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor.

CDFW previously provided comments on the City's proposal to translocate burrowing owl to the "250-foot buffer area" in a joint CDFW – US Fish and Wildlife Service (USFWS) comment letter written in response to the City's DBESP submitted for review as required by the Western Riverside MSHCP. In the joint letter (dated December 19, 2014) CDFW and the USFWS articulated to the City that the 250-foot buffer area is not appropriate as a receptor site for burrowing owl because it is insufficient in terms of area, spatial configuration, and conflicting planned use (the City has proposed the construction of detention basins, etc., within the buffer area). Burrowing owl require large open expanses of sparsely vegetated habitat to forage and nest, and the 250-foot buffer area would not provide these ecological needs. Further, because the buffer area is proposed to be planted with trees, CDFW and the USFWS also stated that the City's proposal to plant trees within the buffer area would provide perch sites for bird-eating raptors, such as red-tailed hawks, which eat burrowing owls, further reducing the appropriateness of the City's proposed mitigation approach.

MM 4.4.6.4D also includes reference to Planning Area 30. CDFW maintains similar concerns regarding the suitability of this area for burrowing owl: Planning Area 30 is insufficient in terms of area and spatial configuration. Further, based on CDFW's review of aerial photography the topography of much of Planning Area 30 is unlikely to be suitable for burrowing owl.

CDFW appreciates that the City has included an additional relocation option: CDFW's San Jacinto Wildlife Area. However, CDFW is concerned that MM 4.4.6.4D does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of burrowing owl (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant. CDFW is unable to assume this financial burden, and it is the responsibility of the Project Applicant to mitigate Project impacts.

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MM 4.4.6.4D identifies that CDFW would review any active and/or passive relocation plan for burrowing owl. Please note that these plans will also need to be reviewed and approved by the USFWS and the Western Riverside County Regional Conservation Authority (RCA).

To improve the specificity and enforceability of MM 4.4.6.4D and to ensure consistency with the MSHCP, CDFW recommends that the City revise mitigation measure MM 4.4.6.4D and condition the measure as following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.4D If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (**CDFW**), **U.S. Fish and Wildlife Service (USFWS)**, and the **Western Riverside County Regional Conservation Authority (RCA)**. A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and the RCA~~ if active and/or passive relocation is necessary. The relocation plan will outline the basic process, ~~and provides options for avoidance and mitigation,~~ **identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site.** Artificial burrows - may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW, **the USFWS, and RCA.**

A relocation plan ~~may~~ **will** be required by ~~California Department of Fish and Wildlife CDFW, the USFWS, and RCA~~ if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated **following written approval by CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas).** Construction activity may occur within 500 feet of the burrows at the discretion of

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the biological monitor, **following consultation with CDFW, the USFWS, and RCA.**

Los Angeles Pocket Mouse

MM 4.4.6.4E provides mitigation measures for impacts to Los Angeles pocket mouse (LAPM):

Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas as determined by the United States Fish and Wildlife Service. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division.

MM 4.4.6.4E identifies that the City will review LAPM “protocol surveys,” and the USFWS will review any relocation plan for LAPM. CDFW is concerned that City staff are not appropriately qualified to determine if appropriate survey methodology has been employed by the Project Applicant, or review trapping results. CDFW recommends that proposed survey methodology and trapping results be reviewed and/or approved by CDFW and the USFWS. Further, any relocation plan prepared for LAPM will also need to be reviewed and approved by CDFW (in addition to the USFWS).

CDFW appreciates that MM 4.4.6.4E identifies that LAPM translocation, if deemed necessary, may occur to a site other than the 250-foot buffer area. CDFW and the USFWS previously commented that the 250-foot buffer area may not be appropriate as a receiver site because of size and configuration (it will be a narrow, relatively restricted area), and because of potential disruptions to existing small mammal populations, and predator-prey relationships. CDFW appreciates that the City has included an additional relocation option however, CDFW is concerned that MM 4.4.6.4E does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of

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LAPM (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant.

To improve the specificity and enforceability of MM 4.4.6.4E CDFW recommends that the City revise mitigation measure MM 4.4.6.4E and condition the measure as following (edits are in **bold** and ~~strike~~through):

MM 4.4.6.4E Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to **CDFW and the USFWS for review and approval prior to submission to the City**. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated **to locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas)** ~~as determined by the United States Fish and Wildlife Service~~. **All costs associated with the relocation, as well as short-and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant**. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biologically Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division **following coordination with CDFW and the USFWS**.

Fish and Game Code section 1602

MM 4.4.6.3C conditions the Project Applicant(s) to submit to the City copies of appropriate permits/agreements for impacts to Waters of the State and Waters of the U.S. The measure identifies the “need for permits based on the results of the 2012 jurisdictional delineation.” Please note that CDFW will require that any stream mapping submitted to CDFW as a component of a Notification of Lake or Streambed Alteration be current. CDFW recommends the measure be revised to remove all reference to the “2012 jurisdictional delineation.” In addition to removing reference to out-of-date mapping, CDFW recommends that errors

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included in the measure be corrected. CDFW recommends that the City revise mitigation measure MM 4.4.6.3C as follows (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.3C Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), **Regional Water Quality Control Board**, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements **are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City** ~~will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required.~~ **The Applicant shall consult with** ~~However, permitting through the Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) may still be required for these improvements. The applicant shall consult with~~ **and United States Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board** to establish the need for permits based on the results of the ~~2012~~ **current stream mapping jurisdictional delineation** and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the ~~U.S. Fish and Wildlife Service~~ **Regional Water Quality Control Board**, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.

Wildlife Movement

The Biological Resources section (Section 4.4) of the Revised Sections of the FEIR (page 4.4-37) discusses that the Project will incorporate fencing to separate development areas from MSHCP open space areas to the south and along Gilman Springs Road. CDFW agrees that fencing is appropriate to minimize unauthorized public access, illegal trespass, and dumping. In addition, fencing

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along Gilman Springs Road should be designed to minimize wildlife movement and direct wildlife towards wildlife crossings. CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the construction of such fences as the Project is developed. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the construction of fencing along the Project's southern and eastern boundaries, and wildlife fencing along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.

CDFW is concerned about the project's potential to restrict wildlife movement to and from the San Timoteo Badlands (Badlands) and SJWA/Mystic Lake area. As proposed, the Project will border the Badlands along portions of its northern border as well as its nearly 2-mile long eastern border at Gilman Springs Road, creating an obstruction to wildlife movement between the Badlands and open areas to the south (Mystic Lake, Lake Perris, and SJWA). The Project is located between the SJWA and the two existing culverts under State Route 60 (SR-60), and will also be located immediately west of Gilman Springs Road and the existing culverts under this road. Because the Project encompasses logistics centers that will significantly increase traffic volume, CDFW argues that the Project will have substantial effects on existing wildlife movement patterns. Species of concern include mountain lion, bobcat, badger, coyote, deer, long-tailed weasel, black-tailed jackrabbit, and desert cottontail. A fair argument can be made that the Project will increase noise, lighting, and traffic which may in turn negatively affect wildlife through direct mortality or alter movement patterns by forcing wildlife to move east or west, away from the Project. CDFW recommends that the Project install appropriate fencing along Gilman Springs Road and SR-60 to reduce wildlife mortality and direct animals to future or existing wildlife crossings.

CDFW recommends that the City condition the Project to require the installation of wildlife fencing along SR-60 and Gilman Springs Road to reduce Project-related wildlife mortality. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

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Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.

Section 4.4 of the Revised Sections of the FEIR (page 4.4-61) discusses that the RCA submitted comments to the City stating that the project would likely cause an increase in truck traffic along Gilman Springs Road which “could significantly affect wildlife movement between Core H and proposed Core 3.” To mitigate these impacts the Revised Sections of the FEIR (page 4.4-61) states that it would be appropriate for the Project to contribute (financially) to the “fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings.” CDFW agrees that contribution of funding for improvements to wildlife crossings along Gilman Springs Road would be appropriate, but CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the contribution of funds for this purpose. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the contribution of funds to a mitigation account, to held by CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.

Impacts to the San Jacinto Wildlife Area

CDFW previously provided comments on the Project’s proposal to construct buildings within 450 feet of the SJWA (refer to CDFW’s April 8, 2013, and June 11, 2015 comment letters). SJWA is an active hunting area, and hunts are regularly conducted along the SJWA’s northern boundary. Fish and Game Code Section 3004 prohibits the discharging of firearms within 150 yards (450 feet) of any building without express permission of the owner. Given that the City is proposing the construction of buildings within 450 feet of the northern property boundary of the SJWA, the City’s actions will directly constrain the public’s use of the SJWA. CDFW reiterates that unless the City increases the buffer distance between the SJWA and constructed elements of the Project to a minimum of 450 feet, the City will have effectively created restraints on hunting with the Wildlife

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Area. Further unless the environmental document is revised, it continues to be deficient in its analysis of impacts on public access and recreational pursuits within the SJWA.

CDFW strongly recommends that the buffer distance between the northern boundary of the SJWA and the Project be increased to a minimum of 450 feet.

Project's Consistency with Adopted HCPs/NCCPs

Projects proposed for construction within the MSHCP and the Stephens' kangaroo rat Habitat Conservation Plan (SKR HCP) are subject to payment of mitigation fees. Pages 4.4-60 and 4.4-61 discuss the required payment of these fees, however the City did not include a mitigation measure to ensure the enforceability of payment of fees. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the payment of MSHCP and SKR HCP fees, as appropriate, prior to issuance of grading permits. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.

Resource Management

MM 4.4.6.4F discusses the development of a Biological Resource Management Plan for the proposed 250-foot setback area. The measure discusses that the plan will be reviewed by the City's "Planning Official in consultation with the San Jacinto Wildlife Area Manager." CDFW is unaware that the City contacted CDFW's SJWA manager to verify that CDFW were available and able to contribute to the review of this plan, or whether this workload element could be accommodated based on CDFW's current staffing levels. CDFW appreciates that the City is requesting review of the proposed Biological Resource Management Plan, but we request that review of this document be determined by CDFW.

CDFW recommends that the City revise mitigation measure MM 4.4.6.4F as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained **in perpetuity**. This plan will identify frequent and infrequent vegetation management requirements (i.e.,

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removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. **The Biological Resource Management Plan will include an estimate of short-and long-term management costs, a discussion of how funds will be made available in perpetuity, and entities responsible for contribution of funds to support the Biological Resource Management Plan.** The Biological Resource Management Plan will also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E.

The Biological Resource Management Plan, **including the short-and long-term funding strategy** shall be reviewed and approved by the Planning Official in consultation with **California Department of Fish and Wildlife** ~~San Jacinto Wildlife Area Manager~~. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist, to the satisfaction of the City Planning Division.

Fuel Management

MM 4.4.6.4J discusses the preparation of a Fuel Management Plan for those Planning Areas adjacent to the south and east boundary of the Project and MSHCP lands. The measure identifies that the plan shall demonstrate that adjacent MSHCP lands are adequately protected from expected fire risks. CDFW recommends that MM 4.4.6.4J be revised to also demonstrate that the Fuel Management Plan adequately protect CDFW's SJWA lands. CDFW recommends that the City revise mitigation measure MM 4.4.6.4J as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4J A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas **and/or San Jacinto Wildlife Area (SJWA) lands**. The Fuel Management Plan shall be prepared by the project proponent and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan **and/or SJWA** boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:

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- A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area.
- A list of non-native invasive plants that are prohibited from installation.
- Maintenance activities and a maintenance schedule.

Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas **and SJWA lands** are adequately protected from expected fire risks.

Minor Errors

MM4.4.6.2B and 4.4.6.3B include reference to the “Resource Conservation Agency (RCA).” CDFW assumes that the City is referring to the Western Riverside County **Regional Conservation Authority**. CDFW recommends that the City review the aforementioned mitigation measures and correct all references to the Regional Conservation Authority.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDDB). Information can be submitted online or via completion of the CNDDDB field survey form at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The completed form can be mailed electronically to CNDDDB at the following email address: CNDDDB@wildlife.ca.gov. The types of information reported to CNDDDB can be found at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>.

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FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CDFW CONCLUSIONS AND FURTHER COORDINATION

CDFW appreciates the opportunity to comment on the RFEIR for the City of Moreno Valley's World Logistics Center Project (SCH No. 2012021045) and recommends that the City address the CDFW's comments and concerns prior to adoption of the RFEIR. Pursuant to CEQA Guidelines section 15097(f) CDFW has prepared a draft mitigation monitoring and reporting program (MMRP) for the new mitigation measures identified in this letter. The draft MMRP is enclosed at the end of this letter.

If you should have any questions pertaining to the comments provided in this letter, and to schedule a meeting, please contact Joanna Gibson at (909) 987-7449 or at Joanna.Gibson@wildlife.ca.gov.

Sincerely,

DocuSigned by:

 8091B1A9242F49C...

Scott Wilson
 Environmental Program Manager

ec: California Department of Fish and Wildlife
 HCPB CEQA Coordinator

Office of Planning and Research, State Clearinghouse
State.clearinghouse@opr.ca.gov

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Mitigation Monitoring and Reporting Program for the City of Moreno Valley's World Logistics Center Project

Mitigation Measure	Timing	Responsible Parties
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and to the City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.</p>	<p>Prior to issuance of grading permit.</p>	<p>City of Moreno Valley</p>

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Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.	Prior to issuance of grading permit.	City of Moreno Valley
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May 14, 2020

VIA E-MAIL ONLY

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**RE: World Logistics Center Revised Final Environmental Impact Report
(SCH # 2012021045)**

Dear Ms. Descoteaux:

Attorney General Xavier Becerra, in his independent capacity,¹ and the California Air Resources Board (CARB) jointly submit the following comments on the April 2020 Final Environmental Impact Report (FEIR) prepared for the World Logistics Center (the Project) in advance of the Project’s May 14, 2020 Moreno Valley (City) Planning Commission hearing.

The Attorney General and CARB have the following concerns regarding the FEIR, as explained in detail below:

1. The FEIR does not correct the improper GHG analysis the Attorney General and CARB critiqued in multiple comment letters on prior versions of the Project’s environmental impact report.²

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14–15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the FEIR’s compliance with the California Environmental Quality Act (CEQA).

² The Attorney General and CARB previously reviewed the City’s July 2018 Revised Final Environmental Impact Report (RFEIR) and submitted comments regarding the RFEIR on September 7, 2018. As noted in those comment letters, the RFEIR’s analysis of greenhouse gas (GHG) related impacts does not meet CEQA’s requirements. On January 30, 2020, CARB also

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2. The FEIR also continues to misrepresent CARB's positions.
3. The FEIR's new GHG Mitigation Measure 4.7.7.1 is inadequate.
4. The FEIR fails to adopt feasible mitigation measures that would substantially lessen the Project's significant adverse effects.
5. The addition of Mitigation Measure 4.7.7.1 is "significant information" that requires recirculation of the FEIR.

Until these shortcomings are corrected, the FEIR should not be certified by the City.

I. THE FEIR CONTINUES TO RELY ON ENVIRONMENTALLY IRRESPONSIBLE AND LEGALLY FLAWED ARGUMENTS TO AVOID PROPERLY ANALYZING AND MITIGATING THE PROJECT'S ENORMOUS GREENHOUSE GAS IMPACTS.

Under CEQA, a project's significant GHG impacts must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact. 14 Cal. Code Regs. (CEQA Guidelines) § 15064.4. Yet, the FEIR continues to improperly divide the Project's GHG emissions into two categories, which it terms "capped" and "uncapped"; classifications that are created by the FEIR and have no relevance under CEQA. The FEIR asserts that "capped" emissions are "covered" by CARB's Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation.³

To purportedly support its improper approach to GHG analysis and mitigation, the FEIR relies on a few weak, misguided bases: (1) two mitigated negative declarations (MND); (2) an outdated guidance document from an air district with no jurisdiction in the South Coast Air Basin; (3) an inapposite appellate court decision that did not benefit from the input of California's expert agencies and other key stakeholders, and (4) unsupported arguments about indirect costs.

The FEIR does not, and cannot, explain why its GHG analysis and mitigation approach did not comply with the CEQA Guidelines, applicable case law, and other relevant guidance regarding GHG analysis and mitigation. In addition, the FEIR ignores the objections in our previous comment letters.

filed comments on the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR). These three comment letters are attached to this letter as Exhibits A-C. Further, the Attorney General and CARB's amicus brief in *Paulek et al. v. Moreno Valley Community Services District et al.* (E071184) (*Paulek*), which further discusses the legal inadequacies of the GHG analysis, is attached hereto as Exhibit D.

³ Though Mitigation Measure 4.7.7.1 agrees to offset "capped" emissions in the event the City's GHG analysis is invalidated in *Paulek*, the improper legal arguments regarding the distinction between "capped" and "uncapped" emissions will remain.

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The City cites the San Joaquin Valley Air Pollution Control District (SJVAPCD) Policy APR-2025, issued in 2014, and two MNDs approved by SCAQMD in 2014. The City states that its approach has been applied “for years” in light of those same documents. (FEIR at 23.) However, as the California Supreme Court has repeatedly held in more recent years, GHG law continues to evolve, and lead agencies have an obligation under CEQA to “stay in step.” *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504 (*SANDAG*).⁴ The documents the City relied on are out of date and not the appropriate guidance for analyzing GHG impacts under CEQA.

Note that in 2014, the California Supreme Court had not yet issued its seminal *Newhall* decision, which was published on November 30, 2015. *Center for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 230 (*Newhall*). The Court then issued the *SANDAG* decision on July 13, 2017. (*SANDAG, supra*, (2017) 3 Cal.5th 497.) The FEIR ignores post-2014 materials that establish its approach is unlawful, including the *SANDAG* California Supreme Court decision referenced above, as well as CARB’s 2017 Scoping Plan.⁵

The City also relies on *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*). However, as previously noted, *AIR* did not broadly validate the City’s approach of excluding all fuel and electricity related emissions from its GHG analysis, particularly for a project that is not regulated by the Cap-and-Trade Regulation. (See FEIR at 22, 23.) That issue simply was not before the court, and was not given due consideration as a result. (See Exhibit A at 6; Exhibit B at 11-12; Exhibit D at 30-31.) *AIR* is thus inapposite.

Finally, the City also attempts to argue that the Project would effectively be paying for GHG mitigation through fuel and electrical costs passed down to the end consumer. (FEIR at 18-19.) It still remains unclear how there would be any price signal to Project proponents in this situation, given that any fuel-related costs would be paid by the fuel suppliers, and potentially passed down to the Project’s tenant logistics companies. Regardless, these fuel costs would not be paid by the Project proponents.

⁴ As the California Supreme Court has held, “CEQA requires public agencies ... to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG* at 504.) The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Ibid.*) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17.)

⁵ Available at https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. See, in particular, the “Climate Action through Local Planning and Permitting” chapter beginning at page 99, which describes the critical role played by local government contributions to CEQA reductions, including through the CEQA review process. See also CARB’s 2018 comment letter for more information on this point.

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In sum, the City's weak attempts to support the FEIR's unlawful GHG analysis and mitigation approach are without merit. Thus, the FEIR violates CEQA by failing to fully analyze and mitigate the significant GHG impacts of the Project.

II. THE FEIR CONTINUES TO INCORRECTLY CLAIM THAT CARB SUPPORTS THE WLC'S GHG APPROACH.

The FEIR continues to misrepresent CARB's views on GHG analysis and mitigation.⁶ As noted in CARB's September 7, 2018 letter and in its *Paulek* amicus brief, CARB does not support the approach proposed; the approach is unlawful, inconsistent with relevant climate plans and regulations, and likely to set back the state's climate mitigation efforts if applied. Once again, the Cap-and-Trade Program was not designed to mitigate all GHG impacts associated with land use planning decisions. Rather, it was designed with responsible local CEQA compliance in mind as a complementary strategy. (See, e.g., 2017 Scoping Plan at 99-102.) Cap-and-Trade, which is neither tailored to nor affected by the Project, simply does not provide project-level mitigation in this case.

The FEIR points to several cherry-picked provisions from the 2011 Final Statement of Reasons for the Cap-and-Trade Project. (FEIR at 18-19.) Yet it fails to explain why there is not a single provision, from any point in time, indicating that CARB intended Cap-and-Trade compliance to constitute CEQA mitigation for unregulated entities and projects, or that it excuses land use projects wholesale from evaluating or mitigating their GHG emissions. Cap-and-Trade does not and CARB plainly never intended Cap-and-Trade to obviate CEQA mitigation requirements; that is a much bigger change that CARB would have expressly addressed had that been the intent. While the FEIR points out selected Scoping Plan provisions (FEIR at 25), it conveniently omits the directly applicable "Climate Action through Local Planning and Permitting" chapter describing how CARB relies on complimentary local planning actions (including robust CEQA analysis and mitigation) to accomplish the state's GHG mandates and goals. (See 2017 Scoping Plan at 99-102.) The City's approach would effectively render superfluous the CEQA mitigation recommendations in CARB's Scoping Plan, as there would be essentially nothing left to mitigate if agencies took the City's approach. It would also allow lead agencies to disregard their CEQA obligations and make less informed decisions. (See, e.g.,

⁶ In the *Paulek* litigation, attorneys for the developer argued that because CARB did not specifically object to the project's GHG significance methodology in its early comment letters, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions." (Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, p. 18, lines 3-7.) The City has failed to address this issue or otherwise correct this clear and consequential misrepresentation in its responses to comments.

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SANDAG, supra, 3 Cal.5th at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”].)

Despite failing to mitigate 95% of the Project’s emissions, the FEIR appears to claim that the Project would be consistent with the “Climate Action through Local Planning and Permitting” chapter of the Scoping Plan mentioned above. (FEIR at 29.) This is incorrect. As noted above, that chapter of the Scoping Plan discusses how the State needs more, not less, responsible GHG planning and mitigation from project developers and lead agencies. Here, the City seeks to avoid almost entirely its obligation to mitigate its GHG emissions.

III. THE NEW GHG MITIGATION MEASURE 4.7.7.1 IS INADEQUATE.

As stated in our previous comments, under CEQA, the City must revise the FEIR to analyze all of the Project’s significant impacts relating to GHG emissions, including capped emissions. The FEIR must also adopt all feasible mitigation to address the Project’s significant GHG impacts. (*Newhall, supra*, 62 Cal.4th at p. 231.) Instead, the City revised the FEIR to add a mitigation measure for the Project, but this measure does not correct the FEIR’s CEQA violations. The new GHG mitigation measure would require the Project to purchase GHG offsets to mitigate its emissions, but only if the City loses the *Paulek* appellate litigation. (Measure 4.7.7.1.) This measure is inadequate for multiple reasons.

First, the City should adopt meaningful GHG mitigation measures in the FEIR, rather than continuing to avoid its responsibility to require mitigation unless specifically so ordered by a court. The City has conceded that such a measure is feasible by including its contingent GHG mitigation measure in the FEIR. (CEQA Guidelines, § 15092, subd. (b)(2)(A) [“A public agency shall not decide to approve or carry out a project for which an EIR was prepared unless . . . [t]he agency has . . . [e]liminated or substantially lessened all significant effects on the environment where feasible.”].) Indeed, more beneficial mitigation measures are feasible – including the use, for instance, of electrified trucks for the Project, which would reduce both GHGs and air pollution risk, as CARB has long recommended. Yet, the Project has not even adopted its inadequate offset measure, much less failed to explain why it has not adopted ostensibly feasible measures presented by CARB regarding design changes to favor zero emission vehicles. There is no indication in the record that even a more robust, legally-adequate GHG mitigation measure would be infeasible for the Project.

Second, the proposed measure, if it ever becomes effective, may not actually reduce the Project’s GHG emissions. Mitigation Measure 4.7.7.1 uses similar language to CARB’s offsets program, it lacks the essential safeguards that make CARB’s program successful. For example, the measure states that any offsets used must be “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” (FEIR at 36.) However, these terms are not defined in the mitigation measure. They are left to the sole interpretation and discretion of the City’s Planning Official and thus not enforceable as CEQA requires. (See Pub. Resources Code, § 21081.6, subd. (b); CEQA Guidelines, § 15126.4, subd. (a)(2).) There is a broad continuum of voluntary-market offsets available for purchase by project proponents, ranging

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from ineffective and unenforceable to rigorous. It remains unclear which types of offsets would be deemed by the City’s Planning Official to meet these undefined criteria.

In the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. Offsets do not provide the important co-benefits of on-site mitigation such as local jobs, reduced local air pollution, local infrastructure and efficiency improvements. (See e.g. 2017 Scoping Plan at 102 (“CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from [vehicle miles traveled], and direct investments in GHG reductions within the project’s region that contribute potential air quality, health, and economic co-benefits locally.”) This is why the 2017 Scoping Plan prioritizes local direct investments, and recommends turning to offset credits “[w]here further project design or regional investments are infeasible or not proven to be effective.” (2017 Scoping Plan at 102.) The proposed measure, by contrast, does not obligate the Project to first consider additional direct reductions, or other local or regional GHG emissions reductions, before deciding to purchase offsets. Such direct or local measures could otherwise benefit those in the Project vicinity. Furthermore, the measure does not in any way limit the percentage of offsets which may be used to mitigate the Project’s GHG emissions, as compared to more direct methods of GHG reduction. California’s Cap-and-Trade Program, for its part, sets a quantitative usage limit, which allows only 4-8% (depending on the calendar year) of an entity’s compliance obligation to be met through surrendering offsets. (See 17 Cal. Code Regs., § 95854.) This helps ensure that offsets are a relatively small part of the overall Cap-and-Trade Program, ensuring that the majority of GHG reductions come from reductions by regulated entities rather than from non-covered sectors.

The FEIR’s proposed measure entirely lacks this protection, instead allowing offsets (even ones that may not actually result in GHG reductions, as described above) as the sole GHG mitigation mechanism. These disadvantages, combined with the lack of any adequate criteria to ensure quality or enforceability of the offsets that may be purchased in this case, make the mitigation measure ineffective and unreliable.

Mitigation Measure 4.7.7.1 also seems to imply that CARB has broadly “approved” the offset registries it lists. The measure’s text states: “Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, Verra (formerly Verified Carbon Standard) or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above.” (FEIR at 36). CARB has approved only the American Carbon Registry, Climate Action Reserve, and Verra for the limited purpose of participation as Offset Project Registries in CARB’s Cap-and-Trade Program, pursuant to the process set forth in section 95986 of Title 17 of the California Code of Regulations. This approval only pertains to the registry’s participation in the Cap-and-Trade Regulation, in connection with issuing CARB offset credits. By contrast, the offsets contemplated by Mitigation Measure 4.7.7.1 are known as “voluntary market” offsets, which are generated under separate protocols adopted by the registries. CARB does not review

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these voluntary market protocols. CARB's "approval" of a registry as an Offset Project Registry under the Cap-and-Trade Program does not mean CARB has reviewed or approved that registry's voluntary market offset protocols.

Mitigation Measure 4.7.7.1 improperly bypasses onsite and local mitigation and violates CEQA because of its unenforceability and thus must be revised.

IV. THE FEIR IMPROPERLY DECLINES TO ADOPT FEASIBLE MITIGATION MEASURES THAT WOULD SUBSTANTIALLY LESSEN THE PROJECT'S SIGNIFICANT ADVERSE EFFECTS.

The FEIR simultaneously argues the proposed use of offsets and credits is a feasible mitigation measure, and yet refuses to adopt such a measure now by conditioning it on the outcome of the *Paulek* litigation. This approach violates CEQA, which instructs that "public agencies should not approve projects as proposed if there are... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." (Pub. Res. Code 21002). The FEIR recognizes it is possible to offset the entire 232,402 metric tons of GHG from this Project but only guarantees the offset of 8,563 metric tons of GHG emissions. (See FEIR at page 39.) The entire 232,403 metric tons of GHGs will *not* be offset if the "trial court's judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed." However, if the appeal is dismissed, an appellate court will not have upheld the City's GHG analysis and, as described above, the City's misleadingly-named "capped" emissions would be considered a significant environmental effect. These emissions would need to be mitigated, and could be via a feasible and rigorous GHG mitigation measure (as described above). By refusing to adopt such a feasible mitigation measure here, the FEIR violates CEQA. (See CEQA Guidelines, § 15092.)

V. MITIGATION MEASURE 4.7.7.1 IS "SIGNIFICANT NEW INFORMATION" THAT REQUIRES RECIRCULATION OF THE FINAL EIR.

Pursuant to Public Resources Code section 21092.1, Mitigation Measure 4.7.7.1 is "significant new information" that requires a new opportunity for public comment. "Significant new information" includes a new "feasible way to mitigate or avoid [a substantial adverse environmental effect]... that the project's proponents have declined to implement." (*Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1129, as modified on denial of reh. (Feb. 24, 1994)). As described above, Mitigation Measure 4.7.7.1 identifies a feasible, although not necessarily proper, way to mitigate the Project's greenhouse gas emissions, yet declines to adopt such mitigation unconditionally.

When "significant new information... is added to an environmental impact report after notice... but prior to certification" the public agency must "give notice again pursuant to Section 21092... before certifying the environmental impact report." (Pub. Resources Code, § 21092.1). Notice pursuant to Public Resources Code Section 21092(b)(2) requires a comment period.

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However, Mitigation Measure 4.7.7.1 was added to the FEIR through a “Response to Comments on the Revised Sections of the Final EIR and Draft Recirculated Revised Sections of the Final EIR” without any such comment period. Instead, the City simultaneously released that document and a Notice of Completion informing the public that the Moreno Valley Planning Commission would review the Revised FEIR at a public hearing on May 14, 2020. Moreno Valley should have recirculated the EIR and provided an opportunity for public comment on the EIR with the addition of Mitigation Measure 4.7.7.1.⁷

VI. CONCLUSION

The Attorney General and CARB urge the City of Moreno Valley not to certify the FEIR without further revisions to the GHG analysis as described above. As stated in our previous comments, the City must take its obligations as a local government to mitigate climate change impacts seriously. The addition of a weak GHG measure that would apply only if the City’s approach is invalidated on appeal is not enough. However, if the City implements the actions that the state’s expert agencies have requested for years, the Project could be an important environmental leadership project. Indeed, the Project could create jobs by building a world-leading clean logistics project, protecting communities all along its supply chains. We encourage the City to take this opportunity to innovate and to lead. As always, we would be happy to work with the City to take the additional steps needed to fully comply with CEQA’s GHG analysis and proper mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 Deputy Attorney General

For XAVIER BECERRA
 Attorney General

⁷ In its January 30, 2020 comments, CARB informed the City of its concerns with not being able to review the new GHG-related mitigation measure. (See January 30, 2020 CARB comment letter at page 1.) When CARB reached out to a City representative at that time, CARB was informed that the reference to the new GHG mitigation measure was included in the RRSFEIR in error, and it would be removed in the FEIR. Rather than remove that measure, the FEIR now includes a new GHG mitigation measure that has never before been circulated for public review, and which the City had previously indicated would not be part of the FEIR. The City only now has decided to release this measure as part of a vast FEIR package, just 14 days prior to the Project approval hearing.

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Richard W. Corey
Executive Officer, CARB

cc: Albert Armijo, Interim Planning Manager, alberta@moval.org
Kenneth B. Bley, Attorney for Project Proponents, kbley@coxcastle.com

EXHIBIT A



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September 7, 2018

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RE: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project

Dear Mr. Armijo:

Attorney General Xavier Becerra submits the following comments on the Revised Sections of the Final Environmental Impact Report (“RFEIR”) prepared for the World Logistics Center (the “Project”).¹ The Project, a proposed warehouse and logistics complex in the City of Moreno Valley (“City”), would be one of the largest warehouse facilities in the world, with square footage equaling approximately 700 regulation-size football fields.

INTEREST OF THE ATTORNEY GENERAL

For well over a decade, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change. It is now well-established that California, through law and policy, and consistent with sound science, is committed to achieving a low-carbon future by 2050 in order to reduce and avoid the most catastrophic effects of climate change. California has already begun to experience adverse climate effects, such as rising sea levels and longer, more intense fire seasons. The Attorney General is particularly concerned about how such effects may impact our most vulnerable communities, such as Inland Empire residents, who are already burdened by some of the worst air quality in the country.

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RFEIR’s compliance with the California Environmental Quality Act (“CEQA”).

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Every large development project has the potential either to facilitate, or instead hinder, the State's achievement of its climate goals. It is therefore important that as lead agencies consider the impacts of individual development projects – many of which will operate for decades into the future – they evaluate and impose feasible mitigation for climate change impacts.

With these goals in mind, the Attorney General has provided guidance to local governments, commented on potential projects, and engaged with local interest organizations concerned with climate change and environmental justice. (See California Department of Justice, Office of the Attorney General, *California Environmental Quality Act*, <https://oag.ca.gov/environment/ceqa> (as of Sept. 7, 2018).) The Attorney General has also participated in litigation throughout the State to ensure that local governments comply with state requirements to fully analyze and implement all feasible mitigation measures to lessen significant impacts from greenhouse gas emissions (“GHGs”) caused by land use development projects. (See, e.g., *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497; *People of the State of California v. County of San Bernardino* (Cty. of San Bernardino filed April 12, 2007) No. CIVSS700329.) The Attorney General also has a long-standing interest in ensuring environmental justice throughout the State and for communities in the Inland Empire. (See, e.g., *CCA EJ v. County of Riverside, et al.*, Case No. RIC1112063; California Department of Justice, Office of the Attorney General, *Environmental Justice at the Local and Regional Level: Legal Background* (July 10, 2012) https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.)

After review of the GHG analysis in the RFEIR, the Attorney General believes that the City has failed to comply with CEQA's requirements for analyzing and implementing feasible mitigation for the significant GHG emissions that will result from this Project. For the reasons outlined below, the City's approach falls substantially short of meeting the requirements of CEQA, the regulations implementing CEQA – the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), and applicable case law. The City's approach in the RFEIR has the potential to seriously undermine the overall effort to meet the State's science-based GHG reduction goals for the transportation and land use sectors, and to disproportionately disadvantage environmental justice communities.

THE RFEIR'S GHG ANALYSIS VIOLATES CEQA AND UNDERMINES THE STATE'S CLIMATE OBJECTIVES.

As the RFEIR acknowledges, this Project at buildout will cause over 281,000 metric tons of GHGs to be released into the atmosphere every year, and will result in over 200,000 metric tons of GHG emissions beginning as early as 2028. (RFEIR at 4.7-35.) These emissions will presumably continue throughout the life of the project, though the RFEIR does not address this.

The RFEIR takes a very unusual and troubling approach to addressing the Project's GHG-related impacts, especially since climate pollution is undeniably a *cumulative* problem. (*Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 256-257.) The RFEIR divides the Project's GHG emissions into two categories, which it terms

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“capped” and “uncapped” – classifications created by this RFEIR. What the RFEIR deems “uncapped” emissions constitute only about 3% of the Project emissions. They include the comparatively minor landfill emissions caused by waste generated at the Project and the use of refrigerants at the Project. (RFEIR at 4.7-33.) For these emissions, the RFEIR follows the approach that would be expected under CEQA: the City has, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHGs as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold.² (RFEIR at p. 4.7-19.) What the RFEIR terms “capped” emissions, however, constitute the remaining 97% of the Project’s predicted emissions. Those include emissions caused by mobile sources (namely, diesel trucks) and electricity use at the Project. (RFEIR at p. 4.7-33.) With respect to these emissions, the RFEIR deviates dramatically from standard CEQA methodology. The RFEIR asserts that these emissions are “covered” by the California Air Resources Board’s (“CARB”) Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation. (RFEIR at p. 4.7-22.) This is a novel and unsupportable approach under CEQA.

As discussed below, the RFEIR’s approach does not comply with CEQA, for several reasons. First, the Project is not regulated under the State’s Cap-and-Trade Program, so purported compliance with that Program cannot be used to exclude 97% of the Project’s GHG emissions from the analysis of whether the Project’s GHG emissions will result in significant climate change impacts. Second, CEQA requires that all of the emissions attributable to the Project be evaluated for significance, regardless of their source. Third, when comparing all of the Project’s emissions to California’s ambitious, science-based climate goals, as well as statewide, regional, and local plans for the reduction or mitigation of GHG emissions, the Project’s GHG emissions are clearly significant, requiring further feasible mitigation measures.

We are concerned about the City’s use of this analytical approach, both in the context of this Project and more generally. If the RFEIR’s approach is put into general use by the City, or followed by other lead agencies, emissions from transportation and electricity could largely be exempt from analysis and mitigation under CEQA. This is directly counter to the purposes of CEQA, and the Legislature’s considered decision to make clear that GHG emissions must be analyzed. (Senate Bill 97 (2007); Pub. Resources Code, § 21083.05.) The State cannot meet its well-established, long-term environmental GHG reduction goals if new local projects are free to add hundreds of thousands of tons of GHGs to the atmosphere every year without undergoing the

² Lead agencies may choose to use a “threshold of significance,” a working presumption that can assist in determining whether an impact is significant. (Cal. Code Regs., tit. 14, §§ 15064.4(b)(2); 15064.7.) “A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” (Cal. Code Regs., tit. 14, § 15064.7, subd. (a).)

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analysis and mitigation that CEQA requires. Moreover, the RFEIR’s approach will likely expose already-burdened communities in the State to greater amounts of GHG co-pollutants, such as diesel particulate matter and nitrogen oxides.

We urge the City to revise its GHG analysis to comply with CEQA by properly evaluating whether *all* of the Project’s emissions—for all phases of the Project, direct and indirect, short-term and long-term—are cumulatively significant, and adopting feasible mitigation to ensure those emissions do not have a significant impact on the environment.

I. THE RFEIR’S NOVEL APPROACH TO “CAPPED” EMISSIONS VIOLATES CEQA.

The purpose of an environmental impact report is “to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project.” (Pub. Resources Code § 21061.)

The City’s approach violates a number of well-established CEQA principles. Lead agencies must “consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect.” (Cal. Code Regs., tit. 14 § 15003, subd. (h).) This Project as a whole includes both the “capped” and “uncapped” GHG emissions, but the RFEIR fails to analyze and mitigate “capped” emissions. Moreover, both “direct and indirect significant effects” and “short-term and long-term effects” should be considered. (Cal. Code Regs., tit. 14, § 15126.2, subd. (a).) The RFEIR fails to inform the public of the long-term effects of the Project’s GHG emissions by failing to analyze GHG emissions past buildout.

In addition to violating these more general principles, the City’s approach to “capped” emissions contradicts the CEQA Guidelines specific to GHG analysis. “The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data.” (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The CEQA Guidelines advise lead agencies on how to determine the significance of a Project’s GHG emissions. A lead agency should consider three non-exclusive methods for determining climate significance:

- (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project[;]
- (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. . . . If there is substantial evidence that the possible effects of

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a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. (Cal. Code Regs., tit. 14, § 15064.4, subd. (b)).

While “[a]n ironclad definition of significant effect is not always possible,” (Cal. Code Regs., tit. 14 § 15064, subd. (b)), the RFEIR’s conclusion that the Project’s GHG impacts are not significant under CEQA (RFEIR at p. 4.7-33) is based solely on its unjustifiable exclusion of the vast majority of the GHG emissions of the Project. That exclusion is neither consistent with CEQA nor justified by the Cap-and-Trade Program, which does not apply to the Project.

A. Since the Project is Not Regulated Under Cap-and-Trade, The RFEIR Cannot Use Cap-and-Trade to Ignore the Significance of the Project’s GHG Emissions.

The RFEIR effectively treats the Cap-and-Trade Program as if it is a qualified mitigation plan for the Project and its “capped” emissions. (See Cal. Code Regs., tit. 17, §§ 15064, subd. (h)(3); 15064.4 subd. (b)(3)). It is not.

California’s Cap-and-Trade Program applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for compliance instruments.” (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) The Cap-and-Trade Program only applies to expressly identified entities, such as cement producers, petroleum refiners, electricity generators, natural gas supplies, fuel importers, and liquid petroleum gas supplies. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities.

Although the operator of a refinery that produces liquefied petroleum gas in California is subject to the Cap-and-Trade Program, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing its own GHG emissions or surrendering compliance instruments, but the gas station that resells the gas, the truck drivers who purchase it, and the warehouses to which the trucks drive do not. Because CEQA Guidelines section 15064.4, subdivision (b)(3) instruct lead agencies to consider the extent to which *the project* complies with GHG regulations or requirements, it is inappropriate to rely upon compliance with Cap-and-Trade by other entities downstream in the chain of commerce as a basis for avoiding analysis of project-related emissions. In the Final Statement of Reasons for the CEQA Guidelines addressing GHG emissions, the California Natural Resources Agency confirmed that, in implementing CEQA Guidelines section 15064.4, a lead agency must show that a GHG reduction plan “actually addresses the emissions that would result from the project.” (California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009), available at http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf, at p. 27.)

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Further, the City's approach is not, as the RFEIR claims (RFEIR at 4.7-20), supported by *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 ("AIR"). Without commenting on whether or not that case was rightly decided, AIR is facially inapposite because the project being evaluated under CEQA in that case was a refinery, a covered entity under the Cap-and-Trade Program. Because this Project is not a covered entity under the Cap-and-Trade Program, it is unjustifiable for the RFEIR to use compliance with Cap-and-Trade as a factor in analyzing the significance of the Project's GHG emissions. There is no basis in the law for the use of Cap-and-Trade to exclude a full 97% of the Project's GHG emissions from analysis or mitigation.

The flaw in the City's approach becomes even more apparent when one considers its incongruous results. The RFEIR describes the Project, in part, as follows: "Goods imported through the Ports of Long Beach and Los Angeles as well as other locations are delivered via truck to the proposed distribution centers and distributed via truck both in and out of state locations. . . ." (Original FEIR at 3-27-3-28.) The heart of this Project is this movement of goods via trucks. Yet, the City's approach avoids any analysis of 210,596 metric tons of GHG emissions associated with the movement of goods via trucks. (RFEIR at p. 4.7-33.) 97% of the Project's total GHG emissions are simply dismissed under this approach. CEQA does not permit such a dismissal.

B. The RFEIR Must Consider All Emissions in Determining Significance.

Correctly applying CEQA requires an evaluation of *all* the Project's GHG emissions in determining significance. (See Cal. Code Regs., tit. 14, §§ 15064.4, subd. (b)(2); 15378 (defining "project" as "the whole of an action. . . .")) There is no basis here for comparing some of the Project's emissions to the significance threshold, but not others. Here, the City elected to use a threshold of 10,000 metric tons of GHGs. (RFEIR at p. 4.7-19.) CEQA Guidelines section 15064.4, subdivision (b)(2), notes that when using a threshold, an agency should compare all of the "project emissions" of GHGs to that threshold. Emissions from trucks and electricity are a result of the Project just as much as the "uncapped" emissions. They therefore must be compared to the significance threshold, and mitigated to the extent feasible.

Further, the City's attempt to exempt an impact from any significance analysis based solely on purported compliance with a single rule or regulation is unwarranted. Courts have repeatedly held compliance with a single environmental or land use law or regulation does not create an exemption from CEQA's requirement that lead agencies evaluate all of a project's significant environmental impacts. For example, "compliance with a general plan in and of itself 'does not insulate a project from the EIR requirement, where it may be fairly argued that the project will generate significant environmental effects.'" (*East Sacramento Partnerships for a Livable City v. City of Sacramento* (2016) 5 Cal.App.5th 281, 301; see also *Keep Our Mountains Quiet v. County of Santa Clara* (2015) 236 Cal.App.4th 714, 732 ("[A]n EIR is required if substantial evidence supports a fair argument that [a project] may have significant unmitigated noise impacts, even if other evidence shows the [project] will not generate noise in excess of [a] County's noise ordinance or general plan."))

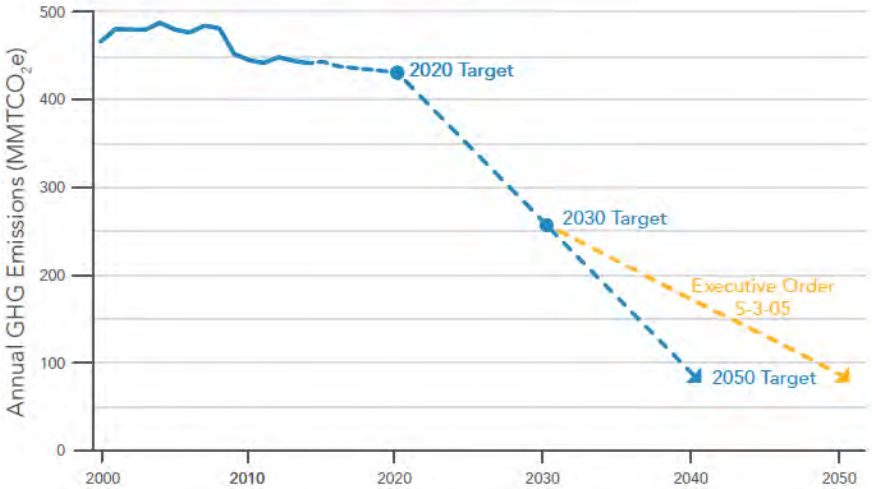
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C. In Light of the Project’s Substantial, Long-Term Projected Emissions, Its GHG Impacts Must Be Deemed Significant.

It seems impossible a proper evaluation of the Project’s emissions under CEQA could support a finding that the Project’s emissions are not significant. This Project—as currently designed—will lock in hundreds of thousands of tons of GHG emissions for decades to come, and may put this City and the region on a path that deeply undermines the State’s climate goals.

To reduce and avoid the most catastrophic effects of climate change, science tells us that we must dramatically reduce our annual statewide GHG emissions. California has taken ambitious steps to accomplish that objective. Assembly Bill 32 (“AB 32”) requires California to reduce its total statewide GHG emissions to 1990 levels by 2020. (Health & Saf. Code, § 38550.) Under Senate Bill 32 (“SB 32”), California must reduce its GHG emissions to 40% below 1990 levels by 2030. (Health & Saf. Code, § 38566.) In addition, the Governor’s Executive Order S-3-5 (“EO S-3-05”) directs state agencies to reduce statewide GHG emissions to 80% below 1990 levels by 2050. To achieve such ambitious but necessary goals, California will have to reduce GHG emissions from various sectors of the economy. Transportation, industry, and electricity generation are the top three contributing sectors to the State’s total GHG emissions. (CARB, 2017 Climate Change Scoping Plan (Nov. 2017) at p. 11 (“Scoping Plan”).) Below is a graph showing the dramatic downward trajectory of statewide GHG reductions necessary to achieve the State’s climate goals.

FIGURE 5: PLOTTING CALIFORNIA’S PATH FORWARD



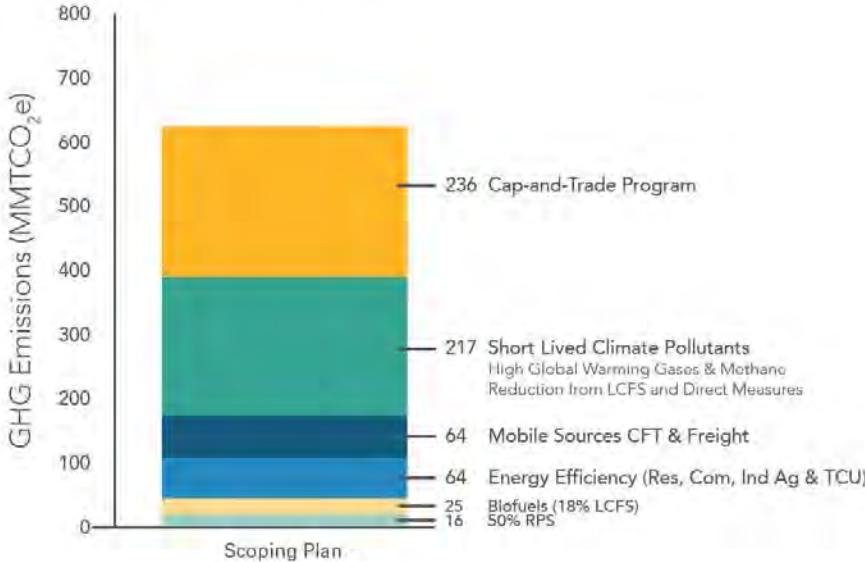
(Scoping Plan at p. 24.)

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California has adopted a multitude of regulations, requirements, plans, and policies to achieve the substantial reductions in statewide GHG emissions required by AB 32, SB 32, and EO S-3-5. CARB identified, in its Climate Change Scoping Plan, multiple required and voluntary measures working in concert as necessary for California to achieve its ambitious climate goals as depicted in the graph below. (See Scoping Plan at p. 28.)

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴



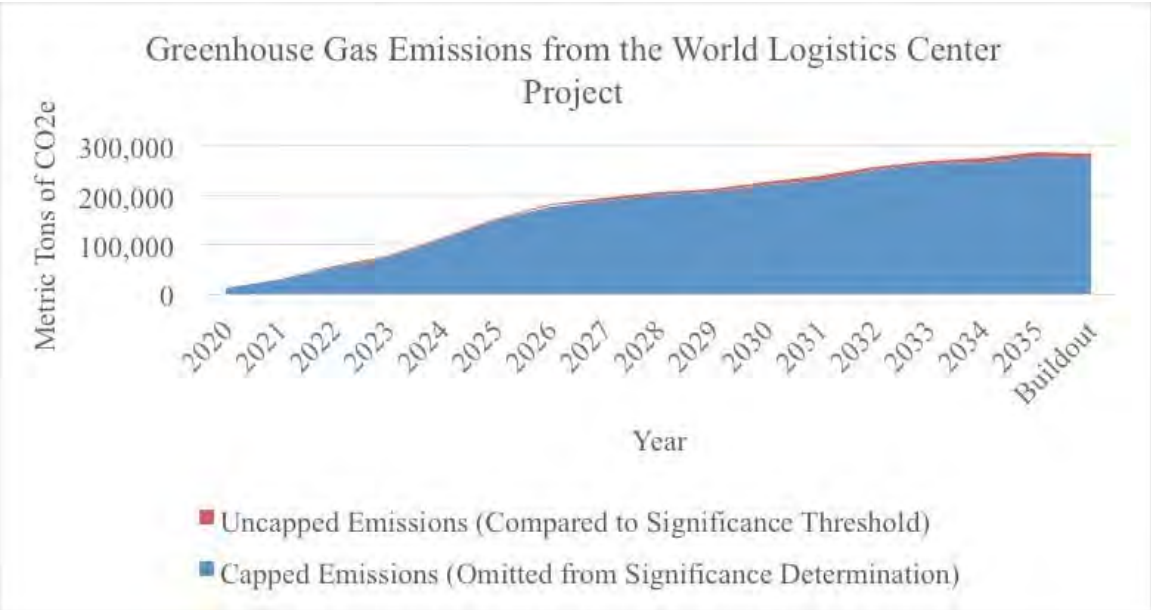
The Scoping Plan proposes various strategies for reductions in emissions from transportation and energy sectors. The Scoping Plan notes that for the GHG reductions from the transportation sector, “[vehicle miles traveled (“VMT”)] reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan.” (Scoping Plan at p. 112.) In addition, under SB 375, CARB assigns California’s 18 Metropolitan Planning Organizations targets for GHG emission reductions in the transportation sector which are to be achieved based on land use patterns and transportation systems. (CARB, Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (2017), available at https://www.arb.ca.gov/cc/sb375/final_staff_proposal_sb375_target_update_october_2017.pdf.) CARB’s recommended target for the Southern California Association of Governments is a 19% reduction in GHG emissions from transportation by 2035. (*Id.* at p. 34.)

CEQA requires the City evaluate the consistency of the Project’s substantial increases in GHG emissions with state and regional plans and policies calling for a dramatic reduction in GHG emissions. The Supreme Court in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (“*SANDAG*”) affirmed that an EIR should consider the project’s long-range greenhouse gas emission impacts through the year 2050, and address whether the project as a whole is in accord with the state’s climate goals. (*Id.* at p. 515.) The Supreme Court further instructed lead agencies to “stay in step with evolving scientific knowledge and state regulatory schemes.” (*Id.* at p. 504.)

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The RFEIR estimates that the Project’s total emissions will increase from the existing conditions of no emissions at the Project site to over 281,000 metric tons of GHG emissions annually at full buildout of the Project in 2040. (RFEIR at p. 4.7-33.) See the graph below depicting the trajectory of the Project’s GHG emissions.³



The Project’s substantial *increase* in GHG emissions conflicts with the downward trajectory for GHG emissions necessary to achieve state climate goals. This is illustrated clearly in the sharp difference in the upward trajectory of the graph of the Project’s GHG emissions versus the steep downward trajectory in the graph of the State’s climate goals as depicted in Figure 5 of the Scoping Plan and reproduced above. Yet, the RFEIR failed to evaluate the Project’s consistency with state and regional goals, requirements, plans, and policies to reduce

³ Visual depictions such as this graph make it easier to understand the significant impact of GHG emissions from the Project on the environment. Such clarity is encouraged by the CEQA Guidelines, which state that EIRs should be “written in plain language and may use appropriate graphics so that decisionmakers and the public can rapidly understand the documents.” (Cal. Code Regs., tit. 17, § 95811.) Such graphs are also helpful because they allow the decisionmakers to see a project’s proposed greenhouse gas emissions as a trajectory and assess the “significance of the *shape* of that emissions curve as a whole.” (Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17, 19, available at http://legal-planet.org/wp-content/uploads/2018/09/environmental-law-news_2017_vol-26-no-2_fall_the-sandag-decision.pdf.) To better inform the public of the Project’s unmitigated GHG emissions, we recommend revising the RFEIR to include graphical representations of the emissions trajectory of the project.

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

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GHGs that should have been analyzed under CEQA. Comparing the Project's GHG trajectory against the state's climate goals would inform the public of the Project's GHG impacts. For example, the RFEIR's GHG analysis should have considered whether the Project will increase VMT. Because it did not, it is inconsistent with SB 375. Although the RFEIR's revised traffic analysis does include a VMT analysis, it is included only to address air quality issues, and not GHGs. (RFEIR at pp. 4.7-19 and 4.15-3.) Under CEQA, the City is required to consider how the project can reduce VMT and electricity use, "rather than expecting[ing] these reductions to come [only] from technological advances or other measures." (SANDAG, at 523.) The City ignores its CEQA obligations and instead, the RFEIR obscures the Project's GHG impacts by improperly exempting them from CEQA analysis.

In addition, there is no discussion in the RFEIR of the GHG emissions from the Project over its expected lifespan. GHG emissions are estimated up until the Project's full buildout in 2040 (RFEIR at p. 4.7-33), but the Project will clearly continue beyond that point, and the RFEIR gives no indication of how long that will be. The cumulative impact of the Project's GHG emissions over its entire lifespan should be considered and mitigated to the greatest extent feasible. Notably, by failing to estimate emissions through 2050, the RFEIR obscures the extent to which the Project does or does not comply with California's explicit 2050 climate goals.

D. The RFEIR Should Analyze and Adopt Feasible Mitigation Measures to Avoid or Lessen the Project's GHG Impacts.

CEQA requires that an EIR consider and adopt feasible alternatives or mitigation measures that would substantially lessen the significant and harmful environment effects of the project being analyzed. (See Pub. Resources Code, § 21002.) The RFEIR's failure to properly analyze the Project's significant GHG impacts also results in a failure to mitigate those impacts as required by CEQA. If the RFEIR's analysis were done properly, the Project's GHG emissions from vehicles and electricity would have vastly exceeded the significance threshold selected by the City. Those emissions would therefore have to be reduced through changes or alterations in the Project, or the City would be required to explain why "[s]pecific economic, legal, social, technological, or other considerations including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives... ." (Cal. Code Regs., tit. 22, § 15091, subds. (a)(1) and (a)(3).) There may be mitigation measures or project alternatives that could reduce or avoid the Project's GHG emissions, such as the adoption of requirements mandating the use of zero emission vehicles or a certain percentage of electricity from renewable electricity sources, such as on-site solar power generation.⁴ By

⁴ The Attorney General recognizes that devising climate mitigation on a project-by-project basis can be challenging. Many local governments have therefore elected to move toward enforceable Climate Action Plans ("CAPs") integrated with their general plans. (CARB, California Climate Action Portal Map, <https://webmaps.arb.ca.gov/capmap/> (as of Sept. 7, 2018).) Done correctly, CAPs can put local governments on the path to a lower-carbon future

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excluding 97% of the Project's GHG emissions from its significance determination, the RFEIR obscures the extent of the Project's emissions and improperly evades the City's obligation to mitigate the Project's GHG impacts.

II. ADOPTION OF THIS METHOD OF EXEMPTING "CAPPED" EMISSIONS FROM CEQA ANALYSIS WILL UNDERMINE THE STATE'S VARIOUS POLICIES AND PROGRAMS TO REACH OUR AMBITIOUS CLIMATE GOALS.

The RFEIR's failure to comply with CEQA will have real consequences. If this RFEIR's approach is widely adopted, the State will not be able to achieve its ambitious climate goals. The RFEIR exempts the Project's emissions attributable to mobile sources and electricity use from CEQA analysis and mitigation. And yet transportation and electricity are two of the State's three largest sources of GHG emissions. (Scoping Plan at p. 11). Transportation and electricity are thus two of the most important areas in which GHG emissions must be reduced.

The RFEIR's approach to the transportation and electricity sectors incorrectly presumes that the Cap-and-Trade Program will achieve *all* GHG reductions necessary in those areas. But as CARB's 2017 Scoping Plan points out, "[l]ocal land use decisions play a particularly critical role in reducing GHG emissions associated with transportation, both at the project level, and in long-term plans..." (Scoping Plan at pp. 100-101.) If other lead agencies adopt the City's approach, millions of metric tons of GHGs resulting from development projects would be ignored and unmitigated through what amounts to a categorical exemption from CEQA. Local governments would therefore not be doing their part to help the State reach its ambitious, yet necessary, climate goals of emitting 40% below 1990 GHG levels by 2030 and 80% below 1990 levels by 2050. (Heath & Saf. Code, § 38566, Governor's Executive Order No. S-3-05 (June 1, 2005).)

Instead of claiming that no amount of transportation and electricity emissions can be significant under CEQA, and thus excluding them from any analysis and mitigation, lead agencies have an obligation to acknowledge the significance of such emissions and work to implement feasible mitigation of them.⁵

III. REVISING THE GHG ANALYSIS WILL LIKELY LEAD TO GREATER PROTECTION OF ENVIRONMENTAL JUSTICE COMMUNITIES.

In addition to, and separate from, the CEQA issues, revising the RFEIR's GHG analysis will likely help mitigate some of the Project's direct harmful effects on environmental justice communities. Moreno Valley contains some of the most pollution-burdened census tracts in the

while substantially streamlining the approval of individual projects that are consistent and comply with the CAP.

⁵ There are several examples of economically viable land use development projects that contributed no net additional GHG emissions. (Scoping Plan at p. 99.)

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State according to California Environmental Protection Agency's CalEnviroScreen tool.⁶ City residents experience ozone and particulate matter (PM) 2.5 at rates higher than 90% of the State. The South Coast Air Basin, where Moreno Valley is located, exceeds federal public health standards for ozone, ozone precursors, and particulate matter. Exposure to these air contaminants contributes to asthma, lung cancer, and cardiovascular disease. Indeed, residents in Moreno Valley experience higher than average emergency room visits due to asthma and higher than average rates of cardiovascular disease, particularly residents living along freeways.

Furthermore, environmental justice concerns are significant for the residents of Moreno Valley. Moreno Valley residents are predominately people of color, made up of 56.5% Hispanic and 18% African American populations. (United States Census Bureau, Quick Facts for Moreno Valley, California, <https://www.census.gov/quickfacts/fact/table/morenovalleycitycalifornia.ca/PST045217> (as of Sept. 7, 2018).) The rates of poverty are dramatically higher in Moreno Valley compared to the state—according to U.S. Census data, 18.6% of Moreno Valley residents live in poverty, compared with the statewide poverty rate of 14.4%. (*Ibid.*, and United States Census Bureau, Quick Facts for California, <https://www.census.gov/quickfacts/fact/table/ca/PST045217> (as of Sept. 7, 2018).) They experience high rates of unemployment and housing burdens (paying more than 50% of their income for housing costs). These socioeconomic characteristics of Moreno Valley residents increase their sensitivity to the health effects of the heavy pollution burdens they experience.

Adding to these burdens, Riverside County as a whole, and the City of Moreno Valley specifically, are experiencing a great influx of logistics warehouse projects. Recent developments in Moreno Valley alone include an 825,000 square-foot distribution facility for the Aldi grocery chain, a 1.6 million square-foot distribution facility for Deckers Brands footwear company, and a 1.25 million square-foot fulfillment center for Amazon. These large projects, and their related impacts on the low-income communities of color who live nearby and in the communities residing along the freeways serving them, are dwarfed by the over 40 million square-foot Project.

By conducting a proper GHG analysis in the RFEIR and adopting feasible mitigation, the City will likely better protect the environmental justice communities living near both the Project and along the freeways that trucks will use to reach the Project. Reduction of GHG emissions leads to the reduction of co-pollutant emissions. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL'Y REV. 377, 387 (“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant

⁶ CalEnviroScreen is a tool that uses environmental, health, and socioeconomic information to produce scores and rank every census tract in the state. A census tract with a high score is one that experiences a much higher pollution burden than a census tract with a low score. (See CalEnviroScreen 3.0 Report, Office of Environmental Health Hazard Assessment, January 2017, available at <https://oehha.ca.gov/media/downloads/calenviroscreen/report/ces3report.pdf>.)

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reductions as GHGs are being reduced [which] should improve the health of local communities.”)) This is especially true in the context of diesel truck emissions, where a VMT reduction would reduce both GHG emissions and co-pollutant emissions. Indeed, the RFEIR acknowledges that “[t]he *most effective way to reduce air pollution* impacts on the health of our nearly 17 million residents, including those in disproportionately impacted and environmental justice communities that are concentrated along our transportation corridors and goods movement facilities, *is to reduce emissions from mobile sources*,” and that those mobile sources constitute “the principal contributor to our air quality challenges.” (RFEIR at 4.3-11 (emphasis added).) Therefore, while revising the GHG analysis is necessary to comply with CEQA, the City should also see this as an opportunity to implement mitigation measures that would benefit the City’s residents and the other environmental justice communities impacted by this Project.

CONCLUSION

We appreciate the difficulty in analyzing GHG emissions under CEQA. However, local agencies must comply with the CEQA Guidelines for GHG analysis and cannot exempt GHG emissions from any significance analysis because of California’s Cap-and-Trade Program. We urge the City of Moreno Valley to revise the GHG analysis in the RFEIR as described above so as to support this State’s efforts to reduce GHG emissions, achieve our ambitious but necessary climate goals, and benefit local communities in the area who are already suffering some of the worst air pollution in the country. We would be happy to work with the City of Moreno Valley to take the additional steps needed to fully comply with CEQA’s GHG analysis and mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 BRIAN BILFORD
 Deputy Attorneys General

For XAVIER BECERRA
 Attorney General

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EXHIBIT B



Mary D. Nichols, Chair
 Matthew Rodriguez, CalEPA Secretary
 Edmund G. Brown Jr., Governor

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Re: World Logistics Center Revised Final Environmental Impact Report
 (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the World Logistics Center (WLC or project) Revised Final Environmental Impact Report (RFEIR). CARB appreciates the opportunity to comment on the RFEIR. Unfortunately, despite revisions, the RFEIR mischaracterizes (1) the scope of the Cap-and-Trade Program administered by CARB as they relate to the state's overall greenhouse gas reduction mandates, and (2) how that program may be relevant to a CEQA analysis. Because the RFEIR's GHG analysis relies almost entirely on those mischaracterizations for its GHG analysis and significance determination, it does not meet California Environmental Quality Act (CEQA) requirements.

The RFEIR's core flaw with regard to greenhouse gases (GHGs) is that it declines fully to analyze or mitigate emissions from fuel and electricity demand that the project will cause - the vast majority of the project's emissions - on the ground that CARB's Cap-and-Trade Program purportedly "covers" the project's emissions for this purpose. In fact, the Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground. The RFEIR's approach obscures the project's significant potential contribution to greenhouse gas emissions, and does not properly account for the combination of federal, state, and local approaches to address climate change that the crisis demands and the law requires.

We also note that the project still has not been modified to address serious health concerns from criteria and toxic air pollutants that CARB discussed in prior letters. Although this letter focuses on GHGs, we continue to be very concerned that local communities may face undue pollution from this project, if completed, as a result of inadequate mitigation.

We urge the City of Moreno Valley (City) to address the criteria and toxics issues we previously raised, and to revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, adopt feasible mitigation to

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ensure those emissions would not cause significant impacts, and recirculate the RFEIR, all as required by CEQA.

I. CARB's Participation in This Project's Review Process

CEQA requires analysis of a project's GHG emissions. Like all CEQA analyses, these disclosures must inform the public and provide appropriate information on mitigation. Planning for greenhouse gas reductions is critical at the project level, as CARB and other state agencies have repeatedly determined. Although various statewide programs address the climate change crisis as well, the CEQA guidelines, and state guidance documents, are clear that achieving the necessary reductions requires project-level focus.

The WLC project proponents have taken a different view in prior versions of the RFEIR and in related litigation, *Paulek v. City of Moreno Valley* (Riverside County Superior Court Case No. RIC 1510967) ("*Paulek*"). That case addresses, among other topics, the initial GHG analysis conducted for the WLC, and in the RFEIR. There, WLC advocates contended that, because some of the suppliers of the fuels and electricity consumed by the project are in the Cap-and-Trade Program CARB administers, the project was not required to analyze or mitigate the significant emissions impacts it would cause. Attorneys for the WLC also argued that because CARB did not specifically object to the project's GHG significance methodology, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions."¹

CARB had, in fact, recommended an array of project-based emissions reductions strategies contrary to these claims. CARB takes this opportunity to reiterate those recommendations (prior letters are attached) and to explain why the Cap-and-Trade Program's operations do not allow a departure from CEQA's general rule that project-level impacts be properly addressed.²

¹ Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, page 18, Lines 3-7.

² In both of CARB's comment letters, which we again incorporate by reference, CARB indicated that its recommendations were for the purpose of reducing not only criteria and toxics pollutants, but also for GHG emissions. CARB reviewed the Draft Environmental Impact Report (DEIR) and provided comments to the City of Moreno Valley in a letter dated April 16, 2013. CARB's comment letter expressed concern over the increase in health risk in the immediate area and the significant and unavoidable air quality and greenhouse gas (GHG) related impacts caused by the proposed WLC. To address those concerns, CARB recommended actions to support the development, demonstration, and deployment of zero and near-zero emission technology at the WLC. On June 8, 2015, CARB again provided comments on the Final Environmental Impact Report (FEIR), making similar recommendations. In those comments, CARB noted that the FEIR was unresponsive to the comments CARB provided in its April 16, 2013 letter regarding the DEIR. (See CARB April 16, 2013 letter at 2; CARB June 8, 2015 letter at 1, 3, and 8.)

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II. The RFEIR's Claims About CARB's Cap-and-Trade Regulation Are Incorrect

CEQA translates between high-level policy goals, and individual project choices to better inform the public and support decision-making. The GHG section of the RFEIR takes a novel, and factually unsupported, departure from ordinary CEQA practice by essentially excusing analysis and potential mitigation of GHG emissions when they are indirectly "covered" by a state program. Yet, state programs regularly address at least some aspect of essentially all CEQA impact areas – from state water pollution standards to habitat conservation laws to building codes to endangered species mandates, projects are always considered against a backdrop of state rules. In the ordinary course, the presence of state programs is not taken simply to "cover" the relevant project level impact. On the contrary, CEQA requires project proponents to inquire as to how the project affects environmental resources of statewide concern and to focus on project-level analysis and mitigation. The same rule applies with regard to greenhouse gases. As the California Supreme Court has held, "[l]ocal governments thus bear the primary burden of evaluating a land use project's impacts on greenhouse gas emissions."³

Project proponents may refer to statewide analyses and programs, but, as the Court held, ultimately must provide "substantial evidentiary support" explaining how project-level decisions relate to state-level programs to justify findings of significance based on those programs.⁴ This is particularly important for new projects, as, per the Court, "a greater degree of reduction may be needed from new projects than from the economy as a whole."⁵ And these projects may not simply point to *any* statewide regulations; on the contrary, "[a] significance analysis based on compliance with such statewide regulations ... only goes to impacts within the area governed by the regulations."⁶

In this instance, the Cap-and-Trade Program simply does not cover the project, or require it do anything to mitigate its emissions. As the Court explained, CARB has not "propose[d] statewide regulations of land use planning, but relies instead on local governments." (*Id.* at 230).

CARB has expressed its non-binding views on these matters via the Scoping Plans it is required to prepare under AB 32. The California Supreme Court has recognized the

CARB was not silent. Moreover, an inference from silence would be improper, in any event. CARB sometimes does not comment on individual projects' GHG or other analyses due to resource constraints and other considerations. Nothing should be inferred from silence on a particular matter.

³ *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 230).

⁴ *Id.* at 226-230.

⁵ *Id.* at 225.

⁶ *Id.* at 229.

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Scoping Plan as a valuable source of data for local governments.⁷ As each version of CARB's Scoping Plan, including the recent 2017 Scoping Plan Update, explains, on the basis of extensive modeling and analysis, the Cap-and-Trade Program is not intended to address project-level impacts and does not do so. Rather, complementary measures, including land-use planning and project-level analyses, are vital adjuncts to the Cap-and-Trade Program, serve additional purposes to address climate change, and, if neglected, put undue and unanticipated pressure on the Program. The RFEIR's analysis would thus make the problem it purports to analyze even worse; if followed generally, it would result in development patterns and mitigation choices that would lessen the state's ability to address climate change, and would contribute to cumulatively considerable impacts.

Rather than address project-level emissions, the Cap-and-Trade Program covers activities related to electricity generation, natural gas supply, oil and gas extraction, refining, and transportation fuel supply and combustion. The points of regulation are the operators of electricity generating plants, natural gas fuel suppliers, operators of oil and gas extraction facilities, refinery operators, and transportation fuel suppliers at the rack. See Tit. 17, Cal. Code Regs., § 95811. The Program also addresses GHG emissions in aggregate at the state level and is not intended nor designed to mitigate greenhouse gas from, or otherwise inform, local land use decisions. Without adequate analysis and mitigation, local jurisdictions may not appropriately consider the greenhouse gas implications of their decisions, conflicting with a core CEQA principle of promoting informed decisionmaking. Rather, demand for fuels and electricity created by poorly-planned local projects creates unnecessary demand on the Cap-and-Trade system, potentially raising prices in the system and making statewide compliance more difficult.

These impacts could be substantial because the transportation sector is the state's largest source of GHG emissions (as well as criteria and toxic pollutant emissions, as we have previously addressed with regard to this project). The recently released California Greenhouse Gas Emission Inventory – 2018 Edition shows that while the state's overall GHG emissions declined from 2015 to 2016, the emissions in the transportation sector increased 2 percent over that same time period.⁸ This increase was driven by increases in fuel purchases and use. To effectively achieve the State's GHG target, both production and demand for energy and fuels must be addressed. The

⁷ As the California Supreme Court has held "CEQA requires public agencies...to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Cleveland National Forest Foundation v. San Diego Ass'n of Governments* (2017) 3 Cal. 5th 497, 504.) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17))

⁸ See https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf.

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Legislature recognized this need with regard to electricity when passing SB 350 (Stats. 2015 Ch. 547, De León) to increase the Renewable Portfolio Standard and double energy savings. A similar approach is needed for transportation sector emissions. State-level production side policies such as the Renewable Portfolio Standard, Low Carbon Fuel Standard, and Cap-and-Trade Program cannot alone achieve the State's GHG reduction targets.

In this instance, the RFEIR not only improperly relies on the Cap-and-Trade Regulation; it also fails fully to address consistency with the local measures that *do* more clearly apply. There are a suite of potential emissions reduction strategies identified in the 2017 Scoping Plan aimed at reducing GHG emissions from on-road vehicle travel (e.g., fuel economy standards, technology advancements, SB 375⁹), and the majority of such emissions are not covered in any way by the Cap-and-Trade program.

The City chose not to analyze the project's consistency with the applicable Regional Transportation Plan (RTP), for example, which is subject to GHG emissions reduction targets set by CARB pursuant to SB 375. The City asserted that the RTP does not apply to this project (Table 4.7-11, page 4.7-41 of the RDEIR). We disagree, and suggest that a more appropriate analysis would be whether the project's GHG emissions from on-road transportation would be consistent with, or conflict with, assumptions in the applicable RTP found to comply with SB 375. The city might also refer to the additional nonbinding recommendations offered in CARB's Scoping Plan, though the application of these recommendations, if used, depend on the circumstances of a particular project.

We discuss these points in more detail below.

A. The Cap-and-Trade Regulation Was Never Designed to Achieve All Necessary GHG Reductions From Land Use and Logistics Planning.

The Cap-and-Trade Program was designed from the start as one of a diverse suite of measures, some statewide and some local, to move California toward achieving its GHG targets. To understand the Cap-and-Trade Program's purposes and limitations, the Scoping Plan provides helpful context. The Cap-and-Trade Program covers about 80 percent of all GHG emissions in California.¹⁰ Crucially, just because emissions are "covered" by Cap-and-Trade does not mean all of those emissions from any particular covered entity are mitigated or reduced. It simply means they are included in the cap.

⁹ SB 375 (Steinberg, Statutes of 2008).

¹⁰ Scoping Plan at ES16.

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Thirty-nine percent of California's GHG emissions come from the transportation sector, including logistics-related transportation (like the WLC would involve).¹¹ Another 19 percent of the state's GHG emissions comes from electricity generation.¹² In addition to Cap-and-Trade, the Scoping Plan includes various other CARB measures, some of which also address transportation and electricity sector emissions, including SB 350, the Low Carbon Fuel Standard, the Mobile Source Strategy, and the Sustainable Freight Action Plan. In addition to the other complementary Scoping Plan measures, the Scoping Plan also clearly states that "[l]ocal government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals."¹³

The RFEIR's GHG methodology departs from this science, and has enormous implications for other projects across the state: it would amount to a determination that massive logistics centers, sprawling far-flung residential developments, and other types of remote greenfield development need not do anything to address and mitigate their GHG emissions because those emissions are already "taken care of" by the Cap-and-Trade Program. This is simply not true.

B. The Cap-and-Trade Regulation Is Not Intended to Bear the Burden of Achieving the State's Transportation and Energy Sector GHG Goals Alone.

Cap-and-Trade is not intended to achieve California's climate goals on its own. Rather, Cap-and-Trade is designed to motivate behavior by capping and pricing carbon at the regulated entity level – that is, at the industrial facility and fuel/energy supplier level. It does not send a direct price signal to developers of land use or logistics projects. This means, if CEQA and other "checks" on unsustainable development are weakened as the WLC analysis proposes, such development would simply continue without direct cost to the developers, while adding market demand without mitigating the WLC's emissions.

Moreover, if land use development does not account for GHG emissions, more and more of our state's carbon "cap" would be taken up by increasing transportation emissions. Developers do not receive a price signal from Cap-and-Trade, meaning that there will be no clear incentive to alter this pattern, even as it impacts the Cap-and-Trade system. Thus, the prices of compliance instruments under the Cap-and-Trade Program would increase at a higher rate than was contemplated when CARB developed the Cap-and-Trade Program. This would eventually cause a greater cost burden than

¹¹ As noted above, transportation-related GHG emissions have increased, from 37% in 2015, to 39% in 2016. See CARB, *California Greenhouse Gas Emissions for 2000 to 2016, Trends of Emissions and Other Indicators* (July 2018) at 1 (available at https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf); see also Scoping Plan at ES1.

¹² Scoping Plan at ES1.

¹³ Scoping Plan at 99.; see also page 101.

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anticipated, and it would be borne by all Californians rather than dealt with during the project design phase. Properly-designed local policies, by contrast, may account for GHG emissions of development in a direct way—which furthers the equity objectives of AB 32, complements Cap-and-Trade, and better achieves California’s climate goals.

C. There Is No Substantial Evidence Showing that the Project’s Transportation and Electricity Related Emissions Would Actually Be Mitigated.

In the face of these substantial difficulties, the RFEIR does not articulate substantial evidence demonstrating a rational connection to the Cap-and-Trade Program – and that connection is badly attenuated, as we have explained. The project developer in this instance is claiming it may do nothing with regard to fuels and electricity, and will rely on reductions other entities may achieve. This is not the tight evidentiary connection required by the Supreme Court and by CEQA, and it is not consistent with the State’s GHG reduction programs.

The Final Statement of Reasons (FSOR) prepared when section 15064.4 of the CEQA guidelines, concerning GHGs, was promulgated demonstrates that to properly rely on subsection (b)(3), concerning compliance with statewide programs, a project must demonstrate *with evidence in the record* how the regulations of GHG emissions would actually address the emissions that result from the project. That document states:

Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. *Thus, for example, a subdivision project could not demonstrate consistency with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision.* (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)¹⁴

Here, there is no evidence in the RFEIR regarding who is responsible for complying with Cap-and-Trade for all the GHG emissions at issue in this case – and it certainly is not the project itself. The project is a logistics facility, with trucks involved in interstate commerce, and it is not covered by that Program. Indeed, there is no basis for the

¹⁴ See Natural Resources Agency, Final Statement of Reasons for Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009) at 27 (emphasis added).

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RFEIR's conclusion that the fuel for all of the vehicles serving the project would be covered under the Cap-and-Trade regulation, since it is not clear that all of these vehicles would even purchase their fuel in California.

D. The Project Fails to Account for the Duration of the Project Compared to the Duration of the Cap-and-Trade Program.

The RFEIR states the project's buildout year is 2035,¹⁵ yet the GHG analysis seems to stop after 2035. This raises multiple problems for the RFEIR analysis.

First, it is unclear why the analysis stops at buildout, when GHG emissions (and other environmental impacts) would continue into the indefinite future – at their highest levels – once full operations begin. Without further analysis throughout the project's anticipated life (which does not appear to be stated in the RFEIR but, presumably, would be at least 30 years after buildout), the analysis is incomplete and dramatically understates the project's GHG emissions. This also means the project would likely place a much higher burden on the Cap-and-Trade program than disclosed in the RFEIR – a burden that, as described above, is pushed onto all Californians instead of the project developer as a result of the project's failure to mitigate the vast majority of its GHG emissions.

Second, the RFEIR fails to account for, or even consider, the fact that the current Cap-and-Trade regulation extends only to 2030 – which is five years *before* the project's full buildout is achieved. This means that the RFEIR has no plan whatsoever to account for its GHG emissions once the project is fully built out. The RFEIR also does not address the inconsistency between the project's GHG emissions and Executive Order S-03-05, which, among other things, establishes a state GHG reduction target to reduce GHG emissions to 80 percent below 1990 levels by 2050.¹⁶ The California Supreme Court has emphasized the importance of California's GHG targets in selecting appropriate CEQA thresholds.¹⁷ Despite these considerations, there is no substantial evidence in the record to ensure that *any* of the project's post-buildout operational emissions are mitigated by the Cap-and-Trade program.

E. The Project Fails to Include a Backstop In Case Cap-and-Trade is Altered.

¹⁵ Revised FEIR at 3-1.

¹⁶ See Governor's Executive Order No. S-03-05 (June 1, 2005) (available at [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf)); see also Governor's Executive Order No. B-30-15 (April 29, 2015) (available at <https://www.gov.ca.gov/2015/04/29/news18938/>).

¹⁷ See *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497 at 516-519.

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In addition to its other evidentiary flaws, the RFEIR does not analyze how the analysis would change, and how the project's significant GHG impacts would be mitigated, if Cap-and-Trade were revised in a way that affects the state's GHG levels. In other words, the RFEIR's approach puts an almost complete reliance on the Cap-and-Trade Program in ways that, if adopted generally, would considerably affect the Program, and then fails to consider the possibility that the Program might change even as the Project continues to exist. This could include, for example, a scenario in which:

- The Cap-and-Trade program ceased to exist, or
- If the scope of the program were limited to exclude fuels and electricity, or
- If the Legislature or other factors required the program to be amended in a way that allows a higher cap.

Rather than anticipating any of these or other potential contingencies and building in an appropriate backstop to ensure the project's GHG emissions are mitigated below significance, the RFEIR instead blindly relies on the current Cap-and-Trade Program, with no further commitments or requirements. As a result, the RFEIR fails to provide substantial evidence supporting its conclusion that the project will result in less than significant GHG emissions, while forwarding an analysis that, if accepted, would make the state significantly less able to address climate change impacts resulting from its built infrastructure.

III. The RFEIR is Inconsistent with CEQA Requirements.

The RFEIR's multiple errors with regard to the Cap-and-Trade Program render it contrary with CEQA law. The RFEIR misapplies the key CEQA Guideline, section 15064.4(b), which provides in pertinent part:¹⁸

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 3. The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and

¹⁸ CEQA Guidelines § 15064.4(b) (emphasis added).

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must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. *If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Thus, the CEQA Guidelines focus on project-level compliance and project-level impacts. State programs are available for consideration, but they are not held out as a panacea, for GHGs any more than for any other resource area.

Yet, the RFEIR relies upon subsection (b)(3) of this provision to claim that emissions which are indirectly included under the “cap” created by the Cap-and-Trade Program (referred to in the RFEIR as “capped emissions”) need not be analyzed and mitigated under CEQA. This approach would excuse all of the WLC’s transportation and electricity related emissions, leaving the project only “on the hook” for analyzing and mitigating a tiny fraction of its emissions. The following sections explain why this approach is legally and factually flawed.

A. Subsection (b)(3) Itself Does Not Allow The Approach Used in the Revised Final EIR.

As noted above, subsection (b)(3) of CEQA Guidelines section 15064.4 can be used as a factor to assess GHG significance when “*the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions...*” Here, the RFEIR concedes that the project is not subject to the Cap-and-Trade Regulation.¹⁹ This in itself should be sufficient to demonstrate that subsection (b)(3) is inapplicable to the project, as “the project” does not “comply” with Cap-and-Trade at all.

B. The RFEIR’s Hybrid Approach Used To Determine Significance Is Not Allowed.

In addition to improperly relying on subsection (b)(3), as described above, the RFEIR improperly attempts to create a “hybrid” significance scheme based on selectively combining subsection (b)(3) with the South Coast Air Quality Management District’s (SCAQMD) bright-line threshold. As explained in the RFEIR, a potentially appropriate significance threshold in this case is the SCAQMD’s 10,000 metric ton threshold.²⁰ The problem here is that the RFEIR does not compare the project’s GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Rather, the RFEIR simply subtracts from its emissions quantifications any GHG emissions that it deems to be “capped,” and compares only the net “non-capped” emissions against the bright-line threshold.

¹⁹ See page 4.7-4.

²⁰ RFEIR at 4.7-21.

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This approach is unsupported in law. Regardless of which threshold applies, CEQA requires lead agencies to “make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project.”²¹ CEQA then provides that the lead agency must consider “whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project.”²² Thus, even if subsection (b)(3) properly applied here (which it does not, as explained above), nothing in the CEQA Guidelines allows this hybrid approach of cherry-picking what emissions are applied to an otherwise-applicable bright-line threshold. The City has not even attempted to satisfy its burden of providing such substantial evidence. As noted elsewhere in this letter, Cap-and-Trade does not result in ton-for-ton mitigation of each metric ton covered by the program. Rather, it is a declining market-wide cap designed to achieve certain statewide goals – which, as explained elsewhere in this document, is not designed to mitigate all GHG emissions from land use and logistics facilities.

Because the REFIR fails to properly apply the vast majority of the project’s GHG emissions to the applicable bright-line significance threshold, it also fails to mitigate those emissions, as it simply dismisses them as “less than significant”. If the full scope of the GHG emissions attributable to the project were compared to the applicable bright-line threshold, the mitigated emissions would still be substantially over the threshold. CEQA requires that the project’s significant GHG emissions must be mitigated to the extent feasible. Additional mitigation measures are available to further reduce the project’s GHG emissions that were not considered due to the inappropriate exclusion of the majority of project-generated emissions from the analysis.

C. Reliance Upon *AIR v. Kern County* Is Improper.

While the RFEIR provides little support for the GHG significance approach it takes, the briefing for *Paulek* further explains the reasoning behind the project’s GHG analysis. In those briefs, attorneys for the developer claim that an unrelated appellate ruling, the *AIR v. Kern County* decision²³ is relevant. That decision concerned CEQA analyses for sources actually covered by the Cap-and-Trade Regulation, but the claim is that it somehow applies not only to GHGs from projects that are directly subject to the Cap-and-Trade Regulation, but also to all transportation and electricity related GHG

²¹ CEQA Guidelines § 15064.4(a).

²² CEQA Guidelines § 15064.4(b)(2).

²³ *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal. App. 5th 708. In CARB’s view this case was wrongly decided as to the Cap-and-Trade issue, and it is certainly not apposite in this very different context.

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emissions, the logic being that those emissions are technically included in the statewide "cap" on emissions. This is incorrect factually, for all the reasons discussed above.

It is also not a controlling case legally. The holding in *AIR v. Kern County* addressed whether it "is appropriate for a lead agency to conclude a *project compliance* [sic] with the cap-and-trade program provides a sufficient basis for determining the impact of the project's greenhouse gas emissions will be less than significant."²⁴ The project at issue in that case was a refinery that was directly subject to the Cap-and-Trade Regulation. The court did not address the broader question of whether *all* GHG emissions from resources that are indirectly covered by Cap-and-Trade, at some undefined upstream point, may be cast aside as less than significant. Here, as noted above, the WLC is *not* subject to the Cap-and-Trade regulation. It therefore does not "comply" with the Cap-and-Trade program, and is distinguishable from the project at issue in *AIR v. Kern County*.

C. Reliance Upon Obscure 2013 Negative Declarations and a Policy Document from Another District Is Similarly Uncompelling.

The RFEIR itself also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations,²⁵ and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD) titled Policy APR-2025. The RFEIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a 2014 policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. Furthermore, the primary SJVAPCD guidance documents regarding analyzing and mitigating GHG emissions under CEQA make no mention of Policy APR-2025, including the guidance documents relied upon in the *AIR v. Kern County* decision.²⁶

To the extent the RFEIR is considering what other air districts have done, it is worth noting that the California Air Pollution Control Officers' Association (CAPCOA) has considered a range of potential CEQA significance thresholds, none of which summarily

²⁴ *AIR v. Kern County* at 743 (emphasis added).

²⁵ The Revised FEIR only cryptically references these MNDs, without citations or links to the documents, and without any other information explaining the basis for their CEQA significance approach. The RFEIR's failure to include or adequately reference these mitigated negative declarations hampers the public's ability to review and comment on the RFEIR.

²⁶ See, e.g., *AIR v. Kern County* at 743-744; see also http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf; <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>.

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exclude emissions that are indirectly included within the Cap-and-Trade program.²⁷ While that document was generated in 2008, it makes multiple references to the Cap-and-Trade program, and does not endorse simply subtracting all so-called “capped emissions” from GHG analyses.

D. Even If CEQA Guideline 15064.4(b)(3) Applied Here, The RFEIR Ignores Other Requirements in the CEQA Guidelines.

The sections above provide in-depth analysis regarding why subsection (b)(3) of CEQA Guideline 15064.4 does not allow this project to simply disregard the vast majority of its GHG emissions. Even if that subsection did apply, there are other deficiencies in the RFEIR’s GHG analysis that must be addressed.

First, the CEQA Guidelines make clear that an agency cannot focus solely on a single significance consideration while ignoring other evidence or indicators showing potentially significant impacts. For example:

- Section 15064.4(b) states that “[a] lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment.”
- Section 15064.4(b)(3) provides in pertinent part: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.”
- Section 15064(h)(3) provides: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding that the project complies with the specified plan or mitigation program addressing the cumulative problem, an EIR must be prepared for the project.”

As discussed in depth above, there is evidence in this record showing significant GHG impacts that were not analyzed or mitigated in the RFEIR. CEQA does not allow these impacts to be overlooked, even if the lead agency believes the project’s GHG emissions would be less than significant under one particular (and here, improper) significance metric.

IV. Criteria Pollutants and Toxic Emissions Must Still Be Considered

In its 2013 and 2015 comment letters, CARB noted its substantial concerns regarding the project’s air pollutant and toxics emissions, and suggested several feasible means of reducing the significant impacts from those emissions. These emissions raise

²⁷ See CAPCOA, CEQA & Climate Change (January 2008). Available at <http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf>.

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substantial local exposure and environmental justice concerns, as Moreno Valley already suffers from very substantial air pollution exposures. These exposures would likely be worsened without appropriate mitigation measures.²⁸ CARB incorporates the comments from those letters into this letter by reference, and strongly recommends that the RFEIR be revised to incorporate all mitigation recommended in its 2013 and 2015 comment letters.

V. Conclusion

While the WLC has enormous GHG implications in itself, the attention this project has received, and the recent legal developments in the emerging *AIR v. Kern County* and *Paulek* line of cases, demonstrate that the City's decisions in the RFEIR have implications beyond the WLC project as well. The City should revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, and adopt feasible mitigation to ensure those emissions would not cause significant impacts, as required by CEQA.

Sincerely,



Richard W. Corey
Executive Officer

²⁸ On these issues of acute local exposure, especially to roadway emissions, and the importance of fully addressing these sources of risk, see Ann Carlson, *The Clean Air Act's Blind Spot: Microclimates and Hotspot Pollution* (2018) 65 UCLA L. Rev. 1036.

EXHIBIT C



Gavin Newsom, Governor
 Jared Blumenfeld, CalEPA Secretary
 Mary D. Nichols, Chair

January 30, 2020

Albert Armijo, Interim Planning Manager
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Re: World Logistics Center Draft Recirculated Revised Sections of the Final Environmental Impact Report (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR) for the World Logistics Center (WLC or Project). CARB appreciates the opportunity to comment on the RRSFEIR, and raises two primary issues with the RRSFEIR in this letter.

1. The RRSFEIR contains the same flawed GHG analysis as the RFEIR.

CARB previously reviewed the City's July 2018 Revised Final Environmental Impact Report (RFEIR), and submitted comments regarding the RFEIR on September 7, 2018. As noted in that comment letter, CARB believes the RFEIR's analysis of greenhouse gas (GHG) related impacts does not meet California Environmental Quality Act (CEQA) requirements, as it relies almost entirely on mischaracterizations to reach its less-than-significant impact determination.

Unfortunately, the flaws described in CARB's September 7, 2018 comment letter remain in the RRSFEIR, which continues to rely upon mischaracterizations regarding California's Cap-and-Trade Program to dismiss any serious analysis or mitigation of the Project's GHG emissions. Therefore, as part of its comments on the current draft RRSFEIR, CARB re-submits its September 7, 2018 comment letter (attached to this letter) in its entirety. CARB directs its comments toward both the direct and cumulative impact analysis sections in the RRSFEIR.

2. The RRSFEIR does not include the new GHG mitigation measures it references.

The RRSFEIR includes passing references to new GHG-related mitigation measures, particularly measures 4.7.6.1E-1 and 4.7.6.1E-2 (see pages 4.7-20, 6.7-14, and 6.7-20). However, it appears the measures themselves have not been included in the RRSFEIR. Without the ability to review the mitigation measures relied upon by the City in reaching its significance determinations, the public has no way to evaluate the effectiveness of those measures, thwarting CEQA's public disclosure purpose.

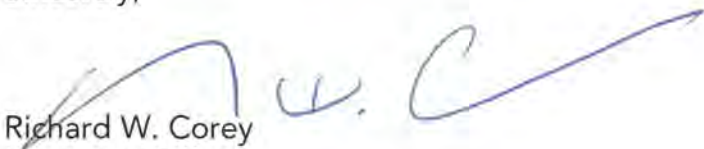
Mr. Albert Armijo
January 30, 2020
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Conclusion

Both this comment letter and CARB's September 7, 2018 comment letter set forth substantial deficiencies in the environmental analysis prepared for the WLC project. Given these deficiencies, the City should revise the RRSFEIR to include adequate analysis and mitigation regarding all of the Project's environmental impacts, including GHG, air quality, and cumulative impacts. The City should then re-circulate the document for public review to allow the public to review and comment on the City's revised proposal.

Thank you for your consideration. As always, we welcome any questions from the City regarding ways to adequately analyze and mitigate the Project's GHG emissions.

Sincerely,


Richard W. Corey
Executive Officer

Enclosure: CARB's September 7, 2018 comment letter regarding the WLC RFEIR.

EXHIBIT D

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FOURTH APPELLATE DISTRICT, DIVISION TWO

ALBERT THOMAS PAULEK, et al.,

Plaintiffs and Respondents,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Appellants.

HF PROPERTIES, et al.,

Real Parties in Interest and Appellants.

Case No. E071184
(Riverside Cty.
Super. Ct. No.
RIC1510967 MF,
RIC1511279, RIC1511327,
RIC1511421, &
RIC1511195)

**LABORERS INTERNATIONAL UNION OF
NORTH AMERICA, LOCAL 1184, et al.,**

Plaintiffs and Appellants,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Respondents.

HF PROPERTIES, et al.,

Real Parties in Interest and Respondents.

(Riverside Cty. Super. Ct.
No. RIC 1511279 &
RIC1511327)

Riverside County Superior Court
The Honorable Sharon J. Waters, Judge

**BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE
CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS
AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND
PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION
OF NORTH AMERICA, LOCAL 1184, ET AL.**

Counsel listed on next page

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Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

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INTRODUCTION

The massive World Logistics Center (Project) will cause approximately 70,000 daily truck trips transporting goods from the ports of Long Beach and Los Angeles to Moreno Valley. (AR 003039, 058605–06.) These vehicle trips will emit hundreds of thousands of metric tons of greenhouse gas (GHG) emissions every year over the life of the Project. (AR 002729.) These GHG emissions, along with emissions from electricity needed to power the more than 40-million-square-foot project, will add to the existing climate pollutant problem, accumulating in the atmosphere and persisting for decades or longer.

Rather than analyzing and mitigating the Project’s emissions, lead agency Respondents Moreno Valley Community Services District, *et al.* (Respondents) shirk their responsibility as a local government to address climate change. They improperly rely on CARB’s statewide Cap-and-Trade climate program (Cap-and-Trade Program), which does not impose any regulatory requirements on this Project, as an excuse not to analyze and mitigate the Project’s climate change impacts. Respondents improperly ignore roughly 95% of the GHG emissions from the Project (AR 002718–19), disregarding the significance of those emissions, avoiding their duty to adopt all feasible mitigation measures, and failing to properly disclose their responsibility for this pollution to the public.

Respondents’ approach mischaracterizes the way state climate policies work and violates the California Environmental Quality Act (CEQA). CEQA directs that Respondents take “all action necessary” to protect the environment, recognizing the importance of local action driven through “meaningful” consideration of environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21002, 21002.1.) CEQA does not allow Respondents to waive their CEQA obligations by pointing to a regulation that does not bind them (Cal. Code Regs., tit. 14, § 15000 et seq. (CEQA

Guidelines), § 15064.4), and Respondents wholly misconstrue the regulatory scheme they seek to use.

Although Respondents claim their approach is consistent with state climate policy, it is not. (See Plaintiffs/Appellants’ Supplemental Request Regarding Judicial Notice, Exhibit 1, California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) (2017 Scoping Plan) at pp. 19 [“Local actions are critical for implementation of California’s ambitious climate agenda”], 97–99 [more extensive discussion about the need for local action to achieve California’s climate goals]; see also Health & Saf. Code, §§ 38502, subd. (h) [identifying competing priorities to balance in emissions reductions], 38592 [nothing in this division relieves any person, entity, or agency of compliance with other law], 38690 [identifying overlapping automobile emissions policy].) Respondents’ approach has been repudiated by CARB, the Attorney General’s Office, and the Natural Resources Agency, as contrary to critical state climate goals. The state has long—and expressly—relied on a portfolio of climate change measures, including significant efforts by local governments, to address emissions that result from their land use decisions.

Respondents rely on the Cap-and-Trade Program to excuse their obligation to make better land use decisions. Cap-and-Trade is not intended as a stand-alone climate policy; instead, it assumes steady efforts to reduce emissions across the state. While Cap-and-Trade has an important role to play in limiting emissions from entities like power plants and refineries, the Program does not cover a host of other sources, including warehouses. Although the Program creates financial and legal obligations on fuel suppliers and electricity generators that may ultimately supply this Project, the Project experiences neither the direct legal requirements of the Program nor the full economic costs associated with its additional emissions. If projects were allowed to evade responsibility in

this way, they would steadily increase Cap-and-Trade Program costs upstream, while locking the state into ever-more expensive and inappropriate high-emitting development patterns. This is a recipe for failure in achieving the state’s climate goals. To avoid this scenario, the state relies on local governments to limit emissions from new development projects. Emissions from such projects are the responsibility of local governments and should be mitigated through the proper application of CEQA. Eliminating this crucial piece of the state’s portfolio approach undermines the state’s climate goals.

We have arrived at a crossroads for the future of GHG analysis under CEQA. If Respondents prevail, this case could singlehandedly undo the will of the Legislature by excusing essentially all projects from the obligation to consider GHG impacts from vehicle trips and energy use. This Court should reject Respondents’ argument and confirm that all lead agencies must do their part if we are to meet the state’s long-term climate stabilization objective.

STATEMENT OF INTERESTS

I. INTEREST OF THE ATTORNEY GENERAL

California has already begun to experience significant adverse impacts from climate change such as “more frequent, more catastrophic and more costly” wildfires, drought, “coastal erosion, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.” (2017 Scoping Plan at p. ES2.) As California’s chief law enforcement officer, the Attorney General has the independent power and duty to protect the interest of all of California’s current and future residents in a clean, health, and safe environment. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 15.)

Upholding this duty, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change for well over a decade. (See, e.g., *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”]; *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465; *People v. County of San Bernardino* (San Bernardino County 2007) No. CIVSS0700329.)

The World Logistics Center, like every large development project, has the potential to either facilitate or hinder the state’s achievement of its climate goals. Here, Respondents’ unsupported approach to analyzing the Project’s GHG emissions has the potential to seriously undermine the overall effort to meet the state’s science-based GHG reduction goals for the transportation and land use sectors and to disproportionately affect environmental justice communities.¹ Given these significant interests, the Attorney General submits this amicus brief in support of Appellants,² in compliance with rule 8.200(c)(7) of the California Rules of Court in his independent capacity and on behalf of the California Air Resources Board (CARB).

¹ The Attorney General opposed this methodology in a comment letter it submitted on the revised sections of the Final EIR for this Project (Revised Final EIR or RFEIR). (Letter re: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project, Sept. 7, 2018, at:

<<https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/comments-revised-sections-feir.pdf?>>.) The Revised Final EIR is not at issue in this litigation, but it includes the original EIR’s same flawed GHG analysis.

² This brief is submitted in support of Plaintiffs and Respondents Albert Thomas Paulek, et al. and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, et al.

II. INTEREST OF THE CALIFORNIA AIR RESOURCES BOARD

CARB has a strong interest in participating in this case as amicus curiae. CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. As creator and administrator of the Cap-and-Trade Program, and as the lead agency on the Scoping Plan setting out many of the state’s climate policies, CARB is an expert on how the Cap-and-Trade Program was designed to function and interact with other state laws and programs as part of California’s portfolio approach to addressing GHG emissions. In their briefing, Respondents misrepresent CARB as effectively endorsing the EIR’s approach to GHG analysis. (Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 17, 36–38, 47–48, 56, 63.) But CARB has repeatedly made clear it does *not* support Respondents’ approach.³ As explained more fully below, Respondents’ arguments regarding GHG analysis are contrary to the construction given to applicable regulations by CARB, and by the Natural Resources Agency, agencies charged with interpreting and enforcing the programs at issue.

BACKGROUND

I. LEGAL BACKGROUND REGARDING CALIFORNIA’S EFFORTS TO COMBAT CLIMATE CHANGE

In 2006, recognizing the importance of combatting climate change and furthering the objectives of Executive Order S-3-05, the Legislature enacted the Global Warming Solutions Act of 2006, commonly known as

³ CARB also explained this approach when it formally opposed the GHG analysis Respondents rely on here through its comments on the RFEIR for this Project. (Letter re: World Logistics Center Revised Final Environmental Impact Report, Sept. 7, 2018, at: <https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.236813640.855160185.1575908432-1460774677.1564163003>.)

AB 32. (Health & Saf. Code, § 38500, et seq.) AB 32 mandates that, by 2020, California must reduce its total statewide annual GHG emissions to the level they were in 1990, and to 40 percent below that level by 2030. (Health & Saf. Code, §§ 38550, 38566.) This mandate puts the state on a trajectory of significant and continuous GHG emissions reductions through 2050, in order to stabilize the atmospheric levels of GHGs and reduce the risk of dangerous climate change.

Under AB 32, the Legislature tasked CARB with preparing a guidance planning document, known as the Scoping Plan that, while not binding, set out the state's views based on extensive environmental and economic analyses on how policies may be effectively implemented so that California will meet the its ambitious GHG reduction goals. (See Health & Saf. Code, §§ 38561 et seq.) The Scoping Plan emphasizes the need for a multi-pronged emissions reduction approach that can be carried out by many entities and reflects the state's position that it is necessary to reduce emissions at the source and through reductions in demand for energy. (2017 Scoping Plan, pp. 12, 19, 28).

The Scoping Plan includes a suite of regulations, measures, and policies designed to operate together to reduce GHG emissions. The Cap-and-Trade Program is one such policy. Entities that are directly subject to the Cap-and-Trade Program—like power plants, factories, refineries, and electricity generators and importers—must purchase and surrender compliance instruments (e.g., allowances) for their emissions. (See Cal. Code Regs., tit. 17, § 95812.) Downstream emitters such as cars and trucks, much less warehouses that such cars and trucks drive to, are not covered entities under Cap-and-Trade and have no such obligation to purchase or surrender allowances. The existence of the Program, in other words, does not obviate the need for action at other levels of the economy. On the contrary: If sources like the long-lasting development project in this

case build without regard to their emissions, they will increase overall state emissions and hence increase pressure and costs within the Cap-and-Trade Program.

To address the wide range of GHG emissions sources that are not directly controlled through the Cap-and-Trade Program, the state relies on other policies⁴—many of which require collaboration between the state and local governments. Agencies large and small across the state (including, crucially, cities and counties) are responsible for ensuring that proposed new land use plans, transportation projects, and development projects are consistent with evolving scientific knowledge and state regulatory schemes; CEQA is a critical tool for implementing these obligations.⁵ (See *SANDAG, supra*, 3 Cal.5th at p. 519; see also CEQA Guidelines, § 15064.4, subd. (b).)

The Scoping Plan makes clear that the Cap-and-Trade Program was *not* designed to replace local governments’ long-term planning obligations, but rather designed to work in concert with those policies to achieve the

⁴ See, e.g., Health & Saf. Code, §§ 38561, subd. (e) (requiring CARB to consider “the relative contribution of each source or source category to statewide greenhouse gas emissions”), 43018.5, subd. (a) (requiring CARB to “adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles”).

⁵ For example, CARB provides regional emission reduction targets for local jurisdictions’ land use and transportation planning obligations under Senate Bill (SB) 375. (See Health & Saf. Code, § 65080, subd. (b)(2)(A) [known as “The Sustainable Communities and Climate Protection Act”].) CARB also works with regional air pollution control districts and air quality management districts to address emission sources that have both local and global effect, including methane from landfills and hydrofluorocarbons (HFCs), as well as to support state- and federally-mandated permitting of certain industrial sources of GHG emissions. (See California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) pp. 3, 104 <https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf >.)

state’s goals. (2017 Scoping Plan at p. 102 [“California’s future climate strategy will require increased focus on integrated land use planning”].)

Recent state reports have shown that California’s vehicular GHG emissions continue to increase year after year, and CARB has emphasized the need for local action. (See California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) These increasing emissions demonstrate the crucial need for *more* complementary local action—not less—to ensure the state meets its GHG targets in cost-effective ways.

In light of the state’s GHG reduction policies, and CEQA’s focus on embedding environmental considerations in local decision-making, the Supreme Court has emphasized that careful CEQA analysis of GHG impacts will be required going forward, as lead agencies must “stay in step” with the evolving science and law related to the state’s long-term climate objectives in order to carry out their duties under CEQA. (*SANDAG, supra*, 3 Cal.5th at p. 519.)

II. OVERVIEW OF THE GHG ANALYSIS IN RESPONDENTS’ EIR

Mischaracterizing the collaborative efforts required to combat climate change and the role of the Cap-and-Trade Program, Respondents’ EIR takes a very unusual and troubling approach to addressing the Project’s GHG-related impacts.⁶ Respondents divide the Project’s GHG emissions into two categories, which the EIR terms “capped” and “uncapped.” (AR 002719.) What the EIR deems “uncapped” emissions constitute only about 4.6% of the Project’s emissions. (*Ibid.*) The “uncapped” category includes comparatively minor landfill emissions caused by waste generated at the

⁶ The Attorney General and CARB only address Respondents’ inappropriate use of the Cap-and-Trade Program in the GHG analysis of the EIR. This amicus brief is not intended to and should not be construed as an exhaustive discussion of the EIR’s compliance with CEQA.

Project and the use of refrigerants at the Project. (*Ibid.*) For these emissions, the EIR follows the approach that would be expected under CEQA: the City of Moreno Valley, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHG emissions as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold. (AR 002719, AR 002729.)

What the EIR terms “capped” emissions, however, constitute the remaining 95.4% of the Project’s predicted emissions. (AR 002719.) Those include emissions caused by mobile sources (namely, diesel trucks), as well as natural gas and electricity use at the Project. (*Ibid.*) For these emissions, the EIR deviates dramatically from standard CEQA methodology. The EIR asserts these emissions are “covered” by Cap-and-Trade and therefore wholly exempt from any further CEQA analysis or mitigation. (AR 002723.) The EIR does *not* compare the Project’s “capped” emissions to the 10,000 metric ton threshold. (AR 002725.) Indeed, after mitigation measures are applied to the Project, the “capped” emissions remain nearly 40 times greater than the significance threshold. (AR 002729.) In forgoing any attempt to decrease the Project’s true total emissions to a less-than-significant level, Respondents fail to consider further mitigation measures that could have made this Project more compatible with the state’s climate goals. As described below, this approach is unlawful.

ARGUMENT

Respondents avoid disclosing and addressing mitigation for thousands of tons of GHG emissions each year pursuant to the misguided theory that those emissions are addressed by Cap-and-Trade. This argument is founded on misunderstandings of both the Cap-and-Trade Program and

CEQA—both of which require different industries and projects to take responsibility for their own impacts, rather than rely on others for mitigation. Most fundamentally, warehouse projects like the Project are not subject to Cap-and-Trade. Respondents therefore cannot accurately assert that “compliance” with Cap-and-Trade provides any legal basis to avoid analyzing and adequately mitigating the majority of the Project’s emissions.

The CEQA Guidelines allow projects to consider regulations “[with] which the project complies” for purposes of considering significance of GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3).) However, that consideration does not apply here and Respondents’ approach, which in effect relies on other entities to undertake Respondents’ CEQA mitigation, not only violates both CEQA’s legal requirements and public disclosure and mitigation purposes, but also undermines the state climate objectives Cap-and-Trade is intended to further. Cap-and-Trade is designed to act in tandem with—not in spite of—critical tools like local land use planning to reduce GHG emissions. If allowed for Respondents and adopted by other local jurisdictions, such abdication by local governments would dramatically hinder the state’s ability to achieve its legislatively mandated long-term climate stabilization objectives and forgo pollution reduction co-benefits from GHG mitigation measures that are vital for environmental justice communities.

The Resources Agency agrees with CARB that “to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project.” (See California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009),

<http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf>, at p. 27.)

I. WAREHOUSE AND LOGISTICS PROJECTS ARE NOT REGULATED BY CAP-AND-TRADE AND THEIR EMISSIONS MUST STILL BE MITIGATED BY LOCAL GOVERNMENTS

Warehouse and logistics complexes are not regulated by Cap-and-Trade. The Cap-and-Trade Program thus provides no legal or policy basis for Respondents to avoid their obligation to evaluate and mitigate GHG emissions. Cap-and-Trade applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for” such allowances. (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) Respondents seek to use Cap-and-Trade to zero-out and excuse the application of feasible mitigation measures to over 95% of all GHG emissions from the Project. Cap-and-Trade applies only to expressly identified entities (“covered entities”) such as cement producers, petroleum refiners, electricity generators, natural gas suppliers, fuel importers, and liquid petroleum gas suppliers. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities. Cap-and-Trade compliance instruments do not factor in *whatsoever* because this Project is not covered by Cap-and-Trade.

The mere fact that warehouse and logistics complexes are in the chain of commerce with covered entities does not transform them into covered entities themselves. As an example, although the operator of a refinery that produces gasoline in California is subject to Cap-and-Trade, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing the refinery’s own GHG emissions or surrendering allowances, but the gas station that resells the gas, the truck drivers who purchase it, and

the warehouses to which the trucks drive do not have compliance obligations. Under the state's portfolio approach, while the refinery may have met some or all of its climate obligations via Cap-and-Trade, the downstream entities have not. Because warehouses receive no set price or regulatory signals from Cap-and-Trade, they are not being directly incentivized to reduce emissions. Instead, other components of the state's portfolio address those emissions. Nothing in Cap-and-Trade explicitly or impliedly repealed the use of other measures to address climate change; they were designed to work together. (See, e.g., 2017 Scoping Plan at p. 28.) Local governments must responsibly plan new development to further the state's climate goals.

II. ALLOWING RESPONDENTS' UNTENABLE APPROACH TO GHG ANALYSIS WOULD HAVE SIGNIFICANT, NEGATIVE STATEWIDE CONSEQUENCES

If Respondents' approach to GHG analysis is endorsed, other lead agencies will undoubtedly follow this approach, and emissions from the transportation and land use sectors will be largely omitted from analysis and mitigation under CEQA. Widespread adoption of this approach would: (1) place the entire burden of California's well-established, long-term land-use related GHG reduction goals on Cap-and-Trade, thereby straining the program beyond its intended purpose and (2) expose already burdened communities in the state to greater amounts of GHG emissions and co-pollutants that accompany GHG emissions, such as diesel particulate matter and nitrogen oxides.

A. Respondents' GHG analysis undermines California's GHG reduction goals

As explained above, the Cap-and-Trade Program is just one part of a suite of complementary measures designed to achieve California's ambitious GHG reduction and climate stabilization objectives. Cap-and-

Trade provides no legal basis for Respondents to avoid local governments' obligations as lead agencies under CEQA to evaluate and mitigate GHG emissions from a project that the Cap-and-Trade Program does not even cover.

While any one policy may be insufficient or at risk of circumvention, the suite of policies work in concert toward the state's goals.^{7,8} This overlap is by design, and makes the suite of policies more resilient to changed circumstances, enforcement problems, and legal challenges. The upstream Cap-and-Trade Program thus works in tandem with downstream choices, including planning choices, to ensure both that total emissions decline and that projects throughout the state are designed to avoid putting undue upstream pressure on emissions or control costs. Weakening one policy because another policy might address it runs contrary to this approach.

⁷ See 2017 Scoping Plan, *supra*, pp. ES7–8, 10, 22, 97; cf. Elinor Ostrom, A Polycentric Approach for Coping with Climate Change (2014) 15 *Annals Econ. & Fin.* 97, 123 <<https://perma.cc/YSF4-B7N8>> (Nobel laureate describing an ideal policy approach to climate change as “Complex, Multi-Level Systems to Cope with a Complex, Multi-Level Problem”); Amir Bazaz, et al., *Global Covenant of Mayors, Summary for Urban Policymakers: What the IPCC Special Report on Global Warming of 1.5.°C Means for Cities* (Dec. 2018) pp. 22–23 <<https://perma.cc/R37B-3WDD>> (identifying interaction between sources of governance and importance of incentives beyond financial consequences at the community level).

⁸ Complementary measures are also important in light of the risk to any one measure posed by litigation. Private parties and the federal government have challenged California's GHG reduction policies, including aspects of the Cap-and-Trade Program. California's GHG vehicle emissions regulatory authority is currently also under challenge. The wisdom of the portfolio approach endorsed by the Scoping Plan is to ensure that the state's efforts continue via many channels, rather than relying on any one potentially challenged measure.

If other lead agencies adopt Respondents' approach to GHG analysis under CEQA, their development projects would produce millions of metric tons of GHG emissions that would go unmitigated through what amounts to an unauthorized categorical exemption from CEQA. The economic analyses and feasibility of achieving the state's legislatively mandated goals in the Scoping Plan account for all policies working in tandem. If any one policy fails to deliver reductions, this would put strain on the Cap-and-Trade Program to deliver more reductions than anticipated and at higher costs.

Respondents' failure to account for the significance of the Project's GHG emissions from transportation is particularly troubling in light of the fact that the transportation sector accounts for over 35% of the state's total GHG emissions and these emissions continue to rise. (2017 Scoping Plan, *supra*, pp. ES1, 11 [charts of emissions by source]; see also California Air Resources Board, 2018 Progress Report: California's Sustainable Communities and Climate Protection Act (November 2018) at 4.) As the California Supreme Court noted, "transportation emissions are affected by the location and density of residential and commercial development, the Scoping Plan does not propose statewide regulation of land use planning but *relies instead on local governments.*" (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 230; emphasis added.) Local governments thus play a unique role in decreasing GHG emissions from the transportation sector.

Respondents contend that because statewide emissions are capped under the Cap-and-Trade Program, the amount of emissions from "capped" sources will be the same with or without their Project, but this claim ignores both their obligations under CEQA to disclose and mitigate their emissions and the intended design of the Cap-and-Trade Program. (See

Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 48–49.)

Cap-and-Trade is not a program designed to reduce emissions from local government actions, or land use; instead, it was designed on the assumption that local actors would simultaneously work to reduce emissions within their spheres. Cap-and-Trade alone was designed to account for less than 40% of the total emissions reductions needed to achieve California’s 2030 climate goals, and on the explicit assumption that local design choices would continue to reduce overall emissions (and hence economy-wide costs in the Cap-and-Trade Program). (2017 Scoping Plan at p. 28.) Indeed, relying entirely on the Cap-and-Trade Program to address land use would produce a mismatch that would strain the Program by functionally increasing demand for emissions reductions as unregulated entities displace their obligations onto the Program rather than taking action themselves, raising compliance costs for covered entities across all sectors and all consumers across the state at all income levels. California’s portfolio approach was designed to meet AB 32’s requirement that “greenhouse gas emissions reduction activities . . . adopted and implemented by [CARB] are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.” (Cal. Health & Saf. Code, § 38561.) By taking a portfolio approach, the state has recognized that taking GHG action in specific sectors ensures that we achieve our broader climate and energy demand reduction goals. (See 2017 Scoping Plan at pp. 2, 24, 100 [describing Governor Brown’s five key climate change strategy “pillars”].) Ultimately, cost increases could make the Cap-and-Trade Program less effective as a key part of the suite of California’s climate policies.

In sum, Respondents’ position is fundamentally inconsistent with the state’s approach to climate change, and so disregards significant emissions

that should properly be addressed under CEQA, not an unrelated emissions program like Cap-and-Trade. Moreover, Respondents' approach would allow similar emissions from other projects that would follow its lead. (See Part III(A), *infra.*) The majority of land use projects are, like this Project, not covered by the Cap-and-Trade Program. Freight alone is an enormous industry; over 1.5 billion tons of freight were moved in California during 2015. (*Id.* at p. 73.) And other types of projects such as residential developments or agricultural enterprises may seek to invoke precedent created by this case. Thus, even if the Project standing alone does not excessively strain the Cap-and-Trade system, the collective weight of new projects failing to address GHG emissions in the CEQA process would.

B. Respondents' GHG analysis prevents co-pollutant reduction measures necessary to protect California's environmental justice communities

Permitting massive land development projects without requiring the necessary mitigation measures to decrease project emissions will also harm California's environmental justice communities—those already suffering from the worst environmental pollution in the state. The census tract the Project will be built in is ranked in the 75th to 80th percentile of census tracts in California in terms of greatest pollution burden indicators and health and vulnerability factors for population characteristic indicators. (CalEnviroScreen 3.0 for Census Tract 6065042624, Office of Environmental Health Hazard Assessment, last visited November 27, 2019 <<https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>>.) Even without the Project, residents of this census tract already experience ozone, the main ingredient of smog, at a rate higher than 98% of the rest of California. (*Ibid.*) Relatedly, these residents also experience cardiovascular disease, which can result from exposure to air pollution, at a rate higher than 95% of the state. (*Ibid.*)

Considering additional mitigation properly may have resulted in additional zero-emissions technologies used for the Project, including, perhaps, from its trucks, as many commenters recommended. If such measures are not considered from this Project and other future projects like it are not mitigated, Moreno Valley and communities throughout the state will likely continue to suffer from worse air pollution. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL’Y REV. 377, 387 [“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant reductions as GHGs are being reduced [which] should improve the health of local communities.”]; see also Scoping Plan at p. 74 [“Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions . . . , low income communities, and communities of color.”].)

III. RESPONDENTS’ EIR VIOLATES CEQA

As explained above, the EIR’s approach to GHG analysis misrepresents the Cap-and-Trade Program and the Project’s place in that scheme. As a result, the EIR takes an unsupportable approach to evaluating the significance of GHG emissions from the Project. Contrary to CEQA’s focus on information disclosure and local responsibility for mitigation, the EIR ignores the vast majority of the Project’s emissions, and, in a misleading analysis, compares only a small fraction of the Project’s emissions to the applicable significance threshold. This flawed analysis leads the EIR to conclude that the impact from GHG emissions would be mitigated to a less-than-significant level, misleading the public and shirking mitigation responsibilities. Even if the Cap-and-Trade Program directly

applied to the Project’s emissions (it does not since, as explained above, this Project is not a covered entity under the Program), this method of evaluating a project’s significance *after* taking into account purported “mitigation” or impact-reducing components is not allowed by CEQA. As a result of its flawed analysis, the EIR fails to adopt all feasible mitigation measures and subverts CEQA’s important political function of ensuring informed decision making and informed public participation.

The EIR’s approach to GHG analysis fails on multiple levels. Perhaps most critically, in addition to pointing to “compliance” with a regulation that simply does not cover the Project to excuse mitigation, the EIR focuses on a single significance consideration while ignoring other evidence showing potentially significant impacts. CEQA does not allow clearly significant GHG impacts to be overlooked, even if a lead agency believes those impacts are considered less than significant under one particular metric. (See, e.g., *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal.App.3d 872, 274 [citizens’ personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards]; accord *SANDAG, supra*, 3 Cal.5th at p. 515 [“An adequate description of adverse environmental effects is necessary to inform the critical discussion of mitigation measures and project alternatives at the core of the EIR”].) This failure to address potentially significant impacts not only minimizes the Project’s significant impacts, but also warps the evaluation of whether the Project’s contribution to GHG emissions is a cumulatively considerable impact. (CEQA Guidelines, § 15064.) The cumulative effect of dozens of similar warehouse projects in the Moreno Valley area could—and almost certainly will—be significant.

A. The EIR improperly applies CEQA Guidelines Section 15064.4 to determine the significance of the Project’s GHG emissions.

The Resources Agency, the state’s expert on CEQA, has rejected the approach of using purported “compliance” with an inapplicable program to mitigate emissions. (Final Statement of Reasons for the CEQA Guidelines Amendments (2018) at p. 27 [“a subdivision project could not demonstrate ‘consistency’ with [CARB’s] Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision”].)

The EIR misapplies CEQA Guidelines section 15064.4, which offers multiple factors a lead agency should consider in assessing the significance of impacts from GHG emissions. That Guideline provides, in pertinent part:

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
 - (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 - (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - (3) The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project’s incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a *particular project* are still cumulatively considerable notwithstanding compliance with the adopted

regulations or requirements, an EIR must be prepared for the project.⁹

(CEQA Guidelines, § 15064.4, subd. (b), *italics added.*)

As reflected in subdivision (b)(3), compliance with “regulations or requirements adopted to implement a statewide, regional, or local plan” can factor into the assessment of GHG significance, but only when *the project complies* with those regulations or requirements. Yet, the EIR relies upon subsection (b)(3) to claim that emissions for which upstream suppliers surrendered allowances need not be analyzed and mitigated under CEQA. This approach excuses all of the Project’s transportation- and electricity-related emissions, thus requiring analysis and mitigation of only a tiny fraction of the Project’s emissions.

⁹ The 2018 update to the CEQA Guidelines added the following language:

(b) In determining the significance of a project’s greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.

(b)(3) . . . In determining the significance of impacts, the lead agency may consider a project’s consistency with the State’s long-term climate goals or strategies, provided that substantial evidence supports the agency’s analysis of how those goals or strategies address the project’s incremental contribution to climate change.

(c) A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Respondents' application of subdivision (b)(3) to this Project is wrong. Because the Project is not a covered entity under the Cap-and-Trade Program, subsection (b)(3) is inapplicable, as the project cannot "comply" with Cap-and-Trade at all. Moreover, as discussed above, such "compliance" would undermine Cap-and-Trade's purposes if adopted as a CEQA approach, not serve the environmental goals both AB 32 and CEQA set out to deliver.

B. The EIR failed to apply the SCAQMD's GHG emissions threshold to *all* of the Projects' GHG emissions.

The EIR takes an impermissible approach of applying the Cap-and-Trade Program to ostensibly reduce the Project's emissions significantly, then comparing only that reduced quantity to the bright-line significance threshold. This approach is not supported in law.¹⁰

CEQA requires lead agencies to "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." (CEQA Guidelines, § 15064.4.) CEQA then provides that the lead agency must consider "whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project." (*Id.* at subd. (b)(2).) As explained in the EIR, a potentially appropriate

¹⁰ The EIR also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations from other lead agencies, and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD). (EIR 4.7-33.) The EIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. These irrelevant, project-specific documents do not constitute substantial evidence supporting Respondents' argument.

significance threshold in this case is the South Coast Air Quality Management District's (SCAQMD) SCAQMD's 10,000 metric ton limit.¹¹ (EIR at p. 4.7-32.)

The problem here is that the EIR does not compare the Project's total GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Instead, the EIR simply subtracts from the total any GHG emissions it deems to be "capped," and compares only the few "non-capped" emissions to the bright-line threshold. Because the EIR only compares a small fraction of the Project's GHG emissions to the applicable bright-line significance threshold, it only requires relatively minor mitigation measures to reduce the Project's emissions to what the EIR considers "less than significant." (EIR at pp. 1-55–57.)

Respondents' approach improperly applies so-called "mitigation" (the Cap-and-Trade Program) *before* comparing GHG emissions to the significance threshold. By combining impacts and mitigation analyses, it is unclear how the purported mitigation reduces impacts. This approach was rejected in *Lotus v. Dept. of Transportation* (2014) 223 Cal.App.4th 645, where the court stated:

The failure of the EIR to separately identify and analyze the significance of the impacts . . . before proposing mitigation measures is not merely a harmless procedural failing. . . . [T]his shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decisionmaking and informed public participation. It precludes both identification of potential

¹¹ It is worth noting that the Scoping Plans are not binding as to any particular CEQA methodology, or as to land use planning generally, and do not require use of any particular significance threshold. They are guidance documents; individual land use authorities can and do depart from particular suggestions in them if they have appropriate reasons to do so. The issue in this case, however, is that the Cap-and-Trade program does *not* provide such an appropriate reason.

environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The deficiency cannot be considered harmless.

(*Id.* at p. 658.)

Furthermore, if the full scope of the GHG emissions attributable to the Project were compared to the applicable bright line threshold, the emissions, as mitigated, would still be substantially over the threshold—and would therefore require consideration of additional mitigation measures. (See EIR, pp. 4.7-35–36.)

Applying appropriate mitigation measures to reduce the so-called “capped” emissions would not “result in double counting and double mitigating emissions that are already mitigated through cap-and-trade” as Respondents assert. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 57.) Gesturing towards Cap-and-Trade regulated entities is not proper mitigation because Cap-and-Trade does not apply to this Project in any way, and the Project itself has ample mitigation opportunities onsite. To mitigate this Project’s GHG emissions, Respondents would have to address emissions from mobile sources, which account for over 70% of the Project’s total emissions (which again are nearly 40 times greater than the significance threshold). (AR002729.) To reduce these emissions, fewer trucks could drive from the Project to the Ports of Long Beach and Los Angeles every day, the Project could be built closer to the ports, the Project could require more zero emission vehicles be used or provide charging equipment or incentives to encourage their use, or any number of other meaningful mitigation measures. But Cap-and-Trade does not require any of this. Such measures are instead included by local governments in local land use projects to ensure approved project impacts fall below significance thresholds. By never counting the “capped” emissions toward the significance threshold, there is *no* counting and *no*

project-level mitigation of hundreds of thousands of tons of yearly GHG emissions from this Project.

C. Respondents fail to consider the long-term GHG impacts of the Project.

The Supreme Court has made clear that an EIR should consider a project’s long-term GHG impacts, and should address whether the project as a whole is in accord with the state’s climate goals. (*Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 515.)¹² The state’s climate change goals extend beyond 2030. (See, e.g., Executive Order S-03-05 [established a statewide target of reducing GHG emissions to 80 percent below 1990 levels by 2050].) Because the Project is expected to operate for decades into the future, Respondents must account for emissions beyond 2030. But Respondents fail to account for emissions beyond that point—despite the fact that the Project’s full operation will not start until *five years later*, in 2035. (EIR at p. 4.3-61.) Respondents present no substantial evidence that any of the Project’s post-buildout operational emissions are mitigated by the Cap-and-Trade Program. (See, e.g., EIR, pp. 4.7-36–37 [stating, without citation, that “[s]ome of the project’s GHG emissions are subject to the requirements of the AB 32 Cap and Trade Program and will have a GHG allocation based on current GHG emissions levels”].) This is not an adequate CEQA analysis. (See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 904 [EIR must contain substantial evidence that mitigation measures will reduce associated impacts to less-

¹² The parties in *AIR v. Kern* did not have the opportunity to brief the significance of *SANDAG* because the California Supreme Court filed its opinion in *SANDAG* over a month after the close of briefing in *AIR v. Kern*. It appears to amici that this is the first case at the California Court of Appeal where parties have had the opportunity to address both *SANDAG* and *AIR v. Kern* in their briefs.

than-significant-levels, such as by requiring compliance with applicable regulatory standards and preparation of site-specific studies]; Cal. Code Regs. tit. 14, § 15370, subd. (d) [“mitigation” includes “[r]educing or eliminating the impact over time by preservation and maintenance operations during the life of the action”].)

D. Reliance on *AIR v. Kern County* is improper.

Respondents incorrectly claim the Fifth Appellate District’s decision in *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*) upheld the use of the same GHG methodology as Respondents attempt to use here. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 53.) Respondents’ use of the Cap-and-Trade Program here goes far beyond what was sanctioned in *AIR*. In *AIR*, the project being evaluated under CEQA was a refinery, a *covered entity* under Cap-and-Trade. The court held a lead agency was authorized “to determine that a project’s greenhouse gas emissions will have a less than significant effect on the environment based on *the project’s* compliance with the cap-and-trade program.” (*Id.* at p. 718; italics added.) Regardless of whether or not *AIR* was rightly decided, *here*, the question is much simpler and different from the question before the court in *AIR*. Here, it is undisputed that the Project is *not* a covered entity required to comply with the Cap-and-Trade Program. (Cal. Code Regs., tit. 17, § 95811.) Accordingly, this Court need only decide if projects that are *not* covered entities under Cap-and-Trade are nonetheless allowed to use the program to ignore significant GHG emissions they cause. The answer to that question is no.

Respondents argue the distinction between covered and non-covered entities is “a distinction without a difference.” (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 63.) Respondents are incorrect.

This distinction is crucial under CEQA and vital to the success of California’s ambitious climate policies.

From a CEQA perspective, the distinction is important because CEQA Guidelines section 15064.4, subdivision (b)(3) instructs lead agencies to consider the extent to which *a project* complies with GHG regulations or requirements. It is thus inappropriate for entities downstream in the chain of commerce from a covered entity to rely upon compliance with the Cap-and-Trade Program as a basis for avoiding analysis of project-related emissions.

From a policy perspective, as described above, the distinction is crucial because projects that are not subject to the Cap-and-Trade Program do not have the same direct incentives to reduce their GHG emissions as covered facilities, and Cap-and-Trade alone is not designed to achieve California’s ambitious climate goals. The distinction between covered and not-covered entities is thus crucial to the portfolio of climate change measures the state is relying on to protect our citizens going forward.

E. Respondents’ GHG analysis obfuscates the climate change impacts of this Project, undermining CEQA’s public disclosure purpose.

By failing to comply with CEQA Guidelines Section 15064.4, failing to compare all of the Project’s emissions to the GHG emissions threshold, and failing to consider the long-term GHG impacts of the Project, Respondents’ analysis undermines the informational purpose of CEQA. The purpose of an EIR “is to inform the public generally of the environmental impact of a proposed project.” (Cal. Code Regs. tit. 14, § 15003, subd. (c).)

CEQA prohibits public agencies from approving or carrying out a project that will have significant effects on the environment unless the agency makes “findings” demonstrating either that it made changes to the

project to avoid or mitigate those significant impacts, or that certain overriding considerations outweigh the impact. (Pub. Resources Code, § 21081.) Without a full and accurate disclosure of the Project’s impacts, Respondents erroneously concluded that the GHG impact would be less-than-significant, and thereby avoided making the subsequent findings that would inform the public whether the Project’s significant impacts are unavoidable and/or justified. Additionally, Respondents’ approach hinders the public’s ability to submit informed comments during the EIR’s public comment period—aside from addressing the *lack* of analysis—because the public is not provided with, and thus cannot evaluate, complete information or proper CEQA analysis.

CONCLUSION

California is striving on all fronts to meet its ambitious, long-term GHG reduction objectives; the health of its citizens and the environment depend on it. But this Court’s approval of Respondents’ approach to GHG analysis and mitigation would treat the Cap-and-Trade Program as the sole remedy to limit GHG emissions from land-use projects, placing unnecessary strain on Cap-and-Trade’s cost-effectiveness and seriously undermining the state’s critical climate change efforts. Amici respectfully request this Court reject the trial court’s holding and find in favor of Appellants as to GHG analysis.

Dated: January 10, 2020

Respectfully submitted,

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 Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

CERTIFICATE OF COMPLIANCE

I certify that the attached Brief of Amici Curiae the Attorney General and the California Air Resources Board in Support of Plaintiffs and Respondents Albert Thomas Paulek, *et al.* and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, *et al.* uses a 13 point Times New Roman font and contains 7,647 words.

Dated: January 10, 2020

XAVIER BECERRA
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DECLARATION OF ELECTRONIC SERVICE VIA TRUEFILING

Case Name: **PAULEK, ET AL., V. MORENO VALLEY COMMUNITY SERVICES DISTRICT, ET AL., California Court of Appeal, Fourth Appellate District, (Amicus Brief)**

No.: **E071184**

I declare:

I am employed in the Office of the Attorney General, which is the office of a member of the California State Bar, at which member's direction this service is made. I am 18 years of age or older and not a party to this matter. I am familiar with the business practice at the Office of the Attorney General. Correspondence that is submitted electronically is transmitted using the TrueFiling electronic filing system. Participants who are registered with TrueFiling will be served electronically.

On January 10, 2020, I electronically served the attached:

BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION OF NORTH AMERICA, LOCAL 1184, ET AL.

by transmitting a true copy via this Court’s TrueFiling system to the parties as follows:

SEE ATTACHED SERVICE LIST

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on January 10, 2020, at Sacramento, California.

PAULA CORRAL
Declarant

/s/ Paula Corral
Signature

SA2019105249

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May 14, 2020

Ms. Julia Descoteaux
Associate Planner
City of Moreno Valley
juliad@moval.org

Re: NOTICE OF COMPLETION - Revised Final Environmental Impact Report (Revised Final EIR) (2012021045); Agenda Item No. 2 on May 14, 2020 Planning Commission Meeting (World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report)

Dear Ms. Descoteaux:

I respectfully submit the following comments to the 2020 Revised Final Environmental Impact Report (“Revised FEIR”) for the World Logistics Center Project (“WLC” or “Project”), in addition to the World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes Only. Please present these comments and the attachments to the Planning Commission prior to hearing this matter.

As described in the Revised FEIR, this Project entails construction of the largest warehouse development in the nation. For a development of this magnitude, it is vital to properly disclose the environmental consequences of the proposed action and to identify and adopt all feasible mitigation measures and alternatives. Unfortunately, the Revised FEIR continues to fail in its duty to comply with the California Environmental Quality Act (“CEQA”). As such, the City cannot rely on the environmental review contained in the document for the purpose of Project approval, and must require preparation and circulation of a new Recirculated Draft Environmental Impact Report (“Recirculated DEIR”) to allow the public and decision-makers an opportunity for meaningful review of the Project’s impacts, prior to issuing any Project approvals.

I. The Air Quality Analysis Continues To Be Flawed.

The various versions of the EIR constantly have sought to understate air quality impacts from this project. But, high levels of emissions and impacts will result from this Project. The thousands of trucks and other vehicles associated with this project will harm a large area of the region with impacts to local residents in the project vicinity most acutely. The decision on this Project is being based on a flawed air quality analysis.

For example, the Statement of Overriding Considerations concludes “[c]urrently, the 2016 AQMP is being reviewed by the U.S. EPA and CARB. Until the approval of the EPA and

CARB, the current regional air quality plan is the Final 2012 AQMP adopted by the SCAQMD on December 7, 2012. Therefore, consistency analysis with the 2016 AQMP has not been included.” Statement of Overriding Considerations, at 151. This is wrong. The EPA approved the 2016 AQMP on October 1, 2019. 84 Fed. Reg. 52005 (Oct. 1, 2019). Therefore, the EIR must analyze the projects compliance against the 2016 AQMP. Moreover, conclusory statements about compliance with the 2016 AQMP are not sufficient. The Revised FEIR and the Statement of Overriding Considerations must actually analyze compliance with this most recently approved air plan.

The Revised FEIR also continues to ignore the feasibility of implementing zero-emission technologies, including zero-emission trucks – amongst many classes (ie class 2-8) – as a mitigation measure. The Revised FEIR notes “[t]he mitigation measures adopted included some of the suggestions from [California Air Resources Board’s (“CARB”)] previous letters, but do not include the zero-emission technology requirements. Subsequent environmental review may require that specific technology that work with future users be required as condition of approval, but a broad requirement that unknown future users use a specific technology is not currently feasible since current zero-emission technology is very limited in medium-duty and heavy-duty trucks.” Revised FEIR, at 89.

The Revised FEIR’s dismissal of zero-emissions technologies for a project that spans decades based on an analysis from the past is not supported by CEQA. The Revised FEIR notes that “[t]he status of zero-emission technology was addressed in the responses to both of CARB’s previous letters. Essentially, as CARB’s ongoing multi-year planning (not implementation) effort on the Sustainable Freight Plan to lay out pathways to get to a zero-emission freight sector demonstrates, there are no commercially available technology zero-emission on-road heavy-duty trucks available and as CARB’s own progress report on heavy-duty technology and fuels assessment states zero- and non-zero emission technologies are still at the demonstration phase.” Revised FEIR, at 89. This basis is largely based on an analysis completed by CARB in 2015.

In fact in a more recent fact sheet from the Air Resources Board, the commercial availability is answered with the following:

Are any zero-emission trucks commercial available?

There are more than 70 different models of zero-emission vans, trucks, and buses that already are commercially available from several manufacturers. Most trucks and vans operate less than 100 miles per day and several zero-emission configurations are available to serve that need. As technology advances, zero-emission trucks will become suitable for more applications. Most major truck manufacturers have announced plans to introduce market ready zero-emission trucks in the near future.

California Air Resources Board, Advanced Clean Trucks Accelerating Zero-Emission Truck Markets, available at <https://ww2.arb.ca.gov/sites/default/files/2019-07/190521factsheet.pdf>. In fact, CARB feels comfortable enough with this feasibility of zero-emission trucks that next month it will adopt the Advanced Clean Trucks Rule, which will require manufacturers to produce zero-emission trucks starting as soon as 2024. The Revised FEIR never explains with substantial evidence why zero-emission trucks for any of the classes that will visit this Project

are infeasible to be used at the project start for a portion (or all) of the trucks servicing the new warehouses as they are built. And the Revised FEIR also does not provide substantial evidence why these zero-emission technologies cannot be used out into the future when CARB will require manufacturers to make zero-emission trucks across a broad class of trucks. *See* CARB, Proposed Amendments to the Proposed Clean Trucks Regulation, *available at* <https://ww3.arb.ca.gov/regact/2019/act2019/30daynotice.pdf>. The Revised FEIR failure to address new data on feasibility of zero-emission trucks, including addressing the forthcoming sales mandate from CARB, violates CEQA.

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Climate Impacts.

The City’s review of this Project’s climate and greenhouse gas (“GHG”) emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA’s requirements.

a. Legal Standards

The City’s determinations regarding the significance of greenhouse gas (“GHG”) emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency’s use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the FEIR continues to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO_{2e}”) per year, the same quantitative evidentiary standard controls.

CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (*See* Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and regulatory requirements. (See CARB, *California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring requirements that can be ... enforced by ARB.” (AR 1383:66171.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 66174-75.)

b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (FEIR 1a at 755-56.) As a threshold matter, the

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.

The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.

First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[.]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”.]) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review

whatsoever of whether those credits or the protocols they were generated under satisfy the measure's stated criteria, and without any ability even to question whether the credit is adequate.

Second, CARB "approval" of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is "approved by CARB" does not establish that voluntary market carbon credits sold by that registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB's procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1's reference to "approved" registries reflects a misinterpretation of CARB's regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure's reliance on CARB "approval" is legally erroneous. As a result, a registry's "CARB-approved" status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure's purported criteria, or the significance of the Project's impacts after mitigation.

Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB's regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB's compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism ("CDM") methodologies.⁴

³ Notably, despite MM 4.7.7.1's suggestion to the contrary, the "GHG RX" registry has *not* been approved by CARB to handle transactions in Cap-and-Trade offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The "GHG Rx" program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)

⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting "any methodology developed under the [CDM] ... for projects and programs registering with VCS).

Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project's GHG emissions (whether those measures are denominated "offsets" or "carbon credits"), it must meet CEQA's requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards "the mitigation *will* achieve." (CEQA Guidelines § 15126.4(a)(1)(B).) The measure's list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries' processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by "presuming" otherwise. Nor is there any evidence the City's Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, "[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place." *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA's prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on "forecasted" emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA's requirement that mitigation be in place before impacts occur.

iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third-party broker of offset credits. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between an carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased....” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to meet its

long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

vi. The FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the FEIR of any evidentiary support.

c. The FEIR Must Be Recirculated for Full Public Review and Comment.

The FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

Recirculation is required here for at least two reasons. First, the FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the FEIR only a few days before the Planning Commission hearing, the City has thwarted meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the FEIR’s new analysis in reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

Sections of the Final Environmental Impact Report measured only “Total Uncapped” Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though “Total Capped” emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The FEIR, in contrast, at least conditionally considers all Project emissions—both “capped” and “uncapped”—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after. avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The FEIR must be recirculated.

III. The Revised FEIR’s Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques to the GHG analysis. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project. This letter solely addresses a few new items included in the Revised FEIR.

Importantly, the California Air Resources Board, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the “[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground.”⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:

Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions

Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): “Project-related greenhouse gas emissions resulting from sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

⁶ Letter from California Air Resources Board to Moreno Valley, September 7, 2018, *available at* https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at* http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

Response 44.37

The Agency declines to make any changes in response to this comment. The decision in *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (“AIR v. Kern”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated referencing the Air Resources Board’s letter on the exact project studied in the Draft Recirculated FEIR.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, in addition to the agency responsible for drafting the CEQA Guidelines the Draft Recirculated FEIR relies upon for authority disagrees with the approach taken by the City to rely on Cap-and-Trade for all transportation and energy emissions.

Instead of adhering to the position of the relevant agency, the Revised FEIR continues to rely on two agencies that deserve no deference on this issue. But, even if these agencies positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised Final EIR includes new attachments A and B, which are the specific South Coast AQMD Documents relied upon for the conclusion to support the use of cap and trade to erase

⁸ *Id.*

⁹ *Id.*

transportation and energy emissions. Importantly, both of these documents are from 2014. Since that time, the South Coast has produced several other CEQA documents. In fact, in the most recent document from 2020, they do not use this same approach of arguing emissions from transportation will be addressed under the cap and trade program. See South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>. The Developer asked the South Coast to weigh in on its settlement in Attachment Q, so it is unclear why the Developer failed to ask whether the South Coast AQMD continues to use this clearly flawed cap and trade rationale for transportation and energy-related emissions. In reviewing the other CEQA documents where the South Coast AQMD was a lead agency, I could not find other instances of this approach being used after 2014.

In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. The FEIR Must Be Recirculated Before Project Approval and Certification.

Under CEQA, an EIR must be re-circulated for review and comment whenever significant new information becomes known to the lead agency and is added to the EIR after public notice of the availability of the draft document has been made, and before the EIR is certified. Pub. Res. Code § 21092.1. Under such circumstances the lead agency is specifically required to re-notice the environmental review document to the public and all responsible agencies, and is required to obtain comments from the same, before certifying the document's impacts and alternatives analyses as well as any mitigation measures. See *id.*; see also, Pub. Res. Code § 21153. A lead agency's decision not to recirculate an EIR must be supported by substantial evidence. Cal. Code Regs. tit. 14 ("CEQA Guidelines" or "Guidelines") § 15088.5(e). "Significant new information" includes any information regarding changes in the environmental setting of the project under review. Guidelines § 15088.5(a). It also includes information or data that has been added to the EIR and is considered "significant" because it deviates from that which was presented in the draft document, depriving the public from a meaningful opportunity to comment upon a significant environmental effect of the project, or a feasible way to mitigate or avoid such an effect at the time of circulation of the draft. *Id.* Some examples of significant new information provided in the CEQA Guidelines are: "(1) information relating to a new significant environmental impact that would result from the project or a new mitigation measure; (2) a substantial increase in the severity of an environmental impact [that] would result unless mitigation measures are adopted; and (3) any feasible alternative or mitigation measure considerably different from others previously analyzed ..." Guidelines § 15088.5 (a)(1)-(3). Recirculation is further required where the draft EIR is "so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." Guidelines § 15088.5 (a).

The required re-noticing and new comment period for a re-circulated EIR is essential to meeting CEQA's procedural and substantive environmental review requirements, as the EIR's

assessment of a project's impacts, mitigation measures and alternatives and the public's opportunity to weigh in on the same is at the heart of CEQA. *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1123. Where new information is added to an EIR in such a way as to highlight informational deficiencies in the draft document's environmental impacts, mitigation and alternatives analyses, the public must be allowed the opportunity and additional time to comment on the changes made in the final document's analyses. Moreover, where significant new information that is added to the EIR's assessment of a particular impact area falls within the purview of another responsible agency's area of expertise that agency must also be allowed a meaningful opportunity to review and respond to such new information and any changes implicated in the EIR's analyses.

While re-circulation is indeed an exception and not the rule in the preparation of final environmental review documents, it is an exception that must be invoked here – where the absence of significant information rendered the draft EIR ineffective in meeting CEQA's substantive mandates, and now, where included, the addition of significant new information substantially changes the FEIR's analyses and conclusions regarding the Project's impacts, feasible alternatives and required mitigation. *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1132. As stated in numerous comments to the various versions of the EIR, that document failed to provide critical information regarding the project area and scope of the project's impacts; it failed to adequately describe fundamental information relating to the phasing and timing of the project's massive structural and infrastructural developments; it lacked adequate detail specifically regarding the construction and operations phases of the project; and it contained analyses and mitigation measures relating to the Project's air quality, traffic, human health and biological resources impacts based on outdated or inapplicable studies and data. In some instances the Revised FEIR erratically and arbitrarily includes selective new data into its analysis of the Project's impacts and mitigation measures, and in others critical information remains absent from the document. Whether referenced in the Revised FEIR as new information, or wholly omitted from the document's analyses, the addition of such information is essential to the public's ability to participate in the environmental review process. The Revised FEIR must therefore be re-drafted and re-circulated document to provide the public at large and the Project's numerous other responsible agencies with more time to review and analyze the Project's impacts and to assess or prescribe necessary mitigation measure to minimize those impacts. The City cannot render a determination on the issuance of the project approvals under consideration until such recirculation occurs, and CEQA compliance is assured.

V. The Draft Statement of Overriding Considerations is Unsupported by Substantial Evidence and Fails To Justify the Project's Significant Impacts and Interference with Health Protective Air Quality Standards Attainment

The Statement of Overriding Considerations is insufficient to justify the Project's significant and unavoidable impacts for the reasons explained below. The statement's terms are insufficiently analyzed in both the draft EIR and in the Revised FEIR. Moreover because the Revised FEIR as a whole suffers from serious deficiencies that taint the whole of the analyses contained in the document, the draft statement cannot adequately weigh the Project's adverse, significant impacts with the espoused benefits from the Project contained in any statement of overriding considerations. *Vedanta Society of So. California v. California Quartet, Ltd.* (2000)

84 Cal.App.4th 517, 530 (a project with significant and unmitigated environmental impacts can only be approved when “the elected decision makers have their noses rubbed” in the Project’s environmental effects, and still vote to move forward). As such the statement and its purported benefits must be rejected.

As the lead agency for the Project, if the City is to approve a project of this magnitude, and with the unmitigated significant environmental and human health impacts that the Project will cause, it “must adopt a statement of overriding considerations.” Pub Res. Code § 21081, subd. (b); Guidelines, § 15093. In contrast with mitigation and feasibility findings, overriding considerations can be “larger, more general reasons for approving the project, such as the need to create new jobs, provide housing, generate taxes, and the like.” *Concerned Citizens of South Central L.A. v. Los Angeles Unified School Dist.* (1994) 24 Cal.App.4th 826, 847. Yet, like mitigation and feasibility studies, a statement of overriding consideration is also subject to a substantial evidence standard of review. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).” Thus, an agency's unsupported claim that the project will confer general benefits is insufficient, and the asserted overriding considerations must be supported by substantial evidence in the FEIR or somewhere in the record. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).”

As part of the EIR review process, statements of overriding consideration are intended to “vindicate the ‘right of the public to be informed in such a way that it can intelligently weigh the environmental consequences’ of a proposed project[;]” and they must make a good-faith effort to inform the public of the risks and potential benefits of the Project whose approval is proposed. *Woodward Park Homeowners Ass'n, Inc. v. City of Fresno* (2007) 150 Cal.App.4th 683, 717-718 (citing *Karlson v. City of Camarillo* (1980) 100 Cal.App.3d 789, 804).

In accordance with this standard, before approving the Project and the FEIR the City must show that it has considered each of the Project’s significant and unavoidable impacts in light of *each* of the alleged overriding considerations that it asserts will justify those impacts. *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 357 (upholding a statement of overriding consideration on the basis that “the City found the project had eight benefits, each of which ‘separately and individually’ outweighed its unavoidable impacts). Thus, the City must specifically consider and set forth overriding considerations to justify the Project’s significant and unavoidable direct indirect and cumulative impacts in each of the following areas: aesthetics, land use and biological resources, noise, traffic and air quality.

The statement of overriding consideration attached to the FEIR asserts two general areas of benefits that it asserts outweigh the Project’s significant and detrimental, un-mitigated impacts: (1) an increase in jobs that improves the job to housing ratio in the City of Moreno Valley, and (2) an increase the in the City’s overall tax revenue, which could be used to improve schools and confer other public benefits to the residents of the City. Any additional public benefits that the draft statement assumes may result from approval of the Project flow from one of those two underlying considerations.

These two alleged benefits are, however, based on erroneous assumptions that (a) the

Project will bring secure, desirable and certain jobs to the City of Moreno Valley; and (b) that the environmental degradation caused by the Project's significant and unavoidable impacts will not outweigh the benefits conferred by the Project in monetary terms, or based on any other form of valuation methodologies. While the draft statement sites thoroughly to "appendix O" the Fiscal and Economic Impact Study, it fails to account for aspects of the job market that will undoubtedly impact the nature and desirability of the jobs made available at the Project, if it is approved, constructed and permitted to operate. Just some of these unmentioned aspects include trends towards employing largely contract, part-time or temporary or short-term labor to fill the jobs created by the WLC. Indeed the study is based on an assumption that either the WLC or other logistics uses will result in the permanent employment of .5 employees per 1,000 building square feet. Appendix O, at 20. Yet the study fails to calculate what the rate of employment would be if some or all of those jobs were characterized as part-time or temporary contract labor employment.

The draft statement of overriding considerations similarly fails to account for any discrepancy in full-time vs. part time, temporary or contract jobs. Moreover, additional aspects of job desirability including working conditions for laborers employed at the WLC or similar logistics enterprises that would operate in the project area are left wholly omitted from both the Appendix O study and the statement, and to the extent the draft statement relies on the development agreement to ensure that such jobs are actually ensured, such assurances are illusory as the development agreement terms remain unclear.

The draft statement of overriding considerations also fails to adequately quantify, either monetarily or based on some other form of valuation method, the consequences of the Project's impacts, specifically including its impacts to human health, the environment and invaluable threatened and endangered biological resources that surround the proposed project area.

Weighing the Project's true impacts against its purported benefits is a critical environmental review requirement. *See Woodward Park Homeowners Ass'n, Inc. v. City of Fresno*, 150 Cal.App.4th, 720. The City must therefore engage in a good faith effort to thoroughly analyze of the full scope of the impacts for which the statement of overriding consideration is being offered.

Doing so here would involve some process by which to measure conclusory statements that fully contradict the evidence on the record, such as the statement that the Project will improve health public health. Draft Statement of Overrid., at 209.

Finally, the draft statement of overriding considerations fails to justify the Project's impediment to the South Coast Air Basin achieving federal and state NAAQS, and it's steady, foreseeable future contribution to the region's ability to meet Air Quality Management Plan targets, which are essential to ensuring compliance with state and federal law. The statement of overriding consideration cannot, in essence justify the Project's apparent conflict of potentially causing violations of air quality standards, which carry severe economic sanctions for the 18 million people living the South Coast Air Basin based on parochial economic justifications for one city.

For these reasons stated herein and because the alleged Project benefits included in the draft statement of overriding consideration run counter to the evidence on the record, the City cannot approve the Project, and cannot certify the Revised FEIR as an informational document.

Given the limited time, this comment only raises some of the issues that are of concern related to this project. We appreciate your consideration of these comments. Please do not hesitate to contact us at amartinez@earthjustice.org if you have questions about this comment letter.

Sincerely,



Adriano L. Martinez
Earthjustice

The following Exhibits have been emailed to the Planning Commission for Review.

Exhibit List
(All exhibits submitted in electronic format)

Exhibit	Title
A	California Air Resources Board, <i>California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation</i> (May 2013).
B	Haya, B., A. Strong, E. Grubert, and D. Cullenward, <i>Carbon Offsets in California: Science in the Policy Development Process</i> , in J.L. Drake et al. (eds.), <i>Communicating Climate-Change and Natural Hazard Risk and Cultivating Resilience, Advances in Natural and Technological Hazards Research</i> 241-254 (2016) (“Haya et al. 2016”).
C	Haya, B. (2019). The California Air Resource Board’s U.S. Forest Projects offset protocol underestimates leakage. GSPP Working Paper (“Haya 2019”).
D	Anderson, C. & J. Perkins. (2017). Counting California Forest Carbon Offsets: Greenhouse Gas Mitigation Lessons from California’s Cap-and-Trade U.S. Forest Compliance Offset Program. Stanford (“Anderson & Perkins 2017”).
E	Aldy, J. E. & R. N. Stavins. (2012). The Promise and Problems of Pricing Carbon: Theory and Experience. <i>Journal of Environment & Development</i> , 2, 152-180 (“Aldy & Stavins 2012”).
F	Cames, M., R. O. Harthan, J. Füssler, M. Lazarus, C. M. Lee, P. Erickson & R. Spalding-Fecher. (2016). How additional is the Clean Development Mechanism? Berlin (“Cames et al. 2016”).
G	Haya, B. (2009). Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol’s Clean Development Mechanism (Report No. ERG09-001). Berkeley: Energy and Resources Group (“Haya 2009”).

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

H	He, G. & R. Morse. (2013). Addressing Carbon Offsetters' Paradox: Lessons from Chinese Wind CDM. <i>Energy Policy</i> , 63, 1051-1055 ("He & Morse 2013").
I	Wara, M. (2008). Measuring the Clean Development Mechanism's Performance and Potential. <i>UCLA Law Review</i> , 55, 1759-1803 ("Wara 2008").
J	Zhang, J. & C. Wang. (2011). Co-benefits and additionality of the clean development mechanism: An empirical analysis. <i>Journal of Environmental Economics and Management</i> , 140-154 ("Zhang & Wang 2011").
K	Schneider, L. & A. Kollmuss. (2015). Perverse effects of carbon markets on HFC-23 and SF6 abatement projects in Russia. <i>Nature Climate Change</i> , 5, 1061-1063 ("Schneider & Kollmuss 2015").
L	Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, <i>Sierra Club, et al. v. County of San Diego</i> , Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019).
M	California Air Resources Board, Offset Project Registries, at https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm (visited May 8, 2020).
N	CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020).
O	Haya, B. & P. Parekh. (2014). Hydropower in the CDM: Examining additionality and criteria for sustainability (Working Paper ERG-11-001). Berkeley: Energy and Resources Group ("Haya & Parekh 2011").
P	Kansanga, M. M. & I. Luginaah. (2019). Agrarian livelihoods under siege: Carbon forestry, tenure constraints and the rise of capitalist forest enclosures in Ghana. <i>World Development</i> , 113, 131-142 ("Kansanga & Luginaah 2019").
Q	Beymer-Farris, B. A. & T. J. Bassett. (2012). The REDD menace: Resurgent protectionism in Tanzania's mangrove forests. <i>Global Environmental Change</i> , 22, 332-341 ("Beymer-Farris & Bassett 2012").
R	Cavanagh, C. & T. A. Benjaminsen. (2014). Virtual nature, violent accumulation: The 'spectacular failure' of carbon offsetting at a Ugandan National Park. <i>Geoforum</i> , 56, 55-65 ("Cavanagh & Benjaminsen 2014").

California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation

1 BACKGROUND

Under the Cap-and-Trade Program, covered entities may use compliance offset credits to satisfy up to eight percent of their compliance obligation.¹ This limit applies to each individual covered or opt-in covered entity for each compliance period. Compliance offsets are tradable credits that represent verified greenhouse gas (GHG) emissions reductions or removal enhancements from sources not subject to a compliance obligation in the Cap-and-Trade Program and resulting from one of the following: (1) a project undertaken using an Air Resources Board (ARB or Board) approved Compliance Offset Protocol pursuant to Subarticle 13 of the Cap-and-Trade Regulation; (2) an offset credit issued by a linked jurisdiction pursuant to Subarticle 12 of the Cap-and-Trade Regulation; or (3) a sector-based offset credit issued by an approved sector-based crediting program pursuant to Subarticle 14 of the Cap-and-Trade Regulation. In almost all cases, these GHG sources are outside of the industrial, energy, and transportation sectors. This document describes ARB’s process for the review and approval of new ARB Compliance Offset Protocols. As an important market feature, offset credits can provide covered entities a source of low-cost emissions reductions for compliance flexibility. The inclusion of offset credits will also support the development of innovative projects and technologies from sources outside capped sectors that can play a key role in reducing emissions both inside and outside California.

As required by Division 25.5 of the Health and Safety Code (Assembly Bill 32 or AB 32), any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code §38562(d)(1) and (2)). Any offsets issued by ARB must be quantified according to Board-approved Compliance Offset Protocols. The Cap-and-Trade Regulation (Regulation) includes provisions for collecting and submitting the appropriate monitoring documentation to support the verification and enforcement of reductions realized through the generation and retirement of Compliance offset credits. The regulatory provisions and the requirements of the Compliance Offset Protocols will ensure that the reductions are quantified accurately, represent real GHG emissions reduction, and are not double-counted within the system. Compliance Offset Protocols are considered regulatory documents and are made publicly available so that anyone interested in

¹ “Compliance obligation” is defined as “the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB.” Title 17, California Code of Regulations, section 95802(a).

developing an offset project can do so if their project meets Board-approved standards. Information on existing and proposed protocols can be found here:

<http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

It is important to note that compliance offset credits are only one way to incentivize voluntary GHG reductions outside of the Cap-and-Trade Program. Projects that could reduce GHG reductions could be incentivized through the use of grants, the generation of voluntary offsets, and potentially as regulatory offsets for compliance with the California Environmental Quality Act.

2 COMPLIANCE OFFSET PROTOCOL REQUIREMENTS

2.1 How will ARB determine which protocols to take through the approval process?

Periodically, ARB staff will review offset protocols that are available for use in the voluntary offset programs. These voluntary protocols will be assessed against the protocol criteria listed below. This process will be coordinated with our Western Climate Initiative (WCI) partners. Staff will also consider proposed protocols submitted by stakeholders that include elements to ensure any resulting offsets would meet the AB 32 offset and ARB protocol requirements presented in section 2.2. The specific process and steps prior to Board consideration are provided in section 3 below.

In addition to the ability to generate offsets that meet the AB 32 criteria, there are several other factors that are considered when deciding which project types will be considered for potential development of a Compliance Offset Protocol. These factors include, but are not limited to, the following:

- Potential for projects in California;
- Potential offset supply;
- Cost-effectiveness; and
- Co-benefits.

ARB staff is also working with our WCI partner jurisdictions to identify which offset project types to evaluate next as part of the regional trading program, which may also include a review of existing protocols from voluntary offset programs.² Staff will determine if a proposed protocol for a project type can be applied in California and/or at the regional level, and if it has the potential to meet the criteria listed above. There may be instances where a protocol is not applicable in every jurisdiction of a linked program. In all cases, all linked jurisdictions will have to agree on offset project protocols to

² See: <http://www.westernclimateinitiative.org/component/repository/Offsets-Committee-Documents/> accessed May 3, 2013.

ensure nothing will impact the fungibility of offsets across a regional Cap-and-Trade Program.

ARB staff will continue to meet with stakeholders and consider additional proposed offset project types that meet the AB 32 offset and ARB protocol requirements as we coordinate with WCI partner jurisdictions.

2.2 What criteria will ARB use to evaluate new protocols?

ARB must ensure that all GHG emissions reductions issued as offset credits under a Compliance Offset Protocol meet the AB 32 offset criteria as defined in the Regulation. ARB's decision not to develop a Compliance Offset Protocol does not preclude that project type from being incentivized through grants, development of voluntary offsets, or potentially as mitigation for compliance with the California Environmental Quality Act.

The Regulation also specifies the criteria for Compliance Offset Protocols in section 95972. These requirements will be broadly applied to each offset project type for which ARB is developing a protocol. There may be additional considerations that staff, in collaboration with stakeholders, may look at for specific offset project types.

New protocols can only be considered for project types that meet the following requirements:

- The resulting GHG emission reductions are from sources that are not covered by the cap and that are not subject to a compliance obligation. This is because there is no net reduction (i.e. no "offset") as a result of emissions being shifted from one source under the cap to another source under the cap. As a matter of policy, we do not issue offset credits for reductions from sources that would be covered by the cap but are located outside the State. For example, energy-related projects, such as the installation of solar panels, would not be eligible for offsets as the actual emission reductions are associated with power generation and all electricity generation is already covered under the Cap-and-Trade Program. Similarly, transportation fuels are covered in the program starting in 2015, so ARB will not adopt a Compliance Offset Protocol for cleaner vehicle fleets.
- The GHG emissions reduction must be a direct reduction within a confined project boundary. Recycling activities would not be eligible for offset credit as the recycling activities do not have a direct GHG reduction at the recycling facility, but may have an emissions impact upstream when new materials are extracted or manufactured in lieu of the recycling. Currently, to avoid double counting

issues in the Cap-and-Trade Program, ARB does not plan to adopt protocols that include a lifecycle analysis.

- The GHG emissions reduction must be permanent. For avoided GHG emissions, there must be no opportunity for a reversal of the avoided emissions. An example of this type of permanence is methane flaring in livestock digester projects, which permanently destroys methane. For GHG sequestration, the project must be able to ensure the GHG will not be released into the atmosphere for at least one hundred years. Both the U.S. Forest and Urban Forestry Projects Compliance Offset Protocols require a commitment to keep any credited carbon stocks sequestered for at least 100 years.
- The GHG emissions reduction must be conservatively quantified to ensure that only real reductions are credited. This requires a sound foundation and understanding of the underlying quantification for all sources, sinks, and reservoirs within a project boundary so that the net change from implementing the project represents a real reduction for issuing credit.
- The GHG emissions reduction must be verifiable and enforceable. This requires a Compliance Offset Protocol to have clear monitoring and measurement requirements that can be audited by a verifier and enforced by ARB.
- The GHG emissions reduction must be additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative³ business-as-usual scenario.⁴ In order for ARB to ensure offset credits are additional, ARB would not adopt a protocol for a project type that includes technology or GHG abatement practices that are already widely used. See section 4 for more information.

³ “Conservative,” in the context of offsets, means “utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements.” Title 17, California Code of Regulations, section 95802(a).

⁴ “Business-as-usual scenario” means “the set of conditions reasonably expected to occur within the offset project boundary in the absence of the financial incentives provided by offset credits, taking into account all current laws and regulations, as well as current economic and technological trends.” Title 17, California Code of Regulations, section 95802(a).

3 PROCESS FOR ADOPTION OF COMPLIANCE OFFSET PROTOCOLS

3.1 What are the rulemaking requirements for approving Compliance Offset Protocols?

Compliance Offset Protocols are considered regulatory documents and are subject to the Administrative Procedure Act (APA).⁵ As with any regulation that is considered by the Board, each Compliance Offset Protocol must be developed through a full stakeholder process. As part of this APA process and consistent with ARB's certified regulatory program, staff will also develop an environmental analysis that is included in the staff report prepared for any Compliance Offset Protocol to be considered by the Board. This process satisfies the requirements of the California Environmental Quality Act (CEQA). The primary steps and details of the APA process and how it applies to protocol review and adoption are as follows:

- Offset Protocol Announcements and Timing:** Staff will announce decisions to develop new offset protocols in a public setting, open to all stakeholders. Information related to new offset protocols will be shared in a transparent and public process so as not to give any one entity a potential market information advantage over another entity.
- Informal Development Activities:** During this step, staff will hold public workshops or technical meetings to discuss the development of a potential offset protocol, focusing on areas such as, but not limited to, project specific mitigation methods, defining a project boundary, quantification of baseline conditions, and quantification of actual GHG reductions or removal enhancements. Staff will look at offset supply potential that could be generated under each potential Compliance Offset Protocol, prioritizing those with supply in California and then broadly across the United States. When considering offset supply, staff will be interested not only in the potential supply from a single project and the potential supply if only small projects can occur, but also in whether the mitigation methods or technology(ies) are easily transferrable for a larger volume of reductions. This process would, where appropriate, also include the development of draft protocol text following stakeholder input.

Depending on the complexity of the project type, ARB may hold a series of workshops or technical workgroup meetings. Dates of the workshops or

⁵ Government Code, § 11340 et seq. Although Health and Safety Code section 38571 exempts quantification methodologies from the Administrative Procedure Act (APA), Compliance Offset Protocols and the corresponding adoption through the Cap-and-Trade Regulation would include regulatory components that are subject to APA requirements.

meetings will be posted on the ARB website and posted to the relevant email listservs. When possible, such meetings are webcast for broad public participation.

All workshop presentations will be posted on the ARB website and a protocol-specific development webpage will be posted that contains information about the development of that specific protocol. During the first public workshop, a protocol staff lead for ARB will be identified along with his or her contact information.

- **Issuing the Notice:** This step initiates the APA rulemaking action. When, after completing the preliminary activities described above, ARB determines that it would like to proceed with a formal rulemaking on a proposed Compliance Offset Protocol, ARB will issue a notice of proposed rulemaking, which is included in the California Regulatory Notice Register. This notice will include the Board hearing date when staff will present the proposed Compliance Offset Protocol for Board consideration. This notice is posted at least 45-days prior to the Board hearing.
- **Availability of the Proposed Text and the Initial Statement of Reasons:** At least 45-days prior to the Board hearing, ARB will make available the proposed Compliance Offset Protocol text and a staff report that includes an explanation of why certain decisions were made in the development of the proposed Compliance Offset Protocol, any relevant analyses to support the proposed Compliance Offset Protocol, and an analysis of potential environmental impacts. ARB will post the proposed text and the staff report on its rulemaking website with the 45-day notice. ARB practice is to notify the public of the availability of these documents through the relevant email listservs.
- **45-Day Comment Period:** ARB will provide at least 45 days for the public to review the proposed Compliance Offset Protocol text and staff report and provide written comments to ARB.
- **Public Hearing:** Staff will present the proposed Compliance Offset Protocol to the Board for its consideration. This process usually includes a staff presentation at a regularly scheduled Board hearing. The dates and agendas for each hearing are posted on the rulemaking website. Stakeholders can provide written and oral testimony to the Board before the Board takes any action on the proposed Compliance Offset Protocol text. The Board may choose to adopt the proposed Compliance Offset Protocol text as written or to direct staff to make changes and release amended material for a formal comment period of at least 15-days. ARB will consider all formal comments on its proposed Compliance Offset Protocol as required by the APA and Board policy.

- Summary and Response to Comments:** ARB must summarize and respond to all formal comments submitted during the 45-day comment period, at the Board hearing, and during any subsequent 15-day comment periods on the proposed Compliance Offset Protocol in a document referred to as the Final Statement of Reasons. In this document, ARB will indicate where it made a change in response to a comment, or why a change is not appropriate. When applicable, the written responses to comments addressing the environmental analysis will be considered by the Board prior to making any findings required by the CEQA before a proposed protocol is adopted. This process ensures that ARB has understood and considered all relevant material presented to it before adopting a proposed protocol.
- Submission of a Rulemaking Action to the Office of Administrative Law (OAL) for Review:** Following final ARB approval, the rulemaking record is submitted to OAL for review. ARB also posts a Notice of Decision with the Secretary of Natural Resources in accordance with its CEQA certified program. OAL has 30 working days to review the rulemaking record to determine whether it demonstrates that ARB satisfied the requirements of the APA. Upon OAL approval, the Board-adopted Compliance Offset Protocol is filed with Secretary of State and becomes effective within a quarterly time schedule provided in the APA.

The Administrative Procedures Act mandates that ARB complete a rulemaking within one calendar year from the date the 45-day notice is published in the California Notice Register. If ARB does not submit the final protocol and regulatory amendments to the Office of Administrative Law by that date, ARB must initiate a new rulemaking. This includes a new 45-day comment period and Board hearing.

4 ADDITIONALITY

AB 32 and the Cap-and-Trade Regulation require any reductions used for compliance to be beyond what would otherwise be required by law, regulation, or legally binding mandate, and that exceed what would otherwise occur in a conservative business-as-usual scenario. For each proposed Compliance Offset Protocol, staff will establish whether GHG reductions or removal enhancements that result from the implementation of offset projects under the protocol are already being required by a local, state, or federal regulation. If a specific GHG mitigation method is already required by regulation, any reductions from that mitigation method would not meet the requirements for additionality. In this case the proposed Compliance Offset Protocol could not include

that specific GHG mitigation method and compliance offsets would not be issued for that reduction activity.

To assess if a specific GHG mitigation method may have “otherwise occurred,” staff will establish if that method is common practice in the geographic area in which the proposed Compliance Offset Protocol is applicable. Where possible, this review would include staff’s best estimate of the percent of the technology or mitigation in use for that sector. This can be done through outreach to the sector that would generate potential offsets, discussions with trade organizations, data research, and reviews of technology trends. Staff will take into consideration cost barriers that may prohibit technology or GHG mitigation methods from occurring in the absence of revenues from the generation of offset credits. For each proposed Compliance Offset Protocol, staff will share their findings during a stakeholder process and solicit feedback to determine whether a specific technology or GHG mitigation method is beyond common practice, and if the resulting reductions would meet the requirements for additionality.

5 HOW DOES ENVIRONMENTAL CREDIT STACKING WORK UNDER THE CALIFORNIA COMPLIANCE OFFSET PROGRAM?

Environmental credit stacking refers to a situation where a single activity provides more than one marketable environmental credit. For example, forest projects can result in carbon sequestration and improved watershed quality benefits. ARB believes that environmental co-benefits are a desired result of its Compliance Offset Protocols. The additional incentives such as other environmental credits would not by themselves disqualify a project type from being considered for the development of a Compliance Offset Protocol. ARB’s assessment of additionality will be based on how prevalent a mitigation practice or technology is within a sector, regardless of whether or not the activity could generate other marketable environmental credits.

6 WILL ARB PERIODICALLY REVIEW COMPLIANCE OFFSET PROTOCOLS?

Yes, ARB will continue to monitor the adoption of new or modified regulations that could affect additionality, as well as new developments in scientific data and quantification related to adopted Compliance Offset Protocols that would warrant a change to an existing Compliance Offset Protocol. Staff will propose amendments to Compliance Offset Protocols as necessary through a stakeholder process prior to Board consideration. Staff will weigh the decision to update a protocol against the market desire for certainty to support an active and robust compliance offset program. Any amendments to an existing Compliance Offset Protocol would involve the same APA process as developing a new Compliance Offset Protocol.

Once ARB updates an existing Compliance Offset Protocol, the previous version would no longer be used by new projects from the date that OAL approves the new version. Any existing projects under the previous version of the protocol would be required to use the new version of the protocol once the existing crediting period has ended.

7 HOW CAN I PARTICIPATE IN THE COMPLIANCE OFFSET PROTOCOL DEVELOPMENT PROCESS?

ARB encourages interested parties, including subject matter experts and general members of the public to attend Compliance Offset Protocol development workshops and provide informal and formal written feedback on proposed content during the Compliance Offset Protocol development process. Stakeholders can also request meetings with ARB staff to discuss protocol-related issues. Stakeholders are encouraged to sign up for the Cap-and-Trade listserv to make sure they are notified of any workshops or public information related to Compliance Offset Protocol development:

http://www.arb.ca.gov/listserv/listserv_ind.php?listname=capandtrade.

8 SUBMITTING IDEAS FOR COMPLIANCE OFFSET PROTOCOLS?

8.1 Can a voluntary offset program recommend a protocol for review?

Yes. Voluntary offset programs such as the American Carbon Registry, Climate Action Reserve, Verified Carbon Standard, and others may submit protocols to ARB for review. However, regardless of how the voluntary protocols are developed, ARB staff must determine whether the voluntary protocol should be developed for use in the Cap-and-Trade Program and if so, to conduct its own rulemaking process under the Administrative Procedure Act. As outlined above, under this process ARB would review, modify, and present a proposed Compliance Offset Protocol for Board consideration. This process ensures that any voluntary protocol modified for consideration by the Board demonstrates the resulting reductions meet the offset criteria in AB 32 as defined in the Cap-and-Trade Regulation and the criteria listed earlier in this document.

Protocols developed by the voluntary programs are not Compliance Offset Protocols as they are not developed through a rulemaking process, may not meet the AB 32 and Cap-and-Trade Regulation criteria, and were not approved by the Board.

8.2 Why has ARB not developed Compliance Offset Protocols for all of the existing voluntary offset protocols?

There are many existing voluntary offset protocols for use in the voluntary offset market. However, ARB must ensure any Compliance Offset Protocol it develops will result in

offset credits that meet the AB 32 offset criteria and the general protocol criteria in section 2.2. ARB will periodically review the available voluntary offset protocols and the potential to develop them into Compliance Offset Protocols.

8.3 Why can't we limit offset protocols just to California projects?

An important role for compliance offsets in the Cap-and-Trade Program is to provide cost containment for covered entities in the program. A covered entity can meet up to eight percent of its compliance obligation by using offsets in each compliance period. It is important to note that if all entities under the cap were to maximize the use of offsets up to the eight percent limit, there would still need to be on-site GHG emissions reductions at covered entities to meet the overall cap limits through 2020. Since the Cap-and-Trade Program already covers most sectors of California's economy under the cap, limiting offsets to just projects in California would significantly reduce the offset supply potential available to covered entities. This would increase their cost for compliance under the Cap-and-Trade Program. As stated in section 2.1, ARB will try to identify potential Compliance Offset Protocols that may be applicable in California, as well as across the United States.

8.4 What if I have a good idea for an offset protocol?

ARB encourages stakeholders to engage with staff regarding the development of new Compliance Offset Protocols and potential new project types that may fit the criteria for compliance offsets. Section 2.2 of this document contains the requirements for Compliance Offset Protocols. These requirements can help stakeholders discern if their ideas could potentially be considered for the Compliance Offset Program.

8.5 Will ARB only approve protocols based on a standardized approach?

Yes, approved Compliance Offset Protocols serve as a cornerstone of the Compliance Offset Program to ensure that reductions are appropriately quantified, monitored, reported, and documented. Those protocols taken to the Board for adoption will consist of standardized methods that quantify reductions based on specific criteria and pre-established calculation methods. This approach streamlines the calculation of project baselines and determination of the additionality of projects by using standard eligibility criteria that ensure projects are additional. By establishing the standardized criteria in the Compliance Offset Protocol, there is less subjectivity by verifiers or offset project developers as to whether a project may be additional and this supports consistent quantification rigor in the offset program.

8.6 Will ARB approve protocols developed under a project-based approach?

No, ARB is not planning to accept project-based protocols because each individual project protocol must be approved by the Board and such a process would be lengthy and administratively burdensome.

Additional Information

More information on the Cap-and-Trade Program, compliance offsets, and current rulemaking activities can be found here:

<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

Staff contacts for the Cap-and-Trade Program can be found here:

http://www.arb.ca.gov/cc/capandtrade/contacts/capandtrade_contacts.htm

Chapter 15

Carbon Offsets in California: Science in the Policy Development Process

Barbara Haya, Aaron Strong, Emily Grubert, and Danny Cullenward

Abstract Natural and social scientists are increasingly stepping out of purely academic roles to actively inform science-based climate change policies. This chapter examines a practical example of science and policy interaction. We focus on the implementation of California's global warming law, based on our participation in the public process surrounding the development of two new carbon offset protocols. Most of our work on the protocols focused on strategies for ensuring that the environmental quality of the program remains robust in the face of significant scientific and behavioral uncertainty about protocol outcomes. In addition to responding to technical issues raised by government staff, our contributions—along with those from other outside scientists—helped expand the protocol development discussion to include important scientific issues that would not have otherwise been part of the process. We close by highlighting the need for more scientists to proactively engage the climate policy development process.

Keywords Carbon offsets • Climate change policy • Carbon markets • Science and policy

15.1 Introduction and Background

Natural and social scientists in the field of global climate change are increasingly stepping out of purely academic roles to inform and support policy that is science-based. This chapter explores the roles that science and scientists play in climate policy development using an example from the California climate policy process. Beginning in the spring of 2013, we participated in the public process for

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developing two new carbon offset protocols in California. We relay our experiences as scientists in these processes with two main goals. First, we describe the types of input we and other natural and social scientists provided to regulators, in order to shed light on how scientific issues emerge in policy development and the associated role scientists play in practice. Second, we hope this example will encourage interested scientists to engage the climate policy process more directly. Fundamentally, we believe that scientists' active participation in climate policy development can improve policy outcomes and generate useful research agendas.

The primary theme of our work is supporting the robustness of California's offsets policies, a topic on which most of our efforts focused. As used in discussions of global climate change, another term—*resilience*—most commonly refers to the ability of communities or nature to adapt to the uncertain impacts of climate change. In the context of climate change policy, *robustness* offers a similar framing. It refers to the ability of a policy to reliably meet its goals despite substantial uncertainty in predicting or measuring its outcomes (Lempert and Schlesinger 2000).

The concept of policy robustness is particularly relevant in the context of policies concerning carbon offsets because of the deep scientific and behavioral uncertainties involved in calculating accurate emission reductions from offset projects. Because greenhouse gas emitters in a climate policy system that recognizes offsets—such as California's carbon market—use offset credits to justify increased emissions within the policy system's boundaries, it is critical that offsets accurately represent true emission reductions. Meeting this standard is no simple matter, however, as it requires scientifically complex and inherently uncertain methodologies.

The uncertainty stems from the need to calculate emission reductions by comparing an offset project's emissions against an inherently unknowable counterfactual scenario: the emissions that would have occurred without the offset project. Both estimates are subject to uncertain physical, social, and economic drivers. In light of this uncertainty, ensuring that offset credits represent true emission reductions requires conservative decisions about project and baseline emissions to ensure that protocols actually reduce the credited emissions reductions. Accordingly, our participation in California's public policy development processes focused on ways to preserve the robustness of the two offset protocols on which we worked.

The chapter is organized as follows. We begin with an overview of California's climate mitigation policies, describing how offsets fit into the state policy system, as well as the key challenges offsets pose for policy-makers. Next, we describe our activities as stakeholders in the public process for developing new offset protocols. We illustrate our work with a handful of examples that highlight scientific issues that emerged in the policy process, including issues that the regulatory agency identified for public input, as well as those issues we raised in our independent capacity. In the final section, we offer some concluding thoughts about our experience and the various roles we and other scientists played in these policy processes. Finally, we encourage other environmental scientists to explore proactive models of policy engagement.

15.1.1 *California's Climate Policy*

In 2006, California passed the Global Warming Solutions Act (AB 32), launching the state's comprehensive approach to climate mitigation policy. Its key feature is a legally binding requirement to reduce statewide greenhouse gas (GHG) emissions back to 1990 levels by the year 2020. To accomplish this goal, state law delegated broad authority to the California Air Resources Board (CARB), which developed a suite of climate policy instruments over the last several years (CARB 2008, 2014a). The most prominent is California's cap-and-trade program. This program applies to California's electricity, industrial, and fuels sectors, covering about 85 % of state-wide emissions.

Briefly, cap-and-trade carbon markets set an overall limit (or *cap*) on anthropogenic greenhouse gas emissions within the covered sectors. The regulator then issues tradable emissions allowances, with the total number equal to the cap. Each emissions allowance credit confers the right to emit one tonne of GHG pollution (measured in tonnes of CO₂ equivalent, tCO₂e). Covered entities must submit one allowance per tCO₂e of pollution they emit. Since allowances are tradable, if a regulated emitter can reduce emissions more cheaply than the price of a permit, it can do so, freeing up permits to sell to others who face costlier mitigation opportunities. This lowers compliance costs compared to a system in which each emitter must meet an established standard without trading.

Carbon offsets extend the flexibility of this approach by allowing covered entities to seek lower-cost emission reduction opportunities outside of the carbon market—for example, in another state or in an economic sector not covered by the cap—instead of reducing emissions within the capped sectors. The financial benefits to regulated emitters are straightforward: expanding the range of mitigation opportunities outside the capped system through offsets reduces compliance costs. Since climate change is driven by the global stock of GHGs in the atmosphere, reducing one tonne of emissions has the same effect regardless of location.¹ As we discuss below, however, accurately calculating the net emissions reductions raises new challenges.

15.1.2 *Offsets in California*

Companies subject to the cap-and-trade market can use offset credits to cover up to 8 % of their total emissions. This limit on the use of offsets appears significantly more generous when expressed as a percentage of the total mitigation required in the carbon market: if all regulated parties use the maximum amount allowed, offsets

¹ Though other pollution impacts that are coincident with the greenhouse gas emissions may have important local and regional effects, including on public health

would contribute about half of the total emission reductions expected under California’s climate policy through 2020 (Haya 2013).

Carbon offsets in California work as follows. CARB issues offset credits for projects that follow approved protocols. The protocols themselves determine what project activities are eligible and define the methodologies by which projects estimate their emission reductions. Thus, offset protocols must be designed to anticipate all of the emissions-related drivers that apply in a given sector—a task that typically involves complex issues of environmental and social science.

Although the decision to develop a new protocol lies entirely at CARB’s discretion, offset protocol methodologies must meet certain standards. State law and market regulations both require that emission reductions from offsets be “real, additional, quantifiable, permanent, verifiable, and enforceable.”² Each of these terms has a formal legal definition. The most challenging requirement has been *additionality*, defined in AB 32 as crediting only those emission reductions that are made “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.”³ CARB’s climate regulations provide more context on how additionality is to be tested, requiring the use of a “conservative, business-as-usual scenario.”⁴

The regulations also directly address uncertainty and risk management, defining conservative scenarios as those whose “project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG emission reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of [net GHG reductions].”⁵

Finally, it is important to recognize that political perspectives on offsets vary widely. Many stakeholders, including most major emitters in the market, are strongly supportive of offsets as a mechanism to keep compliance costs low. After all, the supply of offset credits is widely expected to meaningfully reduce carbon market prices relative to a market without offsets (Borenstein et al. 2014; EPRI 2013). In contrast, several nonprofit stakeholders have expressed concerns about whether California’s offsets truly represent reductions in GHG emissions. For example, two environmental groups sued CARB, claiming that the agency’s decision to evaluate additionality using a performance standard at the protocol level does not satisfy the requirements of AB 32. The trial court rejected the plaintiffs’ claims, finding that CARB had the necessary legal authority to adopt its performance standard approach. The court then applied a highly deferential standard to review CARB’s treatment of additionality in each of its existing protocols (*Our Children’s Earth Foundation v. CARB* 2015). Beyond highlighting the political opposition to offsets, this decision suggests that future legal challenges to CARB’s protocol methodologies would face a difficult legal test under which the regulator is likely to prevail.

² Cal. Code Regs. tit. 17, § 95802(a)(14); see also Cal. Health & Safety Code § 38562(d)(1)-(2).

³ Cal. Health & Safety Code § 38562(d)(2).

⁴ Cal. Code Regs. tit. 17, § 95802(a)(4).

⁵ Cal. Code Regs. tit. 17, § 95802(a)(76).

15.1.3 *Critical Issues for Carbon Offsets*

Offsets raise a number of technical challenges, and CARB's two new protocols are no exception. A carbon market maintains its environmental integrity only if the offset credits it recognizes represent actual net reductions in greenhouse gas emissions. In practice, however, uncertainty about those reductions requires detailed scientific input and is often the subject of significant controversy.

A critical task for policy-makers is establishing a robust standard for offset additionality. An offset project is considered additional only if it occurred because of the financial investment made in return for offset credits. In other words, an offset program should only credit those emission reductions it causes and should not credit reductions that would otherwise have occurred. This standard is necessary to ensure that any climate policy system that accepts offsets achieves its intended emission reductions. But additionality is difficult to achieve in practice. Several studies have shown that a large portion of credits generated by the Clean Development Mechanism (CDM, the Kyoto Protocol's offsets program) were non-additional projects that would have occurred without the financial incentive of offset credits and thus do not represent net emission reductions (Cullenward and Wara 2014; Haya 2009; Haya and Parekh 2011; Wara 2008). As a result, their use by countries to meet Kyoto Protocol targets came at the expense of real reductions in greenhouse gas emissions.

Two issues further complicate the basic question of establishing whether offset credits represent real additional emission reductions. First, uncertainty analysis is particularly important for offset projects in the land-use and agricultural sectors, where emissions vary widely across location, crop, and ecosystem types. Second, there is the risk that offset program incentives cause emissions to increase outside of offset project boundaries. The most egregious example involves offset credits in the CDM awarded for the destruction of hydrofluorocarbons (HFCs), a potent family of greenhouse gases emitted as byproducts in the production of certain refrigerants. Manufacturers realized they could earn greater profits from destroying HFCs than from the sale of the refrigerant itself. There is strong evidence that they increased their production as a result of this incentive, creating surplus HFC byproducts that they subsequently destroyed to earn offset income (Wara 2008). Beyond enticing non-additional credits, the income from HFC-related offsets might have discouraged national governments from directly regulating HFC emissions, in order to maintain offset project eligibility—an effect that has been documented for a range of other project types (Figueres 2006).

Although the problems observed in past offset systems remain relevant, it is important to recognize that CARB's approach to additionality is different than that of its predecessor, the Kyoto Protocol's CDM. The CDM requires individual offset project applicants to evaluate their counterfactual emissions scenarios and demonstrate additionality for each individual project. In contrast, the California system makes these determinations at the protocol level by defining project eligibility criteria. Once CARB has approved a protocol, a project applicant needs only to

demonstrate compliance with the protocol's eligibility criteria in order to earn credit. Given the use of up-front project eligibility criteria, robust protocol design is particularly critical to ensuring that California's offset credits represent real emission reductions.

Finally, we note the importance of CARB's early offset protocols as institutional precedents in American climate policy. As one of the first legally binding climate policies in the United States, California's cap-and-trade system has already become a standard point of reference for climate policy design. In turn, CARB's treatment of complex and uncertain scientific issues in its offset protocol development process will surely set an important example for others.

15.1.4 Proposed Mine Methane Capture and Rice Cultivation Protocols

By the beginning of 2013, CARB had approved four offset protocols covering projects in the following areas: (1) forestry, (2) urban forestry, (3) livestock waste management, and (4) destruction of ozone-depleting substances. We participated in the policy development process for two new protocols: (1) mine methane capture and (2) rice cultivation, which we describe briefly here for background.

CARB approved the Mine Methane Capture (MMC) protocol in April 2014 (CARB 2014b), following a year of development and stakeholder engagement. The protocol awards credits to projects that capture methane that otherwise would have been released into the atmosphere from coal and trona⁶ mining activities. CARB's MMC protocol recognizes two types of projects. Methane can be captured for use as a fuel, such as by injecting captured gas into natural gas pipelines or using it to fire an on-site power plant. Alternatively, MMC projects can destroy methane without putting it to productive use through flaring or oxidation. In any of these cases, methane (CH₄) is converted to carbon dioxide (CO₂), a much less potent greenhouse gas.

At the time that this chapter was written, CARB was in the process of developing a rice cultivation protocol and responding to comments submitted on a discussion draft of the protocol released in March 2014. This protocol would credit reductions in methane emissions from changes in rice cultivation practice in California and the South Central United States. Rice cultivation produces methane emissions because production fields are submerged under water for a large portion of the year. This causes biomass to decompose without oxygen, producing CH₄ rather than CO₂. Methane emissions can be reduced if the fields are submerged for less time or if less biomass is left on the field to decompose anaerobically.

⁶Trona is a mineral mined as the primary source of sodium carbonate in the United States.

15.2 Science in the Policy Development Process

In April 2013, CARB established technical working groups to bring together stakeholders to inform the development of two new offset protocols. The working groups included offset project developers, project verifiers (who verify that project developers have met the protocol's requirements), representatives from industries facing compliance obligations in the carbon market (i.e., offset buyers), environmental nonprofit staff, academic research scientists, representatives from organizations that develop offsets standards for voluntary carbon markets, and state and federal officials from outside agencies. Each working group convened approximately once every three months, though additional discussion continued between meetings.

15.2.1 *The Interdisciplinary Nature of Climate Change Policy Development*

As a preliminary matter, we note that the scientific and technical expertise needed to ensure the environmental integrity of carbon offset protocols spans a wide range of disciplines. For example, the MMC and rice cultivation protocols drew on experts—including a number of outside scientists, in addition to our group—who provided advice on statistical uncertainty assessment, biogeochemical and ecological modeling, field measurements of gas fluxes, economic analysis, life-cycle analysis, basic mineralogy, engineering of mine construction, wildlife ecology, insect population dynamics, the sociology of agricultural crop production practices, modeling hydrological connectivity above- and belowground, state and federal water law, land-use law, environmental law, and organizational theory. As this list indicates, there are many opportunities for a variety of scientific experts to proactively engage the climate policy process—no agency has all of the necessary experts on staff.

15.2.2 *What Did We Do?*

Our participation in the offset protocol development process included a wide range of activities. We interfaced with a variety of stakeholders, including CARB staff, CARB board members, offset project developers, and nonprofit groups. Similarly, our communications ranged from informal conversations in person to formal written comment letters. As members of the technical working groups for each protocol, we attended meetings at the agency's headquarters in Sacramento and brought attention to issues we viewed as critical to the environmental integrity of the draft protocols as they developed, based on detailed independent analysis.

We provided our assessments to CARB staff as informal communications and later submitted formal comment letters during public comment periods in the administrative process. At times when we believed that CARB was not adequately addressing critical concerns, we spoke with individual CARB staff and board members outside of the formal working group process, occasionally with the participation of other stakeholders; we also raised our concerns through public testimony at formal board meetings.

The overarching goal of our involvement was to apply our research team's interdisciplinary expertise to helping ensure the environmental quality of the protocols. We did not use a single set of methods in our contributions, but rather, each of us brought methods from our respective disciplines to our shared goal. Below, we offer examples of scientific issues that highlight the kinds of input we offered in an effort to ensure that California's offset protocols reflect the best available science and are robust in the face of significant uncertainty.

Our examples are organized according to different ways that scientific issues arose in the policy development process—at the agency's request or according to our independent review of the protocols—rather than by protocol or chronology. In this way, we hope to illustrate both how science was used in developing the protocols and what roles scientists can expect (or be expected) to play in such processes.

15.2.3 Scientific Issues Raised by the Agency

Our first category of scientific engagement in the policy development process focuses on those issues that CARB proactively identified, either via agency staff asking stakeholders directly for input or by inclusion on agency-drafted meeting agendas. We review one such example in this section.

15.2.3.1 Scale of Uncertainty Assessment in Model-Estimated Emissions from Rice Cultivation

If the proposed rice cultivation protocol is adopted, it will become the first California protocol to use a computer-based model to estimate emission reductions. Using a model is necessary in this case because direct field measurements of emissions are technically challenging, costly, and time-consuming. The proposed protocol relies on a mechanistic biogeochemical model, the DeNitrification-DeComposition (DNDC) model, originally developed at the University of New Hampshire (2012).

The DNDC model is used to estimate offset project emissions and emission reductions. Through the technical working group, we—along with other scientists, including DNDC model developers, biogeochemists, and agricultural experts—addressed questions about model uncertainty and validation, the model's ability to estimate emissions of the potent GHG nitrous oxide (N_2O), and specific biogeochemical parameters used in the model.

Models are by definition simplifications of complex processes and are not perfectly accurate. Accordingly, the draft protocol applies a *deduction* that reduces the model-estimated emission reductions to conservatively account for any model error. Early drafts of the protocol included this deduction, but applied only one value for all eligible projects. Since DNDC must be field-calibrated to particular crop types, however, we were concerned that a blanket assessment of an uncertainty deduction for model error was too general and would not reflect the uncertainty of the model as it would be applied in the rice cultivation protocol—specifically, to fields in different ecosystems, with different cultivars, and in different regions around the country.

We focused our attention on how finely to parse assessments of model uncertainty, raising this issue in both formal and informal comments. Ultimately, the draft protocol included separate uncertainty deduction calculations for each of the rice-growing regions, rather than a single uncertainty deduction for all applications of the model. Furthermore, CARB decided to update the uncertainty deduction coefficients on an annual basis, a feature that will make the protocol more robust in light of new information. On the other hand, there is no formal mechanism for updating the model itself in response to newly published scientific information that directly affects relevant calculations. In the end, the potential for model structures and inputs to change highlights the profound challenge of integrating active scientific research into a fixed policy structure. Inevitably, there will be trade-offs between the adaptability of the protocol to new information and the stability of compliance rules that offset project developers desire.

15.2.4 Scientific Issues We Raised

A second category of scientific engagement describes our independent evaluation of issues that emerged during the protocol development process, as opposed to the assessment of issues on which CARB specifically requested input. In this section, we discuss examples of issues we raised about the conservative estimation of emission reductions from individual projects, additionality assessment, and the risk of unintended consequences caused by interactions between offset protocols and other policies. In some cases, we raised questions that were not being addressed at the time, and in others, we advanced new perspectives on issues that were already under agency consideration.

15.2.4.1 Statistical Bias in the Rice Cultivation Emissions Model

Statistical bias occurs when a prediction repeatedly over- or underestimates real-world outcomes. A model is unbiased if its outcomes are equally likely to over- and underpredict actual emissions as determined by direct field measurements. An unbiased model may still over- or underestimate the reductions achieved by an

individual offset project, but the uncertainty deduction factor (discussed above) ensures that over-crediting is still avoided with a high degree of certainty. However, a model that has not been validated as statistically unbiased for the project types credited under the protocol may result in an overestimation of the emissions reduced by those project types, even after the uncertainty deduction factor is applied.

During the rice protocol development process, CARB staff referred to hundreds of field measurements that had validated the DNDC model, finding no trend in the estimates. Thus, they concluded that the model was not biased. We were concerned, however, that some of the project types eligible under the protocol were not included in the data used to validate the model. Noting this gap, we argued that an assessment of bias at the level of the entire DNDC model was insufficient, and that project-type specific assessment of model bias was warranted. To avoid over-crediting, we suggested that CARB approve the eligibility of a project type under the protocol only if the DNDC model has been validated to have no statistical bias for the type of activities credited by that project type. As of this writing and to the best of our knowledge, CARB staff provided the technical working group with only a list of published references, not the actual data from the model runs used in the bias assessment.

As CARB continues to collect field data to validate the model, we hope to view the complete dataset on which CARB validates the DNDC model. This example illustrates the important role scientists play in reviewing the technical basis of policy—in this case, the methods used to assess statistical bias in an emissions model, in order to avoid over-crediting. It also illustrates the importance of transparency and access to data, both of which are necessary to enable scientific review.

15.2.4.2 Additionality of Methane Capture at Abandoned Mines

Our second example in this category concerns the treatment of additionality in the MMC protocol. CARB determines the additionality of different project types by assessing whether the project activity is *common practice* among a relevant population; a project type is considered additional if it is not common practice. Applying this approach to methane capture at abandoned mines under the MMC protocol, CARB staff studied abandoned underground mines in the United States, finding that “few currently capture and destroy mine methane. Methane capture and destruction is therefore deemed not to be business-as-usual at these mines” (CARB 2013, p. 7). This language suggests that CARB was prepared to deem all abandoned mine methane control projects additional under the MMC protocol.

The case of methane capture at abandoned mines demonstrates the importance of assessing additionality for subcategories of project types and not just for the entire population of possible projects as a whole. It also highlights the value of performing a conservative quantitative assessment to examine compliance with the protocol level additionality standard. While only 38 of the more than 10,000 abandoned mines in the United States have implemented methane capture projects, these 38 mines emit one third of all methane released from abandoned mines in the country (Ruby Canyon Engineering 2013a). Thus, existing methane capture projects at

abandoned mines are correlated with high rates of methane emissions—exactly as one would expect, given that the costs of capturing methane decrease as the rate and concentration of methane emissions at mines increase.

If all abandoned mines were eligible for MMC offset credits, the protocol could generate non-additional credits from projects that would have proceeded regardless of the financial incentives offsets provide. Indeed, if methane capture project development trends at abandoned mines from the last two decades were to continue, the volume of non-additional credits enabled by CARB's initial common practice assessment would likely far exceed methane capture from truly additional projects enabled by the financial incentive created by the offsets program as assessed by Ruby Canyon Engineering (2013b).

A more detailed analysis of abandoned mines suggested a path forward. Currently, most methane capture at abandoned mines occurs at mines that captured methane for pipeline injection when they were active. In fact, all mines that captured methane and were closed within the last ten years continued to capture methane after being abandoned. Methane capture at this subcategory of mines is undoubtedly common practice. Accordingly, CARB narrowed its eligibility criteria in the final protocol it adopted in April 2014, excluding those abandoned mines where methane had been captured and injected into pipelines when the mine was active (CARB 2014b, p. 14).

Our calculations showed that this approach excludes most, but not all, of the non-additional crediting that would conceivably be generated under CARB's initial definition of common practice at abandoned mines. While most non-additional methane capture is excluded from crediting by the narrowing of CARB's eligibility criteria for abandoned mines, past trends suggest that a smaller amount of methane capture may still be cost-effective on its own. We performed a quantitative analysis on the narrowed pool of eligible projects.

We found that if past trends in the development of new methane capture projects at abandoned mines that never previously captured methane were to continue, the expected generation of credits from non-additional projects is likely to be small compared to the expected effect of the protocol on new project development. Our analysis further indicated that under-crediting from conservative methodologies used to estimate emission reductions from abandoned mines under the protocol can reasonably be expected to counterbalance this non-additional crediting.⁷ In other words, even though it is likely that some abandoned mines that would have chosen to implement methane capture technology regardless of the offset credit could generate credits under the protocol, the total quantity of offset credits generated by the protocol is unlikely to exceed the net emission reductions enabled by the protocol.

⁷For a more detailed description of this assessment, please see comments submitted by Barbara Haya on behalf of our research team dated February 14, 2014, "RE: Comments on the informal draft of the Mine Methane Capture (MMC) Projects Compliance Offset Protocol released 31 January 2014" available on California Air Resources Board's Workshop Comments Log: <http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=discussion-draft-ws>.

As a result, we concluded that the protocol is expected to meet the additionality requirement defined under AB 32.

In addition to describing how the regulator's approach to a particular technical issue evolved during the MMC protocol development process, this example illustrates a methodological issue that speaks to the broader architecture of California's offsets policy. CARB's common practice approach appears to be designed to avoid the subjectivity of other eligibility metrics by referring to objective measurements of the frequency of emission-reducing activities. Nevertheless, we believe that this approach belies a persistent analytical subjectivity. As the abandoned mine issue shows, how CARB defines the population of project types against which it makes its common practice determination has important implications for the additionality of the offset protocol as whole. This example illustrates the importance of performing additionality assessments on subcategories of projects and conservatively excluding subcategories that could be considered common practice. More broadly, it also shows that the decision to use a common practice standard does not avoid the need for careful risk assessments of possible outcomes; these assessments remain necessary to identify appropriate project eligibility criteria that contain the risk of over-crediting.

15.2.4.3 Potential Conflicts with Clean Air Act Implementation

Our final example concerns a prospective impact that could occur beyond offset project boundaries. Here, our analysis focused on the potential for California's MMC protocol to interfere with other states' implementation of regulations under the federal Clean Air Act. The problem is this: although California's offset regulations exclude as ineligible those offset projects whose emission-reducing activities are separately required by law, they do not consider the incentive California's offset protocols create to keep legal standards in other jurisdictions low.

Under the Clean Air Act, any major new source of greenhouse gases is required to apply for a Prevention of Significant Deterioration (PSD) permit from its state environmental agency. In turn, the state agency is required to determine the best available control technology (BACT) for that particular project. State agencies have broad discretion in setting each project's BACT, with limited room for the federal Environmental Protection Agency (EPA) to review their findings. We expressed concern that California's MMC protocol would create incentives for out-of-state agencies to keep GHG BACT standards for mines artificially low. After all, were an out-of-state regulator to require methane destruction under the BACT determination for a PSD permit that methane destruction project would become ineligible for offset credits (and revenues).

In order to mitigate this risk, we recommended a do-no-harm precaution, temporarily excluding from the MMC protocol those mines that would require a PSD permit under the Clean Air Act. Once a specified number of PSD permits were

issued to comparable mines, however, we suggested the MMC protocol could then expand its eligibility to mines that required PSD permits—so long as the early BACT determinations indicate that this course would be appropriate. Ultimately, these issues were not addressed in the adopted protocol and will be monitored informally.

15.3 Conclusions

The development of two new carbon offset protocols in California provides a rich case study in science-based policy-making. As public members of the technical working groups established by the California Air Resources Board, we both observed and contributed to the scientific discussions that arose during the course of protocol development. In addition to responding to the issues and questions raised by CARB directly, we—along with other outside scientists—played an essential role in expanding the protocol development discussion.

Most importantly, our engagement focused extra attention on the robustness of the protocols, providing strategies to avoid over-crediting despite substantial uncertainty in predicting protocol outcomes. Robustness is critical in the development of carbon offset protocols because of the significant scientific and behavioral uncertainty involved in accurately calculating emission reductions from individual projects. Fundamentally, this uncertainty stems from the challenge of estimating emission reductions (and the number of offset credits awarded) against an inherently unknowable counterfactual scenario of what would have happened without the offset program. Because offset credits are used in place of emission reductions within existing climate policy systems, methodological decisions must be made conservatively and guided by scientific risk assessments in order to avoid weakening these systems. Protocols should also be responsive to new scientific information and changes in the socioeconomic drivers of emissions. By conducting independent analyses of these kinds of issues, we aimed to increase the agency's capacity to evaluate key risks and improve the robustness of the offset protocols.

Finally, we hope the examples in this chapter encourage more members of the scientific community to seek ways to actively engage the development of climate policies. Although the offset protocols on which we worked were certainly informed by traditional scientific publications, our experience shows how the full treatment of scientific issues in the policy process occurs more through direct participation than literature reviews. Many of the critical policy questions involving science and uncertainty analysis would be difficult, if not impossible, to anticipate from a detached distance. In addition, their successful resolution depends on professional relationships built through iterative interactions in the policy process. Collectively, these factors suggest the need for more academics to explore ways to actively engage the climate policy process in the future.

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POLICY BRIEF: The California Air Resources Board's U.S. Forest offset protocol underestimates leakage

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SUMMARY

Analysis of projects generating 80% of total offset credits issued by the California Air Resources Board's (ARB) U.S. Forest offset protocol finds that 82% of these credits likely do not represent true emissions reductions due to the protocol's use of lenient leakage accounting methods. The U.S. Forest protocol has generated 80% of the offset credits in California's cap-and-trade program. The total quantity of emissions allowed because of this over-crediting equals approximately 80 million tons of CO₂, which is one third of the total expected effect of California's cap-and-trade program during 2021 to 2030 (ARB 2017).

Leakage, in the context of the protocol, occurs when a reduction in timber harvesting at a project site causes an increase in timber harvesting elsewhere to meet timber demand. The way ARB's protocol accounts for leakage when calculating the number of credits awarded has three serious problems.

First, the protocol uses a 20% leakage rate when a rate of 80% or higher is supported by published studies of leakage rates from reduced timber harvesting in the United States (Gan & McCarl 2007, Wear & Murray 2004). Using an unsupported low rate results in over-crediting.

Second and more importantly, there is an inconsistency between the timing of when increases in on-site carbon storage and releases due to leakage are accounted for in the protocol's methods. Most improved forest management projects assume and credit a large reduction in timber harvesting in the first year of the offset project, but deduct the associated leakage over 100 years. This outcome is physically inconsistent, as it assumes the forest would be harvested in the first year for the purpose of giving credit but assumes harvesting would be spread out over 100 years for the purpose of reducing credits to account for leakage. As a result, most forest offset projects begin in greenhouse gas debt; project landowners generate offset credits that allow emitters in California to emit more than the state's emissions cap today, in exchange for promises that their lands will continue to increase their storage of carbon over 100 years.

Third, it is unclear whether the protocol requires forestland owners to increase carbon stocks to cover leakage for 25 years or for 100 years. The ambiguity relates to whether forestland owners are required to continue to maintain on-site growth to cover the impacts of leakage after the end of the project's 25-year crediting period. If forestland owners are only required to account for leakage for 25 years, participating projects could result in no net increase in carbon storage over 100 years compared to the baseline scenario.

The below table presents the actual emissions reductions achieved by projects under the protocol under different assumptions, reported as proportions of the credits already issued. For example, the cell on the upper left (100%) represents the assumptions underlying current policy. If these

assumptions are accurate, then 100% of the credits issued represent true emissions reductions. On the other hand, if these assumptions are inaccurate, the proportion of credits that represent actual emissions reductions can be much lower. The cell on the lower right (18%) shows that if the true leakage rate is 80% and ARB chose to only credit reductions already achieved, rather than reductions expected in the future, then the real reductions achieved to date by the project add up to only 18% of the credits issued.

This analysis was performed on all credits generated by 36 compliance forest offset projects through March 23, 2019. Collectively, these projects generated offset credits equal to 97 million tons of CO₂ reductions, which is 80% of the total credits that ARB has issued under its U.S. Forest protocol.

Actual emissions reductions by U.S. Forest offset projects as percent of credits issued to date

		Expected over 100 years (ARB's current approach)	Achieved to date (Recommended approach)
If the true leakage rate is:	20%	100%	65%
	40%	99%	49%
	60%	97%	33%
	80%	96%	18%

ARB can avoid the over-crediting discussed here with a few modifications to its protocol. ARB should (1) apply a leakage rate that is 80% or higher; and (2) determine the net benefits of reduced harvesting on an annual basis by accounting for both the increased carbon storage on site and the decreased carbon storage elsewhere due to leakage at the same time. This solution is reflected in the bottom right cell of the above table (18%).

These changes are needed for the protocol to be in accordance with current law and regulation. First, given the uncertainty in true leakage rates from reduced timber harvesting within the United States, using an 80% leakage rate or higher, as is supported by the academic literature, better fulfills the conservativeness principle laid out in ARB's cap-and-trade regulations.¹ Using low rates that are not reflected in published literature is unjustified and does not fulfill the conservativeness principle. Second, generating credits today for expected net reductions over many decades into the future runs contrary to the goals of California's Global Warming Solutions Act (AB32), the 2006 law authorizing California's cap-and-trade and offsets programs. This law states that for any trade in credits using a market-based compliance mechanism, the reductions credited should occur "over the same time period" and be "equivalent in amount to any direct emission reduction required" under California's climate change law.²

¹ " 'Conservative' means, in the context of offsets, utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements." California Code of Regulations, title 17, § 95802.

² California Health & Safety Code § 38562(d)(3).

DETAILED DISCUSSION

How the U.S. Forest offset protocol works

The large majority of U.S. Forest offset projects credit forestland owners for holding more carbon on site per acre than they would have in the business-as-usual baseline scenario. Landowners must commit to maintaining those higher carbon levels for 100 years. Projects can be anywhere in the United States, and to date, approximately 20% of credits generated have been from projects in California, and 80% have been from projects elsewhere in the United States.

Most of these improved forest management projects define a business-as-usual baseline scenario that involves aggressive timber harvesting that brings on-site carbon storage close to the average per acre for forests in their region. The assumption is that these offset projects maintain higher on-site carbon stocks by reducing timber harvesting.

In the first year of an improved forest management offset project, the landowner earns offset credits for the amount of carbon on their land above the business-as-usual baseline scenario minus two factors. First, estimates of carbon released due to leakage are deducted. Second, not all loss of on-site carbon is released into the atmosphere. The protocol accounts for the portion of harvested timber that remains long-term in wood products like in houses and furniture and buried in landfills, which would be reduced if total timber harvesting is reduced by the project. Each subsequent year, the landowner is credited for any incremental increase in carbon sequestration on the participating lands as trees grow and sequester more carbon, minus the same two factors.

Leakage rate

ARB's U.S. Forest offset protocol uses a 20% leakage rate. A 20% leakage rate means that 20% of the reduction in timber harvesting caused an offset project is replaced by an increase in harvesting on other forestlands. The other 80% of the reduction is assumed not to be replaced and simply represents a decrease in timber use (i.e., fewer houses built, less paper produced, etc.)

Published literature suggests the leakage rate from reduced timber harvesting in the United States is at least 80%. Using a computable general equilibrium model, Gan & McCarl (2007) estimate that if timber production were reduced in the United States, 77% of that that timber harvesting would be displaced to other countries. Wear & Murray (2004) use econometric modeling to trace the effects of reductions in federal timber sales in the western United States in the late 1980s through the 1990s. They estimate that 84% of the reduced timber production was displaced to elsewhere within North America. Both articles underrepresent total leakage from conservation on U.S. forestlands. The former only estimates international leakage, ignoring leakage that might occur among forestland within the United States; the latter only estimates leakage in North America, ignoring leakage that could occur elsewhere. The existing academic literature on leakage rates from reduced forest harvesting does not support a 20% leakage rate. A conservative approach to addressing uncertainty in the true leakage rate would apply a leakage rate that is at least 80%.

The Climate Action Reserve, which developed the original U.S. Forest offset protocol on which ARB based its own protocol, revised its leakage rate from 20% to a sliding scale up to 80%,

depending on the amount of timber harvesting performed by the offset project itself. Under this protocol, an 80% leakage rate is applied to offset projects that do not harvest at all.

The timing issue explained

As is typically done with offset projects, emissions reductions are estimated against a baseline scenario representing what would likely have happened without the offset program. Almost all ARB improved forest management offset projects define baseline scenarios that are well below their actual carbon stocks in their first year. On average across all projects analyzed, these baselines equal 70% of current carbon stocks. This means that in the first year of a project, the land owner is issued a quantity of credits equal to, on average, around 30% of the carbon stocks on their project lands, adjusted downward to account for leakage and any reduction in carbon held long-term in harvested wood products and landfills.

To create a baseline, the landowner models the carbon stocks and fluxes associated with a 100-year timber harvest scenario that reflects the harvesting expected to take place without the financial incentives from the offset program. The modeled scenario should be financially feasible and fulfill all legal and contractual obligations. In order for most projects to earn credits under the protocol, the calculated average carbon stocks in the baseline scenario over 100-years should be no less than that of the average forestlands for the project's region and forest type.

This modeled scenario is then abstracted into two key parameters used to calculate emissions reduced and credits generated by the project. Baseline on-site carbon storage and harvesting rates are assumed to equal the average values generated by the modeled scenario over 100 years. This simplified baseline is treated as equivalent, in terms of carbon accounting, to the range of financially feasible timber harvest scenarios that could have happened without the offset program. Flat average baseline values have the advantage of not requiring the landowner to calculate year-to-year increases in carbon storage against the harvest and growth cycles in one specific baseline management regime for each of 100 years. But this approach has one important disadvantage—flat average baseline values for carbon storage and harvest rates are internally contradictory and physically impossible.

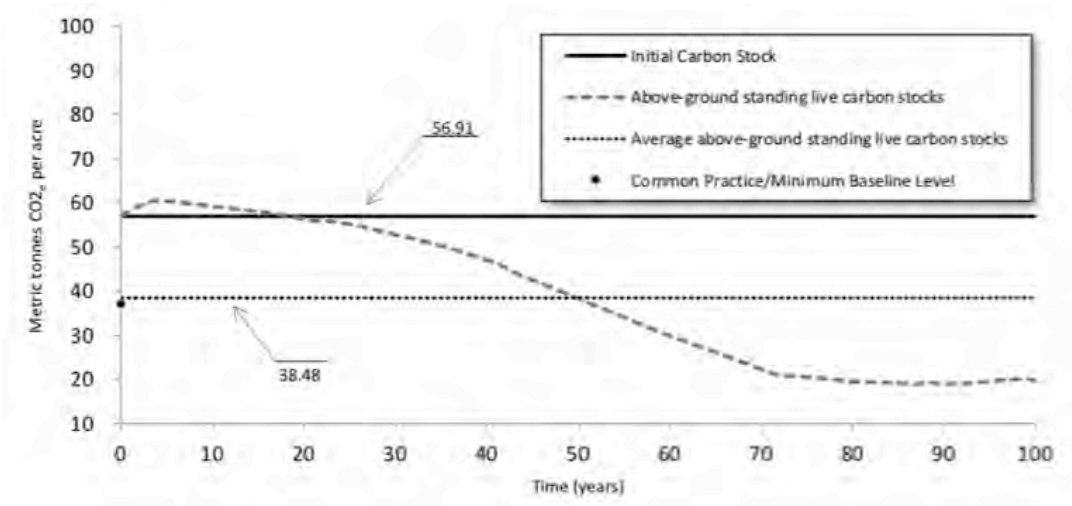
The figure below presents an example of a modeled harvesting scenario used to define the baseline for one large offset project – ACR360, a half million acre project in southern Alaska. The curved dotted line is the modeled business-as-usual scenario for above-ground standing live carbon stocks. The straight dotted line is the baseline used to generate credits, which is the average above-ground standing live carbon stock in the 100-year modeled scenario. The solid line is the actual carbon storage on the project lands at the start of the project.

This simplified baseline scenario suggests that, if the project were not earning offset credits, its lands would be harvested to baseline levels in year 1 and maintained at those carbon stocking levels for 100 years. However, contradicting this assumption, the baseline also assumes that a constant quantity of timber is harvested each year over the project life, equal to the average rate over the 100-year modeled scenario. This second assumption is used to calculate leakage.

These two assumptions are contradictory because it is not possible for both carbon storage and harvesting to simultaneously remain at their respective average values over the project life. Carbon storage and harvesting rates are correlated with one another, and inextricably tied to the actual net growth rate of the project forest. If carbon storage is assumed to drop to the baseline in year 1, that

would happen because of a large amount of timber harvesting. If the harvesting rate is assumed to be constant over 100 years, however, then the carbon storage on the land will also decrease slowly, rather than abruptly in year 1. By mixing these two assumptions into a physically impossible baseline scenario, the protocol maximizes credits generated without reflecting the actual rate at which emissions to the atmosphere are avoided. The protocol calculates gains in carbon against the baseline using the first assumption, and losses in carbon from leakage using the second assumption. As a result, credit generation is frontloaded, and landowners need to continue to increase net carbon storage for decades to make up for the leakage effects associated the reduced harvesting credited at the start of the projects.

Baseline carbon stocks for Finite Carbon – Ahtna Native Improved Forest Management offset project



From: ACR360 “Finite Carbon – Ahtna Native Alaskan IFM” Version 1.3, Attachments G and H: Baseline Carbon Stocks, Submittal Date: 1/19/2018

This over-crediting allows emitters in California to emit more than the state’s emissions cap today in exchange for promises of forest carbon sequestration over 100 years to cover leakage from the start of the project. This is problematic for several reasons. First, emissions today are not equivalent to reductions decades from now given the urgency of climate change mitigation to avoid tipping points. California is designing its cap-and-trade and offset programs as models for other jurisdictions. If California exports a model that trades emissions today with reductions decades from now, California would promote a form of climate policy that fails to reduce emissions in these immediate critical years. Second, these promises can be difficult to keep since productivity slows in ageing forests (Gray et al 2016) and as forests respond to a warming climate. On project lands with less harvesting, fewer older trees will be replaced with younger trees, and the average tree age will increase over the 100 years of the project.

ACR360 generated close to 15 million offset credits in its first year, equal to more than 60% of the expected average annual effect of California’s cap-and-trade program on emissions during 2021-2030.

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

The 25 year versus 100 year issue explained

If forestland owners are required to increase carbon to cover leakage for 100 years, then there would be no over-crediting over 100 years of the project. Over-crediting in the early years of the project would slowly be compensated as leakage is deducted each year for the project life.

However, it is unclear whether the protocol requires forestland owners to account for the emissions from leakage for 25 or for 100 years. The crediting period of a U.S. Forest offset project is 25 years. After the end of each 25-year crediting period, landowners can choose to renew their offset project for another 25 years but are not required to do so. For each year of a crediting period, landowners must report the net impact of the project on emissions taking into account any change in on-site carbon storage, and any releases due to leakage or reductions in carbon held long-term in harvested wood products and in landfills. If the net impact of the project in any year is negative, a *reversal* is understood to have occurred. The carbon reductions that were previously credited and later released must be replaced with additional procurement of allowance or offset credits.

How a reversal is defined after the last year of crediting is unclear in the protocol. Following the last year of crediting, forestland owners are required to maintain the credited on-site carbon storage for another 100 years. It is unclear if they are also required to ensure their forestland continues to grow to cover off-site releases due to leakage and due to reductions in carbon held long-term in harvested wood projects and landfills.

If forestland owners are only required to account for leakage for 25 years, crediting for reduced harvesting in the first year of the project will be awarded in full, while potentially, as low as only 1% of the leakage associated with that reduced harvest is deducted each year for only 25 years. It would be possible for participating projects to result in a net decrease in carbon storage over 100 years compared to the baseline.³

Methods

Landowners report how they calculate their requested credit issuance in Offset Project Data Reports (OPDRs) based on instructions laid out in the protocol. These reports are made public through the offset registries. We reproduce these calculations for all credits issued to 36 projects as of March 23, 2019. We use data provided by the landowner in their OPDRs and supplemental materials, and adjust the projects' assumptions for leakage and the timing of harvesting in the baseline to investigate the quantity of over-crediting.

Adjusted leakage rate

Using data reported in the OPDRs, we reproduce the calculations of leakage (also called *secondary effects*), carbon in harvested wood products and landfills (HWP&L), and total reductions achieved using leakage rates of 40%, 60%, and 80% instead of 20%.

³ Please see public comments submitted to ARB on May 10, 2018, *Comments on proposed cap-and-trade regulatory amendments*, for a more detailed discussion of this need to clarify and revise how the protocol defines a reversal after the last year of credit issuance, found at <http://bhaya.berkeley.edu>.

Adjusted timing of baseline harvesting

We recalculate the credits that would have been generated if the protocol's leakage calculations matched its assumption that timber is harvested in year 1 of the baseline scenario to bring carbon storage down to baseline levels, and continues to be harvested at smaller rates needed to maintain the baseline carbon storage level for one hundred years.

We do this in the following manner:

First, the baseline harvesting level prior to delivery to the mill (PDM) in the first year of the project is calculated as the difference between standing live carbon in the project compared to the baseline.

Second, we calculate the baseline carbon in trees harvested in years 2 to 100 so that the sum of the baseline PDM over 100 years is the same as the sum using ARB's current methods. We calculate the baseline PDM in years 2 through 100 (99 years) as:

$$PDM_{\text{annual after year 1}} = (PDM_{\text{total}} - PDM_{\text{year 1}}) / 99$$

Third, we recalculate the carbon in baseline HWP&L in a similar manner, by:

- a) using the ratio of HWP&L to PDM in year 1 of the baseline in the OPDR to recalculate carbon in HWP&L in year 1 of the baseline for the revised PDM value;
- b) calculating carbon in HWP&L in years 2 through 100 using the same process as for timber harvesting, so that the sum of carbon in HWP&L over 100 years of the baseline is the same in our estimates as it is in ARB's current estimates over the project life;

Fourth, we recalculate emissions reductions from the project using these revised leakage and carbon in HWP&L figures, and otherwise following the methods defined by the protocol.

When baseline or project PDM figures are missing from any of the OPDRs, we calculate the missing PDMs mathematically from other reported figures when possible, and apply the following assumptions when needed:

- The ratios of carbon in HWP&L to PDM remain the same across reporting periods.
- When the first reporting period does not equal exactly one year, the PDM in the first year is a prorated amount, reflecting what most projects with at least two reporting periods have done.
- The ratio of carbon in HWP&L to PDM is the same in both the baseline and project scenarios.

Other than the changes and assumptions described above, we repeat the methods used in the OPDRs to re-estimate emissions reduced and credits generated.

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Counting California Forest Carbon Offsets

Greenhouse Gas Mitigation Lessons from California's
Cap-and-Trade U.S. Forest Compliance Offset Program

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Cover photo from Flickr Creative Commons, available at <https://goo.gl/6lbL3Q>.

Executive Summary

In 2013, California launched a multisector cap-and-trade market designed to reduce greenhouse gas pollution and meet the greenhouse gas mitigation targets set forth in Assembly Bill 32 (2006). Building on many years of effort and policy deliberation, California included in the cap-and-trade market the ability for covered entities with a compliance obligation to pay actors outside the program to reduce *their* emissions, frequently referred to as purchasing ‘offsets’. Since 2013, California has operated a first-of-its-kind forest carbon offset program, in which 39 forest projects across the United States have earned credits through July 2016.

This research analyzes California’s experience in running a first-ever compliance offset program for forests. To our knowledge, no official program evaluations of the forest offset program have been conducted to date. In the absence of identified and measurable official metrics and goals, this paper takes a more general ‘lessons learned’ approach, asking what the State has gotten from this policy innovation and what insights can be applied to other forest carbon sequestration efforts, like California’s ongoing natural and working lands inventory.

From project design document review, survey responses and interviews with project owners and developers, we have four core findings. First, the California program has gone much further towards assuring additionality than other programs, including most voluntary forest offset programs, though some lingering and perhaps unavoidable questions remain. Second, a wide variety of California compliance entities buy forest offset credits, including some that operate facilities located in areas identified by the State as disadvantaged communities. Third, environmental benefits have been created by the program, though their financial importance may be minimal. Finally, California has taken forest offset protocols and policy to new levels, though the future of the market is quite uncertain given the need for supermajority reauthorization of the cap-and-trade program.

This paper first provides an overview of the forest offset program, its history and development, and some data about the current state of the program. It then describes the methods used in this study, and presents the above findings in detail. It concludes by illustrating several ‘lessons learned’ that should be incorporated by the Air Resources Board and cooperating agencies into the broader natural and working lands effort in California.

Overview and Development of the California Forest Carbon Offset Program

Before presenting the results of our research into the offset program, it is necessary to briefly describe the origins, history, policy design choices, and project performance of the California forest offset program in order to inform readers and put our findings in proper context. As of this writing, no comprehensive program evaluations have been conducted of the forest offset program.

Climate Change, Forests, and California Policy

Forest Carbon History and Potential

Forests have played an integral role in climate forcing emissions throughout American history, though only more recently have they served as a net carbon sink. Historically, American forests served as a significant net source of emissions in the 19th and early 20th Centuries, as old growth forests were harvested and trees were a primary building material and energy source. As fossil fuels replaced wood as a fuel source, and as forests regrew in the middle decades of the 20th Century, American forests became a net carbon sink, reaching their lowest net emissions rate (or, alternatively, highest carbon storage rate) in the 1980s. Since then, increased harvesting has lessened American forests' utility as a carbon sink, however significant carbon storage potential remains if deforestation is avoided in the 21st Century.¹ It has been estimated that forest carbon sequestration is equivalent to 12-19% of US fossil fuel emissions,² and the Obama Administration's Climate Action Plan noted the sequestration role being played by US forests,³ though net carbon sinks from land use and forestry changes have been smaller in recent years than in 1990.⁴

California's Experience

Although the concept of forest offsets and other land use-related policies designed to incentivize carbon sequestration stretch back before the adoption of the

¹ Richard Birdsey et al., *Forest Carbon Management in the United States: 1600-2100*, 35 J. ENVIRON. QUAL. 1461, 1465 (July 2006).

² Michael Ryan et al., *A Synthesis of the Science on Forests and Carbon for U.S. Forests*, ISSUES IN ECOL. 13 (Spring 2010), at 1.

³ Executive Office of the President, THE PRESIDENT'S CLIMATE ACTION PLAN (June 2013), at 11, available at <https://goo.gl/KX1ULM>.

⁴ See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015* (February 2017) (Table 6-3 at 6-3, 6-4), available at <https://goo.gl/GYpaXH>.

Kyoto Protocol,⁶ California's commitment to forest offsets can be traced to Senate Bill (SB) 1771 (Sher) in 2000.⁷ That bill established the California Climate Action Registry (CCAR), a voluntary emissions inventory established by the state to define, measure and track greenhouse gas emissions. As part of its Climate Change Inventory, CCAR was instructed to acquire and develop data on the "costs, technical feasibility, and demonstrated effectiveness of . . . net reductions through the management of natural forest reservoirs."⁸

Land trust organizations sought to take this forest carbon data-gathering role at CCAR further, and promoted Senate Bill 812 in 2002 (Sher).⁹ SB 812 directed CCAR to develop procedures and protocols for measuring and crediting the emissions impacts of "conservation and conservation-based management [activities in] . . . native forest reservoirs in California" that went beyond "applicable federal, state, and local land use laws and regulations."¹⁰ How, exactly, CCAR would implement this measuring and crediting was a policy design task delegated to a state-convened working group that engaged land trusts, state foresters, forest industry representatives and an electric utility.¹¹

This first 2002-2005 working group fleshed out many of the initial policy design questions, which led to the opening of California's voluntary carbon offset market in 2005. Importantly, from the very beginning, the state focused on a carbon-based payment structure, that is, strict accounting for forest carbon on a per-ton basis that could interface with cap-and-trade programs. The state chose not to take a practice-based or area-based payment approach to offset crediting that would have involved more general and less reliable carbon estimation and impact assumptions.¹² This tradeoff likely resulted in greater carbon sequestration from the projects who participated, perhaps multiple times more, but at the price of increasing project development and monitoring costs and thus a smaller population of potentially eligible projects. Indeed, this initial voluntary protocol (and its update in 2006) drew criticisms from other landowners not involved in conservation or conservation-based

⁶ Cornelis van Kooten et al., *How Costly Are Carbon Offsets? A Meta-Analysis of Carbon Forest Sinks*, 7 ENVION. SCI. & POL. 239, 239 (2004); Marissa Schmitz and Erin Kelly, *Ecosystem Service Commodification: Lessons from California*, 16 GLOB. ENVIRON. POLIT. 90, 90 (Nov. 2016). See also Mark Trexler et al., FORESTRY AS A RESPONSE TO GLOBAL WARMING (1989), available at <http://goo.gl/Pwd8sg>.

⁷ 2000 Cal. Stat. 7482 et seq. (Ch. 1018).

⁸ 2000 Cal. Stat. 7493 (Ch. 1018).

⁹ Schmitz and Kelly, *supra* note 6 at 97.

¹⁰ 2002 Cal. Stat. 2406 (Ch. 423).

¹¹ Schmitz and Kelly, *supra* note 6 at 97.

¹² See Ing-Marie Gren and Abenezer Aklilu, *Policy Design for Forest Carbon Sequestration: A Review of the Literature*, 70 FOREST POL. & ECON. 128, 130 (discussing studies of policies that took these approaches, at left).

management, as its stringent environmental and permanence requirements made initial participation rather unattractive for many for-profit private landowners and the California forest industry at the prices offered by voluntary carbon markets.¹³

A second working group, engaging more forest industry participants, followed after passage of California's landmark Assembly Bill (AB) 32 in 2006. From the beginning of planning the cap-and-trade portion of AB 32 compliance, the California Air Resources Board (ARB) signaled that forest offsets would play a cost-containment role in this new market. Cost-containment was an important concern – ARB's expectations for carbon prices in the cap-and-trade market ranged as high as \$50/ton before the market began operating¹⁴ (though in actual program experience, the allowance price has not risen above \$20/ton since market launch¹⁵). Eventually, the State decided that entities could use offsets to meet up to 8% of their compliance burden, though use of offsets was optional and no particular participation goals were set.¹⁶ With all reductions required to be “real, permanent, quantifiable, verifiable, enforceable, and additional” under AB 32,¹⁷ the second protocol working group focused on “revis[ing] the early protocol to make it compliance-ready,” a shift that had never before been attempted in any other jurisdiction.¹⁸ In addition, to serve the goal of maximum participation and lower project costs (thus greater cost-containment for the cap-and-trade market), the new protocol was to be available for use nationwide, not just for projects in California.¹⁹

¹³ Schmitz and Kelly, *supra* note 6 at 92, 97.

¹⁴ Marc Lifisher, *California's First Auction of Greenhouse-Gas Credits Nears*, L.A. TIMES (November 6, 2012), available at <https://goo.gl/hjzu2F>

¹⁵ Danny Cullenward and Andy Coghlan, *Structural Oversupply and Credibility in California's Carbon Market*, 29 ELECTR. J. 7, 9 (2016).

¹⁶ See California Air Resources Board, Resolution 11-32 (October 2011), at 4, available at <https://goo.gl/s3IbTZ>; see also Press Release, CARB, California Air Resources Board Adopts Key Element of State Climate Plan (Release 11-44; October 20, 2011) available at <https://goo.gl/le0q5M>.

¹⁷ CARB, California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation [hereinafter Protocol FAQ], at 1, available at <https://goo.gl/DL8ZoV>; 2006 Cal. Stat. 3427 (Ch. 488), now CAL. HEALTH AND SAFETY CODE § 38562(d) (2017). See also Timothy Fahey et al., *Forest Carbon Storage: Ecology, Management, and Policy*, 8 FRONT. ECOL. ENVIRON. 245, 249 (2010) (providing a more general elaboration on what these terms entail in the forestry context).

¹⁸ Schmitz and Kelly, *supra* note 6 at 100, 101.

¹⁹ Protocol FAQ, *supra* note 17 at 10.

Program History: The Design Challenges of Forest Offsets

Two Key Periods of Policy Design

Throughout this formative period from 2002-2009, when California went through two full rounds of forest offset protocol design, stakeholders grappled with five critical design challenges in creating standards for offset projects. First, three commodification hurdles stemming from the United Nations Framework Convention on Climate Change proceedings had to be navigated: additionality, permanence, and leakage.²⁰ In short, to deliver credible climate mitigation, carbon offset projects must only receive credit for emissions reductions that would not have otherwise happened without program intervention (i.e. be ‘additional’ versus a conservative, business-as-usual scenario), must show that the reductions they deliver will persist over time (be ‘permanent’) and must demonstrate that no other emission-causing land use changes will result (no ‘leakage’). In addition, two other design challenges were present – how to maintain the environmental integrity of forests managed for carbon storage, and how to ensure market availability and acceptance of offsets as a salable commodity. Table 1 below summarizes how the 2002-05 and 2007-09 working group protocol-writing periods addressed these key design questions.²¹

²⁰ Steven Ruddell et al., *The Role for Sustainably Managed Forests in Climate Change Mitigation*, 105 J. OF FORESTRY 314, 316-17 (September 2007). The Kyoto Protocol’s Clean Development Mechanism offset program uses similar, though not exactly the same, terms. See UN Framework Convention on Climate Change, GLOSSARY – CDM TERMS (Version 8.0) (defining “additional”, “leakage”, and “long term certified emissions reduction”), available at <https://goo.gl/rZQCQ3>.

²¹ One update did occur between these dates in 2007, though most of the changes came with respect to more technical details of forest data and verification steps. See Climate Action Reserve, VERSION 2.1 at <https://goo.gl/HpcpJJ> (last visited March 15, 2017).

Table 1. Protocol Evolution on Key Design Questions, 2005 and 2009

<u>Design Challenge</u>	<u>Description</u>	<u>Early Protocol Approach</u> (Version 1.0, 2005) ²²	<u>Compliance-Ready Protocol Approach</u> (Version 3.0, 2009) ²³
Additionality	Proving emissions reductions as compared to a no-project counterfactual (a 'baseline')	<ul style="list-style-type: none"> • Crediting sequestration on project lands up to the maximum allowable harvest under CA forest rules 	<ul style="list-style-type: none"> • Quantifying primary effect, consisting of: Crediting sequestration on project lands above a standardized Common Practice baseline, taking into account growth models, legal obligations and project start date
Permanence	Delivering a long-term guarantee of emissions reductions	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement 	<ul style="list-style-type: none"> • Requiring a 100-year commitment • Percentage contribution to buffer pool of credits depending on project-specific reversal risks • Allowed voluntary termination
Leakage	Preventing concomitant emissions from induced land use change and activities elsewhere	<ul style="list-style-type: none"> • Perform an assessment for activity-shifting leakage (required) and market leakage (optional) 	<ul style="list-style-type: none"> • Quantifying secondary effects, including a project-specific leakage adjustment factor, but not including energy effects of alternate materials. • Market leakage adjustment only for IFM projects
Environmental Integrity	Guaranteeing sustainable and environmentally-conscious management (i.e. avoiding mere 'tree farm' projects)	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement • Maintenance of native forests • Natural forest management (preventing even-aged cutting) 	<ul style="list-style-type: none"> • Requiring adherence to sustainable harvesting practices (certification) • Natural forest management for the project area • Increasing standing live carbon stocks
Market Availability and Acceptance	Ensuring offset credit availability and purchaser confidence for a functioning offset market	<ul style="list-style-type: none"> • Five-year third-party certification of forest project results 	<ul style="list-style-type: none"> • Lifting the conservation easement requirement • Permitting even-aged management (with limits) • Six-year third-party verification, with periodic desk reviews

As Table 1 details, the two California working groups engaged in an intricate policy design process in order to meet AB 32's requirement that offsets be real, permanent, quantifiable, verifiable, enforceable, and additional. Several tradeoffs were made in order to expand the possible pool of projects that could participate across the

²² Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 1.0 (September 2005) at <https://goo.gl/1oyTIs> (last visited March 15, 2017) (see PDF of that name on this webpage).

²³ Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.0 (September 1, 2009) at <https://goo.gl/5clWdB> (last visited March 15, 2017) (same).

program. Changes were made to the additionality, permanence and environmental integrity requirements that facilitated greater program participation.

Analyzing California's Protocol Changes in the Second Working Group

For additionality, California first chose a performance benchmark test in 2005, allowing credit above harvest floors permitted by California regulations.²⁴ Once the program expanded to cover the continental US, however, a new approach was needed rather than one reliant on California regulations.²⁵ The second 2009 working group developed a multi-part approach to additionality that would be applicable across the country. Projects would only receive credit for:

- 1) actions taken after a defined project start date;
- 2) sequestration above all legal, regulatory and financial harvesting and stocking constraints; and,
- 3) credit relative to an area-specific 'Common Practice' baseline developed using US Forest Service Forest Inventory and Analysis Program Data ('FIA data').

This approach combines three types of additionality 'tests'—legal or regulatory, common practice, and timing tests, as identified in Trexler et al (2006). This generally represents a more stringent approach to additionality than in the earlier 2005 protocol. Having multiple additionality screens almost certainly increases the proportion of credited reductions in the program that are truly additional, but at a higher cost of participation and with less supply flexibility.²⁶

Stakeholders also eased the permanence requirement to broaden participation. In order to incentivize lands managed for multiple uses (and not just conservation management), the 2009 protocol no longer required conservation easements. Instead, projects were required to give a 100-year sequestration commitment, and agree to set aside a project-specific proportion of their credits in a 'buffer pool' as insurance against later losses of carbon stock, referred to as 'reversals'.

This permanence policy change no doubt made the program more attractive to for-profit timber companies and family landowners, though it did not eliminate all potential reversal risks program-wide. Buffer pools, later described as the "most commonly used" approach to program impermanence risk, neatly manage the

²⁴ See Mark Trexler et al., *A Statistically-Driven Approach to Offset-Based GHG Additionality Determinations: What Can We Learn?*, 6 SUSTAIN. DEVEL. L. & POL. 30, 31 (Winter 2006) (describing various illustrative types of additionality 'tests').

²⁵ In general, states must be careful about designing state programs that affect out of state entities, since regulations with 'extraterritorial' effect are vulnerable to legal attack under the Commerce Clause of the US Constitution or federal laws. See generally *North Dakota v. Heydinger*, 825 F. 3d 912 (8th Cir. 2016) (finding that a Minnesota clean energy law had impermissible out of state effect).

²⁶ See Trexler et al., *supra* note 24 at 38 (showing tradeoff between flexibility and additionality in Fig. 8).

individual risk of projects by essentially making them insure both themselves and others in the currency of the program – credits. However, this approach to risk does *not* take into account program-level reversal risks, i.e. the fact that individual project risks may under certain circumstances, be correlated.²⁷ The buffer approach essentially assumes that even if one project falls victim to a reversal event (e.g. a wildfire), most others will not. This program-level assumption may not hold if projects share certain common risk-relevant characteristics, like being located in close geographic proximity to one another. Cross-cutting risks, like the increased potential for wildfires as global temperatures rise and climate change progresses, can increase reversal risk across the board, not just for isolated individual projects.

Finally, with respect to environmental integrity, several changes helped make the program more attractive to timber companies and other landowners. Instead of a conservation easement, the 2009 protocol allowed a sustainable forestry certification to suffice as a commitment to environmental integrity. Though natural forest management remained a requirement, this definition was altered to allow some degree of even-aged management over portions of the project area, and in increments less than 40 acres. Projects were also expected to maintain or increase standing live carbon stocks,²⁸ as a way to promote biodiversity and wildlife habitat. In general, the 2009 protocol took several important steps to ensure greater participation while generally not changing the strict verification requirements that help facilitate investor confidence in offset credits.

Administration by ARB and Subsequent Challenges

The 2005 and 2009 protocols had been adopted pursuant to SB 1771 and SB 812, in stakeholder processes run through the CCAR, which was restructured and relaunched as the Climate Action Reserve (Reserve) in 2008. When ARB included forest offsets as part of the broader cap-and-trade program, however, the protocols then became official documents of the ARB, which noted that they had been drawn from version 3.2 of the Reserve's protocol.²⁹ After several years of accepting projects

²⁷ David Cooley et al., *Managing Dependencies in Forest Offset Projects: Toward a More Complete Evaluation of Reversal Risk*, 17 MITIG. ADAPT. STRATEG. GLOB. CHANGE 17, 17 (2011) (describing three different kinds of correlated catastrophic reversal risks – fat tails, micro-correlations, and tail-dependence – that may be present, yet are unaccounted for by buffer pools). See also Christopher Galik and Robert Jackson, *Risks to Forest Carbon Offset Projects in a Changing Climate*, 257 FOREST ECOL. & MGMT. 2209, 2209 (describing systemic climate risks not accounted for in project-by-project analysis).

²⁸ Compare the 2005 protocol, *supra* note 19 at 15-16, with the 2009 protocol, *supra* note 20 at 12.

²⁹ See CARB Resolution 11-32, *supra* note 13 at 10. See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: OCTOBER 20, 2011) [2011 Forest Offset Protocol], at 7 available at <https://goo.gl/OpLQvv>.

designated as Early Action, the compliance portion of the offset market launched in 2013 with the beginning of the cap-and-trade program.³⁰

ARB implemented compliance protocols based on the 2009 protocol and updated the protocol in 2011, 2014, and 2015. Most of the key issues described above have not changed in these updates, including project-level risk assessments.³¹ Some distinctions and developments have occurred across protocol updates, though there has been more consistency than change.³² Since 2011, ARB has mandated higher levels of professional education and skills in verification teams.³³ Also, two updates to the protocol were released in 2014 and then in 2015, along with growing amounts of interpretive guidance and FAQs posted on the ARB website.³⁴

Importantly, ARB's approach to additionality under this protocol and the other offset protocols was upheld as lawful by the California Court of Appeal in 2015 in *Our Children's Earth Foundation v. California Air Resources Board*.³⁵ That case decided that as a legal matter, ARB had the authority under AB 32 to implement the "standards-based approach" it has taken in adopting offset regulations and protocols since 2011, including for the US forest program.³⁶ CARB did not have to take an idiosyncratic project-specific approach to additionality, as the challengers had wanted. Observing that it is "virtually impossible to *know* what otherwise would have occurred in most cases," ARB could not be held to an additionality standard of omniscience and perfection – the legislature had directed ARB to "establish a workable method of

³⁰ CARB, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (updated February 9, 2015) at 2 <https://goo.gl/qxOSqZ>.

³¹ See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: JUNE 25, 2015) [2015 Forest Offset Protocol], at <https://goo.gl/hJuX8c>. See also CARB, COMPLIANCE OFFSET PROGRAM (updated March 8, 2017) (website with links to the protocols and other details from past iterations) available at <http://goo.gl/WUBm4Y>.

³² For example, starting with the 2011 protocol, ARB has used the language of 'intentional' versus 'unintentional' reversals in dealing with project owner compensation liability, whereas the previous protocols had distinguished between avoidable and unavoidable reversals, though the substantive standards remain the same. Compare 2011 Forest Offset Protocol, supra note 25 at 59 with Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.2 (August 31, 2010) at <http://goo.gl/XX3ubS> (last visited March 15, 2017) at 63. See also CAL. CODE REGS. tit. 17 § 95802(a)(190) (2017) (defining intentional reversal), available at <https://goo.gl/PUMgye>.

³³ See Climate Action Reserve, COMPARISON OF RESERVE FOREST PROJECT PROTOCOL TO ARB COMPLIANCE OFFSET PROTOCOL FOR FOREST PROJECTS (last accessed March 15, 2017), available at <https://goo.gl/jVrLLE> (comparing Version 3.2 to the first CARB protocol).

³⁴ See CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST OFFSET PROJECTS: ADOPTED JUNE 25, 2015 (updated December 2, 2015), available at <https://goo.gl/7XiB8G> (website explaining 2015 protocol).

³⁵ 184 Cal Rptr. 3d 365, 378 (2015). See also Alan Ramo, *The California Offset Game: Who Wins and Who Loses?*, 20 J. ENV. L. & POL. 109, 133-43 (Winter 2014), available at <https://goo.gl/eCWrlQ> (providing more background on the case).

³⁶ *Our Children's Earth Foundation*, 184 Cal Rptr.3d at 371, 373, 378.

ensuring additionality with respect to offset credits” in the context of “a market-based compliance mechanism,” which is precisely what ARB did.³⁷

Another important event came in 2014, when ARB recorded its first invalidation of offset credits under any protocol. The Clean Harbors Environmental Services waste incinerator in El Dorado, Arkansas participated in the Ozone Depleting Substances (ODS) protocol up until 2014, when a compliance issue with their hazardous waste environmental permit came to ARB’s attention. For a period in 2012, it was found that Clean Harbors was not in compliance with their hazardous waste permit, though an investigation revealed no environmental integrity concerns with their ODS activities. After investigation, assessment, lobbying from market participants, and a final determination, ARB decided to invalidate 88,955 of the approximately 4.3 million tons of offset credits Clean Harbors had earned, sending ripples of concern through the offset marketplace.³⁸

Though not the precise subject of legal action, or at least not yet, environmental justice concerns have been leveled at the offset program. Offsets are viewed skeptically by environmental justice advocates because they allow facilities located in disadvantaged communities to cover their emissions with offset reductions that happen elsewhere. This has been particularly concerning since several industry sectors have shown increased emissions since the 2013 start of the cap-and-trade market, though to date, the data made available to the public does not permit a very detailed assessment of these equity concerns. A 2016 analysis from scientists at UC Berkeley and several other California universities showed that most compliance entities did not use offsets, though those that did tended to have larger GHG emissions.³⁹ We discuss these environmental justice questions further in the Findings section.

³⁷ *Id.* at 379.

³⁸ See California Air Resources Board, Final Determination: Air Resources Board Compliance Offset Investigation Destruction of Ozone Depleting Substances (November 14, 2014), available at <https://goo.gl/KGeHrr>; Laurel Rosenhall, CalMatters, *A Little Town in Arkansas and its California Connection* 89.3 KPCC (July 26, 2015), available at <https://goo.gl/bnwIu1>; Gloria Gonzalez, *Despite Market Outcry, California Voids Some Carbon Offsets*, ECOSYSTEM MARKETPLACE (November 14, 2014), available at <https://goo.gl/Obv367>.

³⁹ Lara Cushing et al., USC Dornsife Program for Environmental and Regional Equity, A PRELIMINARY ENVIRONMENTAL QUALITY ASSESSMENT OF CALIFORNIA’S CAP-AND-TRADE PROGRAM: RESEARCH BRIEF – SEPTEMBER 2016 [hereinafter Climate Equity Brief] at 7-10, available at <http://goo.gl/2VrnXm>.

Current Status of Today's Forest Offset Market

A Small But Notable Part of the Cap-and-Trade Market

According to the latest ARB Compliance Instrument Report at the time of this writing (up through Q4 2016), 95% of program compliance has been achieved through the use of allowances. Of the remaining 5% of offsets, a majority (3% of the total) comes from US Forest projects, with the remainder primarily coming from the Ozone Depleting Substances protocol and smaller amounts from livestock and mine methane capture projects. The amount of offset credits issued is slightly greater, as seen in Table 2. More credits have been issued than have been retired to-date, and Table 2 includes credits that are held back in the forest buffer pool and those that are held by offset project owners, market participants or compliance entities for future compliance. These figures are presented in Figure 2 and Table 2 below.

Table 2. ARB Offset Credits Issued as of March 11, 2017

Project Type	Ozone Depleting Substances	Livestock	U.S. Forest	Urban Forest	Mine Methane Capture	Rice Cultiv.	<u>Totals</u>
Compliance	7,222,320	1,521,590	21,851,822	--	1,259,314	--	31,855,046
Early Action	6,336,710	1,695,029	13,276,494	--	2,879,684	--	24,187,917
Totals	13,559,030	3,216,619	35,128,316	--	4,138,998	--	56,042,963

Source: ARB, Compliance Offset Program website,⁴⁰ at <https://goo.gl/gBSWoj>

⁴⁰ The text appearing alongside this table on the CARB website is: *Table includes all offset credits issued including offset credits placed in ARB's Forest Buffer Account, offset credits returned to an Early Action Offset Program's forest buffer pool, and offset credits subsequently invalidated.*

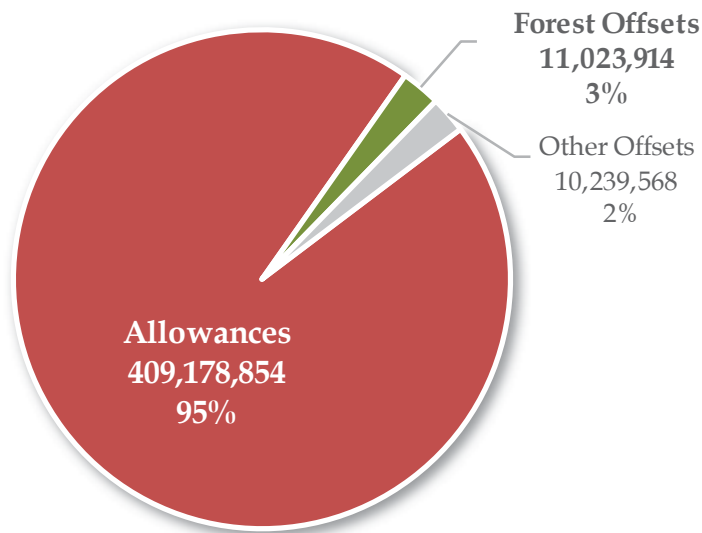


Figure 1. Retired Compliance Instruments Used 2013-16 in the California Cap-and-Trade Program. Source: ARB Compliance Instrument Report, Data through Q4 2016, accessed March 11, 2017, available at <https://goo.gl/Jsj8kf>

Given that offsets account only for 5% of the total compliance instruments used so far in the cap-and-trade program, it would be easy to dismiss their role in the sweep of California’s aggressive climate policies. Indeed, one author likened the cap-and-trade market as a whole to ‘dessert’ after a full meal of other ‘complimentary policies’ for climate action including building energy efficiency standards, tailpipe emission standards, the Low Carbon Fuel Standard and renewable energy mandates. These policies are expected to account for approximately 70% of California’s climate action, with cap-and-trade’s 30% “no ton is left behind” contribution following at the end.⁴¹ In this conception, offsets would be the garnish on that dessert – playing a small role in the last-in-line climate policy. Depending on the future carbon price, of course, offsets could stand to play a much larger role. If carbon prices increase considerably and more entities use closer to their full 8% allotment of offset-based compliance, then it is possible that offsets will exert considerable influence over the overall cap-and-trade program’s economic and environmental outcomes.

Whether a large or small portion of compliance, offsets are somewhat financially beholden to the vagaries of the broader cap-and-trade market. Given that they are substitutes, offset prices according to market participants are generally pegged to the going rate for allowances, though at a small discount likely due to the additional search and transactions costs investing in offsets requires. With market data indicating

⁴¹ Michael Wara, *California’s Energy and Climate Policy: A Full Plate, But Perhaps Not a Model Policy*, 70 BULL. OF THE ATOM. SCI. 26, 27, 28 (2014).

a structural oversupply of compliance instruments in the cap-and-trade market,⁴² the latest allowance price floor⁴³ of \$13.57 may operate as somewhat of a price ceiling on offsets, especially when allowances are abundantly available for purchase from ARB or in the secondary market.

However, as a financial matter offsets should not so easily be dismissed. Both from published data made public by ARB,⁴⁴ and from anonymous survey results collected in this research, offset prices have been in the general vicinity of \$9-13 per ton CO₂e. This price range combined with the information in Table 2 above suggests that the 56 million offsets issued to-date by ARB are in total worth around \$500 million, with about \$300 million of that in forest offsets alone. As a matter of state policy and as an unprecedented experiment in carbon sequestration program design, the forest offset program is certainly worthy of close examination.

Explaining the Distribution of Offset Credits by Project Type

As seen in Table 2 and Figure 2 above, the US Forest offset program accounts for a clear majority of both the credits earned and the offsets surrendered for compliance. This research also draws on project design documents available through the forest offset program, pulled from the climate registry websites as of July 2016. This analysis was conducted for all the projects that had then earned or were earning credits in the program.⁴⁵ Looking at just these projects that had made it all the way through the application process helps show how the project protocols are playing out in practice. From the project document data analyzed for this study, we draw the following project summary statistics in Tables 3 and 4, and the map in Figure 3 below.

Table 3. Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

	Number of Projects	Total Credits	Total Acres
Improved Forest Management	33	24,142,947	854,598
Avoided Conversion	6	1,376,803	8,588
Reforestation	0	0	0
Totals	39	25,519,750	863,186

⁴² Cullenward and Coghlan, *supra* note 15 at 13.

⁴³ CARB, FEBRUARY 2017 JOINT AUCTION #10: SUMMARY RESULTS REPORT (last accessed March 15, 2017), available at <https://goo.gl/MSDdTD>.

⁴⁴ See CARB, 2015 SUMMARY TABLE OF MARKET TRANSFERS (last accessed March 15, 2017), available at <https://goo.gl/qwxFDS>.

⁴⁵ Other analysis has focused on all projects listed in the program, an earlier step in the crediting process. See Erin Kelly and Marissa Schmitz, *Forest Offsets and the California Compliance Market: Bringing an Abstract Ecosystem Good to Market*, 75 GEOFORUM 99, 102 (2016).

Table 4. Credit-Earning Projects in the Offset Program by Protocol Type

	<i>Compliance Program</i>			<i>Early Action Program</i>		
	Number of Projects	Total Credits	Total Acres	Number of Projects	Total Credits	Total Acres
Improved Forest Management	16	16,757,595	691,393	17	7,385,352	163,204
Avoided Conversion	0	0	0	6	1,376,803	8,588
Reforestation	-	-	-	-	-	-
Totals	16	16,757,595	691,393	23	8,762,155	171,792

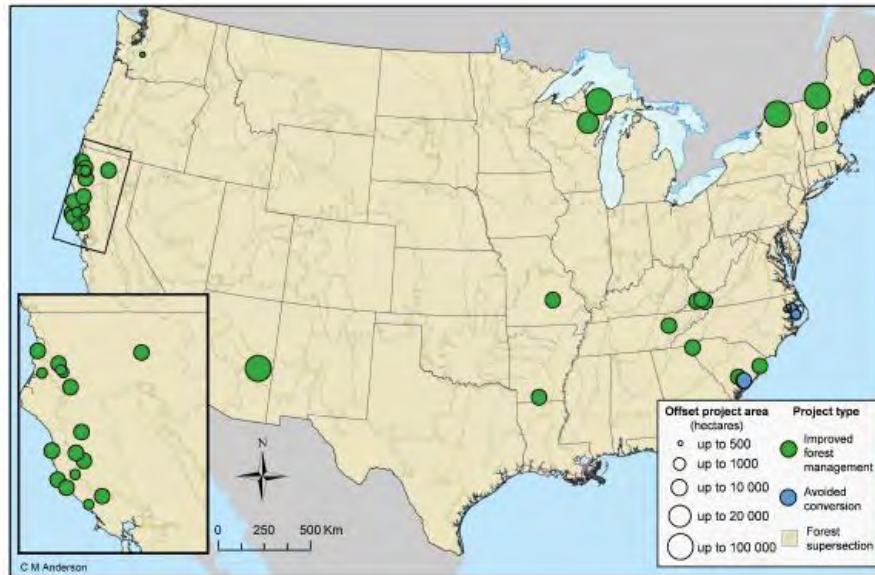


Figure 2. Map of Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

Several trends stand out in the project data presented above. First, improved forest management (IFM) projects dominate the pool of projects that have made it to the crediting phase of the program. The potential reasons for this are several, though interviewees highlighted three important ones. Given that tree growth from plantings does not begin to show financially significant returns in terms of carbon accumulation for 15-20 years, the financial payback period for reforestation projects is simply too

long, explaining why no projects have yet been credited. Second, only a handful of avoided conversion projects have been successfully credited in the program. This may be in part because in ARB's protocol, projects must show that the anticipated alternative land use for the project is more than 80% higher than its current forested value or face credit reductions.⁴⁶ This requirement essentially imposes a property conversion value test whereby converting to another land use must nearly double the value of the land, or face credit erosion by an 'uncertainty discount factor'. The purpose of this discount factor is additionality – only projects with high potential conversion values (i.e. those most likely to actually be converted) can make it into the program and receive full credit. Finally, IFM projects have the benefit of obtaining credit in the first year for the amount of carbon stock above their own modeled harvest baseline and above the Common Practice baseline. Put differently, this means that when an IFM project comes into the program, in the first year they are eligible for an initial crop of carbon offset credits for their current carbon stock that is above both the regional average stock (Common Practice baseline), and above the project-specific modeled baseline that includes financial, legal, and regulatory constraints. In short, above-average forests earn significant credits up front, and multiple interviewees acknowledged that this initial tranche of credits is all but essential for IFM project participation.⁴⁷ Many interviewees note that part of the initial revenue inflow is often used to finance startup costs.

Two additional pieces of evidence reinforce the essential role of up-front revenue. Published research on the potential financial returns from potential small offset projects in the northeastern US found that initial carbon stocking above the Common Practice baseline was the strongest predictive variable of financial returns.⁴⁸ Also, our analysis of project documents for the IFM projects currently earning credits indicates that 4 out of every 5 IFM projects in the program entered with carbon stocking above the Common Practice baseline. The quartile boxplot in Figure 4 below shows that most projects come in above, and many come in significantly above their area's Common Practice baseline. For a project at the median carbon stock (32 tons/acre above) and of a median size (9,753 acres for IFM projects), this means roughly 300,000 credits will be awarded up-front. At approximately \$9 a credit, that amounts to \$2.7 million in year 1 revenue for the project. Figure 5 below shows how IFM projects earn credit over time, demonstrating that about 70% of credits come in the first year and small annual amounts after, reflecting the (slow) net growth of carbon stock after year one.

⁴⁶ 2015 Forest Offset Protocol, *supra* note 31 at 72.

⁴⁷ See also Kelly and Schmitz, *supra* note 45 at 105.

⁴⁸ Charles Kerchner and William Keeton, *California's Regulatory Forest Carbon Market: Viability for Northeast Landowners*, 50 FOREST POL. & ECON. 70, 75 (2015).

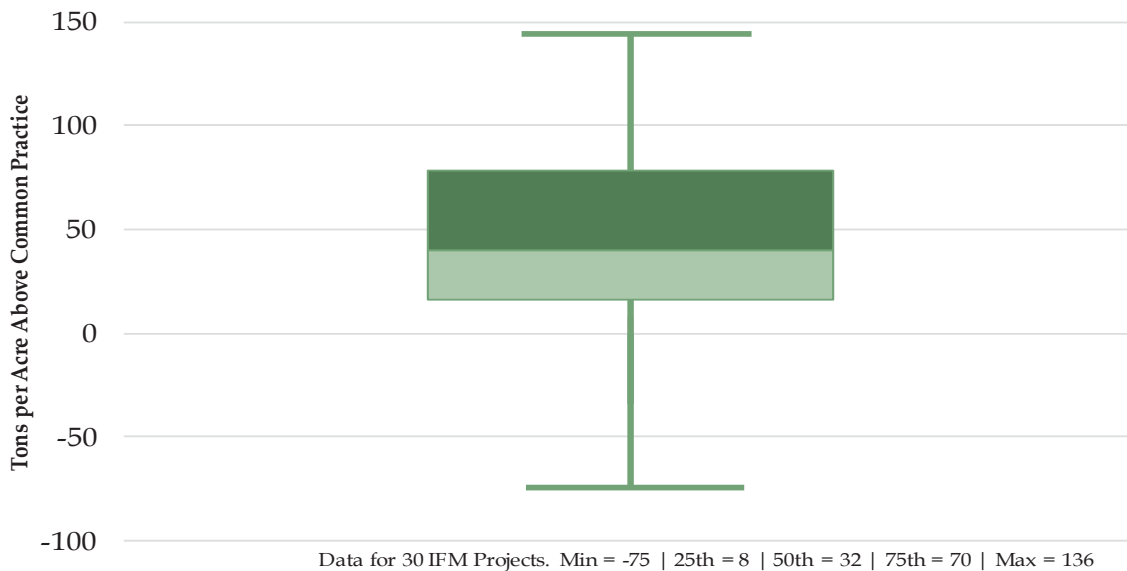


Figure 3. Boxplot of Initial Tons per Acre Above Common Practice from IFM Projects in the US Forest Offset Program as of July 2016.

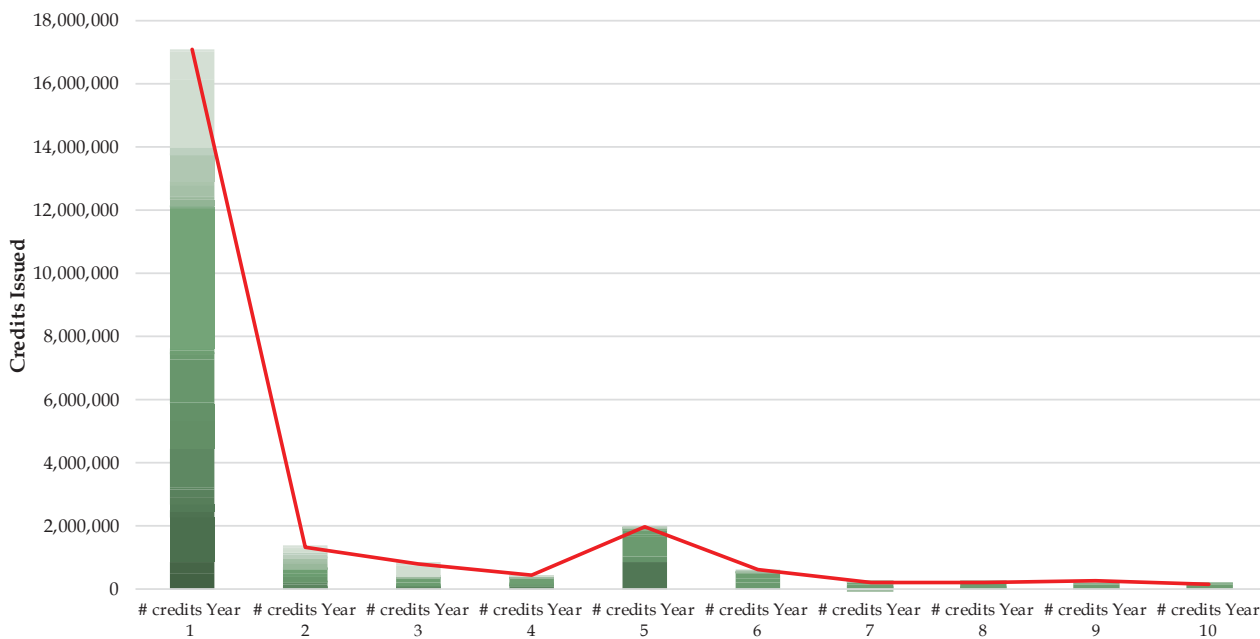


Figure 4. Total Credits per Year Earned by IFM Projects in the US Forest Offset Program as of July 2016.

Summary

In summary, today's California forest offset market is populated by several dozen projects selected for their exceedingly good fit under the rules of the program as specified in the ARB protocol. With a multifaceted approach to additionality, stringent verification and monitoring expectations and robust carbon accounting rules, the projects in the program reflect ARB's emphasis of quality over quantity in the number of projects that earn credits. Project developers have previously reported that only 5-10% of the projects they initially investigate end up being profitable enough to proceed given these high program hurdles.⁴⁹

However, with over 100 projects listed in the program so far (an initial stage in the application process), it is possible that significantly more projects could complete the process and begin earning credits if the price of carbon increases. Reauthorization of the cap-and-trade program past 2020 could cause such a price spike, which would likely lead to the crediting of many more IFM and avoided conversion projects. These projects would presumably be less financially dependent on returns from crediting their initial stocking over the Common Practice baseline, as future growth would be more remunerative. It remains to be seen whether any plausible market scenario will bring reforestation projects into the program, though. What is clear is that future market dynamics will depend largely on future developments in state policy and carbon prices.

⁴⁹ Kelly and Schmitz, *supra* note 45 at 104.

Methods

This review undertook three approaches to assessing forest offset project and program characteristics. First, we conducted an assessment of all 39 credited forest offset projects (listed in Appendix I) using a text review of the public project documents available for each project. Projects must meet stringent reporting requirements, and must be listed on approved carbon registries with public project documents. For this research, available documents included an offset verification statement, annual offset project data reports, offset project listings, and biennial project emissions reporting, yielding a database of 46 variables for each project.

Second, we administered a survey of forest owners/operators and a separate survey of forest offset project developers to gain information beyond what is reported in project documents. The surveys included questions about participant motivations, forest offset credit sales, and other project characteristics, experiences, and opinions. Online surveys were sent to all 32 identified project owners/operators. Postcard reminders were mailed, seven survey reminders were sent by email, and hard copy surveys were sent to those who did not respond within a week. 17 complete survey responses were collected, with a survey response rate of 53%.⁵⁰ These responses covered 21 of the 39 credited projects, also 53% of the total. The same process was used for the project developer survey. Three of four project developers responded. For context, we estimate that 72% of all projects in the program used a project developer to implement their forest offset project.

Third, we conducted in depth interviews with eight project owners (including four on-site forest visits) and with two project developers. These in depth interviews provided nuanced details for specific projects and corroborated information gained from the document review and survey. Between surveys and interviews, this research obtained detailed data from the owners of 28 of the 39 projects credited in the program (72%). This paper draws on each of these three data sources—documents, survey responses, and interviews—in formulating the following findings and lessons.

Last, we compiled additional data for mapping forest offset use in disadvantaged communities (see Finding 2 below). Using a combination of publicly available data from ARB and other sources, we analyzed the share of forest offsets that were used at facilities in disadvantaged communities (estimated to be a pro-rata share of their parent entity's offset use) as compared to offset-linked facilities not located in disadvantaged communities. This analysis used forest offset data from 2013-2015, and annual emissions from facilities in 2014, as described further in footnote 60 below.

⁵⁰ The majority of projects covered in survey responses were Early Action projects.

Findings

Based on document analysis, interviews, and surveys, we elaborate four primary findings on California's forest offset program below.

Finding #1: Additionality is Much Stronger than in Other Forest Offset Programs, But Questions Remain

Project 'additionality' refers to the idea that a forest offset project earns credits for changing practices from what would have happened without the project. For example, forest owners can earn credits by cutting less timber than they would have otherwise, or by keeping forest land standing that they would have otherwise converted to agriculture. The challenge with credit accounting under this approach is that it is never possible to know the counterfactual (what would have happened in the absence of the forest offset project) for certain. By definition, all counterfactuals are hypothetical exercises. Many forest offset programs have been plagued by difficulty in determining the appropriate counterfactual or 'baseline' activity level. California's program continues to face this challenge as well, but it has gone several steps further than prior efforts on forest offsets.

Efforts to Ensure Additionality

This analysis finds that California's forest offset program has incorporated several accounting and protocol elements in an effort to ensure project additionality. First, projects entail rigorous carbon accounting with standardized baselines across the country which are established with long-term forest data from the US Forest Service Forest Inventory and Analysis program.⁵²

Second, forests are required to provide data showing that the project-specific harvest baseline against which their project will be credited would have been financially viable.⁵³ That is, when forests set counterfactual timber harvest levels or forest conversion rates, they are required to provide a net present value analysis or recent sales records from neighboring forests showing that the proposed baseline timber harvest is financially viable for the duration of the offset project.

Third, projects are required to exclude any forest carbon that is already legally protected by another mechanism.⁵⁴ Forest carbon that is already legally protected from harvest would by definition not be harvested, and any crediting for such carbon would

⁵² 2015 Forest Offset Protocol, Appendix F, *supra* note 31 at 139.

⁵³ 2015 Forest Offset Protocol, *supra* note 31 at 28, 62.

⁵⁴ 2015 Forest Offset Protocol, *supra* note 31 at 27.

clearly not be additional. Common legally protected forest carbon in offset projects, for which projects do not receive credits, include legal prohibitions from harvest near streams, on steep slopes, or near endangered species. Another common legal prohibition that prevents some forests from participating in the offset program is the presence of a longstanding conservation easement that prohibits timber harvest on the forest land in question.⁵⁵ The rigor of these requirements is new to the California offset program; preceding voluntary forest offset programs have not generally required this level of scrupulousness.

The Views of Forest Owners and Operators on Additionality

Our survey asked forest owners and project developers to assess their confidence in the additionality of both their forest offset project and other projects. Not surprisingly, the majority of respondents were confident that both their project and other projects in the program are additional (Figure 5).

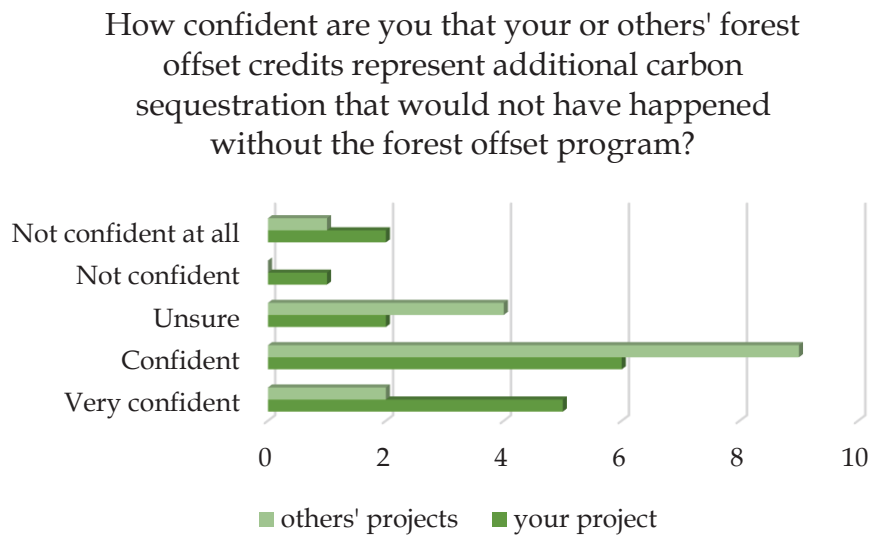


Figure 5. Survey responses from 17 forest owners re: confidence in additionality.

In more detailed narrative survey responses there were two types of information that stood out on additionality. First, some project owners and operators shared that as long as they maintained property ownership, they were unlikely to have harvested timber at the baseline level calculated in project documents. This would be a concern for project additionality. Second, in both interview and survey responses, project owners and operators emphasized that the *commitment* to carbon sequestration was

⁵⁵ For early action projects which started prior to the compliance market start, projects that already had conservation easements were grandfathered in to the program.

additional. In other words, projects were thought to be additional regardless of the counterfactual because they ensured a 100-year commitment to maintaining forest carbon. The counterfactual would be no *commitment* to maintaining carbon and thus an uncertain future for the forest carbon in question.

Our survey also asked forest owners and operators whether participation in the forest offset program changed their forest management practices. A change in forest management practices would signify a change from the baseline activity and would serve as another indicator for project additionality. Of survey respondents, 4 reported that starting a forest offset project changed their forest managed practices, an additional 6 reported that practices changed somewhat, and 6 reported that practices did not change (Figure 6). Management changes reported by project operators included decreasing harvest levels, adding a forest certification, and purchasing additional forest land.

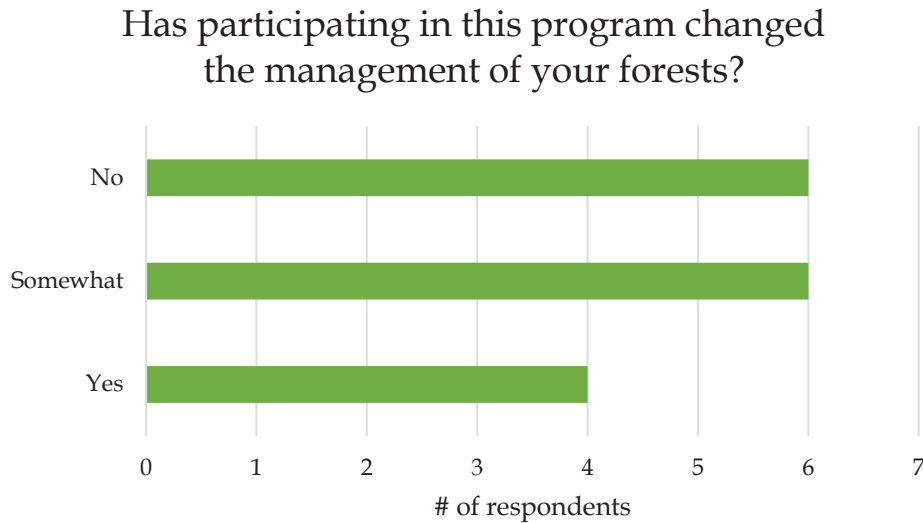


Figure 6. Survey responses from 16 forest owners re: forest management.

Concerns about Project Additionality

One of the most commonly voiced concerns about additionality in the forest offset program concerns conservation easements. California’s forest offset protocol allows projects to simultaneously implement a conservation easement together with a forest offset program, and this is a common occurrence in the program. This type of joint implementation of an easement and offsets would be considered additional under a ‘barriers test’ of additionality, which assumes that a project would not be possible (i.e. would face insurmountable barriers) without implementing both the offset project

and the easement jointly.⁵⁶ However, in the initial Early Action period of the forest offset program, projects were able to join the program even if they had long standing conservation easements already in place. Any easement stipulations prohibiting timber harvest still had to be excluded from crediting, but this early period included multiple projects with long-standing conservation easements already in place. It is an important positive amendment that such projects are no longer permitted to join the offset program.

Finding #2: A Wide Variety of Entities Purchase Offset Credits

Forest Offset Credit Buyers

In the California cap-and-trade market as of 2015, 272 entities and 438 facilities fall under the cap. (Each ‘entity’ may have multiple facility sites.) According to data from CARB⁵⁷ analyzed in this study, 150 facilities purchased offsets and 79 have used forest offsets from 2013 through 2015. The cap-and-trade policy limits each entity to covering a maximum of 8% of its obligations by using offsets. As discussed earlier, the total rate of use falls well below the 8% maximum at present.

Among forest project owners surveyed, 53% of project owners sell their forest offsets directly to entities with a California offset obligation. The remainder of owners sell their credits to brokers and intermediaries who in turn sell credits to entities in the cap-and-trade program. Offsets were initially included in California’s cap-and-trade program to serve as a cost containment mechanism. Capped facilities could avoid or delay the most expensive emissions reductions investments by purchasing offsets. However, since the carbon price in the California market has remained very low through the duration of the market to date,⁵⁸ offsets have not served as a cost containment mechanism, and the cost of offset credits has also remained low. 11 survey respondents anonymously reported on their average carbon sales price. The average price from this data is \$10.20/ton, with a range of \$9-\$13/ton. As shown below in Figures 13 and 14, most respondents anticipated that prices would increase slightly or stay about the same up to 2020. Estimations were similar for prices after 2020, with the addition of a few respondents anticipating prices to increase significantly (more than a 25% increase).

⁵⁶ See Trexler et al., *supra* note 24 at 31.

⁵⁷ See explanation in footnote 60 below.

⁵⁸ Cullenward and Coghlan, *supra* note 42 at 13.

Forest Offset Credits and Environmental Justice

The environmental justice community in California has voiced concern that use of offsets disproportionately impacts disadvantaged communities in the state. Environmental justice advocates have argued that facilities that buy offsets are likely located in disadvantaged communities, and if emissions were reduced onsite instead of through offsets, those communities would gain health benefits from reduced pollution, especially of non-GHG co-pollutants such as particulate matter and air toxics.⁵⁹ We used offsets sales data and facility emissions data from CARB to construct a first-order approximation of the connection between offsets and emissions in disadvantaged communities and to assess whether forest offsets have been used disproportionately in disadvantaged communities.⁶⁰

Forest offsets account for a small share of facility emissions across all facilities. 79 of 438 facilities in the cap-and-trade program (total as of 2015) used forest offsets. Of these facilities, 43% (34) are located in disadvantaged communities (see Figure 7). In 2014, facilities in disadvantaged communities on average offset 2.2% of their emissions with forest offsets, whereas facilities not in disadvantaged communities used offsets slightly more, covering 3.2% of their emissions. As with the rate of use, the total *number* of estimated forest offsets used is also higher outside of disadvantaged communities. Where facilities in disadvantaged communities used close to 70,000 forest offset credits on average, facilities outside of disadvantaged communities used

⁵⁹ See Climate Equity Brief, *supra* note 39 at 7-10.

⁶⁰ This analysis weaves together the forest offsets information reported in the CARB Compliance Reports (available for 2013-14 and 2015) and compares it to facility information made available in CARB's the Integrated Emissions Visualization Tool, with an overlay of the OEHHA's CalEnviroScreen 3.0 shapefile for disadvantaged community location (defined here as a score of 75 or above). We first downloaded all data for the facilities listed as subject to cap-and-trade as of 2013 in the Integrated Emissions Visualization Tool (324 facilities). Then we matched that facility information with the forest offset usage data reported in the Compliance Report's Compliance Offsets Detail tab by entity ID. This matching used the Entity ID data, and ARB GHG ID info reported in the Compliance Summary tab of the Compliance Reports to link entities, and the facilities they own, with offsets usage. Unfortunately, because CARB does not report offset usage down to the facility level, our analysis at that point had to use a pro-rata estimate for each entity; that is, if a particular entity had purchased and retired 100,000 offsets, and owned four facilities subject to cap-and-trade, we have assumed that they retired 25,000 offsets for compliance at each facility. More detailed information would need to be made public about both offset purchase and retirement as well as about facility location and emissions in order for finer and more instructive sets of analyses to be conducted. We recommend that CARB at a minimum commission a program evaluation of the environmental and equity impacts of the offsets program using more finely grained data than what has been made publicly available. For data sources, please visit CARB, INTEGRATED EMISSIONS VISUALIZATION TOOL (last accessed March 15, 2017), available at <http://goo.gl/WJGiVF>; CARB, CAP-AND-TRADE PROGRAM (last accessed March 15, 2017), available at <http://goo.gl/4qeAfj> (specifically, under Publicly Available Market Information, the 2013-14 and 2015 Compliance Reports); Office of Environmental Health Hazard Assessment, CALENVIROSCREEN 3.0 (last accessed March 15, 2017), available at <http://goo.gl/K9Foqg> (specifically the CalEnviroScreen 3.0 Results Shapefile).

more than 130,000 forest offset credits on average. Initial analysis suggests that trends are similar when all offsets, not just forest offsets, are considered. Facilities in disadvantaged communities used 6.4 million offsets cumulatively, while facilities outside of disadvantaged communities used 10.2 million offsets cumulatively. Further analysis and more finely-grained data are needed to more precisely compare the effects of offsets on emissions in and out of disadvantaged communities.

Though any lessening of the incentive to reduce pollution in disadvantaged communities is concerning, and though offset data alone cannot tell us precisely what would have happened in the absence of offset availability, it appears that the use of offsets to date affects but does not appear to disproportionately impact disadvantaged communities. As compared to other areas, fewer facilities in disadvantaged communities purchase offsets, and those that do use a smaller share of offsets. But, this trend could change over time and should continue to be monitored.

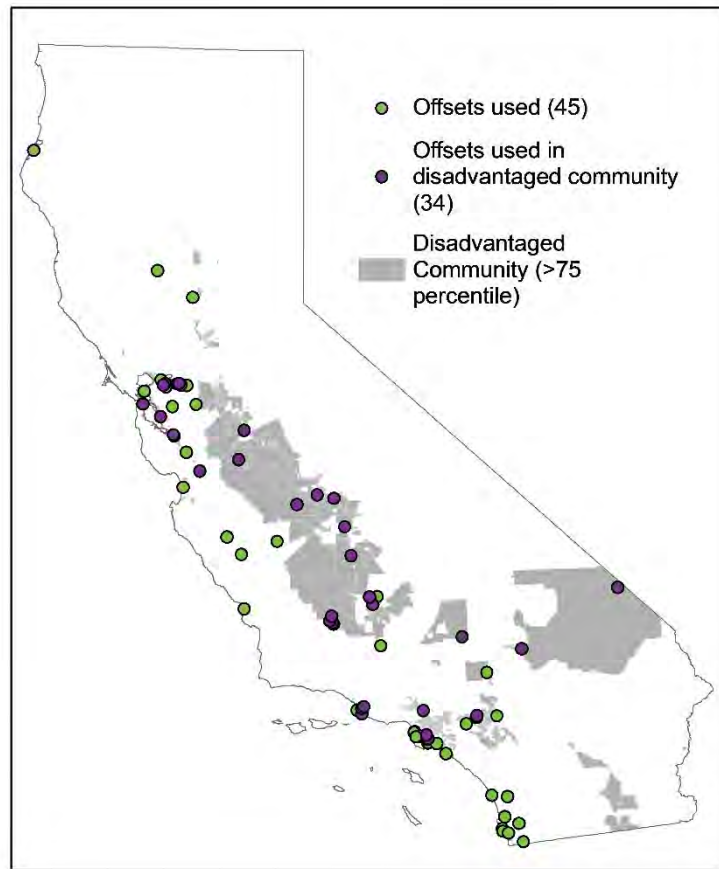


Figure 7. Location of Cap-and-Trade Facilities whose Parent Entities Retired Offsets to Meet Compliance Obligations.

Finding #3: Project Co-Benefits Are Not Monetized

Project document review, interviews, and surveys all corroborate that forest offset projects convey co-benefits for conservation and sustainable forest management. However, delivery of these project co-benefits is a decidedly secondary concern to the financial success of projects, which is conveyed by carbon credits. Project co-benefits may be of greater interest in the long run, and several projects report potential for ‘benefit stacking,’ or deriving financial benefit from co-benefits alongside carbon revenues from participating forest land.

From our analysis of project design documents, 92% of credited offset projects report having at least one environmental co-benefit. In the survey data, however, most respondents report that co-benefits are not important in the sale of their offset credits (11 of 16, 69%). This indicates that while forest owners are aware of the existence of co-benefits, these co-benefits are not financially relevant to the sale of offset credits, though they may be relevant to other ecosystem services markets. Similarly, interviewees often noted their co-benefits with interest, and enjoyed telling stories about them, but generally acknowledged that carbon credit buyers do not ascribe monetary value to co-benefits.

Survey respondents report that their projects provide a number of co-benefits. Most respondents also report that co-benefits are present, but few expend resources to measure these benefits.

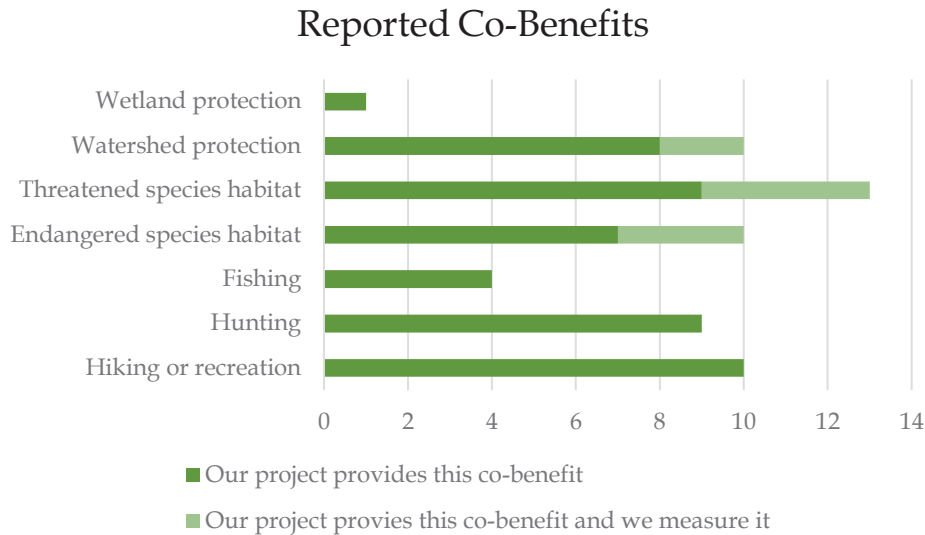


Figure 8. Survey Responses from 17 Forest Owners on project co-benefits.

No project operators or developers that we interviewed or surveyed were interested in additional reporting requirements, on co-benefits or otherwise, although at least one noted that if nationally standardized tracking metrics were developed, the reporting burden to California would be manageable. Respondents were concerned that reporting requirements are already onerous, so any future co-benefit reporting would likely need to have clear benefits for project operators and the state. We note that higher expected carbon prices might alter these assessments.

Finding #4: California Offsets Have Broken New Ground, but Regulatory Risks Hamper Further Development

Transitioning Into a More Mature Policy and Marketplace

The California forest offset program is currently in somewhat of an interstitial period, having traveled far up the learning curve of forest carbon policy experimentation, but still beset with uncertainty about the future. Unlike some other protocols the IFM and avoided conversion portions of the forest offset program have experienced notable project uptake. These areas have delivered emissions reductions and credits used by compliance entities and stand ready to deliver more in the future. Yet judging by the lengthy project listings and the persistently low price of offsets beneath an already low allowance price floor, the offset market seems to be in somewhat of a holding pattern while market participants wait to see how California policymakers chart a climate policy course past 2020.

Survey and interview results tend to confirm these indications. As detailed below, although ARB generally receives good marks in its program implementation thus far, market participants do not have the policy certainty they need to continue growing the program with more participating projects.

Bright Spots: Readiness and Program Experience

Although the price of allowances since 2013 has never risen high enough to necessitate the use of offsets as a cost-containment mechanism,⁶¹ California's unprecedented innovation in developing a compliance-quality program and protocol for forest carbon offsets has resulted in a marketplace with dozens of credited projects. It is possible that many more could participate in the future. Projects that are now marginally economic at a carbon price of around \$10/ton could be brought into the program in the future if the price rises. If the carbon price rises significantly, it is

⁶¹ Cullenward and Coghlan, *supra* note 15 at 7.

possible that whole project types that are not currently financially attractive, such as reforestation projects and urban forest projects, may become economically viable.

In addition, ARB has received generally encouraging reviews in both survey and interview responses collected for this study. Of 17 responses, only three project owners expressed dissatisfaction with ARB’s handling of the program overall, and only two expressed dissatisfaction with individual project application handling. Only two owners expressed that they would not consider expanding or bringing new land into the program in the future, while more than half of respondents expressed interest in the possibility. These results are conveyed in Figures 9, 10 and 11 below. When asked a narrative question about whether their satisfaction levels with ARB had changed over time though, responses were mixed. Some project owners remarked that ARB’s project application reviews had become less predictable and more cautious, and others hypothesized that application interactions had become more frustrating because of an increase in application volume without an increase in ARB processing capacity. (Interestingly, no project owner expressed dissatisfaction with their developer or their registry, although at least one interviewee did indicate having markedly different impressions of two developer entities, one negative and one positive.)

How satisfied have you been with CARB's handling of the program overall?

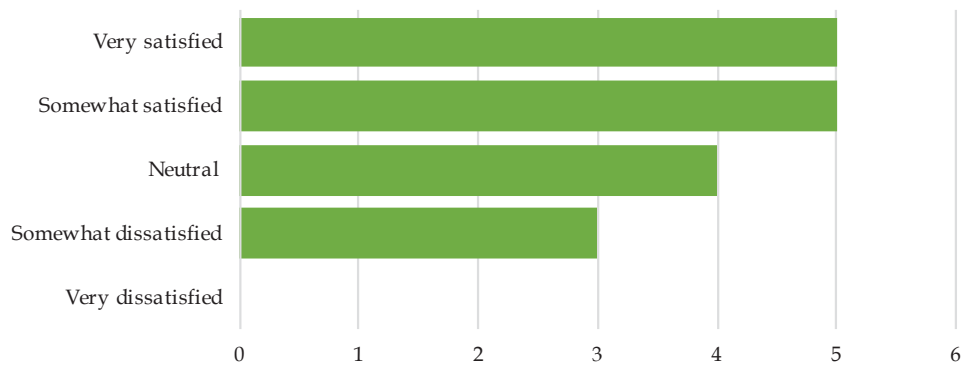


Figure 9. Survey Responses from 17 Forest Owners on CARB’s performance.

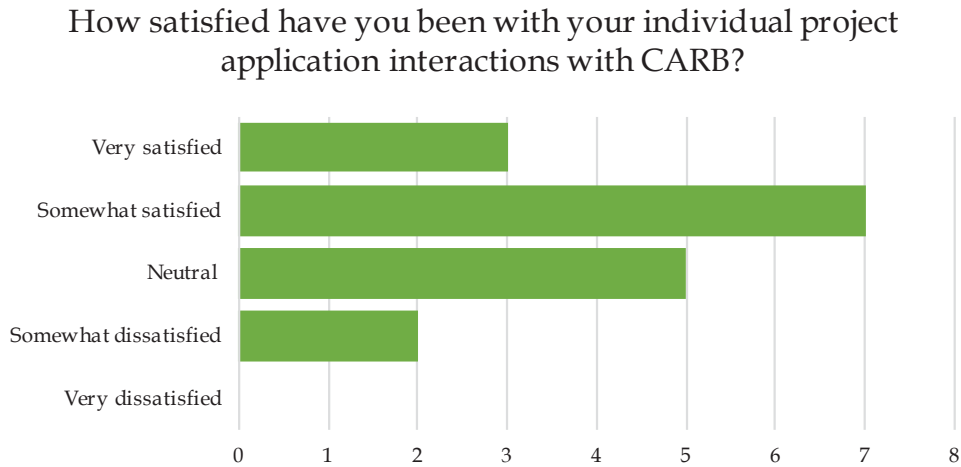


Figure 10. Survey Responses from 17 Forest Owners on CARB’s application handling.

Additional Participation: Would you consider expanding an existing project or starting a new project on other forests?

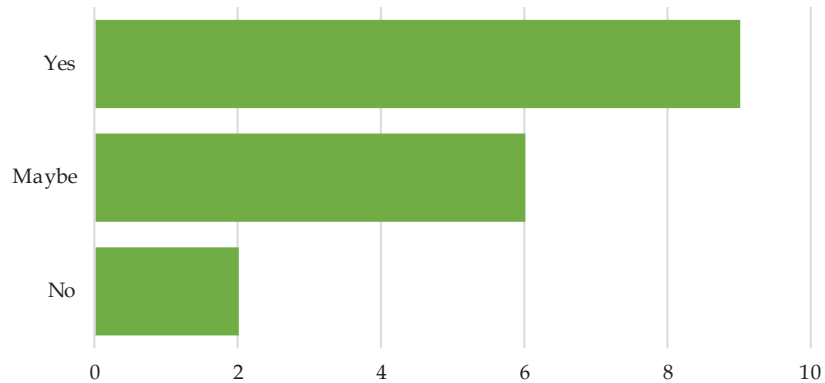


Figure 11. Survey Responses from 17 Forest Owners on additional participation.

Project developers were less sanguine in their appraisal, however. Only one respondent indicated satisfaction with the program (the others had neutral feelings), and divergent satisfied/unsatisfied opinions were reported about individual project interactions. All expressed that their satisfaction had changed over time, with two voicing concern that inefficiencies and the expense of meeting program requirements had not improved.

Both project developers and owners agreed in their general praise for CARB’s approach to project risks. Two of three developers and 16 of 17 project owners reported that CARB has been appropriately accounting for project risks through the individualized project assessment and buffer pool requirements. The lonely dissenters took issue with 20% as the standard buffer pool credit contribution and advocated an individualized fire risk assessment for a particular project, respectively, but generally speaking ARB’s approach to risk was reportedly appropriate in the eyes of market participants. Although the subject came up in some interviews, only one developer and one project owner reported being concerned about invalidation risks in their surveys.

Concerns: Instability, Carbon Price Uncertainty and Rising Verifier Costs

Project owners have much more divergent opinions about what the future may hold for the offset program, reflecting the general uncertainty about state policy and carbon prices that have the offset program in somewhat of a holding pattern. Although the state has committed to continuing climate programs in some form after the year 2020 with the passage and signing of Senate Bill 32 in 2016,⁶² program participants report not being sure yet whether this new policy commitment will impact the return from their current projects. Figure 12 below presents the results from a survey question asked of offset project owners, reflecting their unresolved uncertainty in the wake of SB 32. This uncertainty may help explain the six ‘maybe’ answers reported above with respect to additional participation in the program – so much depends on the next few steps state policymakers take in extending the cap-and-trade program (or not), that possible future projects may simply wait until there is more certainty about the future of the program.

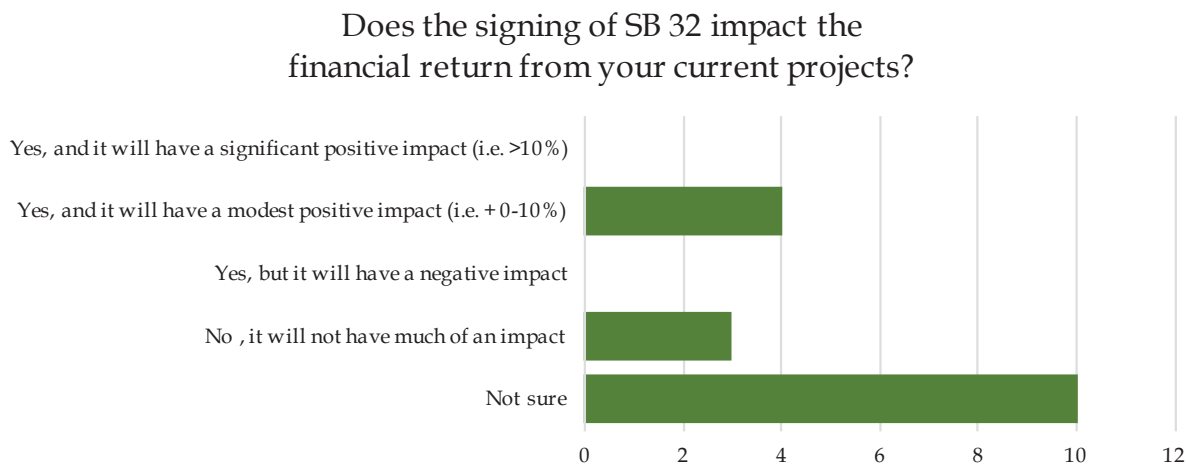


Figure 12. Survey Responses from 17 Forest Owners on the impact of Senate Bill 32.

⁶² See Chris Megerian and Liam Dillon, *Gov. Brown Signs Sweeping Legislation to Combat Climate Change* L.A. TIMES (September 8, 2016), available at <https://goo.gl/ewXwbN> (describing SB 32).

Project owners generally seem optimistic about future price trends, assuming policy stability is provided. An open-ended narrative question on the project owner survey elicited many responses that cited program complexity, changing regulations and future policy uncertainty as major barriers in the program. But, when asked in an anonymous portion of the survey for their opinions about future price trends, project owners in general expressed bullishness and confidence about both near and longer term price trends. As seen in Figures 13 and 14 below, a 60% majority of respondents thought average sale prices for offsets would increase slightly in the time before 2020, and a majority believed they would rise slightly or significantly after 2020 as compared to today. However, when read together with the more cautious additional participation responses and concerns about policy certainty and complexity, this optimism may not translate to deeper program participation without more stability.

Expected Price Trend Between Now and 2020

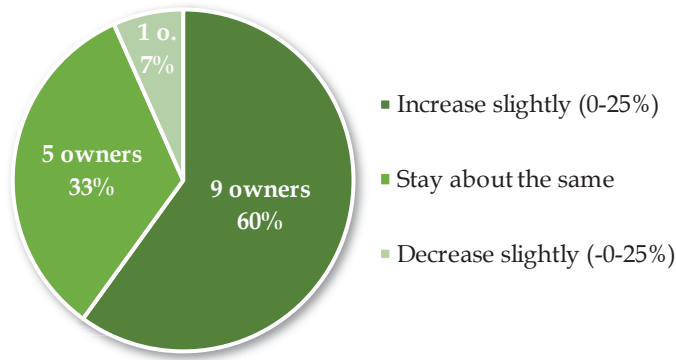


Figure 13. Survey Responses from 15 project owners re: near term price trend expectations

Expected Price Trend After 2020

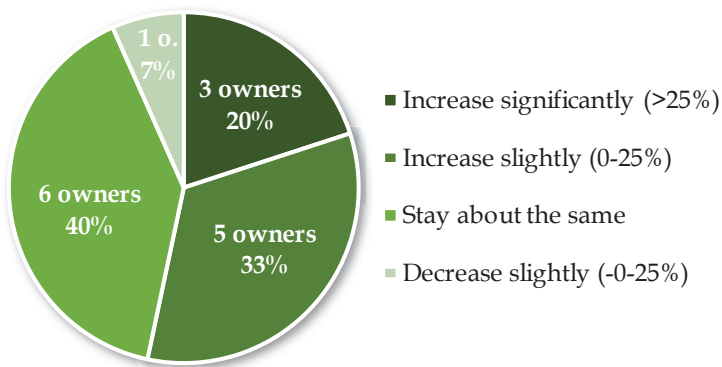


Figure 14. Survey Responses from 15 project owners re: longer term price trend expectations

While owners were conditionally bullish about future price trends, a worry that was repeatedly raised in multiple interviews and in survey data as well was rising verification costs. Other answers to the barriers question cited the steep and rising costs of monitoring and verification. In response to a question asking for their opinion of published verification and monitoring costs appearing in Kerchner and Keeton,⁶³ several respondents with recent verification cost experience stated that the published verification costs were much lower than actual costs. While opinions on that question were somewhat mixed and included five ‘I don’t know’ answers, multiple interviewees expressed the same concern about rising verification costs. Some speculated that invalidation risk concerns had increased the length of verifications and financial exposure of the verifiers. However, most interviewees who mentioned the subject indicated that the likely causes are a short supply of verifiers and verification bodies, and large demands of verification in a compliance program as compared to in the voluntary market. ARB staff have reported that expanded training opportunities for verifiers are on the way to address this shortage. But, these efforts may need to bear fruit in the nearer term in order to keep pending projects from being dissuaded from joining the program at current carbon prices.

⁶³ See Kerchner and Keeton, *supra* note 49 at 75 (reporting ~\$8,000 annual monitoring costs plus \$15,000 costs incurred every six and \$27,000 every 12 years).

Lessons for Natural and Working Lands

The State of California is in the process of updating its climate scoping plan, which sets goals for GHG emissions in each state sector. For the first time, the scoping plan will cover the period to 2030 and will include goals for carbon on natural and working lands, including agricultural lands and forests.⁶⁴ The draft scoping plan sets as an overarching goal that natural and working lands would be an overall emissions sink rather than a source. There are a number of activities and plans associated with this goal. We offer several recommendations for the state's goals in natural and working lands based on its experience thus far managing land-based carbon through the forest offset program:

- **Lesson #1:** Rigor of approach to carbon accounting drives implementation cost

The Forest Offset Program requires a very rigorous approach to carbon accounting, estimating the exact tonnage of forest carbon present on individual project lands. This is currently achieved at the project level through forest inventory, growth and yield modeling, and third party verification.⁶⁵ Detailed accounting through these methods cannot be scaled statewide. This level of detailed accounting is appropriate and feasible when dealing with compact and contiguous project lands, but costly and infeasible to conduct on a statewide basis. The State should and does consider methods of carbon accounting on Natural and Working Lands that are significantly less onerous than the Forest Offset Program, but that are still meaningful in terms of measuring changes in emissions and carbon sinks.⁶⁶ This is a case in which the Forest Offset Program uses a method that works well, but cannot be used at the scale of Natural and Working Lands.

The Proposed Plan offers a scale-appropriate method for carbon accounting on lands in California. It indicates that an updated Natural and Working Lands emissions inventory presently underway “applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon.”⁶⁷ Combining remotely-sensed data with ground-based data is a good approach to take at the scale of the state-wide inventory, and should be continued as the inventory is expanded in the coming years.

⁶⁴ California Air Resources Board, THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET (January 20, 2017), at 107-17, available at <https://goo.gl/ZBkyCN>. Hereafter 'Proposed Plan'.

⁶⁵ See generally 2015 Forest Offset Protocol, *supra* note 31.

⁶⁶ See Proposed Plan at 108.

⁶⁷ Proposed Plan at 108.

➤ **Lesson #2:** Transparency and Accessibility of Program Information

The Forest Offset Program produces voluminous data about carbon accounting, project details, and offset usage, and much of it is available to the public through CARB’s website and project registries. However, these data are not easy to locate or interpret. Data sheets can be difficult to find online, and reporting categories change over time, making consistent comparison over time difficult. In this case, the Forest Offset Program is not using best practices, and based on this experience we recommend a more coordinated approach for Natural and Working Lands data transparency and accessibility.

A clear and pre-designed framework for reporting on Natural and Working Lands should be devised as a part of the Integrated Natural and Working Lands Climate Change Action Plan (“Action Plan”).⁶⁸ This will avoid difficulty in reporting and evaluation later on. The Proposed Plan states that the California will “develop implementation tracking and performance monitoring systems for the Action Plan.”⁶⁹ This is especially important and should be a high priority as reporting in the Natural and Working Lands sector requires complex multi-agency efforts.

➤ **Lesson #3:** Approaches to Uncertainty and Risk

Uncertainty: Emissions accounting on Natural and Working Lands, like that for forests, comes with fundamental risks and uncertainties. The designers of the Forest Offset Program developed a number of notable mechanisms to deal with risk and uncertainty in carbon accounting and carbon crediting. For uncertainty, the Forest Offset Program reduces credits earned proportional to the sampling error of an on-the-ground forest inventory.⁷⁰ A similar approach could be applied to data used for carbon accounting on Natural and Working Lands.

At present neither the Proposed Plan nor Appendix G refer to estimation of uncertainty in developing goals or in developing the Action Plan for Natural and Working Lands.⁷¹ Including uncertainty estimates in ongoing modeling and in the Action Plan will help ensure that the State accomplishes its carbon sink goal for Natural and Working Lands. Including uncertainty estimates is also consistent with

⁶⁸ Proposed Plan at 114.

⁶⁹ Proposed Plan at 117.

⁷⁰ 2015 Forest Offset Protocol at 112.

⁷¹ See Proposed Plan at 117; see also California Air Resources Board, PROPOSED PLAN: APPENDIX G, NATURAL AND WORKING LANDS MODELING (January 2017), available at <https://goo.gl/axN6vS>.

IPCC Good Practice Guidance.⁷² This is a case in which the Forest Offset Program is using a successful practice that can be adapted for use on Natural and Working Lands.

Risk: For risk, the Forest Offset Program also reduces carbon crediting based on the estimated risk of fire, pests, and other ‘reversal’ risks – the risk of releasing forest carbon to the atmosphere over the life of the project.⁷³ Carbon credits deducted based on a project’s risk rating are allocated to a buffer pool of credits, which can be used in case of carbon loss due to fire, disease, or other unintentional losses.

The Natural and Working Lands sector does not need an explicit buffer account because of its more general carbon sink goals (discussed below), but it does need to plan for unavoidable carbon reversals. The Proposed Plan rightly acknowledges that “recent trends indicate that significant pools of carbon [are at] risk [of] reversal,” and that climate change may exacerbate these risks, especially for wildland fire.⁷⁴ Risk should be explicitly incorporated into ongoing Natural and Working Lands modeling to ensure that the State meets its goals for the sector. We recommend adapting the buffer pool approach used in the Forest Offset Program and ‘buffer’ the Action Plan with activities that would exceed the State’s carbon sink goal. This would ensure a ‘contingency fund’ of emissions reductions and enhanced sinks in case of ‘reversal’. Risk estimations could be improved over time as improved data and modeling are available. At present, the Proposed Plan and Appendix G do not discuss accounting for risk in GHG emissions goal-setting for Natural and Working Lands.

➤ **Lesson #4:** Setting a Broad Carbon Sink Goal is Advisable

The experience of the Forest Offset Program shows that modeling future carbon stock, even at the project scale, is a difficult task. Land-based carbon stocks carry risk and uncertainty, as discussed above. The Forest Offset Program dealt with risk by carefully measuring carbon and creating a forest buffer pool—a sort of insurance pool or contingency fund of carbon credits to be used in case of unintentional loss of carbon. The Forest Offset Program further ensures accuracy by requiring multiple levels of verification. While measurement methods for Natural and Working Lands should continue to take advantage of improvements in remote sensing and ground-based data, the method of detailed ton-by-ton carbon accounting used by the Forest Offset Program is not currently feasible at a statewide scale.

⁷² See generally Intergovernmental Panel on Climate Change, 2013 REVISED SUPPLEMENTARY METHODS AND GOOD PRACTICE GUIDANCE ARISING FROM THE KYOTO PROTOCOL at 2.57-2.60 (Section 2.4.3 ‘Uncertainty Assessment’), available at <https://goo.gl/bJWwZW>.

⁷³ 2015 Forest Offset Protocol, *supra* note 31 at 131-36.

⁷⁴ Proposed Plan at 108.

The Proposed Plan states that “California’s climate objective of natural and working lands is to maintain them as a carbon sink (i.e., net zero or even negative GHG emissions).”⁷⁵ The Proposed Plan rightly acknowledges that “the State’s lands, as well as sub-tidal waters, can be both a source and a sink for GHG emissions.”⁷⁶ The State’s goal of maintaining Natural and Working Lands as a carbon sink is an appropriate one. An alternative goal would be to specify a particular percentage or numerical decrease in emissions and/or increase in sinks on Natural and Working Lands. Such an exact goal would be inappropriate because it would necessitate many of the onerous measurements and verification activities pursued under project-based programs like the Forest Offset Program, which are impractical for statewide inventories, as mentioned above. Also, measuring carbon in some sectors of Natural and Working Lands (such as soils) remains quite difficult. The overall ‘carbon sink’ goal is less precise but is also therefore feasible to both measure and attain in a statewide inventory.

While we support the overall ‘carbon sink’ goal for Natural and Working Lands, we recommend that the Proposed Plan clarify whether this is a cumulative or annual goal covering the years between now and 2030. There is likely to be considerable year-to-year variability in emissions from Natural and Working Lands, due to fire and other natural causes. The goal is referred to as cumulative on page 109 of the Proposed Plan, but the measure is not specified in the initial statement of the goal.⁷⁷ The Initial Scoping Plan (2008) set a specific annual goal for forest carbon sequestration,⁷⁸ and this goal has been difficult to measure and attain on an annual basis.

- **Lesson #5:** The Offsets Program Does Not Measure Co-Benefits, But Many Are Clearly Delivered

In part because the Forest Offset Program has stringent and detailed carbon accounting requirements, it was not practical, at least in initial years of the program, to require additional accounting of individual project co-benefits. As detailed in the attached report, we advise that the Forest Offset Program now take up ‘no cost’ opportunities for co-benefits reporting. Co-benefits reporting is even more feasible and important for Natural and Working Lands. Because the Natural and Working Lands goals and accounting can take advantage of remotely sensed data, and can tolerate

⁷⁵ Proposed Plan at 107.

⁷⁶ Proposed Plan at 108.

⁷⁷ Proposed Plan at ES5, 107.

⁷⁸ California Air Resources Board, CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE (December 2008) at 64-65, available at <https://goo.gl/UFhkyT>.

greater uncertainty in acre-level carbon data, state agencies should be able to collect data and account for carbon *and* co-benefits.

The Proposed Plan rightly notes that policies must advance both carbon sequestration and co-benefits⁷⁹ and states that “strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors.”⁸⁰ Accounting for these co-benefits will allow the state to measure the synergies and efficiency gains it is earning by implementing policies that have win-win benefits for carbon, water, agriculture, biomass utilization, land restoration, and conservation. As the State develops tracking and monitoring systems for Natural and Working Lands, these co-benefits should be included. In the Proposed Plan section for ‘Scoping and Tracking Progress’,⁸¹ the text should be amended to read, “develop implementation tracking and performance monitoring systems for the Action Plan, *[including accounting of carbon and other co-benefits]*.”⁸²

⁷⁹ Proposed Plan at 107.

⁸⁰ Proposed Plan at 110.

⁸¹ Proposed Plan at 116-17.

⁸² Proposed insertion in brackets. See Proposed Plan at 117.

Appendixes

Below are two appendixes that provide more information about the sources, methods, and findings of this analysis. The first appendix presents a list of the 39 projects for whom we compiled and analyzed project design document information. The second appendix presents the list of entities who were reported as retiring forest offsets from 2013-15, and the forest offset projects those offsets came from.

Appendix I – Projects Included in Design Document Analysis

	<u>ARB Project ID #</u>	<u>Project Name</u>	<u>State</u>	<u>Type of Protocol</u>	<u>Registry</u> ⁸³	<u>Project Documentation Locator</u>
1	CAFR0030	Blue Source – Francis Beidler Improved Forest Management Project	SC	Early Action	CAR	CAR683
2	CAFR0087	Finite Carbon – Brosnan Forest	SC	Early Action	CAR	CAR658
3	CAFR0063	Green Assets – Middleton <u>Avoided Conversion</u>	SC	Early Action	CAR	CAR749
4	CAFR5034	Finite Carbon – The Forestland Group CT Lakes	NH	Compliance	ACR	ACR199
5	CAFR0088	Finite Carbon – Shannondale Tree Farm	MO	Early Action	CAR	CAR780
6	CAFR5089	Finite Carbon – The Forestland Group Champion Property IFM	NY	Compliance	CAR	CAR1088
7	CAFR5029	Green Assets- Brookgreen Gardens Improved Forest Management Project	SC	Compliance	ACR	ACR192
8	CAFR5016	Miller Forest	CA	Compliance	ACR	ACR189

⁸³ CAR = Climate Action Reserve; ACR = American Carbon Registry

9	CAFR0070	Finite Carbon – Berry Summit	CA	Early Action	CAR	CAR1004
10	CAFR0049	The Van Eck Forest	CA	Early Action	CAR	CAR101
11	CAFR0064	Yurok Tribe Sustainable Forest Project	CA	Early Action	CAR	CAR777
12	CAFR0029	Blue Source – Alligator River <u>Avoided Conversion</u>	NC	Early Action	CAR	CAR497
13	CAFR5043	Blue Source – Goodman Improved Forest Management Project (Michael Hart)	WI	Compliance	ACR	ACR202
14	CAFR5028	Round Valley Indian Tribes Improved Forest Management Project	CA	Compliance	ACR	ACR173
15	CAFR0040	Garcia River Forest	CA	Early Action	CAR	CAR102
16	CAFR5096	Brushy Mountain	CA	Compliance	CAR	CAR1095
17	CAFR0041	Big River / Salmon Creek Forests	CA	Early Action	CAR	CAR408
18	CAFR0042	Gualala River Forest	CA	Early Action	CAR	CAR660
19	CAFR0001	Willits Woods	CA	Early Action	CAR	CAR661
20	CAFR0116	Finite Carbon – NEFF (New England Forestry Foundation)	NH	Early Action	CAR	CAR672
21	CAFR5072	White Mountain Apache Tribe Forest Carbon Project	AZ	Compliance	ACR	ACR211

22	CAFR5095	Ashford III	WA	Compliance	CAR	CAR1094
23	CAFR0058	Virginia Conservation Forestry Program – Clifton Farm	VA	Early Action	CAR	CAR686
24	CAFR0057	Virginia Conservation Forestry Program – Rich Mountain	VA	Early Action	CAR	CAR696
25	CAFR5037	Virginia Highlands I	VA	Compliance	CAR	CAR1032
26	CAFR0103	Finite Carbon – MWF Brimstone IFM Project I	TN	Early Action	CAR	CAR582
27	CAFR0073	McCloud River	CA	Early Action	CAR	CAR429
28	CAFR5055	Buckeye Forest Project	CA	Compliance	CAR	CAR1013
29	CAFR0100	Rips Redwoods	CA	Early Action	CAR	CAR1015
30	CAFR5076	Trinity Timberlands University Hill Improved Forest Management Project	CA	Compliance	CAR	CAR1046
31	CAFR0031	Blue Source – Pocosin Lakes Forest Conservation Project (<u>Avoided Conversion</u>)	NC	Early Action	CAR	CAR676
32	CAFR5084	Finite Carbon – Potlatch Moro Big Pine CE IFM	AR	Compliance	CAR	CAR1086
33	CAFR0002	Finite Carbon Farm Cove Community Forest Project	ME	Early Action	CAR	CAR657
34	CAFR0026	Blue Source – Pungo River Forest Conservation	NC	Early Action	CAR	CAR659

		Project (<u>Avoided Conversion</u>)				
35	CAFR0027	Blue Source – Noles South <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR802
36	CAFR0028	Blue Source – Noles North <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR688
37	CAFR5003	Blue Source-Bishop Improved Forest Management Project	MI	Compliance	CAR	CAR973
38	CAFR5011	Yuork Tribe/Forest Carbon Partners CKGG Improved Forest Management Project	CA	Compliance	CAR	CAR993
39	CAFR5012	Hanes Ranch Forest Carbon Project	CA	Compliance	ACR	ACR182

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Appendix II – Compliance Entities Using Offset Credits

This information is drawn from the Compliance Reports available on the CARB website at <https://goo.gl/m61Kj1>, and matched with data from project design documents for the projects listed in Appendix I above.

Compliance Entities Retiring Forest Offsets, 2013-15

California Cap-and-Trade Compliance Offset Program: Retired Forest Offsets by Compliance Obligation Entity			
For Offsets Redeemed 2013-2015			
<u>CARB Entity ID</u>	<u>Compliance Obligation Entity</u>	<u># of Forest Projects Obtained From</u>	<u>Number of Retired Credits</u>
CA1248	AES Alamos, LLC	2	100,105
CA1089	Air Products and Chemicals, Inc.	1	96,601
CA1281	Algonquin Power Sanger, LLC	1	1,620
CA1328	Applied Energy, LLC - NAS North Island	3	16,605
CA1406	California Dairies, Inc.	1	10,140
CA1119	Calpine Energy Services, LP	4	686,178
CA1592	Carson Cogeneration Company	1	1,378
CA2039	Chevron Power Holdings, Inc.	1	49,187
CA1075	Chevron U.S.A., Inc.	10	4,019,283
CA1101	City of Glendale	1	17,649
CA1370	Coalinga Cogeneration Company	1	30,730
CA1311	Double C Limited	1	347
CA1183	Dynegy Moss Landing, LLC	2	165,460
CA1742	Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
CA1234	Fresno Cogeneration Partners, LP	1	1,298
CA1070	GenOn Energy Management, LLC	1	7,667
CA1116	GWF Energy, LLC	1	20,867
CA1291	High Desert Power Project, LLC	1	125,000
CA1307	High Sierra Limited	1	353
CA1253	Ingomar Packing Company, LLC	1	5,841
CA1312	Kern Front Limited	1	318
CA1343	Kern River Cogeneration Company	2	102,040
CA1017	La Paloma Generating Company, LLC	4	74,356

CA1552	Macpherson Oil Company	1	17,516
CA1077	Mariposa Energy, LLC	1	3,344
CA1476	Martinez Cogen Limited Partnership	1	9,630
CA1367	Mid-Set Cogeneration Company	1	32,547
CA1107	Midway Sunset Cogeneration Company	1	39,478
CA1138	NRG Power Marketing, LLC	1	245,756
CA1137	OLS Energy - Chino	1	19,960
CA1046	Pacific Gas and Electric Company	1	61,495
CA2106	PBF Energy Western Region, LLC	3	140,179
CA1326	Praxair, Inc.	1	5,000
CA1925	Pro Petroleum, Inc.	1	35,000
CA1204	Rio Tinto Minerals Inc.	1	26,532
CA1136	Russell City Energy Company, LLC	1	39,964
CA1371	Salinas River Cogeneration Company	1	32,244
CA1085	San Diego Gas & Electric Company	1	27,602
CA1372	Sargent Canyon Cogeneration Company	1	32,987
CA1762	SEI Fuel Services, Inc.	3	103,840
CA1251	Shell Energy North America (US), LP	2	209,000
CA1029	Southern California Edison Company	5	501,170
CA1338	Sycamore Cogeneration Company	1	100,608
CA1165	Tesoro Refining & Marketing Company, LLC	10	1,488,172
CA1325	The Procter & Gamble Paper Products Company	1	25,691
CA1195	TransAlta Energy Marketing (U.S.), Inc.	1	6,773
CA1057	Ultramar, Inc.	1	13,857
CA1419	Union Pacific Railroad Company	1	38,184
CA1056	Valero Refining Company-California, Benicia Refinery and Asphalt Plant	3	103,112
CA1590	Valley Electric Association, Inc.	2	813
Grand Total			8,903,291

Compliance Entities and The Forest Offsets They Buy

Forest Offsets -- Retired Credits by Compliance Obligation Entity and Project Name

Compliance Entities and Forest Offset Projects	# of Listings in Compliance Report	Total Quantity
AES Alamos, LLC	2	100,105
Blue Source – Francis Beidler IFM Project	1	94,705
Hanes Ranch Forest Carbon Project	1	5,400
Air Products and Chemicals, Inc.	1	96,601
Blue Source-Bishop IFM Project	1	96,601
Algonquin Power Sanger, LLC	1	1,620
Blue Source – Pungo River Forest Conservation Project	1	1,620
Applied Energy, LLC - NAS North Island	5	16,605
Finite Carbon – Shannondale Tree Farm	1	2,077
Green Assets – Middleton Avoided Conversion	3	11,687
Round Valley Indian Tribes IFM Project	1	2,841
California Dairies, Inc.	1	10,140
Garcia River Forest	1	10,140
Calpine Energy Services, LP	8	686,178
Finite Carbon – The Forestland Group CT Lakes	1	275,000
Hanes Ranch Forest Carbon Project	1	70,349
Trinity Timberlands University Hill IFM Project	1	222,398
Willits Woods	5	118,431
Carson Cogeneration Company	1	1,378
Green Assets – Middleton Avoided Conversion	1	1,378
Chevron Power Holdings, Inc.	1	49,187
Blue Source-Bishop IFM Project	1	49,187
Chevron U.S.A., Inc.	38	4,019,283
Blue Source – Francis Beidler IFM Project	3	250,000
Blue Source – Goodman IFM Project	1	693,615
Blue Source – Noles North Avoided Conversion Forest Project	6	14,795
Blue Source – Noles South Avoided Conversion Forest Project	6	14,090
Blue Source – Pungo River Forest Conservation Project	6	21,115
Blue Source-Bishop IFM Project	2	379,649

Brushy Mountain	2	1,250,441
Finite Carbon – The Forestland Group Champion Property IFM	1	678,550
Finite Carbon Farm Cove Community Forest Project	1	146,666
Willits Woods	10	570,362
City of Glendale	1	17,649
Big River / Salmon Creek Forests	1	17,649
Coalinga Cogeneration Company	2	30,730
Blue Source-Bishop IFM Project	2	30,730
Double C Limited	1	347
Willits Woods	1	347
Dynergy Moss Landing, LLC	4	165,460
Buckeye Forest Project	1	100,000
Willits Woods	3	65,460
Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
Garcia River Forest	1	9,814
Fresno Cogeneration Partners, LP	1	1,298
Willits Woods	1	1,298
GenOn Energy Management, LLC	2	7,667
Willits Woods	2	7,667
GWF Energy, LLC	3	20,867
Willits Woods	3	20,867
High Desert Power Project, LLC	2	125,000
Finite Carbon – The Forestland Group CT Lakes	2	125,000
High Sierra Limited	1	353
Willits Woods	1	353
Ingomar Packing Company, LLC	1	5,841
Green Assets – Middleton Avoided Conversion	1	5,841
Kern Front Limited	1	318
Willits Woods	1	318
Kern River Cogeneration Company	4	102,040
Blue Source-Bishop IFM Project	2	86,918
Willits Woods	2	15,122
La Paloma Generating Company, LLC	4	74,356
Finite Carbon – Brosnan Forest	1	1,314

McCloud River	1	15,038
Trinity Timberlands University Hill IFM Project	1	10,473
Willits Woods	1	47,531
Macpherson Oil Company	1	17,516
Green Assets – Middleton Avoided Conversion	1	17,516
Mariposa Energy, LLC	1	3,344
Willits Woods	1	3,344
Martinez Cogen Limited Partnership	1	9,630
The Van Eck Forest	1	9,630
Mid-Set Cogeneration Company	2	32,547
Blue Source-Bishop IFM Project	2	32,547
Midway Sunset Cogeneration Company	1	39,478
Willits Woods	1	39,478
NRG Power Marketing, LLC	4	245,756
Gualala River Forest	4	245,756
OLS Energy - Chino	2	19,960
Blue Source – Francis Beidler IFM Project	2	19,960
Pacific Gas and Electric Company	1	61,495
Willits Woods	1	61,495
PBF Energy Western Region, LLC	9	140,179
Big River / Salmon Creek Forests	3	52,762
Garcia River Forest	1	48,456
The Van Eck Forest	5	38,961
Praxair, Inc.	1	5,000
Virginia Conservation Forestry Program – Clifton Farm	1	5,000
Pro Petroleum, Inc.	1	35,000
Big River / Salmon Creek Forests	1	35,000
Rio Tinto Minerals Inc.	1	26,532
Big River / Salmon Creek Forests	1	26,532
Russell City Energy Company, LLC	1	39,964
Willits Woods	1	39,964
Salinas River Cogeneration Company	2	32,244
Blue Source-Bishop IFM Project	2	32,244

San Diego Gas & Electric Company	2	27,602
Trinity Timberlands University Hill IFM Project	2	27,602
Sargent Canyon Cogeneration Company	2	32,987
Blue Source-Bishop IFM Project	2	32,987
SEI Fuel Services, Inc	1	28,756
Finite Carbon – MWF Brimstone IFM Project I	1	28,756
SEI Fuel Services, Inc.	2	75,084
Finite Carbon – Shannondale Tree Farm	1	35,084
Green Assets – Middleton Avoided Conversion	1	40,000
Shell Energy North America (US), LP	2	209,000
Blue Source-Bishop IFM Project	1	84,000
Miller Forest	1	125,000
Southern California Edison Company	5	501,170
Blue Source – Francis Beidler IFM Project	1	30,295
Finite Carbon – The Forestland Group CT Lakes	1	125,000
Hanes Ranch Forest Carbon Project	1	6,548
Round Valley Indian Tribes IFM Project	1	241,164
Trinity Timberlands University Hill IFM Project	1	98,163
Sycamore Cogeneration Company	2	100,608
Blue Source-Bishop IFM Project	2	100,608
Tesoro Refining & Marketing Company, LLC	11	1,488,172
Blue Source – Francis Beidler IFM Project	1	908
Finite Carbon – Berry Summit	1	193,277
Finite Carbon – Shannondale Tree Farm	1	50,000
Finite Carbon – The Forestland Group CT Lakes	1	316,601
Green Assets – Middleton Avoided Conversion	2	50,000
Green Assets-Brookgreen Gardens IFM Project	1	160,000
McCloud River	1	65,000
Miller Forest	1	94,084
Trinity Timberlands University Hill IFM Project	1	13,209
White Mountain Apache Tribe Forest Carbon Project	1	545,093
The Procter & Gamble Paper Products Company	1	25,691
Blue Source-Bishop IFM Project	1	25,691

TransAlta Energy Marketing (U.S.), Inc.	1	6,773
McCloud River	1	6,773
Ultramar, Inc.	1	13,857
Blue Source – Francis Beidler IFM Project	1	13,857
Union Pacific Railroad Company	1	38,184
Finite Carbon – Brosnan Forest	1	38,184
Valero Refining Company-California, Benicia Refin. and Asphalt Plant	3	103,112
Blue Source – Francis Beidler IFM Project	1	36,143
Finite Carbon Farm Cove Community Forest Project	1	48,888
Willits Woods	1	18,081
Valley Electric Association, Inc.	2	813
Blue Source-Bishop IFM Project	1	5
The Van Eck Forest	1	808
Grand Total		8,903,291

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

The Promise and Problems of Pricing Carbon: Theory and Experience

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Abstract

Because of the global commons nature of climate change, international cooperation among nations will likely be necessary for meaningful action at the global level. At the same time, it will inevitably be up to the actions of sovereign nations to put in place policies that bring about meaningful reductions in the emissions of greenhouse gases. Due to the ubiquity and diversity of emissions of greenhouse gases in most economies, as well as the variation in abatement costs among individual sources, conventional environmental policy approaches, such as uniform technology and performance standards, are unlikely to be sufficient to the task. Therefore, attention has increasingly turned to market-based instruments in the form of carbon-pricing mechanisms. We examine the opportunities and challenges associated with the major options for carbon pricing—carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reductions—and provide a review of the experiences, drawn primarily from developed countries, in implementing these instruments. Our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing in the context of developing countries.

Keywords

global climate change, market-based instruments, carbon pricing, carbon taxes, cap-and-trade, emission reduction credits, energy subsidies, clean energy standards

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Introduction

In a modern economy, nearly all aspects of economic activity affect greenhouse gas—in particular, carbon dioxide (CO₂)—emissions, and hence the global climate. To be effective, climate change policy must affect decisions regarding these activities. This can be done in one of three ways: (a) mandate businesses and individuals to change their behavior regarding technology choice and emissions; (b) subsidize businesses and individuals to invest in and use lower emitting goods and services; or (c) price the greenhouse gas externality, so that decisions take account of this external cost.

By internalizing the externalities associated with CO₂ emissions, carbon pricing can promote cost-effective abatement, deliver powerful innovation incentives, and ameliorate rather than exacerbate government fiscal problems. By pricing CO₂ emissions (or, equivalently, by pricing the carbon content of the three fossil fuels—coal, petroleum, and natural gas), governments defer to private firms and individuals to find and exploit the lowest cost ways to reduce emissions and invest in the development of new technologies, processes, and ideas that could further mitigate emissions. A range of policy instruments can facilitate carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction.

Some of these instruments have been used with success in other environmental domains as well as for pricing CO₂ emissions. The U.S. sulfur dioxide (SO₂) cap-and-trade program cut U.S. power plant SO₂ emissions more than 50% after 1990 and resulted in compliance costs one half of what they would have been under conventional regulatory mandates (Carlson, Burtaw, Cropper, & Palmer, 2000).¹ The success of the SO₂ allowance trading program motivated the design and implementation of the European Union's Emission Trading Scheme (EU ETS), the world's largest cap-and-trade program, focused on cutting CO₂ emissions from power plants and large manufacturing facilities throughout Europe (Ellerman & Buchner, 2007). The U.S. lead phase-down of gasoline in the 1980s, by reducing the lead content per gallon of fuel, served as an early, effective example of a tradable performance standard (Stavins, 2003). These positive experiences provide motivation for considering market-based instruments as potential approaches to mitigating greenhouse gas emissions. This article focuses on the experience in industrialized countries that have implemented these instruments extensively. We hope that our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing for developing countries.

Climate Change Policy Instruments for the Regional, National, or Subnational Level

We consider five generic policy instruments that could conceivably be employed by regional, national, or even subnational governments for carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction. First, however, we examine the possibility of relying

on conventional environmental policy approaches, namely, command-and-control instruments, which have dominated environmental policy in virtually all countries over the past four decades.²

Command-and-Control Regulations

Conventional approaches to environmental policy employ uniform standards to protect environmental quality. Such command-and-control regulatory standards are either *technology based* or *performance based*. Technology-based standards typically require the use of specified equipment, processes, or procedures. In the climate policy context, these could require firms to use particular types of energy-efficient motors, combustion processes, or landfill-gas collection technologies.

Performance-based standards are more flexible than technology-based standards, specifying allowable levels of pollutant emissions or allowable emission rates, but leaving the specific methods of achieving those levels up to regulated entities. Examples of uniform performance standards for greenhouse gas abatement would include maximum allowable levels of CO₂ emissions from combustion (e.g., the grams-of-CO₂-per-mile requirement for cars and light-duty vehicles recently promulgated as part of U.S. tailpipe emission standards) and maximum levels of methane emissions from landfills.

Uniform technology and performance standards can—in principle—be effective in achieving some environmental purposes. But, given the ubiquitous nature of greenhouse gas emissions from diverse sources in an economy, it is unlikely that technology or ordinary performance standards could form the centerpiece of a meaningful climate policy.

Furthermore, these command-and-control mechanisms lead to non-cost-effective outcomes in which some firms use unduly expensive means to control pollution. Since performance standards give firms some flexibility in how they comply, performance-based standards will generally be more cost-effective than technology-based standards, but neither tends to achieve the cost-effective solution.

Beyond considerations of static cost-effectiveness, conventional standards would not provide dynamic incentives for the development, adoption, and diffusion of environmentally and economically superior control technologies. Once a firm satisfies a performance standard, it has little incentive to develop or adopt cleaner technology. Regulated firms may fear that if they adopt a superior technology, the government may tighten the performance standard. Technology standards are worse than performance standards in inhibiting innovation since, by their very nature, they constrain the technological choices available.

The substantially higher cost of a standards-based policy may undermine support for such an approach, and securing political support may require a weakening of standards and hence lower environmental benefits.³

The key limitations of command-and-control regulations can be avoided through the use of market-based policy instruments. In the context of climate change, this essentially means carbon pricing.

Carbon Taxes

In principle, the simplest approach to carbon pricing would be through government imposition of a carbon tax (Metcalf, 2007). The government could set a tax in terms of dollars per ton of CO₂ emissions (or CO₂-equivalent on greenhouse gas emissions) by sources covered by the tax, or—more likely—a tax on the carbon content of the three fossil fuels (coal, petroleum, and natural gas) as they enter the economy. To be cost-effective, such a tax would cover all sources, and to be efficient, the carbon price would be set equal to the marginal benefits of emission reduction, represented by estimates of the social cost of carbon (Interagency Working Group on Social Cost of Carbon, 2010). Over time, an efficient carbon tax would increase to reflect the fact that as more greenhouse gas emissions accumulate in the atmosphere, the greater is the incremental damage from one more ton of CO₂. Imposing a carbon tax would provide certainty about the marginal cost of compliance, which reduces uncertainty about returns to investment decisions, but would leave uncertain economy-wide emission levels (Weitzman, 1974).

The government could apply the carbon tax at a variety of points in the product cycle of fossil fuels, from fossil fuel suppliers based on the carbon content of fuel sales (“upstream” taxation/regulation) to final emitters at the point of energy generation (“downstream” taxation/regulation). Under an upstream approach, refineries and importers of petroleum products would pay a tax based on the carbon content of their gasoline, diesel fuel, or heating oil. Coal-mine operators would pay a tax reflecting the carbon content of the tons extracted at the mine mouth. Natural-gas companies would pay a tax reflecting the carbon content of the gas they bring to surface at the wellhead or import via pipelines or liquefied natural gas (LNG) terminals. Focusing on the carbon content of fuels would enable the policy to capture about 98% of U.S. CO₂ emissions, for example, with a relatively small number of covered firms—on the order of a few thousand—as opposed to the hundreds of millions of smokestacks, tailpipes, and so forth, that emit CO₂ after fossil fuel combustion.

A carbon tax would be administratively simple and straightforward to implement in most industrialized countries, since the tax could incorporate existing methods for fuel-supply monitoring and reporting to the regulatory authority. Some developing countries with effective tax systems, including monitoring and enforcement regimes to minimize tax evasion, could also implement carbon taxes in a relatively straightforward manner. Given the molecular properties of fossil fuels, monitoring the physical quantities of these fuels yields a precise estimate of the emissions that would occur during their combustion.

In the event that carbon capture and storage technologies become commercially available, a crediting system for downstream sequestration could complement the emission tax system. A firm that captures and stores CO₂ through geological sequestration, thereby preventing the gas from entering the atmosphere, could generate tradable CO₂ tax credits and sell these to firms that would otherwise have to pay the emission tax.⁴

As fuel suppliers face the emission tax, they will increase the cost of the fuels they sell. This will effectively pass the tax down through the energy system, creating incentives for fuel-switching and investments in more energy-efficient technologies that reduce CO₂ emissions.

The effects of a carbon tax on emission mitigation and the economy will depend in part on the amount and use of the tax revenue. For example, an economy-wide U.S. carbon tax of US\$20 per ton of CO₂ would likely raise more than US\$100 billion per year. The carbon tax revenue could be put toward a variety of uses. It could allow for reductions in existing distortionary taxes on labor and capital, thereby stimulating economic activity and offsetting some of a policy's social costs (Goulder, 1995; Goulder & Parry, 2008). Other socially valuable uses of revenue include reduction of debt, and funding desirable public programs, such as research and development of climate-friendly technology. The tax receipts could also be used to compensate low-income households for the burden of higher energy prices as well as compensating others bearing a disproportionate cost of the policy.

The implementation of a carbon tax (or any other meaningful climate policy instrument) will increase the cost of consuming energy and could adversely affect the competitiveness of energy-intensive industries. This competitiveness effect can result in negative economic and environmental outcomes: firms may relocate facilities to countries without meaningful climate change policies, thereby increasing emissions in these new locations and offsetting some of the environmental benefits of the policy. Such "emission leakage" may actually be relatively modest, because a majority of the emissions in developed countries occur in nontraded sectors, such as electricity, transportation, and residential buildings. However, energy-intensive manufacturing industries that produce goods competing in international markets may face incentives to relocate and advocate for a variety of policies to mitigate these impacts (Aldy & Pizer, 2011).

Additional emission leakage may occur through international energy markets—as countries with climate policies reduce their consumption of fossil fuels and drive down fuel prices, those countries without emission mitigation policies increase their fuel consumption in response to the lower prices. Since leakage undermines the environmental effectiveness of any unilateral effort to mitigate emissions, international cooperation and coordination becomes all the more important. These competitiveness impacts on energy-intensive manufacturing could be mitigated through policy designs we discuss below. Also, it is important to keep in mind that these emission leakage effects exist with any meaningful climate policy, whether carbon pricing or command-and-control.

Real-world experience with energy pricing demonstrates the power of markets to drive changes in the investment and use of emission-intensive technologies. The run-up in gasoline prices in 2008 resulted in a shift in the composition of new cars and trucks sold toward more fuel-efficient vehicles, while reducing vehicle miles traveled by the existing fleet (Ramey & Vine, 2010). Likewise, electric utilities responded to the dramatic decline in natural gas prices (and decline in the relative

gas-coal price) in 2009 and 2010 by dispatching more electricity from gas plants that resulted in lower carbon dioxide (CO₂) emissions and the lowest share of U.S. power generation by coal in some four decades (U.S. Energy Information Administration, 2009). Longer term evaluations of the impacts of energy prices on markets have found that higher prices have induced more innovation—measured by frequency and importance of patents—and increased the commercial availability of more energy-efficient products, especially among energy-intensive goods such as air conditioners and water heaters (Newell, Jaffe, & Stavins, 1999; Popp, 2002).

Cap-and-Trade Systems

A cap-and-trade system constrains the aggregate emissions of regulated sources by creating a limited number of tradable emission allowances—in sum equal to the overall cap—and requiring those sources to surrender allowances to cover their emissions (Stavins, 2007). Faced with the choice of surrendering an allowance or reducing emissions, firms place a value on an allowance that reflects the cost of the emission reductions that can be avoided by surrendering an allowance. Regardless of the initial allowance distribution, trading can lead allowances to be put to their highest valued use: covering those emissions that are the most costly to reduce and providing the incentive to undertake the least costly reductions (Hahn & Stavins, in press; Montgomery, 1972). Cap-and-trade sets an aggregate quantity, and through trading, yields a price on emissions, and is effectively the dual of a carbon tax that prices emissions and yields a quantity of emissions as firms respond to the tax's mitigation incentives. Uncertainty in the costs of abatement leads to uncertainty regarding the allowance price in a cap-and-trade system and uncertainty regarding emissions under a tax. This has potentially important economic and political implications, which we discuss below.

In developing a cap-and-trade system, policy makers must decide on several elements of the system's design. Policy makers must determine how many allowances to issue—the size or level of the emission cap. Policy makers must determine the scope of the cap's coverage: identify the types of greenhouse gas emissions and sources covered by the cap, including whether to regulate upstream (based on carbon content of fuels) or downstream (based on monitored emissions).

After determining the amount of allowances and scope of coverage, policy makers must determine whether to freely distribute or sell (auction) allowances. Free allocation of allowances to firms could reflect some historical record (“grandfathering”), such as recent fossil fuel sales. Such grandfathering involves a transfer of wealth, equal to the value of the allowances, to existing firms, whereas, with an auction, this same wealth is transferred to the government. With an auction, the government would, in theory, collect revenue identical to that from a tax producing the same amount of emission abatement. As with tax receipts, auction revenues could be used to reduce distortionary taxes or finance other programs.

In an emission trading program, cost uncertainty—unexpectedly high or volatile allowance prices—can undermine political support for climate policy and discourage

investment in new technologies and research and development. Therefore, attention has turned to incorporating “cost-containment” measures in cap-and-trade systems, including offsets, allowance banking and borrowing, safety valves, and price collars.

An offset provision allows regulated entities to offset some of their emissions with credits from emission reduction measures lying outside the cap-and-trade system’s scope of coverage. An offset provision can link a cap-and-trade system with an emission-reduction-credit system (see below). Allowance banking and borrowing effectively permit emission trading across time. The flexibility to save an allowance for future use (banking) or to bring a future period allowance forward for current use (borrowing) can promote cost-effective abatement. Systems that allow banking and borrowing redefine the emission cap as a cap on cumulative emissions over a period of years, rather than a cap on annual emissions. This makes sense in the case of climate change, because it is a function of cumulative emissions of gases that remain in the atmosphere for decades to centuries.

A safety valve puts an upper bound on the costs that firms will incur to meet an emission cap by offering the option of purchasing additional allowances at a predetermined fee (the safety valve “trigger price”). This effective price ceiling in the emission allowance market reflects a hybrid approach to climate policy: a cap-and-trade system that transitions to a tax in the presence of unexpectedly high mitigation costs. When firms exercise a safety valve, their aggregate emissions exceed the emission cap. A price collar combines the ceiling of a safety valve with a price floor created by a minimum price in auction markets or a government commitment to purchase allowances at a specific price.

Increasing certainty about mitigation cost—through a carbon tax, safety valve, or price collar—reduces certainty about the quantity of emissions allowed.⁵ Smoothing allowance prices over time through banking and borrowing reduces the certainty over emissions in any given year, but maintains certainty of aggregate emissions over a longer time period. A cost-effective policy with a mechanism insuring against unexpectedly high costs—either through cap-and-trade or a carbon tax—increases the likelihood that firms will comply with their obligations and can facilitate a country’s participation and compliance in a global climate agreement.

In a similar fashion as under a carbon tax, domestic cap-and-trade programs could include some variant of a border tax to mitigate some of the adverse competitiveness impacts of a unilateral domestic climate policy and encourage trade partners to take on mitigation policies with comparable stringency. In the case of a cap-and-trade regime, the border adjustment would take the form of an import allowance requirement, so that imports would face the same regulatory costs as domestically produced goods. However, border measures under a carbon tax or cap-and-trade raise questions about the application of trade sanctions to encourage broader and more extensive emission mitigation actions globally as well as questions about their legality under the World Trade Organization (Brainard & Sorking, 2009; Frankel, 2010).

Emission-Reduction-Credit Systems

An emission-reduction-credit (ERC) system delivers emission mitigation by awarding tradable credits for “certified” reductions. Generally, firms that are not covered by some set of regulations—be they command-and-control or market-based—may voluntarily participate in such systems, which serve as a source of credits that entities facing compliance obligations under the regulations may use. Individual countries can implement an ERC system without having a corresponding cap-and-trade program.

For example, as we discuss below, the Clean Development Mechanism (CDM) under the Kyoto Protocol provides credits used by firms covered by the EU ETS. A firm earns credits for projects that reduce emissions relative to a hypothetical “no project” baseline. In determining the number of credits to grant a firm for a project, calculation of the appropriate baseline is therefore as important as measuring emissions. Dealing with this unobserved and fundamentally unobservable hypothetical baseline is at the heart of the so-called “additionality” problem.

While ERC systems can be self-standing, as in the case of the CDM, governments can also establish them as elements of domestic cap-and-trade or other regulatory systems. These ERC systems—often referred to as offset programs—serve as a source of credits that can be used by regulated entities to meet compliance obligations under the primary system. For example, the Regional Greenhouse Gas Initiative (RGGI) in the northeast United States, which regulates CO₂ emissions from electric power plants (and which we discuss below), recognizes offsets from activities such as landfill methane capture and destruction, reductions in emissions of sulfur hexafluoride from the electric power sector, and afforestation. Electricity generators covered by RGGI can use these offset credits to cover part of their emissions. Other cap-and-trade systems that we discuss below also contain offset provisions.

Clean Energy Standards

The purpose of a clean energy standard is to establish a technology-oriented goal for the electricity sector that can be implemented cost-effectively (Aldy, 2011). Under such standards, power plants generating electricity with technologies that satisfy the standard create tradable credits that they can sell to power plants that fail to meet the standard, thereby minimizing the costs of meeting the standard’s goal in a manner analogous to cap-and-trade.

In the United States, for example, state renewable electricity standards (RESs), a restricted type of a clean energy standard, typically establish the objective of the standard as a specific renewable share of total power generation that increases over time (U.S. Congressional Budget Office, 2011). A few states have implemented alternative energy standards in their power sector that target renewables, new nuclear power generating capacity, and advanced fossil fuel power generating technologies.

The European Union and China have promoted renewable power through renewable electricity mandates that include tradable renewable energy credits.

Clean energy standards that focus on technology targets do not explicitly price the greenhouse gas externality and thus impose a higher cost for a given amount of emission reductions than a carbon tax or cap-and-trade program. A renewable mandate treats coal-fired power, gas-fired power, and nuclear power as equivalent—none of these technologies create credits necessary for compliance—despite the fact that a natural gas combined cycle power plant typically produces a unit of generation with half the CO₂ emissions of a conventional coal power plant, and a nuclear plant produces zero-emission power, as do wind, solar, and geothermal. Thus, mandating power from a limited portfolio of technologies can result in higher costs by providing no incentive to switch from emission-intensive coal to emission-lean gas or emission-free nuclear.

A more cost-effective approach to a clean energy standard would employ a technology-neutral performance standard, such as tons of CO₂ per megawatt hour of generation. All power sources, from fossil fuels to renewables, could be eligible under such a performance standard. This has the advantage over the portfolio approach of providing better innovation incentives and of enabling all possible ways of reducing the emissions intensity of power generation. The Canadian province of Alberta has employed such a tradable carbon performance standard for most large sources of CO₂ emissions and has required a 12% improvement in the emission intensity of these sources since 2007.

Power plants would be awarded credits for generating cleaner (less emission-intensive) electricity than the standard. These clean power plants could sell credits to other power plants or save them for future use. Tradable credits promote cost-effectiveness by encouraging the greatest deployment of clean energy from those plants that can lower their emission intensity at lowest cost. Those power plants could then sell their extra credits to other power plants that face higher costs for deploying clean energy. The creation and sale of clean energy credits would provide a revenue stream that could conceivably enable the financing of low- and zero-emission power plant projects.

Eligible technologies for the standard could extend beyond generation technologies and also permit improvements in energy efficiency, or a broad set of emission offset activities, to create tradable credits. Extending the price on carbon to a broader set of activities could improve cost-effectiveness, but allowing for energy efficiency and other offsets poses risks. As emphasized above, estimating offsets is complex, requires extensive review and monitoring by third parties or regulatory agencies, and risks undermining the objective of a policy because of the additionality problem.

Monitoring and enforcement could be relatively straightforward under either a portfolio or performance standard approach. For example, in the United States, electricity generation, generating technology type, and CO₂ emissions are already tracked at power plants by state and Federal regulators.

A clean energy standard represents a de facto free allocation of the right to emit greenhouse gases to the power sector. Suppose that the U.S. government created a clean energy performance standard of 0.5 tons of CO₂ per megawatt hour (the 2010 U.S. power sector emission intensity was 0.56 tons of CO₂/MWh); this is roughly comparable to a 50% clean energy standard that allows all technologies with lower emission intensity than conventional coal to qualify (with partial crediting for low- but non-zero-emitting facilities). As a result, a clean energy standard could not generate the revenues that a carbon tax or a cap-and-trade program with an allowance auction could.

Eliminating Fossil Fuel Subsidies

Phasing out fossil fuel subsidies can represent significant progress toward “getting prices right” for fossil fuel consumption, especially in some developing countries, where subsidies are particularly large. Imposing a carbon price on top of a fuel subsidy will not lead to the socially optimal price for the fuel, but removing such subsidies can deliver incentives for efficiency and fuel switching comparable to implementing an explicit carbon price. In sharp contrast with our discussion above of other policy instruments, in which we focused on ways to price externalities to correct a market failure, our overview of eliminating fossil fuel subsidies addresses the removal of policy interventions that represent “government failures” and thereby exacerbate a market failure.

At the 2009 G20 Summit in Pittsburgh, Pennsylvania, the leaders of 20 of the largest developed and developing countries agreed to phase out fossil fuel subsidies over the “medium term,” and encouraged all other nations to eliminate such subsidies. The agreement called for phasing out these subsidies while targeting support for the poor, and noted that “inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change” (G20 Leaders, 2009). Soon thereafter, leaders of the APEC nations⁶ reached agreement on fossil fuel subsidy elimination at the 2009 Singapore Summit.

The economic and climate benefits of fossil fuel subsidy reform could be significant. In 2008, fossil fuel consumption subsidies exceeded US\$500 billion globally and could exceed US\$660 billion by 2020 without policy reforms (International Energy Agency [IEA], 2011). In at least 10 countries, fossil fuel subsidies exceeded 5% of GDP, and constituted substantial fractions of government budgets (IEA, 2010). Eliminating fossil fuel subsidies could reduce global oil consumption by about 4.7 million barrels per day by 2020, representing a decline of about 5% of current consumption. The International Energy Agency (2010) estimates that eliminating all fossil fuel subsidies would reduce global CO₂ emissions by about two gigatons per year by 2020. To put this in perspective, the UN Environmental Programme (2010) estimates that the Copenhagen Accord emission pledges will reduce greenhouse gas emissions by three to seven gigatons relative to business as usual in 2020.

The vast majority of fossil fuel subsidies suppress the prices for petrol, diesel, electricity, natural gas, and coal that consumers face, primarily in developing countries.⁷ Some developing country governments have been historically reticent to let fuel and electricity prices rise to market-determined levels because of concerns of public opposition. For example, protests over reducing petrol subsidies contributed to President Suharto's downfall in Indonesia in 1998 (Beaton & Lontoh, 2010). Interestingly, Indonesia successfully reduced their fossil fuel subsidies—doubling consumers' prices for petrol and diesel and tripling consumers' prices for kerosene—in 2005 by coupling the change in the fuel price regime with a targeted, means-tested program to transfer government resources from fuel subsidies to income support. Before its late 2010 subsidy reform that significantly raised petrol and diesel prices in exchange for lump-sum cash transfers, Iran priced diesel fuel at about 10 cents per gallon (Coady et al., 2010).

Critics of subsidy reform claim it will harm low-income households, but most fossil fuel subsidies disproportionately benefit the relatively wealthy in developing countries. Indeed, about 40% of the benefits of petroleum subsidies accrue to the wealthiest quintile, while the lowest income quintile enjoys less than 10% of the subsidy benefits, on average globally (Coady et al., 2010).⁸

To promote implementation and cooperation on the G20 fossil fuel subsidies commitment, the leaders established two processes that enable a de facto “pledge and review” process. First, the leaders tasked their energy and finance ministers to compile a list of their own country's fossil fuel subsidies and present their strategies for eliminating them. After a series of staff-and ministerial-level consultations among the G20, the energy and finance ministers presented their plans in 2010 (G20 Leaders, 2010a). Second, the leaders tasked the Organization of Economic Cooperation and Development (OECD), International Energy Agency (IEA), World Bank, and the Organization of Petroleum Exporting Countries (OPEC) to evaluate fossil fuel subsidies (G20 Leaders, 2009). These international organizations subsequently produced joint reports that serve as independent benchmarks of fossil pricing policies by which countries may evaluate others' subsidy elimination plans (IEA, OPEC, OECD, & World Bank, 2010).

In 2010, the G20 leaders explicitly called on these international organizations to “further assess and review the progress made in implementing the Pittsburgh and Toronto commitments” (G20 Leaders, 2010b). While the G20 has no formal compliance mechanism to explicitly enforce the leaders' commitment, it does establish a goal, an implementation process, and what can effectively be a third-party expert review. This combination provides transparency for governments and stakeholders to assess whether nations are delivering on their leaders' commitments. This can promote credibility and trust for future international cooperation and may provide some lessons for the design of bottom-up international climate policy (see more on this below in our discussion of international coordination of carbon pricing policies).

Regional, National, and Subnational Experiences With Carbon Pricing

We briefly examine the few explicit carbon pricing policy regimes that are currently in place: the European Union's Emission Trading Scheme; New Zealand's cap-and-trade system; the Kyoto Protocol's Clean Development Mechanism; northern European carbon tax policies; British Columbia's carbon tax; and Alberta's tradable carbon performance standard (similar to a clean energy standard).⁹

European Union Emission Trading Scheme

By far the world's largest carbon pricing regime is the European Union Emission Trading Scheme (EU ETS), a cap-and-trade system of CO₂ allowances. Adopted in 2003 with a pilot phase that became active in 2005, the EU ETS covers about half of EU CO₂ emissions in 30 countries in a region of the world that accounts for about 20% of global GDP and 17% of world energy-related CO₂ emissions (Ellerman & Buchner, 2007).¹⁰ The 11,500 emitters regulated by the *downstream* program include large sources such as oil refineries, combustion installations over 20 MWth, coke ovens, cement factories, ferrous metal production, glass and ceramics production, and pulp and paper production. Up until now, the program has not covered sources in the transportation, commercial, or residential sectors (Ellerman & Buchner, 2007) although the EU plans to extend the ETS to cover aviation sector emissions starting in 2012.

The EU ETS was designed to be implemented in phases: a pilot or learning phase from 2005 to 2007, a Kyoto phase from 2008 to 2012,¹¹ and a series of subsequent phases. Penalties for violations increase from 40 Euros per ton of CO₂ in the first phase to 100 Euros in the second phase. Although the first phase allowed trading only in carbon dioxide, the second phase broadened the program to include other GHGs, such as nitrous oxide emissions.

The process for setting caps and allowances in member states was initially decentralized (Kruger, Oates, & Pizer, 2007), with each member state responsible for proposing its own national carbon cap, subject to review by the European Commission. This created incentives for individual countries to try to be generous with their allowances to protect their economic competitiveness (Convery & Redmond, 2007). Not surprisingly, the result was an aggregate cap that exceeded business-as-usual emissions.

In the spring of 2006, it became clear that the allocation of allowances in 2005 on net had exceeded emissions by about 4% of the overall cap. This led, as would be anticipated, to a dramatic fall in allowance prices. In January, 2005, the price per ton was approximately €8/tCO₂; by early 2006, it exceeded €30/tCO₂, then fell by about half in one week of April, 2006, before fluctuating and returning to about €8/tCO₂ (Convery & Redmond, 2007). This volatility was attributed to the absence of transparent, precise emissions data at the beginning of the program, a surplus of allowances, energy price volatility, and a program feature that *prevents banking* of allowances

from the first phase to the second phase (Market Advisory Committee, 2007). In truth, the “overallocation” was concentrated in a few countries, particularly in Eastern Europe, and in the nonpower sectors (Ellerman & Buchner, 2007).

The first and second phases of the EU ETS require member states to distribute almost all of the emissions allowances (a minimum of 95% and 90%, respectively) freely to regulated sources, but beginning in 2013, member states will be allowed to auction larger shares of their allowances. The initial free distribution of allowances led to complaints from energy-intensive industrial firms about “windfall profits” among electricity generators, when energy prices increased significantly in 2005. But the higher electricity prices were only partly due to allowance prices, higher fuel prices also having played a role; and it is unclear whether the large profits reported by electricity generators were due mainly to their allowance holdings or to having low-cost nuclear or coal generation in areas where the (marginal) electricity price was set by higher cost natural gas (Ellerman & Buchner, 2007).

The system’s cap was tightened for Phase 2 (2008-2012), and its scope expanded to cover new sources in countries that participated in Phase 1 plus sources in Bulgaria and Romania, which acceded to the European Union in 2007. Liechtenstein, Iceland, and Norway joined the EU ETS in 2008 although sources in Iceland are not yet subject to an emissions cap. Allowance prices in Phase 2 increased to over €20/tCO₂ in the first half of 2008, averaged €22/tCO₂ in the second half of 2008, and then fell to €13/tCO₂ in the first half of 2009, and down to €10/tCO₂ in the fall of 2011, as the economic recession brought decreased demand for allowances due to reduced output in the energy-intensive sectors and lower electricity consumption.

The European Union plans to extend the EU ETS through Phase 3, 2013-2020, with a centralized cap becoming increasingly stringent (20% below 1990 emissions), a larger share of the allowances subject to auctioning, tighter limits on the use of offsets, and unlimited banking of allowances between Phases 2 and 3.

Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is a *downstream* cap-and-trade program that was originally intended to limit CO₂ emissions in the United States from power sector sources in 10 northeastern states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey,¹² New York, Rhode Island, and Vermont).¹³ The system is both narrow in its sectoral coverage and unambitious in terms of its emissions reduction objectives.

The program took effect in 2009, after approval by individual state legislatures, and set a goal of limiting emissions from regulated sources to then current levels in the period from 2009 to 2014. Beginning in 2015, the emissions cap is set to decrease by 2.5% each year until it reaches an ultimate level 10% below 2009 emissions in 2019. It was originally anticipated that meeting this goal would require a reduction approximately 35% below business-as-usual emissions (13% below 1990 emissions levels). However, due to the combined effects of the economic recession and drastic

declines in natural gas prices relative to coal prices, the program is no longer binding and is unlikely to become binding through 2020, unless the targets are revised.¹⁴

Because RGGI only limits emissions from the power sector, incremental monitoring costs are low, because U.S. power plants are already required to report their hourly CO₂ emissions to the Federal government (under provisions for continuous emissions monitoring as part of the SO₂ allowance trading program). The system sets standards for certain categories of CO₂ offsets, and limits the number and geographic distribution of offsets. The program requires participating states to auction at least 25% of their allowances and to use the proceeds for energy efficiency and consumer-related improvements.¹⁵ The remaining 75% of allowances may be auctioned or distributed freely. In practice, states have auctioned virtually all allowances.

Several problems with the program's design can be noted. First is the leakage problem, which is potentially severe for any state or regional program, particularly given the interconnected nature of electricity markets (Burtraw, Kahn, & Palmer, 2005). Second, the program is downstream for just one sector of the economy and so very limited in scope. Third, despite considerable cost uncertainty, a true firm safety valve mechanism was not adopted. Instead, there are trigger price that allow greater reliance on offsets and external credits in the expectation that these can increase supply. The program does impose a price floor in the allowance auctions, without which the allowance prices would have approached zero (when the combined forces of the economic recession and lower natural gas prices caused emissions to fall below the declining cap). Fourth, as mentioned above, the program limits the number and geographic origin of offsets.

New Zealand Emissions Trading Scheme

In January, 2008, the New Zealand Emissions Trading Scheme (NZ ETS) was launched. Under this system, the intention is to include all sectors of the economy and all greenhouse gases by 2015, using free allocation of allowances, with special protections (output-based updating allocations) for emission-intensive, trade-sensitive sectors. The forestry sector entered the program first, in 2008; and stationary energy, industrial, and liquid fuel fossil fuel sectors joined in 2010. The waste (landfills) sector is scheduled to enter in 2013, and agriculture—which accounts for nearly half of New Zealand's gross emissions—is scheduled to enter in 2015.¹⁶

Covered sources have the option of paying a fixed fee of NZUS\$25 per ton of emissions, and until 2013, all sectors other than forestry require only one unit of allowances for each two units of emissions. Thus, although the NZ allowances are indirectly linked with the EU ETS through the CDM, the current effective price is very low while the system becomes established. Early evidence suggests that the forestry component has deterred deforestation and may be encouraging new planting, although international policy and consequent price uncertainty are major problems for investment (Karpas & Kerr, 2010).

The Climate Change Response Act of 2002, which provided for the creation of the emissions trading scheme for the purpose of meeting the country's Kyoto obligations,

required a review of the NZ ETS by an independent review panel every 5 years. The first review (Emissions Trading Scheme Review Panel, 2011) was released by the government in September, 2011. While most of the scheme was upheld, it recommended that the agriculture sector face a lower price as it enters the system and that the government should review the wisdom of allowing offsets from HFC-23 destruction projects under the Clean Development Mechanism (see below). The government hopes to link with Australia's emissions trading program, scheduled to be launched in 2015.

Clean Development Mechanism

The most significant GHG emission-reduction-credit system to date is the Kyoto Protocol's Clean Development Mechanism (CDM). Under the CDM, certified emission reduction (CER) credits are awarded for voluntary emission reduction projects in non-Annex I countries (largely, developing countries) that ratified the Protocol, but are not among the Annex I countries subject to the Protocol's emission limitation commitments—also known as the Annex B countries.¹⁷ CDM projects can potentially take the form of building new wind farms, investing in more energy efficient equipment in a manufacturing facility, and capturing methane from landfills. While CERs can be used by the Annex I countries to meet their emission commitments, they could also be used for compliance purposes by entities covered by other cap-and-trade systems, including systems in countries that are not Parties to the Protocol, such as the United States.

From the perspective of the industrialized countries, the CDM provides a means to engage developing countries in the control of GHG emissions, while from the perspective of the developing countries, the CDM provides an avenue for the financing of "sustainable development." Essentially, the purchase of CERs by industrialized country entities to offset their own emissions can reduce the aggregate cost of compliance with the Kyoto Protocol, because it tends to be much less expensive to construct new low-carbon energy infrastructure in developing nations than to modify or replace existing infrastructure in industrialized countries (Wara, 2007).

Of the six GHGs covered by the Kyoto Protocol,¹⁸ approximately 38% of projects in the CDM pipeline as of 2007 were for CO₂, 28% for HFC-23, 23% for methane, and 11% for nitrous oxide (Wara, 2007). In terms of CO₂-equivalent reductions, the CDM has accounted for annual reductions of 278 million tons, about 1% of annual global emissions of CO₂ (U.S. Energy Information Administration, 2011).¹⁹ The largest shares of CERs have been generated in China (52%) and India (16%), with Latin America and the Caribbean making up another 15% of the total, Brazil (at 7%) being the largest producer in that region (World Bank, 2010).

Because the CDM is an ERC system, it is subject to concerns about the additionality of emission-reductions associated with its projects (see generic discussion above regarding ERC systems). Empirical analysis has validated these concerns, with estimates that up to 75% of claimed reductions would have occurred in the absence of the program (Zhang & Wang, 2011).

A particular concern has centered on the fact that nearly 30% of average annual CERs have come from the destruction of HFC-23, a potent GHG that is a by-product of the manufacture of certain refrigerant gases. It is very inexpensive to destroy HFC-23, and companies can earn nearly twice as much from sale of CDM credits as they can from selling respective refrigerant gases. As a result, it has been argued that plants are being built simply for the purpose of generating CERs from destruction of HFC-23. Because of this, beginning in 2013, CERs from HFC-23 destruction will not be valid for purposes of compliance with the EU ETS.

As debate continues regarding a possible second commitment period for the Kyoto Protocol, it appears that the CDM will continue to function, in any event (Bodansky, 2011). A variety of proposals have been put forward to improve its structure and implementation, many targeted at increasing the additionality of approved projects (Hall, Levi, Pizer, & Ueno, 2010). In the meantime, as we discuss below, the CDM may provide a significant function by facilitating indirect linkages among diverse national cap-and-trade systems.

*Northern European Experience With Carbon Taxes*²⁰

In the 1990s, a number of northern European countries imposed carbon taxes to limit their greenhouse gas emissions. In 1991, Norway implemented a carbon tax that varied in its level across sectors of the economy, despite the fact that cost-effective abatement would call for a uniform tax. In the transportation sector, by 2009, the Norwegian carbon tax had increased to about US\$58/tCO₂ on gasoline, but only US\$34/tCO₂ on diesel (Government of Norway, 2009). Natural gas faced a carbon tax of US\$31/tCO₂ to US\$33/tCO₂ in 2009, depending on use. By 1999, facilities using coal paid US\$24/tCO₂ for coal for energy purposes and US\$19/tCO₂ for coal for coking purposes (Bruvoll & Larsen, 2004), but the Government of Norway exempted these activities from the carbon tax starting in 2003 (Government of Norway, 2009). In 2009, the carbon tax applied to about 55% of Norwegian greenhouse gas emissions, while the emission trading scheme that is linked to the EU ETS covered an additional 13% of emissions.²¹ In 2003, Norway also introduced a tax of about US\$33/tCO₂-equivalent on HFCs and PFCs, which slowed the growth rate of these potent greenhouse gases (Government of Norway, 2009).

Likewise in 1991, Sweden implemented a carbon tax of about US\$33/tCO₂ as a part of a fiscal reform that lowered high income tax rates (Speck, 2008). The carbon tax has since increased to more than US\$135/tCO₂ by 2009 (Government of Sweden, 2009). At the same time, Sweden reduced its general energy tax on many of the sources bearing the carbon tax. Refineries, steel, and other primary metal industries received an exemption from the carbon tax (Daugjberg & Pedersen, 2004). In addition, those industries covered by the EU ETS were exempted from the carbon tax (Government of Sweden, 2009). About 33% of Sweden's greenhouse gas emissions are covered by the EU ETS, a smaller fraction than the norm in the EU (Government of Sweden, 2009).

In 1992, Denmark implemented a carbon tax of about US\$18/tCO₂, and reduced this tax modestly to a level of about US\$17/tCO₂ in 2005, where it remained through 2009 (Speck, 2008; Government of Denmark, 2009). Manufacturing industries bear discounted tax rates of more than 90% depending on their energy intensity and participation in a voluntary agreement (Government of Denmark, 2009). The carbon tax on gasoline amounted to about 16 cents per gallon in 2009.

Since 1997, Finland has imposed a general tax on energy coupled with a surtax based on the carbon content of the energy. Like other northern European nations, Finland reduced its carbon tax for some industries covered by the EU ETS, reflecting concerns about adverse competitiveness impacts on trade-exposed manufacturing. Since 2008, the carbon surtax has been about US\$28/tCO₂ although natural gas faces half this rate (Government of Finland, 2009).

Obviously, implementation of carbon taxes in northern Europe have yielded significant variations in the effective tax per unit CO₂ across fuels and industries within each country, contrary to the cost-effective prescription of a common price on carbon among all sources. In addition, fiscal cushioning to carbon taxes—by adjustments to preexisting energy taxes—and to the EU ETS—by adjustments to then preexisting carbon taxes—was common, especially for those industries expressing concerns about their international competitiveness. Nonetheless, these nations have demonstrated that carbon taxes can deliver greenhouse gas emission reductions and raise revenues to finance government spending and lower income tax rates (OECD, 2001; Government of Denmark, 2009; Government of Finland, 2009; Government of Norway, 2009).

British Columbia Carbon Tax

Since 2008, the Canadian province of British Columbia has had in place a carbon tax as one part of its plan to reduce provincial GHG emissions by 33% by 2020 (British Columbia, 2007). The carbon tax is intended to be economy-wide, with a tax of C\$10 per ton of CO₂-equivalent emissions in 2008, increasing by C\$5 per year for 4 years, and reaching C\$30/ton in 2012. The tax is collected “upstream” at the wholesale level (fuel distributors) based on the carbon content of fuels to facilitate administration (Duff, 2008). By law, 100% of the tax revenue must be refunded through tax cuts to businesses and individuals, and low-income individuals are further protected through a Low Income Climate Action Tax Credit.

During 2008 and 2009, the tax generated C\$846 million in revenue. This was accompanied by reductions in a variety of personal and corporate income taxes, plus tax credits for low-income individuals. These cuts totaled approximately C\$1.1 billion, so that the policy yielded significant net tax reductions (Plumer, 2010). A similar pattern occurred in 2010. The government estimates that by 2020, the carbon tax will reduce British Columbia’s CO₂ emissions by approximately 3 million tons annually.

Interestingly, another part of the province’s Climate Action Plan is a provincial cap-and-trade system, which is to be linked with a similar systems planned in

California (under Assembly Bill 32), Ontario, and Quebec through the Western Climate Initiative. The province's plans have not addressed how the carbon tax and cap-and-trade system will be coordinated.²²

Alberta Tradable Carbon Performance Standard

In 2007, the Canadian province of Alberta designed a market-based policy to reduce the carbon intensity of its large sources of greenhouse gas emissions. This program established a rate-based performance standard for emission sources exceeding 100,000 metric tons of CO₂ annually. Building on emission inventories dating to 2003, each large source covered by the program was required to reduce the emission intensity of its production 12% below a base year intensity drawn from the 2003-2006 period.²³ The program covers about 100 sources from the power sector, pulp and paper, cement, and fertilizer industries, and oil sands development. The unit of measure is emissions of CO₂ per unit of physical production from that industry, for example, per barrel of oil from oil sands development (Sass, 2010).

Covered firms have four options for complying with the performance standard. First, they can reduce the emission intensity of production to meet the standard. Second, they may purchase credits from other covered firms with emission intensities below the standard. Third, they may purchase Alberta-based emission offset credits through an emission-reduction credit program. Finally, they may pay the provincial government C\$15 for every metric ton they exceed the standard by, which serves as a safety valve on the cost of compliance with the program (Province of Alberta, 2008).

In 2010, covered sources employed all four options to comply with the performance standard. These sources reduced their emissions relative to baseline by about 2.7 million tons of CO₂ (with a majority of this effort traded from low mitigation cost facilities to high mitigation cost facilities), purchased about 3.9 million tons emission offset credits, and satisfied the remaining 4.7 million ton emission reduction obligation through the C\$15/tCO₂ safety valve. This last option generated about C\$70 million of revenue directed to the Climate Change and Emissions Management Fund, which invests in emission-lean technologies and projects (Province of Alberta, 2011).

International Coordination of Carbon Pricing Policies

Climate change is truly a global commons problem: the location of greenhouse gas emissions has no effect on the global distribution of damages. Hence free-riding problems plague unilateral and multilateral approaches. Furthermore, nations will not benefit proportionately from greenhouse gas mitigation policies. Thus mitigation costs are likely to exceed direct benefits for virtually all countries. Cost-effective international policies—insuring that countries get the most environmental benefit out of their mitigation investments—will help promote participation in an international climate policy regime.

In principle, internationally employed market-based instruments can achieve overall cost effectiveness. Three basic routes stand out. First, countries could agree to apply the same tax on carbon (*harmonized domestic taxes*) or adopt a *uniform international tax*. Second, the international policy community could establish a system of *international tradable permits*—effectively a nation-state level cap-and-trade program. In its simplest form, this represents the Kyoto Protocol's Annex B emission targets and the Article 17 trading mechanism. Third, a more decentralized system of internationally linked domestic cap-and-trade programs could ensure internationally cost-effective emission mitigation.

International Taxes and Harmonized Domestic Taxes

In principle, a carbon tax could be imposed on nation states by an international agency. The supporting agreement would have to specify both tax rates and a formula for allocating the tax revenues. Cost-effectiveness would require a uniform tax rate across all countries. It is unclear, however, what international agency could impose and enforce such a tax, and so an alternative more frequently considered has been a set of harmonized domestic carbon taxes (Cooper, 2010). In this case, an agreement would stipulate that all countries are to levy the same domestic carbon taxes and retain their revenues.

The uniformity of tax rates is necessary for cost-effectiveness. But some developing countries may argue that the resulting distribution of costs does not conform to principles of distributional equity and call for significant resource transfers. Under a harmonized tax system, an agreement could include fixed lump-sum payments from developed to developing countries, and under an international tax system, an agreement could specify shares of the total international tax revenues that go to participating countries.

As an alternative to these explicit transfers, developed countries could commit to constrain the use of their tax revenues in ways that produce global benefits. For example, carbon tax revenues in developed countries could, in part, finance major research and development programs on zero-carbon technologies and adaptation efforts in developing countries, while developing countries could freely use their tax revenues in ways that best facilitate their development.

In some developing countries reluctant to implement a carbon tax, an initial cost-effective contribution to combat climate change could take the form of reducing fossil fuel subsidies. For example, a developing country cutting a petrol subsidy equal to 10% of its price is approximately equivalent to a rich country imposing a carbon tax on petrol that raises its price 10%. Well-planned, broad fossil fuel price reforms in a developing country could deliver substantial emission mitigation just as a carbon tax in a developed country (IEA, 2010). The energy prices are higher in both countries, providing the incentive to invest in energy-efficient technologies and nonfossil energy sources, but the relative prices remain unchanged, so that energy-intensive firms do not face the incentive to relocate to the developing country.

Lowering energy subsidies can free up government revenues that could be directed to other beneficial uses and improve the allocation of resources in the economy to promote faster economic growth. Of course, some energy subsidies in developing countries address pressing, basic energy needs, and efforts to combat climate change may need to account for these social objectives.

International Tradable Permits: Cap-and-Trade and Emission-Reduction-Credits

Under an international tradable permit scheme, all participating countries would be allocated permits for “net emissions,” that is, emissions minus sequestration. A permit would define a right to emit a given volume over some time period, such as a year. In each period, countries would be free to buy and sell permits on an international exchange.

Initial permit allocations could reflect a variety of criteria, such as previous emissions, gross domestic product, population, and fossil fuel production. Whatever the initial allocation, subsequent trading can, in theory, lead to a cost-effective outcome (Montgomery, 1972), if transaction costs are not significant (Stavins, 1995). This potential for pursuing distributional objectives while assuring cost-effectiveness is an important attribute of the tradable permit approach.

Providing large initial permits to developing countries (for reasons of distributional equity) implies that they would sell permits primarily to developed countries. Since permit prices represent an implicit tax on all participating countries, the terms of trade within the coalition for countries with the same carbon intensities in production would remain unaffected. From a distributional point of view, developing countries would receive compensation, whereas developed countries would have to pay for their own emission abatement and for permit purchases from abroad to cover the balance of their emissions (Olmstead & Stavins, 2012).

An important obstacle to the successful operation of such a system is that by its very nature, the trading would be among nations (Hahn & Stavins, 1999). Nation-states are hardly simple cost-minimizers, like private firms, so there is no reason to anticipate that competitive pressures would lead to equating of marginal abatement costs across countries. The system would not have the cost-effectiveness property ordinarily associated with a domestic tradable permit system among firms. Even if nations were cost-minimizers, they do not have sufficient information about the marginal abatement costs of firms within their jurisdiction to define their own aggregate marginal costs. The notion of a simple trading program among countries may be more of a metaphor than a practical policy.

If every country participating in such a system were to devolve the tradable permits to firms within its jurisdiction, that is, if each country instituted a domestic tradable permit system as its means of achieving its national target, then the trading could be among firms, not governments, both within countries and internationally (Hahn & Stavins, 1999). Such a system could indeed be cost-effective. In the near term, this

trading system could be integrated with an emission-reduction-credit system, such as the CDM, for countries that do not take on emission caps.

The current design of the CDM does not secure all low-cost mitigation opportunities in developing countries. The project basis for credits under the CDM increases transaction costs and excludes policy reforms that undermine the cost-effectiveness of the mechanism. Modifying the CDM along several lines could improve its cost-effectiveness, increase the investment in low-carbon technologies in developing countries, and address concerns about whether CDM activities truly reflect additional emission mitigation effort (Hall et al., 2010).

First, the CDM could be expanded to cover mitigation policies. Some of the potentially low-hanging fruit in developing countries—from reducing energy subsidies to designing and enforcing building codes—do not neatly fall within a “project” under the CDM. A policy-oriented CDM could deliver price signals to a greater share of a developing country’s economy that can yield more emission mitigation and reduce the potential for emission leakage. This could also serve as a mechanism for transfers to developing countries that pursue a carbon tax. The obvious challenge lies in setting baseline emissions to assess the emission reduction benefits for any given policy. This effort may be substantial, but when spread over all of the potential emission reductions, the transaction costs may be minor in comparison to the costs of a project-based approach resulting in the same abatement.

Second, the CDM could be expanded to cover sectors as an alternative to projects. A sectoral CDM could establish emission baselines for entire sectors (such as the power sector or the steel sector), and allow countries to implement mitigation policies in those sectors to generate credits. Integrating these policies into the international regime—such as pegging a sectoral carbon tax to the international tradable permit price, or implementing a sectoral cap-and-trade system linked to the international regime—could promote cost-effectiveness. Focusing on the most energy-intensive sectors could also address concerns about competitiveness and emission leakage in developed countries. It would also provide developing countries with the experience to inform their consideration of taking on broader emission or policy commitments in future agreements.²⁴

Decentralized, Bottom-Up Architectures

Cap-and-trade systems seem to have emerged as the preferred national and regional instrument for reducing emissions of greenhouse gases throughout much of the industrialized world, and the CDM has developed a substantial constituency, despite concerns about its performance. Because linkage between tradable permit systems (that is, unilateral or bilateral recognition of allowances from one system for use in another) can reduce compliance costs and improve market liquidity, there is great interest in linking cap-and-trade systems with each other.

There are not only benefits but also concerns associated with various types of linkages (Jaffe, Ranson, & Stavins, 2010). A major concern is that when two

cap-and-trade systems are directly linked (that is, allow bilateral recognition of allowances in the two jurisdictions), key cost-containment mechanisms, such as safety valves, are automatically propagated from one system to the other. Because some jurisdictions (such as the European Union) are opposed to the notion of a safety valve, whereas other jurisdictions (such as the United States) seem very favorably predisposed to the use of a safety valve, challenging harmonization would be required.

This problem can be avoided by the use of indirect linkage, whereby two cap-and-trade systems accept offsets from a common emission-reduction-credit system, such as the Clean Development Mechanism. As a result, the allowance prices of the two cap-and-trade systems converge (as long as the ERC market is sufficiently deep), and all the benefits of direct linkage are achieved (lower aggregate cost, reduced market power, decreased price volatility), but without the propagation from one system to another of cost-containment mechanisms. Such indirect linkage may already be evolving as a key element of the de facto post-2012 international climate policy architecture.

Despite the apparent current popularity of cap-and-trade as a national policy approach in many parts of the world, in reality, there are a variety of policy instruments—both market based and conventional command-and-control—that countries can employ to reduce their GHG emissions. Hence it is important to ask whether a diverse set of heterogeneous national, subnational, or regional climate policy instruments can be linked in productive ways. The basic answer is that such a set of instruments can be linked, but the linkage is considerably more difficult than it is with a set of more homogeneous tradable permit systems (Hahn & Stavins, 1999). In fact, the basic approach behind emission reduction credit systems such as the CDM and Joint Implementation (JI) can be extended to foster linkage opportunities among diverse policy instruments, including cap-and-trade, taxes, and certain regulatory systems (Metcalf & Weisbach, 2010).

Another form of coordination can be unilateral instruments of economic protection, that is, border adjustments. In the case of a national carbon tax, this would take the form of a tax on imports that was equivalent to the implicit tax on the same domestically produced goods. In the case of a cap-and-trade system, this would take the form of an import-allowance-requirement. Such border adjustments are found as part of most existing, planned, and proposed national climate policies.

The Future of Carbon Pricing

The political responses to possible market-based approaches to climate policy in most countries have been and will continue to be largely a function of issues and structural factors that transcend the scope of environmental and climate policy. Because a truly meaningful climate policy—whether market based or conventional in design—will have significant impacts on economic activity in a wide variety of sectors (because of the pervasiveness of energy use in a modern economy) and in every region of a country, it is

not surprising that proposals for such policies bring forth significant opposition, particularly during difficult economic times.

In the United States, political polarization—which began some four decades ago, and accelerated during the economic downturn—has decimated what had long been the key political constituency in the Congress for environmental (and energy) action, namely, the middle, including both moderate Republicans and moderate Democrats (Stavins, 2011). Whereas Congressional debates about environmental and energy policy had long featured regional politics, they are now fully and simply partisan. In this political maelstrom, the failure of cap-and-trade climate policy in the U.S. Senate in 2010 was essentially collateral damage in a much larger political war.

It is possible that better economic times will reduce the pace—if not the direction—of political polarization. Furthermore, it is also possible that the ongoing challenge of large budgetary deficits in many countries will increase the political feasibility of new sources of revenue. When and if this happens, consumption taxes (as opposed to traditional taxes on income and investment) could receive heightened attention, and primary among these might be energy taxes, which can be significant climate policy instruments, depending on their design.

It is much too soon to speculate on what the future will hold for the use of market-based policy instruments for climate change. It is conceivable that two decades of relatively high receptivity in the United States, Europe, and other parts of the world to cap-and-trade and offset mechanisms will turn out to be no more than a relatively brief departure from a long-term trend of reliance on conventional means of regulation. On the other hand, it is also possible that the recent tarnishing of cap-and-trade in U.S. political dialogue will itself turn out to be a temporary departure from a long-term trend of increasing reliance on market-based environmental policy instruments. It is too soon to say.

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1. In the developing country context, refer to Coria and Sterner (2010) and Coria, Löfgren, and Sterner (2010) for an assessment of air pollutant emission trading in Chile.
2. Where market-based policy instruments have been employed, they have typically complimented rather than substituted for command-and-control regulations. Green taxes have been employed in some contexts for the purpose of raising revenue, with little concern for their impacts on environmental outcomes. The OECD (2001) provides an assessment of environmental taxes in a variety of pollution contexts. Beyond the OECD, Máca, Melichar, and

- Š asný (in press) evaluate environmental taxes and subsidies in central and eastern European countries, Cao, Ho, and Jorgenson (2009) assess green taxes in China, and Blackman (2010) and Sterner and Coria (2012) review a variety policy instruments in developing countries.
3. However, in special cases where emission monitoring and enforcement is particularly costly—such as for methane emissions in agriculture—a standards-based approach may be appropriate.
 4. Similar approaches could be undertaken to promote biological sequestration in forestry and agriculture and potentially emission-reduction projects (“offsets”) in other countries. See discussion of Emission Reduction Credit programs below.
 5. From a political perspective, environmentalists have expressed concerns about “emission certainty,” as an alternative to “cost certainty.” From an economic welfare perspective, cost certainty is more important than emission certainty if the slope of estimated marginal abatement costs is relatively steeper than the slope of estimated marginal benefits of abatement (Pizer, 2002; Weitzman, 1974).
 6. The 21 “member economies” of APEC (Asia-Pacific Economic Cooperation) are Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taipei, Thailand, United States, and Viet Nam.
 7. Refer to Badiani, Jessoe, and Plant (in press) for a detailed discussion of electricity subsidies in the agricultural sector in India.
 8. The G20 agreement permits exclusion for subsidies that are explicitly targeted to low-income households. For example, the U.S. government has indicated that it considers the Low Income Home Energy Assistance Program to be exempt from the subsidy elimination commitment for this reason.
 9. In addition to the EU ETS and the New Zealand cap-and-trade system, the Japanese Voluntary Emissions Trading System has operated since 2006, and Norway operated its own emissions trading system for several years before joining the EU ETS in 2008. Legislation to establish cap-and-trade systems is under debate in Australia (combined with a carbon tax for an initial 3-year period) and in the Canadian provinces of Ontario and Quebec. Japan is considering a compulsory emissions trading system.
 10. The EU ETS covers all 27 member states plus Iceland, Liechtenstein, and Norway.
 11. This is the first commitment period of the Kyoto Protocol, 2008-2012.
 12. In May of 2011, New Jersey Governor Chris Christie announced that his state would withdraw from the system.
 13. In addition to RGGI, other regional and state efforts to limit GHGs in the United States have begun. One of the most prominent is California’s enactment of the Global Warming Solutions Act of 2006, which set a statewide GHG emissions limit for 2020 equal to California’s 1990 emissions level. In 2008, the California Air Resources Board proposed the use of a cap-and-trade program as a primary policy for achieving this target. The cap initially would cover electric generators and large industrial facilities, and its scope would later be expanded to include smaller facilities and the transportation sector. The cap-and-trade system is scheduled to commence operations in 2012.

14. Allowance prices have reflected these realities, falling from approximately US\$3 per ton of CO₂ at the first auction in September, 2008, to the floor price of US\$1.89 per ton in 2011.
15. Three states have used some of their auction revenue to help balance their overall state budgets.
16. See <http://www.climatechange.govt.nz/emissions-trading-scheme/>
17. Parties include 37 industrialized countries and emerging market economies of central and eastern Europe. Like the CDM, Joint Implementation (JI) was established as a project-based flexibility mechanism under the Kyoto Protocol. Unlike the CDM, JI applies to emission reduction projects carried out in an Annex I country (the host country) that has a national emissions target under the Protocol. JI projects generate credits, referred to as emission reduction units (ERUs), which can be used to cover increased emissions in other countries.
18. These are CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
19. Note that carbon sequestration projects of forestation and reduced deforestation are not included in the CDM under the Kyoto Protocol's first commitment period, 2008-2012.
20. All carbon taxes reported in this subsection are in 2009 U.S. dollars, based on market exchange rates.
21. Greenhouse gas emissions in the offshore oil sector, representing 24% of the nation's emissions, are covered by both a (lower) carbon tax and the emission trading scheme (Government of Norway, 2009).
22. An important issue for national and subnational climate policies is the potential for interactions—some problematic and some positive—among overlapping policy instruments. On this, see McGuinness and Ellerman (2008); Fischer and Preonas (2010); Levinson (2010); Goulder and Stavins (2011); and Organization for Economic Cooperation and Development (2011).
23. New sources covered by the program initially bear less stringent performance standards that converge to the 12% objective over time (Province of Alberta, 2007).
24. Such an approach could be superior to some calls for sectoral policies that effectively set industry-specific performance standards common across participating developed and developing countries. This standard approach establishes walls between sectors that can increase the total mitigation cost for any given emission goal and eliminates opportunities to raise revenues, either through a carbon tax or an allowance auction, to benefit other social objectives.

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How additional is the Clean Development Mechanism?

Analysis of the application of current tools and proposed alternatives

Berlin,
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Abbreviations

CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CO₂	Carbon Dioxide
CORSIA	Carbon Offset and Reduction Scheme for International Aviation
CP	Crediting Period
CPA	Component Project Activity of a PoA
DOE	Designated Operational Entity
EB	Executive Board of the CDM
ETS	Emissions Trading Scheme/System
f_{NRB}	Fraction of non-renewable biomass
GHG	Greenhouse Gas
GS	Gold Standard
JCM	Joint Crediting Mechanism
LED	Light Emitting Diode
MP	Methodologies Panel under the CDM EB
MRV	Monitoring, Reporting & Verification
NDC	Nationally Determined Contribution
NRB	Non-renewable Biomass
OECD	Organisation for Economic Co-operation and Development
PDD	Project Design Document
PMR	Partnership for Market Readiness (Initiative of the World Bank)
PoA	Programme of Activities
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VCS	Verified Carbon Standard

Executive summary

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the Clean Development Mechanism (CDM) as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the CDM certainly forms an important basis for the elaboration and design of future international crediting mechanisms.

While this study provides important insights to **improve the CDM up to 2020**, the approach taken in this study could **also be applied more generally both to assess the environmental integrity of other compliance offset mechanisms**, as well as to avoid flaws in the design of new mechanisms being used or established for compliance. Many of the shortcomings identified in this study are inherent to crediting mechanisms in general, not least the considerable uncertainty involved in the assessment of additionality and the information asymmetry between project developers and regulators.

A fundamental feature of both the CDM and the mechanism under Article 6.4 is that they aim to achieve environmental integrity by ensuring that only real, measurable and additional emission reductions are generated. This study analyzes the opportunities and limits of the current CDM framework for ensuring environmental integrity, i.e. that projects are additional and that emission reductions are not overestimated. It looks at the way in which the CDM framework has evolved over time, assesses the likelihood that emission reductions credited under the CDM ensure environmental integrity and provides findings on the overall and project-type-specific environmental integrity of the CDM. In addition, it provides lessons learned and recommendations for improving additionality assessment that can be applied to crediting mechanisms generally, including to mechanisms to be used for compliance under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), and to mechanisms to be implemented under Article 6 of the Paris Agreement.

To ensure robust judgements, we have systematically analyzed the determination of additionality, the determination of baseline emissions and other issues that are key for environmental integrity. Towards this goal, we have evaluated those general CDM rules that are particularly relevant for environmental integrity and assessed in the case of specific project types the likelihood that they deliver real, measurable and additional emission reductions. Based on our analysis **key findings** include the following:

- Most **energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, energy efficiency improvements or fossil fuel switch.
- **Industrial gas projects** (HFC-23, adipic acid, nitric acid) are **likely to be additional** as long as the mitigation is not otherwise promoted or mandated through policies.
- **Methane projects** (landfill gas, coal mine methane) have a **high likelihood of being additional**.
- **Biomass power projects** have a **medium likelihood of being additional** overall because the assessment of additionality very much depends on the local conditions of individual projects.
- The additionality of the current pipeline of **efficient lighting projects** using small-scale methodologies is **highly unlikely** because in many host countries the move away from incandescent bulbs is well underway.

- In the case of **cook stove projects**, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Cook stove projects are also likely to considerably **over-estimate the emission reductions** due to a number of unrealistic assumptions and default values.

Overall, our results suggest that 85% of the projects covered in this analysis and 73% of the potential 2013-2020 Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated. Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated.

Our analysis suggests that the **CDM still has fundamental flaws in terms of overall environmental integrity**. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions.

When considering the Paris Framework, the most important change from the Kyoto architecture is that all countries have made mitigation pledges in the form of Nationally Determined Contributions (NDC). An important implication is that host countries with ambitious and economy-wide mitigation pledges have **incentives to limit international transfers of credits** to activities with a **high likelihood of delivering additional emission reductions**, so that transferred credits do not compromise the host country's ability to reach their own mitigation targets. A second important implication is that countries should **only transfer emission reductions where this is consistent with their NDC**, implying that baselines may have to be determined in relation to the host country's mitigation pledges rather than using a 'counterfactual' business as usual scenario as a default.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either **existing projects which risk discontinuing GHG abatement** when the incentive from the CDM ceases, such as landfill gas flaring or to new **projects among** the few project types identified that **have a high likelihood of ensuring environmental integrity**.
- Buyers should **accompany purchase of CERs with support for a transition of host countries to broader and more effective climate policies**. In the short-term, where offsetting is used, it should only be on the basis that purchase of CERs does not undermine the ability of host countries to achieve their mitigation pledges.
- Given the inherent shortcomings of crediting mechanisms, we recommend focusing **climate mitigation efforts** on forms of carbon pricing **that do not rely extensively on credits** and on measures such as results-based climate finance that does not result in the transfer of credits or offsetting the purchasing country's emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement alternative climate policies.
- To enhance the environmental integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We also recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report.
- We also recommend provisions that provide strong incentives to the Parties involved to ensure the integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission reductions, but could also extend to other elements, such as im-

plementation of **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche role** focusing on those project types for which additionality can be relatively assured. Crediting should serve as a stepping-stone to other, more effective policies to achieve cost-effective mitigation. Continued support to developing countries will be key. We recommend using new innovative sources of climate finance, such as revenues from auctioning of emission trading scheme allowances, rather than crediting for compliance, to support developing countries in implementing their NDCs.

Summary

Aim of the study

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the **CDM** certainly forms an **important basis** for the elaboration and design of future mechanisms for international carbon markets. One key feature of both the CDM and the mechanism under Article 6.4 is that they should generate **real and additional** emission reductions. In other words, emission reductions that are credited and transferred should not have occurred in the absence of the mechanism and should not be overestimated. This study analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides findings on the **overall and project-type-specific environmental performance of the CDM** in the form of estimates of the **likelihood that the CDM results in real and additional emission reductions**. In addition, it provides lessons and recommendations for improving additionality assessment that can be applied to future crediting mechanisms.

Methodological approach

The main focus of this study is to assess the extent to which the CDM meets its objective to deliver “real, measurable and additional” emission reductions. In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, we systematically analyze CDM rules and how they have been applied to real projects in practice. We examined the rules for 1) **additionality assessment**, for 2) the **determination of baseline emissions** and 3) a number of **other issues** including the length of crediting period, leakage effects, perverse incentives, double counting, non-permanence, monitoring provisions and third party validation and verification. We approach these aspects from two different perspectives: we evaluate 1) **general CDM rules** that are particularly relevant for the delivery of real, measurable and additional emission reductions and we evaluate 2) **specific project types** with a view to assessing how likely these project types deliver additional emission reductions. To assess the impacts of our analysis, we further estimate the **potential 2013-2020 CER supply** from different project types.

Project-types-specific results

Table 1-1 (p. 13) below provides an overview of the findings on environmental integrity based on the detailed analysis of individual project types. **Most energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespectively of whether they involve the increase of renewable energy, efficiency improvements or

fossil fuel switch. An important reason why these project types are unlikely to be additional is that the revenue from the CDM for these project types is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. Moreover, many projects are economically attractive, partially due to cost savings from project implementation (e.g. fossil fuel switch, waste heat recovery) or domestic support schemes (renewable power generation).

Table 1-1: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered **likely to be additional** as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and do not generate significant revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-23 and nitric acid projects, perverse incentives have been adequately addressed. With regard to **adipic acid** projects, the risks for **carbon leakage have not yet been addressed**.

Methane projects (landfill gas, coal mine methane) also have a **high likelihood of being additional**. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face **issues with regard to baseline emissions and perverse incentives** and may thus lead to over-crediting.

Biomass power projects have a **medium likelihood of being additional** since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects **can be additional**, particularly if CER revenues for **methane avoidance can be claimed**. Biomass projects also face other issues, in particular with regard to demonstrating that the **biomass used is renewable**.

The additionality of **efficient lighting** projects using small-scale methodologies is **highly problematic** because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The **new methodologies** address these problems but they are **not mandatory** and the small-scale methodologies are, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For **cook stove** projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Particularly in urban areas, the additionality of these project types is questionable. Cook stove projects are also likely to considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Overall environmental assessment

Based on these considerations, we estimate that **85% of the covered projects and 73% of the potential 2013-2020 CER supply have a low likelihood** of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only **2% of the projects and 7% of potential CER supply have a high likelihood** of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity (Table 1-1, p. 13).

Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's **performance as a whole has anything but improved**, despite improvements of a number of CDM standards. The main reason for this is a **shift in the project portfolio towards projects with more questionable additionality**. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential of these project types is only less than a quarter. A second reason is that the **CDM Executive Board (EB)** has not only improved rules but also **made simplifications** that undermined the integrity. For example, positive lists have been introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). A third reason is that the **CDM EB** did not take effective means to **exclude project types** with a low likelihood of additionality. While positive lists have been introduced, project types with more questionable additionality have not been excluded from the CDM. Standardized baselines provide a further avenue to demonstrating additionality but do not reduce the number of projects wrongly claiming additionality. The improvements to the CDM mainly aimed at **simplifying requirements and reducing the number of false negatives** but did not address the false positives.

The result of our analysis therefore suggests that the **CDM has still fundamental flaws in terms of environmental integrity**. It is likely that the large majority of the projects registered and CER issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC.

Recommendations for improving general additionality rules

For an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. **Information asymmetry** between project developers and regulators, combined with the economic incentives for project developers to have their project recognised as additional, are a major challenge. We carefully scrutinised the **four main approaches** used to determine additionality. Our analysis shows that **prior consideration** is a necessary and important but not sufficient step for ensuring additionality of CDM projects and that this step largely

works as intended. The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. Especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters, such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio. The **barrier analysis** has lost importance as a stand-alone approach of demonstrating additionality. Non-monetized barriers remain subjective and are often difficult to verify by the DOEs. In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. However, the way in which common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality; it is important to reflect that market penetration is not for all project types a good proxy for the likelihood of additionality.

Against this background, we recommend that the **common practice analysis** is given a **more prominent role in additionality determination** though only after a significant reform:

- The 'one-size-fits-all' approach of determining common practice should be replaced by **sector- or project-type-specific guidance**, particularly with regard to distinguishing between different and similar technologies and with regard to the threshold for market penetration.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country.
- The common practice analysis should at least cover the **entire country**. However, if the absolute number of activities in the host country does not ensure statistical confidence, the scope needs to be extended to other countries.
- As a default, all CDM projects should be included in the common practice analysis, unless a methodology includes different requirements.

We further recommend that the **investment analysis** is excluded as an approach for demonstrating additionality for projects types in which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence. For those project types in which the investment analysis would still be eligible, the project participant must confirm the all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders. The **barrier analysis** should be abolished entirely as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types). Barriers that can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

In addition, we recommend improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period the validity of the baseline scenario should be assessed for CDM project types for which the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex should be limited to one single crediting period. Moreover, generally abolishing the renewal of crediting periods while allowing a somewhat longer single crediting period for project types that require a continuous stream of CER revenues to continue operation may be considered.
- **Positive Lists:** The review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of na-

tional policies and measures to support low emission technologies (so-called E- policies). To maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists.

- **Standardized baselines:** Once established in a country, their use should be made mandatory and all CDM facilities should be included in the peer group used for the establishment of standardized baselines.
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity by over-crediting emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by being excluded from the crediting baseline where possible.
- **Suppressed demand:** An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand could be restricted to countries where development needs are highest and the potential for over-crediting is the smallest.

Recommendations to improve project type specific rules

Industrial gas projects: Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. Therefore, a global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects would provide for a high degree of environmental integrity. However, industrial gas projects provide for low-cost mitigation options. These emission sources could therefore also be addressed through domestic policies, such as regulations, or by including the emission sources in domestic or regional ETS, and help countries achieve their Nationally Determined Contributions (NDCs) under the Paris Agreement. Parties to the Montreal Protocol are also considering regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM.

Energy-related project types: We recommend that these project types should, in principle, no longer be eligible under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers. These project types may thus remain **eligible in least developed countries**. In cases in which **biomass power generation** is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM, provided that the corresponding provisions in the applicable methodologies are revised appropriately.

With regard to **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass and if approaches for determining the penetration rate of efficient lighting technologies were made mandatory for all new projects and CPAs while the older methodologies are withdrawn, we recommend that these project types should remain eligible.

Methane projects: Landfill gas and coal mine methane projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and requesting DOEs to verify that landfilling practices are not changed. With regard to landfill gas, we recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Implication for the future use of international carbon markets

The **CDM has provided many benefits**. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer, may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures and created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of gathering considerable experience, the **enduring limitations** of GHG crediting mechanisms are apparent.

Firstly and most notably, the **elusiveness of additionality** for all but a limited set of project types is very difficult, if not impossible, to address. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is **difficult to address through improvements of rules**. Secondly, international crediting mechanisms involve an **inherent and unsolvable dilemma**: either they might create **perverse incentives for policy makers** in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they **credit activities that are not additional** because they are implemented due to policies or regulations. Thirdly, for many project types, the **uncertainty of emission reductions** is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain for how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules. A further overarching shortcoming of crediting mechanisms is that they do **not make all polluters pay but rather they make them subsidize the reduction of emissions**. Most of these shortcomings are inherent to using crediting mechanisms, which **questions the effectiveness of international crediting mechanisms as a key policy tool** for climate mitigation.

The future role of crediting mechanisms should therefore be revisited in the light of the Paris Agreement. Several **elements of the CDM could be used** when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. The Paris Agreement therefore requires countries to **adjust their reported GHG emissions** for international transfers of mitigation outcomes, in order to **avoid double counting** of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond what they had pledged under their NDC. A second important implication relates to the incentives for host countries to ensure integrity. Host countries with ambitious and economy-wide mitigation pledges would have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. In combination, this suggests that the

future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries. A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules in assessing the additionality of projects considered for funding.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either existing **projects that are at risk of stopping GHG abatement** or the few project types that have a **high likelihood of ensuring environmental integrity**. Continued purchase of CERs should be accompanied with a plan and support to host countries to **transition to broader and more effective climate policies**. We further recommend to pursue the purchase and cancellation of CERs as a form of **results-based climate finance** rather than using CERs for compliance towards meeting mitigation targets.
- Given the inherent shortcomings of crediting mechanisms, we recommend **focusing climate mitigation efforts on** forms of carbon pricing that do **not rely extensively on credits**, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement broader climate policies.
- To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend **limiting** such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches. We also recommend curtailing the length of the crediting periods with no renewal.
- Given the high integrity risks of crediting mechanisms, we recommend provisions that provide strong incentives to the Parties involved to ensure integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission re-

ductions, but could also extend to other elements, such as **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM has had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment confirms, alongside other evaluations, the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche-specific role** in which additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

1. Introduction

With almost 7,700 Clean Development Mechanism (CDM) projects and almost 300 programmes of activities (PoAs) registered and more than 1.6 billion Certified Emissions Reductions (CER) issued, the CDM has developed into an important component of the global carbon market. However, its role in the future remains uncertain. With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end, most likely soon after 2020.

However, in terms of its standards, procedures and institutional arrangements, the CDM forms certainly an important base for the elaboration and design of future mechanisms for international carbon markets. The mechanism established under Article 6.4 of the Paris Agreement includes several provisions that are similar to the CDM. Parties also decided that the rules, modalities and procedures of the new mechanism should be adopted on the basis of the “experience gained with and lessons learned from existing mechanisms”. Moreover, experiences gained from the CDM can also be used for the development of domestic baseline and credit policies both in developed and developing countries.

One key feature of both the mechanism under the Paris Agreement (Article 6.4) and domestic baseline and credit policies is that they should generate real and additional emission reductions, in other words: the credited and transferred emission reductions should not have occurred in the absence of the mechanism and or policy. The ability to deliver such a result depends heavily on having a reasonably effective way to assess additionality both for specific project types and on an aggregate basis, and to set a baseline such that the number of credits issued does, in total, not exceed actual reductions.

Demonstrating additionality and setting baselines are the areas in which the most concerns have been raised with the CDM, in particular regarding the investment, barrier and common practice analysis and the assessment of prior consideration. Given its counterfactual nature, asymmetries of information regarding costs, financing, barriers and local project conditions, and signal-to-noise issue, it has been difficult to implement a reliable method for assessing additionality and setting baselines. Other factors that also affect the overall mitigation outcome are the length of the crediting period used, how leakage concerns are dealt with and whether any perverse incentives are addressed, among others.

The difficulties with these traditional approaches have resulted in further refinement and revision of these approaches as well as the introduction of several alternative approaches to setting of baselines and testing additionality. Examples include the use of default values, performance benchmarks or penetration rates and discounting approaches. More fundamental changes include the use of highly standardized baselines and additionality tests at the sectoral level. It remains to be seen whether the methodological difficulties with highly standardized approaches can be solved to make them operational, and whether they will result in a lower likelihood of non-additional credits being issued.

The additionality of CDM projects has been assessed in the past in several general and project-specific studies. Much of the research was conducted before the improvement of rules and the introduction of new approaches, such as standardized baselines. This study aims to assess whether and how these changes have affected the quality of CDM projects, focusing on the project portfolio available in the second commitment period of the Kyoto Protocol and taking due account of the improvements implemented over time.

In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, a systematic assessment is required of the CDM rules and how they have been applied to real projects in practice. A similar exercise should be carried out for the different reforms suggested to the existing rules. This study therefore analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides robust and quantified conclusions on the overall and project-type-specific environmental performance of the CDM in the form of estimates of the likelihood that the CDM results in real and additional emission reductions.

2. Methodological approach

2.1. General research approach

The main focus of this study is to assess the extent to which the CDM meets its objective stipulated in Article 12.5(c) of the Kyoto Protocol to deliver “real, measurable and additional” emission reductions. Based on the findings, concrete recommendations are made for further reform of the CDM and implications for the future role of the CDM are discussed.

There are two principal challenges to evaluating of the ability of the CDM to deliver additional emission reductions: the inherent uncertainty of a counter-factual baseline and the uncertainty and bias associated with project and baseline data. Therefore, any assessment of the extent of non-additional or otherwise under- or over-credited CDM activity can therefore only provide rough and directional estimates. Project design documents (PDDs) and monitoring reports provide substantial data and assumptions. However, these data and assumptions are often limited (they may not cover all relevant activity, especially non-CDM activity) and can involve considerable judgment by parties that have an interest in the outcome (e.g. selecting among alternative projections of future fuel prices) made for the purpose of meeting CDM requirements.

We examine the three main aspects as regards whether the CDM delivers additional emission reductions:

1. **Additionality assessment:** The assessment of additionality refers to the question of whether a project was implemented due to the CDM. Additionality is the most important prerequisite to providing an emissions benefit. If a project would have been implemented in the absence of the CDM incentives, the emission reductions would have occurred anyway. If a Party uses non-additional CERs rather than reducing its own emissions to meet its emission reduction commitments, global GHG emissions would be higher than they would have otherwise been. Because errors in additionally determination affect the validity of an entire project’s CERs, additionality assessment forms the main focus of this study.
2. **Determination of baseline emissions:** A second important aspect is how the baseline emissions are determined. Determining baseline emissions is associated with considerable uncertainty. A crediting baseline that is above the emissions that would most likely occur in the absence of the project can lead to significant over-crediting. Vice versa, ambitious baselines that are below the emissions that would most likely occur in the absence of the project, can result in under-crediting.
3. **Other issues:** A number of other issues are important to deliver additional emission reductions, including:
 - the length of crediting period,
 - criteria for the renewal of the crediting period,

- approaches for determining indirect emission effects, such as leakage effects,
- the way in which perverse incentives for both project developers and policy makers are addressed,
- the extent to which double counting of emission reductions within the mechanism and with other mechanisms and pledges is avoided,
- whether potential non-permanence of emission reductions is sufficiently addressed,
- whether monitoring provisions are appropriate, and
- the effectiveness of the regulatory framework for third party validation and verification.

We also touch upon these issues, in particular when they raise concerns with regard to the integrity of the CDM. They do not, however, form the focus of this study.

In our examination, we approach these aspects from two different perspectives:

- **General CDM rules:** In Chapter 3, we evaluate approaches for determining general CDM additionality rules that are particularly relevant for the delivery of real, measurable and additional emission reductions. This includes an assessment of innovative and potentially more objective approaches for setting baselines and determining additionality and an analysis of whether and how these approaches could improve the determination of additionality under the CDM.
- **Specific project types:** In Chapter 4, we evaluate specific project types with a view to assessing how likely these project types deliver additional emission reductions. A separate evaluation by project type is important as the likelihood of additional emission reductions can differ significantly among project types. This evaluation covers the major project types contributing to a large share of the emission reductions in the CDM portfolio.

Drawing on findings from Chapters 3 and 4, we provide an overall assessment of the additionality of the CDM project portfolio in Chapter 5. In Chapter 6, we provide a summary of key recommendations for further reform of the CDM. Finally, we discuss the implications for the future use of the CDM in Chapter 7.

The study employs several analytical methodologies and approaches:

- **Literature analysis** forms the basis for our evaluation of general CDM rules, specific project types, and innovative approaches towards baseline setting and additionality assessment.
- **Qualitative assessment of relevant CDM rules** with a view to their ability for ensuring additional emission reductions. We identify potential shortcomings in the current rules and propose options for addressing them.
- **Empirical, quantitative evaluation of how the CDM rules are applied** through analysis of a representative random sample of projects. The analysis will be based on information in PDDs and validation reports and, where necessary, also monitoring and verification reports. The projects will be identified through stratified random sampling, aiming to ensure representativeness of host countries and project types. This empirical analysis aims to identify possible shortcomings in the application of general CDM rules. The information and data to be evaluated is specific for each of the identified general CDM rules and the questions identified. The methodological approach of the empirical evaluation is further specified in Section 2.2 below.
- **Economic assessment** of the feasibility of different project types is another important building block of the study. The economic assessment is conducted for the evaluation of

specific project types in Chapter 4. The methodological approach of the empirical evaluation is further specified in Section 2.3 below.

- **Sectoral analysis** of the market situation for specific project types to assess whether the technology has often already been implemented without the CDM and whether an observed market uptake occurs due to the CDM. The sectoral analysis is conducted for the evaluation of specific project types in Chapter 4. The methodological approaches are further specified in the corresponding sections.

We use the CDM rules and the CDM project portfolio as of 1 January 2014 as the basis for the assessment.

To assess the impacts of our analysis, we further estimate the potential 2013-2020 CER supply for different project types. The method used to estimate the potential CER volume is described in Section 2.3.

2.2. Empirical evaluation of CDM projects

The assessment of key CDM rules for additionality demonstration in Chapter 3 is based on an in-depth evaluation of PDDs, validation reports, etc. of randomly selected CDM projects. The project samples were randomly drawn from the so-called CDM project pipeline as of 1 January 2014 (UNEP DTU 2014). This pipeline is a compilation of certain information and data provided in the project design document (PDD) of each CDM project. For this assessment, only registered CDM projects were taken into account as the PDDs usually undergo significant changes during the validation period. To ensure representativeness, the samples were stratified by the following characteristics and strata:

- Location (host country/region)
 - China
 - India
 - Asia & Pacific
 - Brazil
 - Latin America
 - Rest of the World
- Technology
 - Industry (HFC-23, N₂O, cement, energy efficiency, energy distribution, etc.)
 - Electricity generation from hydro
 - Electricity generation from wind
 - Electricity generation from renewable energy (solar, tidal, etc.)
 - Other renewable energy (biomass, geothermal, mixed renewable energy, etc.)
 - Waste sector (landfill gas, methane avoidance, etc.)
 - Other (afforestation, reforestation, agriculture, transport, etc.)
- Scale
 - Large-scale projects
 - Small-scale projects
- Time (registration year)
 - Pre 2010
 - In 2010 or 2011
 - Post 2011.

The in-depth assessment of project samples was conducted for the key additionality determination rules: investment analysis (Section 3.2), barrier analysis (Section 3.3) and common practice analy-

sis (Section 3.3). For each of these rules a separate sample of 30 randomly selected CDM projects was drawn.

Since the CDM project pipeline did not include information about which option of additionality determination was applied in the PDD, we had to conduct a two-step sampling: In the first step, we drew a representative sample of 300 projects. For each of the projects of this sample we identified which additionality determination rules were applied so that we could use this sample as population for the second sampling step in which we drew the samples for each of the additionality determination rules.¹

2.3. Estimation of the potential CER supply

We estimate the potential CER supply² for the purpose of assessing the overall integrity of the CDM based on our findings for specific project types or specific additionality tests. The potential CER supply is estimated mainly on the basis of the CDM pipeline as of 1 January 2014 (UNEP DTU 2014). Moreover, we included additional information from a similar pipeline which is provided by IGES (2014). All CDM projects which were registered by 1 January 2014 are taken into account (7,418). In the case of industrial gas projects (HFC-23, adipic acid, nitric acid), some baseline and monitoring methodologies were significantly revised, which has a major impact on the potential CER supply in the second and third crediting periods. For these projects, we use specific bottom-up estimates derived from project-specific information (Schneider & Cames 2014).

We distinguish the CER supply potential considering the duration of the commitment periods under the Kyoto Protocol:

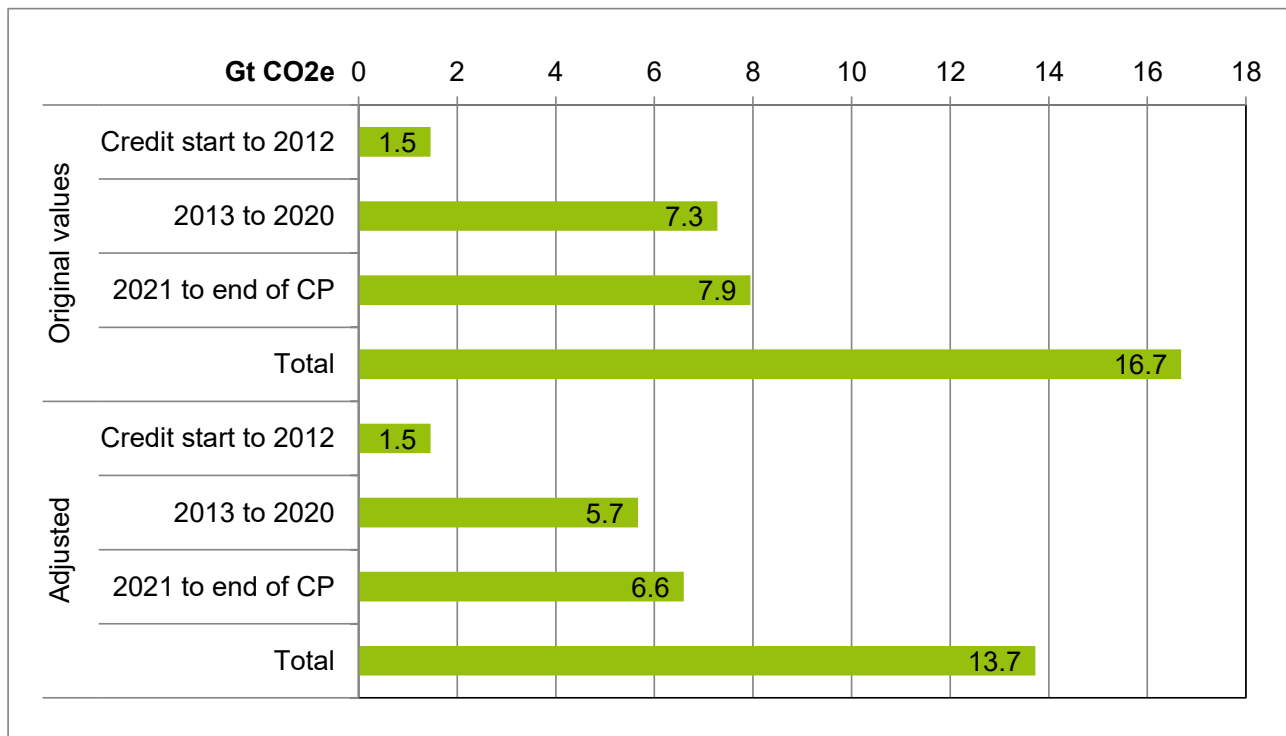
- from credit start to the end of 2012,
- from the beginning of 2013 to the end of 2020 and
- from the beginning of 2021 to the end of the crediting periods (CP).

Our study is focused on the period of 2013 to 2020.

Figures for the period from credit start to the end of 2012 reflect the actual CER issuance rather than the potential supply (UNFCCC 2015a). For the latter two periods, we take into account the issuance success rate provided in the CDM pipeline and adjust the expected CER supply accordingly. For some projects, more CERs were issued than projected while for most of the CDM projects less CERs were issued. Several projects had not issued any CERs (4,913). For those projects we assume either the average issuance rate for the respective project type or – if no CERs have been issued for that project type so far – the overall average of the issuance success rate. Figure 2-1 provides an overview of the potential CER supply.

¹ A more detailed description of the sampling approach, the code used for drawing the samples and the reference numbers of the projects drawn into each of the samples can be found in Section 8.1 of the Annex.

² The actual CER supply depends on various conditions of the global carbon market and particularly on price expectations. However, also under normal market conditions, price forecasts are very uncertain. Under post-2012 market conditions, prices are even more uncertain. We therefore only estimate the potential CER supply which is derived from information in PDDs and other project specific or general documents but ignore any interaction with the global carbon market. At price levels of less than \$1/CER, the estimated volumes will not be achieved in practice.

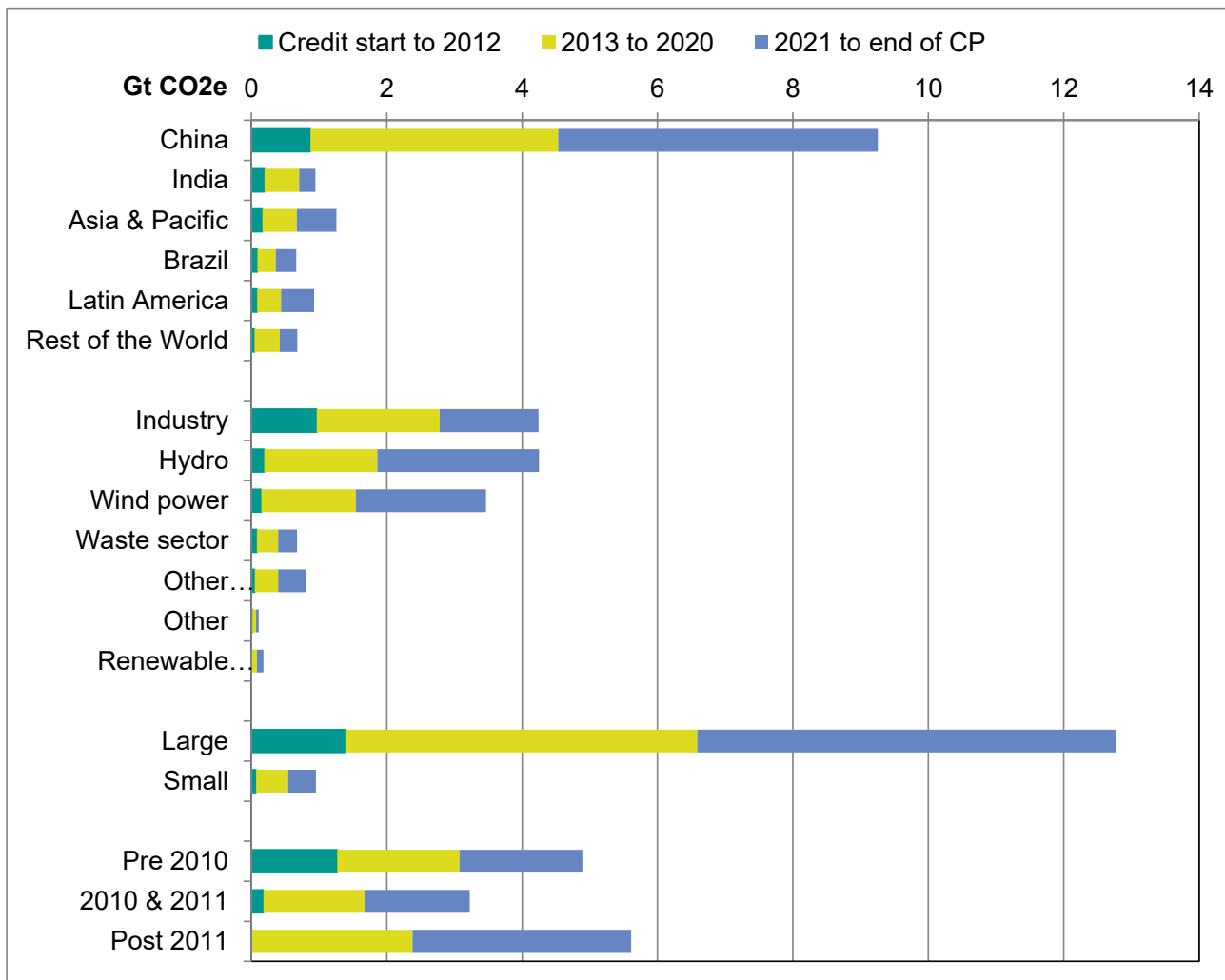
Figure 2-1: Potential CER supply, original and adjusted values

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The average adjustment factor is -22% though it ranges from -4% for N₂O projects to some -67% for transport projects. The adjusted CER supply for the period of 2013 to 2020 amounts to almost 5.7 billion CERs, almost 4 times the volume issued for the first crediting period.

Figure 2-2 illustrates where the potential CER supply stems from. Obviously China was and will remain the largest potential supplier of CERs. Almost two thirds (64.5%) of the potential CER supply in 2013 to 2020 are expected to be provided by Chinese CDM projects. In terms of project types, the large majority of supply stems from industry (32.0%), hydro (29.4%) and wind (24.6%) projects. Not surprisingly, the large majority (91.3%) of CERs stems from large scale projects while the breakdown in terms of registration period is more even: 31.8% stems from projects registered before 2010, 26.3% from projects registered in 2010 and 2011 while 41.8% of the potential CER supply in the period of 2013 to 2020 can be generated from CDM projects registered after 2011.

Figure 2-2: Potential CER supply by stratification categories



Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

In Chapter 4 we analyze the extent to which the likelihood of projects and CERs being additional depends on the project type. We look at 12 different project types, which together cover a broad range of activities and technologies. In terms of CER supply, these 12 project types amount to 85% of the potential supply in the period of 2013 to 2020 (Table 2-1). The largest supply potential is provided by hydro and wind power projects (29.4% and 24.6%, respectively). Industrial gas projects amount to almost 15% of the supply potential while biomass power, landfill gas, waste heat recovery and fossil fuel switch projects could each generate some 3-4% of the supply potential. Compared to these project types the supply potential of cook stoves (0.04%) and efficient lighting (0.07%) are almost negligible. However, since these project types are often included in government purchase programs or voluntary offset schemes and since their share among projects registered after 2012 is significant, we consider it worthwhile to examine these two project types in greater depth and to assess their likelihood of being additional and of generating additional CERs.

Table 2-1: Potential CER supply by project type

	No. of projects	Credit start to 2012	2013 to 2020	2021 to end of CP Adjusted	Total
			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production	19	507	375	547	1,429
Adipic acid	4	201	257	269	727
Nitric acid	97	57	175	172	404
Hydro power	2,010	191	1,669	2,388	4,249
Wind power	2,362	148	1,397	1,929	3,475
Biomass power	342	25	162	169	355
Landfill gas	284	57	163	159	380
Coal mine methane	83	34	170	123	327
Waste heat recovery	277	63	222	62	346
Fossil fuel switch	96	51	232	175	458
Cook stoves	38	0.1	2.3	0.4	2.7
Efficient lighting	43	0.4	3.8	0.2	4.5
Not covered	1,763	124	842	603	1,569
Total	7,418	1,459	5,671	6,596	13,726

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The first Programme of Activities (PoA) was registered in July 2009. From then until the end of 2013, 243 PoAs were registered in total, the large majority of them in 2012 (193). While cook stoves and efficient lighting account for only a small share in the CDM project pipeline, they are quite relevant in the context of PoAs. By the end of 2013, they account together for a quarter of the registered PoAs. Table 2-2 provides a breakdown of the potential CER supply from PoAs by project types.

Table 2-2: Potential CER supply from PoAs

	No. of programs	Credit start to 2012	2013 to 2020	2021 to end of CP	Total
			Mt CO ₂ e		
Hydro power	26		5	13	17
Wind power	24		18	45	63
Landfill gas	4	0	12	27	40
Coal mine methane	2		5	10	15
Fossil fuel switch	2		0	0	0
Cook stoves	31	0	33	82	115
Efficient lighting	30	2	17	63	82
Not covered	124	0	70	144	214
Total	243	2	161	385	547

Sources: UNEP DTU 2014, UNFCCC 2015b, authors' own calculations

The main difference of PoAs compared to projects bundles is that PoAs can – once registered – be extended over time by an unlimited number of so-called component project activities (CPA). An estimate of the CER supply potential is thus less reliable than the estimate for the project pipeline.

However, taking into account all CPAs included in PoAs by the end of 2013, the potential CER supply can roughly be estimated, though it is obvious that the actual supply could be much higher. PoA volumes are much more difficult to estimate, because a PoA might be registered with only one CPA that has 1,000 tCO₂ per year emissions reductions but which may ultimately include CPAs that reduce hundreds of thousands of tCO₂ per year.

Noting these limitations, all PoAs could supply some 0.16 billion CERs in total in the period of 2013 to 2020. The final volume of these PoAs could be many times this amount. Almost a third (31.4%) of this supply would be provided by cook stove or efficient lighting PoAs. CERs from renewable power generation programmes amount to 14% of the supply potential of PoAs. Interestingly, almost half of the PoAs do not fall into the project type categories which together account for 85% of the potential CER supply from CDM projects. This supports the hypothesis that PoAs address project categories or technologies that cannot be adequately addressed by individual CDM projects.

2.4. Economic assessment of CER impact

The demonstration of additionality has been a key issue in the CDM since the beginning of the Kyoto mechanisms (Chapter 3). While most researchers agree that there is no simple and objective approach to determining additionality, several authors argue that the impact of CER revenues on the economic feasibility of projects is an important indicator for the likelihood for projects to be additional (for example Sutter 2003, Schneider 2007, Spalding-Fecher et al. 2012). This builds on the assumption that project proponents are more likely to implement a project due to the CDM if CER revenues have a significant impact on the economic performance of the project. While other benefits from the CDM (e.g. the public relation aspect of registering a project under the UNFCCC) may in some cases help projects to go ahead that would not be implemented in the absence of the CDM, the economic benefit of CER revenues may be considered the main driver to implement CDM projects on a larger scale.

A high economic benefit resulting from CER revenues does not guarantee additionality, because some projects may already be economically viable without CER revenues and may only become more profitable with the CDM. However, low CER revenues are an indicator of a lower likelihood that the project is additional, because with low CER revenues it also becomes more likely that the project would be implemented in the absence of the CER revenues.

In 2005, the CDM Executive Board (EB) decided that, in order to be additional, projects have to demonstrate that they are economically unattractive; however, they are not required to demonstrate that with CER revenues they would become economically viable. Schneider (2007) highlighted that this leads to the situation in which projects with very low CER revenues can prove additionality even though the CER revenues contribute only marginally to closing the profitability gap.

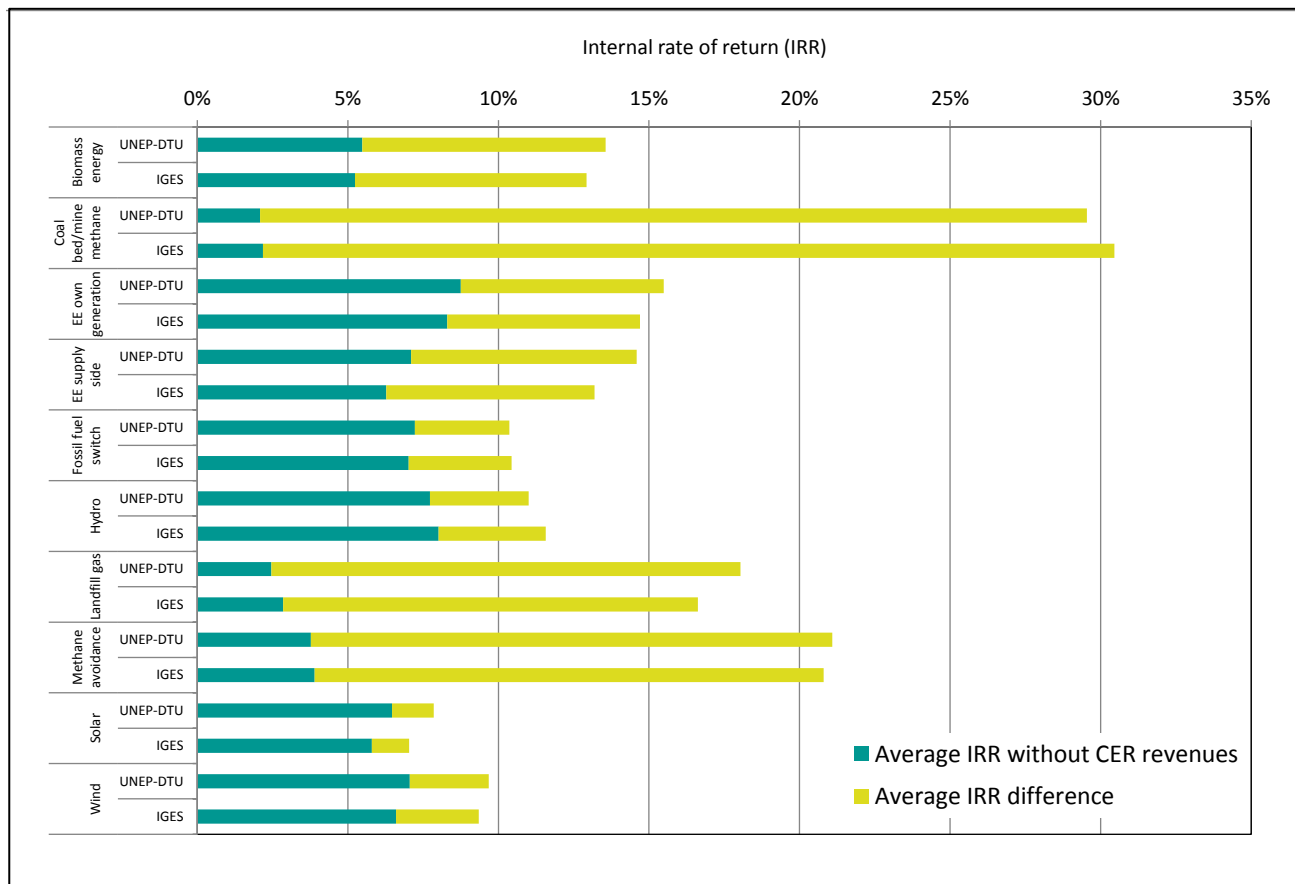
It is difficult to define a minimum required level of contribution from CER revenues that is needed to trigger an investment decision. An important concept in this context is the *signal-to-noise ratio* issue for investment analysis, as mentioned by, for example, Spalding-Fecher et al. (2012): The generally high variability and uncertainty of key parameters that determine the profitability of a mitigation project is often considerably higher than the expected economic benefit of CERs. If the economic impact of the CERs is lower than key uncertainties in the investment analysis, it is rather unlikely that the registration under the CER was the conclusive trigger for the investment and, hence, it is likely that the project is non-additional.

Table 2-3: Impact of CER revenues on the profitability of different project types

Type	Source	Projects with available IRR information	Average IRR without CER revenues	Average IRR with CER revenues	Average IRR difference
Biomass energy	UNEP-DTU	271	5.5%	13.6%	8.1%
	IGES	216	5.2%	12.9%	7.7%
Coal bed/mine methane	UNEP-DTU	70	2.1%	29.5%	27.5%
	IGES	75	2.2%	30.5%	28.3%
EE own generation	UNEP-DTU	205	8.8%	15.5%	6.7%
	IGES	202	8.3%	14.7%	6.4%
EE supply side	UNEP-DTU	36	7.1%	14.6%	7.5%
	IGES	23	6.3%	13.2%	6.9%
Fossil fuel switch	UNEP-DTU	47	7.2%	10.4%	3.1%
	IGES	39	7.0%	10.4%	3.4%
Hydro	UNEP-DTU	1,753	7.7%	11.0%	3.3%
	IGES	1,635	8.0%	11.6%	3.6%
Landfill gas	UNEP-DTU	183	2.5%	18.0%	15.6%
	IGES	165	2.8%	16.6%	13.8%
Methane avoidance	UNEP-DTU	203	3.8%	21.1%	17.3%
	IGES	204	3.9%	20.8%	16.9%
Solar	UNEP-DTU	154	6.5%	7.9%	1.4%
	IGES	122	5.8%	7.0%	1.2%
Wind	UNEP-DTU	2,162	7.1%	9.7%	2.6%
	IGES	1,804	6.6%	9.4%	2.8%

Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Figure 2-3: Impact of CER revenues on the profitability of different project types



Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Information on the impact of CER revenues on economic profitability is available from different sources. Table 2-3 and Figure 2-3 show the impact based on data included in project design documents and as documented in the databases by UNEP DTU (2014) and IGES (2014). In addition, Lütken (2012) has analyzed the annual CER revenues in relation to the capital investment and observed for some project types a (very) limited impact stemming from CER revenues. Spalding-Fecher et al. (2012) analyze the impact of CER revenues on the project IRR for different project types in the IGES database. They conclude that the CER impact on the project IRR is the lowest for renewables including hydro and wind (increase of IRR by 2-3%), fuel switch (4%), and supply-side efficiency (5%). They also provide an overview of more studies analysing the impact of CER revenues for different project types. The relatively low impact of CER revenues compared to other cash flows that are relevant for investment decisions is shown for energy efficiency projects below (Box 2-1).

Overall, the available information shows that the impact of CER revenues on the economic performance of projects varies considerably between project types:

- **Non-CO₂ projects**, such as industrial gas abatement, manure management, waste water treatment, landfill gas utilisation and coal mine methane capture, are characterised by a medium to high impact of CER revenues. For several of these project types, CER revenues increase the IRR by more than 10 percentage points, and for coal mine methane projects even by more than 25 percentage points. For these project types, the CER revenues clearly make a difference, which indicates a higher likelihood of additionality.

- **CO₂ projects in renewable energy** such as wind and hydro projects are characterised by a relatively low impact of CER revenues: for wind power, the IRR increases by about 2.5% to 3%, for hydropower by about 3% to 4%, and for solar by about 1% to 1.5%. According to Lütken (2012), the annual CER revenues in relation to investment costs (median) amounted to 1.84% for wind and 3.5% for hydro. Given the typical uncertainties surrounding costs and load factor in renewable projects, this level of CER contributions seems relatively low to justify that the project would not have been implemented in the absence of the CDM. Therefore, in many cases, the additionality of projects within these types may seem rather unlikely (though in some cases it may not be ruled out that additional CER revenues of +3.5% may be the decisive factor rendering a project attractive – though it may not be possible to prove this in an objective way). In addition, many renewable energy projects – in particular hydropower – show a relatively high economic performance without CER revenues (e.g. an IRR of nearly 8% for hydropower without CER revenues), compared to non-CO₂ projects (e.g. landfill gas, coal mine methane and methane avoidance with an IRR of about 2% to 4% without CER revenues).
- **CO₂ projects in fuel switch, energy efficiency, and waste heat utilisation** are typically characterised by relatively low investment costs. Thus, CER revenues are higher compared to investment costs (5% for waste heat and 20% for fuel switch – median value). The impact of CER revenues on the internal rate of return is about 3 to 8 percentage points. However, in this project type, fuel prices are the decisive element determining its profitability. Box 2-1 compares the impact of typical fuel costs and CER revenues for energy efficiency projects. Our analysis indicates that CER revenues tend to have a low impact on project profitability. In addition, these project types show a relatively good economic performance without CER revenues, compared to non-CO₂ projects.

Lütken's analysis was based on a CER price of €12. Our analysis in Table 2-3 and Spalding-Fetcher's build on PDD data with similar CER price assumptions. With today's much lower CER prices, the low impact of CER revenues on CO₂ projects and therefore their high risk of non-additionality is further aggravated.

In conclusion, non-CO₂ projects are characterised by a medium-to-high impact of CER revenues and a relatively low economic performance without CER revenues, while for most CO₂ project types the impact of CER revenues is much smaller and the performance without CER revenues higher. Overall, this indicates that on average non-CO₂ projects have a higher likelihood of additionality.

Box 2-1: An analysis of the impact of CER revenues for energy efficiency projects

Another way of assessing the relevance of CER revenues in investment decisions is to compare them to other important revenues or savings in the investment analysis. For instance, for energy efficiency projects to become profitable, they have to (i) save sufficient costs for fossil fuels and (ii) earn sufficient CERs to pay back the investment costs for new equipment improving the energy efficiency. Figure 2-1, Figure 2-2 and Figure 2-4 illustrate the order of magnitude of fuel cost savings in relation to one tonne of CO₂ reduced or CERs generated in the case of projects saving natural gas, light fuel oil and steam coal. For instance, if an installation implements new equipment that reduces the specific consumption of natural gas and the related GHG emissions by one tonne of CO₂, then the related reduction in fuel costs in 2010 would amount to approx. 150 USD/tCO₂ (at OECD average prices in 2010). For light fuel oil, the fuel cost reduction amounts to over 250 USD/tCO₂ and for steam coal, the savings still amount to 37 USD/tCO₂ (in 2010). With this, it becomes obvious that the impact of fuel cost savings on the project cash flow is much higher than contribution from CER revenues.

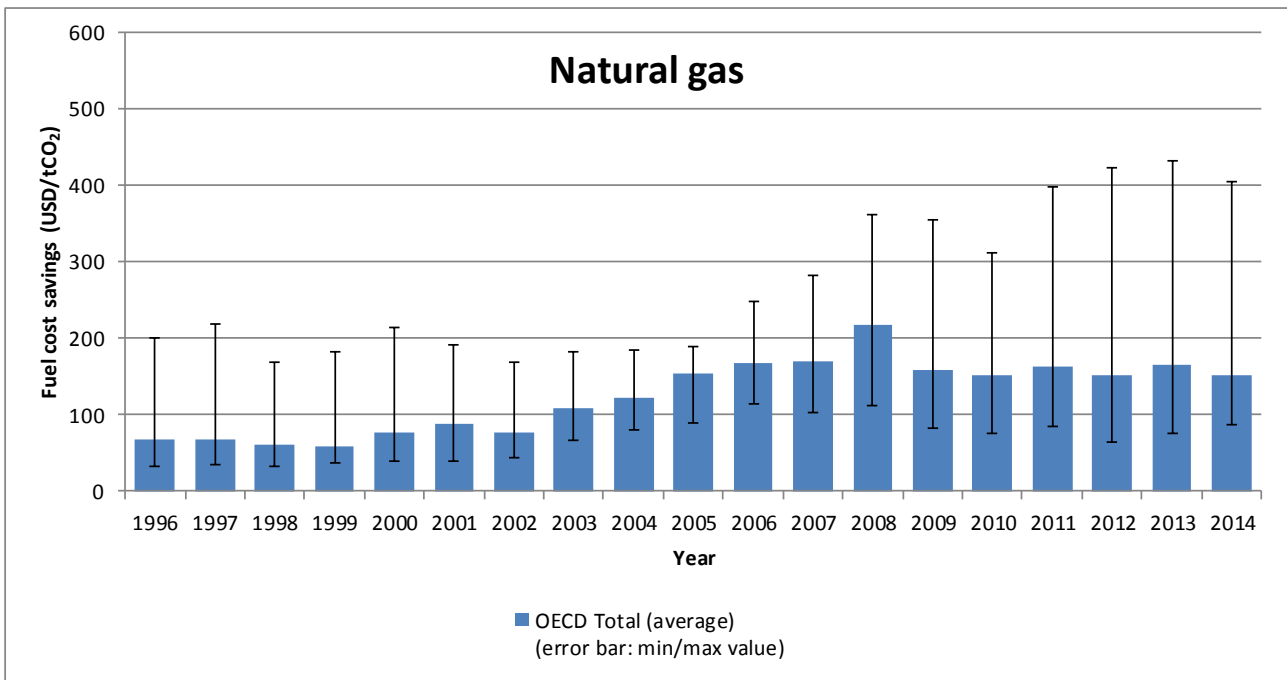
Figure 2-1, Figure 2-2 and Figure 2-4 also show the development of average (and min. and max.) OECD prices over time, which illustrates the high variability of energy prices since 1996. Average specific energy prices have fluctuated in the order of 20 USD/tCO₂ (steam coal) to 200 USD/tCO₂ (light fuel oil). Also compared to the historic fuel price variability, typical CER revenues are low to negligible compared to fuel cost savings.

Please note that because of limitations in data availability, the figures are based on fuel prices in OECD countries, which in many cases also include taxes and may not be representative for all developing countries. In particular, in some developed and developing countries fossil fuel subsidies are very high. In these cases, because of the low prices, the fuel cost savings are low and may be on a similarly low level as the contribution from CER revenues to the positive project cash flow. However, in such a low price situation, the total positive cash flow may in any case be far too small to justify investments in energy efficiency equipment and the scope for CDM may become rather limited.

Overall, it may be argued that for projects to have a high likelihood of additionality the impact of CER revenues should at least be comparable to the main contributor to a positive cash flow, the related fuel savings. This would indicate that in such project types CER prices for energy efficiency projects would need to reach a level of at least 10-20 USD/tCO₂ for steam coal, 30-50 USD/tCO₂ for natural gas and 100-200 USD/tCO₂ for light fuel oil based systems (if prices on the level of OECD countries are assumed). With such CER prices, the economic contribution from CER revenues to positive cash flow reaches a level that may be considered significant (i.e. in the order of ¼ to ½ of fuel cost savings).

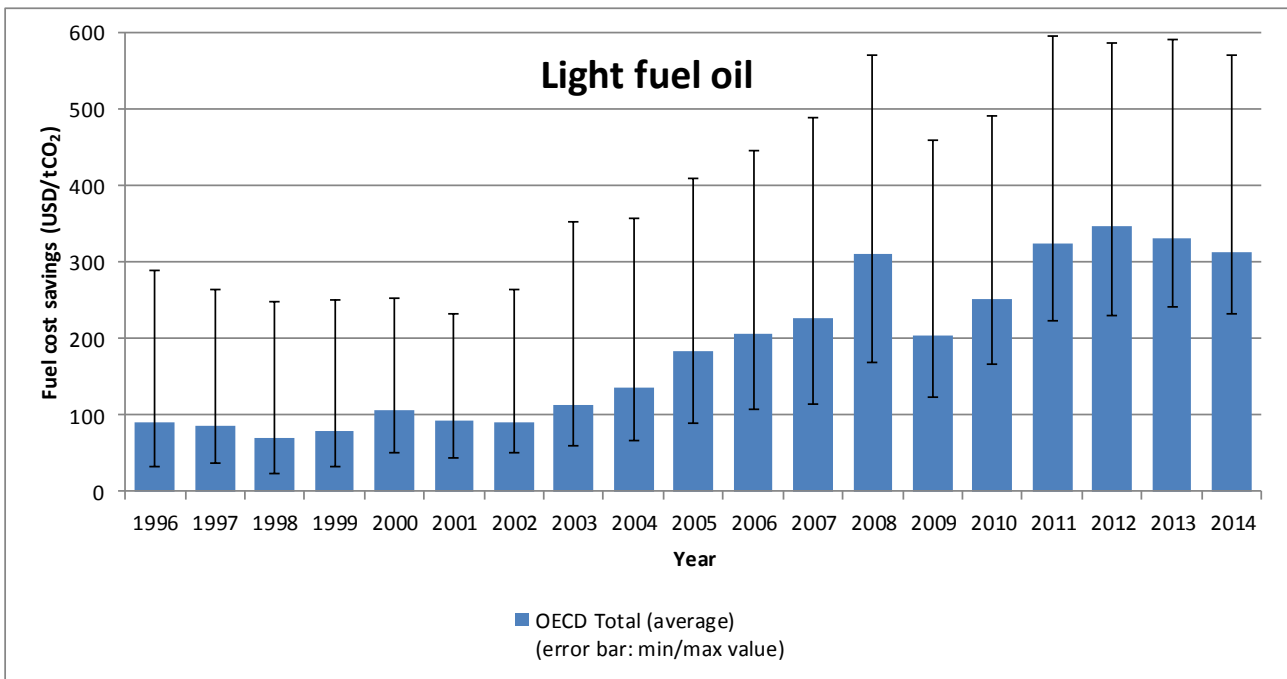
At prices significantly below this level, the economic impact of CERs is insignificant and the risk of non-additionality is very high.

Figure 2-4: Natural gas cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).
Sources: IEA 2015, IPCC 2006, authors' own calculations

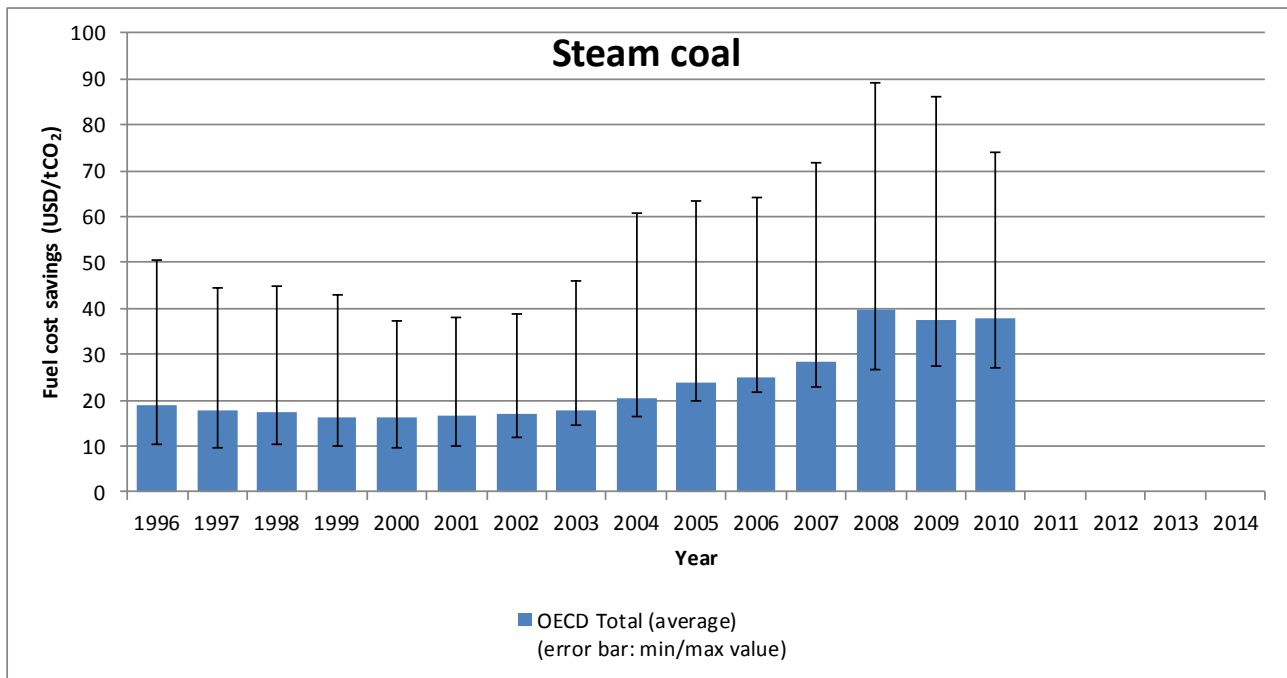
Figure 2-5: Light fuel oil cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).
Sources: IEA 2015, IPCC 2006, authors' own calculations

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

Figure 2-6: Steam coal cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

3. Assessment of approaches for determining additionality and rules relevant towards additionality

3.1. Prior consideration

3.1.1. Overview

Prior consideration is a key requirement in the CDM. It aims to ensure that only projects are registered in which the CDM was seriously considered when the decision to proceed with the investment was made.

In the first version of the additionality tool prepared in 2004³, a provision was introduced for projects with a crediting period starting prior to registration, which stipulated that evidence has to be provided “that the incentive from the CDM was seriously considered in the decision to proceed with the project activity” and that the “evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available to third parties at, or prior to, the start of the project activity.” The provision remained almost unchanged in the second version of the additionality tool in 2005.

In the third version of the additionality tool in 2007, the provision was removed and then included in the Guidelines for completing the PDD, which are applicable to all projects and not only those applying the additionality tool. These guidelines stipulated that “project proponents shall provide an implementation timeline of the proposed CDM project activity” and that “the timeline should include, where applicable, the date when the investment decision was made, the date when construction

³ EB 16, Annex 1: Tool for the demonstration and assessment of additionality.

works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started)". Also, according to the guidelines, "project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions"⁴.

In 2008, the CDM EB introduced general guidance on the demonstration and assessment of prior consideration⁵. The guidance was subsequently revised twice⁶, including further guidance for DOEs on how to validate real and continuing actions; in 2011 it was incorporated in the project standard (PS)⁷. According to the latest version of the project standard⁸, "if the start date of a proposed CDM project activity ... is prior to the date of publication of the PDD for the global stakeholder consultation, project participants shall demonstrate that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity". More specifically, project participants of project activities with a starting date on or after 2 August 2008 "*shall inform the host Party's designated national authority (DNA) and the secretariat of their intention to seek CDM status in accordance with the Project cycle procedure*", while "for a proposed CDM project activity with a start date before 2 August 2008 and prior to the date of publication of the PDD for global stakeholder consultation, project participants shall demonstrate that the CDM was seriously considered in the decision to implement the proposed project activity". For this purpose, "project participants shall provide evidence of their awareness of the CDM prior to the start date of the proposed project activity, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project"⁹, "*provide evidence that continuing and real actions were taken to secure CDM status for the proposed project activity in parallel with its implementation*"¹⁰ and "provide an implementation timeline of the proposed CDM project activity. The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). Project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions".

The CDM project cycle procedure¹¹ includes details about the notification process related to prior consideration (i.e. forms to be used, etc.). According to this procedure, for project activities with a start date on or after 2 August 2008, notification to the DNA of the host country and to the Secretariat must be made "within 180 days of the start date of the project activity". A list of notifications received by the Secretariat is available on the UNFCCC website.¹²

The requirements for demonstrating prior consideration set out in the project standard are generally applicable with the exception of programmes of activities (PoAs).

⁴ EB 41, Annex 12: Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM) (Version 07).

⁵ EB 41, Annex 46: Guidance on the Demonstration and Assessment of Prior Consideration of the CDM.

⁶ EB 48, Annex 61 and EB 49, Annex 22.

⁷ EB 65, Annex 5.

⁸ CDM project standard, Version 07.0, EB 79, Annex 3.

⁹ Relevant evidence could, for instance, relate to "minutes and/or notes related to the consideration of the decision by the EB of Directors, or equivalent, of the project participants, to undertake the project as a CDM project activity".

¹⁰ Relevant evidences "should include one or more of the following: contracts with consultants for CDM / PDD / methodology / standardized baseline services; draft versions of PDDs and underlying documents such as letters of authorization, and if available, letters of intent; emission reduction purchase agreement (ERPA) term sheets, ERPAs, or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds); evidence of agreements or negotiations with a DOE for validation services; submission of a new methodology or standardized baseline, or requests for clarification or revision of existing methodologies or standardized baselines to the EB; publication in a newspaper; interviews with DNA; earlier correspondence on the project with the DNA or the secretariat".

¹¹ Current version 07.0, EB 65, Annex 32.

¹² <https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>.

With regard to PoAs, the project cycle procedure includes the non-binding provision that “*the coordinating/managing entity may notify to the DNA(s) of the host Party(ies) of the PoA and the secretariat in writing of the intention to seek the CDM status for the PoA, using the [corresponding form] for the purpose of determining the start date of the PoA*”. According to the CDM project standard, the start date of a PoA is either “*the date of notification of the intention to seek the CDM status by the coordinating/managing entity to the secretariat and the DNA*” or “*the date of publication of the PoA-DD for global stakeholder consultation*”. With regard to CPAs, “*the start date of a CPA is the earliest date at which either the implementation or construction or real action of the CPA begins*” and it shall be confirmed that “*the start date of any proposed CPA is on or after the start date of the PoA*”. The only exception to this rule relates to afforestation and reforestation (A/R) PoAs, which allows “*the inclusion of any A/R project activity that started after 1 January 2000 but has not been registered as a CDM project activity as a CPA in an A/R PoA*”.¹³

3.1.2. Assessment

The issue of projects obtaining registration as CDM projects without serious consideration of the CDM benefits at the time of the investment decision was especially a concern during the first years of the CDM. The requirement to demonstrate prior consideration was only gradually introduced over time and became generally applicable only in 2007. Also, as pointed out by Schneider (2007), the requirement was also not always followed: only 36% of the projects seeking retroactive crediting provided evidence that the CDM was considered in the decision to proceed with the project and it is reported that relevant documentation has been backdated. It can, therefore, be concluded that for early CDM projects, the demonstration of prior consideration was questionable.

The approach applied as of August 2008 (i.e. for the bulk of projects and generated CERs) requires notification of the prior consideration of the CDM as well as, in situations of delay, evidence of continued interest in the CDM using a form designed for this purpose. This requirement addresses the issue of prior consideration in a more objective and appropriate manner, avoiding the risk of back-dating of company-internal information or subjective claims of prior consideration. In this regard, the rules have improved over time and there is no evident flaw in the current rules and therefore no need for the current practice to be changed.

However, it should be noted that the notification of prior consideration ensures that projects cannot claim CDM registration retroactively, but does not demonstrate whether or not a project is additional. In this regard, this rule does not provide any information on the additionality of projects since both truly additional projects and free riders may apply for the CDM status. This rule is therefore important to exclude projects which did not consider the CDM at all and are therefore clearly not additional, but it is not sufficient for assessing whether a project can be considered additional or not.

With regard to the practical implementation, a period of 180 days for notification of prior consideration can be considered quite generous. While a certain grace period is certainly reasonable due to the administrative process of making the PDDs available for global stakeholder consultation, a period of six months could mean that the project is already quite advanced, which would then call into question whether CDM benefits were actually necessary for the project to proceed. A long grace period could therefore be regarded as allowing retroactive crediting.

The requirements regarding the start date of PoAs and CPAs are sufficiently strict to avoid any project activity that has already started being registered as CPAs under a PoA. The only rule that cannot be considered adequate relates to the inclusion of old A/R activities in a newly registered

¹³ Clarification "Start date and crediting period of component project activities under an afforestation and reforestation programme of activities", EB 73, Annex 16.

A/R PoA (see above). For these A/R activities, CDM rules do not require demonstrating prior consideration of the CDM.

3.1.3. Summary of findings

There is no evident flaw in the general design of this rule with the exception of the inclusion of old A/R activities in a newly registered A/R PoA. Also, as outlined above, the time frame for notification of prior consideration appears to be quite generous.

3.1.4. Recommendations for reform of CDM rules

The only rule that needs to be changed relates to the inclusion of old A/R activities in a newly registered A/R PoA (see above). It is therefore recommended that the corresponding rule be withdrawn.

Furthermore, it is recommended that the time frame for notification of prior consideration be shortened in order to reduce the risk that projects apply for the CDM having only learned of the possibility after the project has started. The grace period for notification to the secretariat should therefore be reduced in general, e.g. to a maximum of 30 days after the project start.

3.2. Investment analysis

3.2.1. Overview

The CDM's *additionality tool* requires demonstration that a prospective project is either not financially viable without the CDM (using investment analysis) or that there is at least one barrier preventing the proposed project without the CDM (using barrier analysis). Though both methods are common (and some projects use both), investment analysis is the most widely used, by over three-quarters of all projects and over 90% of the renewable energy (especially hydro and wind) projects that are expected to dominate future CER supplies (Spalding-Fecher & Michaelowa 2013). Investment analysis (or a variation of it) is also used in the *combined tool* and in some CDM baseline and monitoring methodologies that refer neither to the *additionality tool* nor to the *combined tool* for demonstrating additionality.

The additionality tool provides three alternative options for conducting investment analysis:

- For projects with costs but no revenues (other than CERs), a **simple cost analysis** can be used to demonstrate that at least one scenario (other than the project) is less costly. This approach is quite common for a few project types (e.g. projects that capture N₂O from adipic acid plants, or methane from landfills), but it is not common overall.
- The **investment comparison analysis** compares the economic attractiveness of the project without revenues from CERs to other investment alternatives that provide similar outputs or services; this approach is common for just a few project types (e.g. higher-efficiency fossil power), and is not common overall.
- The **benchmark analysis** is used to demonstrate that a proposed project is, without revenues from CERs, economically not attractive (i.e. it does not meet a stated financial benchmark); this approach is, by far, the most common form of investment analysis.

In all cases, investment analysis relies on the premise that, if a project is not a better investment (or less costly) than an alternative or a financial benchmark, then it would not have proceeded but for the existence of the CDM. Exactly how the CDM causes it to proceed, whether through CER revenue or otherwise, does not need to be specified.

The approach to investment analysis has also been refined over time. In particular, in 2008 the CDM EB adopted “Guidelines on the assessment of investment analysis”, which aimed to provide further clarity and reduce ambiguity by, for example, clarifying how to calculate the common financial benchmarks net present value (NPV) and internal rate of return (IRR) and suggested ranges for conducting sensitivity analysis in these parameters. In 2011, this guidance was further revised to introduce default values for the expected return on equity for different project types and host countries, which can (but are not required to) be used by project developers as benchmarks for the benchmark analysis.

3.2.2. Assessment

The expected financial performance of a project is clearly one important factor in determining whether or not it will proceed (see further discussion of this in Section 2.3). For example, unless mandated by an (enforced) government policy, there is little reason for projects with no revenue (other than CER values) to proceed, simplifying the assessment of additionality.

For projects that do collect revenue other than CER values, such as by selling electricity, the CDM rules seek to determine whether the project would not have been financially attractive (and therefore not have proceeded) without the CDM. Researchers have raised several critiques of this approach, which we address in this report under two broad themes.

The first is perhaps the most fundamental, and is whether investment analysis is appropriate for investments that may be driven largely by other (non-economic) factors. This critique asserts that many investments in common CDM activities – e.g. power generation – are undertaken for a host of political, social, and strategic reasons that extend beyond simple project-level economics and may not be designed to maximise economic return. Such critics argue that a market-based test such as investment analysis is not applicable in what is largely a non-market environment, perhaps especially so in centrally planned countries such as China (He & Morse 2010). For example, Bogner & Schneider (2011) and Haya & Parekh (2011) have argued that governments have already subsidized and developed large hydroelectricity projects in developing countries well before the CDM, making them financially viable and therefore raising questions about the extent to which investment analysis can credibly determine that they would not proceed but for the incentive provided by the CDM. For investment analysis to function properly – indeed, for any additionality test to function properly – it must be able to demonstrate, with high confidence, that the CDM was the deciding factor for the project investment. For project types that are routinely constructed outside the CDM, including (but not exclusively) for broader economic, energy security, or political reasons, it remains highly difficult to determine with confidence that, in any particular case, a project’s financial returns are the reason it is not proceeding and that the financial incentive provided by the CDM is the reason for it proceeding (Dechezleprêtre et al. 2014).

Table 4-5 provides an example of how the decision of selecting a certain fuel (coal, fuel oil or natural gas) may depend on many factors that are not only insufficiently covered in an investment analysis, such as level of initial investment or flexibility in operation that may lead, for example, in investment in a natural-gas-fired boiler rather than a coal-based one, even though natural gas may be more costly than coal in terms of direct costs.

The second critique is concerned with transparency, subjectivity, and information asymmetry, such as whether project developers provide sufficient and credible information to allow replication of their calculations and justification of their conclusions, as well as the inherent information asymmetry between project developers and those, especially the CDM EB, tasked with reviewing the information. For example, early research found that project developers regularly provided investment analyzes that were opaque, relied on proprietary company information, or were incomplete (Schneider 2009).

This analysis takes a new look at several aspects of this second critique, including:

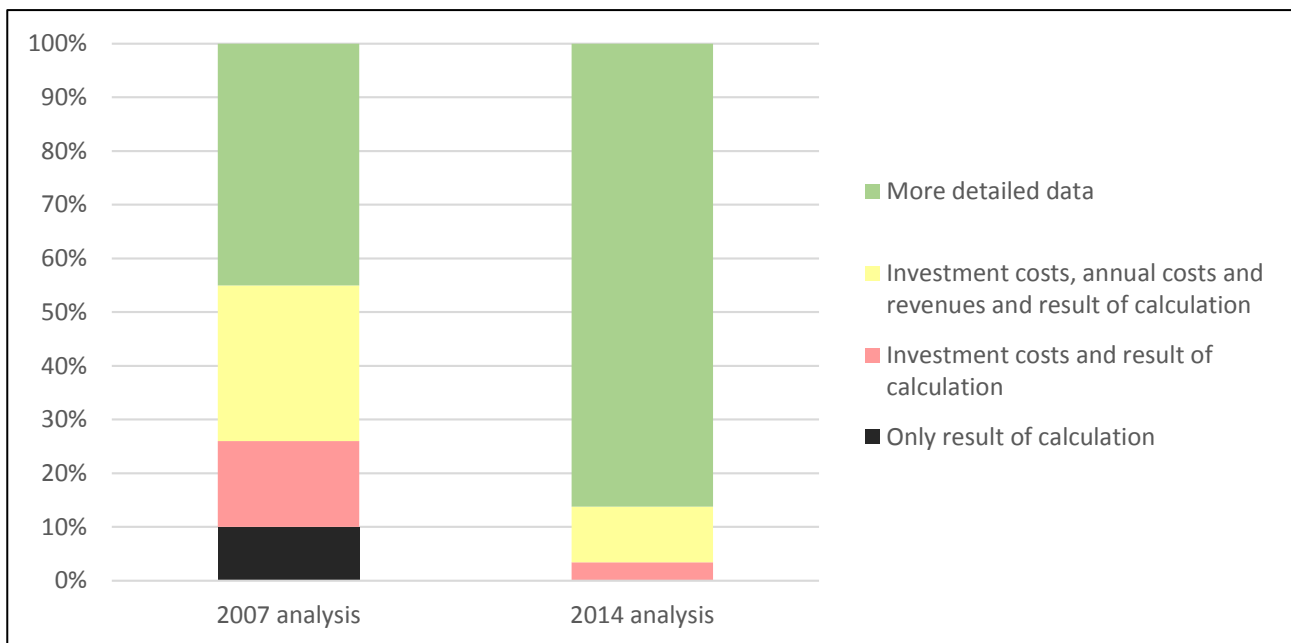
- Transparency, by re-visiting the prior work of Schneider (2009) to gauge how transparently developers conduct the investment analysis.
- Subjectivity and asymmetry, with a new exploration of benchmark rates and CER prices.

These two broad topics are addressed in turn below.

Transparency

To explore transparency in investment analyzes, Figure 3-1 updates the analysis of Schneider (2009) who reviewed a randomly selected group of PDDs for the level of information provided. In our updated analysis, 29 registered projects using the investment analysis were selected at random.¹⁴ Over 90% of the projects selected were registered after 2007, the year of Schneider's prior analysis, so this sample can indicate how practices have changed. In particular, over 80% of the 29 projects in this new analysis provided detailed input data to support their calculations of capital and operating costs and revenues, compared to 2007, when fewer than half did. Furthermore, no projects provided only the result of their calculation in this analysis, with no input data to support their findings. These findings suggest that investment analysis has become more transparent.

Figure 3-1: Level of information provided in PDDs on the investment analysis



Notes: 2007: n=31, 2014: n=29.

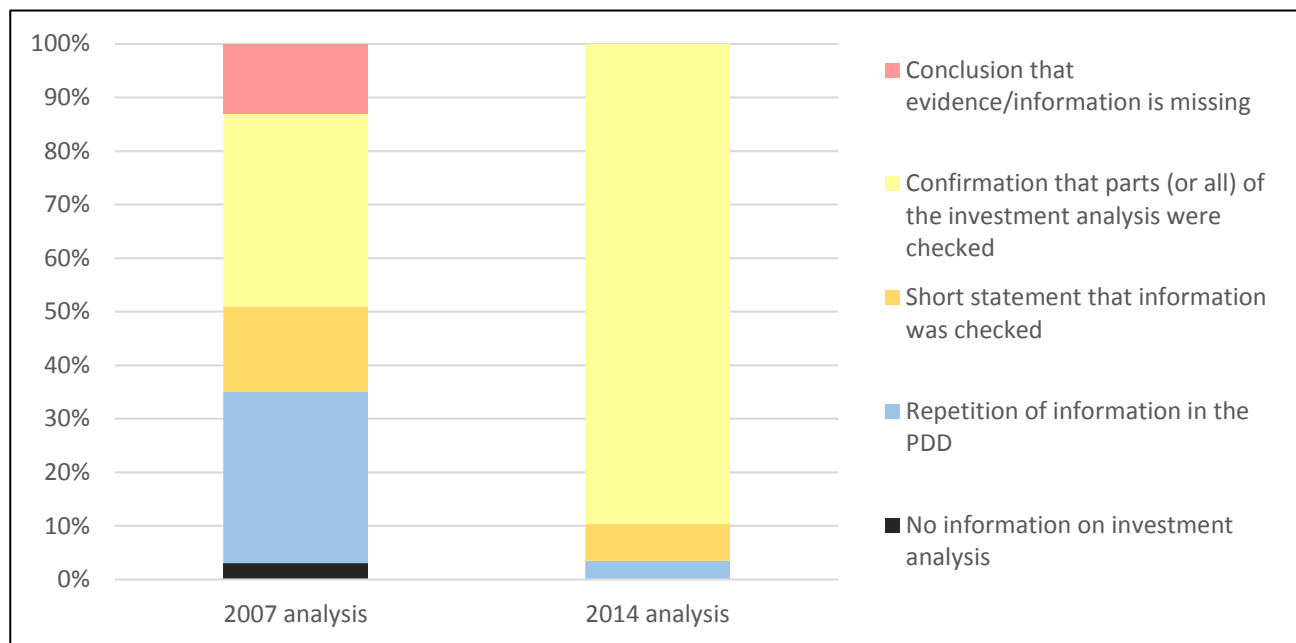
Sources: Schneider (2009), authors' own calculations

Validation reports that review the investment analyzes also appear to have become more thorough. Figure 3-2 also returns to Schneider's prior analysis to update it based on the same randomly selected group of projects as in Figure 3-1. As seen in Figure 3-2, more than 80% of the validation reports confirm that validators checked some or all of the key assumptions of the investment analyzes. The validation reports often review each of several of the most critical investment analy-

¹⁴ According to the sampling design, 30 projects using investment analysis were to be selected. Upon further examination, one of the thirty projects selected, a small-scale, run-of-river hydropower plant, had demonstrated additionality using other methods, as outlined in the "Guidelines for Demonstration Additionality of microscale project activities" and so was not considered in this analysis.

sis inputs and describe that the inputs are reasonable, in many cases citing contract or other documents reviewed to support the choice of inputs.

Figure 3-2: Information in validation reports on the investment analysis



Notes: 2007: n=31, 2014: n=29.

Sources: Schneider (2009), authors' own calculations

Subjectivity and information asymmetry

Despite the findings above, transparency and validator review of the input parameters do not remove subjectivity or choice of alternate input parameters in different contexts. For example, in some cases, project proponents have used different values for key input parameters when submitting applications to financial institutions (Haya 2009), suggesting that the metrics used (and choice of inputs therein) and reliability of such may vary. Indeed, project developers will always have much more information on the project's local conditions – including costs and technical parameters – than will outside parties, whether validators or CDM administrators, and therefore have an incentive to provide biased or inaccurate information to increase the chance of a successful additionality determination and, therefore, the eventual awarding of credits to their project (Gillenwater 2011). This phenomenon is widely referred to as '*information asymmetry*'. As shown above, validators do have more information at their disposal now than in the past, but still lack an objective basis for determining that the investment would not have been undertaken and that inputs provided are the same as they would have been had CDM credits not been sought. Small changes in a number of input parameters – even if individually well within the range of other similar projects (CDM or not), could lead to significant changes in the overall stated financial return of the project. Interestingly, under the CDM, project participants do not need to provide any confirmation that they are submitting truthful information. Some project developers reported that different versions of investment analysis were used for CDM purposes and for the purpose of securing other funding for a project (e.g. loans). Other crediting mechanisms, such as the VCS and CAR, require declaration or attestations from project developers that all information is accurate and presents the truth. To explore further the issue of subjectivity and information asymmetry in input parameters, we take a deeper look at two particular inputs: benchmark rates and CER prices.

Closer examination of benchmark rates

This critique concerns appropriate levels for financial benchmarks (e.g., IRR) (Michaelowa 2009). To explore this question, we reviewed data on IRR benchmarks used by wind, hydro, biomass, and waste gas or heat projects in China, wind and hydro projects in India, and hydropower projects in Vietnam.¹⁵

Nearly all projects in China use standard, government-issued IRR benchmarks. By far the most common benchmark used is 8%, which is applied for most power projects, and derives from a 2002/2003 Chinese government source, *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. Other common benchmarks based on government rules include 10% for small hydro projects, and 12-13% for waste gas/heat projects.

Table 3-1: Summary of most common benchmark rates used in IRR analysis in Chinese CDM projects

Project type	Common IRR benchmark	Fraction of projects using this benchmark	Source of this benchmark
Wind	8.0%	99%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	10.0%	71%	Government's <i>Economic Evaluation Code for Small Hydro-power Projects</i> (1995)
Hydro	8.0%	29%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	12.0%	30%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
Waste gas / heat	8.0%	98%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	13.0%	17%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
	18.0%	16%	Conch Cement Company internal WACC

Notes: In this table, and throughout this section, we report IRR benchmarks and values based on analysis of IGES's investment analysis database. We believe that most of the benchmarks, and values reported in the database, are in real terms, based on a review of a small number of PDDs and the assumption in the CDM's Guidelines on the Assessment of Investment Analysis that is conducted in real terms. We make no attempt to identify or convert values in the database that may be in nominal terms.

Sources: IGES 2014, authors' own calculations

Despite the ubiquity of the 8% government-set threshold in China, it is not clear how or why it matches the internal thresholds used by actual project inventors, who may themselves demand returns either higher or lower. (For example, benchmarks for wind power projects in India, where they are determined to a greater extent by investor hurdle rates, are more variable and, on average, higher). For this reason, it is not clear why 8% is the 'correct' benchmark for a test intended to gauge the attractiveness of an investment. Furthermore, it is not clear why common benchmarks used for hydro or waste gas are higher (10% or at least 12%, respectively), and whether these

¹⁵ These project type / country combinations were selected because each of them represents at least 1% of the registered projects in the CDM that use investment analysis (IGES 2012). Though this 1% threshold is arbitrary, it provided us with a basis for focusing the analysis.

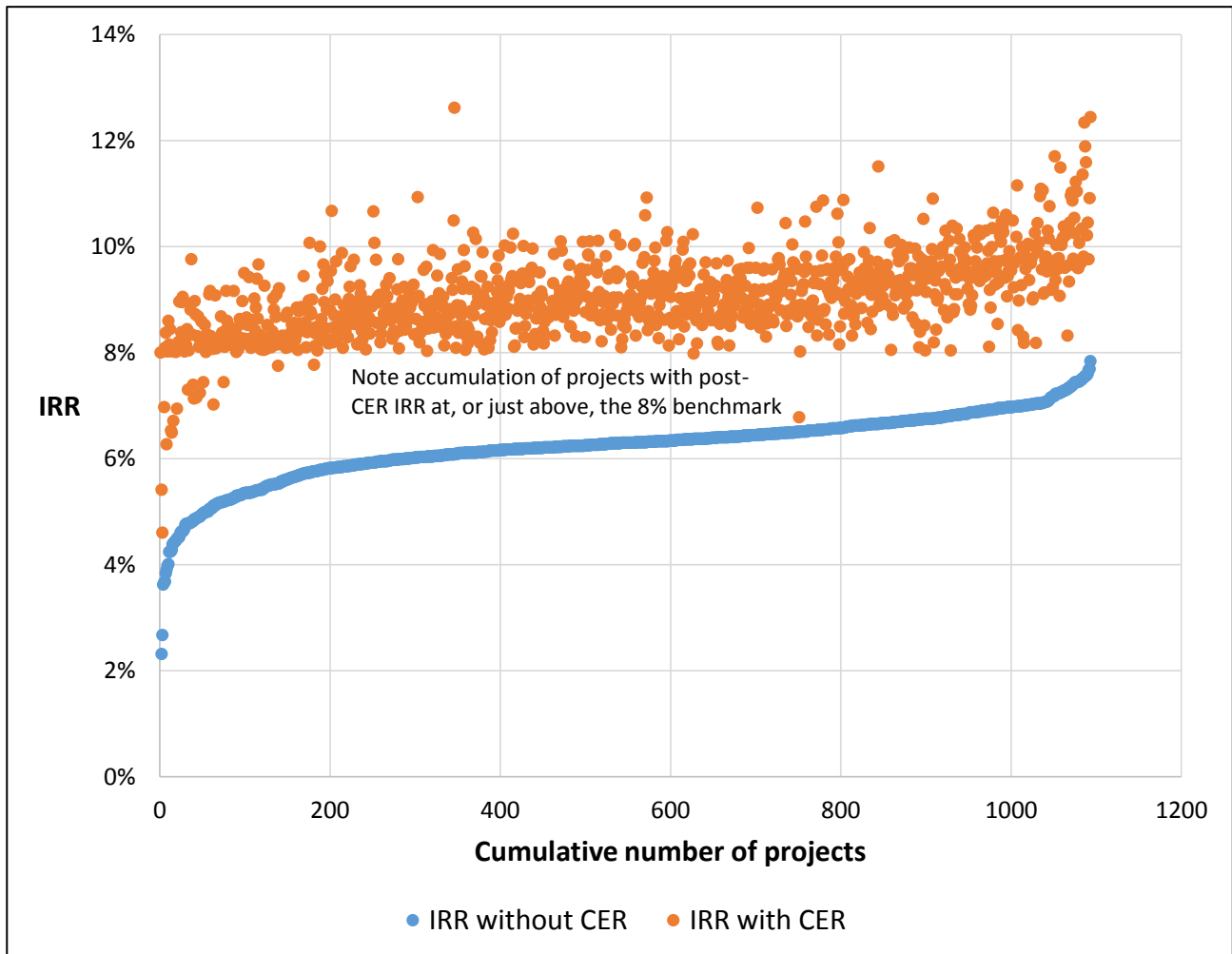
rates accurately capture the risk and expected financial returns in these types of projects. Further analysis of this issue may be warranted, e.g. by comparing it with other sources of equity rates for different investments in China or for similar projects in other countries. A source of such data for projects within China was not immediately known, however.

In principal, the logic of investment analysis is that the project would not have proceeded but for the financial incentive provided by the CDM. That financial incentive is the value of CERs. Many project developers conduct an analysis to show that, at assumed CER prices, the financial return of the project is expected to clear the financial benchmark used. However, this is not actually required by the additionality tool. (In the first versions of additionality, a step 5 'impact of the CDM' was included, which was interpreted by many project developers as an obligation to show that the project is made economically attractive through the CDM. This was later removed).

The above discussion investigated benchmarks used in China, with special attention paid to the widely used 8% benchmark. Because of its ubiquity, this 8% benchmark provides an opportunity to investigate the extent to which CER values indeed bring about expected project returns above this value and therefore, in the logic of the investment analysis, enable the project to proceed. As stated above, though projects are not required to actually show that CER values would push the project above its stated threshold, most do report results of expected return.

The following chart (Figure 3-3) shows the stated IRRs before and after CERs for all wind projects in China that use a benchmark of 8%. As seen in the figure, most of these projects state an IRR without CERs of between 6% and 7%, and an IRR after CER value of 8% to 10%. Note in particular the sharp line at 8%, at which very few projects claim an after-CER IRR of just under 8%, but a large number of projects find a post-CER IRR of just barely more than 8%.

Figure 3-3: Stated IRRs of Chinese wind projects using a benchmark of 8% before and after assumed CER value



Sources: IGES 2014, authors' own calculations

In principle, one explanation for this distribution is that projects in which the 8% threshold is not reached with CER revenues are not implemented, do not apply for CDM registration, and are therefore not represented in this graph. The fact that so many projects just barely meet the 8% threshold (even though they are not required to do so), and so few do not meet it, may instead indicate, however, that project developers are eager to claim that the CER value has allowed the project to clear the benchmark rate.

In contrast to the situation in China where standard government benchmarks are provided, most projects in India use internal, company-specific required rates of return as their IRR benchmarks. However, as in China, the CER value tends to provide a similar increase in expected return (e.g., an increase in IRR of two to three percentage points), just clearing the stated benchmark.

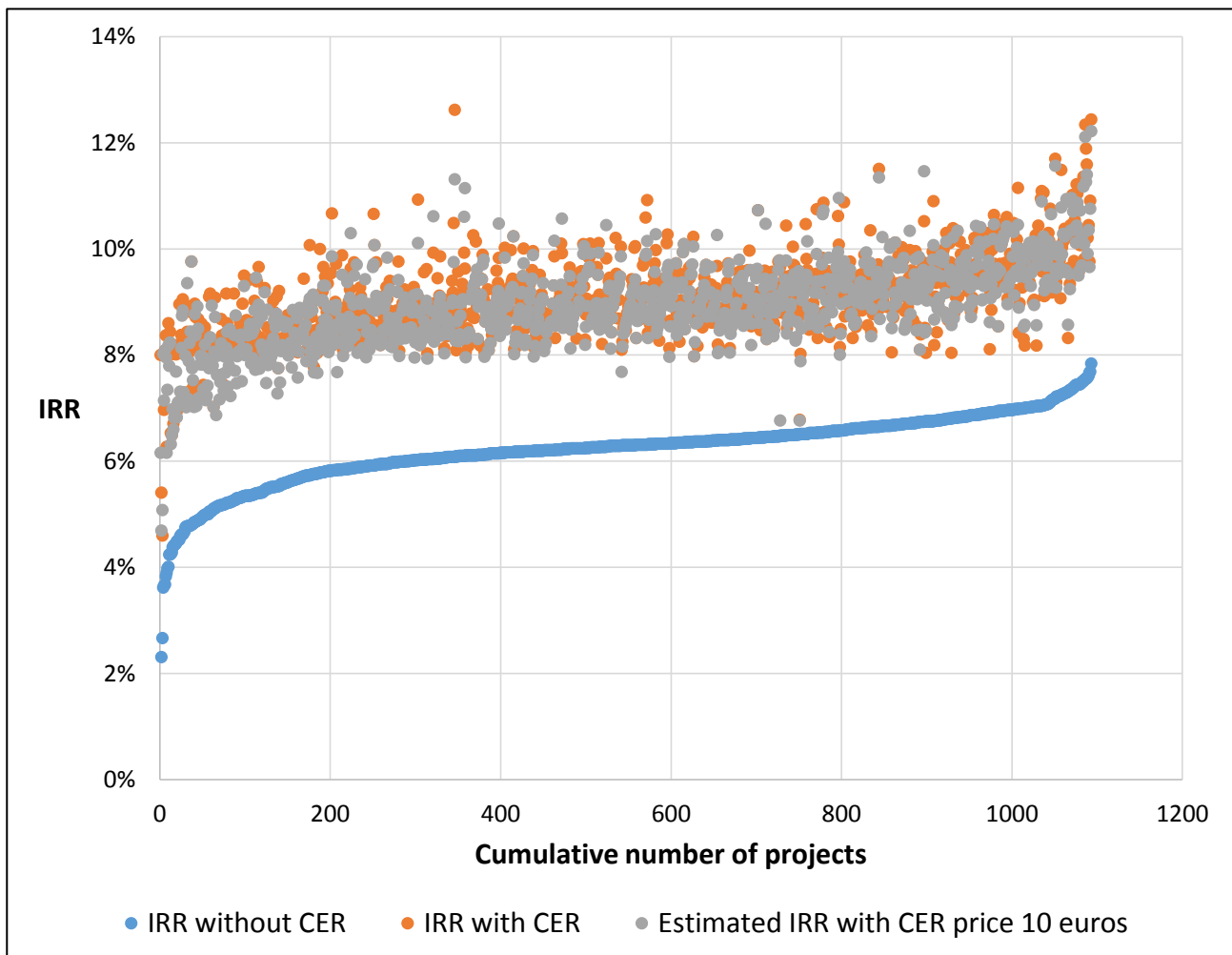
To demonstrate that projects just clear the benchmarks, project developers could select project input parameters so that the benchmark is achieved. These parameters could include CER price, load factor, electricity tariff, or a number of other inputs required in calculating an IRR.

One such parameter that could be adjusted is the expected CER price, which rose consistently through mid-2008, then fell precipitously, and for which forecasts have varied widely since, providing a potentially broad scope for selecting possible future CER prices.

Closer examination of selection of the CER price

To explore the potential effect of the CER price in more detail, Figure 3-4 adjusts the post-CER values stated in the PDDs (as displayed in Figure 3-3) to use a common CER value of €10 for all projects. (€10 is the median value used across all registered projects.) In this example, a large number of projects no longer meet the 8% benchmark. In particular, about 70 projects with pre-CER IRRs of 4% to 6% used CER prices as high as €17 in order to claim they would meet the 8% benchmark. Though this represents just a small share (about 1%) of wind power projects in China, it strongly suggests that input parameters (CER values) have been chosen to achieve the desired result of the 8% government-set IRR benchmark.

Figure 3-4: Estimated IRRs of Chinese wind projects using a benchmark of 8% before and after CER value of €10



Sources: IGES 2014, authors' own calculations

Similar to the situation for Chinese wind power projects discussed above, a number of Indian wind projects that claimed that CER values (median price assumed: €14) would lead them to exceed their benchmark would not have been able to claim that their benchmarks are met if they had used

a lower, and more common, CER price of €10. This suggests that, as found in the case of wind power projects in China, project developers in some instances may select CER values that depart from values used by their peers in order to claim that CDM revenues will make the projects financially attractive.

A similar pattern emerges for hydropower projects in Vietnam, where benchmarks (averaging 13.1%) were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate.¹⁶ Of the projects analyzed¹⁷, over half of the hydro projects would not have met their benchmarks if they had used a CER price of €10 instead of higher prices (median price assumed: €15.5, and as high as €30, in contrast to the remainder of Vietnamese hydro projects with median price assumed of €10). As above, while this is not definitive evidence of gaming, it suggests that project developers tend to invoke higher CER prices than their peers when needed to claim that their projects become economically viable under the CDM.

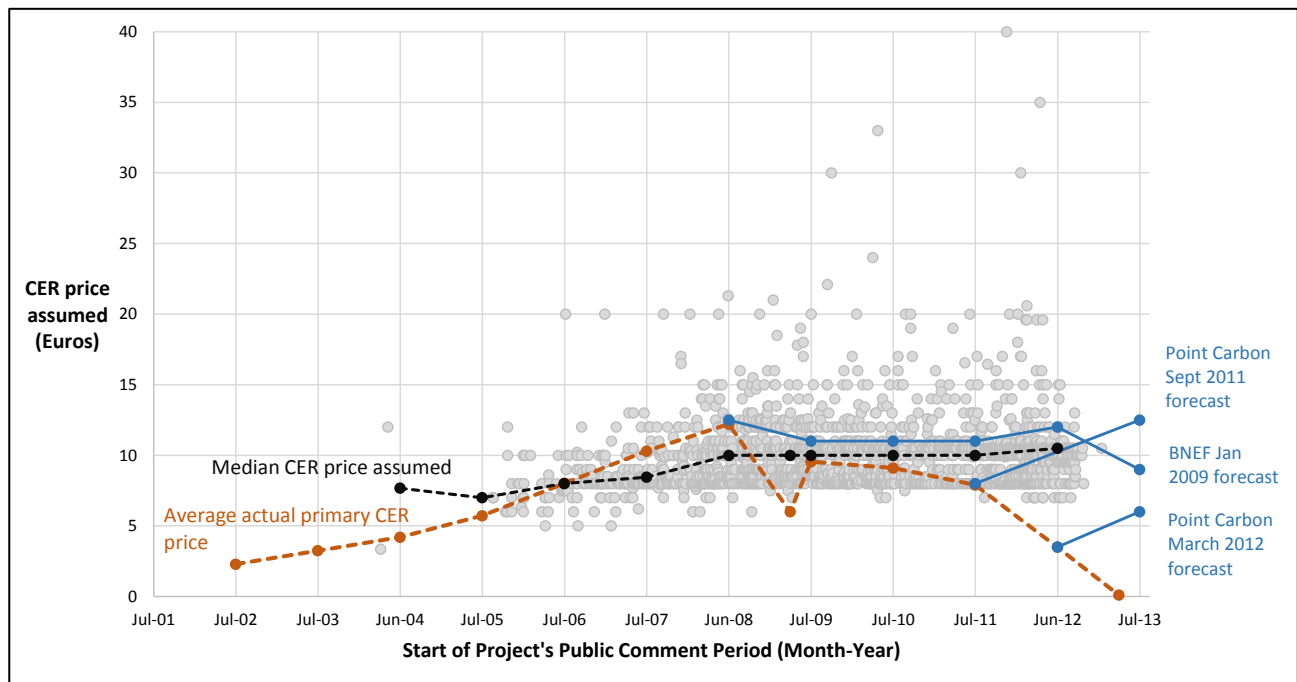
This raises the question of the plausibility of CER prices used by project developers. Looking at all registered projects (Figure 3-5), it appears that the CER prices used by project developers, though highly variable, tended to track then-current primary CER prices, through 2010, when CER prices began a steady decline. Project developers did not then use lower prices, but neither did industry analysts, who forecasted that higher prices would return.

These trends therefore display little evidence that project developers have systematically over- or under-estimated expected CER prices, at least as judged by the median (black line) values. However, the distribution of prices around that median displays a skew wherein a small fraction of projects use very high prices, perhaps because, as shown above, such high prices may be needed to demonstrate that these projects have met benchmarks.

¹⁶ In Vietnam, the median IRR benchmark used by projects in Vietnam was 13.1%, and most benchmarks were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate. The default expected return on equity for power projects in Vietnam, per the CDM's *Guidelines on the Assessment of Investment Analysis*, is 12.75%; 60% of power projects in Vietnam use an IRR benchmark higher than this rate; 5% have an IRR without a CER value exceeding this.

¹⁷ From the IGES investment analysis database, all hydro projects in Vietnam were selected that reported CER price assumptions in € as well as pre- and post-CER IRR values.

Figure 3-5: CER prices – assumed and estimated



Notes: CER prices assumed by project developers (grey dots) have been relatively consistent with industry forecasts made at the time (blue lines), even though they have been higher than market prices (orange line) since 2008.

Sources: IGES 2014, Point Carbon 2011, Point Carbon 2012

Sensitivity analysis: can it help address subjectivity?

The CDM addresses the subjectivity of input parameters, in part, through the use of sensitivity analysis required in investment analysis. As specified in the *Guidelines on the assessment of investment analysis*, “variables...that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation ... and the results of this variation should be presented.” However, the guidelines do not require that parameters be varied simultaneously, and few project developers do so. For example, in calculating project IRRs (in the PDDs), no project developer of the 30 randomly selected projects assessed the possibility that more than one of the key input variables could vary simultaneously. Furthermore, nearly all claim that even the standard variations of as much as 10% in the individual parameters are implausible, despite evidence (as presented here) that variation in the input values used is quite common. Accordingly, because the possibility that individual parameters could vary widely is discounted, and the possibility that multiple inputs could vary is not considered, the sensitivity analysis as currently applied is not sufficient to address the subjectivity in these parameters.

3.2.3. Summary of findings

Investment analysis is designed to determine whether a project would be uneconomical or less attractive than an alternative in the absence of the CDM. The premise is that if the project is not economical (most often as compared to a particular investment threshold), it would not have proceeded. From a strictly financial perspective, this may well be the case. However, researchers have pointed out that several types of projects in the CDM – especially large power projects that dominate the CDM pipeline – are pursued for reasons that extend beyond simple financial return, particularly in the largely non-market regulatory environments that are found in some of the largest CDM countries. This may be the most fundamental critique of investment analysis, and yet it is also the most analytically challenging to prove or disprove. Projects may proceed for a variety of

factors – economic, strategic, and social – that defy attempts to attribute the viability, or failure, to any one factor. Complicated statistical tests have been proposed – and some statistical research has been attempted – but few compelling approaches have yet emerged.

This research has further explored the issues of information asymmetry, transparency, and subjectivity of input assumptions. Regarding information asymmetry, project developers have considerably more information about their own project than do those – likely including validators – that are charged with reviewing and assessing their additionality. Regarding transparency, this research finds that, since 2007, the transparency of both project design documents and validator assessments has increased markedly, such that the strong majority of projects now include detailed information on input assumptions that their investment analysis could be replicated.

In some cases, there is little reason to question the validity of these input assumptions, as they are based on contract documents (e.g. with equipment providers that would seem to reflect actual prices paid). In other cases, the input assumptions are highly subjective, as in estimates of future fuel prices (e.g. for biomass), electricity tariffs that may be adjusted, or CER prices. In particular, this research has identified dozens of cases in China, India, and Vietnam in which it appears that project developers have used CER prices higher (in some cases, much higher) than their peers in order to claim that the CDM would make their project exceed the chosen financial benchmark. This demonstrates how eager some project developers may be to select input values to give results that would give the appearance of additionality.

3.2.4. Recommendations for reform of CDM rules

As stated above, for an additionality test to function properly, it must be able to demonstrate with high confidence that the CDM was the deciding factor in project implementation. This analysis has demonstrated that the subjective nature of the investment analysis limits its ability to provide that confidence. It is possible that improvements could decrease this subjectivity, such as by applying more complicated tests to assess the true motivations and financial performance of the project. Still, doubts may remain, especially for project types for which the financial impact of CERs is insufficiently large relative to variations in other potential inputs to provide a strong ‘signal-to-noise’ ratio, such as for large power projects. CDM administrators may therefore want to consider whether certain project types, if they cannot be confidently deemed additional by other tests (e.g. barrier analysis, common practice analysis, as in the next sections of this report), might be phased out of the CDM. If the investment analysis continues to be applied, we recommend further improving the guidance to reduce subjectivity. CDM rules could also require formal declarations by the project participants that information is true and accurate. Such declarations may discourage project participants from providing false information, as a violation of such a declaration may have consequences under national legislation. An even stronger form could be a declaration in lieu of an oath.

3.3. First of its kind and common practice analysis

3.3.1. Overview

The CDM uses two approaches to assess additionality based on the market penetration of technologies: the first-of-its-kind approach and the common practice analysis. Under the first-of-its-kind approach, a project is deemed automatically additional if certain conditions apply. The common practice analysis often complements the investment or barrier analysis. It requires an assessment of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. It is a credibility check to demonstrate that a project is not common practice in the region or country in which it is implemented. The common practice analysis can also be used to demonstrate that the baseline technology or practice is frequently implemented and is hence a realistic scenario. The common practice analysis is only relevant for large-scale

projects. Small-scale projects are entitled to use simplified modalities and procedures for small-scale CDM project activities, which do not require common practice analysis.

The first-of-its-kind approach was initially applied as part of the barrier analysis; it was sometimes also referred to as the barrier of lack of 'prevailing practice'. In 2011, the EB adopted guidelines specifying how first-of-its-kind should be demonstrated. The guidelines were further revised in 2012 and reclassified as a tool in 2015.¹⁸ Showing that a project is the first-of-its-kind is the first step in the additionality tool and combined tool, which stipulate that if a project is the first-of-its-kind, it is considered additional. The steps to be followed for demonstrating first-of-its-kind are further specified in the corresponding guidelines and, since 2015, the methodological tool. According to version 03.0 of the tool, a project activity is "first of its kind in the applicable geographical area" if

- "the project is the first in the applicable geographical area that applies a technology that is different from technologies that are implemented by any other project" with the same output and that "have started commercial operation in the applicable geographical area before" the PDD "is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier", if
- "the project implements one or more of the measures" and
- "the project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal".

The common practice test was first introduced in the additionality tool in 2004 to complement the investment and barrier analyzes, as a safeguard to ensure the environmental integrity of the CDM. In a first step, other previous or current projects which are similar to the project activity were analyzed. Projects were considered similar "if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc." Other CDM projects were excluded from this analysis. In case similar activities were identified, it was necessary to justify why these exist, while the project activity is considered to be financially unattractive or as facing barriers. 'Essential distinctions' had to be identified which may for instance be due to the fact that new barriers have arisen or promotional policies have ended.

For both the first-of-its-kind approach and the common practice analysis, the key issues are defining what is regarded as a comparable technology, what the appropriate geographical scale is and what threshold should be used for a technology to be regarded as first-of-its-kind or common practice. Critics pointed out that no clear definitions of when a project activity should be regarded as common practice were given in the early versions of the additionality tool (Schneider 2009). Another criticism was that the common practice test allows project developers to claim that a frequently implemented project type is not deemed common practice if they can justify 'essential distinctions' from other projects. Yet the key terms 'similar' and 'essentially distinct' were defined so vaguely that any project could be argued to be not common practice, simply by defining 'similar' very narrowly or 'distinct' very broadly (Schneider 2009; Spalding-Fecher et al. 2012).

The requirements for the common practice analysis in the additionality tool remained largely unchanged until September 2011 when the "Guidelines on Common Practice" were introduced, incorporating elements from the additionality tool and providing additional guidance¹⁹. In parallel to the revision of the "Guidelines on first-of-its-kind", the "Guidelines on Common Practice" were further revised in 2012 and reclassified as a tool in 2015.

¹⁸ Methodological tool. Additionality of first-of-its-kind project activities (version 03.0).

¹⁹ The new requirements of the Guidelines on Common Practice were then also incorporated in the additionality tool in the same year.

Both guidelines or tools are applicable to four GHG reduction activities, namely, “fuel and feedstock switch, switch of technology with or without change of energy source (including energy efficiency improvement), methane destruction” and “methane formation avoidance”²⁰. Both also use similar approaches for defining similar or different technologies and the appropriate geographical area.

In the 2011 version of the common practice guidelines, the first step was to calculate the applicable output range as +/-50% of the capacity of the project activity. In the next step, all existing plants in the geographical area within this capacity range needed to be identified (with the exception of registered CDM projects). The default applicable geographical area was the entire host country. If the technology was not country-specific, the geographical area should be extended to other countries. If projects differ significantly between locations, the geographical area could also be smaller than the host country. In the next step, among the identified projects, those with different technologies from the project activity were identified. A technology was considered different if it has a different energy source/fuel, feedstock, installation size (micro, small, large), investment climate at the time of the investment decision²¹ or other features.²² Eventually, if the share of plants using similar technology as in the project activity in all plants with the same capacity as the project activity is greater than 20% and if the absolute number of projects using a similar technology is larger than three, then the project activity is considered common practice.

In revising the Guidelines on Common Practice in September 2012, the rules and definitions were further clarified. It is now mandatory to provide a justification for using a geographical area smaller than the entire host country (e.g. province, region). The reference to extending the geographical area was removed from the guidelines. The exclusion of CDM activities was broadened to include registered projects, those requesting registration and those at validation. Furthermore, several definitions and the step-wise approach were better explained (without change in substance). Minor changes to the common practice analysis were made in subsequent versions of the additionality tool.

The definition of different technologies in the first-of-its-kind approach corresponds to the common practice analysis, with the exception that investment climate at the time of the investment decision and other features are not included.

3.3.2. Assessment

The general strength of using market penetration approaches for assessing additionality is that they do not assess the motivation or intent of project developers, but provide a more objective approach to evaluating additionality, based on the extent to which the project activity is already being implemented in the host country or region (Schneider 2009).

The initial criticism of the lack of clear definitions of similar projects and essential distinctions for common practice was addressed by the introduction and further refinement of the common practice guidelines, which clearly outline steps to follow and provide a definition of terms for a common understanding between project developers. Especially, the introduction of a threshold for common practice (20% and at least three similar projects) constitutes a significant improvement since it requires a quantitative assessment against a clear threshold. Clarity about the rules related to common practice analysis has therefore improved considerably over time. Also, from the sampled projects, it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs.

²⁰ For other types of GHG reduction activities, the more general rules of the additionality tool continue to apply.

²¹ “Inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations.”

²² Such as a difference in unit cost of output by at least 20%.

However, several unresolved issues still exist. In the following, different aspects of the common practice analysis and the first-of-its-kind approach are discussed and assessed. The assessment is based on an analysis of the common practice provisions and on the findings of an empirical evaluation of 30 representatively selected projects (i.e. the review of PDDs and validation reports) (Section 2.2).²³

When defining similar projects in the common practice tool, the applicable output range is defined as “+/-50% of the design output or capacity of the proposed project activity”. This definition does not always reflect the scales of a technology, between which meaningful technological differences occur. For instance, in the case of a power plant with a size of 400 MW, power plants between 200 MW and 600 MW would need to be considered in the analysis. However, there may be smaller (e.g. 100 MW) or larger (e.g. 800 MW) power plants which still feature similar technical, economic characteristics (e.g. efficiency), a similar regulatory environment, or which are used in a similar manner (e.g. provision of electricity to the public grid). At the same time, a small power plant (e.g. 5 MW), may be significantly different in terms of technology or use. Also, when several plants are grouped to form a project (e.g. wind farm consisting of several wind generators), an output of +/-50% may be misleading. For instance, for a wind farm with 20 wind generators of 1 MW capacity, the output range would be 10 to 30 MW. However, a smaller wind farm with only 10 wind generators of 1 MW capacity has similar characteristics since the wind generator is identical. For wind power, the test may provide more meaningful results if there was no scale at all since wind parks are usually composed of different wind generators of the same size. However, small internal combustion engines may well differ, from a technological perspective, from a large combined cycle power plant. In conclusion, the definition in the common practice guidelines (+/- 50%) does not allow for a meaningful classification of scale for different technology types. This definition can therefore be considered arbitrary and may lead to the erroneous exclusion of similar plants from the analysis. In contrast to the common practice tool, the first-of-its-kind tool does not use an output range to define similar technologies. This approach seems more appropriate.

When identifying similar projects, the common practice tool excludes CDM projects (registered, submitted for registration or undergoing validation) from the analysis. In the empirical analysis, of the 30 sampled projects, only three identified similar non-CDM projects. All other projects only identified projects under the CDM. A commonly used rationale (i.e. used by 9 of the 30 projects) is that, because all other comparable facilities are either CDM projects or are awaiting registration as CDM projects, the proposed project would also be non-viable without the CDM (i.e. not common practice). However, it could be argued that the general viability of projects is assessed as part of the barriers and/or investment analyzes and should therefore not be used as a pre-emptive argument for excluding CDM projects from the common practice analysis. The exclusion of CDM projects from the common practice analysis is particularly problematic if most or all new facilities in a sector use the CDM. For example, if all new wind power plants in a country register under the CDM, wind power could never become common practice, even if it reached a market share of more than 50% and was highly economically attractive. In contrast to the common practice tool, the first-of-its-kind tool does not have provisions to exclude CDM projects, which suggests that all existing projects, including CDM projects, are considered.

²³ Of the 30 projects sampled for the evaluation of the common practice analysis, the majority stem from China (20 projects), followed by India (3), Egypt (2), Pakistan (2), Brazil (1), Nicaragua (1) and Israel (1). Ten projects were registered before 2010, eight in the 2010-2011 period and twelve after 2011. Technology types in the sample are wind power (17 projects), hydropower (5), industrial projects such as coal mine methane utilisation or waste heat recovery (3), waste projects such as landfill gas capture (4) and other renewable energies such as biomass (1). Most projects (28 of 30) are classified as large-scale. Although the sampled two small-scale projects are not required to conduct a common practice analysis, some information on common practice was given in the corresponding PDDs.

The common practice tool and the first-of-its-kind tool use the same definition of the geographical area, which should be the entire host country, unless justification can be provided for a smaller geographical area. In the common practice analysis sample, 24 of 30 projects limited the applicable geographical area to a specific area smaller than the host country (such as province, region, state, municipality, etc.). All sampled wind projects from China (11)²⁴ and from India (3) selected an area smaller than the host country as the applicable geographical area. The most commonly used justification in the corresponding PDDs for limiting the geographical area is that investment conditions, especially in terms of electricity tariffs, available resources and labour costs, differ from province to province, making provincial/state level comparison necessary.

At first sight, this appears to be plausible since China and India are large countries with regions/states being important players in infrastructure development. Notwithstanding this, the size of the country and the political structure may not be sufficient to justify the choice of the regional/state level. In China, a nationwide feed-in tariff for wind power generation was introduced in 2009, establishing four different tariff categories, ranging from 0.51 CNY/kWh (0.08 USD/kWh) to 0.61 CNY/kWh (0.10 USD/kWh), depending on the region's wind resources (International Renewable Energy Agency 2012). For projects in India, the Electricity Act of 2003 and the resulting new tariff regulations were cited as the cause of different investment climates in various states. In fact, for wind power, the tariff varies based on local wind resources. Four bands of wind power density in W/m^2 determine the level of the feed-in tariff (International Energy Agency 2012). This means that the feed-in tariff may differ even between project locations in the same province if these feature different wind conditions. Therefore, the fact that there are different feed-in tariffs between provinces alone does not explain fundamentally different investment conditions in the different regions, as claimed in many PDDs, but rather only accounts for locally different wind resources, while the general support scheme is national²⁵. Based on these considerations, the rationale used by many projects for limiting the geographical area to a level below the entire country seems questionable. It can also be problematic to consider only the host country as the geographical area. If no or only a very few plants providing the same service exist in the host country, market penetration approaches do not give reasonable results. For example, the first aluminium plant in a country would always automatically be deemed additional, even if it used a technology that is clearly business-as-usual.

While the introduction of the common practice guidelines aimed to address the criticism of a vague definition of what constitutes 'different' technologies, several concerns remain. The possibility of defining a technology "as being different if there is a difference with regard to energy source/fuel, feed stock, installation size (micro, small, large), investment climate at the time of the investment decision (including, "inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations") or other features (such as difference in unit cost of output by at least 20%)" still allows for significant possibilities to claim that rather similar projects are very different. This allows for the project to be defined rather narrowly and other plants very broadly, so that the threshold of 20% is not reached. With regard to the installation size, the same issue as for the output range (above) applies. Also, the criterion 'energy source/fuel' may be misleading. For instance, if a country has been using light fuel oil as a basis for its power plants, a switch to natural gas constitutes a different fuel, but does not explain a significant difference since the same generation technology can be used for both fuels. The same holds true for different solid fuels. Finally, 'other features' is a very broad term allowing for arbitrary interpretations. For example, a difference in unit cost of output does not constitute a plausible difference per se²⁶. For instance, higher unit costs

²⁴ Also all other Chinese (non-wind) projects included in the sample use a sub-national geographical area with a similar rationale as that for wind projects.

²⁵ A differentiation of the feed-in tariff depending on local wind resources is common practice in other countries as well.

²⁶ Two sampled hydro projects used this rationale.

may be required for technical or other reasons and may be compensated for by higher yields²⁷. Also, according to this interpretation, a proposed CDM project with *lower* unit costs would be considered different from projects already implemented without CDM, even though it is more profitable than other projects. Although in some cases, 'differences' may be well justified (e.g. by explaining that the investment climate was significantly different due to a change from a state-controlled to a more private investment-oriented power market), overall, the review of arguments presented in the sampled PDDs indicate that the term 'different' allows for significant room for interpretation.

The threshold of 20% market diffusion in the common practice tool cannot be considered robust if applied to all technologies and sectors. The stringency of the 20% is highly dependent on the number of technologies in a sector. In a sector with only two technologies, both available technologies could easily exceed the threshold, whereas none of the technologies may ever reach the 20% threshold in sectors with many different technologies. For instance, in a country with several fuels and technologies available for power generation (e.g. natural gas, coal, wind, hydro, biomass, PV), a low market diffusion may still constitute common practice due to the abundance of options and due to the (potentially) limited potential of some technologies. For instance, hydro electricity generation may constitute only 5% of overall electricity generation. Nevertheless, hydropower could still be considered common practice due to the fact that hydro resources are limited and most of the resources have already been exploited. In contrast, in a sector in which there are only a few technologies (e.g. for a certain industrial process) a market diffusion of 20% may constitute a reasonable value for determining common practice. Also, even though a technology may not be considered common practice considering all existing plants in a sector (i.e. considering the market saturation), it may be common practice considering the recent trend (i.e. considering the market share in a certain year)²⁸. For instance, electricity generation from wind may constitute only a small share of the overall electricity generation in a country (e.g. 1%). However, capacity additions in recent years may constitute a significant share of overall new capacity built. In the former case, wind power would not be considered common practice, whereas in the latter, trend-oriented, perspective wind power would constitute common practice. This issue is especially relevant in the case of long-lived capital stock such as in the power sector (Kartha et al. 2005). Similarly, the provision that at least three plants with a similar technology must have been constructed to consider a project common practice may not be appropriate in all situations. For example, if only four plants exist in a country and three use the same technology, thus constituting a market share of 75%, the construction of a fifth plant with the same technology would still not be regarded as common practice. In conclusion, a one-fits-all value as threshold for market diffusion cannot be considered appropriate.

With regard to the quality of evidence used for the demonstration that a project is not common practice, almost all PDDs provided anecdotal evidence to support their claims. Commonly made statements are that there is no evidence to suggest that a similar project has been, is being or will be implemented in this area and that all other projects use CDM financing as well. To support these claims, publicly available external documents such as energy statistics were used in the majority of projects (20 of 30 projects). Yet, these public documents do not provide information about different investment climates in terms of labour costs, available resources and feed-in tariffs.

As regards the validation of common practice, in 21 of 30 sampled projects, the DOE reviewed documents such as the World Bank website or energy statistics. Other means of validation were conducting interviews with stakeholders such as personnel with knowledge of the project design and implementation, local residents and officials.²⁹ However, the DOEs did not evaluate claims

²⁷ E.g. higher units costs may be required for certain equipment for small hydro in a mountainous area, which may be compensated for by higher yields due to a higher head of water.

²⁸ See Kartha/Lazarus/LeFranc (2005) for a definition of market saturation vs. market share.

²⁹ There is no further information available in the PDDs on the content of the interviews with the stakeholders.

made in the PDDs about different investment climates. In nine cases, the DOE in its validation report just repeated the claims made by the PDD.

3.3.3. Summary of findings

Overall, clarity about the rules related to first-of-its-kind and common practice analysis have improved considerably over time. In addition, from the sampled projects it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs. However, several flaws remain:

- The definition of the output range in the common practice tool is arbitrary and not linked to actual differences in scale of technologies or use.
- The exclusion of CDM projects from the analysis is questionable in a market situation in which most projects are implemented as CDM projects and significant technological changes and cost reductions occur.
- The rationale for limiting the geographical area to a level below the entire country is questionable. In some instances, limiting the geographical area to the host country can be problematic.
- The definition of a project as 'different' in the current common practice guidelines is still too vague and corresponding rules still leave significant room for interpretation.
- The share of 20% market diffusion and absolute number of three similar projects, across all sectors, cannot be considered robust since the appropriateness of these values depends on the number of available technologies in the sector. Additionally, the result of the common practice analysis is highly sensitive to whether all plants of a sector are considered or whether the recent trend (new plants built) is considered. This is especially relevant for sectors with long-lived capital stock.
- Generally, evidence used for the common practice analysis was not adequate in the sampled projects since relevant information for the determination of common practice (e.g. on different investment climates, available resources or feed-in tariffs) was not provided in the PDDs. Also, the validation by DOEs was not adequate in the sampled projects since claims on investment climates were not evaluated and since in several cases the DOE only repeated the claims made by the project participants.

3.3.4. Recommendations for reform of CDM rules

In general, the first-of-its-kind approach and the common practice analysis can be considered more objective approaches than the barrier or investment analysis due to the fact that information on the sector as a whole is taken into account rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis. In this regard, expanding the use of market penetration approaches could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way in which first-of-its-kind and common practice are currently assessed needs to be reformed in order to provide a reasonable means of demonstrating additionality. In the following, several recommendations are made for the reform of the current rules.

We identified several issues with the approach of using the same generic approach in the context of rather different sectors or project types. We therefore recommend abandoning this 'one-size-fits-all' approach and introducing specific approaches for specific project types, which adequately reflect the circumstances of the sector, in particular with regard to the definition of what is considered

a different technology and the threshold used to define common practice. A practical means of implementing this is including specific guidance in each methodology.

- Due to the inherently vague concept of ‘different’ technologies, it is recommended that the common practice rules are revised in such a way that methodologies or overarching guidance provide clearer guidance on how to support the claim of a ‘different’ technology including the evidence required (including evidence to demonstrate credible differences in the investment climate). Corresponding provisions in the VVS should also be amended in such a way to provide more specific guidance on how DOEs should assess the claim of ‘essential distinctions’ for different projects types. With regard to the above-mentioned arbitrary definition of the applicable output range, it is recommended that the common practice guidelines are revised in such a way to provide general guidance on how meaningful differences according to scale can be identified for different technologies. More specific guidance on how to define a range of capacity/output should then be defined in the corresponding methodology. In the absence of any definition of capacity/output range in the methodologies, the whole spectrum of plants or activities (from very small to very large) should be covered by the analysis.
- With regard to the exclusion of CDM projects from the common practice analysis, the rules should be amended in such a way that all CDM projects are to be included in the analysis as a general rule, unless specified otherwise by the methodology. Methodologies could specify that CDM projects are excluded to a certain extent and then gradually introduce them in the analysis. This is especially relevant if all projects of a certain technology use the CDM. As Schneider (2009) points out “other CDM projects could be included in the common practice analysis after a certain period or after a specific number of CDM projects have been implemented”. Another criterion for inclusion of CDM could be their market penetration. (International Rivers 2011) suggest that “after 3 years of full operation, a CDM project should be included in the common practice analysis”. Furthermore, a “list of project types that are not eligible for the CDM because they are common practice” (ibid.) (negative list) could also be helpful in this regard.
- Due to our finding that the selection of an area below the host country level as the applicable geographical area is a questionable assumption, it is recommended that the rules be revised to define the appropriate geographical area in the context of the specific circumstances, such as the number of projects or installations in the host country. A level below the host country level should not be used.
- The threshold for common practice should be defined depending on the type of technology and sector. Corresponding guidance should be provided in the methodologies. In sectors with long-lived capital stock (e.g. power sector), the common practice analysis could consider two different perspectives: a) common practice in the sector (e.g. power sector) as a whole (market saturation) and b) common practice in more recent investments (market share) (i.e. similar to the operating and build margin approach for projects displacing electricity). If common practice is established according to at least one of these perspectives, the project should be considered common practice. Since data availability for determining market diffusion may not be sufficient in each country and in order to ensure consistency in determining market diffusion, efforts (e.g. multilateral) for collecting this data and for providing this information to project developers could be helpful. Several global datasets already exist (e.g. UNEP DTU 2014, statistics by the World Bank, sectoral statistics, Platts database on power plants or cement statistics by Cembureau), which could be used to estimate market diffusion in different countries in a consistent manner. An extensive discussion of

the usefulness of market penetration for establishing common practice for certain projects types is included in (Kartha et al. 2005).

Due to the fact that several DOEs repeated the claims made by the project participants without documenting the way in which they actually assessed the appropriateness of the claims, we recommend strengthening efforts to ensure that all DOEs effectively comply with the reporting requirements related to the common practice analysis outlined in the VVS. For this purpose, no change in rules has to be applied, but the accreditation system may need to be strengthened to ensure compliance of all DOEs with applicable CDM requirements.

Another option for improving the analysis of common practice is to consider the overall potential available in a country. For instance, a small share of hydro in overall electricity generation may, on the one hand, be due to barriers, risks or economic unfeasibility of hydro construction (hydro electricity generation would therefore not be common practice). On the other hand, the small share of electricity generation from hydro may be due to the very limited hydro potential in the country. Most of the (small) potential may already have been exploited. Any additional hydro capacity could then be considered common practice since it has been exploited before. However, this approach would bring about the problem of defining ways to establish the potential (e.g. technical vs. economic potential, etc.), and the practicalities and transaction costs of evaluating this for many different technologies.

Furthermore, the common practice analysis could “be the first step in the additionality tool rather than the last” (International Rivers 2011). This way, instead of using often vague arguments for establishing common practice *after* the investment analysis, project developers would need to discuss common practice explicitly at the beginning of the analysis.

3.4. Barrier analysis

3.4.1. Overview

Historically, barrier analysis has been used as an important alternative or complement to the investment analysis analyzed above in Section 3.2. The barrier analysis is used to demonstrate that a project faces barriers that impede the project’s implementation in the absence of the incentives from the CDM. It is applicable to both small- and large-scale CDM projects:

Small-scale projects

According to Attachment A to Appendix B to Annex II of 4/CMP.1 the following barriers may be considered for small-scale projects:

- **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions; this includes “the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis”.³⁰ In essence, this barrier allows an investment analysis to be conducted, as described in Section 3.2, but without providing any guidance on how the investment analysis should be conducted. In practice, however, it appears that guidance for investment analysis for large-scale projects (e.g. justification of benchmark IRR or sensitivity analysis) is, in most cases, also applied to small-scale projects.
- **Access-to-finance barrier:** the project activity could not access appropriate capital without consideration of the CDM revenues;

³⁰ See “Non-binding best practice examples to demonstrate additionality for small-scale projects” (EB 35, Annex 34).

- **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- Barrier due to **prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- **Other barriers** such as institutional barriers or limited information, managerial resources, organisational capacity, or capacity to absorb new technologies.

Large-scale projects

In large-scale projects, the barrier analysis is part of the additionality tool and the combined tool. It is applied in two steps:

1. Identify barriers that would prevent the implementation of the proposed CDM project activity. Here, the eligible barriers are similar to the barriers relevant for small-scale projects, with the following differences:
 - The ‘investment barrier’ of the small-scale guidance is, in the large-scale guidance, referred to as ‘investment analysis’ (Section 3.2); a separate option for demonstrating additionality besides ‘barrier analysis’;
 - The ‘access-to-finance barriers’ of the small-scale guidance is called ‘investment barriers’ in the large-scale guidance; and
 - ‘prevailing practice’ of the small-scale guidance is, in the large-scale guidance, usually a mandatory additional step termed ‘common practice analysis’ that is required but is not sufficient in itself to prove additionality.
2. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

Another important requirement of the two tools is the following: “If the CDM does not alleviate the identified barriers that prevent the proposed project activity from occurring, then the project activity is not additional.”

If these steps are satisfied, the project is potentially additional (pending passing of the common practice analysis).

In late 2009 (EB50), the CDM EB adopted the “Guidelines for objective demonstration and assessment of barriers” with a view to improving the objectivity of the barrier analysis. The document provides guidance on the objective demonstration of different types of barriers. For instance, it requires that “barriers that can be mitigated by additional financial means can be quantified and represented as costs and should not be identified as a barrier for implementation of project while conducting the barrier analysis, but rather should be considered in the framework of investment analysis” (Guideline 4 in EB50 A13).

In addition, methodologies may – instead of using one of the tools – provide their own combination of steps from the tools.

3.4.2. Assessment

The concept of barriers preventing investments and mitigation activities is an important element of the research and discussion on technology diffusion and low carbon pathways. From this, it seems reasonable that the additionality test could also take barriers into account and not only be based on

investment analysis. However, the barrier analysis faces multiple challenges in practice that strongly limit its usefulness in the context of the CDM.

Objectivity in barrier analysis

In earlier phases of the CDM, the claim for barriers preventing the implementation of projects was often based on anecdotal evidence, and it was very difficult to provide objective proof of why a barrier is sufficient to “prevent the implementation” (Schneider 2009). In practice, the concept of barriers per se as proof for additionality is problematic, as all investment projects in all countries faces some sort of barriers to its implementation, be they financial, technical or other. In earlier CDM projects, it was sufficient for PDD consultants to state barriers without providing objective and verifiable evidence that they actually *prevent* the implementation of the project. This led to some market participants claiming that with good PDD consultants you could have any project registered based on barriers.

Guidance on objective barriers

In late 2009 (EB50), these problems with barrier analysis led to the adoption of the “Guidelines for objective demonstration and assessment of barriers” by the CDM EB (Section 3.4.1). With their requirement to monetize barriers, the guidelines aim to assess the role of barriers in preventing the implementation of projects in a more transparent way. The monetization of barriers and their inclusion in the investment analysis provide a framework that allows an objective balancing of higher barriers and associated costs with the need for higher revenues. This may be one of the reasons why investment analysis (with or without monetized barriers) has largely replaced the use of the barrier analysis without application of investment analysis in demonstrating additionality (see below).

How much alleviation is necessary to overcome a barrier?

Another weakness of the barrier analysis lies in the application of the requirement to demonstrate that the CDM “alleviates the identified barriers that prevent the proposed project activity from occurring”. The fulfilment of this requirement was not often (explicitly) provided in PDDs nor checked by DOEs. Moreover, the tools do not require that the degree of ‘alleviation’ should be at least comparable to the strengths of the barrier under consideration. To demonstrate the viability of the project with the CDM, one would need to make the case as to why, for example, €x of CER revenues are sufficient to alleviate the risk of damage to a wind farm due to severe sand storms.

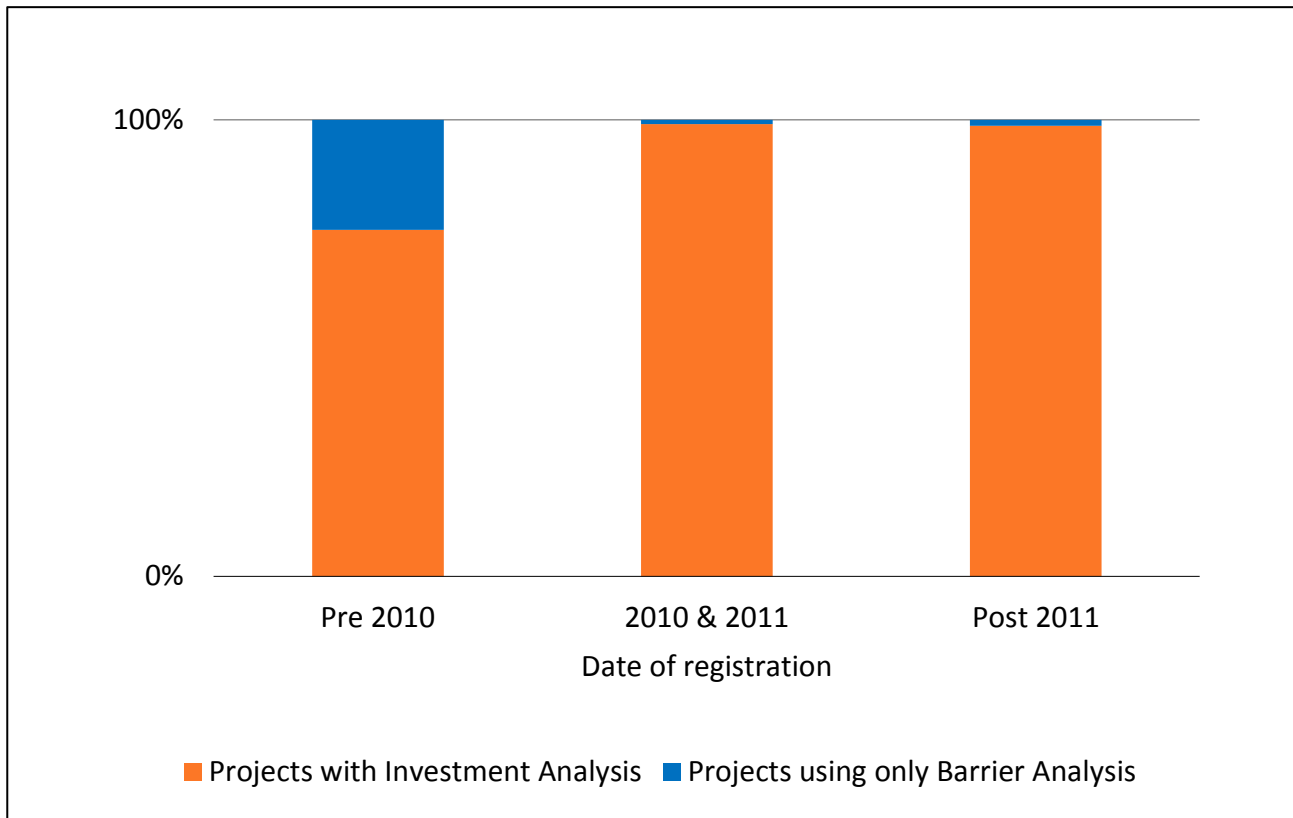
Also with regard to this requirement, the Guidelines provide greater specificity: “Demonstrate in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers” (Guideline 2 in EB50 A13).

The vanishing role of barrier analysis in the CDM

The role of barrier analysis in demonstrating additionality in the CDM has been dramatically reduced from 2010 onwards (Figure 3-6). While in the period before 2010 approx. 24% of registered projects used the barrier analysis *without applying an investment analysis in parallel*, this share was reduced to approx. 1-2% of registered projects from 2010 onwards. Since then, the barrier analysis plays a certain role in reinforcing the additionality argument made in the investment analysis, but has largely lost its role as the main approach for demonstrating additionality.

This development might be explained by the introduction of the guidelines for objective demonstration and assessment of barriers.

Figure 3-6: Share of projects using the barrier analysis without applying the investment analysis in total projects



Notes: Own research based on a representative sample of PDDs from 30 stratified and randomly sampled projects that were labelled Investment Analysis option 'none' by the IGES (2014) database revealed that a certain percentage of these PDDs used an approach that in essence follows the Investment Analysis approach of the additionality tool, but was labelled 'Barrier Analysis'. The confusion in terminology was most prominent in small-scale project PDDs, which have the option to demonstrate 'financial barriers' which includes and is often an Investment Analysis. In the representative sample, the fraction of PDDs using actually an Investment Analysis while being labelled Investment Analysis option 'none' by IGES was 36.4% pre 2010 and 90% afterwards. The share of projects using Investment Analysis from the IGES database has, therefore, been increased by these shares from the sample analysis. Without this correction, the share of projects without investment analysis in the IGES database are 38%, 10% and 14%, respectively, for the three considered time periods of registration.

Sources: IGES 2014, authors' own PDD research

With the adoption of the guidelines, the barrier analysis has largely lost its role as the main argument for demonstrating additionality. After 2010, non-financial barriers are quoted in some projects, but merely as additional information to reinforce the main case for additionality, which tends to be based almost uniformly on investment analysis. Potentially, this development may have been supported by an improved performance of DOEs in validating barrier analysis in PDDs, due to an improved accreditation system.

3.4.3. Summary of findings

In early CDM projects, the routine use of anecdotal and often subjective evidence for claiming barriers has led to the registration of projects with questionable claims for additionality, which cannot be objectively assessed by DOEs. With the adoption of the Guidelines and possibly the improved performance of DOEs, the barrier analysis has largely lost its role as the main line of argument for demonstrating additionality. Rather, barriers are monetized and reflected in the investment analysis.

In the CDM, barrier analysis has lost importance as a stand-alone approach to demonstrating additionality because of the subjectivity of the approach. With the guideline, if barriers are claimed, they are monetized and integrated as costs in the investment analysis.

3.4.4. Recommendations for reform of CDM rules

Non-financial barriers can be important factors preventing the implementation of projects even though they may be profitable. Therefore, considering barriers in approaches for additionality determination is a valid approach.

However, the objective demonstration of barriers (as required in the Guidance) has turned out to be very difficult to operationalise without the reflection and monetization in an investment analysis.

Given the de facto non-application of the barrier analysis without investment analysis approaches in the current CDM practice, we recommend removing the barrier analysis from the additionality and combined tools. In return, key aspects of the Guideline related to the monetization of barriers³¹ may be included in the investment analysis step in the additionality and combined tools.

In order to demonstrate additionality of projects with high (non-financial) barriers that may not be monetized, a comprehensive 'common practice' analysis or in small-scale projects 'prevailing practice' analysis shall be carried out (Section 3.3). Here, objective data on market shares of technologies/project types may be collected that may serve as objective proxy information for the extent to which barriers actually prevent the implementation of projects.

On another note, the approval of "Guideline on objective demonstration and assessment of barriers" by the CDM EB may be seen as a positive example of how the CDM regulator, under the right conditions, can react to an obvious flaw in the rules and practice, and rectify the system.

3.5. Crediting period and their renewal

3.5.1. Overview

Project participants can choose between one crediting period of 10 years without renewal or a crediting period of seven years for their project, which is due for renewal every 7 years for a maximum of two renewals (a total of 21 years for normal CDM projects). (For afforestation and reforestation projects, the choice is between one period of 30 years and three periods of 20 years). The Marrakesh Accords state that for each renewal, a designated operational entity shall determine that "the original project baseline is still valid or has been updated taking account of new data where applicable".

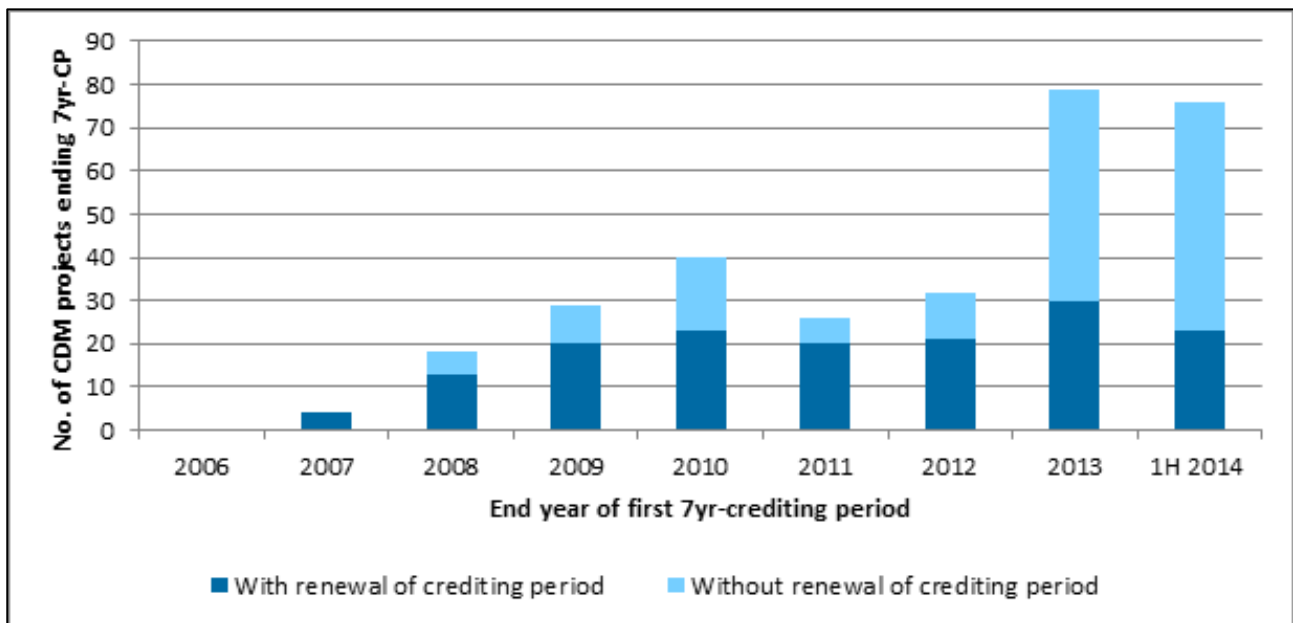
Requirements regarding the renewal of the crediting period were initially adopted in 2006 (EB28, Annex 40), subsequently revised several times (EB33, EB36, EB43, EB46, EB63, EB65, EB66), and partially incorporated in the project standard. At the renewal of crediting period, the latest valid version of a methodology must be used. If a methodology has been withdrawn or is no longer applicable, the project developers may use another methodology or request deviation from an applicable methodology. The CDM EB interpreted the 'validity test' in the Marrakech Accords in such a way that neither additionality nor the baseline scenario needs to be reassessed during the renewal of the crediting period. "The demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the emissions which would have resulted from that scenario" (Project Standard, Version 07.0, paragraph 289). The current rules mainly require an assessment of the regulatory framework, an assessment of

³¹ This relates to Guidelines no. 4 and 5 of EB50 Annex 13 that may be integrated as cost items related to barriers/risks in the investment analysis of the additionality and combined tool. Guideline 2 may also be implemented in the context of the investment analysis in the tools, in that the CER revenues should be sufficient to overcome the financial gap in project finance that is due to the barrier.

circumstances, an assessment of the remaining lifetime of technical equipment to be used in the baseline, and an update of data and parameters, such as emission factors.

Figure 3-7 plots the number of projects that have chosen a 7-year crediting period and that end their first crediting period in a given year and are therefore potentially entering a process of crediting period renewal. The increase in project registrations with the maturing of the CDM market from 2005 is mirrored by a steep increase in candidate projects for renewal seven years later, after 2012. The graph also indicates that the fraction of these candidate projects that actually underwent renewal significantly declines after 2012: While before 2012 roughly two thirds of all candidate projects underwent renewal on average, the rate dropped to roughly one third after 2012. This may be explained by the collapse in pricing and the petering out of the classical CDM market in 2011-2012, whereby CER prices below marginal transaction costs make renewal of crediting economically non-viable for most projects that do not benefit from long-term futures contracts with higher prices.

Figure 3-7: Number of CDM projects ending first seven-year-crediting period – with and without renewals



Sources: UNFCCC 2014, authors' own analysis

3.5.2. Assessment

The requirements to use the latest approved version of a methodology is a very important rule to assure that changes in the methodological ruling are also implemented in CDM projects within a reasonable timeframe and therefore seem appropriate. At the same time, it provides some certainty for investors that rules regarding the calculation of emission reductions are not changed within their crediting period.

The CDM EB's decision to interpret the Marrakesh requirement of assessing that "the original project baseline is still valid" in such a way that that only baseline emissions must be updated but that neither additionality nor the baseline scenario needs to be re-assessed could constitute a major risk for the environmental integrity of some project types. In 2011, the Meth Panel highlighted cer-

tain issues with this approach in an Information note to the EB (MP51 Annex 21³²), but the rules were not changed in response. In the following, we briefly analyze two main issues:

- The case of the baseline scenario changing over the course of the crediting period in a way that is not captured by the baseline methodology;
- The case of limited 'lifetime' of a baseline scenario.

Baseline scenario changing over of the course of crediting periods

In a number of instances, a baseline scenario could change over time during crediting periods and deviate from the assumptions in the underlying methodology. One example is a CDM project consisting of the conversion of an existing open cycle power plant to a closed cycle system. Assuming that after the first crediting period, new and lower cost technologies for the conversion would become available that would make the project economically viable, the implementation of the project activity after the first crediting period might be the most probable baseline scenario in the absence of the CDM. We are not referring here to the concept of dynamic baselines, e.g. the fact that baseline emissions are calculated based on the project output (e.g. in tons of steel or MWh per year). Rather, the scenario is changing, i.e. this refers to projects (or another low carbon activity) which, in the absence of the CDM project, would have been implemented at a later date due to changing circumstances.

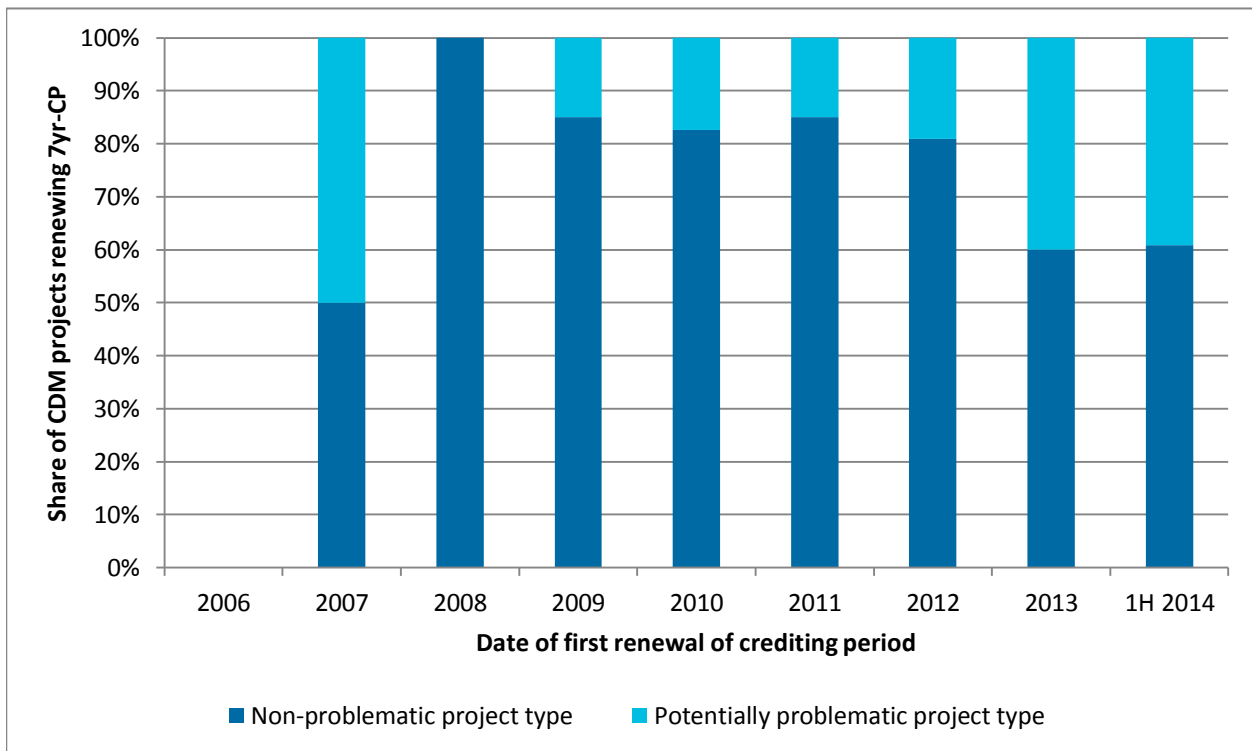
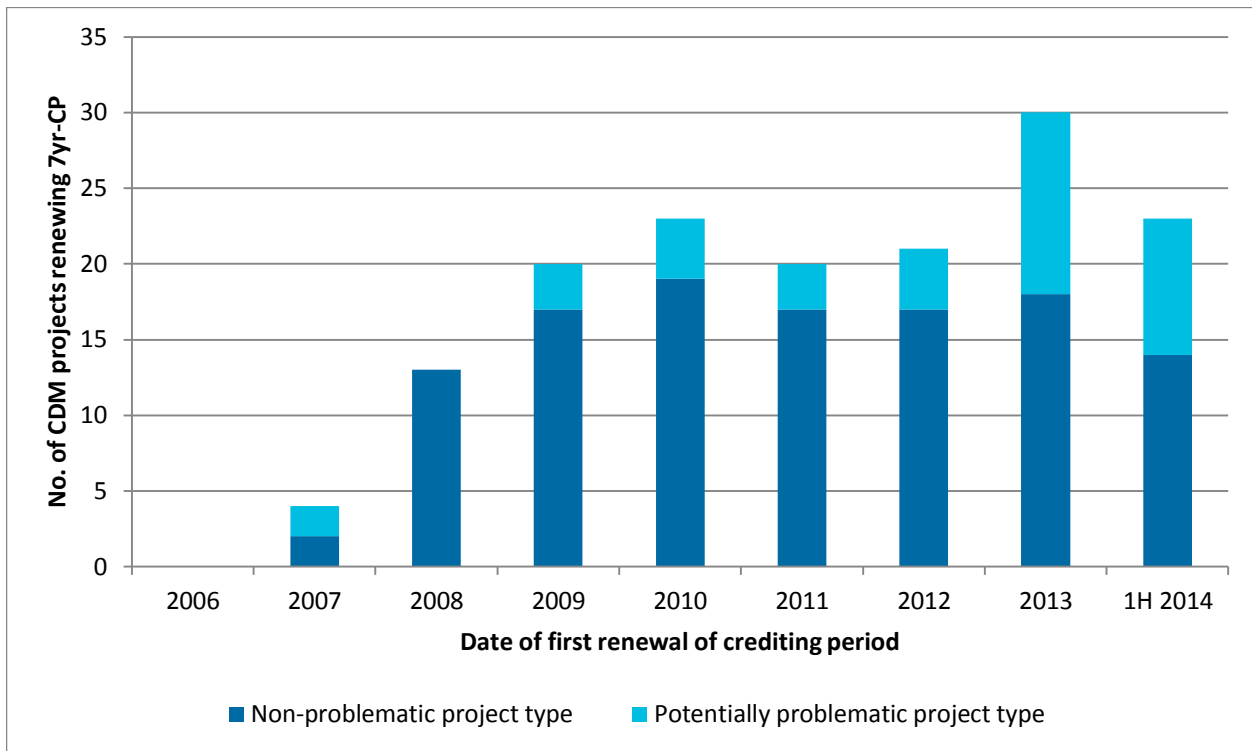
However, it is important to note that not all CDM project types are prone to changing baseline scenarios. Baseline scenarios typically change over time if they are the 'continuation of the current practice'. In such cases, changes such as retrofits could also be implemented at a later stage. In contrast, baseline scenarios do not change over time when they include a significant investment at project start in an alternative that provides similar services. This is the case if, for example, an industry can choose to fulfil their heat demand by either a new biomass boiler (project activity) or a new coal boiler (baseline). If one assumes that the project participant carries out a significant investment at the beginning of the baseline (e.g. to build the new coal boiler), it may be assumed that this investment is used until the end of its operational lifetime; replacing the coal boiler by a biomass boiler after seven years is economically not viable in general.

However, because CDM requirements explicitly rule out the re-assessment of the baseline scenario, cases with a change in baseline scenario cannot be taken into account, which leads to potential over-crediting in the second and third crediting periods in the case that the activity would have been implemented after the first crediting period due to changing circumstances.

Practical examples of such changing circumstances and related potential over-crediting can be found in Purdon (2014) for the co-generation sector. The paper provides an overview of how a change in external influence factors (e.g. sugar price) can influence the additionality and how a baseline scenario that is kept constant over several crediting periods can result in over-crediting.

³² https://cdm.unfccc.int/Panels/meth/meeting/11/051/mp51_an21.pdf.

Figure 3-8: Share of CDM projects renewing their seven year crediting period that is deemed non-problematic



Notes: Potentially non-problematic project types have been selected according to the criteria of having a lower risk of changes in the baseline scenario over several crediting periods.

Sources: UNFCCC 2014, authors' own analysis

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

Assessment of the scale of the issue

In the following, we make a very rough assessment of the scale of this issue. As mentioned above, not all project types are in danger of undergoing changes in baseline scenarios that are not foreseen in the underlying methodology. In order to arrive at a preliminary estimate of the scale of the potential issue, a list of 'potentially problematic' project types was identified that have a higher risk of changes in the baseline scenario over several crediting periods than those categorised as 'unproblematic'.³³

Please note that 'potentially problematic' does not mean that all projects in that project type have issues with the renewal of the crediting period, it simply means that the projects are in a sub-type that may contain potentially problematic projects. Figure 3-8 depicts the number of projects of a non-problematic project type in the total number of projects that actually underwent renewal of the 7-year crediting period in a given year.

The graph indicates that the number of projects renewing their crediting periods increased in 2007-2009. Until 2012, non-problematic projects made up the large majority of renewals. However, from 2013 the share of non-problematic projects dropped to approx. 60% of renewed projects. With such a low share, the issue may become more important in the future with a further increase in renewals (although the increase may be somewhat muted by the unfavourable market conditions).

In this context, it is important to note that CDM projects do not need to renew immediately, but may wait until market conditions are more favourable. Given the high number of projects that may undergo renewal at a later point in time combined with the lowering in the share of non-problematic project types may lead to considerable over-crediting.

Lifetime of baseline scenario

Another, also related, issue is that in more complex and very dynamic systems, such as the transport sector, the determination of a counterfactual baseline scenario is exposed to fundamental limitations in the ability to predict future developments. These limitations can lead to very high uncertainties in the baseline determination. In some instances even after a very few years, the actual baseline emissions could be significantly higher (or lower) than the calculated baseline emissions. For example, while it may be relatively certain that a project proponent choosing in the baseline situation to build a coal-fired boiler will continue to operate this boiler over its lifetime to meet its heat demand, the development of a city's transport system in the absence of a specific urban rail project could be very difficult and uncertain to predict: over some years one may assume that an increase in transport demand is catered for by increased use of private cars; however, street capacities may be limited and the municipalities may have to find solutions to their transport problems anyway, also in the absence of a specific project activity.

It therefore might be considered that for some project types in complex and dynamic environments, such as transport systems, the baseline scenario cannot be reasonably extended over a period of

³³ For a preliminary screening, the following projects sub-types (according to the classification of UNEP DTU) have been classified as "potentially problematic", i.e. it cannot be ruled out that the projects would be implemented later in time without the CDM under changing circumstances (please note that the sub-types may also contain projects which clearly do not have an issue): Adipic acid, Aerobic treatment of waste water, Agricultural residues: mustard crop, Air conditioning, Appliances, Biodiesel from waste oil, Biogas from MSW, Bus Rapid Transit, Cable cars, Caprolactam, Carbon black gas, EE industry - Cement, Cement heat, Charcoal production, EE industry - Chemicals, EE own generation - Chemicals heat, Clinker replacement, CMM & Ventilation Air Methane, CO₂ recycling, Coal Mine Methane, Coal to natural gas, Coke oven gas, Combustion of MSW, Composting, Domestic manure, EE public buildings, Existing dam, Food, Glass, Glass heat, HFC134a, HFC23, Industrial waste, Iron & steel, Landfill composting, Landfill aeration, Landfill flaring, Landfill power, Lighting, Machinery, Manure, Mode shift - road to rail, Natural gas pipelines, Nitric acid, EE industry - Non-ferrous metals, EE own generation - Non-ferrous metals heat, Non-hydrocarbon mining, Oil and gas processing flaring, Oil field flaring reduction, Oil to natural gas, EE industry - Paper, EE industry - Petrochemicals, PFCs, Power plant rehabilitation, Rail: regenerative braking, Solar water heating, Stoves, EE industry - Textiles, Ventilation Air Methane, Waste water. All other project types are deemed "non-problematic".

ten years and a renewal of crediting periods should not be allowed, given the risks of inadequate and very uncertain baseline scenarios for later time periods.

It was for this reason that the crediting period was initially limited to a single crediting period for some project types, including:

- PFC emissions from manufacturing in the semi-conductor industry (e.g. AM0092). This is an industry in which manufacturing technologies and composition of materials etc. change frequently compared to the duration of a 7-year crediting period
- Power saving from efficient management of data centers. Technologies and operating systems also typically have short lifespans compared to a 7-year crediting period.
- Complex transport systems such as the introduction of Bus Rapid Transport (BRT) systems in cities. In this context, the uncertainty in the baseline scenario and the resulting baseline emissions grows very rapidly, because development of transport systems over 5-10 years is difficult to predict with accuracy.

For these project types, the maximum crediting period has been set to 10 years in earlier versions of the methodology, because the uncertainty in the baseline scenario after 10 years did not allow for an objective determination of the emission reduction.

This limit in the crediting period to 10 years also allowed the methodology to be simplified, as the projection of baseline emissions over a limited period allows for simpler approaches and requires less monitoring provisions, thus reducing transaction costs.

Subsequently, however, the CDM EB took the decision (EB67, Para 107) that for each project type and methodology multiple crediting periods can be used (independent of any methodological limitations and uncertainty issues for the baseline setting as discussed above). This decision has been taken based on para 49 of the Modalities and Procedures for the CDM (decision 3/CMP.1, annex) that mentions alternative approaches. The paragraph was interpreted in such a way that both options shall be allowed in *each and every* methodology.

Since then, the relevant methodologies have been revised, allowing crediting for up to 21 years for all methodologies, without providing for further safeguards that would reduce the uncertainty in baseline scenario projection and potential over-crediting.

The issue of renewal of crediting period and more generally the updating of baseline scenarios is further discussed in Schneider et al. (2014).

3.5.3. Summary of findings

When the crediting period of a CDM project is to be renewed, the Marrakesh Accords require that the DOE check the validity of the original project baseline. A subsequent EB ruling (EB 43, Annex 13, paragraph 3) limited this check to an assessment of the regulatory framework, an assessment of the remaining lifetime of technical equipment that would be used in the baseline and an update of data and parameters, such as emission factors. The EB clarified that the validity of the baseline scenario should not be re-assessed.

With CDM project types for which the baseline scenario does not require a significant investment at the beginning of the crediting period (that would determine the baseline technology over the lifetime) this may lead to potential over-crediting. A preliminary analysis of projects that underwent renewal of the crediting period in recent years reveals that from 2013 onwards the share of potentially problematic project types (that might have issues of changing baseline scenarios leading to

over-crediting) increases to approx. 40% of projects with renewal. It is therefore recommended that this issue is resolved.

A subsequent ruling by the EB to remove the limit in the crediting period that some project types had in their methodology in sectors especially prone to baseline uncertainty over one crediting period (e.g. semi-conductor manufacturing, information technology, transport) further exacerbated the issue.

3.5.4. Recommendations for reform of CDM rules

We recommend two reforms to the current rules:

- Reassessing the baseline scenario at the renewal of the crediting period: The issue of potential over-crediting arising from inadequate checking of the validity of the baseline at the renewal of the crediting period could be addressed by expanding the assessment to the validity of the baseline scenario for CDM projects that are potentially problematic in this regard. For this, clear criteria for problematic project types should be formulated and guidance should be provided on how to test the validity of baseline scenarios for specific CDM methodologies.
- Limitation of the overall length of crediting for specific project types: Project types in sectors or systems that are highly dynamic and complex, and in which the determination of baselines is notoriously difficult (e.g. urban transport systems) should be limited to a single 10 year CDM crediting period or should be supported by other (non-crediting) finance sources.
- A further step that may be considered is a general limitation of projects to one 7 years crediting period. This may also build on the observation that when discounting future streams of CER revenue beyond 7 (or 10) years at typical hurdle rates longer crediting periods do not really matter for the NPV calculation. Longer crediting periods would only be allowed for project types that require a continuous stream of CER revenues to continue operation such as landfill gas utilization/flaring etc.

3.6. Additionality of PoAs

The advent of CDM Programmes of Activities (PoA) in 2007, and the subsequent refinement of related additionality approaches, changed the nature of additionality testing for many project types. Additionality assessment for PoAs is simplified compared to the requirements for the registration of individual projects. Project developers can establish eligibility criteria to assess additionality, including eligibility criteria, which identify project types that may be automatically additional. More importantly, because the thresholds for identifying small-scale and microscale activities with simplified additionality procedures are set at the level of the Component Project Activity (CPA) and not the level of the PoA, the overall PoA could be far larger than these thresholds. For example, the registered PoA “Installation of Solar Home Systems in Bangladesh” (Ref. 2765) has so far installed 123 MW of solar power and has estimated emissions reductions of 569,000 tCO₂ per year, or almost ten times the small-scale CDM threshold.

In the period of 2013 to 2020, PoAs potentially could supply 0.16 billion CERs. However, as discussed in Section 2.3, the eventual volume for these PoAs could be many times this amount.

3.6.1. Assessment

There are three principle issues with the demonstration of additionality in PoAs: specific additionality concerns about the technology areas covered by PoAs, the robustness of eligibility criteria to check additionality, and the use of small and microscale thresholds for PoAs that are much larger

in total than these thresholds. The first point is largely addressed in Chapter 4, because it is related to the mitigation technologies used in PoAs. As shown in Table 2-2, the majority of PoAs are in technology areas that are analyzed in this report (e.g. efficient cook stoves, efficient lighting, wind, hydropower, biomass), so these chapters should be consulted for an assessment of those technologies.

The second point concerns eligibility criteria, namely that the PoA rules require that the project participants develop a set of eligibility criteria that should guide the inclusion of CPAs. The criteria should be constructed so that, for each new CPA, simply confirming that the CPA meets the criteria is enough to ensure that the CPA is additional. These criteria should be based on approaches used in the relevant methodology or other additionality approach that is relevant for the PoA. In other words, there is not a detailed additionality assessment for each CPA in the way that project activities submitted for registration are evaluated. Instead, the eligibility criteria in the registered PoA design document (PoA-DD) should ensure that the CPA meets the relevant additionality test. For example, if part of demonstrating additionality in the relevant methodology is proving that the project is a particular scale or uses a particular technology, then the scale and technology specification would be listed as eligibility criteria against which each new CPA was checked. A possible concern could be that, if the project participants proposed eligibility criteria in the PoA-DD that did not fully capture the additionality requirements of the underlying methodology, there would be a risk that future CPAs could be included even if they were not additional. Although there was some confusion during the early days of PoAs on how to formulate eligibility criteria, this has not been the case since late 2011 when the EB published a standard for eligibility criteria. This was later replaced by the standard for “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” (CDM-EB65-A03-STAN, version 3.0). This standard provides not only the full list of issues that must be covered in the eligibility criteria, but also clear rules on how additionality may be assessed for PoAs.

The third point is perhaps the most important – whether allowing PoAs that are, in total, much larger than the size thresholds for small and microscale projects could increase the risks of non-additionality among PoAs. The small-scale CDM thresholds are 15 MW for renewable energy, 60 GWh savings for energy efficiency, and 60,000 tCO₂ per year emissions reductions for other project types with approved small-scale methodologies. The scale limits for the microscale additionality rules are 5 MW for renewable energy, 20 GWh savings for energy efficiency projects, and 20,000 tCO₂ for other project types, and are then combined with other criteria (described in detail in Chapter 4, e.g. country type, size of individual units, or even designation by a national authority), to qualify as automatically additional. However, the EB decided at their 86th meeting that microscale technologies using unit size as the basis of automatic additionality (i.e. independent units of < 1500 kW for renewables, < 600 MWh for energy efficiency and < 600 tCO₂ for other projects, all serving households and communities) would have no limit of the total scale of the project or CPA. In other words, an efficient cook stove project activity or CPA could have total emission reductions of greater than 20, or even 60, ktCO₂ per year.

Projects (in this case, CPAs) that qualify as small-scale CDM (SSC) then have access to the technology-based ‘positive list’ in the tool for “Demonstration of additionality of small-scale project activities” (Tool21, version 10.0). CPAs below the micro-scale thresholds would all be automatically additional as long as they meet both the scale and other requirements (e.g. technology, location, etc.). For small-scale CDM, the list of technologies considered automatically additional includes the following:

- Certain technologies whether grid-connected or off-grid: solar (PV and thermal), off-shore wind, marine (wave and tidal), and building-integrated wind turbines or household rooftop wind turbines up to 100 kW;

- Additional off-grid technologies below the SSC thresholds: micro/pico-hydro (with power plant size up to 100 kW), micro/pico-wind turbine (up to 100 kW), PV-wind hybrid (up to 100 kW), geothermal (up to 200 kW), biomass gasification/biogas (up to 100 kW);
- Technologies with isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;
- Rural electrification projects using renewable energy in countries with rural electrification rates less than 20%.

Both microscale additionality and the small-scale CDM positive list approaches have been used extensively by PoAs. As shown in Table 3-2, 33% of the CPAs in registered PoAs, representing 27% of expected CERs, have applied the microscale or small-scale positive list approaches ('first of its kind' is discussed in Chapter 4). An analysis by the UNFCCC Secretariat³⁴ also shows that 142 of the 282 registered PoAs use microscale or small-scale rules for automatic additionality, with 65% of PoAs targeting households utilising one of these tools (Table 3-3). Many of these PoAs have already exceeded the microscale and small-scale thresholds at an aggregate level, as allowed in the CDM PoA rules. In contrast, the 120 CDM project activities that have used small-scale positive lists or microscale guidelines comprise only 0.8% of projects and 0.1% of expected emissions reductions (UNEP DTU 2015a).

Table 3-2: Use of automatic additionality approaches in CPAs within registered PoAs

Approach for automatic additionality	Annual CERs (ktCO ₂ /yr)	CPAs	CERs	CPAs
Microscale tool: country, unit size or DNA selection	3,520	188	11%	23%
Microscale tool: SUZ	60	9	0%	0%
SSC positive list	5,078	91	16%	10%
None	21,279	551	70%	65%
Total	29,936	839	100%	100%

Notes: A more recent version of the PoA pipeline was used here because of a revision of how the use of automatic additionality is classified.

Sources: UNEP DTU 2015b

³⁴ "Concept note: Thresholds for microscale activities under programmes of activities" (CDM-EB85-AA-A09)

Table 3-3: Technology and end-user types in registered PoAs that applied microscale and/or small-scale positive list criteria

Technology type	PoAs	Share of this type of PoA
End use type: Households	92	65%
Household biogas digesters	13	
Energy efficiency - household	2	
Energy-efficient lighting (LED and CFL)	28	
Improved cookstoves	36	
Solar water heaters	7	
Water purifiers	5	
Renewable-based rural electrification	1	
End use type: Others	50	35%
Energy efficiency – industrial	2	
Fuel switch	3	
Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)	35	
Waste treatment (e.g. Wastewater, animal waste)	10	
Total	142	100%

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

Whether granting automatic additionality to PoAs that are over the small and microscale thresholds poses a risk for additionality testing depends on the *reason* for the positive list designations. One of the main issues raised by the positive list is the *unit size* of the technology, with the argument being that the unit size on its own may be sufficient to identify a project type with a high likelihood of additionality (in combination with the other microscale criteria, where relevant). On this basis, the EB recently agreed that the size criterion for the microscale additionality tool should be *only* unit size, and not total project size.³⁵ This means that even a PoA using a large-scale methodology and have a total size beyond the SSC thresholds can still apply microscale additionality guidelines, as long as the unit size and other criteria are met.

The SCC positive list sets unit size limits for most categories of eligibility, although not for rural electrification or the grid-connected technologies (other than the 15 MW limit). The microscale guidelines also include the option of using a unit size less than 1% of the SSC threshold as a justification for applying these guidelines even if the projects are not located in Least Developed Countries (LDCs) or Special Underdeveloped Zone (SUZs).

The most important categories of PoAs (in terms of their contribution to expected CERs) utilising these tools are improved cook stoves, energy efficient lighting, biogas and small unit size solar power³⁶. For the first three technologies, the unit size is inherently small, so the size of the total project or PoA should not, by itself, determine the viability of the technology (bearing in mind, however, that overhead programme costs are obviously lower per unit for larger programmes). The additionality issues with improved cook stoves and energy efficient lighting are reviewed in Sections 4.12 and 4.13, respectively. These sections raise important questions about the additionality

³⁵ The changes to the Tools for “Demonstration of additionality of small-scale activities” (version 22) and “Demonstration of additionality of microscale project activities” (version 07) were approved at EB86 (October 2015), as were changes in the Project Standard, Project Cycle Procedure, and standard on standard on “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities.”

³⁶ Although the table from the UNFCCC Secretariat refers to “Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)”, our analysis has not identified any wind or geothermal PoAs using the small-scale positive list or the microscale guidelines.

of these project types, despite their small unit size, particularly because of the role of other support programmes in promoting these technologies and possible over-crediting for cook stoves, for example. On the other hand, the extensive literature on household energy access technologies and carbon markets also points to numerous well documented barriers, and the high unit transaction costs associated with small unit size technologies (e.g. Gatti & Bryan 2013; IFC 2012; Warnecke et al. 2015, 2013). In addition, the analysis from the UNFCCC Secretariat mentioned earlier also shows that the average unit size of PoAs using the small-scale and microscale positive lists is, in fact, far below even the microscale unit size of 1% of the SSC threshold (Table 3-4).

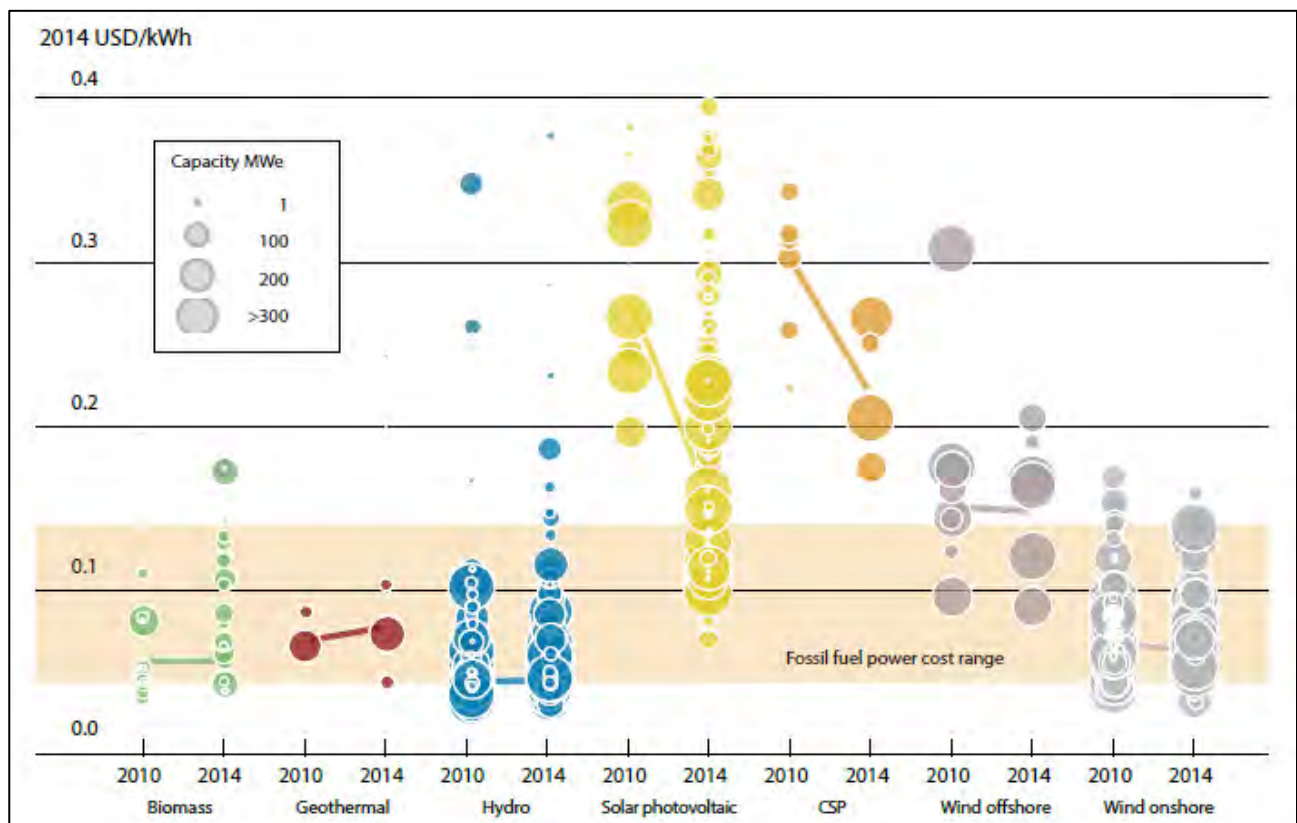
Table 3-4: Size of individual units in microscale and small-scale PoAs using positive lists

Unit size as % of SSC threshold	Type I (kW)	Type II (MWh)	Type III (tCO ₂)
1%	150	600	600
PoAs applying microscale criteria			
Average – 0.022%	3.3	13.3	13.2
Std deviation – 0.054%	8.1	32.4	32.4
PoAs applying small-scale criteria			
Average – 0.23%	34	136	137
Std deviation – 0.34%	51	204	204

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

For renewable power technologies, even if the total capacity of a PoA was over 15 MW, the unit size could not be larger than 5 MW for most technologies (15 MW for solar PV or solar thermal) to qualify for automatic additionality. Given the economies of scale in renewable energy power generation (Pryma 2012), small unit sizes would be expected to have higher capital costs, and would therefore be more likely to face investment barriers than larger scale plants. Project-level analysis by the International Renewable Energy Agency (IRENA) also suggests that smaller renewable energy plants not only have higher costs (i.e. because the smaller dots, representing smaller scale projects, are generally higher up in the figure), but that for solar PV and solar thermal these costs are still considerably higher than for fossil fuels (Figure 3-9). Analysis by EPRI has also shown that solar power at the several MW scale is considerably more expensive than conventional alternatives (EPRI 2012). This suggests that a solar PV (grid connected or off-grid) programme of any total size would not be economically viable if the units were below the small-scale thresholds. However, the challenge with solar technologies is that they are so expensive that carbon revenue is unlikely to close the financial viability gap, so they may be more driven by national policies than carbon markets (Section 3.7).

Figure 3-9: Levelized cost of electricity from renewable technologies, 2010 and 2014



Notes: Size of the diameter of the circle represents the size of the project. The centre of each circle is the value for the cost of each project on the Y axis. The LCOE of a given technology is the ratio of lifetime costs to lifetime electricity generation, both of which are discounted back to a common year using a discount rate that reflects the average cost of capital.

Sources: IRENA (2015)

On the basis of the unit size analysis shown in Table 3-4, the Secretariat prepared a concept note with recommendations to the EB using on unit size, and not total project or CPA size, as the basis for determining microscale additionality (CDM-EB85-AA-A09). The EB agreed to begin to implement an approach of using only a unit size threshold to determine if the size of the project qualifies for microscale (EB85 report, paragraph 42). The other requirements for microscale (e.g. location in an LDC or SUZ, if the unit size is greater than 1% of the SSC threshold) would remain unchanged. This means that the CPAs comprised of technologies that were below the unit size threshold would not be limited in their total size. For example, a CFL PoA in an LDC could have a CPA with 100,000 MWh savings and still apply the microscale additionality guidelines.

3.6.2. Summary of findings

While the PoA rules do allow programmes with a total size greater than the small-scale and microscale thresholds to utilise the automatic additionality provisions for these scales of projects, there is no evidence that this increases the risk of non-additional projects on its own (i.e. the share of projects that could be non-additional). In other words, the PoA rules do not fundamentally change the additionality risks for a given category of project technologies. The PoA process could, of course, increase the overall *scale* of the risk because they were designed to facilitate the large scale dissemination of small, distributed technologies. For example, there are 40 registered 'improved stove' project activities with expected CERs of 1 million tCO₂ per year, but there are 46 registered 'improved stove' PoAs that already have expected CERs of 8.1 million tCO₂ per year.

3.6.3. Recommendations for reform of CDM rules

Reform of the CDM rules related to additionality for particular project types and positive lists will address any concerns about additionality of PoAs.

3.7. Positive lists

The concept of 'positive lists' means that specific project types are considered automatically additional. Positive lists are one option to reduce transaction costs and increase the certainty of the CDM system from the perspective of project developers. Similar to standardized baselines, creating a positive list requires an upfront evaluation of technologies and their economic and regulatory environment, independent of the assessment of a particular CDM project proposal, to establish certain objective criteria that, if met, will result in a high likelihood of additionality. Once a positive list is established, a specific CDM project only needs to show that the pre-defined criteria are met, and does not have to apply other tools to justify additionality.

3.7.1. Positive lists in the CDM and impact on CER supply

Positive lists were introduced in the CDM through various routes. As briefly mentioned in Section 3.6, the CDM EB adopted the "Guidelines for demonstrating additionality of micro-scale project activities" in 2010, which were subsequently converted to a methodological tool, which first established automatic additionality for certain project types regardless of the type of methodology used (i.e. small-scale or large scale). Table 3-5 shows the technologies covered under version 7 of that tool, and the criteria they must meet in order to be deemed automatically additional. In addition to total project size (or, in the case of PoAs, the size of an individual CPA), the technologies must meet a further criterion such as location, unit size and/or consumer group.

Table 3-5: Projects considered automatically additional under the tool “Demonstration of additionality of microscale project activities”

<p>1 Based on country (LDCs, SIDSs)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>2 Based on unit size and consumer (households, communities, SMEs) (i.e. any country)</p> <ul style="list-style-type: none"> • Renewable energy of any size as long as unit size is less than 1500 kW • Energy efficiency of any size as long as unit savings are less than 600 MWh per year • Other small-scale CDM projects (Type III) of any size as long as unit savings are less than 600 tCO₂ per year
<p>3 Based on host country designation of special underdeveloped zone (SUZ)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>4 Based on designation of a technology by the host country</p> <ul style="list-style-type: none"> • Grid connected renewable energy specified by DNA, up to 5 MW, which comprises less than 3% of total grid connected capacity
<p>5 Based on other technical criteria</p> <ul style="list-style-type: none"> • Off-grid renewable energy up to 5 MW supplying households/communities (less than 12 hours grid availability per 24 hours is also considered ‘off-grid’)

Notes: LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SME = Small and micro enterprises, DNA = Designated National Authority.

Sources: Tool for “Demonstration of additionality for microscale activities”

In 2011, the “Guidelines on the demonstration of additionality of small scale project activities”, which later were similarly converted to a methodological tool, also included for the first time a list of technologies that would be considered automatically additional for any project meeting the small-scale CDM thresholds. This initially only included a list of grid and off-grid renewable energy technologies (i.e. the first two blocks in Table 3-6), but was expanded in 2012 to include small isolated units serving communities and renewable energy-based rural electrification.

Table 3-6: Technologies considered automatically additional under the tool “Demonstration of additionality of small-scale project activities”

6	Renewable energy (up to 15 MW, grid or off-grid, all end users) <ul style="list-style-type: none"> • Solar PV and solar-thermal electricity generation • Offshore wind • Marine technologies (e.g. wave and tidal) • Building integrated wind turbines or household roof top wind turbines (unit size =< 100 kW)
7	Renewable energy (up to 15 MW, off-grid only) <ul style="list-style-type: none"> • Micro/pico-hydro (unit size =< 100 kW) • Micro/pico-wind turbine (unit size =< 100 kW) • PV-wind hybrid (unit size =< 100 kW) • Geothermal (unit size =< 200 kW) • Biomass gasification/biogas (unit size =<100 kW)
8	Distributed technologies for households/communities/SMEs (off-grid only) <ul style="list-style-type: none"> • Aggregate size up to SSC threshold (15 MW, 60 GWh or 60 ktCO₂ emission reductions) with unit size =< 5 per cent of SSC thresholds (i.e. =< 750 kW, =< 3 GWh/y or 3 ktCO₂e/y)
9	Rural electrification using renewable energy <ul style="list-style-type: none"> • In countries with rural electrification rates less than 20%

Notes: Numbers in left hand column continue from previous table.

Sources: Tool for “Demonstration of additionality of small-scale activities” (version 10.0)

In addition to these tools, which apply across many methodologies, some individual methodologies have provided for automatic additionality for certain project types, often related to regulations. The most widely used is ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0), which was revised in November 2014 to include a two-part positive list for grid connected technologies. The first part is a list of technologies that are considered automatically additional: solar PV, solar thermal, offshore wind, marine wave and marine tidal (i.e. the technologies included in the first part of the small-scale CDM additionality tool, except at larger scale). The second part says that any technology with less than 2% of the total grid-connected capacity or less than 50 MW total capacity in the country is considered automatically additional. Since the revision of ACM0002, ten new project activities have requested and completed registration (no new PoAs have been registered). Of these, only one project has applied the new positive list provisions – a 141 MW solar PV facility in Chile. This is the largest solar facility to be granted automatic additionality.

Another important methodology with automatic additionality provisions includes ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” (version 15.0), which was revised in late 2013 to consider the following technologies automatically additional if, prior to the project activity, landfill gas was only vented and/or flared:

- electricity generation in one or several power plants with a total nameplate capacity that equals or is below 10 MW;
- heat generation for internal or external consumption;
- flaring (assuming no flaring prior to the project).

AM0113 “Distribution of compact fluorescent lamps (CFL) and light-emitting diode (LED) lamps to households” (version 01.0) provides for automatic additionality for any project distributing self-ballasted LED lamps to households. Projects distributing CFLs are only considered automatically additional if they are in a country with “no or only limited lighting efficiency regulations” reported by the UNEP en.lighten initiative’s Efficient Lighting Policy Status Map. AM0086 “Distribution of zero energy water purification systems for safe drinking water” (version 04.0) considers projects automatically additional if less than 60 percent of the population has access to improved drinking water sources or if the project proponents can demonstrate that more than half of the improved drinking water delivered does not actually meet the appropriate health standards. AMS-III.D “Methane recovery in animal manure management systems” (version 19.0) considers projects automatically additional when there is no regulation that requires the collection and destruction of methane from livestock manure. In addition to these, AM0001 “Decomposition of fluorocarbon (HFC-23) waste streams” (version 6.0), the first approved large-scale methodology, essentially uses a positive list approach based on regulation, because any project that does not face a regulatory requirement to abate HFC-23 emissions is considered additional. The same is true for ACM0019 “N₂O abatement from nitric acid production” (version 02.0).

While the positive lists presented above have not been used widely by CDM project activities (e.g. only 121 registered projects), PoAs have utilised the lists in the small-scale and microscale additionality tools (Table 3-2), with a third of CPAs in registered PoAs using these additionality approaches. Whether this growing group of PoAs presents concerns for the additionality depends on the strength of the justification for the original positive lists and for how long this justification is likely to be valid (i.e. how often the lists should be updated).

The criteria used to select the positive lists as well as the validity of these lists are presented in an information note prepared by the Small-scale Working Group in November 2014 called “Criteria for graduation and expansion of positive list of technologies under the small-scale CDM” (CDM-SSCWG46-A23). Table 3-7 summarises all of the positive list approaches, and shows the range of criteria used. The individual methodologies often refer to regulations to determine automatic additionality, or current penetration rates. The small-scale and microscale additionality tools use a mix of end-users, location, cost of service and penetration rates, depending on the specific technology group. This also highlights the similarity between positive lists discussed here and standardized baselines (Section 3.8), which also define a list of automatically additional technologies based on penetration rates and comparative costs.

Table 3-7: Criteria used for determining positive lists

		End-user	Regulation	Location	LCOS	Penetration	Capital cost
1	Microscale based on country (LDCs, SIDSs) Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other up to 20 ktCO ₂			x			
2	Microscale based on unit size and consumer (households, communities, SMEs) (i.e. any country) Renewable energy < 5 MW and unit size <1500 kW; Energy efficiency < 20 GWh and unit savings < 600 MWh; Other < 20 ktCO ₂ with unit savings < 600 tCO ₂	x					x
3	Microscale based on host country designation of special underdeveloped zone (SUZ) Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other < 20 ktCO ₂			x			
4	Microscale based on designation of a technology by the host country Grid connected renewable energy specified by DNA, up to 5 MW, < 3% of capacity					x	
5	Microscale based on other technical criteria Off-grid renewables < 5 MW supplying households	x					
6	Small-scale renewable energy (up to 15 MW, grid or off-grid, all end users) Solar PV and solar-thermal electricity generation; off-shore wind; marine (e.g. wave and tidal); building integrated wind turbines or household p wind =< 100 kW				x		
7	Small-scale renewable energy (up to 15 MW, off grid only) Micro/pico-hydro (unit <= 100 kW); micro/pico-wind (unit <= 100 kW); PV-wind hybrid (unit <= 100 kW); geothermal (unit <= 200 kW); biomass gasification/biogas (unit <= 100 kW)						x
8	Small-scale off-grid distributed technologies for communities Unit size =< 5 per cent of SSC thresholds	x					
9	Rural electrification using renewable energy In countries with rural electrification rates less than 20%						
10	AM0086 water purification <60% access to improved drinking water and <50% use of point-of-use zero energy water purification					x	
11	AM0113 energy efficient lighting CFLs in countries with no or limited regulatory support All self-ballasted LED lamps		x			x	
12	ACM1 landfill gas utilisation LFG for electricity or heat where vented or flared, or flaring where previously vented					x	x
13	AMS III.D methane and manure management Biogas for power < 5 MW where no regulation requires collections and destruction of methane		x				
14	AMS III.C electric and hybrid vehicles Market share of electric/hybrid vehicles < 5%					x	

Notes: LCOS = Levelized cost of service, LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SMEs = Small and micro enterprises, DNA = Designated National Authority.

Sources: UNFCCC documents as cited in text

In terms of the duration of validity of the positive lists, the small-scale and microscale additionality tools did not originally include a time limit, although many of the methodologies specify a three-year duration of validity. The EB (EB81, paragraph 72) accepted a Small-Scale Working Group recommendation in late 2014 to set a three-year limit on validity for the small-scale CDM positive lists. In addition, the EB agreed on thresholds for 'levelized cost of service', 'penetration rate', and 'capital cost', as shown in Table 3-8. Note that these new rules only apply to the positive lists under the tool for "Demonstration of additionality of small-scale project activities", and not to microscale activities or any other positive lists.

Table 3-8: Graduation criteria for technologies under the tool for "Demonstration of additionality of small-scale project activities"

	End-user	LCOS	Penetration	Capital cost
Grid connected renewable electricity generation				
All renewable energy technologies in the current positive list		>= 50% higher than all fossil fuels	Global average penetration <3%	
Off-grid renewable electricity generation				
All off-grid renewable technologies in the current positive list				>= 3 times the cost of all fossil fuels
Distributed technologies for households/communities/SMEs				
All distributed technologies eligible under Type I/II/III and providing services of households/communities/SMEs	Assess appropriateness of user groups		Global average penetration rate < 3%	>= 3 times cost of all plausible baseline technologies

Sources: Information note "Criteria for graduation and expansion of positive list of technologies under the small-scale CDM" (CDM-SSCWG46-A23)

3.7.2. Assessment of current positive lists

The positive lists developed under the CDM to date are based on specific criteria such as penetration rate, costs, regulatory environment, and location. While these lists have not been used widely for automatic additionality among CDM project activities, their use among PoAs is widespread and growing. Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. **This review of validity should also be extended to other project types, in particular those covered by the microscale additionality tool or approaches used in relevant methodologies (e.g. ACM0002).**

An important challenge with the current positive lists, however, is that the basis upon which they are established varies widely, without a clear rationale for the choice or level of the indicator (e.g. why penetration might be used for some technologies but levelized cost of service for others). **A consistent approach to determining technology eligibility is needed** to ensure that existing and new positive lists do not pose risks of non-additionality. The criteria and indicators used should have clear justification for how they influence project implementation. For example, while low market penetration or high capital costs could be strong indicators of prohibitive barriers for some technologies, it is not clear how the concept of 'special underdeveloped zones' (SUZ), which may

be defined differently by each DNA according to UNFCCC guidelines, is a reliable indicator of barriers.

As part of the justification of project types and technology choices, **positive lists must address the impact of national policies and measures to support low emissions technologies** (so-called, E- policies). As discussed in Section 3.9 and many of the sections within Chapter 4, national policies may be the primary driving factor for the implementation of certain technologies, rather than their underlying economics, market position or location. In fact, one of the criticisms of allowing renewable technologies to be considered automatically additional is that their costs are so high that carbon revenue alone cannot possibly make them financially viable, and so other incentives and policies are the real determining factor (Lazarus et al. 2012; Spalding-Fecher et al. 2012). This is even truer with smaller scale technologies. For example, in a study in Southern Africa, the levelized cost of roof-top solar PV was 20% more expensive than utility scale solar PV, while small hydropower was 70% more expensive than large scale (Miketa & Merven 2013). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. An example of this would be the REN21 renewable energy global overview and interactive map,³⁷ which provides a comprehensive technology-specific database of the policies in place to support renewables. A positive list that included renewables could therefore be qualified by restricting its applicability to countries that did not have any support policies in place for that technology. Having support policies in place does *not*, on its own, mean that those technologies would not be additional, but only that there is a greater risk of this and so applying a positive list approach in that country would not be appropriate. Projects in those countries could still use the other tools available for demonstrating additionality for small- and large-scale projects – they would only not have access to automatic additionality based on the positive list. As an example, the positive list in the tool for “Demonstration of additionality of small-scale project activities” includes all solar PV and solar thermal technologies in all CDM-eligible countries. According to the REN21 policy database, however, the following countries have support policies³⁸ in place for solar PV: Algeria, Argentina, Brazil, Cape Verde, China, Côte d'Ivoire, Ecuador, Egypt, Gambia, Ghana, India, Jordan, Lebanon, Malaysia, Mauritius, Nepal, Nigeria, Republic of Korea, Senegal, Thailand, Uruguay, Uzbekistan, and Venezuela. For these countries, therefore, it might be more appropriate to require an analysis of barriers to solar PV rather than considering them automatically additional. This approach could be refined based on additional research into publicly available and up-to-date databases of renewable energy policies.

Finally, to maintain environmental integrity of the CDM overall, **positive lists should be accompanied by negative lists**. This is because the introduction of a positive list without any negative list could, by definition, only lower environmental integrity compared to the traditional approaches. Projects that do not fall within the positive list can still apply the traditional approaches. So, the positive list will lead to more ‘false negatives’ passing the test, but will not rule out any projects that are not additional. Overall, environmental integrity is thus lowered (albeit with the positive element of reducing transaction costs). An exception to this could be the few methodologies that deem projects as ineligible if they reach a market penetration threshold above a certain level, because they, in essence, include both a positive and negative list.

³⁷ The interactive map is shown at: <http://www.ren21.net/status-of-renewables/ren21-interactive-map/>. The full database of policies is available at <http://www.ren21.net/wp-content/uploads/2015/09/Downloadable-Consolidatedv1.2.1.xlsx>.

³⁸ Support policies may include, for example, feed-in tariffs, electric utility quota obligation, capital subsidies, tax credits, and net metering, but exclude renewable energy targets not accompanied by other incentives.

3.8. Standardized baselines

Project developers have repeatedly complained about the expensive and time-consuming process for formally registering a project under the CDM. The setting of the baseline for the greenhouse gas emission reductions associated with a project has required project developers to apply project specific methodologies in order to calculate baseline emission levels. The project developers take on significant costs before the approval of their project when collecting the data necessary to set the baseline and demonstrate additionality. In some cases the risks associated with these upfront costs may be too high for developers of smaller projects in poorer countries (Spalding-Fecher & Michaelowa 2013) – impacting the regional distribution of projects under the CDM. Apart from high transaction costs, the project-specific determination of baselines and assessment of additionality has been criticised in the past for being subjective (Schneider 2009). Due to the information asymmetry between project developers and DOEs subjective assumptions may be difficult to verify, which could result in non-additional projects or over-crediting, which both undermine the environmental integrity of the CDM.

The Cancun Agreements in 2010 provided for the use of *standardized baselines* in the CDM to address these limitations with the aim “to reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism, particularly with regard to under-represented project types and regions, and scale up the abatement of greenhouse gas emissions, while ensuring environmental integrity” (UNFCCC 2011c). In contrast to the project-by-project approach to setting baselines and demonstrating additionality, standardized baselines are established for a project type or sector in one or several CDM host countries. Standardized baselines can address any or all of three areas for standardization: demonstrating additionality, determining the baseline scenario or determining baseline emissions. In the latter case, standardization can include emission factors or individual parameters needed to calculate emission reductions.

Standardized baselines require host country approval and are submitted through the DNA of the host Party. They can cover one or several Parties. Once approved, project developers can use a standardized baseline when submitting a project for registration. In 2014, the EB further decided that it is up to the host Parties to decide whether projects must use an approved standardized baseline or whether they may alternatively use a project-specific approach, but noted that the EB could reject standardized baselines if this poses a risk to environmental integrity (CDM-EB78, para 24). In practice, all approved standardized baselines have so far been voluntary, except for a multi-country grid emission factor in the Southern African region.

The CDM allows standardized baselines to be derived either from suitable methodologies, from tools such as the ‘*Tool to calculate the emission factor for an electricity system*’³⁹ or from a generic framework that is applicable to all project types and sectors such as the ‘*Guidelines for the establishment of sector specific standardized baselines*’⁴⁰ adopted by the EB in 2011. Further regulatory documents include a procedure for submission of standardized baselines, a standard on the coverage and vintage of data, and guidelines for quality assurance and quality control.

The ‘*Guidelines for the establishment of sector specific standardized baselines*’ combine elements of market penetration, performance benchmarks, investment and barrier analysis. Under this framework, the standardized baseline results in a positive list of fuels, feedstocks and/or technologies for a given sector. The least emission-intensive fuel/feedstock/technology needed to produce

³⁹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.pdf>.

⁴⁰ https://cdm.unfccc.int/filestorage/4/II/Y/4IY1RB7DMKLPWPGF59XC3UE6JNH8Q2A/eb62_repan08.pdf?t=N2d8bnRoeHN3fDDSYyp3xU9Kx6IMk5Ho1yFw.

a certain percentage of the sector's output (i.e. defined by the CDM EB)⁴¹ is selected as the baseline fuel/feedstock/technology. All fuels/feedstocks/technologies that are associated with lower emission intensities than the baseline technology are candidates for inclusion in a positive list of fuels/feedstocks/technologies that are automatically deemed additional. The DNA of the host country also needs to demonstrate for each of the candidates for the positive list that they are either less economically attractive than the non-candidates or face barriers to entry (Schneider et al. 2012). The baseline technology is also used to determine the baseline against which emission reductions are calculated (Hermwille et al. 2013).

Table 3-9: Approaches for deriving grid emission factors

DNAs could use either the standardized baseline guidelines or the grid emission factor tool to determine the grid emission factor and submit the value as a standardized baseline. The weaknesses of this opportunity to choose between two alternative approaches are explained below:

- 1) **Pick and choose issue:** The two approaches will provide two different values for the grid emission factor. Thus, the DNA could pick and choose between two completely different methodological approaches for determining the grid emission factor. Countries for which the guidelines result in higher values will use that approach, whereas countries for which the tool results in higher values will use that approach. Overall, having two parallel approaches could undermine the environmental integrity compared to the current situation in which only one approach is available.
- 2) **Vintage of data issue:** The standardized baseline guidelines consider all plants, whether they were recently constructed or decades ago. This could result in a situation in which coal power is determined as the baseline fuel, even if no coal power plant has been constructed or been under construction for a decade. In contrast, the grid emission factor tool aims to consider recent developments by observing which plant types were recently added to the system or are under construction or which plants actually operate at the margin.
- 3) **'One size fits all' issue:** The grid emission factor tool uses a methodologically approach that considers the particularities of the electricity system, considering different possible effects of displacing grid electricity (marginal plants not being dispatched/the construction of other power plants avoided or delayed). In contrast, the guidelines do not consider the characteristics of the sector and make generalised assumptions, which have little meaning in the power sector. The guidelines therefore result in less accurate grid emission factors than the grid emission factor tool.

Sources: Own compilation

The environmental impact of standardized baselines will be affected by how stringently the standardized baseline is set for a given project type. The stringency of standardized baselines needs to safeguard the environmental integrity of the CDM whilst also striking the right balance between accuracy and transactions costs in order to ensure that there is an incentive for developing new CDM projects.

The implications of standardized baselines on environmental integrity will also vary depending upon the sector that they are applied to, as the approach relies considerably upon the assumption that the penetration of a fuel/feedstock/technology is negatively correlated with its cost and/or with barriers that impede their deployment (Hermwille et al. 2013). For certain sectors there will undoubtedly be a strong correlation, i.e. energy efficient lighting and efficient electrical appliances.

⁴¹ In its guidance, the EB has defined a preliminary additionality/crediting threshold of 80 % in priority sectors and 90% in other sectors.

However for other sectors, i.e. with multiple products or with strongly varying circumstances among installations, the correlation will be weaker or absent and alternative approaches for setting baselines and demonstrating additionality may be more suitable (Hermwille et al. 2013). Applying the current framework to sectors for which such a correlation is lacking could broaden the positive lists for technologies that are unlikely to be additional. In the power sector, for example, the guidelines do not reflect the particular features of an electricity system. The Methodologies Panel recommended that the EB limits the applicability of the SB standard to sectors other than the power sector (MP65, paragraph 38 and 39). In response, the EB requested the Methodologies Panel to assess the applicability of the proposed framework to different project types (EB81, paragraph 41). However, as of January 2016, the current guidelines are still applicable to all sectors. In 2015, a standardized baseline was finalized for consideration by the EB, which includes grid emission factors for different islands of Cape Verde and applies for some islands the “*Guidelines for the establishment of sector specific standardized baseline*” and for others the grid emission factor tool. The issues arising from the application of the guidelines to the power sector are highlighted in Table 3-9.

The following issues may pose further environmental risks through the implementation of standardized baselines in the future:

- **Mandatory versus voluntary use of standardized baselines:** The current CDM EB framework does not make the use of standardized baselines mandatory (CDM-EB74, para 24). It is the discretion of the DNA to decide whether project participants can select between project-specific or standardized baselines. In this regard, the DNA can make their use voluntary or mandatory. This may have two consequences:
 - Standardized baselines open an alternative route towards positive lists (Section 3.7), while keeping the approach of demonstrating additionality through the current means. By definition, this can only increase the number of false positives. Hence, the likelihood for additionality is lower, compared to a situation in which there would be no standardized baselines.
 - The voluntary use of standardized baselines could lead to project developers picking and choosing between baseline emission factors which could result in over-crediting (Table 3-9, bullet point 1). Indeed, Spalding-Fecher & Michaelowa (2013) argue that the CMP should make standardized baselines mandatory.

The degree of these risks depends on how conservative the standardized baselines are set. The more conservatively that they are set, the lower the risk is. An example of how picking and choosing between project-specific and standardized baselines can undermine environmental integrity is the approved standardized baseline ASB0018 for cook stove projects in Burundi. The approved standardized baseline provides default values for the amount of non-renewable biomass consumed in the baseline (1.5 tonnes per person and year for households in urban areas and 1.1 tonnes per person and year for households in rural areas). However, at the same time, a PoA (9634) is registered in Burundi with project-specific baseline values based on data from a more recent survey. The project-specific baseline is more ambitious (1.21 tonnes per person and year for households in urban areas and 0.83 tonnes per person and year for households in rural areas). Had the standardized baseline been approved prior to the registration of the project, the project could have opted for the less ambitious standardized baseline. At the same time, projects with higher project-specific baseline values could opt for their project-specific baseline and not use the standardized baseline.

- **Quality assurance and quality control (QA/QC) of standardized baselines:** Version 04.0 of the procedure ‘*Development, revision, clarification and update of standardized baselines*’

(CDM-EB84-A10) sets out how a project developer can submit a proposal for a standardized baseline to the CDM EB following first the approval of the relevant DNA. It is necessary for the project developer to provide a list of documents when submitting a standardized baseline proposal, which includes the Form F-CDM-PSB, supporting documents and an Assessment Report of QA/QC. The CDM EB clarified only in 2015 that DOEs not only need to verify whether the required documents were submitted and that the data were collected according to guidelines for quality assurance and quality control but that they also need to check that the standardized baseline has been calculated in accordance with the relevant standards (CDM-EB85-A10). However, this decision still needs to be adequately reflected in the latest version of the ‘*CDM validation and verification standard*’ (CDM-EB82-A14). Moreover, stakeholders expressed concerns that if the requirements for QA/QC are too stringent, it may prevent the approval of standardized baselines from LDCs (Hermwille et al. 2013). Therefore, the QA/QC Assessment Report is currently not compulsory for countries with 10 or fewer registered CDM projects as of 31 December 2010 for the first 3 submissions (CDM-EB84-A10, Para. 18), even though countries can request financial support from the UNFCCC for the development of Assessment Reports. These exemptions from applying the QA/QC guidelines could undermine the environmental integrity of the CDM.

- **Development of country-specific thresholds:** CMP9 requested the EB “*to prioritise the development of top-down thresholds for baseline and additionality for the underrepresented countries in CDM*” (CDM-EB82-AA-A10, Para. 3). Many stakeholders regard the currently approved default thresholds for additionality and baseline as ‘*unattractive*’ and ‘*not suitable*’ for specific national/regional/sectoral circumstances (CDM-EB82-AA-A10). However, the adoption of country-specific thresholds could be a difficult process as such thresholds are a policy choice rather than a methodological choice. It is uncertain whether or not the development of country-specific thresholds would undermine the environmental integrity of the CDM. However, it would likely result in the incomparability of emission reductions from different standardized baselines within the same project type or technology.
- **Exclusion or inclusion of CDM facilities in the peer group to determine standardized baselines:** The development of certain standardized baselines relies upon the performance and actual output from the facilities of a sector of the host country. Some of these facilities may already have registered CDM projects (i.e. referred to as CDM facilities) that would have improved performance due to the incentives provided by the CDM. Given that it is difficult to determine the performance and outputs of these facilities in the absence of the CDM, it is necessary to take a decision on whether to include CDM facilities in the calculation of a standardized baseline or not. Exclusion of CDM facilities could undermine the environmental integrity of the CDM (CDM-EB78-AA-A05). As a default all CDM projects need to be included in the respective cohort unless the DNA can demonstrate that the cost of fuels/feedstocks/technologies exceed those of certain comparable projects (CDM-EB79, para 41).
- **Vintage of standardized baselines and static versus dynamic standardized baselines:** Standardized baselines are often constructed based on plants for which the investment decision was taken many years in the past. If a standardized baseline is static and not frequently updated, it can mean that additionality is established and baselines are determined based on a market situation that is ten or twenty years old (i.e. failing to take into account technological breakthroughs). This could result in significant crediting of BAU (Table 3-9, bullet point 2). The high-level CDM Policy Dialogue has therefore recommended that in order to drive technological change, the standardized baseline framework must ensure “*that the focus of incentives constantly shifts to the next generation of technologies*” (CDM Policy Dialogue 2012, p. 6). As a consequence, the current standardized baseline framework specified interim data vintages and

update frequencies of 3 years respectively (CDM-EB77-A05). For example, sectors associated with slow dynamic developments in the past may allow for a relaxation in the frequency of updates without compromising the environmental integrity of the CDM.

- **Level of disaggregation:** The level of disaggregation is an important factor to consider in the development of a standardized baseline, which can enable a DNA with limited resources to prioritise which mitigation measures to incentivise within a sector. For example, Hermwille et al. (2013) refer to a case study of the rice mill sector in Cambodia where only a small number of large scale rice mills account for approximately 60% of the total output. Given that the remaining output is provided by thousands of small-scale rice mills with very varied use of technologies that are associated with different emission intensities, it was necessary to disaggregate the standardized baseline on the basis of plant size (i.e. focus standardisation on the large-scale mills). The importance of disaggregation of standardized baselines is further demonstrated in the power sector. If a standardized baseline is based upon the entire power sector of a country, it is likely that the use of renewables and possibly of the most efficient fossil fuel technologies would be encouraged. However, if the standardized baseline was disaggregated further to consider fossil fuel consumption only – different mitigation options such as fossil fuel switching would be encouraged instead (Hermwille et al. 2013). The appropriate level of disaggregation depends very much on the project type and the actual circumstances. With the current approach, DNAs can determine the level of disaggregation, though there is no EB guidance on how the appropriate level can be determined. In addition, such guidance would hardly be compatible with the ‘one size fits all’ approach pursued in the standardized baseline guidance.

In light of all of these challenges, the implementation of standardized baselines may not be suitable for all sectors, project types or countries. The development of a standardized baseline can achieve the objective of simplification in certain sectors associated with more homogenous products. However, standardized baselines will be more difficult to apply to sectors associated with a range of products and strongly varied circumstances amongst installations. Therefore, it should be carefully checked for which purposes, sectors, project types and baseline emission sources standardized baselines are appropriate. Applying one single approach to establish standardized baselines for different sectors, project types and locations, as currently pursued under the CDM, is likely to undermine the environmental integrity of the CDM. Standardized baselines should be developed from actual projects and reflect the particular circumstances of the sector, project type and location. Once approved within a country or region, standardized baselines need to be mandatory for all new CDM projects to prevent that more CERs are issued as if the standardized baseline was not established (Schneider et al. 2012).

To ensure that the concept of standardized baselines provides what it was established for, particularly *“to reduce transaction costs, ... while ensuring environmental integrity”* (UNFCCC 2011c), the EB should review the standardized baseline framework. This review should ensure that

- stringent QA/QC procedures are applied to all standardized baselines,
- all CDM facilities without any exemptions are included in the peer group for the standardized baseline,
- DNAs can build their decision on the appropriate disaggregation level on a clear guidance document which aims to determine the level of disaggregation in a way that covers the mitigation activity of the standardized baseline as accurately as possible and includes as few external factors (‘noise’) as possible;
- the practice of using the same methodological approach to establish standardized baselines for all the different sectors, project types and locations is replaced by the development

of project-specific standards derived from actual projects and reflect the particular circumstances of the sector, project type and location, and last but not least,

- standardized baselines are mandatory for new projects once they are approved for a country.

If these improvements were introduced, standardized baselines could be a valuable tool to improve the environmental integrity of the CDM while lowering transaction costs.

3.9. Consideration of policies and regulations

The consideration of policies and regulations in demonstrating additionality and establishing emissions baseline has been a controversial issue for project-based mechanisms as the CDM. Policies and regulations adopted by the host country can have a significant impact upon future emission pathways. For example, the introduction of air quality regulations for power plants impacts their CO₂ emissions while fossil fuel subsidies reduce the viability of less emission-intensive technologies (Schneider et al. 2014). When setting the baseline and demonstrating additionality there have been concerns raised about both perverse incentives for policy makers (i.e. host countries not implementing policies and measures that reduce emissions so that they can secure greater carbon revenues) and about environmental integrity, by either over-crediting of emission reductions (i.e. inflating the baseline by excluding policies and measures that reduce emissions) or non-additional projects (i.e. registering projects that are economically viable and do not face barriers by allowing the exclusion of subsidies in the investment analysis).

The modalities and procedures for the CDM require that *"a baseline shall be established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector"* (decision 3/CMP.1, para 45(e)). However, in order to avoid the creation of perverse incentives for policy makers, the CDM EB adopted, at its 22nd meeting, the following rules with regard to the consideration of policies in setting baselines:

- **E+ policies:** to not consider policies adopted after 1997 which *"give comparative advantages to more emissions intensive technologies or fuels over less emissions intensive technologies or fuels"* in setting the baseline;
- **E- policies:** to not consider policies adopted after 2001 which *"give comparative advantages to less emissions intensive technologies over more emissions intensive technologies"* in setting the baseline.⁴²

These rules failed, however, to fully address perverse incentives for policy makers, as host countries would continue to have incentives to maintain existing E+ policies such as fossil fuel subsidies. Furthermore, although host countries will not be discouraged from implementing national policies and measures that reduce emissions (E- policies), the rules are likely to result in over-crediting of emission reductions.

Overall, in the case of E- policies it seems difficult to reconcile the two policy objectives: avoiding perverse incentives for policy makers and ensuring environmental integrity. If E- policies were excluded when demonstrating additionality or setting baselines, perverse incentives would be addressed but environmental integrity would be undermined, since projects that are financially viable could claim they are not, and emissions baselines would be inflated. If E- policies were included, environmental integrity would be ensured but perverse incentives not addressed.

⁴² EB 22 report, Annex 3: Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline Scenarios (Version 02), https://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

In 2013, the EB reviewed its E- policy guidelines with a view to balancing these two conflicting policy objectives and *“agreed to pursue an approach by which, for the first seven years from the effective implementation date of the relevant E- policy, the benefit of that E- policy does not need to be considered by project participants in the additionality demonstration through investment analysis”* (CDM-EB73, para. 70). The approach would thus ignore new E- policies but for a limited time period. Initially allowing the exclusion of E- policies could be seen as addressing perverse incentives for policy makers, while ensuring environmental integrity in the longer term. It would also expand the approach of ignoring E- policies from baseline setting to demonstrating additionality. However, the EB has not yet been able to agree on a revision of its E+/- policy guidelines.

Based upon an econometric analysis, Lui (2014) raises questions about the decline of feed-in tariffs in China⁴³ that may imply a gaming to ensure wind projects are not economically attractive for the purpose of demonstrating additionality under the CDM. Schneider et al. (2014) argue that with regards to E- policies it is simply not feasible to achieve both a robust crediting baseline and avoid the creation of perverse incentives at the same time. Striking a balance between the two objectives is therefore required when setting the crediting baseline, which is likely to vary depending upon the sector, project type and type of policy.

Given the contrasting objectives, the decision on whether to include E- policies in the baseline or not and the determination of additionality of a project-based mitigation activity should depend upon the potential risk of either creating perverse incentives or over-crediting. Schneider et al. (2014) recommend that the following approach should be pursued when setting baselines and determining additionality:

- If the **risk of creating perverse incentives** is judged to be considerably larger than the risk of over-crediting, then E- policies should not be considered (for a certain period) in setting the baseline;
- If the **risk of over-crediting** is deemed to be considerably greater than the risk of creating perverse incentives, then E- policies should be considered in setting the baseline.

The extent to which the setting of baseline and determination of additionality for a project-based mitigation activity is more liable to either the risks of perverse incentives or over-crediting depends upon the wider co-benefits associated with a policy other than simply climate change mitigation. For example, the deployment of renewables is associated with multiple co-benefits such as employment opportunities, energy security and air quality improvements. Given the additional benefits associated with such E- policies, it is less likely that these policies would not be adopted as a consequence of changes to an international crediting mechanism. Schneider et al. (2014) and Spalding-Fecher (2013) therefore both argue that the risk of creating perverse incentives (i.e. delaying policies and regulations to secure more CER revenues) may be lower than the risks of setting a less robust baseline (i.e. by not including E- policies in the baseline) that leads to the over-crediting of emission reductions. Spalding-Fecher (2013) also points out that such co-benefits are likely to occur with electricity generation, energy efficiency and agriculture projects.

However, the risk of creating perverse incentives is likely to be greater from mitigation activities such as the capture of HFC-23, which reduce GHG emissions but do not lead to significant co-benefits. In such a case, preventing the creation of perverse incentives (i.e. host country delaying regulation on the capture of HFC-23) could be given priority over additionality and environmental integrity by not considering such E- policies when setting the baseline. Nevertheless, CERs resulting from such projects would be used to offset GHG emissions in other capped systems and, since

⁴³ Spalding-Fecher (2013) discusses the uncertainty within the CDM EB on how such a policy change should be classified under the E+/- policy guidance.

they are not truly additional, result in globally higher emissions. Therefore, it would be more appropriate to support such technologies by other means such as ODA or climate finance or by addressing these mitigation potentials as own contribution under the ADP negotiations.

From a more practical perspective, Spalding-Fecher (2013) emphasises the difficulty of accurately accounting for the effects of E- policies when setting either the baseline or demonstrating additionality. The level of difficulty depends upon the policy type. For example, the impact of direct financial incentives such as mandatory feed-in tariffs can be removed more easily from an emissions baseline than indirect sectoral incentives such as renewable energy portfolio standards or economy-wide policies such as domestic emissions trading schemes. Furthermore, defining the date of policy implementation and the effectiveness of enforcement may sometimes represent additional challenges (Spalding-Fecher 2013). If the guidance provided by the CDM EB – given the difficulty in isolating the impact of multiple (and sometimes conflicting) policies when setting emission baselines or demonstrating additionality – would only relate to direct financial incentives this could lead to the unequal treatment of host countries under the CDM based upon the types of policies implemented (Spalding-Fecher 2013). For example, it would be easier to determine the additionality of a renewable energy project in a host country with direct financial incentives such as feed-in tariffs compared to a host country that adopted a domestic emissions trading scheme. This practical problem could not only undermine the environmental integrity of the CDM but also mean that excluding E+ or E- policies may simply not be practical.

Taking into account the various challenges to strike the right balance between avoiding perverse incentives for policy makers and ensuring environmental integrity, Spalding-Fecher (2013) concludes that the risk of perverse incentives is not as high as previously assumed in many countries and sectors, while the risk of over-crediting is substantial. He therefore suggests that as a general rule all E- policies should be considered in both baseline-setting and additionality determination. Schneider et al. (2014) outline the following options in relation to E- policies:⁴⁴

- No consideration of E- policies: No perverse incentives would be created if both existing and planned E- policies were not considered when setting the crediting baseline. In fact, host countries would be encouraged to introduce further E- policies to further reduce emissions below the baseline. However, the disadvantage of this option would be that the emission baseline would most likely be inflated above BAU.
- Consideration of existing E- policies, exclusion of future E- policies: A more balanced approach could involve the introduction of a cut-off date for excluding future E- policies from being considered in the setting of the crediting baseline. However the setting of a cut-off date is problematic. For example, if the cut-off point is set too early it may inflate the crediting baseline by considering E- policies that have already been adopted. Nevertheless, the option provides a positive incentive for host countries to adopt new E- policies (after the cut-off point) to reduce emissions.
- Consideration of existing and future E- policies: A robust crediting baseline would be established if both existing and future E- policies were considered (either ex-ante or ex-post), however this would most likely create disincentives to introduce E- policies as their introduction could lower the potential for credits. In addition, this option would provide greater uncertainty for investors as to when a crediting baseline would be updated.

In order to prevent the over-crediting of emission reductions, it would be a sensible approach to include current E- policies in the crediting baseline. However, accounting for future E- policies is

⁴⁴ These options are outlined in the context of a sector based crediting mechanism though they also apply to the CDM.

more problematic and warrants further research to ensure that a reasonable balance is achieved between limiting the over-crediting of emission reductions and preventing the creation of perverse incentives. Schneider et al. (2014) and Spalding-Fecher (2013) conclude that the balance should be more in favour of limiting over-crediting in the CDM or future mechanisms as they judge this risk to be greater to undermining environment integrity than from the creation of perverse incentives. Therefore, as a general rule Schneider et al. (2014) recommend that adopted policies and regulations reducing GHG emissions should be included when setting crediting baselines and policies that increase GHG emissions should be discouraged by their exclusion from the crediting baseline where possible.

3.10. Suppressed demand

One of the challenges of applying GHG accounting approaches in poor communities is that the current consumption of many household services (e.g. heating and cooking energy, lighting and potable water) may not reflect the real demand for those services. This could be a result of lack of infrastructure, lack of natural resources or poverty, particularly the high costs of these services relative to household incomes. The situation of 'suppressed demand' creates a problem for setting baselines, because the CDM rules say that the baseline scenario selected for a project should provide the same level of service and quality as the project scenario (Gavaldão et al. 2012; Michaełowa et al. 2014; Spalding-Fecher 2015; Winkler & Thorne 2002). This is clearly not the case if the project scenario provides a much higher service level, owing to low historical consumption. At the same time, the CDM rules state that "the baseline may include a scenario in which future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party" (UNFCCC 2006a para. 46). This section analyzes how the concept of suppressed demand has been implemented in CDM methodologies and what the potential impacts on CER issuance as a result of the revised and new methodologies. For a more detailed conceptual explanation of suppressed demand, as well as background on previous EB decisions and guidance, see Chapter 9 of Spalding-Fecher et al. (2012).

3.10.1. Treatment of suppressed demand in approved methodologies

Table 3-10 below shows the methodologies in which suppressed demand has been explicitly considered, in three different categories. The first group is from a work plan agreed by the EB at their 67th meeting, when the EB requested that the Secretariat and relevant support panels explore how to incorporate suppressed demand. The second group is methodology revisions for which the proponent of the revision motivated the change based on the Suppressed Demand guidance. The final group is new methodologies that were developed after the approvals of the Suppressed Demand guidance and incorporated those ideas, as documented in the UNFCCC Methodology Guidebook. Of the original 10 methodologies in the EB work plan, 5 were revised or replaced, while an additional 8 methodologies fall into the second and third categories.

Note that a group of methodologies not listed here, but that implicitly recognise suppressed demand, are those addressing new large-scale power generation or industrial development. New renewable energy, natural gas or high-efficiency coal power plants are not required to show that they actually replace an existing power plant. Given that most developing countries have shortages in power supply, building a new natural-gas-fired power plant, for example, could potentially increase emissions compared to current levels. However, the accepted principle on baseline development across the CDM is that the baseline is not necessarily the same as historical emissions, but should reflect the most likely development scenario for the sector. Even in countries with chronic power shortages, it would be difficult to argue that there would be *no* capacity increases under the baseline scenario. This means that, even in these cases, CDM projects – if properly justified –

would potentially displace another alternative new plant. The determination of the alternative plant is then the subject of the methodology's baseline scenario analysis.

Table 3-10: Methodologies explicitly addressing suppressed demand or part of EB work plan on suppressed demand

Meth No.	Meth Name	Re-vised?	When	Pipeline ¹⁾	
				Pro-jects	PoAs
From EB67 work plan List of Methodologies					
AM0025	Alternative waste treatment processes	ACM22	EB69	127	5
AM0046	Distribution of efficient light bulbs to households	No		2	0
AM0086	Installation of zero energy water purifier for safe drinking water application	No	EB70	1	0
AM0094	Distribution of biomass based stove and/or heater for household or institution	No	EB70	0	0
ACM0014	Treatment of wastewater	Yes	EB77	47	1
ACM0016	Mass Rapid Transit Projects	No		16	1
AMS I.A	Electricity generation by the user	Yes	EB69	50	17
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	Not necessary	EB70	24	58
AMS II.E	Energy efficiency and fuel switching measures for buildings	No		44	5
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	Yes	EB68	4	14
Additional revisions referring to Suppressed Demand					
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	Yes	EB77	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	Yes	EB70	45	62
AMS III.F	Avoidance of methane emissions through composting	Yes	EB67	103	20
New methodologies where EB noted Suppressed Demand					
ACM0022	Alternative waste treatment processes	New	EB69	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	New	EB73	0	0
AMS I.L	Electrification of rural communities using renewable energy	New	EB66	0	1
AMS III.BB	Electrification of communities through grid extension or new mini-grids	New	EB67	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	New	EB60/62	0	10
Total with revisions or new related to suppressed demand				473	194
Total pipeline				11,990	446²⁾

Notes: ¹⁾ Pipeline is as of 1 January 2014. ²⁾ PoA DD's submitted, which may include multiple methodologies and include 23 PoAs replaced by new versions. Total number of methodology citations in all PoAs submitted is 874.

Sources: Authors' own compilation

While the proportion of project activities influenced by these methodologies is very small, a significant share of PoAs are utilising the revised or new methodologies. In terms of the quantitative impact of the revisions to methodologies to incorporate suppressed demand; however, this may only relate to projects or PoAs entering the pipeline after the revision. While project participants are allowed to update the version of the methodology that they use prior to the renewal of the crediting period, this should not make the emission reduction calculations less conservative. Given that the suppressed demand revisions could increase the baseline significantly, it is not entirely clear whether the EB would approve this revision for existing projects prior to the renewable of the crediting period (when the latest version of the methodology must be used). Because AM00025 was replaced by ACM0022 in order to address suppressed demand, none of the projects or PoAs under AM0025 (which was not used after October 2012) would be able to utilise the new suppressed

demand approach embodied in ACM0022. Table 3-11 below shows the number of PoAs and Projects in the pipeline both before and after the revisions.

Table 3-11: CDM pipeline affected by suppressed demand methodologies

Meth No.	Meth Name	Total pipeline		New pipeline since revision	
		Projects	PoAs	Projects	PoAs
Revised methodologies					
ACM0014	Treatment of wastewater	47	1	0	0
AMS I.A	Electricity generation by the user	50	17	0	13
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	4	14	3	1
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	0	0	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	45	62	2	18
AMS III.F	Avoidance of methane emissions through composting	103	20	7	8
New methodologies that incorporate suppressed demand					
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	24	58	24	58
ACM0022	Alternative waste treatment processes	10	0	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	0	0	0	0
AMS I.L	Electrification of rural communities using renewable energy	0	1	0	1
AMS III.BB	Electrification of communities through grid extension or construction of new mini-grids	0	0	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	0	10	0	10
Total		283	183	46	109

Sources: Authors' own compilation

How the suppressed demand concepts and guidance are implemented varies significantly by methodology. With the exception of AMS III.AR, all of the methodologies use the project activity level as the baseline activity level. Only AMS III.AR defines a quantitative Minimum Service Level that is used to calculate baseline emissions. AMS I.L and AMS III.BB define an MSL, but it is only used to adjust the emissions factor for the baseline, rather than to directly calculate baseline activity levels or emissions. For AMS III.F and ACM0022, the minimum service level is qualitatively defined as having a solid waste disposal site (i.e. rather than considering the quantity of waste processed per household). What the methodologies all do, however, is to define a baseline technology that may have higher emissions than the actual current technology. For example, households may currently only use candles and kerosene hurricane lamps, and therefore have very low lighting services, but the methodologies use a kerosene pressure lamps for the baseline technology, because this can deliver the MSL for lighting services.

For the revised methodologies, the resulting baselines emissions could be substantially higher per household (Annex 8.2, Table 8-1). For example, under ACM0014, baseline methane emissions may still be considered even if the wastewater is currently not treated or stored in a way that would necessarily produce emissions (e.g. lagoons with depth less than 1 m). ACM0022 and AMS III.F have emissions factors that could be double the current practices, while for AMS I.L and AMS

III.BB, the emission factor for very small users (e.g. 50 kWh/yr) is almost 7 times the emissions factor originally used in AMS I.A for these projects.

3.10.2. Impact on CER supply

If current energy service demand is suppressed by lack of income, relatively high energy prices and/or lack of physical access, how quickly might this change without the CDM project? In other words, how long might it take for the current emissions to reach the suppressed baseline emissions? This depends on many factors, including income growth in the host communities and changes in access. Data from the World Bank's World Development Indicators (World Bank 2014), for example, shows that, at a highly aggregated level, per capita incomes in most developing regions have, indeed, increased substantially, but this is slower in low income countries. Electricity consumption per capita, however, has not shown such consistent growth in Africa, largely due to population growth outstripping energy supply growth and electrification programmes (World Bank 2014). This data cannot necessarily be applied to specific sub-regions or project areas, but does show that significant increases in energy consumption are possible in a relatively short time frame. In terms of electrification rates, these have increased relatively rapidly for key countries, rising from 25% or 30% to 60% to 80% in as little as 10 or as many as 30 years (Bazilian et al. 2011). Clearly, the level at which the minimum service level is set will also influence the risk of over-crediting, with lower service levels being more likely to reflect potential consumption in the shorter term without the CDM.

Even if the households were not to reach the minimum service levels in the near term and the emissions factors used in these methodologies is substantially higher than in traditional methodologies, the overall impact on CER generation is likely to be very small. The total CERs projected to 2020 for the methodologies in Table 3-11 after the revisions to those methodologies is approximately 17 million. Even if all of the CERs for those methodologies are considered (i.e. before and after revision), at approximately 112 million, this is still less than 1% of the entire CDM pipeline, and so does not represent a significant impact on emissions.

3.10.3. Additionality concerns

In summary, while the introduction of the concept of suppressed demand in CDM methodologies is expanding, and will have important development impacts, it is unlikely to have a major impact on the overall additionality of CDM projects. In many project areas, it is likely that the communities could reach the Minimum Service Levels during the course of the CDM project life, although this is uncertain and will depend on local circumstances. Creating an open and transparent process of setting minimum service levels, with expert input as well as input from other stakeholders, could also help to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to certain country groups (e.g. LDCs, under-represented countries), in which development needs are highest and the potential for over-crediting it the smallest. Even if the suppressed demand does lead to some over-crediting, the overall impact is very small, particularly if restricted geographically. More importantly, the increased contribution to sustainable development provides a strong justification for this approach to project types that address poverty and development issues.

4. Assessment of specific CDM project types

The relevant literature highlights that the likelihood of CERs representing real, measurable and additional emission reductions varies considerably among project types. Some project types do not generate revenues other than CERs. These projects have a high likelihood of being additional. Other project types are heavily promoted and/or subsidized by governments, generate significant

other revenues, or their economic feasibility is hardly impacted by CER revenues. For these projects, additionality is more questionable.

Other aspects affecting the quality of CERs also vary among project types. Perverse incentives are particularly relevant for projects that generate large CER revenues compared to the cost structure of their main business (e.g. HFC-23 projects). Baselines are particularly challenging to determine in dynamic sectors with high rates of learning and innovation and penetration of new technologies over relatively short periods of time. The length of crediting is critical for project types which are implemented earlier due to the CDM incentives.

For these reasons, this chapter evaluates the ability to deliver real, measurable and additional emissions reductions for specific CDM project types. In the following, we select important project types in Section 4.1 and assess these project types in the subsequent sections.

4.1. Project types selected for evaluation

We select the project types for evaluation mostly based on their potential CER volume in the period of 2013 to 2020 according to the current CDM project portfolio. Focusing on the period of 2013 to 2020 and on the largest CDM project types in terms of potential CER volume allows the best estimation of the quality of the overall CDM project portfolio for future new demand for CERs. Moreover, the project types with the largest market share are most critical for the overall quality of the CDM.

The specific project types selected for evaluation are provided in Table 4-1. The table also shows that these project types cover a potential CER volume of 4.8 billion CERs, which corresponds to 85% of the overall CER supply potential for the period of 2013 to 2020 (Section 2.3). This ensures a large representativeness.

Table 4-1: Project types selected for evaluation

Project type	Potential CER supply 2013 to 2020 [million]	Focus areas analyzed
Wind power	1,397	Additionality, baselines
Hydropower	1,669	Additionality, baselines
Biomass power	162	Additionality, baselines, leakage
HFC-23	375	Perverse incentive, baselines
Adipic acid	257	Perverse incentives (leakage)
Nitric acid	175	Perverse incentives, baselines
Landfill gas	163	Additionality, baselines, perverse incentives
Coal mine methane	170	Additionality, baselines
Waste heat recovery	222	Additionality, baselines
Fossil fuel switch	232	Additionality, baselines
Efficient cook stoves	2.3	Additionality, baselines
Efficient lighting	3.8	Additionality
Total of all selected project types	4,829	
Total of all projects in the CDM portfolio	5,671	

Source: Authors' own compilation and calculations

4.2. HFC-23 abatement from HCFC-22 production

4.2.1. Overview

Hydrofluorocarbon-23 (HFC-23) is a waste gas from the production of hydrochlorofluorocarbon-22 (HCFC-22), which is a GHG and an ozone-depleting substance (ODS) regulated under the Montreal Protocol on Substances that Deplete the Ozone Layer. HCFCs were introduced as an alternative to the highly ozone-depleting chloro-fluorocarbons (CFCs) because of their lower ozone-depleting potential. HCFC-22 is mainly used for two purposes: as a refrigerant in refrigeration and air-conditioning appliances and as a feedstock in the production of polytetrafluoroethylene (PTFE). The production for the refrigeration and air-conditioning industry is regulated under the Montreal Protocol, whereas the production for feedstock purposes is not.

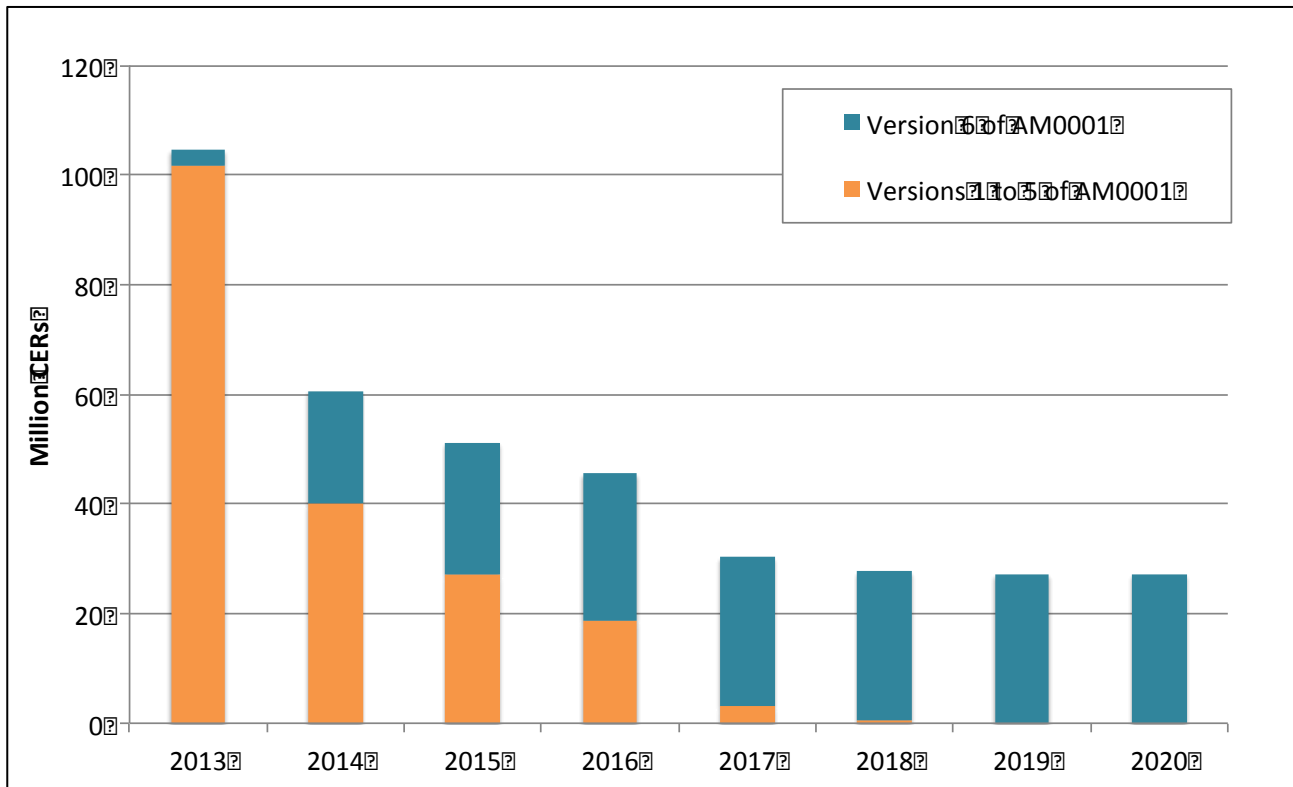
HFC-23 is a potent greenhouse gas; its global warming potential (GWP) is estimated at 14,800 for the second commitment period of the Kyoto Protocol. Emissions of HFC-23 from HCFC-22 production can be abated in two ways: a) by reducing the rate of waste gas generation (by-product rate) through process optimization and b) by capturing and destroying HFC-23 through installation and operation of high temperature incinerators. In the absence of regulations, incentives, or voluntary commitments by the industry, HFC-23 is usually vented to the atmosphere (Schneider & Cames 2014).

4.2.2. Potential CER volume

Under the CDM, 19 HFC-23 projects have been registered. Eleven projects are located in China, five in India; South Korea, Argentina and Mexico each host one project. All projects apply the baseline and monitoring methodology AM0001. In the first commitment period of the Kyoto Protocol, the abatement of HFC-23 has been the project type with the largest CER issuance: 516 million HFC-

23 CERs or 36% were issued of a total of 1.4 billion CERs by the end of 2013. The potential CER supply for the period of 2013 to 2020 is estimated using a bottom-up model based on a detailed evaluation of the information in PDDs and monitoring reports from all 19 projects (Schneider & Cames 2014). In estimating the potential CER supply we differentiate between CERs from the application of versions 1 to 5 and version 6 of the applicable baseline and monitoring methodology AM0001 due to the significant differences between these methodology versions. The potential CER supply for the period of 2013 to 2020 is illustrated in Figure 4-1; it amounts to approx. 375 million CERs for the entire period, with 191 million from the application of version 1 to 5 and 184 million from the application of version 6 of the methodology AM0001.

Figure 4-1: CER supply potential of HFC-23 projects



Sources: Authors' own compilation

4.2.3. Additionality

All versions of the applicable baseline and monitoring methodology AM0001 consider HFC-23 projects to be automatically additional, as long as no regulations to abate HFC-23 are in place in the host country. This rule seems appropriate. Prior to the CDM, none of the plants in developing countries had equipment to destruct destroy HFC-23; HFC-23 generated in the production process was vented to the atmosphere. The same holds for plants that are not eligible for crediting under the CDM because they started commercial operation after 31 December 2001. Plant operators do not have economic incentives to install HFC-23 destruction equipment, as the installation and operation does not reduce costs or generate any significant revenues other than from CERs.⁴⁵ Based on these considerations, we assess that this project type is very likely to be additional.

⁴⁵ Schneider & Cames (2014) report that plant operators could sell HF which is a by-product from flue gas treatment. However, these revenues are likely lower than the costs for HFC-23 destruction.

4.2.4. Baseline emissions

HFC-23 generation from HCFC-22 production depends on two factors: the amount of HCFC-22 production and the ratio between HFC-23 generation and HCFC-22 production, which is often referred to as 'waste generation rate'. The applicable methodology AM0001 determines baseline emissions of HFC-23 based on these two factors, by multiplying the baseline HCFC-22 production with the baseline waste generation rate.⁴⁶ How these two parameters are calculated, has evolved over time.

The approaches changed over time with a view to addressing perverse incentives which are a particular concern for the crediting of HFC-23, due to the low technical abatement costs⁴⁷ and significant profits which can accrue from CER revenues and could exceed the costs of HCFC-22 production (Schneider 2011, UNFCCC 2011b, TEAP 2005). Significant perverse incentives were observed in two JI projects in which plant operators increased the waste generation rate to unprecedented levels once methodological safeguards were abandoned (Schneider & Kollmuss 2015). Perverse incentives can arise from the CDM in the following ways:

- HCFC-22 plants could operate at a higher waste generation rate than they would in the absence of the CER revenues, leading to over-crediting;
- The amount of HCFC-22 produced at CDM plants could be higher than in the absence of the CER revenues. This could lead to over-crediting if
 - HCFC-22 production is displaced at non-CDM plants that have a lower waste generation rate than the baseline rate used at the CDM plants;
 - HCFC-22 production is displaced at plants located in Annex I countries that already are required to abate HFC-23 emissions;
 - HCFC-22 is not produced for use in applications but is vented to the atmosphere;
 - The use of HCFC-22 becomes economically more attractive due to the CDM and is increasingly used compared to other less GHG-intensive alternatives;
 - The base year emissions (2009-2010) under the accelerated phase-out under the 2007 amendment to the Montreal Protocol are higher due to the CDM;
 - The implementation of the accelerated phase-out of HCFC-22 is delayed due to the CDM.
- The HCFC-22 plants could operate longer than they would in the absence of CDM revenues. This could lead to over-crediting under the same circumstances as a higher HCFC-22 production at the plants.

Robustness and conservativeness of the methodology has significantly increased over time. Perverse incentives constitute a major challenge in versions 1 to 5, whereas the conservative approach in version 6 largely avoids and compensates for perverse incentives.

For CERs issued to projects under versions 1 to 5, the amount of over-crediting is uncertain, since it hinges strongly on assumptions on HCFC-22 production levels, HFC-23 waste generation rates and the indirect effects noted above. Munnings et al. (2016) suggest that under-crediting due to conservative baselines may have more than compensated for the potential over-crediting from perverse incentives that these baselines were intended to curb. However, Munnings et al. (2016) make several assumptions that seem rather implausible. For example, they assume that in the absence of the CDM, some plants would have produced more HCFC-22 than they did under the CDM. As a result, we do not find their arguments persuasive.

⁴⁶ Versions 1 to 5 of methodology AM0001 do not explicitly calculate baseline emissions but directly calculate the emission reductions.

⁴⁷ Schneider & Cames (2014), Appendix, provide an overview of technical abatement costs for HFC-23 destruction.

Under version 6, on the other hand, net under-crediting (or net emissions benefit) is very likely since the methodology uses an ambitious default value of 1.0% for the baseline waste generation rate and caps the amount of HCFC-22 production that is eligible for crediting in a more conservative manner (Erickson et al. 2014). However, as of 1 January 2016, no credits have been issued under version 6.

4.2.5. Other issues

Continued low CER prices could jeopardize continued abatement activities at CDM HFC-23 project sites, an unfortunate outcome given the very inexpensive abatement opportunities they provide. At the same time, the failure of the CDM market to ensure continued abatement creates the opportunity for other policies that could yield even greater net emission benefits, especially if no credits are generated that could be also used to increase emissions elsewhere. For example, China recently launched a results-based finance programme that supports HFC-23 abatement in CDM and non-CDM plants (NDRC 2015). This programme helps support HFC-23 abatement across the sector in China. However, continued abatement in other CDM-eligible countries is less certain.

There are also other means to ensure these important abatement opportunities are not lost. Emissions of HFC-23 from HCFC-22 production can be regulated through the Montreal Protocol and for new facilities that have not yet installed GHG abatement, the Protocol's Multilateral Fund (MLF) for GHG abatement can provide financial support (Schneider & Cames 2014).

Note also that continued crediting under the CDM could also create perverse incentives for policy makers not to pursue alternative policies such as these, which address emissions without yielding CERs.

4.2.6. Summary of findings

Past changes to methodologies have now improved the integrity of these projects. If they are operated they are likely to yield more emissions reductions than CERs – i.e. a net mitigation benefit. However, continued low CER prices jeopardize their continued operation in some countries.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed in most recent methodology (version 6). Version 6 could lead to under-crediting (net mitigation benefit)
Other issues	<ul style="list-style-type: none"> Low CER prices jeopardizes continued operation Emissions could be addressed through Montreal Protocol Perverse incentives to avoid domestic regulation

4.2.7. Recommendations for reform of CDM rules

The necessary changes in AM0001 have been implemented in recent years. No changes in CDM rules are needed.

4.3. Adipic acid

4.3.1. Overview

Adipic acid is an organic chemical that is used as a building block in a range of different products, most importantly polyamide, often referred to as 'nylon'. Other applications include the production of polyurethanes and plasticizers. Adipic acid is a globally traded commodity, with more than one-third of the production traded internationally. Nitrous oxide (N₂O) is an unwanted by-product of adipic acid production. The formation of N₂O cannot be avoided; it is the result of using nitric acid

to oxidize cyclohexanone and/or cyclohexanol. Generally, the amount of N₂O generated varies very little over time and among plants.

N₂O in the waste gas stream can be abated in different ways: by catalytic destruction, by thermal decomposition, by using the N₂O for nitric acid production, or by recycling the N₂O as feedstock for adipic acid production (Schneider, L. et al. 2010). These methods typically reach an abatement level of about 90% (IPCC 2006, p. 3.30, Ecofys et al. 2009, p. 44). However, plants implemented under CDM and JI achieved significantly higher abatement levels of approx. 99% in the case of CDM and 92% to 99% in the case of JI, apparently through the strong economic incentives from the CDM and JI (Schneider, L. et al. 2010).

4.3.2. Potential CER volume

Under the CDM, four projects were registered. Two projects are located in China, one is in Brazil and one in South Korea. All four CDM plants had no abatement installed before project implementation and applied either thermal or catalytic abatement. The four implemented CDM plants cover only a part of the adipic acid production in developing countries because the applicable CDM methodology AM0021 is limited to plants that started commercial operation before 2005. Since then, five new plants are known to have started commercial operation in China; none of them abates N₂O emissions (Schneider & Cames 2014). Based on a bottom-up model used by Schneider & Cames (2014), the four CDM projects could generate about 257 million CERs in the period of 2013 to 2020.

4.3.3. Additionality

The applicable methodology AM0021 combines the approaches included in the different approaches to demonstrate additionality. Version 1 establishes three criteria for additionality demonstration: no regulations should require N₂O abatement, the project should not be common practice and it should not be economically viable. Versions 2 and 3 refer to the additionality tool and hence the investment analysis is not mandatory for additionality demonstration, as compared to version 1. Nevertheless, all four registered projects conduct an investment analysis and determine the net present value (NPV). Versions 2 and 3 also require reassessment of additionality during the crediting period if new NO_x regulations were introduced.

N₂O abatement from adipic acid production can be regarded as highly likely to be additional, for several reasons. Firstly, none of the non-Annex I countries in which adipic acid is produced have regulations in place to abate N₂O. Secondly, for thermal or catalytic destruction of N₂O, plant operators have no economic incentives to abate N₂O emissions. The abatement generates steam as a by-product; however, the cost savings or revenues are lower than the investment and operation and maintenance costs. Based on a review of PDDs and literature information, the technical abatement costs are estimated at €0.3/t CO₂e, with a range from €0.1/t CO₂e to €1.2/t CO₂e (Schneider & Cames 2014).

Thirdly, the abatement of N₂O from adipic acid production is not common practice in non-Annex I countries. In Western industrialized countries, N₂O has been abated voluntarily since the 1990s. In non-Annex I countries, only one plant in Singapore had abatement technology installed prior to the CDM (Schneider, L. et al. 2010). None of the plants commissioned after 2004, which are not eligible for crediting under the CDM, installed N₂O abatement technology.

4.3.4. Baseline emissions

Baseline emissions of N₂O are determined by multiplying the amount of adipic acid production eligible for crediting with a baseline emission factor. The methodology further estimates baseline

emissions from steam generated during the catalytic or thermal destruction of N₂O. Baseline emissions from steam generation are very small compared to baseline emissions of N₂O.

The baseline emission factor is determined as the lower value between the actual rate of N₂O formation and a default value of 270 kg N₂O / t adipic acid, which corresponds to the lower end of the uncertainty range of the IPCC default value of 300 kg / t adipic acid (IPCC 2006). This approach is used in all three methodology versions and intends to exclude the possibility of manipulating the production process to increase the rate of N₂O formation. Versions 2 and 3 require the actual N₂O formation rate to be determined in two ways: 1) based on the consumption of nitric acid and the ratio of N₂O to N₂ in the off-gas, and 2) based on direct measurements of N₂O in the off-gas adjusted by a 5% discount factor to account for measurement uncertainty. As a conservative approach, the lower resulting value of the two ways is used to determine the baseline emission factor. Overall, the methodology ensures that the baseline emission factor is determined in a conservative manner. The rate of N₂O formation typically observed is higher than the default value of 270 kg / t adipic acid, which could potentially lead to under-crediting of few percentage points.

The amount of adipic acid production that is eligible for crediting is capped in all three methodology versions with a view to avoiding incentives to expand the production as a result of the CDM. Version 2 and 3 establish the cap as the highest annual production in the three years prior to the implementation of the project activity. Version 1 does not provide a procedure to determine a cap but specifies that the methodology is “only applicable for installed capacity (measured in tons of adipic acid per year) that exists by the end of the year 2004”. There has been controversy about how this requirement is to be interpreted. Following a request for clarification (AM_CLA_0148), the Methodologies Panel recommended using production data from three historical years, similar to Versions 2 and 3. However, the CDM EB concluded that the panels' clarification “provides too extensive interpretation to an older version of methodology” and clarified instead that the cap should be determined as the “validated maximum daily production of adipic acid multiplied by 365 days multiplied by the operational rate”.⁴⁸ This was further interpreted in a way that allowed plants to seek credits beyond their annual design capacity specified in PDDs. All four CDM projects were registered with Version 1 of the methodology. Two projects (0099 and 0116) recently renewed their crediting period, applying Version 3 of the methodology, which lead to caps that are 14.8% and 13.9% lower than the caps applicable in their first crediting period.

While the methodology intended to avoid production shifts through caps on the amount of production that is eligible for crediting, data on adipic acid production, plant utilisation and international trade patterns suggest that carbon leakage, i.e. a shift of production from non-CDM plants to CDM plants, occurred during the economic downturn in 2008 and 2009 (Schneider, L. et al. 2010). Such production shifts do not only lead to distortions in the adipic acid market but can also lead to over-crediting if N₂O is abated in the non-CDM plants. Schneider, L. et al. (2010) estimate that carbon leakage leads to over-crediting of approx. 6.3 MtCO₂e or about 17% of the CERs from adipic acid projects issued in 2008 and approx. 7.2 MtCO₂e or about 21% of the CERs from adipic acid projects in 2009. These effects could thus outweigh the conservative determination of the baseline emission factor.

The lenient interpretation of historical production capacity in version 1 of the methodology considerably contributed to the carbon leakage. However, the more conservative approach for the establishment of the cap on adipic acid production in versions 2 and 3 of the methodology addresses this issue only partially. In a global economic recession, adipic acid production could fall well below historical rates of plant utilisation. Depending on the CER prices, CDM plants operators would then have significant competitive advantage over non-CDM plants, which could lead to similar produc-

⁴⁸ Report of the 48th meeting of the EB, paragraph 24.

tion shifts as observed in 2008 and 2009. As for HCFC-22 production, the underlying issue is that carbon market revenues can have a strong impact on adipic acid production costs. Carbon leakage is unlikely to occur at current market prices for CERs, but could become an issue again if CER prices increased.

4.3.5. Other issues

No other issues were identified.

4.3.6. Summary of findings

Adipic acid projects have a very high likelihood of additionality. The baseline emission factor is determined in a conservative manner that could lead to a few percentage points of under-crediting. The methodology does not include sufficient provisions to address carbon leakage. This could lead to significant over-crediting in times of higher CERs prices and when the adipic acid production capacity significantly exceeds demand.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices
Other issues	<ul style="list-style-type: none"> None

4.3.7. Recommendations for reform of CDM rules

Based on the considerations above, we recommend revising the applicable CDM methodology as follows:

- The provisions for additionality demonstration could be simplified, as this project type can be considered to be very likely additional. We recommend considering this project type as automatically additional, as long as no regulations require N₂O abatement.
- The potential for carbon leakage should be addressed. We recommend introducing a standardized ambitious emission benchmark to determine baseline emissions. Carbon leakage would be avoided most effectively if a consistent emissions benchmark is used for all plants around the world, including plants under ETSSs, and if it is set at or below the abatement level typically achieved in the industry. A standardized global emission benchmark for all adipic acid plants, regardless of policy approach or specific emission trading mechanism, could provide a level playing field for the adipic acid industry and eliminate potential economic distortions. Adipic acid production is particularly amenable to a standardized global benchmark because it is a highly globalized industry, and all plants are very similar in structure and technology (Schneider, L. et al. 2010). We recommend a level at or below 30 kg/t adipic acid, which reflects the abatement level achieved by the large majority of producers world-wide.
- If a standardized ambitious emissions benchmark is introduced, the methodology could be further simplified as measurements and calculations of the rate of N₂O formation would not be necessary.

4.4. Nitric acid

4.4.1. Overview

Nitric acid is mainly used for the production of synthetic fertilizers and explosives. In the industrial production of nitric acid, ammonia (NH₃) is oxidized over precious metal gauzes (primary catalyst) to produce nitrogen monoxide (NO), which then reacts with oxygen and water to form nitric acid. N₂O is an unwanted by-product generated at the primary catalyst. The better a primary catalyst functions, the lower the N₂O emissions. Nitric acid is produced during production campaigns of typically 3-12 months (Kollmuss & Lazarus 2010).

N₂O emissions from nitric acid production can be abated in three ways (Schneider & Cames 2014):

- **Primary abatement** prevents the formation of N₂O at the primary catalyst. According to gauze suppliers, improved gauzes could potentially lead to a 30-40% reduction of N₂O formation (Ecofys et al. 2009).
- **Secondary abatement** removes N₂O through the installation of a secondary N₂O destruction catalyst in the oxidation reactor. The abatement efficiency of the secondary catalyst is often estimated as ranging from 80% to 90%. However, in practice it varies in CDM plants from about 50% to more than 90%. Registered CDM projects achieved an average abatement efficiency of 70% (Kollmuss & Lazarus 2010, Debor et al. 2010).
- **Tertiary abatement** removes N₂O from the tail gas through either thermal or catalytic decomposition. Tertiary abatement can reduce N₂O emissions by more than 90% but involves larger investment and operating costs and more demanding technical requirements than secondary abatement. Registered CDM projects achieved an average abatement efficiency of 86% (Kollmuss & Lazarus 2010, Debor et al. 2010).

Four methodologies have been approved for N₂O abatement from nitric acid production:

- **AM0028** is applicable to tertiary abatement in plants that started commercial operation before 2006. 19 projects used the methodology. In 2013, the methodology was limited to caprolactam production in 2013, and replaced by amending the methodology ACM0019.
- **AM0034** is applicable to secondary abatement in plants that started commercial operation before 2006. 56 projects used the methodology. In 2013, the methodology was withdrawn and replaced by amending the methodology ACM0019.
- **AM0051** is also applicable to secondary abatement in plants that started commercial operation before 2006. The methodology was never used and was withdrawn in 2013. It is therefore not considered in detail in this study.
- **ACM0019** is applicable to both secondary and tertiary abatement and both existing and new plants. 26 projects used the methodology. Since 2013, this is the only valid methodology for nitric acid projects.

Table 4-2 provides an overview of the main features of and differences between the methodologies.

Table 4-2: Overview of methodologies for nitric acid projects

	AM0028	AM0034	AM0051	ACM0019
Projects	19	56	None	26
Technology	Tertiary	Secondary		Secondary and tertiary
Validity	Limited to caprolactam in 2013	Withdrawn in 2013		Valid
Applicability	Plants that started operation before 2006			Existing and new plants
Additionality demonstration	Additionality tool			Automatically additional
Baseline emission factor	Ex-post measurements	Ex-ante measurement campaign	Ex-post measurements	Emission benchmark
Cap on baseline production	Design capacity			No cap
Re-assessment of baseline scenario or additionality	In case of new NO _x regulations			Not applicable

Sources: Authors' own compilation

4.4.2. Potential CER volume

Under the CDM, 97 projects were registered and another four projects were submitted for validation as of January 2014. China is the most important host country with 44 projects. Other important countries are India (5 projects), Uzbekistan (6 projects), South Africa (5 projects), and Brazil, Egypt, Israel and South Korea which host each four projects. Among the 97 registered CDM projects, only 51 have issued CERs as of January 2014. In the current market situation, it is likely that most of the remaining 47 projects have not been implemented. Based on a bottom-up model developed by Schneider & Cames (2014), the 101 published CDM projects could generate approx. 175 million CERs in the period of 2013 to 2020. Potential new projects that have not yet been developed or published are estimated to have a potential of approx. 31 million CERs over the same period.

4.4.3. Additionality

Up to 2011, all three approved methodologies (AM0028, AM0034, AM0051) used the additionality tool to demonstrate additionality. In 2011, ACM0019 was adopted, which deems projects to be automatically additional and employs a dynamic emission benchmark to determine baseline emissions.

N₂O abatement from nitric acid production can be regarded as highly likely to be additional, for similar reasons as for HFC-23 abatement from HCFC-22 production and N₂O abatement from adipic acid production. Non-Annex I countries usually do not have regulations which address N₂O emissions from nitric acid production. Prior to the CDM, secondary or tertiary abatement is not known to have been used in non-Annex I countries and N₂O is usually released to the atmosphere. While plant operators have economic incentives to take primary abatement measures to reduce the rate of N₂O formation, they do not save any costs or generate any revenues – other than car-

bon market revenues – from the installation of secondary or tertiary abatement. Based on a review from PDDs and literature information, the average technical abatement costs are estimated at €0.9/t CO₂e for secondary abatement and at €3.2/t CO₂e for tertiary abatement (Schneider & Cames 2014). For these reasons, in our assessment, the approach in ACM0019 of assuming this project type automatically additional seems reasonable.

4.4.4. Baseline emissions

Baseline emissions are determined by multiplying the amount of nitric acid production with a baseline emission factor. The methodologies AM0028, AM0034 and AM0051 limit the amount of nitric acid production eligible for claiming emission reductions to the design capacity of the plant in 2005; ACM0019 has no such cap. The baseline emissions factor is determined in three different ways in CDM methodologies: through measurement campaigns conducted prior to the installation of the abatement technology (AM0034), through measurements during the crediting period (AM0028 and AM0051), and by using an emissions benchmark (ACM0019).

All three methodologies using measurements (AM0028, AM0034 and AM0051) aim to provide safeguards to avoid perverse incentives to artificially increase the rate of N₂O formation in order to increase CDM revenues (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). In AM0028, the baseline emission factor is capped to the level of previous monitoring periods if project participants do not use a primary catalyst that is common practice in the region or has been used in the nitric acid plant during the last three years and if they cannot justify the use of a different catalyst. In addition, key operating conditions of the plants cannot be changed during project implementation. In AM0034, the methodology requires a new baseline measurement campaign to be conducted if the chemical composition of the primary catalyst is changed after project implementation. While these provisions aimed to avoid perverse incentives to increase the N₂O formation due to the CDM, they provide economic disincentives to plant operators to use primary catalysts that reduce the formation of N₂O, as this would lower their CER revenues and could involve additional costs for conducting a new baseline campaign (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). However, advanced primary catalysts that increase the NO yield and lower the generation of the by-product N₂O are emerging in the industry. They have become widespread in Europe, are gaining market shares in other parts of the world, and have been used in a number of CDM projects prior to their start (UNFCCC 2012b). It is thus possible that some CDM projects applying the AM0034 or AM0028 methodology would, in the absence of the CDM incentives, employ more advanced primary catalysts, in particular over the time frame of three crediting periods, leading to over-crediting (UNFCCC 2012b).

The Methodologies Panel further identified that some plants using the AM0034 methodology had established baseline emission factors which are significantly above the uncertainty range of the IPCC default values and which would result in considerable economic losses for the plant operators (UNFCCC 2012b). The highest reported value from a baseline measurement campaign is 37.0 kg N₂O / t nitric acid, while the highest IPCC default value is 9.0 kg N₂O/t nitric acid, with an uncertainty range of ±40% (IPCC 2006). Such high emission factors indicate that these plants are operated at a high specific ammonia consumption. Plant operators could intentionally reduce the production efficiency during the baseline campaign in order to achieve a higher CDM baseline emission factor (UNFCCC 2012b). Moreover, while inefficient plant operation can be observed in Non-Annex I countries, it seems questionable whether the observed levels of nitrogen loss would continue over the course of three crediting periods. On the other hand, it is important to take into account that the IPCC default emission factors were estimated at times when much less information was available on N₂O formation from nitric acid plants. In particular, continuous measurements over the length of a production campaign, with increasing N₂O emissions towards the end of the

campaign, were not available. The values and their assigned uncertainty should therefore not be outweighed.

To address these two issues, the CDM EB withdrew the AM0034 and AM0051 methodologies and limited the applicability of the AM0028 methodology to caprolactam plants in 2013. At the same time, the EB revised the methodology ACM0019, distinguishing the approach between plants that used AM0028 or AM0034 in their first crediting period and other (mostly newer) plants. For AM0028 and AM0034 plants up to their design capacity, the methodology uses the lower value between the historical baseline emissions during the first crediting period under AM0028 and AM0034 and a default value set at the upper end of the uncertainty range of the IPCC default value and declining by 0.2 kg N₂O/t nitric acid per year to reflect technological innovation in primary catalysts that may reduce emissions over time. This approach caps the baseline emissions particularly for those plants that have established baseline emission factors above the IPCC uncertainty range. It also reduces the maximum amount of baseline emissions that can be claimed over time to account for technological innovations in primary catalysts. For production above the design capacity and other (mostly newer) plants, the methodology uses a more ambitious emissions benchmark set at 3.7 kg N₂O/t nitric acid in 2013 and declining by 0.2 kg N₂O/t nitric acid per year, up to a level of 2.5 kg N₂O/t nitric acid in 2020 which is maintained in subsequent years.

The new approach has several advantages but also some shortcomings:

- Importantly, using default emission benchmarks – whatever the real baseline emissions from a specific plant are – fully avoids perverse incentives for plant operators not to use advanced primary catalysts that reduce the formation of N₂O. Plant operators have incentives to innovate, as this lowers their project emissions and increases the number of CERs issued;
- Using default emission benchmarks further fully avoids the risk that plant operators could intentionally increase the rate of N₂O formation during a baseline campaign in order to maximize CER revenues;
- Using default emission benchmarks can lead to over-crediting in plants that actually have lower N₂O formation rates and to under-crediting in plants that actually have higher N₂O formation rates. Both under- and over-crediting is likely to occur since the N₂O formation rate observed in CDM projects varies by a factor of 10 from 3.5 to 37.0 kg N₂O/t nitric acid, with an average value of 8.6 kg N₂O/t nitric acid (UNFCCC 2012b). Significant over- and under-crediting can have several unintended consequences (Schneider et al. 2014). Plants with a high N₂O formation rate may not be able to reduce their project emissions significantly below the emissions benchmark and may thus not be implemented – although their implementation would be possible with a project-specific baseline. Such ‘lost opportunities’ could increase the global cost of GHG abatement.

The overall impact on environmental integrity depends on the methodology and plant type (Table 4-3). For newer plants, the emission benchmark declining from 3.7 to 2.5 kg N₂O / t nitric acid is rather conservative and will likely lead to under-crediting for most – if not all – plants. For plants that used AM0028 or AM0034 in the first crediting period, the declining project-specific benchmark in ACM0019 is a reasonable baseline on average over all projects in our assessment; projects with higher baseline emission rates than the IPCC range will receive less CERs, while some over-crediting could occur for projects that adopt more advanced catalysts at a faster rate than the decrease of 0.2 kg N₂O / t nitric acid per year foreseen in the methodology. The use of AM0028 and AM0034 could lead to over-crediting in some instances, due to the issues identified above. Considering all plant types and methodology versions together, it seems likely that the approaches for

baseline emissions overall reasonably provide for environmental integrity; the low or moderate levels of over-crediting that could occur under AM0028 and AM0034 could be compensated by significant under-crediting for newer plants applying ACM0019. Over time, the quality of CERs will increase due to the increased phase-in of ACM0019.

Table 4-3: Assessment of environmental integrity of nitric acid projects

Plant type	Methodology	Identified environmental integrity issues	2013-2020 CER potential	Potential for under- or over-crediting
Plants that started operation before 2006: 1 st CP	AM0028 AM0034	<ul style="list-style-type: none"> Perverse incentives not to adopt technologies that reduce the rate of N₂O formation Risk of manipulation of the production process during the baseline campaign 	73 million	Low or moderate over-crediting
Plants that started operation before 2006: 2 nd and 3 rd CP	ACM 0019	<ul style="list-style-type: none"> Under-crediting for plants with higher N₂O formation rates than the IPCC range Over-crediting for plants that adopt advanced primary catalyst technologies at faster rates 	70 million	Neutral / Low over- or under-crediting
Newer plants or plants that did not use AM0028/ AM0034	ACM 0019	<ul style="list-style-type: none"> None 	32 million	Moderate to significant under-crediting

Sources: Authors' own compilation

4.4.5. Other issues

No other issues were identified.

4.4.6. Summary of findings

Nitric acid projects have a very high likelihood of additionality. Baseline emissions can be over- or under-credited; overall, they are likely to reasonably ensure environmental integrity for 2013-2020 CERs, with the average quality of CERs improving over time.

An important lesson learned from this project type is that the potential for technological innovation and perverse incentives was not sufficiently considered when approving the initial methodologies. For sectors that could undergo significant technological innovation, using historic data or measurement campaigns to establish a baseline for up to 21 years is debatable. The more recent ACM0019 methodology accounts for technological innovation by using an emission benchmark that declines over time.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of overall over-crediting
Other issues	<ul style="list-style-type: none"> None

4.4.7. Recommendations for reform of CDM rules

No recommendations.

4.5. Wind power

4.5.1. Overview

CDM wind power projects mainly use four methodologies.⁴⁹ The vast majority of projects (more than 99% of all CDM wind projects) feed electricity into the grid.⁵⁰

According to the UNEP DTU (2014), by the end of 2013, an overall wind power capacity of 111 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (83 GW), India (10 GW), Mexico and Brazil (both 4 GW). The other 36 countries with CDM wind power projects account for 10 GW of installed capacity in total.

Figure 4-2, Figure 4-3 and Figure 4-4 illustrate the development of wind power capacity and the use of the CDM in China, India and Brazil.⁵¹ In China, installation of wind power capacity accelerated from 2005 onwards. A comparison of the total wind power capacity installed and the capacity installed by projects using the CDM⁵² over the 2005 to 2012 period (Figure 4-2) shows that CDM projects accounted for about 90% of the total cumulated installed capacity as of 2012 (about 75 GW). In the case of India (Figure 4-3), installed capacity increased significantly between 2005 and 2012 from 1.4 GW in 2005 to more than 15 GW in 2012. CDM projects accounted for about half (51%) of the total cumulated capacity installed as of 2012. In the case of Brazil (Figure 4-4), the total cumulated installed capacity as of 2012 was much smaller (2.5 GW). The share of CDM projects in cumulative capacity was 43% as of 2012.

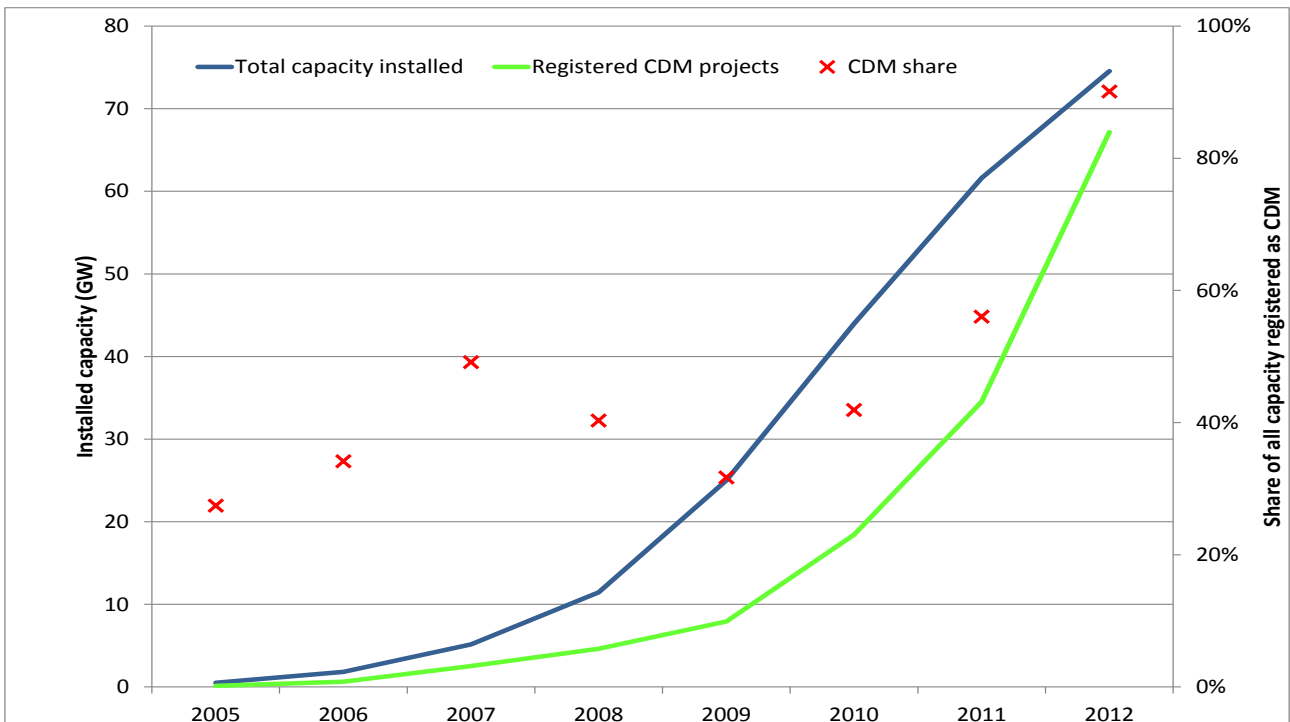
⁴⁹ ACM0002, AMS-I.A, AMS-I.D, AMS-I.F.

⁵⁰ ACM0002 (large scale), AMS-I.D (small scale).

⁵¹ China, India and Brazil are selected for the graphs in order to ensure comparability across chapters on renewable power generation since they are important CDM countries for hydropower and biomass power, too.

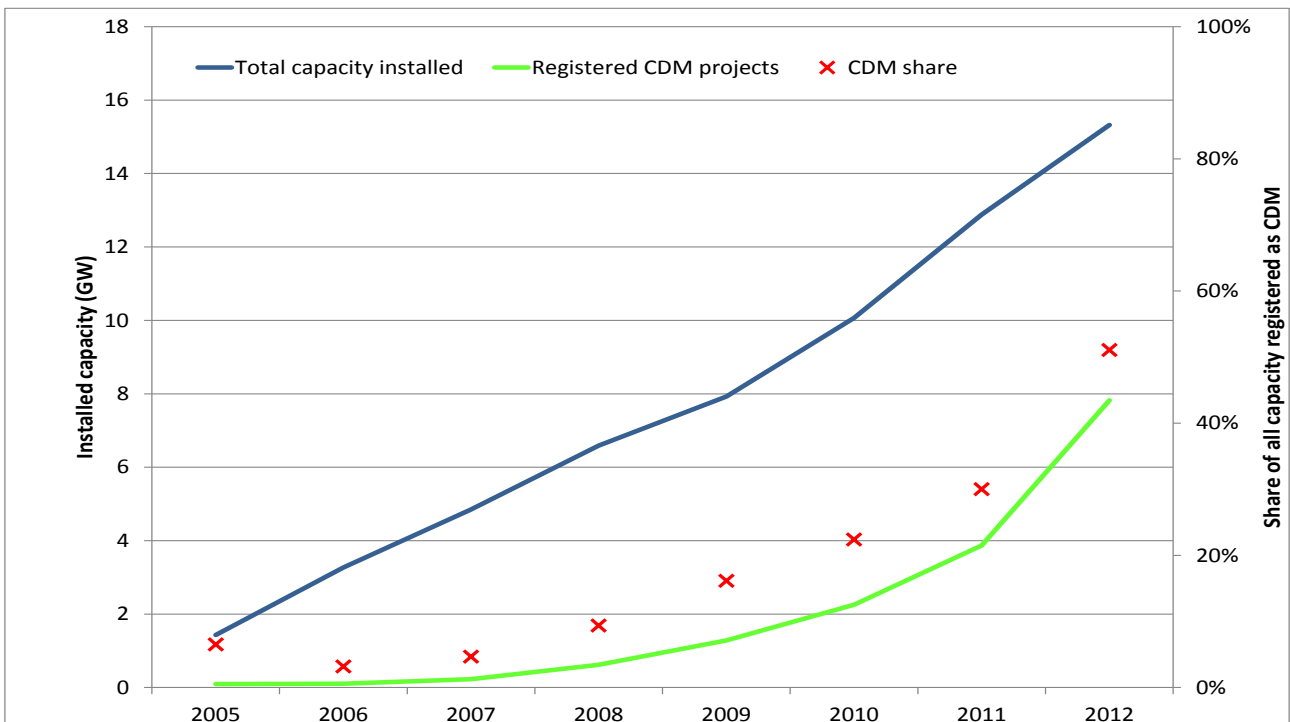
⁵² The total installed capacity between 2005 and 2012 is taken from the World Wind Energy Association statistics (WWEA 2015) and accumulated across the years. The installed capacity of projects using the CDM is taken from UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. Cumulative values were used to illustrate the contribution of the CDM since annual values are misleading due to potential differences between the year of construction and the year in which the crediting period starts. Therefore, cumulative values provide a better picture of the general trend of the CDM share in total capacity installed.

Figure 4-2: Total cumulated wind power capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

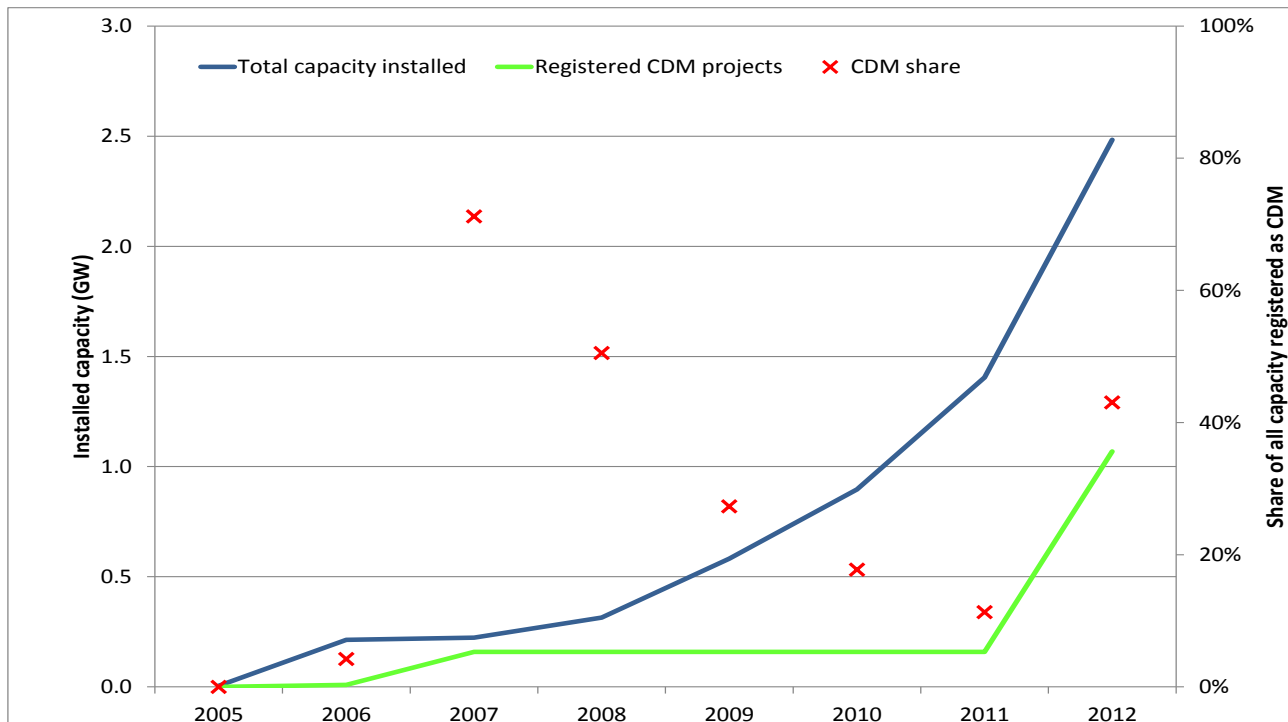
Figure 4-3: Total cumulated wind power capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

Figure 4-4: Total cumulated wind power capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

4.5.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 3.5 billion CERs by the end of their respective crediting periods, of which 1.4 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about one quarter of the total CER issuance potential.

4.5.3. Additionality

Large-scale wind power projects apply the methodology ACM0002 which requires using the “Tool for the demonstration and assessment of additionality” to demonstrate additionality.⁵³ In this tool, the investment analysis is one of the approaches for demonstrating additionality. Most CDM wind power projects use investment analysis. The tool for small-scale projects (“Methodological tool. Demonstration of additionality of small-scale project activities”⁵⁴) requires “an explanation to show that the project activity would not have occurred anyway due [...] to barriers”, among which one of the most important barriers is the so-called ‘investment barrier’, which generally features a similar rationale as for the investment analysis of large-scale projects.

Section 3.2 describes the general criticism associated with the investment analysis and Section 2.4 assesses for different project types the impact of CER revenues on their economic performance. According to these analyzes, for wind power projects, CER revenues lead to an increase in the internal rate of return (IRR) of two to three percentage points. An analysis by the World Bank finds that “the incremental IRR from future carbon revenues in renewable energy projects, taking the World Bank’s projects as an example, is quite low” (Carbon Finance at the World Bank 2010). In

⁵³ Current version 07.0.0 (EB 70, Annex 8).

⁵⁴ Current version 10.0 (EB 83, Annex 14).

this analysis, the incremental IRR for renewable energy projects amounts to 1.7% for a purchase period of 10 years and an assumed CER price of \$10/t. Another analysis finds that “wind, hydro and biomass projects experience only a small increase in profitability through CDM” and that “the change in profitability caused by regional variables is greater than the CDM’s impact for wind, hydro and biomass”⁵⁵ (Schneider, M. et al. 2010). From these analyzes, it can be concluded that the CDM impact in the profitability of wind power plants is generally relatively low and that the ‘signal’ provided by the CDM is usually much smaller than the ‘noise’ of national and regional variations in other parameters.

In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables. Spalding-Fecher et al. (2012) provide an overview of several important support incentives for renewable energy generation in major CDM countries (such as China and India) and find “that national policies on electricity tariffs for renewable power could be a more important driver of the viability of wind, hydropower and biomass projects than the CDM is.” In the case of wind power plants in China, Bogner & Schneider (2011) point out that “the wind power boom in China is mainly driven by favourable policies and not by the CDM” and that “the majority of projects would most likely have been implemented without the CDM”. Liu (2014) elaborates on the links between the CDM and national policy in the case of wind power development in China. He finds that a decreasing national feed-in tariff can increase “CDM-supported installed capacity because more projects may comply with CDM requirements as their financial returns remain below the predefined additionality threshold”, which indicates that there is a clear interference between national policy development and the additionality requirements of the CDM. He also finds that “the reduction of technology costs combined with an increasing local manufacturing capacity has paved the way for a scaled-up deployment of wind capacity” (ibid.), which indicates that other factors than the CDM were important in the significant growth of wind power in China. However, he concludes that the CDM “effect on wind technology diffusion [...] is more than twice as high as that of technology cost and industrial policy” (ibid.). He also finds that “while domestic policies must be the engine for large-scale clean energy investments in developing countries, the international carbon offset policy can help that engine run faster, but only if the engine is running” (ibid.). For India, in comparing wind power projects registered under the CDM with those without such support, Dechezleprêtre et al. (2014) find that, “all other things being equal, CDM wind farms tend to be larger, to benefit from higher feed-in-tariffs, and to be located in windier areas, three factors which increase profitability.” According to this analysis, there is “serious evidence of non-additionality of the CDM” (ibid.). He & Morse (2013) find that “Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs)” and this leads to the conclusion that “IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime”.

Furthermore, investment costs for wind power generators have decreased significantly in recent years, which results in wind power featuring (in many cases) competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013). In addition, IRENA (2015) also shows that specific investments costs for onshore wind power plants are significantly lower in China and India than in OECD and ‘rest of the world’ countries. Similarly, Schmidt (2014) finds that the risk associated with low-carbon investment is higher in some parts of the world than in others. In an analysis for industrialised and low-income countries (using typical values for costs of capital in these countries), he finds that due to the higher cost of capital in low-income countries, levelized costs of electricity for onshore wind power plants could be as much as 46% higher than in low-risk countries. Altogether, the available information indicates that the profitability of wind power

⁵⁵ In this analysis, regional factors are the electricity tariff, the load factor and the discount rate.

plants has generally improved. However, there is also a significant dependence of the profitability on regional circumstances.

Overall, due to the limited impact of CER revenues on the profitability of wind power plants, the widespread introduction of domestic support schemes and the significant decrease of wind power costs, we consider the additionality of wind power projects as generally questionable in the context of the CDM, at least for countries with support schemes, low investment costs for wind power and low investment risks.

4.5.4. Baseline emissions

Baseline emissions of CDM wind power projects feeding electricity into the grid include CO₂ emissions from fossil-fired power plants that are displaced due to the project activity. In most cases, the corresponding baseline CO₂ emission factor is estimated using the “Tool to calculate the emission factor of an electricity system”⁵⁶ (Box 4-1).

Box 4-1: The grid emission factor tool

The grid emission factor is calculated as the “combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM)”⁵⁷. According to the tool, “the operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed CDM project activity. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.”

In the tool, several approaches for estimating the combined margin are presented, depending on the specific conditions of the project and data available. In general, the approach of using a combination of OM and BM, depending on the type of project, is appropriate. It suitably reflects that CDM projects could have short-term impacts on the dispatch of power plants and long-term impacts on the power plants built, and different weights for the OM and the BM can be applied (depending on the crediting period and on whether it relates to a project using intermittent or non-intermittent sources), which also can be considered appropriate. A number of specific issues arise from the tool:

In many cases, so-called low-cost and must-run power plants are not considered in the calculation of the CO₂ grid emission factor, which may lead to higher baseline emissions per amount of electricity produced. Neglecting low-cost/must-run power plants, such as renewables or nuclear power, may generally be considered adequate for the estimation of the operating margin (since low-cost/must-run power plants can be expected to be running irrespective of any other power plant in the system). However, an increasing share of renewables (e.g. wind or solar) in the system may lead to a situation in which renewable power generation is at the margin in some hours, i.e. an additional kilowatt hour of renewable electricity does not displace fossil fuels in that hour. In some countries, for example, wind power plants are switched off when electricity supply exceeds demand in order to ensure a stable electricity system. Furthermore, ‘low-cost’ power plants are not clearly defined and some of them may be dispatchable (such as biomass). Overall, the provision of excluding low-cost/must-run power plants may lead to an overestimation of baseline emissions.⁵⁸

⁵⁶ Current version 04.0 (EB 75, Annex 15).

⁵⁷ AMS-I.D, version 17 (EB 61, Annex 17).

⁵⁸ It has to be noted, however, that in the case the country has a large share of low-cost/must-run power plants (more than 50%), e.g. hydro, the simple adjusted operating margin has to be used. In that case, whenever hydro electricity provides sufficient electricity to cover the load demand in a certain hour, this hour is counted as not emitting. This leads to lower baseline emission factors overall than the simple operating margin. The implicit assumption is that water would be spilled in that hour if additional (i.e. CDM) power

Also, both the operating and the build margin approaches are based on historical production and installation data if the option of determining the grid emission factor at the validation stage (ex-ante) is chosen. The resulting baseline grid emission factor is then kept constant throughout the crediting period and only updated at the renewal of the crediting period. This approach does not reflect the general trend towards an increasing share of less-emitting power sources in the electricity mix of many countries. It is oriented to past power systems (backward-looking perspective) rather than to the actual power systems during the crediting period with a higher penetration of renewables (forward-looking perspective). This is especially problematic in countries with a rapidly changing or expanding electricity system. In countries with a growing share of renewable energy capacities, this approach may lead to an overestimation of baseline emissions. However, due to the long-lived capital stock in the electricity sector, changes of the grid emission factor are only gradual (i.e. take several years) in case the power system as a whole is not expanding fast. An advantage of using historical data is that it relies on observed and objective information, whereas scenarios for the future development of the power system may be prone to uncertainty and use of unrealistic assumptions.⁵⁹ Therefore, the determination of the grid emission factor based on historical data is not considered problematic per se but should be adjusted to account for trends in the sector.⁶⁰ Another option for determining the grid emission factor is the ex-post determination during monitoring. This approach is certainly adequate since it reflects the current state of the power sector.

With regard to the build margin, CDM projects are generally excluded from the estimation of the CO₂ emission factor. CDM projects only need to be gradually included if they comprise a significant share of power plants built in the last ten years. This approach can generally be considered adequate, especially in countries with an already significant share of renewable electricity generation or promotional policies for renewables in place, in which case a neglect of CDM projects in the build margin would not be a plausible representation of what would have happened in the absence of the project. This approach therefore addresses the risk of over-estimating baseline emissions in countries with a large share of CDM projects.

The quality of input data in calculating the grid emission factor is also important. In analysing grid emission factors provided by different DNAs, Michaelowa (2011) finds “that most of the documents provided by the DNAs do not allow an external observer to judge whether the data has been collected correctly” and that “there are clear indications that the grid emission factors, as well as the coal power plant benchmarks, have been overestimated both in China and India.” In some countries, the governments established grid emission factors, and DOEs apparently used the values without validating whether they comply with the methodological requirements under the CDM. In order to address this issue, Michaelowa (2011) recommends, inter alia, an “independent validation of grid EF”. Recently, few grid emission factors are submitted as standardized baselines which ensures independent validation by a DOE or the UNFCCC secretariat.

Furthermore, the tool provides several default values for parameters such as the electric efficiency of power plants. The values provided can be considered quite conservative, i.e. they assume rather high electric efficiencies. For those countries using the default values, this may lead to an under-estimation of baseline emissions.

generation is available. However, some countries do not only have run-of-river hydro power plants (for which case, the assumption of spilling water may be reasonable), but water may also be stored in large reservoirs and thus used at a later stage. In this regard, the estimation of baseline grid emissions for countries with a large share of low-cost/must-run power plants can be considered conservative, i.e. tending to under-estimate baseline emissions. However, it has to be noted that less than 5% of CDM projects used this approach for estimating the grid emission factor.

⁵⁹ E.g. assuming that there would be a significant increase of coal-fired power generation without straightforward evidence.

⁶⁰ For example, trends in a changing composition of the electricity grid or the grid emission factor observed in recent years could be considered and extrapolated for future years. Similar approaches are used in a number of other CDM methodologies.

The overall emissions impact of wind power plants also depends on other factors. Firstly, the upstream emissions from wind power, such as for construction, are relatively low (about 10 g CO₂e/kWh (IPCC 2014)); for most countries they are likely to be lower than upstream emissions from fossil fuel use displaced in grid power plants. Ignoring upstream emissions is therefore a conservative assumption. Secondly, an increasing uptake of wind power plants due to the CDM may lead to decreasing costs for wind power generation, which in turn could contribute to a higher uptake of wind power. This positive spillover effect is, however, difficult to estimate, in particular with regard to any emissions outcome. Thirdly, the length of the crediting period may lead to under-crediting if wind power plants are operated longer than the crediting periods.⁶¹ However, many wind power plants are expected to operate for about 20 years and about three quarter of wind power projects have selected a renewable crediting period of up to 21 years. Further aspects of potential over- and underestimation of baseline emissions are described in (Erickson et al. 2014).

Overall, we conclude that the current approach for estimating emission reductions from CDM wind projects is largely suitable. Methodological assumptions lead to both over- and under-estimation of emission reductions but can be considered appropriate for estimating baseline emissions of CDM wind projects.

4.5.5. Other issues

No other issues were identified.

4.5.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenue has only a limited impact on profitability of wind power plants • Support schemes often exist and are a main driver for wind power development • Investment costs have decreased significantly in recent years, making wind power in some cases competitive with fossil generation (LCOE) • Wind power is already widely used in large CDM countries (e.g. China, India)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; no clear-cut conclusion on whether over- or under-crediting occurs overall
Other issues	<ul style="list-style-type: none"> • None

4.5.7. Recommendations for reform of CDM rules

Due to our finding of an overall questionable additionality of wind power projects, we recommend that this project type is generally no longer eligible for new projects under the CDM. As an exception to this rule, countries with significant technological and cost barriers⁶² may be allowed to further use the CDM for implementing wind power plants.

With regard to the estimation of baseline emissions, we recommend the following:

- The CDM EB should ensure that grid emission factors are always verified by designated operational entities (DOEs);

⁶¹ For a discussion of the effects of the crediting period, refer to Section 3.5.

⁶² Such as transaction costs, e.g. due to the non-availability of technical knowledge in the country, or risk premiums in low-income countries. Least-developed countries could, for instance, be included in the list of eligible countries. Furthermore, the market share of wind power could be used to establish eligibility since it could be considered an indicator for barriers in the country.

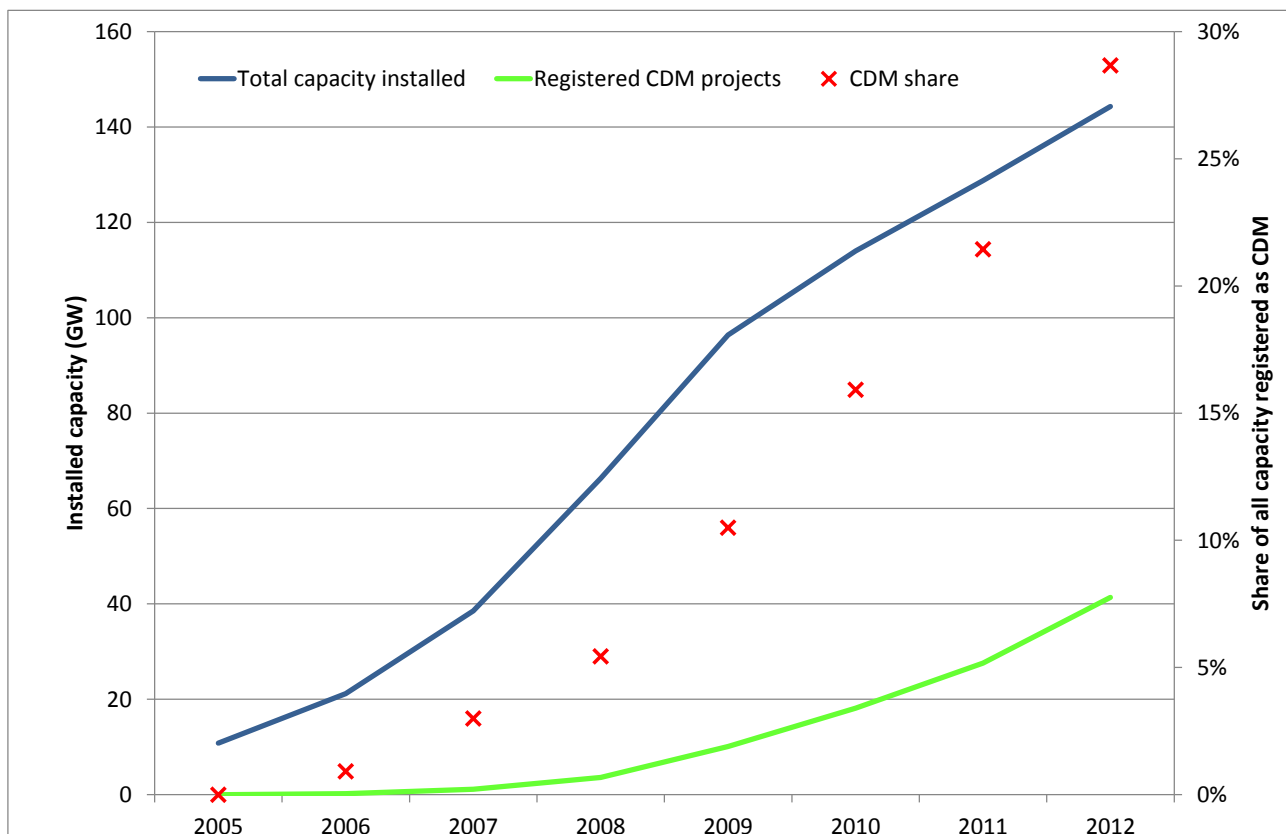
- The provisions for low-cost/must-run plants should be reviewed, including a clear definition of such plants and provisions which ensure that such plants are included in the operating margin if they are at the margin of the dispatch at any time;
- The grid emission factor tool should be revised to reflect trends in the composition of the power sector over time.

4.6. Hydropower

4.6.1. Overview

CDM hydropower projects mainly use two methodologies.⁶³ According to the UNEP DTU (2014), by the end of 2013, an overall hydropower capacity of 92 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (58 GW), Brazil (12 GW), followed by Vietnam and India (6 GW each). The other 44 countries with CDM hydropower projects account for 11 GW of installed capacity in total.

Figure 4-5: Total cumulated hydropower capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

As for wind power, Figure 4-5, Figure 4-6 and Figure 4-7⁶⁴ illustrate the development of hydropower capacity and the use of the CDM in China, India and Brazil. In all three countries, hydropower has played an important role for many decades. Significant capacity has been installed without the CDM. Hydropower may therefore be considered common practice in all three countries.

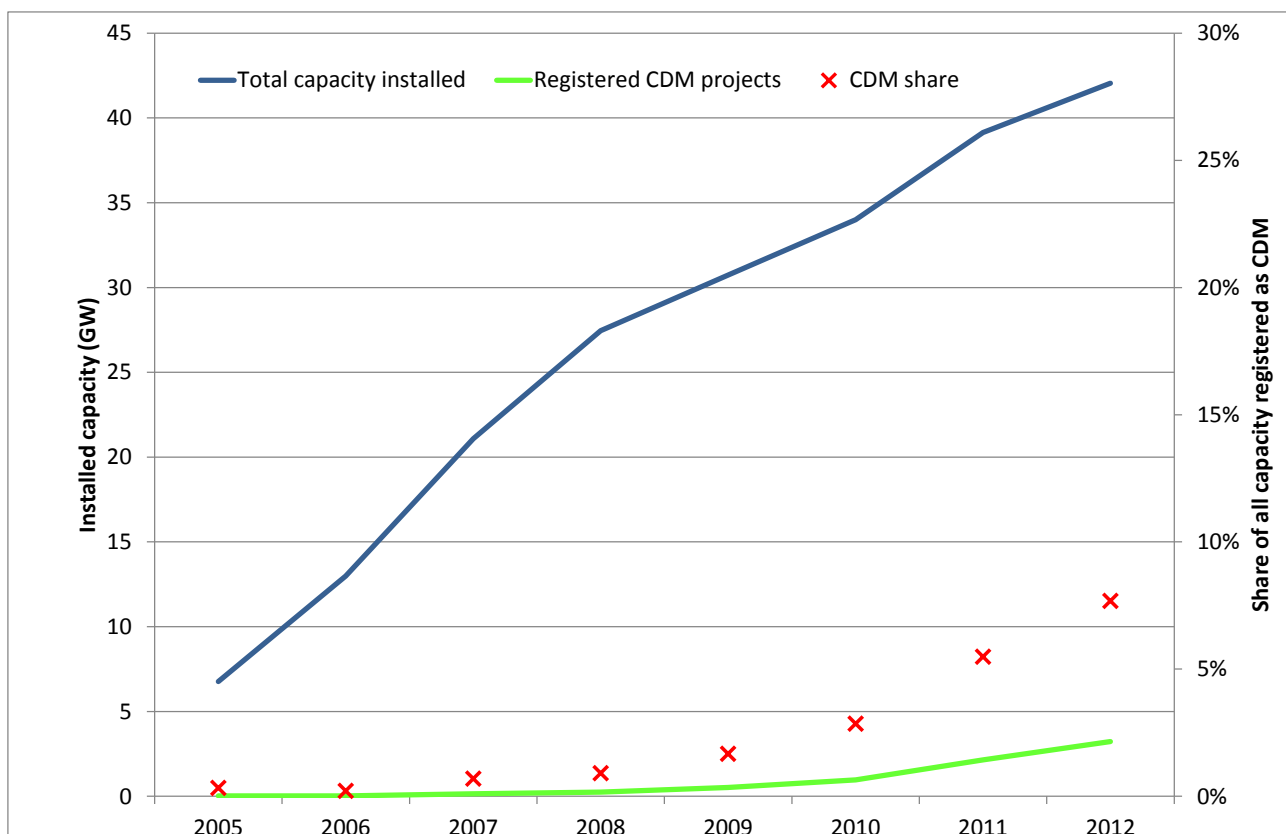
⁶³ ACM0002, AMS-I.D.

⁶⁴ Cf. footnote 51.

In China, the cumulated installed capacity in 1990 amounted to approx. 25 GW. A comparison of total hydro capacity installed and the capacity installed by projects using the CDM⁶⁵ over the 2005-2012 period (Figure 4-5) shows that there were no CDM projects until 2005, even though capacity additions in that year amounted to 11 GW. As of 2012, the share of CDM projects was 29% of total installed capacity.

In the case of India (Figure 4-6), the cumulated installed capacity in 1990 amounted to approx. 19 GW. Almost 7 GW of capacity was added in 2005 alone, with the CDM covering only a negligible share. After the introduction of the CDM, only a small share of hydropower projects used the CDM, with the CDM accounting for about 8% of total cumulated installed capacity⁶⁶ as of 2012.

Figure 4-6: Total cumulated hydropower capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

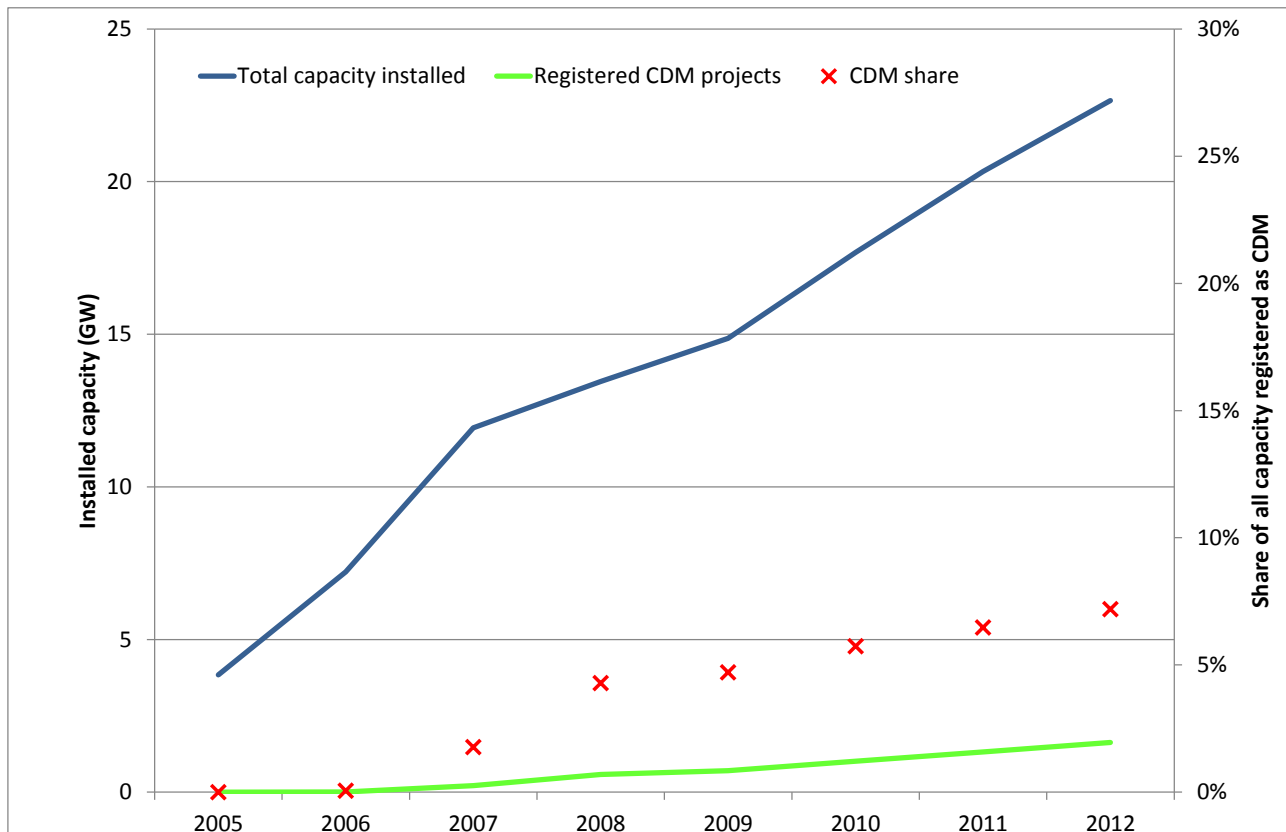
In the case of Brazil (Figure 4-7), the cumulated installed capacity in 1990 amounted to approx. 53 GW. Almost 4 GW of capacity was added in 2005, with no CDM projects being registered in that year. Even after the introduction of the CDM, only a small share of hydropower projects used the CDM (approx. 7% of total cumulated installed capacity⁶⁷ as of 2012).

⁶⁵ The total installed capacity between 2005 and 2012 is taken from the Platts database and accumulated across the years. The installed capacity of projects using the CDM is taken from the UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. See Section 4.5 for the rationale of using cumulative data.

⁶⁶ Between 2005 and 2012.

⁶⁷ Between 2005 and 2012.

Figure 4-7: Total cumulated hydropower capacity installed in Brazil between 2005 and 2012 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

4.6.2. Potential CER volume

According to our own estimates, registered CDM hydropower projects have the potential to issue 4.2 billion CERs by the end of their respective crediting periods, of which 1.7 billion CERs fall in the 2013-2020 period (Table 2-1). CERs from hydropower account for approx. 30% of the total CER issuance potential.

4.6.3. Additionality

Generally, the same methodologies and additionality rules apply as for wind power (Section 4.5.2). Hydropower CDM projects primarily use investment analysis to demonstrate additionality.

The analysis in Section 4.6.1 demonstrates that hydropower plants have been constructed for a long time in many countries, which suggests that the technology may be regarded as common practice in many countries. In many cases, especially large hydropower plants were established without subsidies, which is demonstrated by the uptake of hydropower many years ago (Section 4.6.1). In the case of small hydropower (SHP) plants in China, Bogner & Schneider (2011) find that “apparently, smaller SHP plants face stronger barriers despite the government’s commitment to SHP development” and that “an especially remote location, an inappropriate feed-in tariff or banks that deny loans can be possible barriers”. Therefore, they conclude that “the CDM may have played a certain role for some SHP project developments” (ibid.). However, they argue that “investment in SHP stations between 20 and 50 MW appear more feasible without the CDM” (ibid.). Moreover, according to their analysis “medium and large hydropower has witnessed considerable growth a long time before the CDM even existed, which makes it difficult to justify that new projects

can only be implemented with the help of the CDM. In conclusion, our analysis suggests that the CDM is for most projects not an important factor for investment decisions in the medium and large hydropower plants. It appears likely that most projects would have been implemented in any case, i.e. without the CDM”.

The impact of CER revenues on profitability is, at three to four percentage points, somewhat larger than for wind power (Section 2.4), mostly due to a higher plant utilization than for wind power. However, the increase in profitability due to CDM revenues is still relatively small compared to other project types⁶⁸. Also, in many cases, hydropower generally features competitive leveled costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Overall, due to the fact that hydropower is common practice in many countries, the limited impact of CER revenues on the profitability of hydropower plants and the competitiveness of hydropower with fossil electricity generation in many cases, we consider additionality of hydropower projects as questionable in the context of the CDM, especially for large hydropower.

4.6.4. Baseline emissions

Hydropower projects largely use the same methodological approaches for baseline emissions as wind power plants, and hence the same conclusions apply with regard to different aspects of over- or under-crediting. Few differences should be noted with regard to the emission impacts: Hydropower projects have, on average, somewhat higher upstream emissions for their construction (approx. 20 g CO₂e/kWh related to the “infrastructure & supply chain emissions” according to (IPCC 2014)), which, however, are still lower than typical upstream emissions from fossil use in the baseline. Thus, ignoring upstream emissions is still conservative. More importantly, the lifetime of hydropower can be significantly longer than the maximum crediting period under the CDM (21 years), which adds to the conservatism of the estimation of emission reductions for hydropower plants. In this regard, over the plants' lifetime, overall emission reductions may be rather under-estimated than over-estimated.

4.6.5. Other issues

In addition to baseline emissions, project CH₄ emissions ensuing from hydro reservoirs are considered under the CDM. The ACM0002 methodology uses the power density, which is defined as the installed hydro capacity divided by the reservoir surface, as an indicator of whether CH₄ emissions from reservoirs need to be considered. CDM projects with a power density below 4 W / m² are not eligible and projects with a power density between 4 and 10 W / m² have to estimate methane emissions, using a default emission factor of 90 g CO₂e/kWh. According to (IPCC 2014), methane emissions from “currently commercially available technologies” amount to 88 g CO₂e/kWh, however, the bandwidth is quite large. However, according to (Fearnside 2015), the default emission factor of 90 g CO₂e/kWh refers “only to bubbling and diffusion from the reservoir surface and” is an underestimate “of hydropower impact because these values ignore the main sources of methane release: the turbines and spillways”. Overall, he finds that “tropical hydroelectric dams themselves emit more greenhouse gases than are recognized in CDM procedures”. It can therefore be concluded that the current methodological rules under the CDM may lead to a potential underestimation of methane emissions from hydropower.

⁶⁸ It has to be noted, however, that the range of operating hours and investment costs of hydro power plants depends quite strongly on plant-specific conditions, for which reason the contribution of the CDM to overall profitability may be higher in some cases and lower in others.

4.6.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Common practice in many countries • CERs have only a moderate impact on profitability • In many cases competitive with fossil generation (LCOE)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project, emission reductions are likely to be underestimated
Other issues	<ul style="list-style-type: none"> • Potentially significant methane emissions from reservoirs which may not be fully reflected by CDM methodologies

4.6.7. Recommendations for reform of CDM rules

We recommend excluding large scale hydropower projects from being eligible under the CDM, due to the overall questionable additionality. A similar recommendation is made by (Erickson et al. 2014), who, in an analysis of the net mitigation impact of the CDM conclude “that excluding large scale power supply projects from the CDM could help increase the net mitigation impact of the CDM, as well as steer investment towards projects that are truly dependent on CER revenues”. We recommend that small-scale hydropower projects with significant technological or cost barriers⁶⁹ may be allowed under the CDM.

With regard to the estimation of baseline emissions, our recommendations for wind power plants (Section 4.5.7) also apply here. In addition, the provisions with regard to the estimation of methane emission from hydropower should be revised to address the potentially significant magnitude of these emissions.

4.7. Biomass power

4.7.1. Overview

CDM biomass power projects mainly use four methodologies.⁷⁰ According to the UNEP DTU (2014), by the end of 2013, an overall biomass energy⁷¹ capacity of 8.5 GW was installed by projects using the CDM. The main contributors to this overall capacity are China (3.7 GW) and India (2.1 GW), followed by Brazil (0.9 GW). The other 36 countries with CDM biomass projects account for 1.8 GW of installed capacity in total.

Generally, data availability is not sufficient to judge the magnitude of biomass capacity installed prior to the introduction of the CDM. Moreover, due to inconsistencies in the data, no meaningful comparisons can be made between projects installed with and without the use of the CDM.

4.7.2. Potential CER volume

According to our own estimates, all registered CDM biomass power projects have the potential to issue 0.36 billion CERs by the end of their respective crediting periods, of which 0.16 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from biomass power account for about 3% of the total CER issuance potential.

⁶⁹ The criteria need to be further specified. See also footnote 62.

⁷⁰ ACM0006, AM0015, AMS-I.C, AMS-I.D. It has to be noted, however, that the AM0015 methodology was only used for CDM projects registered in the early phase of the CDM.

⁷¹ Including different energy forms from biogenic sources.

4.7.3. Additionality

For large-scale projects (according to ACM0006), the identification of the baseline scenario and the demonstration of additionality are conducted in parallel.⁷²

With regard to the investment analysis, due to the diversity of project types, no overall conclusions can be drawn. Also, analysis available in the literature is quite limited, in contrast to wind and hydropower. On average, the impact of CER revenues on the profitability of projects is with about eight percentage points considerably larger than for wind or hydropower plants, making additionality claims more plausible (Section 2.4). The profitability of projects without CER revenues is, with an average IRR of approx. 5%, also lower than for wind (approx. 7%) and hydro (approx. 8%). The higher impact of the CDM is mostly due to the claiming of avoided methane emissions in many projects, which significantly improves the profitability of CDM biomass projects.

The investment analysis, which is applied by many projects, involves considerable uncertainty due to the variability of the biomass price, which strongly affects the profitability of biomass plants. In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables, including ones for biomass power generation. In addition, biomass power is not a completely new technology, but is rather based on the technology of thermal power plants in general and has been used extensively in some industries and countries before (e.g. in the sugar cane industry in Brazil), which indicates that the technology has been profitable in the past in some instances. This is underpinned by the fact that biomass power features competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Only a few scholars explicitly deal with the additionality of CDM biomass power projects. Stua (2013) finds that, in the case of China, the national feed-in tariff made “most of the biomass-fuelled power plants [cost-competitive] against [...] coal-fired plants”.

Overall, based on the information presented above, we cannot clearly conclude on the likelihood of the additionality of biomass power plants.

4.7.4. Baseline emissions

As outlined in Section 4.7.2, the identification of the baseline scenario and the demonstration of additionality are conducted in parallel, considering a wealth of different options.

One key requirement in methodologies for using biomass residues is that the biomass residues would not be used in the absence of the project and would be left to decay (sometimes aerobically, sometimes anaerobically also claiming CH₄ baseline emissions). This requirement is appropriate and important due to potential competing uses for the biomass. If the biomass residues were used in the absence of the project for other purposes, there may be no emission reductions, since the diversion of biomass from one use to another due to the CDM may lead to increased emissions elsewhere. If CDM projects only divert the use of biomass residues but do not result in more biomass residues being collected which would otherwise decay, this may also lead to indirect land-use change, i.e. due to the increased use of biomass (residues), previous demand may be covered by drawing on biomass from other areas, thus leading to decreasing carbon stocks there.

Methodologies vary with regard to how they assess that the biomass residues are indeed ‘available in abundance’ and that decay is a likely scenario. In older versions, the abundance of biomass residues had to be monitored annually, while in newer versions this is only checked once at the project start and at the renewal of the crediting period.

⁷² For small-scale biomass projects, the same additionality rules as for wind power apply (Section 4.5.2).

In general terms, there is an increasing demand of biomass for different uses (food, raw materials, energy) worldwide. This means that biomass residues (in many cases) either already have or will likely have a price in the future. As a consequence, the demonstration that biomass residues would otherwise be (completely) left to decay needs to take current market developments into account. For this reason, a regular checking of the abundance of biomass residues through monitoring may be more appropriate than a simple check once at the project start.

Furthermore, in many cases, anaerobic decay of biomass is claimed by project developers. However, this assumption may be contested depending on the circumstances. For instance, if biomass waste is spread on fields, biomass decay is rather aerobic than anaerobic, thus producing little or no methane emissions. In many instances, the amount of methane emissions claimed appears very large; it may be questionable whether truly anaerobic conditions prevail in the typical circumstances in which biomass residues are left to decay. We therefore conclude that the current approach of demonstrating the abundance of biomass residues may lead to a risk of over-crediting as no adequate monitoring of availability of biomass residues is in place. In addition, exaggerated claims of anaerobic decay of biomass may lead to further over-crediting.

With regard to the baseline emissions from displacing power plants in the grid, the same conclusions apply as discussed in Section 4.5.4.

4.7.5. Other issues

No other issues were identified.

4.7.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Significant impact of CER revenues on plant profitability due to claims of methane emission reductions • In many cases competitive with fossil generation (LCOE) • Support schemes exist
Over-crediting	<ul style="list-style-type: none"> • Demonstration that biomass is left to decay or available in abundance is only conducted once at the start of the project activity • Risk of exaggerated claims of anaerobic decay
Other issues	<ul style="list-style-type: none"> • None

4.7.7. Recommendations for reform of CDM rules

Due to our finding that the demonstration of abundance of biomass as well as of the claim that biomass is left to decay (under potentially anaerobic conditions) is key for avoiding any over-crediting of emissions, it is recommended that corresponding provisions in the applicable methodologies are reviewed, with a view to ensuring that this demonstration considers current trends of biomass use and disposal and that any claims for anaerobic conditions of biomass decay are realistic. In particular, the monitoring of biomass abundance should be carried out more frequently (e.g. annually).

4.8. Landfill gas

4.8.1. Overview

Decomposition of solid waste in landfills generates carbon dioxide (CO₂) and methane (CH₄). This landfill gas can be captured and flared or captured and utilised for electricity production or as a fuel. GHG emission reductions are achieved through the destruction of methane, and in the case of

energy production, displacement of a more GHG-intensive energy source. Global estimates suggest that 50 Mt of methane are generated annually from landfills (IPCC 2014).

The composition of landfill gas is usually approx. 50% CO₂ and 50% CH₄ (Hoorweg & Bhada-Tata 2012; US EPA 2013). It varies by climate and waste composition. In general, methane generation increases in wetter versus arid climates and warmer versus cooler climates. Warmer climates increase the growth of methane-producing bacteria (US EPA 2013). Waste composition with a higher percentage of organic material generates more methane and degrades more quickly (US EPA 2013). Waste in lower income countries often includes a higher percentage of organic material than higher income countries (Hoorweg & Bhada-Tata 2012).

4.8.2. Potential CER volume

The potential to capture landfill gas varies by landfill management type. Gas collection rates can be as high as 75% for basic landfills in which waste is compacted and covered and up to 85 - 95% for engineered sanitary landfills whereby landfills are lined or capped to prevent leakage or contamination from the waste (US EPA 2013). Landfill management practices vary by region. While the majority of landfills in developed countries are engineered landfills, in developing countries mitigation opportunities are more limited because the majority of landfills are basic landfills or open dumps (US EPA 2013). In open dumpsites, decomposition is predominantly aerobic; as a result methane generation rates are relatively low and gas recovery rates are limited (~10%) (US EPA 2013). Because there is often a high concentration of food waste and wet condition in developing country sites, waste decays quickly and the methane gas is released quickly. As a result, mitigation activities to capture methane must be implemented on active open dumpsites, since after a lag of even 1-2 years most of the methane will have already been generated⁷³ (US EPA et al. 2012).

There are two primary landfill gas methodologies under the CDM. ACM0001 is the consolidated large-scale methodology and AMS-III.G is the small-scale methodology. As of 1 July 2015, there were 364 registered landfill gas projects. Predominantly these are large-scale projects located in Latin America and Asia/Pacific regions, though there are also projects in Africa, Europe/Central Asia and the Middle East. Of the 364, 149 projects have issued a total of 69 million CERs. As of 1 August 2015, the average issuance success rate amounted to 58% (UNEP DTU 2015a).

4.8.3. Additionality

Prior to 2013, large-scale landfill gas projects assessed additionality according to the CDM "Combined tool to identify the baseline scenario and demonstrate additionality". This tool, similar to the CDM 'additionality tool' requires that projects demonstrate that they are additional based on either an investment or a barrier analysis, complemented by a common practice analysis. Similarly, prior to 2014, small-scale projects applied the general guidelines or tool for small-scale activities. Most projects used investment analysis to demonstrate additionality, predominantly benchmark analysis or simple cost analysis (IGES 2014, similar to earlier results from Spalding-Fecher et al. 2012).

A standardized approach to additionality assessment was incorporated into Version 15 of ACM0001, eligible as of 8 November 2013, and version 9 of AMS-III.G, eligible as of 28 November 2014. This revision established a positive list for additionality of landfill gas projects. All landfill gas projects are automatically considered additional if prior to the implementation of the project they only vented or flared methane, and if under the project activity they either flare the methane, or use methane to generate heat, or use the methane to generate power with a capacity of less than 10 MW. As of 1 May 2014, only one landfill gas project had been registered using this methodology

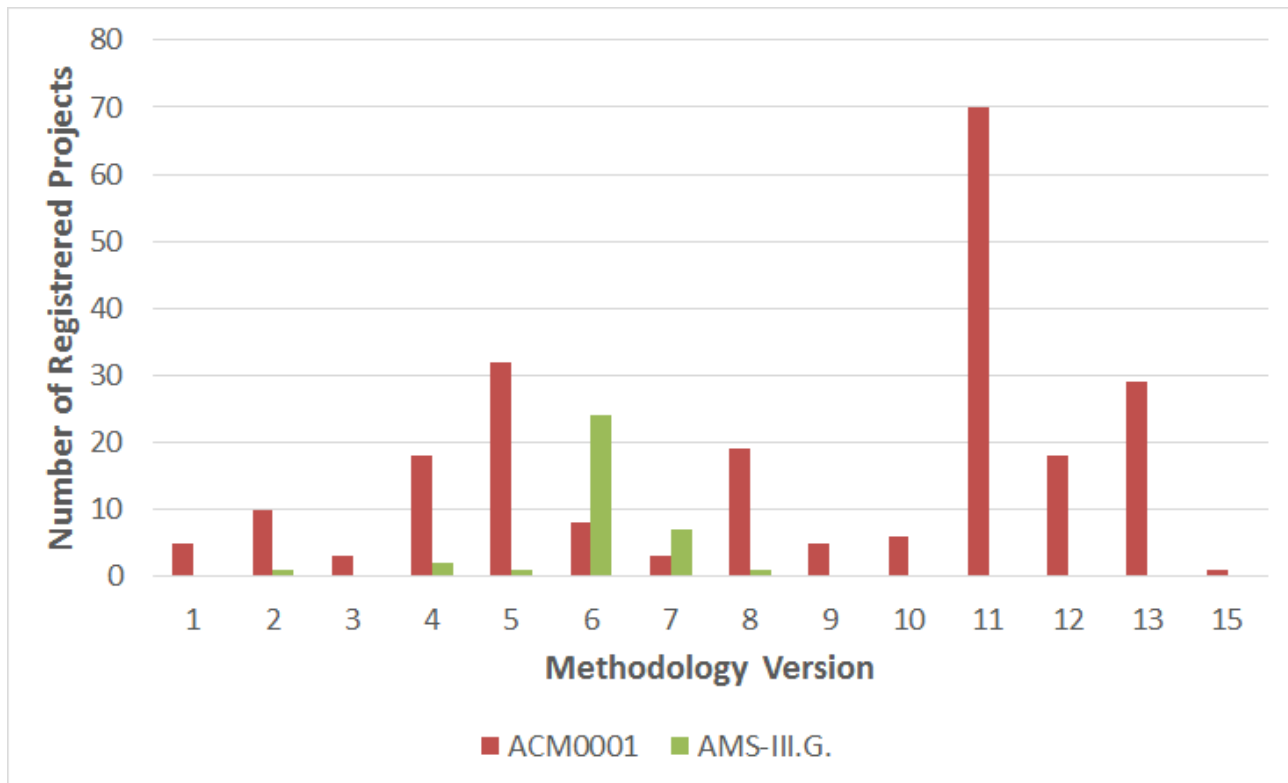
⁷³ While not applicable for the landfill gas methodology (ACM0001), the rapid decay rates may have implications on the applicability of the first order decay model used in the CDM "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" and included in the avoided landfilling via composting methodologies.

Version 15, as shown in Figure 4-8. The CDM EB will review the validity of these standardized procedures after a three-year time period.

CDM projects can only claim emission reductions for methane capture that exceeds any applicable regulations. In regions in which a regulation is in place but it can be demonstrated that it is not enforced, projects can still claim emission reductions for implementing the regulation. This has raised concerns that enforcement may be discouraged by constituencies receiving CER revenues. One such example is in the Philippines, where regulation has been established requiring gas capture and destruction, but it has not been enforced. Concerns have been raised that CER revenue has led to a pressure to discourage enforcement (Docena 2010).

Projects that capture and flare methane have no independent revenue source (US EPA et al. 2012). Flaring projects are therefore very likely to be additional. For projects using landfill gas for energy generation, additionality seems likely. As shown in Section 2.4, the available data from CDM projects indicates that the IRR is rather low without CER revenues (approx. 2.5-2.8% on average) but increase substantially with CER revenues (to approx. 16.6-18% on average). Indeed, collection and flaring of landfill gas is not common practice in developing countries without carbon finance, though it may be possible to implement projects economically where there are renewable portfolio standards (RPS) or feed-in tariffs, to allow energy production revenue to cover costs and provide capital investment for methane collection systems. For projects that supply heat, electricity, or methane to natural gas pipelines, the price and revenue from energy generation are a primary driver of the economics of the project. With economies of scale, the larger the landfill gas project, the more energy can be generated and the more likely the project is profitable.

Overall there are no substantial concerns with the approach to assess additionality for large- and small-scale landfill gas projects. The primary lingering concern is the potential for CDM projects to discourage the implementation of regulations that require capture and destruction of landfill gas.

Figure 4-8: Number of registered landfill gas projects by methodology

Source: IGES 2014

4.8.4. Baseline emissions

The baseline scenario for ACM0001 and AMS-III.G is assumed to be the atmospheric release of methane, unless capture and flaring is required by regulation or unless capture occurred to some extent prior to the implementation of the project. Baseline emissions are determined based on the amount of methane flared or used under the project activity (less any methane gas that was flared under the baseline). The overall volume of emission reductions generated is based on the baseline emissions minus any combustion efficiency losses and minus any methane that would have been destroyed under the baseline via soil oxidation. ACM0001 considers four different cases for how to account for regulation and existing landfill gas capture systems. These include no regulation/no existing capture system, no regulation with existing capture, regulation without existing capture, and regulation with existing capture. The small-scale methodology uses, in principle, the same approach but is less specific; the baseline emissions must take into account the volume of landfill gas required to be collected by regulation and the presence of pre-existing landfill gas collection and combustion systems. The overall approach of estimating the baseline emissions based on the amount of captured gas seems reasonable. However, there are concerns related to the default assumptions for pre-existing systems and regulations, and the accounting for soil oxidation.

If a regulation requires the collection of landfill gas or if a landfill gas collection system was pre-existing, but the regulation does not specify the amount to be collected or the historical amount collected is not known precisely, then both methodologies assume that 20% of the amount captured under the project scenario would be captured in the baseline. The methodology explains that this default value is based on assumptions that the capture efficiency of the project system is 50% and under the baseline 20%, and that in the baseline the methane was flared using an open flare with an efficiency of 50%. Despite the explanation, it remains unclear how the overall default value

of 20% of project emissions is derived. While a 50% destruction efficiency for an open flare is conservative when considering project emissions, used in the context of baseline emissions it has the potential to actually overestimate the emission reductions. The methodologies implicitly assume that the CDM project captures five times the amount of methane than would be captured under a regulation. This assumption seems rather optimistic and likely leads to a significant over-estimation of emission reductions.

There are two types of soil oxidation that can occur at a landfill. Top-layer soil oxidation refers to soil oxidation under baseline conditions when methane oxidizes as it passes through the top layers of the landfill. The second type of oxidation can occur when additional air is introduced into the landfill due to suction from the LFG capture system under the project scenario.

Early versions of ACM0001 and AMS-III.G did not account for these two effects. This likely led to an overestimation of baseline emissions for projects that were registered up to version 11 of ACM0001 (valid until 25 July 2012) and up to version 7 of AMS-III.G (valid for registrations until 28 May 2013). This shortcoming was recognised and, in principle, addressed from version 12 of ACM0001 and version 8 of AMS-III.G onwards, by introducing a default factor for the amount of methane that would oxidize in the baseline, using 10% for “managed solid waste disposal sites that are covered with oxidizing material such as soil or compost” and 0 “for other types of solid waste disposal sites”.

Concerns have been raised about the default values applied for the soil oxidation factor. Methane oxidation in covered landfills occurs mainly through bacterial degradation, primarily by methanotroph bacteria, resulting in production of carbon dioxide, water, and biomass. The rate of oxidation is influenced by a variety of physical factors, including different soil cover types (Chanton et al. 2009). Methane oxidation generally increases with temperature up to around 40°C and is also influenced by moisture, where either too dry or too wet conditions can inhibit methane oxidation (Chanton et al. 2009; Spokas & Bogner 2011). Soil oxidation further depends on the type of soil cover and the thickness of soil cover. Higher soil oxidation rates occur in landfills that are well managed with a thick soil cover. In a study of landfills with similar operational characteristics in different climate zones of the United States, methane oxidation was lowest in humid subtropical regions and highest in arid regions (Chanton et al. 2011). This research suggests that for poorly managed landfills in humid sub-tropical and tropical regions the soil oxidation rates may be very low.

The IPCC sets default values for landfill cover methane oxidation are typically between 0% and 10% of generated CH₄ (IPCC 2006), possibly derived from one early study of a New Hampshire landfill. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories indicate that:

“The use of the oxidation value of 10% is justified for covered, well-managed solid waste disposal sites to estimate both diffusion through the cap and escape by cracks/fissures. The use of an oxidation value higher than 10%, should be clearly documented, referenced and supported by data relevant to national circumstances.”

This highlights that the 2006 IPCC Guidelines consider a soil oxidation value of 10% as justified only for covered and well-managed sites. However, more recent literature surveys and experimental studies indicate that oxidation rates for covered landfills are higher, amounting on average to approx. 30% (Chanton et al. 2009; Chanton et al. 2011), although the 2009 paper indicates that the data may over-represent warmer conditions when oxidation rates would be higher.

Some stakeholders have raised concerns that the soil oxidation factor was not adjusted upwards in the CDM methodologies when more recent research indicated that an average value of 30% may be more representative (Chanton et al. 2009). However, the higher soil oxidation rates reported by

(Chanton et al. 2009) may not be fully appropriate for the context of developing countries, given that both an intermediate and final cap would have to be in place to a certain engineering standard. In most developing countries, landfills are rarely well managed with a thick soil cover required for this level of soil oxidation. This suggests that the higher soil oxidation rates may not be applicable to the conditions for some CDM projects. Nevertheless, having a default factor for both managed and unmanaged landfills avoids creating a disincentive for covering and managing landfills. The use of the soil oxidation rates as a standard default for all projects runs the risk of underestimating the volume of credits generated in some sub-tropical and tropical regions with unmanaged landfills for which soil oxidation rates under the baseline would have been very low or zero.

4.8.5. Other issues

Stakeholders have commented in public submissions to the UNFCCC with regard to revisions of ACM0001 that different types of perverse incentives can arise from landfill gas projects. Two main perverse incentives can be of concern, which both lead to an over-estimation of emission reductions.

Firstly, project developers can have an incentive to store the waste in a manner that generates more methane. For example, a 'flat' landfill with low methane generation potential could be changed to store waste at a greater height. Moreover, project proponents can have an incentive to maximise methane generation through other means, such as pulling water in the landfill to create anaerobic conditions. On a site visit to a landfill gas project in China in 2005, engineers proudly explained how they had found a way to generate more methane by stacking waste higher in one section of the landfill rather than spreading it evenly across the landfill site. While this is just one anecdotal example, there is reason to believe that some landfill projects may be altering management practices to do so. Based on these observations, in 2012 more recent versions of both the large- (version 13.0) and small-scale methodologies (version 8.0) included an applicability criterion that excludes projects in which the management is changed in order to increase methane generation. However, verifying this requirement may be difficult in practice and it has not been included as an explicit provision for DOEs to assess after the project implementation.

Secondly, there could be perverse incentives for policy makers and private actors not to engage in recycling or other ways of preventing waste generation, as this could lower the potential for CDM landfill gas projects. Similarly, there could also be perverse incentives to continue landfilling instead of introducing other waste treatment methods (incineration, composting).

Public comments received on behalf of waste picker organizations have raised concerns that development of a project limits access of waste pickers who, through the informal economy, contribute significantly to the recycling of materials (Global Alliance for Incenterator Alternatives, GAIA). Project developers who were interviewed acknowledged that sites need to be secured for project installation, to avoid having equipment tampered with or material stolen. For certain projects, including examples in Latin America and Thailand, agreements have been made for waste pickers to pick through waste before it is transferred into the secure site. However, in other cases there has not been any cooperation between the project developers and waste pickers, which has resulted in conflict and loss of livelihoods. There is evidence that the development of landfill gas projects is limiting the access of waste pickers and thereby reducing the reuse and recycling of waste through the informal economy. Given the success of collaborative agreements with waste pickers, this may be a model which new projects should be required to incorporate.

Pursuing landfilling instead of other waste treatment methods, such as recycling, incineration or composting, is likely to result in overall higher GHG emissions, even if the landfill gas is captured, because landfill gas collection systems are not able to capture all of the methane. The CDM may thus provide perverse incentives for policy makers or project owners to continue pursuing a waste

treatment method that is more GHG-intensive. If in the absence of the CDM, other waste treatment methods would be pursued, it would lead to an over-estimation of emission reductions.

Early versions of CDM methodologies did not include any provisions to address this issue. Regarding the potential perverse incentive to reduce recycling, starting with version 12 of ACM0001, an applicability criterion requires that “the implementation of the project activity does not reduce the amount of organic waste that would be recycled in the absence of the project activity”. However, there is no reference to how this should be assessed. Moreover, this applicability condition does not address the broader concern that the CDM provides incentives to continue pursuing landfilling and not composting or waste incineration. In public comments submitted by non-governmental organisations, such as the GAIA, there have been calls for eligibility requirements that would allow projects only on closed landfills in order to prevent the potential for this perverse incentive of reducing recycling and composting. Project developers argued that in developing country contexts, with warmer climates and higher percentage of organics in the waste stream, the capture of methane must take place while the landfill is actively being used, otherwise the methane will have already been released once it is closed. This is in contrast to landfills in more temperate climates, where methane production happens more slowly and where it is more common to develop a project at a closed landfill.

Overall, there is reason to believe that landfill gas projects are contributing to perverse incentives to manage landfills in ways that generate more methane and to reduce reuse and recycling or avoid a shift towards composting or waste incineration. In addition, it appears there are cases in which project participants increase methane production – an issue which may deserve particular attention in the validation and verification auditing processes.

4.8.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured under pre-existing collection systems or regulations are unjustified and have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid sub-tropical and tropical regions with very low soil oxidation rates; nevertheless, requiring the use of a default soil oxidation rate for baseline emissions avoids creating a perverse incentive to avoid covering landfills Potential for perverse incentives for policy makers not to regulate landfills or enforcing regulations in place Perverse incentives for project developers to manage landfills in ways that increase methane generation
Other issues	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG-intensive waste treatment methods, such as composting or incineration Some landfill gas projects exclude waste pickers and informal sector recycling, reducing overall rates of reuse and recycling

4.8.7. Recommendations for reform of CDM rules

We recommend several revisions to the CDM landfill gas methodologies to address the potential over-crediting, in particular the perverse incentives for both project owners and policy makers:

- Instead of applying one value for the soil oxidation factor to all projects, different values could be applied to different regions based on the climatic conditions and practices in that region.

- The approach of the default factors used for estimating methane capture from pre-existing collection system or landfills with regulations should be revisited. Assumptions in the default factor could be revised to be more conservative by assuming that more (rather than less) methane was captured and destroyed.
- Include specific requirements for DOEs to verify that the landfilling practice was not changed with a view to generating more methane.
- To avoid the reduction in recycling by excluding waste pickers access to the site, the methodology could be revised to be more specific about how projects should provide waste pickers with access to solid waste before it is deposited in the secure dumpsite.
- Given the long-term need to transition away from landfilling and increase composting and recycling, there could be a sunset clause considered for CDM landfill projects.

4.9. Coal mine methane

4.9.1. Overview

Methane is stored within coal as part of the coal formation process. During coal mining activities some of the methane is released. The build-up of methane in coal mines creates a potential explosive hazard and efforts before, during, and after mining are taken to reduce the safety risk by releasing methane into the atmosphere. Methane released from coal mines makes up approx. 8% of global anthropogenic methane emissions (Global Methane Initiative 2011). Methane originating in coal seams that is drained prior to mining is known as coal bed methane (CBM). Through a process of pre-mining drainage, this methane can be extracted to reduce the safety risk. During coal mining, methane can be vented from coal mines, which is known as ventilation air methane (VAM). After mining has ceased, methane can be extracted, which is known as post mining or post drainage coal mine methane (CMM). Coal mine methane projects involve installation of control technologies to collect and destroy and/or utilise methane from existing and abandoned mines, instead of releasing it to the atmosphere. Under the ACM0008 methodology of the CDM, capturing methane is eligible from pre-mining via underground boreholes and surface drainage of CBM, during mining from VAM that would normally be vented, as well as post mining from abandoned/decommissioned mines.

4.9.2. Potential CER volume

Of the 84 CMM projects that have been registered under the CDM, all are located in China, except for one project in Mexico. Projects from other countries, including India, Indonesia, Philippines and South Africa have been submitted to the UNFCCC but not registered.⁷⁴ As of 1 May 2014, 34 million CERs have been issued from 37 projects located in China. The total volume of credits expected from the credit start dates up to 2020 is 170 million CERs (Section 2.3).

The best conditions for CMM projects are deep coal mines with high methane concentrations. Under these conditions, methane is concentrated and easy to collect. For geographic and regulatory reasons, coal mines in China have been well suited for CMM projects to date. In India, for example, most coal mines are surface mines, where methane concentrations are lower and it is harder to collect the methane. Another barrier in India is national regulation that divides permits for using coal and gas. This means that coal mines do not have a permit to utilise the methane gas generated and would be unable to authorise a CMM project. A CMM project would require an additional permit process, an added administrative barrier.

⁷⁴ There are two projects under validation from India and one from the Philippines. Projects in Indonesia and South Africa have had their validation terminated or validation replaced.

4.9.3. Additionality

All of the registered CMM projects use the large-scale ACM0008 methodology. The most recent ACM0008 Version 8 requires use of the “Combined tool to identify the baseline scenario and demonstrate additionality” and provides further guidance on the application of the tool in the context of CMM projects. As of May 2014, no projects had been registered under version 8, which was approved in February 2014. The majority of projects are registered under versions 6 and 7. In these prior versions, the CDM additionality tool was applied, and a separate procedure was used to select the baseline scenario. Starting with version 6, the methodology was changed to allow for benchmark analysis as part of investment analysis for projects where no investment would occur in the baseline scenario.

Most CDM CMM projects apply a benchmark analysis to demonstrate additionality, as shown in Table 4-4. Benchmark analysis compares the financial performance of the project, often expressed as IRR, to a relevant benchmark or investment ‘hurdle rate’. In contrast to some other project types, CER revenue for CMM projects does make up a large portion of the return on investment on capital expenditures for projects. According to information from PDDs, the IRR without CER revenue is approx. 2% on average and increases to approx. 28% with CER revenues, the largest increase among all project types (Section 2.4). When we derive a simple indicator that puts the capital investment in relation to the number of CERs generated over ten years, as referenced in Section 2.4 in this report, we find an average ratio of about USD 4 / CER for all CMM projects. These calculations show that CMM projects have a high likelihood of additionality. They support reports from technical experts and project developers that abatement costs for CMM co-generation plants are approximately USD 3 - 5 per tCO₂ during 10 years of operation. Other reports indicate that CMM projects are usually not economically viable; according to United Nations (2010) power generation from CMM only becomes economically viable for coal mines with very large methane sources exceeding 20 m³/t (United Nations 2010).

Table 4-4: Additionality approaches used by CDM CMM project activities

Additionality approach	Number of project	Average Annual CERs (1,000)
Benchmark Analysis	76	33,465
Investment Comparison Analysis	4	1,557
Investment Comparison Analysis and Benchmark Analysis	1	266
Simple Cost Analysis	4	1,883

Sources: IGES 2014

A high likelihood of additionality is also supported by observation of common practice in the sector. Coal mines are very averse to having any combustion on-site. Combustion of any kind increases the potential risk of a methane gas explosion. Venting methane is the safest approach to avoid combustion, and miners and management are very familiar with this approach. Coal mine operators are generally averse to having a methane combustion system onsite as a result in order to avoid the risk of mine closures due to concerns around worker safety. Global Methane Initiative staff reported that in China, prior to the presence of the carbon market, efforts by the Global Methane Initiative were wholly unsuccessful in implementing CMM projects. No pilot projects or sponsored projects were able to get off the ground. Technical barriers were significant and persistent. The equipment used was unable to cope with the difficulties of the coal mine system, including the concentrations of volatile methane and the gas volumes. Only with the revenue from CERs were there sufficient incentives to develop technologies that worked well for these conditions. Now, in

China, it has become common practice for large coal mines to capture methane with revenue from a CDM project. As of 2014, there were still 2 projects in China at the validation stage; however since the technology for developing CMM projects in China is now proven, it can no longer be claimed to be first of its kind or a technology barrier. Although the CMM projects have become common practice, this has only been the case with CDM revenue. Overall, the risk for non-additionality is low for VAM projects.

4.9.4. Baseline emissions

Baseline emissions are calculated as the sum of CO₂ emissions from destruction of methane that would occur in the baseline scenario, emissions from the production of power, heat, or use of gas replaced by the project activity, and release of methane into the atmosphere that is avoided by the project activity. The baseline scenario is selected based on an examination of all the options that are technically feasible and comply with applicable regulations and elimination of all baseline scenario alternatives that face prohibitive investment, technological and/or prevailing practice barriers.

There is some concern that mines may take part in marginally more pre-mining drainage than they would have done without incentives from the CDM; however, the drained methane would likely have been emitted upon mining (and likely would have been emitted through ventilation later on). So these concerns seem limited, given that there are provisions in the methodology that emission reductions may only be credited once mining starts, ensuring that CERs are not issued in cases in which mining may not have occurred under the baseline. Our review has not identified any other concerns related to the determination of baseline emissions.

4.9.5. Other issues

The methodology includes a requirement that methane collection must exceed that which is required by applicable regulations, with the exception of cases in which it can be shown that the regulation is not enforced. A regulation was put in place in China requiring that methane captured from coal mines that exceeds 30% methane concentration must be captured and used. It has been suggested by project proponents that the Chinese government actually put this regulation in place as a result of the success of the CDM, to support the use of CDM financing to capture methane as best practice and to stimulate more CDM project development. However, interpretations vary and it has led to questions around the additionality of projects and whether or not they would have been required by regulation. As a consequence, project developers focused on projects where the methane concentration was below 30%. These projects would be avoided for safety reasons in North America or Europe, because this gets close to the explosive range of methane concentrations of 15-25%. It is better practice and safer to improve the capture rate and increase the concentration of methane, however this could run the risk of exceeding the 30% concentration regulatory requirement in China, and hence not meeting the CDM additionality requirements. This raises the risk of perverse incentives for project developers to diluting methane gas to reduce the concentration below 30% in order to be eligible for the CDM. However, no evidence is available whether this happened.

4.9.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Likely to be additional • CDM revenue makes up a large portion of return on capital investment • Technology for CMM in China is now well demonstrated, no longer technical barriers
Over-crediting	<ul style="list-style-type: none"> • Potential concerns regarding increased mining and/or pre drainage of coal mine methane but no evidence whether or not this occurs
Other issues	<ul style="list-style-type: none"> • Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations

4.9.7. Recommendations for reform of CDM rules

There are no recommendations regarding reforming the CDM rules for CMM projects. Further investigation of China's regulations for methane capture are warranted to ensure that perverse incentives are avoided.

4.10. Waste heat recovery

4.10.1. Overview

Waste heat utilization includes generally energy efficiency measures, where the thermal content of hot waste gases that would be vented in the absence of the CDM project activity is used for heating purposes, replacing fossil fuel use. For example, hot exhaust gases from cement kilns can be used to pre-heat the raw material before entering into the kiln.

A related category of projects is waste gas utilization where the calorific value of waste gases that contain a certain fraction of hydrocarbons or hydrogen that would be flared in the absence of the CDM project activity is used to replace regular fossil fuels. For example, waste gases with a high content of carbon monoxide and hydrogen can be used as fuel for steam production in industry. This second project category has similar features than the 'thermal' recovery of waste gases, but the present chapter focusses on the first category.

4.10.2. Potential CER volume

According to our own estimates, registered CDM projects have the potential to issue 0.35 billion CERs by the end of their respective crediting periods, of which 0.22 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from these projects account for about 2.5% of the total CER issuance potential.

4.10.3. Additionality

The methodologies for waste heat utilization (AM58, AM66, AM95, AM98, ACM12, AMS-II.I., AMS-III.P.AMS-III.Q., AMS-III.BI.) generally use standard CDM additionality tests based on barrier and/or investment analysis.

The general issue with this project type is that the use of waste heat is a standard practice in many integrated industrial facilities, in particular where energy costs represent a larger fraction of production costs such as in cement production, refineries, iron and steel and chemicals. However, the extent of the use of waste heat and energy efficiency may vary significantly even within a country, as energy costs, financial resources and engineering and management skills may differ between sectors and plants. While one steel plant may define its competitive edge in systematically using all waste heat and reducing heat loss along the steelmaking process because of competitive steel markets and relatively high fuel costs, a refinery plant may vent significant amounts of waste heat and experience severe heat losses all over the refinery because its cost of fuel is very low.

In the use of investment analysis for demonstrating additionality for waste heat recovery projects involves several uncertainties: the highest uncertainties are in the assumptions on future fuel prices which show high variability over time (Figure 2-4 to Figure 2-6). In addition, the considerable uncertainties in investment cost for equipment and construction and the often uncertain impact of the considered measure on efficiency makes it difficult to objectively determine the profitability of the measure and the relevant hurdle rate (Section 3.2).

For projects implemented in existing plants, the methodologies require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation. This is an important safeguard to assure at least some degree of additionality.

Some methodologies, such as ACM0012, also allow waste heat recovery projects in greenfield plants. This is very problematic, as it is very difficult to demonstrate that the waste heat utilization would not have been implemented in the absence of the CDM (Section 3.2). The methodology ACM0012 (V.5) provides for two options for demonstration additionality in the case of greenfield plants. Option 1 requires to identify similar plants; the project is deemed as additional “if *more than 80 per cent of the analyzed facilities in the list do not use waste energy, it can be decided that the proposed Greenfield facility also would have wasted the energy in the absence of waste energy recovery CDM project*”. While the methodology tries to be descriptive on how to identify baseline waste energy use, there remain large uncertainties and most importantly, data on the degree of waste energy usage in plants from competitors may be very difficult to obtain. Under option 2, project participants can submit a (hypothetical) *alternative design* without or with a lower level of waste heat recovery and demonstrate using investment analysis that the alternative design would be the baseline scenario for the waste energy generated in the greenfield facility. Given the high uncertainties in price data and hypothetical level of waste heat utilization in the absence of the CDM, this leads to significant risks of non-additionality.

The economic impact of CERs on the profitability of the waste heat recovery project is usually rather small compared to related fuel cost saving. I.e. a change in fuel costs of a few percent may have the same impact as the CER revenues (Sections 2.4 and 3.2).

Overall, the risk for non-additionality of greenfield plants seems higher than for existing plants, where the requirement for a minimum of three years of generation of waste heat prior to the start of operation of the CDM project has to be demonstrated.

4.10.4. Baseline emissions

Baseline emissions are usually derived from the amount of waste heat used in the project case. It is assumed, that this heat would be generated by fossil fuels in the baseline scenario.

However, even though the methodologies for existing facilities require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation, in practice it may be very difficult to rule out that waste heat has not been used in some form in existing facilities before project implementation, which may inflate baseline emissions.

Also, waste heat recovery may lead to a different operation of the plant than in the baseline scenario. For example, if waste heat is used for pre-heating of a product, the plant may be run in such a way that more waste heat is generated to assure a certain temperature level of the pre-heated product, which leads to a higher fuel consumption in the boiler generating the waste heat. Therefore the amount of heat wasted in the baseline may be overestimated. Moreover, baseline usually do not capture any other autonomous energy efficiency improvements that might be implemented in the absence of the project.

In greenfield projects, the emission reduction is based on the difference in emissions in modelling a baseline and project scenario. The models build on many assumptions that are difficult to validate objectively. The results are therefore prone to high uncertainty and may lead to over-crediting.

Lastly, the methodologies do not consider emission reductions from the reduction in upstream emissions (such as from the production of natural gas or coal) which leads to a slight under-crediting, if upstream emissions occur in a non-annex I country.

4.10.5. Other issues

None.

4.10.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are very small compared to cost reduction from fuel savings • Ex-ante estimation of key parameters including investment costs and fuel savings has large uncertainties • Waste heat recovery is common practice in many countries and sectors (though not in all)
Over-crediting	<ul style="list-style-type: none"> • In existing facilities: It is very difficult to rule out that waste heat has not been used in some form before project implementation, which may inflate baseline emissions • In greenfield projects: Modelling of amount of waste heat lost in baseline is subject to very high uncertainties. • Waste heat recovery may lead to a different operation of the plant than in the baseline case, e.g. to assure a certain temperature level of the heat medium or to NCV level of waste gas, therefore the amount of gas wasted in the baseline may be overestimated
Other issues	<ul style="list-style-type: none"> • None

4.10.7. Recommendations for reform of CDM rules

Waste heat recovery is standard practice in many energy intensive industrial sectors, though there exist barriers to the implementation of waste to energy measures. The high uncertainty in additionality demonstration make it less suitable for the CDM, the project type may be taken out of the CDM or restricted to cases with clear additionality demonstration, e.g. of a very low uptake of waste heat recovery can be demonstrated in a specific industrial sector. We recommend that option 1 in Appendix 1 of ACM0012 be maintained as it provides a more objective way of assessing the practice in the sector and country and that option 2 not be used.

4.11. Fossil fuel switch

4.11.1. Overview

Fossil fuel switch includes the switching from a fuel with higher carbon intensity (such as coal or petroleum) to a fossil fuel with lower carbon intensity (such as natural gas) in the generation of heat for industrial processes or in power plants. In this section we do not consider switching from fossil fuels to biomass. Methodologies are for existing installations only (e.g. ACM0009, ACM0011, AMS-III.AH., AMS-III.AN) or for both existing and greenfield installations (AMS-III.B and AMS-III.AG – power only).

4.11.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 0.46 billion CERs by the end of their respective crediting periods, of which 0.23 billion CERs fall in

the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about 3.3% of the total CER issuance potential.

4.11.3. Additionality

Both fossil fuels with higher carbon intensity such as hard coal, lignite or fuel oil and fuels with lower carbon intensity such as natural gas are widely used in stationary installations in energy and manufacturing industries as well as in the buildings sector. In existing facilities, the choice of fuel is often determined by the existing fuel, because fuel changes may be costly, though there are also multi-fuel systems. In greenfield plants, the fuel choice usually depends on the economic viability of each fuel option.

Table 4-5: Examples of differences in characteristics between the use of coal and fuel oil compared to natural gas

Characteristics	Hard coal, lignite (fuel with high carbon intensity)	Natural gas (fuel with lower carbon intensity)	Considered in investment analysis
Initial investment for burner/boilers etc.	Higher	Lower ¹⁾	Yes
Fuel cost per energy unit	Lower	Higher	Yes
Non-fuel operation costs	Higher	Lower	Yes
Flexibility in operation ²⁾	Lower	Higher	No
Means of distribution to end-user	Vehicle-based: by trucks, train i.e. requires access roads or rails	Network based: by distribution lines ³⁾	No
Price building mechanisms	In many countries based on world market price	In many countries price is based on local long term contracts, often taking into account a price index, e.g. based on oil price	No
Dependence on specific supplier	Lower	Higher	No
Compliance with local air quality standards (if any)	More difficult: Coal based furnaces may require expensive exhaust cleaning systems	Less difficult: Natural gas based furnaces have generally lower air pollutant emission levels ⁴⁾	No
Need of space for local fuel storage	Yes	No ⁵⁾	No

Notes: ¹⁾ This is the case if the (higher) investment for distribution lines necessary to connect to the natural gas grid is borne by a different entity, e.g. the natural gas supplier. In case of LNG initial investment costs may be somewhat higher for LNG terminals, local storage facilities etc. ²⁾ E.g. shorter time lag to start-up operation of power plant if dispatching system in a grid requires more power. ³⁾ Or Vehicle based in case of LNG. ⁴⁾ Please note that this may hold true even though local air quality standards may be stricter for natural gas than for coal-based systems. ⁵⁾ Except for LNG.

Sources: Author's own research

The large-scale methodologies ACM0009 and ACM0011 require an investment analysis for demonstrating additionality, a barrier analysis (Section 3.2) is not deemed sufficient.⁷⁵ This makes sense as the economic viability may be seen as one of the key aspects when deciding on a specific fuel. Requiring investment analysis may reduce the risk of non-additionality, because using this

⁷⁵ Though e.g. ACM0009 allows for the additionality to be proven by claiming „prohibitive barriers“ for the project (natural gas) scenario applying step 3 of the additionality tool.

test may be more difficult in the case of very lucrative fuel switches (e.g. if cheap natural gas becomes newly available in a project site).

In general, fuel prices per energy unit are generally lower for coal than for natural gas. This is offset to a certain degree by higher initial investment and non-fuel operation costs for coal furnaces (Table 4-5). However, while the investment analysis takes these cost factors into account, there could be other factors that may lead to the choice of natural gas as a fuel, even though it may be economically somewhat less attractive than lignite or hard coal.

An issue that contributes to the high uncertainty in investment analysis are the assumptions made about future developments of fuel prices. In the investment analysis, the fossil fuel switch methodologies allow to choose between (i) keeping fuel prices at present levels for future years, or (ii) to use future prices that *“have to be substantiated by a public and official publication from a governmental body or an intergovernmental institution”* (ACM0009 V.5, Section 5.2.4).

For small-scale projects, however, the barrier analysis is deemed sufficient, which may considerably increase the risk of non-additionality (Section 3.3). This risk is only somewhat mitigated by some small-scale methodologies requiring that the CDM project involves at least some capital investments⁷⁶, ruling out projects where fuel switch can be carried out without any investment in additional fuel switching equipment, e.g. in natural gas burners. Still, small-scale fuel switching methodologies have the full set of issues that have been identified for barrier analysis (Section 3.3).

In addition, similar to other energy related project types, with fuel switch projects CER revenues are very small compared to typical fluctuations of price differences between fuels (dark-spread), which increases the risk of non-additionality.

4.11.4. Baseline emissions

The exploitation, transport, processing and distribution of fossil fuels results in upstream emissions, many of which may originate in non-Annex I countries. In most CDM project types, the amount of fossil fuel used is *reduced* with the project; therefore, it may be assumed that also upstream emissions are reduced. As a conservative simplification, the relevant methodologies usually do not consider upstream emissions. In the case of fossil fuel switch, however, upstream emissions from fossil fuels could either increase or decrease. In general, upstream emissions from natural gas tend to be higher than upstream emissions from lignite, hard coal or fuel oil (depending on source of fuel).

With fuel switch activities the amount of fuel used in terms of energy content remains more or less constant (or may slightly be reduced because of higher efficiency of natural gas burners). Because of the potentially higher upstream emissions of natural gas, switching from coal/oil to natural gas may result in an increase in upstream emissions, the so-called ‘upstream leakage’ emissions. For this reason, CDM methodologies for fossil fuel switch projects consider upstream emissions.

The procedures for estimating upstream emissions are included in the methodological Tool “Upstream leakage emissions associated with fossil fuel use” (V.1, EB69 Annex12). The tool allows project developers to use default values for upstream emissions or to come forward with their own values derived from relevant data. The default values have been substantially revised with the tool (e.g. from the values included in Table 3 of methodology ACM0009 V.4 (EB68 Annex 12)).

For instance, according to the latest version of the tool, default upstream emissions values from natural gas are 2.9 tCO₂/TJ, based on data from the US. This is comparable to the 2.6 tCO₂/TJ

⁷⁶ For example, as in the applicability requirements of small-scale methodology AMS-III.B (V.18): “The methodology is limited to fuel switching measures which require capital investments. Examples of capital investment include creating infrastructure required to use project fuel or retrofitting existing installations.”

(105 tCH₄/PJ; total) default upstream emissions in Western Europe in ACM0009 V.4 (based on IPCC), but is much lower than in e.g. the former values for Eastern Europe and former Soviet Union (23 tCO₂/TJ) or Rest of the World (7.4 tCO₂/TJ).

Also, the revised aggregated default values for natural gas (Table 1 in the tool) of 2.9 appears much lower than the sum of the default values for the different elements in the upstream chain of natural gas (Table 3 in the tool), including exploration and production (3.4 tCO₂/TJ), processing (4 tCO₂/TJ), storage (1.6) and distribution (2.2). The latter are all based on the US Department of Energy's GREET model, which may not necessarily be representative for upstream emissions of natural gas in developing countries.

With this, the revised values become comparable to those from (underground) coal. It is unclear whether this is a reasonable assumption or an artefact because of the origin of the natural gas upstream emissions data. If the values in the upstream tool are not conservative, i.e. provide too low default values for natural gas upstream emissions, this would lead to an increased risk of over-crediting of fuel switch projects.

An additional issue is the assumptions for the default values on the share of upstream emissions that are covered by caps of Annex-I countries – and how effective these caps are in limiting upstream emissions.

Table 4-6: Default emission factors for upstream emissions for different types of fuels reproduced from upstream tool (Version 01.0.0)

Fossil fuel type x	Default emission factor (tCO ₂ e/TJ)	
Natural Gas (NG)	2.9	
Natural Gas Liquids (NGL)	2.2	
Liquefied Natural Gas (LNG)	16.2	
Compressed Natural Gas (CNG)	10	
Light Fuel Oil (Diesel)	16.7	
Heavy Fuel Oil (Bunker or Marine Type)	9.4	
Gasoline	13.5	
Kerosene (household and aviation)	8.5	
LPG (including butane and propane)	8.7	
Coal/lignite (unknown mine location(s) or coal/lignite not 100% sourced from within host country)	Lignite	2.9
	Surface mine, or any other situation	2.8
	Underground (100% source)	10.4
	Lignite	6
	Surface mine, or any other situation	5.8
	Underground (100% source)	21.4

Notes: The detailed table 3 in tool does not seem to provide data for conventional NG upstream emissions.

Sources: EB69, Annex 12, <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-15-v1.pdf>

Table 4-7: Former default emission factors for upstream emissions for different types of fuels

Activity	Unit	Default emission factor	Reference for the underlying emission factor range in Volume 3 of the 1996 Revised IPCC Guidelines
Coal			
Underground mining	t CH ₄ / kt coal	13.4	Equations 1 and 4, p. 1.105 and 1.110
Surface mining	t CH ₄ / kt coal	0.8	Equations 2 and 4, p.1.108 and 1.110
Oil			
Production	t CH ₄ / PJ	2.5	Tables 1-60 to 1-64, p. 1.129 - 1.131
Transport, refining and storage	t CH ₄ / PJ	1.6	Tables 1-60 to 1-64, p. 1.129 - 1.131
Total	t CH ₄ / PJ	4.1	
Natural gas			
<i>USA and Canada</i>			
Production	t CH ₄ / PJ	72	Table 1-60, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	88	Table 1-60, p. 1.129
Total	t CH ₄ / PJ	160	
<i>Eastern Europe and former USSR</i>			
Production	t CH ₄ / PJ	393	Table 1-61, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	528	Table 1-61, p. 1.129
Total	t CH ₄ / PJ	921	
<i>Western Europe</i>			
Production	t CH ₄ / PJ	21	Table 1-62, p. 1.130
Processing, transport and distribution	t CH ₄ / PJ	85	Table 1-62, p. 1.130
Total	t CH ₄ / PJ	105	
<i>Other oil exporting countries / Rest of world</i>			
Production	t CH ₄ / PJ	68	Table 1-63 and 1-64, p. 1.130 and 1.131
Processing, transport and distribution	t CH ₄ / PJ	228	Table 1-63 and 1-64, p. 1.130 and 1.131
Total	t CH ₄ / PJ	296	
Note: The emission factors in this table have been derived from IPCC default Tier 1 emission factors provided in Volume 3 of the 1996 Revised IPCC Guidelines, by calculating the average of the provided default emission factor range.			

Sources: EB68 Annex 12, ACM0009, V.4, Table 3, http://cdm.unfccc.int/filestorage/r/t/4M2I7TA9GRCU5QDB0JLNHK6PY1ZOWE.pdf/eb68_repan12.pdf?t=Z0p8bzJ3YnExfDBVPWpbmgO_k-sMZsZlso1q

4.11.5. Other issues

None.

4.11.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Small-scale methodologies for fuel switching do not require investment analysis but may build only on barrier analysis, which provides a high risk for non-additionality • Even in large scale methodologies, modelling of fuel choice depends not only on prices, but also on availability/reliability, need for diversification, and operational needs (e.g. NG power plants for covering peak demand); this may imply that the investment analysis may not be sufficient to determining additionality • CER revenues are very small compared to typical fluctuations of the price difference between fuels (dark-spark spread)
Over-crediting	<ul style="list-style-type: none"> • Upstream emissions need to be taken into account, but with the revised default values of the tool they may not be addressed in an adequate way anymore
Other issues	<ul style="list-style-type: none"> • None

4.11.7. Recommendations for reform of CDM rules

In sum, the revision of upstream default values as documented in the tool practically eliminates the consideration of upstream emission in a fuel switch e.g. from (underground) coal to natural gas. The assumptions behind the revisions (mostly data from the US may not be representative for the situation with natural gas used in developing countries and require urgent independent analysis and revision.

4.12. Efficient cook stoves

4.12.1. Overview

Under the CDM, there are two methodologies applicable to efficient cook stoves. AMS-II.G⁷⁷ applies to cases where inefficient existing cook stoves are replaced by improved-efficiency cook stoves to reduce the demand for non-renewable biomass. AMS-I.E⁷⁸ applies to cases where a renewable technology, such as biogas or solar cookers, is introduced to displace existing cook stoves using non-renewable biomass. The number of projects has increased quickly since the introduction of these methodologies in 2008/2009. Most notably the introduction of PoAs, enabling multiple project activities to be registered through a single approval process, has lowered the transaction costs and increased scalability for projects like efficient cook stoves.

4.12.2. Potential CER Volume

As of 1 July 2015, a total of 102 cook stove projects have been registered under the CDM, 37 as individual CDM project activities and 65 as PoAs (along with a total of 180 individual CDM Program Activities (CPAs)).

Table 4-8: Number of efficient cook stove single CDM project activities by country

Country	Number of CDM project activities	Annual CERs (1,000)	Avg. CERs per CDM project activity (1,000)
China	1	12	12
India	29	469	16
Lesotho	1	34	34
Malawi	2	71	35
Mozambique	1	192	192
Nepal	1	20	20
Nigeria	1	31	31
Zambia	1	130	130
Total	37	960	

Sources: UNEP DTU 2015a

Project activity under the CDM peaked in 2012 and dropped sharply in 2013. As of 1 July 2015, single CDM cook stove projects are mostly located in the Asia and Pacific regions (Table 4-8), while component project activities developed under PoAs are predominantly located in Africa, as shown in Table 4-9. The annual volume of CERs estimated by project developers from PoA projects is 9.2 million, nearly 10 times the annual volume of CERs projected from single CDM project

⁷⁷ AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass, <https://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLV07LJN8XD1O2RKHEK>.

⁷⁸ AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user, <https://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S>.

activities of 0.96 million. Many of the registered PoAs have only 1 or a few CPAs associated with them (Table 4-9), so there is potential to scale up CPAs in these cases. In Bangladesh and Madagascar, many individual CPAs have already been developed under the one PoA registered in each of these countries (Table 4-9).

Table 4-9: Number of efficient cook stove PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)
Bangladesh	1	543	11	49
Burkina Faso	2	68	1	68
Burundi	2	452	4	113
China	1	10	1	10
Congo DR	3	124	1	124
Côte d'Ivoire	2	160	2	80
El Salvador	2	90	1	90
Ethiopia	3	201	2	121
Ghana	2	377	4	108
Guatemala	1	43	1	43
Haiti	2	68	1	68
Honduras	1	34	1	34
India	5	543	2	302
Kenya	4	319	2	159
Madagascar	1	4,198	59	71
Malawi	6	299	1	257
Mali	1	33	1	33
Mexico	1	40	1	40
Mozambique	1	28	1	28
Myanmar	1	43	1	43
Nepal	4	204	2	136
Nigeria	2	226	4	56
Rwanda	3	229	2	114
Senegal	3	209	1	209
South Africa	1	32	1	32
Tanzania	1	63	1	63
Togo	3	48		144
Uganda	3	265	2	132
Zambia	3	345	3	129
AMS-I.E	7	4,657	9	509
AMS-II.G	57	4,535	2	2,371
AMS-I.E + AMS II.G	1	100	1	100
Total	65	9,292		

Sources: UNEP DTU 2015a

4.12.3. Additionality

Improved cook stove methodologies under the CDM fall under one of two types: improved energy efficiency (AMS-II.G) or fuel switching to renewable energy (AMS-I.E). Under both methodologies projects must apply the CDM “Guidelines on the demonstrating of additionality of SSC project activities” (Methodological Tool: Demonstration of additionality of small-scale project activities. Version 10.0). Following these CDM guidelines, projects using either of these methodologies are on

the positive list of project types and automatically considered additional so long as each unit is no larger than 5% of the small-scale CDM threshold (750 kW installed capacity or 3000MWh energy savings per year or 3,000 metric tons emission reductions per year), and end users are households/communities.

Lambe et al. (2015) reviewed PDDs for cook stove projects in Kenya and India. Although projects are considered automatically additional and were thus not required to document barriers, the study found that several did include a discussion of barriers in the PDDs. The most-cited barrier was household poverty, which makes improved stoves unaffordable. The study found that several PDDs for projects in Kenya include simple cost analysis to assess the ability of households to purchase an efficient cook stove based on their income and their costs for food and fuel; the calculations suggest that households would need to save 22–30% of their remaining income for a year to purchase a stove. This claim was supported in the pricing models the authors found used by projects in rural areas, which nearly exclusively distributed stoves for a free or subsidized price. In an urban setting, the study found that many projects were selling stoves at the retail price with micro-finance options. The study noted that these PDDs suggest that since urban households are already purchasing charcoal, they have an incentive to buy an improved cook stove to reduce their fuel costs. The study authors also found that many projects also cited the lack of access to credit for working capital, low profit margins, high upfront capital costs, lack of sufficient consumer outreach and support for program operations, reduced consumer demand resulting from failure of past efforts, need for ongoing improvement and modifications of stoves to suit user needs as barriers to project implementation.

Lambe et al. (2015) also investigated what contribution offset revenues make to the overall project revenue. The study reviewed claims made in PDDs regarding the use of offset revenue and found that a majority of projects planned to use offset sale revenues to subsidize the price of improved cook stoves, as well as to cover operational costs, including maintenance and replacement of stoves, training of cook stove users, outreach and marketing to households, microcredit systems and distribution. Interviews of market actors affiliated with these projects by the authors found that while some projects were entirely dependent on offset revenue, others admitted that given the uncertainty in revenue from offsets it was advantageous not to depend on carbon revenues.

These conclusions raise substantial concerns about the additionality of improve cook stove projects under the CDM. Carbon revenues are more likely to be a primary financial enabler of projects in rural areas, where revenues are needed to subsidize the price of stoves. In urban areas, where households have a financial incentive to reduce their fuel purchasing costs, business models without carbon financing may be more viable. While these factors may reduce confidence in the additionality of cook stove projects in urban areas, low income urban households are unlikely to be able to afford more efficient and more costly cook stoves with a payback period of more than a few months.

4.12.4. Baseline emissions

In both types of cook stove projects – improved efficiency and fuel substitution – emission reductions are calculated as the product of the amount of woody biomass saved, the fraction that is considered non-renewable biomass, the net calorific value (NCV) of the biomass, and an emission factor for the fuel used. The net calorific value of the non-renewable biomass ($NCV_{biomass}$) is relatively straightforward – it is empirically measurable and a default value from the Intergovernmental Panel on Climate Change (IPCC) exists. However, Lee et al. (2013) concluded that there is uncertainty in the approaches to estimating the other parameters: biomass fuel consumption (B_y), fraction of non-renewable biomass (f_{NRB}), and emission factors for fuel combustion ($EF_{projected_fossilfuel}$). A study by Johnson et al. (2010) assessed the relative contributions of these three variables to the overall uncertainty in

carbon offset estimation for an improved cook stove project in Mexico and found that fuel consumption (B_y) contributed to 28% of the uncertainty, fraction of non-renewable biomass (f_{NRB}) contributed 47%, and emission factors ($EF_{projected_fossilfuel}$) accounted for 25%.

The CDM methodology AMS-II.G presents project developers with three options for quantifying biomass fuel savings from improved stoves: the Kitchen Performance Test (KPT), the Water Boiling Test (WBT), and the Controlled Cooking Test (CCT). The WBT and CCT are laboratory-based methods, whereas the **Kitchen Performance Test** is done in the field, and can thus better represent stove users' actual cooking behaviour. The primary advantage of the **Water Boiling Test** is its simplicity and reduced costs; the laboratory-based method is standardized and replicable. However, the laboratory results on stove performance do not necessarily translate to cooking actual meals in households, and thus the accuracy of this method is frequently called into question (Abeliotis & Pakula 2013; Johnson et al. 2007). Meanwhile, the **Controlled Cooking Test** protocol provides a compromise, better representing local cooking while being conducted in a controlled environment. Berrueta et al. (2008), which evaluated the performance of a stove designed primarily for tortilla-making by using all three tests and found that the WBT "gave little indication of the overall performance of the stove in rural communities", while the CCT was somewhat more predictive of the fuel savings found by the KPT (44-65% for CCT vs. 67% for KPT). There may be options for reducing costs associated with the KPT, such as having local NGOs perform the tests rather than hiring expensive international consultants, as well as opportunities to improve the WBT. In recent years, more comprehensive and appropriate testing methods and performance standards are under development through both ANSI and ISO standardisation organisations. The CDM methodology provides default efficiency values for two traditional stove types – a three-stone fire, or a conventional system with no improved combustion – as well as a default efficiency value for devices with improved combustion air supply or flue gas ventilation. Experts interviewed by Lee et al. (2013) noted that these limited defaults do not cover the range of cook stoves in most countries. The CDM Small-Scale Working Group (CDM SSC WG) considered this in the past, but made the determination not to proceed with developing regional default efficiency values for traditional cook stoves because of the huge variability in values among the available data (UNFCCC 2012a). Lee et al. (2013) conclude that although the KPT is more logistically complicated, and time- and resource-intensive, testing stoves outside of a controlled laboratory setting and using a variety of typical cooking activities appears to be an important factor in ensuring accurate and credible results in the baseline or default analysis. Overall, evidence suggests the Water Boiling Test is not an appropriate tool for assessing baseline fuel consumption and should be removed from the CDM methodology. The methodology should require the use of either the Kitchen or Controlled Cooking Tests. AMS-I.E follows a similar approach for calculating baseline emissions from fuel substitution of cook stoves.

The factor f_{NRB} represents the fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass and is a key variable in all current cook stove offset methodologies

Based on its definition of renewable biomass (UNFCCC 2006b), the EB has identified several indicators of scarcity to help identify non-renewable biomass. Woody biomass is considered non-renewable if at least two of the following indicators are shown to exist:

- A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuelwood suppliers) or alternatively, a trend showing an increase in the distance the fuelwood is transported to the project area;
- Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

- Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;
- Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass (UNFCCC 2011a).

In 2012, the EB issued national default factors for f_{NRB} based on a highly aggregated approach, balancing the mean annual increment in biomass growth (MAI), the annual change in living forest biomass stocks (ΔF) and biomass growth in protected forest areas (UNFCCC 2012a). Under this approach, f_{NRB} values were calculated for nearly 100 countries, based on the total annual national biomass removals minus the portion of demonstrably renewable biomass from growth in protected reserve areas. The large majority (over four-fifths) of default values exceed 80%, with the remainder ranging from 40% to 77%. While Lee et al. (2013) noted that market actors interviewed characterize development of default f_{NRB} values as a ‘huge triumph’, there was also recognition by market actors and researchers interviewed that national-level forest growth and total forest harvest removal data alone do not necessarily capture the impact of fuelwood harvesting on carbon stocks. First, the approach does not distinguish removals for timber harvesting from those for fuelwood. Furthermore, there is no justification or validation of whether the change in national carbon stocks has any correlation to fuelwood harvesting. Second, according to this method, high values of f_{NRB} are calculated for countries with significant deforestation. However, deforestation could occur in different geographical areas and be driven by entirely other factors than fuel wood collection. In practice, renewable biomass may be extracted both from plantations and natural forests that are not under protection. The MAI approach is better suited to assess the fraction of harvested wood products that are renewable, rather than fuelwood. Using the change in carbon stocks due to harvested wood products has the potential to significantly overestimate the fraction of non-renewable biomass. Estimates published by de Miranda Carneiro et al. (2013), based on the use of a spatially-explicit land use model to examine the availability of fuelwood, suggest default values for f_{NRB} of wood-fuel on the order of 20-30%, much lower than the prior estimates. Bailis et al. (2015) estimate that 27–34% of woodfuel harvested was unsustainable, with large geographic variations, and conclude that cookstove methodologies probably overstate the climate benefits.

Under the CDM methodology AMS-II.G and AMS-I.E, the quantification of project emission reductions relies on the factor $EF_{projected_fossilfuel}$, representing the fossil fuel emission factor of “substitution fuels likely to be used by similar users”. Since emission reductions from the LULUCF sector can only be claimed from afforestation and reforestation under the CDM, the use of fossil fuel emission factors for baseline fuels represents something of a workaround. While the short-term emission reductions actually occur from avoiding the depletion of carbon stocks, such as avoiding deforestation, emission reductions are calculated using fossil fuel emission factors. One possible argument for this approach is that kerosene or LPG cook stoves might be used by the households if they had a higher income. In this regard, the consideration of emissions from fossil fuel based cooking devices might be regarded as a suppressed demand baseline. However, the approach combines the efficiency of fuel-wood cook stoves with the CO₂ emission factor of fossil fuels. This approach has been roundly criticized. Johnson et al. (2010) say it has “no scientific basis, given that wood emits approximately double the CO₂ per unit fuel energy compared to LPG or kerosene thus halving possible offsets from non-renewable harvesting of fuel”. One could also argue that it leads to overestimating baseline emissions if one would assume the long-term suppressed demand baseline of using kerosene or LPG cook stoves. By combining the efficiency from inefficient fuel-wood cook stoves with the CO₂ emission factors from fossil fuels, the claimed baseline emissions are higher than if the households would use kerosene or LPG cook stoves. The CDM methodology AMS-II.G. suggests the use of a weighted average value of 81.6 tCO₂/TJ², representing a mix of 50% coal, 25% kerosene, and 25% LPG. However, no justification for this fuel mix provided. Coal is not commonly used as a cooking fuel for households transitioning from traditional to modern biomass.

LPG is the dominant fossil fuel used in households transitioning to modern energy for household cooking. Assuming that households would use coal vs. LPG overestimates the emissions factor. For example, if we compare the emissions factor if the fuel mix was LPG vs. the current emission factor we find that the emissions are overestimated by 23%. For charcoal production, the simplification is stretched even further beyond reality. The methodologies permit calculating wood use by charcoal stoves by multiplying the charcoal volume by six, following the 1996 IPCC accounting guidelines to estimate total biomass consumed (IPCC/OECD/IEA 1996, p. 1.42). Then baseline emissions are estimated by applying the projected fossil fuel use emissions factor, which in effect assumes that the project displaces fossil fuel use for charcoal production, which likely significantly overestimates the baseline emissions (Lee et al. 2013).

4.12.5. Other issues

Improved cook stove projects are dependent on end users to achieve emission reductions: households must actually use the improved cook stoves instead of their traditional stoves. Carbon finance monitoring requirements include checking the efficiency of the stove and confirming at least every two years that the stove is still in use. Additional stove monitoring of the efficiency and usage rate is required annually or biannually. Monitoring requirements furthermore include sampling and surveying as specified in the applicable offset protocol. This has been a significant challenge. Carbon finance project monitoring requirements further specify that projects must either ensure that the improved stoves completely replace traditional stoves, or else the traditional stoves must be monitored and accounted for under the project calculations for emission reductions. Lambe et al. (2014) found in their review of projects in Kenya and India that this presented several challenges. In Kenya, where the predominant mode of traditional cooking is with a three-stone fire, the study found that many PDDs acknowledged that this form of traditional stove cannot really be removed or destroyed. In India, traditional stoves in several regions are known as chulhas. These stoves often have a religious significance and households often build the stoves themselves from locally available materials such as mud, brick, or cement (Lambe & Atteridge 2012). This form and construction makes it difficult to guarantee that a new chulha will not be made following the destruction of the old one. Lambe et al. (2014) found that many projects required households to destroy these existing cook stoves. In some cases, photographic evidence is used to demonstrate that the existing stoves have been destroyed. However, because of the challenges with removing traditional stoves and the barriers to ensuring adoption and sustained use of improved cook stoves, more often a stacking of stoves and fuels occurs where traditional and improved cook stoves are both used for different types of cooking (Ruiz-Mercado et al. 2011). While the methodologies contain monitoring guidance for adjusting the baseline fuel consumption if the traditional stove continues to be used, this adds further uncertainty to quantification of changes in fuel consumption. Use of temperature sensors to monitor usage of traditional and improved cook stoves have shown promising signs of helping to address this issue, but are not yet in widespread use in carbon market projects (Ruiz-Mercado et al. 2011).

There is a broader concern about crediting emission reductions from displacement of non-renewable biomass since the increased carbon storage from changes in carbon stocks may only lead to temporary reductions. The risk of non-permanence of emission reductions is addressed through appropriate accounting approaches for afforestation, reforestation, and carbon capture and storage project activities, but it is not addressed for improved cook stove project types. Under the CDM, there are projects promoting the use of biomass energy to displace fossil fuel, as well as improved cook stove projects aimed at decreasing biomass energy use. In theory, this does not present a conflict, assuming that biomass power projects are based in regions with increasing or stable carbon stocks and improved cook stove projects are located in regions with declining carbon stocks. However, looking at registered CDM projects there are several examples of provinces in which there are both biomass power and cook stove projects. This means that in the same prov-

ince, there are simultaneously CDM projects getting credit for increasing the use of biomass, as well as reducing the use of biomass. For example, in the Henai province in China there are 9 biomass energy projects fuelled by agricultural residues (rice husk and other kinds) as well as 4 improved cook stove projects.

4.12.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs, confidence in additionality may be low in urban settings where households are paying for improved stoves at the retail price
Over-crediting	<ul style="list-style-type: none"> • Uncertainty in some widely used approaches for estimating biomass savings • Significant uncertainty around the fraction of non-renewable biomass values, recent research suggests this parameter may be significantly overestimated. • Emissions intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline. • Emissions factor for suppressed demand use of fossil fuel overestimate emissions; LPG is the appropriate substitute used by similar consumers, including coal and kerosene overestimate emission reductions.
Other issues	<ul style="list-style-type: none"> • Challenges in ensuring adoption and sustained use of improved cook stoves result can lead to over-crediting if traditional stoves continue to be used. • The use of biomass as a renewable energy sources is inconsistently accounted for under the CDM; the same region can have biomass power projects receiving credit for increasing biomass use and improved cook stove projects receiving credit for decreasing biomass use.

4.12.7. Recommendations for reform of CDM rules

We recommend revising the current methodologies as follows:

- Eliminate the use of the Water Boiling Test as a means of determining baseline emissions.
- Reconsider the use of default f_{NRB} factors based on the MAI approach.
- Revise the emission factor for the substitution of non-renewable biomass by similar consumers to one based solely on LPG.
- Explore options for incorporating temperature sensors in monitoring plans to improve reliable assessment of the adoption and sustained use of improved vs. traditional cook stoves in households.
- Review the use of biomass as an energy source under the CDM to ensure consistent accounting across project types and regions. The f_{NRB} should be considered in improved cook stove projects, as well as modern biomass energy projects to confirm that projects are not contributing to loss of carbon stocks. The CDM EB needs to provide justification for how both biomass energy and improved cook stove projects can be approved within a sub-region.

4.13. Efficient lighting

4.13.1. Overview

For energy efficient lighting, we focus our analysis on the replacement of incandescent electrical bulbs with more efficient electric lighting, such as Compact Fluorescent Lamps (CFLs) or Light Emitting Diode (LED) lamps. This includes all projects registered under AM0046⁷⁹ and AMS II.J⁸⁰

⁷⁹ [Distribution of efficient light bulbs to households --- Version 2.0.](#)

⁸⁰ [Demand-side activities for efficient lighting technologies --- Version 6.0.](#)

methodologies as well as projects registered under AMS II.C⁸¹ that are labelled as 'lighting' and 'lighting in service' in UNEP DTU (2014).⁸² This technology category was a late starter in the CDM – in mid-2010 there were only half a dozen registered projects and 3 registered PoAs. Recent growth in PoAs, particularly with larger PoAs, indicates a higher potential in the future – even beyond the current project activity and PoA pipeline. Energy efficient lighting projects are typically implemented by an entity (often public sector or linked to a utility) that distributes energy efficient lamps for free or for a nominal fee, and collects and disposes of the incandescent bulbs that have been displaced.

4.13.2. Potential CER volume

For CDM project activities, the 40 projects registered by the end of 2013 state that they will produce 1.4 million CERs per year. This would be 10.3 million CERs in the period of 2013 to 2020. However, the issuance success for the largest project activity, which is the only project using the large-scale methodology, amounted to only 12% in the first monitoring period. This could be related to the time required for the CFL distribution programme to reach full scale, however, and does not necessarily mean that other projects will have similar issuance rates (or that this rate will not increase over time). Other projects have been much more successful, but are considerably smaller. Project activities are dominated by a stream of small-scale projects in India and a single large-scale project in Ecuador – the only registered large-scale energy efficient lighting project – which account for almost 80% of the expected CERs. More than 80% of the small-scale projects use AMS II.J, which was designed specifically as a simplified approach to energy efficient lighting.

The largest volume of CERs for energy efficient lighting, however, could come from PoAs. Twenty-six PoAs had been registered for energy efficiency lighting by the end of 2013. Just from the CPAs already included in these registered PoAs as of the end of 2013, the volume of CERs is estimated by the project developers at 3.4 million per year, or two and a half times greater than for project activities. This could continue to grow, given that only four PoAs have more than one CPA. For PoAs, the main players are China, India, Mexico and Pakistan, with South Africa also hosting multiple PoAs (Table 4-10). The four PoAs with more than one CPA have large numbers of CPAs (e.g. 9 to 53). For some PoAs, the CPAs are delineated to have very similar emission reductions in each CPA (e.g. in Mexico, India, Bangladesh).

⁸¹ [Demand-side energy efficiency activities for specific technologies --- Version 14.0.](#)

⁸² This excludes one registered PoA under AMS II.C that focuses on street lighting and is labelled as sub-type "Street lighting".

Table 4-10: Number of energy efficient lighting PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)	PoAs with >1 CPA
Bangladesh	1	124	9	14	1
China	14	443	1	32	
India	3	1,555	17	30	1
Kenya	1	31	1	31	
Mexico	1	607	25	24	1
Nigeria	1	29	1	29	
Pakistan	1	557	53	11	1
Senegal	1	4	1	4	
South Africa	3	80	1	27	
AMS-II.C.	6	668	5	22	
AMS-II.J.	20	2,762	6	21	
Total	26	3,431			4

Sources: UNEP DTU 2015b

All of the PoAs for lighting efficiency upgrades have moved to the newer methodology AMS II.J rather than AMS II.C (Table 4-10). No new energy efficient lighting PoAs have entered the pipeline since October 2012, and the new project activity pipeline largely stopped in January 2012, with only one new project activity starting validation in 2013 (in The Gambia).

4.13.3. Additionality

Because only one project activity uses the large-scale methodology, this entire technology area essentially uses SSC methodologies and additionality rules. For SSC projects and PoAs, additionality can be determined through several different routes: All SSC projects (or SSC CPAs within PoAs) must refer to the tool for “Demonstration of additionality of small-scale project activities” (Tool21, ver10.0). This includes the choice of using several different barriers to justify additionality (i.e. investment barrier, technology barrier, prevailing practice barrier, or other barriers). In addition, from July 2012, projects comprised entirely of units below 5% of the small-scale CDM threshold (i.e. 3000 MWh savings for energy efficiency) were considered automatically additional without any further justification. This new ‘positive list’ additionality argument has not been used by CDM project activities but has been used extensively by PoAs, as discussed further below. Most CDM project activities applying the SSC additionality tool cite investment barriers and use simple cost analysis to prove additionality (Table 4-11). This is because the organisations distributing the efficient lamps do not receive the energy savings, so they incur only costs without any revenue (other than a nominal fee from consumers in some cases).⁸³

As mentioned above, since July 2012, the tool for additionality of SSC activities has allowed automatic additionality based on a ‘unit threshold’ described as “project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-

⁸³ The organisations that charge a nominal fee would be receiving less than the wholesale cost of the CFL, so would lose money on each bulb even though there is nominal revenue. In theory, any programme implemented by an electric utility should not be able to use simple cost analysis because the utility has avoided power generation costs (and deferred capital costs) that are a benefit stream to the project. Even where the project is implemented by a utility (e.g. South Africa’s Eskom), this is not addressed because the unit threshold positive list is used to justify additionality.

scale CDM thresholds.” For energy efficiency, this threshold of 3000 MWh is roughly 46,000 CFLs. All projects and PoAs applying SSC methodologies may use this rule to qualify for automatic additionality.

Table 4-11: Additionality approaches used by efficient lighting CDM project activities

Additionality approach	Number of PAs	Total Annual CERs (1,000)
Investment barrier: Benchmark Analysis	2	71
Investment barrier: Investment Comparison Analysis	2	60
Investment barrier: Simple Cost Analysis	33	1.079
Investment barrier: Other	1	18
Positive list	2	44
Total	40	1.272

Sources: Authors' own compilation

Lighting PoAs have also made extensive use of this unit threshold for automatic additionality. A report by the UNFCCC Secretariat in mid-2014 (CDM-EB85-AA-A09) found that 28 of the registered lighting-related PoAs at that time had used either micro-scale or unit thresholds to qualify for automatically additionality. As an example, all 12 of the Chinese PoAs registered in December 2012 used the unit threshold for automatic additionality.

As one of the first 'top-down' large-scale methodologies, the EB published an energy efficiency lighting methodology in November 2013, which included a new approach for additionality demonstration:

- In countries with limited or no regulations supporting energy efficient lighting, as evidenced by a UNEP Global Lighting Map⁸⁴ survey of regulations and support for energy efficient lighting, CFLs are automatically additional.⁸⁵
- For other countries (i.e. those with more regulatory support), the “Tool for the demonstration and assessment of additionality” must be used, with an investment analysis and common practice analysis. While the investment analysis may still use simple cost analysis (which would mean that almost all projects would be additional), any country with a higher than 20% penetration of CFLs is not additional under the common practice test.

This new approach essentially restricted CFL CDM projects to countries with limited regulatory support or low market penetration. Given that there are no new projects or PoAs entering the pipeline, however, this more recent methodology has not yet had an impact.

In November 2014, AMS II.J was also revised to only allow for automatic additionality for CFLs when there were limited or no regulations to support energy efficient lighting. However, for countries in which there is significant support for energy efficient lighting, the methodology says that additionality should be demonstrated using the latest version of the “Guidelines on the demonstration of additionality of small-scale project activities”. This difference is critical, however, because any project participant may simply use the unit threshold in the “Guidelines on the demonstration of

⁸⁴ <http://map.enlighten-initiative.org/>.

⁸⁵ Countries coloured red on the map have limited or no support for energy efficient lighting.

additionality of small-scale project activities” to guarantee automatic additionality, whatever the market penetration in the host country.

The main concern with the additionality of energy efficient lighting in the CDM is whether some activities – at least projects involving CFLs and fluorescent tubes – were already common practice at the time of registration and therefore not additional. The use of micro-scale or unit threshold positive lists means that project activities and PoAs do not have to address this common practice issue at all when using the SSC methodologies. In other words, using the SSC methodologies would be a way of circumventing the higher stringency of the new large-scale methodology. Projects could simply define the size of each CPA in a way that they qualify as automatically additional, whatever the regulations and market penetration in the host country. To evaluate the additionality of the existing pipeline, it is useful to consider the two criteria from AM0113 and the revised AMS II.J: regulatory support and market penetration.

According to the ‘en.lighten’ initiative’s Global Lighting Map referenced in the methodologies, regulatory support for efficient lighting is widespread, but varies greatly by country (Figure 4-9). For the countries with the most CDM PoA activity, the level of support is generally strong:

- China has already banned incandescent lighting⁸⁶ and implemented large state subsidy programmes since 2006.⁸⁷
- India does not have a ban on incandescent bulbs, but does have awareness-raising programmes, energy service company initiatives, and consumer financing options.
- Pakistan’s minimum energy performance standards also still allow incandescent bulbs, but the country has awareness-raising programmes, bulk procurement and tax incentives.
- South Africa has announced that incandescent bulbs will be phased out by 2016⁸⁸, and has testing and certification facilities. More importantly, the national utility, Eskom, distributed 30 million free CFLs between 2002 and 2010.⁸⁹
- A regional report for Latin America on the en.lighten initiative’s website notes that a Mexican regulation was passed in December 2010 prohibiting the sale of 100 watt and higher incandescent lamps for the residential sector after December 2011, and similar bans for 75 watt as of December 2012 and 40-60 watt as of December 2013.⁹⁰ The Mexican PoA was registered in July 2009, which preceded the passing of these regulations.
- In terms of their rating on minimum energy performance standards by the Global Lighting map, all of the countries with PoAs except Kenya and Malawi are orange (some/in progress) or green (advanced). This means that, in terms of the new large-scale methodology (AM0113), projects in all of the countries except Kenya and Malawi would not be automatically additional, but require the use of the additionality tool with investment analysis and the common practice threshold of 20%.

⁸⁶ Imports and sales of 100-watt-and-higher incandescent lamps are banned from 1 October 2012, 60-watt-and-above from 1 October 2014, and 15 watts or higher from 1 October 2016 http://www.chinadaily.com.cn/china/2011-11/04/content_14039321.htm.

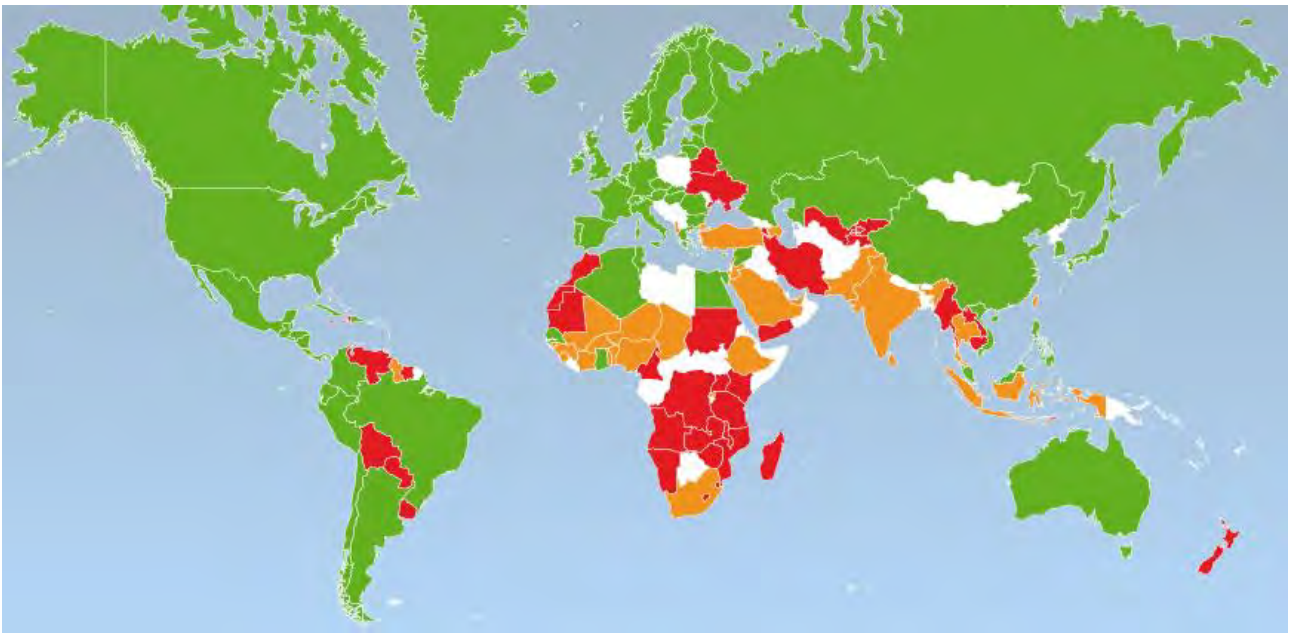
⁸⁷ http://www.sdpc.gov.cn/zjgx/t20080508_210093.htm.

⁸⁸ <http://www.thegef.org/gef/content/phasing-out-inefficient-lighting-combat-climate-change-south-africa-announces-national-phase>.

⁸⁹ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

⁹⁰ <http://www.enlighten-initiative.org/portals/0/documents/country-support/regional-workshops/Regional%20Report%20LA%20&%20C%20Final%20Eng..pdf>. The reference is to regulation “NOM- 028 – ENER – 2010 Energy Efficiency of Lamps for General Use”.

Figure 4-9: Minimum energy performance standards for lighting technologies



Notes: Green = Advanced/in place, Orange=In progress, Red=few/limited, white=no information available

Sources: <http://map.enlighten-initiative.org/>

In terms of assessing common practice, the available evidence suggested that CFLs are likely already common practice in most key CDM countries, and LEDs may be so in the next few years, though not in the poorest countries. The main CDM countries have the following market information:

- According to the “Regional Report on the Transition to Efficient Lighting in South Asia”⁹¹ prepared by the Tata Energy Research Institute in 2014, the market share of CFLs in India amounted to 29% in 2012-2013. Three of the four Indian PoAs were registered in late 2012, while one was registered in early 2010. In addition, for the largest PoA – which was registered in 2010 and has 50 CPAs – the PoA DD states that, “[t]he penetration share of incandescent lamps for lighting in commercial and residential sector put together is thus nearly 80% in India.”⁹² The market share for CFLs, therefore, was almost certainly above 20% when the PoAs were registered.
- In China, a 2012 McKinsey & Company report estimates the penetration of LEDs (the more expensive alternative to CFLs) as 12% in 2011, rising to 46% by 2016. The report also notes that, “CFL is still the dominant technology in the residential segment.”⁹³ This means that, at the time of registration of the PoAs, the market share of CFLs was almost certainly above 20%. China does not have any LED PoAs yet. If they were proposed, AMS II.J and AM0113 both consider LED lamps automatically additional in all countries until at least the end of 2016. Given the McKinsey projections presented above, automatic additionality for LEDs in China would not be appropriate.

⁹¹ <http://www.enlighten-initiative.org/Portals/0/documents/country-support/Regional%20Report%20on%20the%20Transition%20to%20Efficient%20Lighting%20in%20South%20Asia.pdf>.

⁹² <http://cdm.unfccc.int/ProgrammeOfActivities/gotoPoA?id=CZ59J1XMR8K4ELUS6WY3BA01VTGQ2F>.

⁹³ http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/lighting_the_way_perspectives_on_global_lighting_market_2012.ashx.

- The large PoA in Mexico states in the PoA DD that CFL penetration in 2007 was already at 20%, while the PoA was registered in June 2009.⁹⁴
- In South Africa, even before the start of the Eskom free CFL distribution programme, the market share of CFLs was estimated at 7% in 2002 (Nkomo 2005). With 30 million CFLs distributed after this time,⁹⁵ in a country with less than 10 million households, the penetration of efficient lighting was almost certainly well above 20% when Eskom registered their CDM project activity and PoAs in 2012.
- For Pakistan, the “Regional Report on the Transition to Efficient Lighting in South Asia” cited above estimates the CFL market share at 8%, but also notes that linear fluorescent lamps make up 32% of the market.
- For Bangladesh, the same report puts the CFL market share at 25%, with linear tube fluorescent lamps at 18%. This market share could be for 2013 and the PoA was registered in May 2011, so there is a reasonable likelihood that the market share of CFLs was 20% at the time of registration.

This information suggests that the largest CDM PoA countries for energy efficient lighting would not pass the common practice test if the large-scale AM0013 methodology were applied, and so these PoAs would not qualify as additional. Bangladesh, China, India, South Africa and Mexico account for almost 80% of the expected CERs from PoAs, and yet these countries were likely above the 20% market share for CFLs when the PoAs were registered.

For off-grid lighting (AMS III.AR), the situation is quite different. Access to electricity in rural households in Sub-Saharan Africa, for example, is less than 10% (IEA et al. 2010; Legros et al. 2009). Between 2010 and 2015, the estimated number of unelectrified households in Africa was estimated to grow from 110 million to 120 million (Dalberg Global Development Adv. 2010). The off-grid solar lamp market is expanding to address the 1.5 billion people who do not (and, in many cases, will not) have access to electricity (IFC 2012). While solar lantern and solar kit prices are decreasing, they still face major barriers in terms of distribution challenge, upfront costs (and lack of consumer financing), and successful business models for scaling up (ESMAP 2013; IFC 2012).

Assessing the economics of energy efficient lighting faces the classic problem of ‘split incentives’ (Spalding-Fecher et al. 2004). From an economic point of view, upgrades to energy efficient electric lighting are unquestionably economically beneficial (i.e. have large positive IRRs) (McKinsey & Company 2009) but the benefits do not accrue to those who pay for the additional costs if the project is funded by outside agencies. The economics of efficient lighting are more likely to be driven by electricity prices than carbon prices. For example, a 15 W CFL replacing a 60W incandescent lamp operated 3.5 hours per day could save 57 kWh per year. With a relatively carbon-intensive grid (e.g. 0.8 tCO₂/MWh), this would be 0.05 tCO₂e savings per year. Electricity prices to the consumer in developing countries vary widely, from \$50/MWh in heavily subsidized economies to more than \$170/MWh in more competitive emerging economies (EIA 2010; Winkler et al. 2011). This means an energy savings of \$2.87 to \$9.77/year. CFL costs have also declined rapidly, with current costs of \$1.50-\$2.50 in many countries (UNEP 2012). This would mean a typical payback period of much less than one year, before any carbon revenue was received. At current CER prices, carbon revenue would be less than two cents per year only, while at \$3-5/CER, revenue would be \$0.15-0.25, or less than 5% of energy savings.

⁹⁴ http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/17BH6AJX524TYQUZF8KGCWV3OIPSE9/view Annex 3.

⁹⁵ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

In summary, CDM rules on additionality of efficient lighting projects vary considerably. Using market penetration and regulatory support as indicators for the likelihood seems a reasonable approach. The large-scale AM0113 methodology uses market penetration and regulatory support as indicators for demonstrating additionality; this approach seems reasonable and reflects the varying circumstances of host countries. AM0046 may provide for a suitable alternative by monitoring the market penetration of CFLs and LEDs in a control group outside the project boundary; however, the complexity and cost of monitoring under this methodology means that only one project has even chosen to utilise it – so the additionality approaches may not be relevant for the overall impact of this project category. In contrast, under small-scale methodologies, including the revised AMS II.J, this project type is, in practice, considered automatically additional, even if the use of CFLs is required by regulations and is widespread. However, for countries with regulations that have phased out incandescent bulbs or large subsidy programmes for CFLs, these existing registered projects are unlikely to be additional. If we take the 20% market share used in AM0113 as the point at which CFL programmes are no longer likely to be additional, then this would apply to most of the current CDM pipeline for energy efficient lighting.

4.13.4. Baseline emissions

In AMS II.J, AM0113 and AMS II.C (when used for lighting) the baseline is simply the use of the existing incandescent lamps – those which are collected and replaced within the project boundary.⁹⁶ Both AMS II.J and AM0113 take similar approaches, where emissions reductions are related to the difference in power between a CFL and baseline bulb, operating hours, lamp failure rates, a ‘net-to-gross’ adjustment, and the grid emissions factor (taking technical losses into account).⁹⁷ As a default, 3.5 operating hours per day are assumed. If project participants want to use operating hours greater than 3.5 per day, they must conduct a once-off survey at the start of the project to justify this. The lamp failure rates are also based on periodic surveys of the first group of bulbs installed, up to the end of their rated life. The methodologies require project participants to explain how they will collect and destroy baseline lamps. For off-grid lighting, an innovative ‘deemed consumption’ approach assigns a standard emissions reduction to each off-grid lighting unit, based on the fossil fuel alternative. The parameters and assumptions are conservative. Overall, the approaches to baseline emissions for efficient lighting are straightforward and conservative, and the improvements over the last two years have also simplified or clarified many of the sampling procedures.

4.13.5. Other issues

At 3-5 hours of use per day, a typical CFL would last anywhere from 3 to 10 years. This means that a crediting period of 10 years is almost certainly too long, unless the CDM project guarantees free replacements throughout the programme or restricts crediting to the measured life. The latter approach has been adopted under the CDM. Emission reductions do not accrue once the lamp failure rate reaches 100%, so if all lamps fail before the end of the crediting period and are not replaced, then no CERs would be issued. These provisions seem appropriate.

⁹⁶ AM46 also includes the possibility of some efficient lighting in the baseline, as a form of “autonomous efficiency improvement”, but this methodology has only been used once and is unlikely to be used in the future.

⁹⁷ AMS II.C is not so specific, because the guidance was for all energy efficiency technologies, but the approach elaborated by the project participant would essentially be the same.

4.13.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Granting automatic additionality under small-scale methodologies to all energy efficient lighting programmes in the past was highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway; the new large-scale AM0113 methodology appropriately addresses these problems but is not mandatory, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes, so it is unlikely that the large-scale methodology will be used. In many countries with lower income or less regulatory support, however, efficient lighting still faces major barriers, even if it is potentially economic beneficial, and so projects may need the support of the CDM to be implemented; these projects currently form a very small part of the project pipeline but could grow in the future.
Over-crediting	<ul style="list-style-type: none"> Over-crediting is unlikely, given the robust monitoring procedures.
Other issues	<ul style="list-style-type: none"> None

4.13.7. Recommendations for reform of CDM rules

AMS II.J should be revised so that CFL programmes in countries with significant regulatory support may use the tool for “Demonstration of additionality of small-scale project activities” but may not use the paragraph referring to automatic additionality based on small unit size.

5. How additional is the CDM?

Based on the detailed analysis of individual project types in the previous chapter, this chapter provides an overall assessment of the environmental integrity of the CDM project portfolio available for the second commitment period of the Kyoto Protocol. Table 5-1 provides an overview of the summary of findings for each of the analyzed project types.

Table 5-1: Evaluation of project types

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
HFC-23 (up to version 5)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives 	<ul style="list-style-type: none"> None 	Medium
HFC-23 (version 6)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed Ambitious baseline could lead to under-crediting (net mitigation benefit) 	<ul style="list-style-type: none"> Low CER prices could jeopardize continued operation Emissions could be addressed through Montreal Protocol 	High
Adipic acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices 	<ul style="list-style-type: none"> None 	Medium
Nitric acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of overall over-crediting 	<ul style="list-style-type: none"> None 	High
Wind power	<ul style="list-style-type: none"> CER revenue has only limited impact on profitability Investment costs decreased significantly in last years In some cases competitive with fossil generation Support schemes Widespread in many countries 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting 	<ul style="list-style-type: none"> None 	Low
Hydro power	<ul style="list-style-type: none"> Common practice in many countries CERs have only moderate impact on profitability Competitive with fossil generation in many cases 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project likely under-crediting 	<ul style="list-style-type: none"> Methane emissions from reservoirs may be important and may not be fully reflected by CDM methodologies 	Low
Biomass power	<ul style="list-style-type: none"> Significant impact of CER revenues on profitability for projects claiming methane avoidance Competitive with fossil generation in many cases Support schemes 	<ul style="list-style-type: none"> Demonstration of biomass decay/abundance of biomass is key Risk of exaggerated claims of anaerobic decay 	<ul style="list-style-type: none"> None 	Medium

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Landfill gas	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured historically have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid subtropical and tropical regions Perverse incentives for project developers to increase methane generation 	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG intensive waste treatment methods 	Medium
Coal mine methane	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Potential concerns regarding increased mining 	<ul style="list-style-type: none"> Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations 	Medium
Waste heat recovery	<ul style="list-style-type: none"> CER revenues small compared to fossil fuel cost savings Future fuel cost savings uncertain Widespread in many countries 	<ul style="list-style-type: none"> Brownfield: risks for inflated baselines Greenfield: modelling uncertain Plant operation under the project different to baseline 	<ul style="list-style-type: none"> None 	Low
Fossil fuel switch	<ul style="list-style-type: none"> Use of barrier analysis allowed for small-scale projects not appropriate Investment analysis insufficient as choice of fuel depends not only on prices CER revenues have a small impact 	<ul style="list-style-type: none"> Default values for upstream emissions not appropriate 	<ul style="list-style-type: none"> None 	Low

Efficient cook stoves	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs • Additionality questionable in urban areas 	<ul style="list-style-type: none"> • Fraction of NRB likely to be overestimated • Water boiling test not appropriate • Emission intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline • Emissions factors used for suppressed demand are unrealistic • Unrealistic assumptions for charcoal use • Over-crediting if traditional stoves continue to be used 	<ul style="list-style-type: none"> • Inconsistent accounting: CDM credits in the same region both reduction and increase of biomass use 	Low
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Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Efficient lighting (AMS II.C AMS II.J)	<ul style="list-style-type: none"> • Shift to EE lighting well underway and/or mandates in most common PoA countries, and PoAs allowed to use SSC additionality 'loophole' 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	Low
Efficient lighting (AM0113, AM0046)	<ul style="list-style-type: none"> • Likely to be additional 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	High

Notes:

1) High/medium/low likelihood of projects being additional under current rules;

2) High/medium/low likelihood of avoiding over-crediting under current rules;

3) High/medium/low likelihood of emission reductions being additional and not over-credited under current rules.

Sources: Authors' own compilation

Overall, the table shows considerable differences between project types. Most energy-related project types (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are unlikely to be additional, irrespectively of whether they involve the increase of renewable energy, efficiency improvements or fossil fuel switch. An important reason that these projects types are unlikely to be additional is that for them the revenue from the CDM is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. In addition, technological progress was much faster than expected, so that investment and generation costs have fallen considerably. Moreover, some project types are, in many instances, economically attractive (e.g. waste heat recovery, fossil fuel switch, hydropower), or supported through policies (e.g. wind power, efficient lighting), or mandatory due to regulations (e.g. efficient lighting). Some of these project types also have a medium likelihood of overestimating emission reductions, mainly due to risks of inflated baselines.

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered likely to be additional as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and thus do not generate revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-

23, perverse incentives were addressed with the adoption of version 6 of AM0001, which uses an ambitious baseline that could lead to a net mitigation benefit. Similarly, concerns with perverse incentives for nitric acid plant operators not to use less GHG-intensive technologies were addressed. With regard to adipic acid projects, the risks of carbon leakage were not addressed.

Methane projects (landfill gas, coal mine methane) also have a high likelihood of being additional. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face issues with regard to baseline emissions and perverse incentives and may thus lead to over-crediting.

Biomass power projects have a medium likelihood of being additional since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects can be additional, particularly if CER revenues for methane avoidance can be claimed. Biomass projects also face other issues, in particular with regard to demonstrating that the biomass used is renewable.

The additionality efficient lighting project using small-scale methodologies is highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The new methodologies address these problems but they are not mandatory and the small-scale methodologies are while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For cook stove projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. In urban areas, however, the additionality of these project types is questionable. Cook stove projects are also likely considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Based on these considerations we can estimate to which extent the CDM is likely to deliver additional emission reductions during the period of 2013 to 2020 (Table 5-2).

Table 5-2: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Our analysis covers three quarters (76%) of the CDM projects and 85% of the potential CER supply during that period. 85% of the covered projects and 73% of the potential CER supply have a low likelihood of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity.

Has the performance of the CDM in terms of additionality improved over time? Several EB decisions have certainly improved the performance, particularly those which introduced ambitious baselines and/or addressed perverse incentives. However, Schneider (2007) estimated, "that additionality is unlikely or questionable for roughly 40% of the registered projects. These projects are expected to generate about 20% of the CERs". Schneider's methodological approach is not identical with the approach applied in this study but is, nevertheless, similar enough for a comparison of the overall results. Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's performance as a whole has anything but improved, despite improvements of a number of CDM standards. There are several reasons for this:

- The main reason is a shift in the project portfolio towards projects with more questionable additionality. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential from these project types is only less than a quarter. This is mainly due the registration of many energy projects between 2011 and 2013, including both fossil and renewable projects, which represent the largest share of CDM projects and of potential CER supply today, many of which are unlikely to be additional. It can therefore be questioned whether the CDM is the appropriate incentive scheme for those project types, or more generally, whether these project types are appropriate for crediting schemes at all.

- A second reason is that the CDM EB not only improved rules but also made simplifications that undermined the integrity. For example, positive lists were introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). Another example is biomass residue projects, for which requirements to demonstrate that the biomass is available in abundance were strongly simplified, making an over-estimation of emission reductions more likely.
- A third reason is that the CDM EB did not take effective steps to exclude project types with a low likelihood of additionality. While positive lists were introduced, project types with more questionable additionality were not excluded from the CDM. The common practice test is not effective as it stands. Standardized baselines can be optionally used as an alternative to project-specific baselines, which provides a further avenue for demonstrating additionality but does not reduce the number of projects wrongly claiming additionality. In conclusion, the improvements to the CDM mainly aimed at simplifying requirements and reducing the number of false negatives (projects that are additional but do not qualify under the CDM) but did not address the false positives (projects that are not additional but qualify under the CDM).

Our analysis of the environmental integrity of the CDM has focused on the quality of CERs in terms of ensuring emission reductions that are additional and not over-credited. The overall environmental outcome of the CDM is, however, also influenced by several overarching and indirect effects:

- **Awareness raising and capacity building:** The CDM has drawn attention to climate change and to options of how it can be mitigated and thus contributed to the issue of climate change being better understood and taken more seriously in many parts of the world. In this way it has helped to pave the way towards the global agreement achieved at COP 21 in Paris in December 2015.
- **Technological innovation:** The CDM has helped to spread and reduce costs of many GHG mitigation technologies such as renewable energy technologies or technologies to avoid methane emissions in many developing countries. This may have helped developing countries to avoid locking in carbon-intensive technologies. The increased application of these technologies has contributed to reducing their total cost, and the CDM has contributed to building the capacity on how these technologies can domestically be applied in many developing countries.
- **Length of crediting periods:** Certain projects may continue their operation beyond their crediting period and will not receive credits for the respective GHG reductions. This effect has been estimated to have a significant potential for under-crediting (Spalding-Fecher et al. 2012). However, over time the respective technologies often become economically viable without support and thus the common practice in many circumstances. The CDM may thus have contributed to advancing an investment, which would anyhow be conducted some years later, so that even the additionality of CERs generated in the late years of a crediting period could be questioned.
- **Rebound effects:** For CDM project developers and host countries, CER revenues are similar to subsidies, which often lower the cost of the product or service provided (e.g. electricity, cement, transportation), thereby inducing greater demand for the product or service. In contrast, carbon taxes or auctioning of allowances under the ETS generally provide incentives to reduce the demand for products or services. Calvin et al. (2015) show that ignoring such system-wide rebound effects in the power sector can lead to significant over-

crediting compared to the actual reductions at system level. The overall mitigation outcome of crediting could be systematically over-estimated, even if projects are fully additional and the direct GHG emission impact of a project is quantified appropriately. This is mainly because credits subsidize the deployment of technologies with lower emissions instead of penalising the use of more emitting technologies and because CDM methodologies draw the boundary around a project and do not consider the wider rebound effects.

- **Perverse policy incentives:** In some instances, the CDM may provide an incentive to governments not to implement domestic policies to address emissions. For example, policy makers may have disincentives to introduce regulations requiring the capture of landfill gas or to further pursue landfilling instead of less GHG-intensive waste treatment methods, since they would otherwise lose revenues from CERs.

All these effects somehow influence the environmental outcome of the CDM, partly for the better and partly for the worse. The overall effect can hardly be determined. However, it is unlikely that these overarching and indirect effects fully compensate for the overall low environmental integrity of many projects and CERs. On the contrary, in a forward-looking perspective, comparing the situation in which the CDM continues to be used with a situation in which this would not be the case, it is rather likely that these overarching effects further undermine the environmental outcome of the CDM overall.

The result of our analysis suggests that the CDM still has fundamental flaws in terms of environmental integrity. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC. In the following chapters we summarise how the existing CDM should be improved (Chapter 6) and what can be learned from the CDM experience for the future of market mechanisms in general (Chapter 7).

6. Summary of recommendations for further reform of the CDM

The recommendations for the further reform of the CDM can be distinguished according to improvements of the general rules and approaches how to determine additionality and to project type-related recommendations.

6.1. General rules and approaches for determining additionality

As mentioned above, for an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. They cannot fully reflect the complexity of investment decisions. Additionality tests always look at part of the full picture and use simplified indicators, such as economic performance or market penetration, to make a judgment on whether or not a project is truly additional. Information asymmetry between project developers and regulators, combined with the economic incentives for project developers to qualify their project as additional, are a major challenge. The key policy question is how confident regulators should be that a project is additional. In other words, how should the number of false positives (projects that qualify as additional but are not) and false negatives (projects that are additional but do not pass the test) be balanced? We assessed the current additionality tests from the perspective that a high degree of confidence is required. The main reason is that the implications of false positives are much more severe than the implications of false negatives. A false positive leads to both an increase in global

GHG emissions and higher global costs of mitigating climate change, whereas a false negative does not affect global GHG emissions but only leads to higher costs of mitigating climate change (Schneider et al. 2014).

In Chapter 3 we thoroughly scrutinised the four main approaches used to determine additionality. Our analysis shows:

- **Prior consideration** is a necessary and important but insufficient step for ensuring additionality of CDM projects. This step works largely as intended (Section 3.1.4).
- The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. It is possible that improvements could further decrease this subjectivity, e.g. by applying more complicated tests to assess the financial performance of the project. However, especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio (Section 3.2.4).
- To reduce the subjectivity of the **barrier analysis**, the '*Guidelines for objective demonstration and assessment of barriers*' require that barriers are monetized to the extent possible and integrated in the investment analysis. As a result of this, the barrier analysis has lost importance as a stand-alone approach of demonstrating additionality. However, barriers which are not monetized remain subjective and often difficult to verify by the DOEs (Section 3.4.4).
- In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis (Section 3.3.4). In this regard, expanding the use of common practice analysis could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality. Moreover, when expanding its use, it is important to reflect that market penetration is not a good proxy for all project types for the likelihood of additionality. The fact that few others have implemented the same project type is only an indication of the actual attractiveness. It should thus be only applied to those project types for which market penetration is a reasonable indicator.

Against this background we recommend that

- the **prior consideration** grace period for notification after the start of a CDM project should be shortened from 180 to 30 days to reduce the risk that projects apply for the CDM having only learned about this option after the start of the project,
- the **common practice analysis** is significantly reformed and receives a more prominent role in additionality determination,
- the **investment analysis** is excluded as an approach for demonstrating additionality for projects types for which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence; while for those project types for which investment analysis would still be eligible, project participants must confirm that all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders, and

- the **barrier analysis** is entirely abolished as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types); barriers which can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

A prerequisite for expanding the use of the common practice analysis is significant improvements of its current shortcomings, most notably with regard to the following issues (Section 3.3.4):

- The project types and sectors covered by the CDM are very different in their technological and market structure. Determining what is deemed to be common practice must take into account these differences. Therefore, the 'one-size-fits-all' approach of determining common practice should be abandoned and be replaced by **sector or project-type specific guidance**, particularly with regard to distinguishing between different and similar technologies (appropriate level of dis-/aggregation) and with regard to the threshold for market penetration, which can have very different implications for the number of projects passing the test, depending on the features of the sectors or project types.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country. However, results of studies on the technological potential depend strongly on their assumptions and may thus vary significantly. The exploitation rate should therefore only be considered one criterion among others in determining whether a technology is common practice; it should not form the only decisive criterion.
- The common practice analysis should at least cover the **entire country**. However, to ensure statistical confidence, the control group needs a minimum absolute number of activities or installations. If the observations in the host country do not exceed that minimum threshold, the scope needs to be extended to other countries (e.g. the neighbouring countries or the entire continent).
- Last but not least, all CDM projects should be included into the common practice analysis as a default, unless a methodology includes different requirements.

In addition to the above-mentioned improvements of general approaches for determining additionality, we recommend further improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period, not merely the validity of the baseline but the validity of the baseline scenario should be assessed for CDM projects that are potentially problematic in this regard. This is the case if the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex such as urban transport systems or data centres should be limited to one single period of 10 years maximum. Moreover, generally abolishing the renewal of crediting periods but allowing a somewhat longer single crediting period for project types which require a continuous stream of CER revenues to continue operation (e.g. landfill gas flaring) may also be considered (Section 3.5.4).
- **Positive Lists:** Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. This review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of national policies and measures to

support low emissions technologies (so-called E- policies). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. A positive list that included renewables, for example, could be qualified by restricting its applicability to countries that did not have any support policies in place for that specific technology. Finally, to maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists (Section 3.7).

- **Programmes of activities:** PoA rules allow that the total project size exceeds the small-scale or micro-scale thresholds while using the automatic additionality provision established for small-scale and micro-scale projects. This may increase the risk of registering non-additional projects. Reform of the CDM rules related to additionality for particular project types (Chapter 4) and positive lists (Section 3.7) will address any concerns about additionality of PoAs (Section 3.6.3). However, as long as these rules are not reformed accordingly, PoA have the potential to boost the number of non-additional project activities and CERs.
- **Standardized baselines:** These were introduced to reduce transaction costs while ensuring environmental integrity. In contrast to the general expectation, they do not increase the environmental integrity of the CDM. On the contrary, as long as they are not mandatory, once established, they lower the environmental integrity because they allow for increasing the number false positive projects. Therefore, their use should be made mandatory. Moreover, all CDM facilities should be included in the peer group used for the establishment of standardized baselines and clearer guidance needs to be provided for DNAs on how to determine the appropriate level for disaggregation. Finally, the practice of using the same methodological approach for the establishment of standardized baselines for all sectors, project types and locations should be abolished (Section 3.8).
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity through over-crediting of emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by their exclusion from the crediting baseline where possible (Section 3.9).
- **Suppressed demand:** In many cases, the Minimum Service Levels may be reached during the lifetime of CDM project. However, even if the suppressed demand does lead to some over-crediting, the overall impact is very small. An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to countries in which development needs are highest and the potential for over-crediting is the smallest, such as LDCs (Section 3.10).

6.2. Project types

We note that even with ‘perfect’ rules for determining additionality as recommended in Section 6.1, many project types have fundamental problems with this determination. Drawing upon our findings for specific project types (Section 4), this section provides recommendations of which project types should remain eligible in the CDM. In doing so, we not only consider the environmental integrity under current rules, but also whether improvements of general or project type-specific rules could be implemented to ensure overall environmental integrity. We also include other considerations, such as whether the emission sources can be addressed more effectively by other policies.

Industrial gas projects: In contrast to conventional wisdom and their perception in the general public, our analysis shows that industrial gas projects provide for a high or medium environmental integrity. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects now provide for a high degree of environmental integrity. They are very likely to be additional because they involve so-called ‘end-of-the-pipe’ technologies and do not have significant income other than CERs and because revenues from CERs have a large impact on the economic feasibility. Moreover, they partially use emission benchmarks as baselines which underestimate the actual emission reductions. The methodologies for HFC-23 and nitric acid projects have already been improved in the past and do not require further improvements (Sections 4.2.7 and 4.4.7). For **adipic acid**, the situation is different; this project type is also likely to be additional but concerns about carbon leakage due to high CER revenues have never been addressed. Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. A global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate (Section 4.3.7). Industrial gas projects provide for low cost mitigation options. Under current rules, HFC-23 and adipic acid projects may generate large rents for plant operators. These emission sources could therefore also be addressed through domestic policies, such as regulations or by including the emission sources in domestic or regional ETS, and help countries achieve their NDCs under the Paris Agreement. For example, China is introducing a domestic results-based finance policy aiming at incentivising HFC-23 emissions reductions. Parties to the Montreal Protocol also consider regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM. A transition to address these emissions domestically may also be supported by bilateral or multilateral initiatives of (results-based) carbon finance.

Energy-related project types: Our analysis suggests that many energy-related project types provide for a low likelihood of overall environmental integrity, particularly **wind and hydropower** (Sections 4.5.7 and 4.6.7), **fossil fuel switch** (Section 4.11.7) and **supply-side energy efficiency project** types such as **waste heat recovery** (Section 4.10.7). The main reason for this assessment is that CER benefits are often relatively small compared to fuel cost savings, so that the impact of CER revenues on the economic feasibility is marginal (Section 2.4). Many projects are also supported through other policies, such as feed-in tariffs for renewable electricity or emerging ETSs. The costs for renewable power technologies are decreasing rapidly. In our assessment, the potential for addressing additionality concerns through improved tests are rather limited for these project types. Many projects are economically viable and even an improved investment analysis or common practice test may not be suitable to clearly distinguish additional from non-additional projects. We therefore recommend **that these project types should be no longer eligible in principle** under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers (Section 4.5.3). These project types may thus remain eligible in least developed countries.

We recommend that some other energy-related project remain eligible if methodologies are improved. **Biomass power projects** can be competitive with fossil generation technologies under certain but not all circumstances. In cases in which power generation from biomass is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. In these cases, the demonstration of abundance of biomass as well as of the claim that biomass is left to decay is key for avoiding any over-crediting of emissions. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM provided that the corresponding provisions in the applicable methodologies are revised appropriately (Section 4.7.7).

With regard **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, environmental integrity concerns could be addressed if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass (Section 4.12.7), and if approaches for determining the penetration rate of efficient lighting technologies as already established in AM0113 were made mandatory for all new projects and CPAs under these project types and the older methodologies were withdrawn (Section 4.13.7). As CER revenues can have a considerable impact and as barriers persist these projects, we recommend that they should remain eligible, subject to the improvements recommended.

Methane projects: Landfill gas and **coal mine methane** projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and by requesting DOEs to verify that landfilling practices are not changed (Sections 4.8.7 and 4.9.7). For both project types, the CER revenues have a considerable impact on their economic performance. With regard to landfill gas, an important concern is that continued incentives for landfilling could delay the implementation of more sustainable waste management practices, such as recycling or composting. We therefore recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Table 6-1 summarises our recommendations for the specific project types assessed above.

Table 6-1: CDM eligibility of project types

Project type	Environmental integrity under current rules	Environmental integrity if rules were improved	Recommendations
HFC-23	Medium / High	High	Not eligible
Adipic acid	Medium	High	Eligible (with benchmark of 30 kg / t AA)
Nitric acid	High	High	Eligible
Wind power	Low	Low	Not eligible
Hydropower	Low	Low	Not eligible
Biomass power	Medium	Medium / High	Eligible (projects avoiding methane emissions)
Landfill gas	Medium	Medium / High	Eligible (subject to transition arrangements)
Coal mine methane	Medium	Medium / High	Eligible
Waste heat recovery	Low	Low	Not eligible
Fossil fuel switch	Low	Low	Not eligible
Efficient cook stoves	Low	Medium / High	Eligible
Efficient lighting	Low / High	Medium / High	Eligible

Sources: Authors' own compilation

7. Implications for the future role of the CDM and crediting mechanisms

In this section, we consider the implications of our analysis for the future role of the CDM and crediting mechanisms generally. We situate these implications not only in the context of the CDM but also the Paris Agreement and draw general conclusions for the design of international crediting mechanisms under the Paris Agreement as well as crediting policies established at national level.

The CDM has provided many benefits. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer and may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures. The CDM has also helped to build capacity and to raise awareness on climate change. It also created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects have provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of considerable experience, the enduring limitations of GHG crediting mechanisms are apparent.

- Firstly, and most notably, the elusiveness of additionality for all but a limited set of project types is very difficult, if not impossible, to address. Our analysis shows that many CDM project types are unlikely to be additional. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is difficult to address through improvements of rules. Further standardisation can be helpful for reducing transaction costs but has a limited scope, particularly within the CDM, for resolving additionality concerns. The scope for added standardisation is limited by the number of amenable project types and the wide variation of conditions across CDM host countries. Standardisation approaches have been most successful in regional crediting programs such as California or

Australia, where they have focused on a limited number of suitable and largely non-energy project types, such as landfills or coal mines.⁹⁸ The overall integrity of the CDM could only be improved significantly if the mechanism were limited to those project types that have a high likelihood of providing additional emission reductions. In our assessment, this would require excluding most of the current CDM project types and focusing mainly on projects that abate other GHGs than CO₂.

- Secondly, international crediting mechanisms involve an inherent and unsolvable dilemma: either they might create perverse incentives for policy makers in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they credit activities that are not additional because they are implemented due to policies or regulations. This well-known dilemma has been discussed by the CDM EB without a resolution.
- Thirdly, for many project types, the uncertainty of emission reductions is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules.
- A further overarching shortcoming of crediting mechanisms is that they do not make polluters pay but rather subsidize the reduction of emissions. This lowers the cost of the product or service, inducing rebound effects that are not considered under CDM rules and that lead to over-crediting. Most of these shortcomings are inherent to using crediting mechanisms, which questions the effectiveness of international crediting mechanisms as a key policy tool for climate mitigation.

It should be noted that the results of the analysis provided here for the CDM are to a large extent also relevant and valid for other international carbon offset or crediting programs, such as the Japanese Joint Crediting Mechanism (JCM), the Climate Action Reserve (CAR), the Verified Carbon Standard (VCS) or the Gold Standard (GS). The results are also relevant for the mechanisms to be implemented under Article 6 of the Paris Agreement, any mechanism to be used for compliance under the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) and to a certain extent for the Joint implementation (for an overview see Kollmuss et al. 2015a). Even though the programs differ in many aspects, generally speaking, the CDM has been the origin and the role model for these offset programs. In particular, the CDM's approaches to additionality testing and baseline setting have served as the main blueprint for most other programs. With the aim of reducing transaction costs, rules and methodologies for additionality that have been borrowed from the CDM have been simplified, which did not generally strengthen their environmental integrity. Therefore, the issues raised here in the context of the CDM will remain relevant for other international offset programs.

The future role of crediting mechanisms should be revisited in the light of the Paris Agreement. The CDM in its current form will end with the conclusion of the second commitment period of the Kyoto Protocol. Several elements of the CDM could, nevertheless, be used when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. As of 15 December 2015, 187

⁹⁸ <http://wupperinst.org/en/projects/details/wi/p/s/pd/377/>.

countries, covering around 95% of global emissions in 2010 and 98% of global population, have submitted NDCs (CAT 2015). Many mitigation pledges in NDCs cover economy-wide emissions or large parts of the economy. This implies that much of the current CDM project portfolio will fall within the scope of NDCs.

The Paris Agreement requires countries to adjust their reported GHG emissions for international transfers of mitigation outcomes in order to avoid double counting of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond that which they had pledged under their NDCs. Double counting can occur, inter alia, if the same emission reductions are accounted by both the host country – as reflected in its GHG inventory – and the country using these credits towards achieving its mitigation pledge. Avoiding such double counting could imply that host countries will have to add internationally transferred credits to their reported GHG emissions if the emission reductions fall within the scope of their mitigation pledges. This has several important implications.

Firstly, issuing and transferring credits that do not represent additional emission reductions or are under- or over-credited has other implications for global GHG emissions. Under the Kyoto Protocol, non-additional CDM projects or over-crediting increase global GHG emissions, whereas under-crediting from additional projects provides a net mitigation benefit. The implications are different and more complex when the emission reductions fall within the scope of the NDC of the host country: they depend on whether the credited activities are additional, whether they are over- or under-credited, the ambition of the mitigation pledge of the host country, i.e. whether or not it is below BAU emissions, and whether the emission reductions are reflected in the host country's GHG inventory⁹⁹ (Kollmuss et al. 2015b). Compared to the situation in which international transfers of credits would not be allowed, global GHG emissions could not be affected, decrease or increase due to the transfer of credits, depending on the circumstances. For example, if the host country has an ambitious NDC, non-additionality and over-crediting may not necessarily increase global GHG emissions because the country would have to reduce other GHG emissions to compensate for the adjustments to its reported GHG emissions. For the same reasons, under-crediting would not necessarily lead to a global net mitigation benefit. Additionality and over-crediting mainly matter when host countries have weak mitigation pledges above BAU emissions.

A second important implication relates to the incentives for host countries to ensure integrity and participate in international crediting mechanisms. If mitigation pledges are ambitious, host countries might be cautious to 'give away' non-additional credits. To achieve its mitigation pledge, the host country would need to compensate for exports of non-additional credits, by further reducing its emissions. Host countries with ambitious and economy-wide mitigation pledges would thus have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. For those project types with a high likelihood of additionality, the potential for further emission reductions is limited and it is unclear whether host countries would be willing to engage in crediting for this 'low-hanging fruit' mitigation potential. The experience with Joint Implementation showed that most credits originated from countries with 'hot air', i.e. where the emission pledge is less ambitious than BAU emissions, while the potential for crediting was quite limited in countries

⁹⁹ Some emissions reductions may not be reflected in the country-wide GHG inventory, for example, because the country uses simple Tier 1 methods to estimate an emissions source which do not account for the emission reductions achieved through CDM projects or because the reductions occur in a sector that is not covered by the host country's GHG inventory.

with ambitious mitigation targets, also due to overlap with other climate policies (Kollmuss et al. 2015b). In conclusion, this suggests that the future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries, including Japan, Norway and Switzerland, have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries.

A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance, which could indirectly increase global GHG emissions compared to using the available resources more effectively. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. They need to show that their investments *'make a difference'*. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules to assess the additionality of projects considered for funding.

Some countries pursue domestic crediting policies. South Korea allows companies to convert CERs from Korean projects into units eligible under its domestic emissions trading system. The Chinese and California-Quebec ETS allow the use of credits from domestic offsetting projects. Mexico, South Africa and Switzerland are pursuing policies that allow using domestic credits to meet tax or other obligations (see also the paragraph above on other offsetting programs). In these cases, using non-additional credits has no direct implication on global GHG emissions but will increase the country's costs towards achieving its NDC. In the long run, this provides incentives for these countries to limit crediting to project types with a high likelihood of additionality. However, meeting the ambitious long-term climate change mitigation goals of the UNFCCC and the Paris Agreement requires much stronger action and a rapid bridging of the emissions gap (UNEP 2015). It is hard to imagine that such ambitious goals could be achieved on a global level in a timely manner without a sharing of effort or burdens that could encompass some form of transfer of mitigation outcomes and/or results-based climate finance.

Taking into account this context and the findings of our analysis as well as other evaluations, we recommend that policy makers revisit the role of crediting in future climate policy:

- **Moving towards more effective climate policies:** We recommend focusing climate mitigation efforts on forms of carbon pricing that do not rely extensively on credits, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. If well designed, emission trading systems and carbon taxes have several advantages over crediting mechanisms: they do not require additionality to be assessed or hypothetical baselines to be set but rather rely on information on actual emissions for which information asymmetry is more manageable; in principle, they make the polluter pay rather than providing subsidies; and they expose all regulated entities to a carbon price, enabling

up-scaled, sector-wide emission reductions. We recommend that international crediting mechanisms play a limited role after 2020 to address specific emission sources in countries that do not have the capacity to implement broader climate policies. Crediting should not be further pursued as a main tool for GHG mitigation.

- **Fundamental and far-ranging changes to the CDM:** To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting the mechanism to project types that have a high likelihood of delivering additional emission reductions. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches where possible. We also recommend curtailing the length of the crediting periods with no renewal. A larger question is whether the UNFCCC and CDM processes can create the consensus needed to make the fundamental changes needed to improve the integrity of the CDM in significant ways.
- **Purchase of CERs:** We recommend potential buyers of CERs to limit any purchase of CERs to either existing projects that are at risk of stopping GHG abatement ('vulnerable projects') or the few project types that have a high likelihood of ensuring environmental integrity. Continued purchase of CERs should be accompanied with a plan and support to host countries to transition to broader and more effective climate policies that ensure GHG abatement in the long-run. Purchase of CERs could also be used to deliver results-based finance in this context. Further, we recommend pursuing the purchase and cancellation of CERs, as a form of results-based climate finance, rather than using CERs for compliance towards meeting mitigation targets.
- **Mechanisms under Article 6 of the Paris Agreement:** Given the high integrity risks of crediting mechanisms, we recommend that Parties consider provisions that provide strong incentives to the Parties involved to ensure integrity of international transfers of mitigation outcomes. This includes robust accounting provisions, inter alia, to avoid double counting of emission reductions, but should also extend to other elements, such as comprehensive, transparent and ambitious mitigation pledges as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment and other evaluations confirm the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies including international cooperative actions becomes key to bringing down emissions quickly to a pathway consistent with well below 2°C. Our findings suggest that crediting approaches should play a time-limited and niche-specific role, where additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

8. Annex

8.1. Representative samples of CDM projects

8.1.1. Task

The population consists of 7,418 CDM projects which have 4 characteristics (location, technology, size, time), from which representative samples for three additionality approaches (investment analysis, barrier analysis and common practice analysis) should be drawn. One challenge consists of the fact that the additionality approaches are not directly known before the analysis. After some preliminary analyzes, we decided on a two-step approach.

1. Draw a representative sample with regard to all strata of the 4 characteristics of size 300. The additionality approaches are determined for the projects in this sample.
2. Draw sub-samples from the projects belonging to each of the three additionality approaches, which are representative for the strata of the 4 characteristics, as they occur for the projects of each additionality approach. The sub-samples shall consist of 50 projects each, which are to be further divided into one 30-project sample and two 10-project samples. The 30- and 10-project sample should each be representative of the strata and combine to the 50-project sample.

8.1.2. Approach

The challenge consists of the fact that the small sample sizes lead to less than one draw for many strata. In a first step, therefore, a randomised procedure is necessary to identify the strata from which to draw, such that the frequencies of the strata are best preserved from the population to the samples.

Drawing the 300-project sample

1. Randomly select strata from which to draw
 - a) Calculate the target number of draws for each stratum as (stratum frequency) (population size) (sample size). These are decimal numbers and often below.

In order to obtain an integer number of draws for a stratum, discretise its corresponding target number to the enclosing integers, e.g. 2.1 is randomly assigned either 2 or 3, where the probability of the assignment of the higher enclosing integer is weighted with $(\text{target number})^{(\text{lower enclosing integer})}$. In the example, the probability that 2.1 becomes 3 is therefore weighted with $2.1^2 \approx 0.1$. The number of target numbers assigned to the higher enclosing integer is determined such that the sum of all assigned lower enclosing integer and all assigned higher enclosing integer is as close as possible to the rounded sum of all respective target numbers.

For example, assume 3 target numbers between 2 and 3, namely (2.1, 2.3, 2.9). Their rounded sum is 7. Drawing twice from two strata and three times from one strata yields the targeted 7 total draws. The third strata with the target number 2.9 has the highest chance of being chosen for the three draws.

- b) Strata with 0 frequency in the population have of course 0 frequency in the samples as well.
2. Randomly draw from the strata with the discretised target numbers of the previous steps.

Drawing sub-samples of the 300-project sample with the added additionality approach information

From the 300-project sample, we extract the projects that belong to each additionality approach, yielding three sub-samples. From each of these sub-samples, we draw samples of 50 projects, which are representative with regard to the strata of the 4 characteristics in the respective sub-sample. We employ the same approach as for drawing the 300-project sample (Section 2.1).

These three samples of 50 projects are ordered with respect to the strata of the 4 characteristics. Then we extract two sub-sets of 10 projects, one consisting of the 1st, 6th, 11th, 15th... project, the second consisting of the 3rd, 8th, 13th, 18th... project of the ordered sample. The 30-project sample consists of the remaining projects. This ensures that the strata within the 50-project sample are preserved in the smaller samples as well as possible.

8.1.3. Samples

Investment analysis: 69, 544, 1436, 1906, 2007, 2075, 2229, 2525, 3068, 3490, 3703, 4042, 4317, 4657, 5047, 5659, 5661, 5707, 5757, 6052, 6899, 7073, 7185, 7843, 7974, 8057, 8523, 8615, 8801, 9002

1875, 2315, 3033, 3186, 3799, 4600, 4687, 5843, 7024, 7551, 8903

1795, 2931, 4817, 5555, 6173, 6440, 7540, 8291, 8818, 8821

Barrier analysis: 244, 348, 582, 644, 1053, 1408, 1578, 1738, 2180, 2561, 3174, 3191, 3639, 3739, 3856, 4468, 4478, 4508, 4748, 5099, 5749, 5961, 6012, 6302, 6636, 7242, 7392, 7651, 8680, 9419

534, 831, 937, 1151, 1827, 2098, 4147, 5234, 7595, 8319

544, 2077, 2975, 3393, 4089, 5888, 6246, 7578, 8927, 9100

Common practice analysis: 69, 1227, 1602, 1737, 2007, 2075, 2098, 2109, 2302, 2315, 3068, 3186, 3642, 3670, 3799, 4687, 5006, 5359, 5659, 5843, 6173, 6553, 6899, 7648, 7936, 8125, 8140, 8506, 8636, 9699

588, 2486, 3994, 4317, 6440, 7400, 8093, 8505, 8523, 8879

366, 544, 1661, 1875, 3703, 4042, 4310, 5487, 7494, 8818

8.2. Information on suppressed demand in CDM methodologies

Table 8-1: Information on suppressed demand in CDM methodologies

Meth No.	Definition of baseline technology	Definition of MSL	Definition of baseline activity level
ACM0014	Methane Correction Factor of 0.4 for domestic wastewater	None	Project activity level (i.e. quantity of wastewater treated)
AMS I.A	Allows AMS I.L approach	Allows AMS I.L approach	Project activity level (i.e. quantity of electricity consumed)
AMS III.AR	Fossil fuel powered lamp	3.5 hrs per day x 2 CFL lamps (240 lux)	Deemed savings with fossil fuel lamp to match MSL, with annual growth in kerosene consumption
AMS II.G	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of biomass saved)
AMS III.F	Unmanaged waste disposal with > 5m depth (methane Correction Factor of 0.8)	MSL is having a waste disposal site	Project activity level (i.e. quantity of waste converted to compost)
AMS I.E	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of renewable energy used)
ACM0022	Unmanaged waste disposal with < 5m depth (methane correction factor of 0.4)	MSL is having a waste disposal site	Project activity level, although project proponent may propose another baseline
AMS I.L	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.BB	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.AV	Fossil fuel or non-renewable biomass to boil water (only requires justification if share of total population without access to improved drinking water is > 60%)	No minimum, but sets maximum level of 5.5 litres per person-day for crediting	Project activity level (i.e. quantity of water purified by project), but capped at 5.5 litres per person per day

Sources: Authors' own compilation

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**Measuring Emissions Against an Alternative Future:
Fundamental Flaws in the Structure of the Kyoto Protocol's
Clean Development Mechanism**

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Executive Summary

The Kyoto Protocol's Clean Development Mechanism (CDM) enables industrialized countries to partially meet their emissions reduction targets by reducing emissions in developing countries. An appeal of the CDM is its perceived efficiency as a market mechanism. The CDM theoretically creates value for carbon reductions and allows the market to find the cheapest reductions anywhere in the world. A key challenge to the environmental integrity of the CDM is filtering out business-as-usual, or "non-additional," projects. The CDM should only generate carbon credits from activities beyond business-as-usual. Each business-as-usual project that is allowed to generate carbon credits under the CDM will permit an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway rather than actually reducing emissions. The poor quality of the arguments and evidence used to prove project additionality in CDM application documents, and the resulting large-scale registration of non-additional projects, have been well documented. Proposals for reforming the CDM range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting.

This paper examines the possibility of improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism by studying how the CDM is working in practice in the Indian power sector. It is based on interviews conducted in India during 2004 and 2009 with over 80 CDM and renewable energy professionals involved in CDM project development, including project developers, consultants, validators (hired to audit each project applying for CDM registration), carbon traders, bank employees, government officials, members of the CDM governance panels, and others involved in renewable energy and hydropower development in India. It also draws on analysis of the UNEP Risoe CDM project database, and analysis of documents from 70 CDM projects comprising all of the large (over 15 megawatt) wind, hydro, and biomass projects registered in India since 2007 and the 20 most recently registered hydro projects in China. This paper presents the following findings:

- The majority of CDM projects are "non-additional" and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- The large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

The following is a section-by-section summary of the analysis in this paper on which these findings are based.

Widespread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable

energy development in the country. At least twelve developers and consultants told me that the CDM projects that they proposed would have been built regardless of the CDM. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. Validators, tasked with auditing CDM additionality claims, believe that additionality testing procedures are subjective and can be manipulated, with many “knobs you can turn.” Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions due to the uncertainties associated with CDM registration and carbon credit revenues. Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms” rather than based on the small and uncertain financial benefit from carbon credit sales; and “any project can be registered under the CDM.”

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find. A murmur of agreement went through the audience at a carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in decisions to build projects are being forged and post-dated. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own. Only one of the seventeen large wind CDM projects in India that make their financial assessments publicly available uses and correctly calculates the tax benefits offered to wind power developers by the Indian government.

An accurate project-by-project additionality test is infeasible

The “investment analysis” is the means for demonstrating project additionality that is viewed as having the most potential to accurately test project additionality if it is made more rigorous. The investment analysis presumes that it is possible to accurately predict whether a project would be built based on the sign (positive or negative) of a single number – the difference between the expected financial returns from the proposed CDM project and a benchmark defining the boundary between viability and lack of viability for that project type. If the returns are below the benchmark, the project would not likely be built; above it, it would. One indication that the investment analysis has been inaccurate is that just under half of the 29 Indian projects examined in this analysis that make their financial assessments publicly available calculate financial returns below the benchmark even with carbon credit income. This predicts that the projects would not have been built even with income from carbon credit sales. Yet all of these projects were still built.

The main challenge to implementing an accurate investment analysis is that developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM project is additional, so that when a range of values is possible, the values are suspect. Analysis of financial assessments for wind and biomass projects in India reveals assumptions that can be varied within reasonable ranges to change the expected financial returns

of the projects more than the amount that the returns are above or below the benchmark. Even the best cases for an investment analysis – wind projects in India in which all of the main inputs into the financial assessment are typically documented in formal agreements before project construction starts – still have room to vary assumptions (for example the tariff after the end of the power purchasing agreement) within ranges equivalent to the effect of the carbon credit sales. For the investment analysis to be accurate even at this level, supply and loan agreements would need to be signed before the start of the CDM application process. For most other project types there is even more room for manipulation of cost inputs. For example, assumptions about future biomass prices affect the expected financial returns much more than carbon credits do for biomass projects purchasing biomass from neighboring farms.

Large hydropower in India is inappropriate for additionality testing for several reasons. First, large hydropower development is decided by a government planning process and involves a wide range of considerations that are not easily predicted. Second, the per-kilowatt hour tariff provided to large hydropower producers is calculated periodically on a cost-plus basis to ensure that the producer receives a pre-agreed return on their equity investment. The investment analysis is meaningless in this context. Third, financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs. Affecting most project types is the lack of a single accurate benchmark since project development decisions can be based on multiple factors and project risk assessment is inherently subjective. This analysis suggests that an accurate project-by-project additionality test is infeasible for most projects and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

The CDM has little influence on project development

While additionality testing is not very effective in preventing non-additional projects from registering under the CDM, the need to conduct a test that is inherently imprecise and subjective limits the ability of the CDM to support truly additional projects. The CDM's ability to influence the decisions of developers, lenders and investors is compromised by a combination of the length of time it takes to validate and register a proposed CDM project (seventeen and a half months on average for projects registered over the last two years) and the uncertainties associated with CDM validation and registration and carbon credit issuance.

Developers are not waiting to make sure that their projects are successfully validated or registered under the CDM before deciding whether to build their projects. Three-quarters of all registered CDM projects were operational by the time they were registered as CDM projects. Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. Two of these projects were registered within the last year. Developers do not seem to view a positive validation or CDM registration as helpful in acquiring project financing. Developers of 66 of the 70 projects started the CDM validation process around the time of or after the beginning of project construction.

It is likely that most of these developers did not make their decisions to go forward with their projects based on the expectation of CDM income because of the substantial uncertainties

associated with CDM revenues. Uncertainties include the possibility that the project would not pass validation or be accepted for CDM registration, fluctuating carbon credit prices, and uncertainties about the value carbon credits will have post-2012. A large proportion of the risk, time and complexity of the CDM application process is because of additionality testing.

Beyond additionality, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, the structure of project-based offsetting in a number of other ways contributes to the generation of more credits than actual reductions and limits its influence on emissions. The CDM should result in reductions in emissions in developing countries at least as large as the credits it generates. Therefore, since each CDM project is allowed to produce carbon credits for its full lifetime, defined either as a single 10-year period or 21 years (3 consecutive 7-year periods) without retesting additionality, the CDM should only support projects that would not have been built for 10 or 21 years without the CDM.

Hydropower, wind and other low-carbon electricity generation technologies are generally developed in order of their cost effectiveness. A preferred support mechanism would accelerate the development of all of these plants rather than change the order in which they are built. The CDM as it is currently structured could work in one of two ways. It could support a portfolio of projects that would not otherwise have been built for more than a decade, a portfolio of unattractive projects, enabling less attractive projects to be built before more attractive ones. Alternatively, the CDM could accelerate the building of all plants, generating more credits than the emissions actually avoided. Neither is a good option.

The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated. Therefore, the CDM is unable to support many measures that are needed or are more cost effective for the deployment of technologies and the decarbonization of sectors but for which it is especially difficult to measure emissions reductions, such as policy, research and development, demonstration projects, and information dissemination. A long-standing criticism of the CDM is that it may create perverse incentives for governments not to implement climate-friendly policy in order to maintain a high baseline against which domestic facilities can prove additionality and generate carbon credits.

The large-scale use of offsetting credits hinders global efforts to mitigate climate change

Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in carbon emissions in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, will still result in a 2.0-2.4 degree Celsius temperature increase. The large quantities of offsets being proposed for use by industrialized countries post-2012 would put them far away from these reduction pathways, hindering global mitigation efforts in the coming decades.

Any offsetting mechanism in developing countries, whether it is project- or sector-based, involves measuring emissions against an alternative business-as-usual growth scenario and therefore the quantity of emissions reduced is inherently uncertain. Further, the use of large quantities of offsets in one commitment period makes it harder for industrialized countries to

accept meaningful reductions in the next, since industrialized countries will be more dependent on the uncertain availability of credits through the carbon market to meet deepening targets. If industrialized countries are to use the quantities of offset credits they propose post-2012, the majority of global reductions over the next ten years will occur in developing countries. Industrialized countries are therefore committing either to steeper annual reductions in the future, or to long-term inequalities in emissions between the North and the South. Both options make future cooperation more difficult. Major shifts in high emitting sectors in industrialized countries require time to allow for changes in behavior and in support industries, for experimentation and learning, adapting technologies to diverse local contexts, research, development and deployment. The use of offsets postpones these processes in industrialized countries. We live in a globalized world with a widely shared linear view of development and progress. Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of lifestyles in the global North. In a world dominated by a single vision of progress, the vision of progress that we are striving towards must be sustainable. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

The way forward

Our inability to accurately measure the emissions reduced by individual projects, compounded by the large-scale use of offsetting credits by industrialized countries to meet their reduction commitments, risk substantially undermining the effectiveness of the post-2012 climate change regime and our ability to control global greenhouse gas emissions. Any offsetting mechanism included post-2012 will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

The first point is practically difficult, the third, politically difficult. We have seen little indication that countries will agree to an offsetting mechanism that is small enough and targeted enough, with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. Attention must be refocused on reductions in countries with emissions caps, with non-credited support for mitigation efforts in developing countries.

Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism

Abstract

Proposals for reforming the Clean Development Mechanism (CDM) range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting. Interviews conducted in India during 2004-2009 on how the CDM is working in practice in India's electricity sector, an analysis of the project documents from 70 registered CDM projects in India and China, and analysis of the UNEP Risoe CDM project database together indicate fundamental limitations to improving the outcomes of the CDM within its basic structure as a project-based offsetting mechanism. I find: (1) The majority of CDM projects are "non-additional" (would have gone ahead regardless of support from the CDM) and therefore do not represent real emissions reductions; (2) Due to the subjectivity inherent in project development decisions, a reasonably accurate filter for non-additional projects is infeasible; (3) The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects; (4) Beyond the problems with additionality testing, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions; (5) Taking a step back, the large-scale use of carbon credits generated in developing countries by industrialized countries to meet their emissions targets hinders global efforts to mitigate climate change over the next decades. Both the large-scale use of offsetting to meet industrialized country targets and the continuation of project-based offsetting risk undermining the ability of global climate change agreements to control greenhouse gas emissions.

1. Introduction

Industrialized countries have two sets of obligations under current international climate change agreements: to reduce their own emissions, and to support climate change mitigation and adaptation in developing countries. The Kyoto Protocol's Clean Development Mechanism (CDM) is critical for meeting both sets of obligations. The CDM in principle allows industrialized countries to invest in projects in developing countries that reduce emissions, and use the resulting emissions reduction credits towards their Kyoto Protocol targets. Any project registered under the CDM is able to produce carbon credits, called certified emissions reductions, or CERs, totaling the estimated tons of CO₂-equivalent emissions avoided by the CDM project. The CDM is the most used of the Kyoto Protocol's "flexibility mechanisms," which are meant to lower compliance costs by allowing industrialized countries to partially meet their emissions targets through reductions outside of their own borders. It is also the main instrument under current climate agreements supporting climate change mitigation in developing

countries, currently passing around three billion Euros per year to developers of low-emitting projects in developing countries.¹

A key regulatory challenge of the CDM is calculating the emissions reduced by a single project. This requires comparing the emissions from the project with emissions from a counterfactual scenario of what would likely have happened without the CDM project. The biggest challenge in determining the counterfactual baseline scenario is assessing whether the project itself is in that counterfactual scenario, or in other words, if the proposed CDM project would have gone ahead anyway, without the expected revenues from the CDM. The CDM should only generate credits from activities beyond business-as-usual (BAU), since any carbon credits generated by BAU CDM projects allows an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway, rather than actually reducing emissions. Each project applying for CDM registration must demonstrate their “additionality,” that the project would not likely have gone forward had it not been for the expected CDM income.

Another key regulatory challenge of the CDM relates to the nature of the market it creates. A common appeal of the CDM is that it is a market mechanism meant to create a global market for emissions reductions, lowering the cost of compliance by allowing industrialized countries to reduce emissions wherever in the world it is least expensive to do so. In practice, the CDM does not create a market for emissions reductions. It creates a market for emissions permits, since it is the permit to emit that is the primary interest of most CER buyers, as they seek low cost options of complying with domestic climate regulations. For the most part, neither the buyer nor the seller of CDM credits is primarily concerned with emissions reductions, such that neither have a strong interest in ensuring the environmental benefit represented by the permits sold. In addition, these permits to emit are wholly human created, numbers in databases, such that no extra cost is incurred from producing more permits. CDM project proponents not only have little incentive to protect the environmental integrity of the permits, they have a financial interest to exaggerate the number of carbon credits generated by CDM projects. Therefore, the integrity of this market in terms of emissions reductions relies almost entirely on effective regulation. These features – the buyer is unconcerned with the quality of the underlying physical thing represented by the wholly human-made tradable asset – are also features of many of the financial instruments whose deregulation in the US caused the current global financial crisis, reminding us of the importance of regulation for markets to function. As mentioned above, the market in CDM credits is especially difficult to regulate because it involves calculating emissions reductions against a hypothetical scenario, and most importantly, determining if the project itself is a part of that scenario.

The poor quality of the arguments and evidence used to prove project additionality under the CDM have been well documented (Michaelowa & Purohit 2007, Schneider 2007). Schneider (2007) concludes that “for about 40% of the registered CDM projects additionality is unlikely or questionable.” Wara and Victor (2008) estimate that bona fide emissions reductions compose “only a fraction of the real offsets market,” based on a range of evidence including the high proportions of hydropower, wind and natural gas power plants being built in China that are in the CDM pipeline, despite China’s active promotion of these technologies. Various proposals have been put forward for controlling the number of carbon credits generated by business-as-usual

¹ The CDM projects currently registered under the CDM would produce 319 million tons of CERs a year if they meet the expectations in their PDDs (Fenhann J. 2009. October 1, CDM Pipeline Overview. UNEP Risø Centre. <http://www.cdmpipeline.org/>). Primary CER prices are currently around 10 Euro per CER.

projects. Many of these involve continuing the CDM in its current form, and improving the rigor of its additionality test (some of the ideas put forward by Schneider 2009, and by Wara & Victor 2008).

This paper explores how the CDM is working in practice in the Indian power sector. It examines the proportion of CDM projects that are non-additional, and how effective the CDM is at supporting truly additional projects. It also considers whether it is possible to substantially improve the outcomes of the CDM within its current structure as a project-based offsetting mechanism. This paper also explores how the substantial use of offsets purchased from reductions made in developing countries currently being proposed by most industrialized countries post-2012 might help or hinder global efforts to control greenhouse gases to levels needed over the next forty years.

This paper presents the following findings:

- The majority of CDM projects are “non-additional” and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- Taking a step back, the large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

In what follows, section 2 provides background information on the current state of the CDM and how it works, as well as why our ability to effectively filter out non-additional CDM projects has implications for the success of the global climate change regime. Section 3 describes the methods used in this analysis. Section 4 delves into the analysis with stories from my research interviews indicating widespread skepticism among CDM and renewable energy professionals in India regarding the impacts the CDM is having and describing instances of fraud used to demonstrate project additionality. This is followed by analyses of the feasibility of substantially improving the CDM’s additionality testing procedures (section 5) and how effective the CDM is in supporting truly additional projects (section 6). Stepping away from additionality testing, section 7 presents a number of other ways that the CDM structure leads to the over-generation of credits and compromises the CDM’s ability to reduce emissions. Taking one more step back, section 8 asks if it is helpful or harmful to long-term international cooperation for industrialized countries to use large amounts of offset credits towards their near-term targets. Finally, I discuss alternatives to the current CDM in a post-2012 climate change regime.

2. Background

2.1 How the CDM works

Developers of low-carbon projects in developing countries can submit their projects to the CDM Executive Board (EB) for CDM registration. An application for CDM registration includes a Project Design Document (PDD), a validation report from an independent validator, and a letter of approval from the host country government. The PDD gives a detailed description

of the project, including an estimation of the emissions that it will reduce following an accepted “methodology” for doing the estimation, and evidence that the project is additional. The developer must hire a certified third party auditor, called a validator,² to validate that the project meets all of the requirements of the CDM. After a project is approved by the CDM Executive Board, the developer chooses how often to submit requests for the issuance of CERs. Typical end buyers of CERs are governments of and regulated facilities in countries that have Kyoto Protocol targets. Often the first buyers of CERs from the developer are intermediary companies that trade in carbon credits. The developer can choose to enter into a CER purchasing agreement with a buyer before or after credits are generated. Figure A-1 in the Appendix presents the key steps in the process of registering a project under the CDM and applying for CER issuance.

2.2 The current state of the CDM

As of October 1, 2009 there were a little over 1,800 registered CDM projects, and another 2,800 proposed CDM projects in the validation process. The total number of registered CDM projects is presented by country in Figure 1, and by type in Figure 2. China and India host 60% of all registered CDM projects, with few projects registered in Africa and in many other smaller developing countries. 31% of all registered CDM projects are renewable energy projects and 27% are hydropower projects. Non-CO₂ gas projects make up 4% of all registered CDM projects but are expected to produce 61% of the credits generated through 2012 because of their relatively high potency as greenhouse gases, if all projects were to produce the amount of credits predicted in their PDDs (see Figure 3).

2.3 The *Additionality Tool*

The “Tool for the demonstration and assessment of additionality,”³ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* requires developers to demonstrate the additionality of their proposed CDM project by an investment analysis, a barrier analysis, or a combination of both.

- The investment analysis is based on the idea that that carbon credit revenues improve the financial returns of projects, making losing or marginally profitable projects viable. It assesses the financial returns of the proposed project, most commonly in terms of project or equity internal rate of return (IRR).⁴ A benchmark is defined that represents the threshold financial returns, or hurdle rate, defining whether the project would go forward. If the expected financial returns are below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. It is optional to show that CERs bring the financial returns of the project above the benchmark.
- The barrier analysis describes and presents evidence for the existence of one or several barriers that prevent the proposed CDM project from going forward without the additional income from carbon credit sales.

² A validator is also called a Designated Operational Entity, or DOE.

³ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

⁴ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial returns.

Figure 1: Registered CDM projects by host country

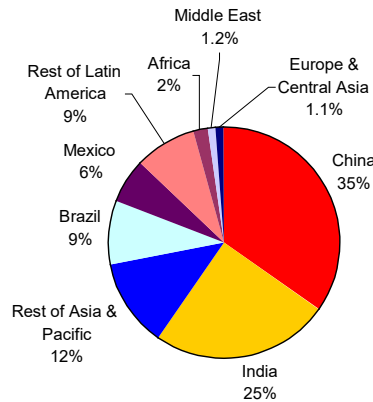


Figure 2: Registered CDM projects by type

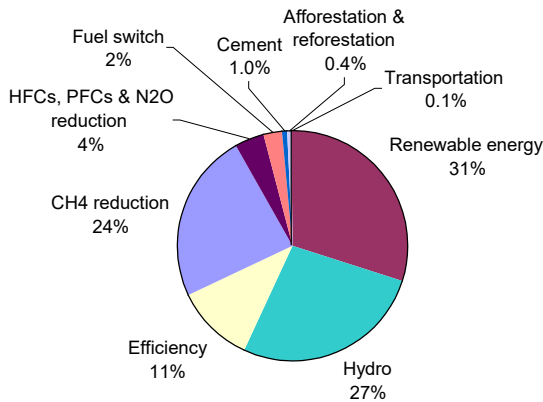
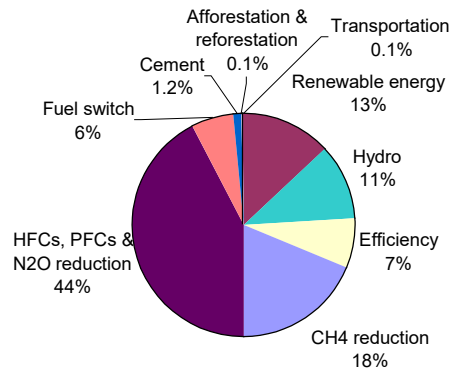


Figure 3: Expected CERs through 2012 from registered CDM projects by type



2.4 Why we should be concerned about additionality

Certainly additionality is a challenge for any climate mitigation program. Estimation of emissions reduced by policies, programs, and projects is often highly inexact in a complex world in which there are multiple influences on behavior and industrial and consumer choices. International funds that pool contributions to support emissions reduction projects in developing countries, the main alternative to crediting mechanisms, could also end up supporting activities that would have happened anyway. There is an important difference between crediting mechanisms and funds in this regard. When a fund supports a BAU project, it fails to reduce emissions through that project; when the CDM supports a BAU project, it also, in effect, weakens an industrialized country target by the amount it claimed to have reduced in the developing country. Secondly, the various risks involved with distributing funds to projects is more transparent. Proponents of project-based offsets commonly assume that emissions

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

reductions from individual projects can be measured accurately enough. The complex and technical nature of the CDM, and a general trust in the efficiency of market mechanisms, masks the uncertain nature of measuring emissions reductions in an offset program. To have a high likelihood of keeping global temperatures below a two degrees increase, substantial efforts are needed in both industrialized and developing countries. Industrialized countries need to both substantially reduce their own emissions and support mitigation in developing countries. To the extent that CERs are over-credited to CDM projects, the CDM fails in both regards at the same time.

3. Methods

The analysis in this paper is based on over 80 interviews conducted in India during 2004 to 2009, an analysis of project documents from 70 CDM projects registered in India and China, and analysis of the UNEP Risoe CDM project database containing information about all projects currently registered under the CDM and in the application process.⁵ I interviewed individuals involved in CDM project development in various capacities (mostly in India), including project developers, CDM consultants, validators (hired to audit projects applying for CDM registration), carbon traders, employees from banks lending to renewable energy projects, government officials, and members of the CDM governance panels, as well as others involved in renewable energy and hydropower development in India. Some interviews were carried out in the interviewees' offices, and some involved less formal discussions in carbon and climate conferences.

I also analyzed the additionality arguments used to register 70 projects. These projects comprise all of the large (over 15 megawatt (MW)) wind, biomass, and hydro projects registered in India since 2007 and the 20 most recently registered hydro projects in China. The specific analyses performed are described below in the paper sections alongside their results. These four projects types are among the most numerous in the CDM pipeline (see Table 1) and together represent one third of projects (registered and in the validation process). I chose to review only "large" projects since the additionality testing procedures for projects above 15 MW are more rigorous than for "small" projects. I chose to review only projects registered from 2007 because additionality testing was weaker in 2005-6, and has gradually been strengthened with various guidances.

Table 1: Projects analyzed

	Projects analyzed	Total projects in CDM pipeline	
Wind in India	20	320	7%
Biomass in India	16	297	6%
Hydro in India	14	130	3%
Hydro in China	20	819	18%
TOTAL	70	1566	33%

⁵ UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009 <http://www.cdmpipeline.org/>

This paper focuses on CO₂ reduction projects, for which CDM credits are typically one among several project benefits, and improve project financial returns by a relatively small amount. Renewable energy, hydropower, coal and natural gas projects, and many efficiency projects are all CO₂ reductions projects, which compose approximately 72% of all registered CDM projects (see Figure 3). In contrast, CERs are often the sole revenue source from HFC and N₂O reduction projects, making these projects more likely to be additional. However, these industrial gas projects pose other problems documented elsewhere (Wara 2007, Wara & Victor 2008) and discussed in brief with the fourth finding of this paper.

4. Wide-spread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable energy development in the country. Research for this paper started in the summer of 2004 when I was told by managers of three sugar factories in India that their sugar mill cogeneration plants, being proposed as CDM projects, would be or would have been, built without the CDM. Each manager told the arguments they were using to demonstrate that their projects were additional, even though they had told me they were planning to build the projects regardless of CDM funding. They treated the additionality proof as a bureaucratic hoop they had to jump through to access this funding source, a sentiment repeated often in later interviews.

Since those early interviews, at least nine more developers and consultants told me that the CDM projects that they proposed would have been built anyway, without the CDM. It was surprising how easy it was to find developers who would say this, given their interest in defending the additionality claims in their CDM application documents. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. The strongest evidence that a project is non-additional is the admission of developers themselves.

Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms,” not based on the small and uncertain change in IRR from carbon credit sales; “any project can be registered under the CDM.” Validators, tasked with auditing CDM additionality claims, believe that current additionality testing procedures are subjective and can be manipulated. One validator described the many “knobs you can turn” to change the results of the financial analysis. Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions, due to the uncertainties associated with CDM registration and CER revenues. Representatives from three banks that lend to renewable energy projects confirmed that the CDM is having no or very little effect on their lending decisions. At a carbon markets conference in 2007 in Mumbai, a carbon buyer in the audience criticized a panelist for saying that it is possible to prove the additionality of just about any project. The buyer went on to say that he could agree to the panelist’s statement if they were chatting at a bar, but that the panelist should not make such statements in a public forum where he could be quoted.

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM

revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find in project documents and to hear about in the halls of carbon conferences and workshops.

A murmur of agreement went through the audience at the carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in the decision to build proposed CDM projects are being forged and post-dated. One validator proudly told me how he discovered one of these forged documents. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own.

In India, wind power is generally considered a good investment, due in large part to tax benefits offered by the central government. India offers wind power developers the ability to take 80% depreciation for wind project capital costs in the first year of operation along with a 10-year tax holiday. 25 large wind projects totaling 1,600 MW of wind power in India are registered under the CDM. 17 of these use an investment analysis to prove additionality, make the analysis spreadsheet publicly available, and were registered since 2007. The project design documents for each of these 17 projects proves additionality by showing that the project is not financially viable without CER sales revenues. Only one of these projects includes the full tax benefits provided by the government in their financial assessments. This one project uses an unrealistically low estimate of the amount of electricity to be generated by the project.⁶ Only 6 of the other 16 projects justify their failure to account for the full tax benefits offered by the government. They claim that the depreciation benefits are not useful to the developer because of their low profits.⁷ But this claim is not credible for all of these projects.⁸

5. An accurate project-by-project additionality test is infeasible

The poor quality of the *CDM Additionality Tool's* barrier analysis and investment analyses being used to prove project additionality has been well documented (Michaelowa & Purohit 2007, Schneider 2009). These two studies describe how barriers used are highly subjective, not credible, poorly documented, or are so general that they are common to a wide range of CDM and non-CDM projects. Investment analyses leave out or do not document important values affecting the feasibility of the project. Another example of the poor quality of additionality testing is how IRR analyses for wind projects in India commonly leave out or incorrectly calculate the tax benefits provided to these projects described above. Many of these problems could be avoided by stricter standards for additionality arguments and evidence and more rigorous validation requirements. But the question still remains, could additionality testing be made substantially more accurate with stricter standards? That is, are there reasonably accurate and auditable indicators of the decisions of developers, lenders and investors? I

⁶ CDM project titled *22.5 MW grid connected wind farm project by RSMML in Jaisalmer* uses a plant load factor of 16% when the average plant load factor in the state was later determined to be 19% according to a wind project consultant.

⁷ I learned about this problem from Axel Michaelowa.

⁸ For example, the largest of the projects is a 468 mw wind project on three wind sites in Tamil Nadu state in southern India, with 209 separate owners. The investment analyses for this set of projects does not include depreciation benefits. It is very likely that at least some, if not all, of the owners chose to invest in wind in part to avail of the depreciation tax benefits.

examine the ability to test the additionality of wind, biomass and hydropower projects in India. This analysis starts with a brief discussion of the barrier analysis but focuses on the investment analysis, considered to have the higher potential for being accurate, if made more rigorous.

5.1 Barrier analysis

The CDM *Additionality Tool's* barrier analysis presents barriers, often described in terms of risks, which prevent a project from going forward. The CDM can offset those risks by improving the expected returns from the project. The PDDs reviewed that use the barrier analysis, either alone or with the investment analysis, list barriers facing the project, and then as required by the *Additionality Tool*, describe an alternative to the project is not prevented by those barriers.

The most common barriers cited in the reviewed PDDs by project category are: Hydro in India: water flow uncertainty, difficult terrain, small private sector developer new to the power industry; Wind in India: regulatory uncertainty regarding the amount and timing of tariff payments; Biomass in India: technological risks due to little experience in India with the technology, lack of skilled manpower, risk that the electricity utility would lower the tariff; Hydro in China: water flow uncertainty, electricity demand uncertainty during the flooding season, tariff uncertainty, increased investment cost due to new government rehabilitation policies.

It is certainly feasible that any of these risks could be important enough to prevent the developer from going forward with the project without the ability to sell carbon credits. It is also completely feasible that such project risk would not prevent the project from being built. Certainly many projects have been developed with these barriers, but without the help of the CDM.

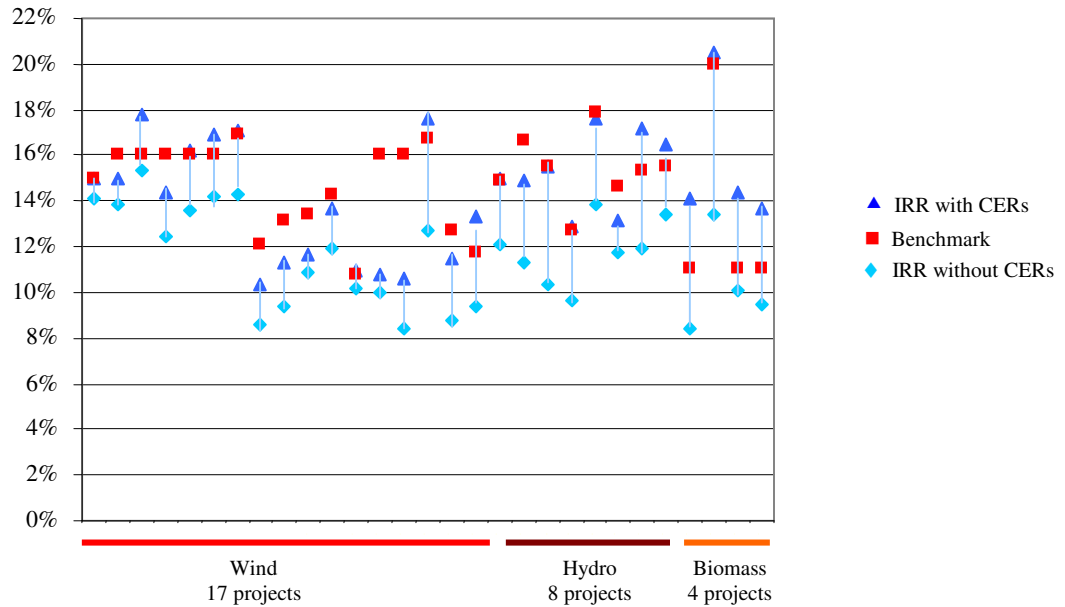
Typically the validator positively validates the project if there is documented evidence that (1) the stated barrier exists and (2) it is significant. They judge if it is feasible that the barrier could have prevented the project from going forward, not that there is a high likelihood that it actually did.

An example might illustrate the subjectivity inherent to the barrier analysis. One of the barriers used to prove the additionality of Patikari Hydro Electric Power Project in India was the difficult terrain where the project is developed posing challenges to project construction. The validation report notes that the validator asked the developer to “provide documentary evidence that these investment barriers are particular to this project activity and not general risks associated with all hydro projects in mountainous regions.” The developer provided a geo-technical report depicting the poor nature of the terrain that might result in the caving in of the tunnel. This report was accepted by the validator as evidence of the existence of this barrier. It is certainly feasible that the risk of tunnel collapse could be important enough to prevent the developer from going forward with the project at its without-CER returns. Or it could be possibly that this risk did not affect the final decision. The validator does not seek to answer that question, for there is little evidence that could document the deliberations of the project developer. Such evidence would be needed for the barrier analysis to be accurate.

5.2 Investment analysis

The investment analysis presumes that it is possible to accurately predict whether a project would be built from the sign (positive or negative) of a single number – the difference between the expected returns from the proposed CDM project and the benchmark. If the returns are below the benchmark, the project would not be built, above it, it would. For illustration, Figure 4 shows the results of the benchmark analysis all of the Indian projects examined for this paper that use the investment analysis to prove additionality and which estimate both with- and without-CER financial returns. Most of the projects analyzed for this paper that use the investment analysis use project or equity IRR as the financial indicator and show with- and without-CER IRRs sitting on either side of the benchmark.

Figure 4: Benchmark investment analysis for all Indian projects analyzed
In chronological order of registration date for each type



It is important to keep in mind that the financial assessment is of a proposed project for which many of the costs and revenues are future projections. The investment analysis indicates additionality only to the extent that developers are unable to choose values to get the desired result – a without-CER result below the benchmark, and a with-CER result above it. That is, it is accurate to the extent that each expected cost and revenue input into the financial returns calculation for the proposed project is a unique and determinable value; and it is accurate to the extent that there is a single benchmark that verifiably tests a decision to go forward with a project. Developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM projects are additional, so when a range of values is possible, the values are suspect.

In India, CERs improve the IRRs of wind projects by 0.8% - 4.9% with most between 1.7% and 2.7%. For hydropower the gain is 3% - 5.2%, and the four biomass projects that use the investment analysis show an increase in IRR of 4.2%, 4.3%, 5.7% and 7.1%. These

investment analyses argue that by improving project IRRs by these amounts, the CDM is able to make non-viable projects viable. Therefore, if a developer is able to vary the assumptions that go into the investment analysis enough to lower the expected IRR or raise the benchmark by these amounts, they can show that some viable projects are non-viable in order to demonstrate that they are additional. The rest of this section examines the extent to which the benchmark and IRR assessments can be manipulated by amounts similar to the expected CDM benefits.

Notable in the above Figure 4 are fourteen projects (just under half) that have with-CER IRRs below the benchmark, some by several percentage points. Yet each of these projects was built. This means that the investment analysis was wrong for each of these projects, since it predicted that these projects would not be built even with CDM revenues. This indicates that something is wrong with the investment analysis or the way it is being performed.

Wind projects

Wind in India is a best case for an accurate investment analysis because of the structure of the industry. As described above, wind power is generally considered a good investment in India in large part because of the tax benefits offered by the central government. As a result of these benefits, a common organizational arrangement for wind development involves an agreement between two sets of actors: a wind manufacturer who identifies and secures a site with good wind resources, and single or multiple investors, most often profitable businesses and wealthy individuals who are relatively unfamiliar with the energy industry but wish to avail of the depreciation tax benefits. The manufacturer typically takes full technical responsibility for the project, signing a supply agreement with the investor for the sale of the wind turbines and land, plant construction, and operations and maintenance.

All of the main costs of the project to the investor are typically well documented in the formal supply agreement prior to construction. In addition, this supply agreement often contains a high-end estimate for the amount of electricity the wind turbine is expected to generate to make the project look attractive to the investor. This high-end figure provides a good conservative choice from the perspective of additionality testing. Also, the tariff for the first ten, thirteen or twenty years of the project is signed into a power purchasing agreement with the utility buying the power. The loan interest rate would be documented in a loan agreement.

An analysis of the seventeen available investment analysis spreadsheets for large registered wind projects in India reveals several undocumented assumption that the developer can include from within a range of reasonable values. Most wind developers sign power purchasing agreements (PPAs) with a state electricity utility for ten or thirteen years, leaving the per kilowatt-hour (kwh) tariff unknown after the end of the PPA period. Most of the seventeen wind investment analyses analyzed here assume that the post-PPA tariff will remain the same after the last year of the PPA. Four assume a substantial drop in the post-PPA tariff. If these projects had instead assumed the post-PPA tariff remained constant after the end of the PPA their IRRs would have been 0.7%, 0.9%, 2.0% and 2.2% higher. Lowering the post-PPA tariffs of the other projects by one rupee per kwh, less than three of the four projects that assume a drop, lowers the IRRs of the projects by 0.5% to 2.2%. Table A-1 in the Appendix describes this analysis in more detail.

Second, one project was validated and registered with a deration rate on the assumed production of electricity. The deration rate represents a decline in the amount of electricity generated by the turbine over time as the turbine ages. Without the deration rate the IRR of this project would have been 0.31% higher.

Third, I describe above how almost all large wind developers in India do not account for the full tax benefits available to them in their CDM investment analysis. Several of the PDDs for these projects explain that the investor is unable to avail of the full depreciation tax benefits because they do not expect to earn enough personal income or profits in other parts of their business to absorb the tax benefits. In some cases this claim too can be difficult to audit because it involves assessing an expectation of future profits in another part of the investor's business or personal income. The ability to take 80% depreciation in the first year of the project changes project IRR by 4-5%.

Together these assumptions can alter expected wind project IRRs by amounts comparable with the 1.7%-2.7% expected effect of CERs, or more in cases with uncertain tax benefits. This analysis indicates that some projects whose expected financial returns are already one or two percentage points above the benchmark could vary these assumptions so to bring the expected financial returns to below the benchmark, and then show that CERs bring the returns back up. The investment analysis would prevent the more viable wind projects in India from registering under the CDM, such as those that are able to take the full tax benefits offered by the government, by requiring cost and revenue values to be taken from the supply, loan, and power purchase agreements, and enforcing the correct application of tax benefits. But this means that in order for the investment analysis to be accurate at this level, the decision to build the project would need to be taken before the start of the CDM application process. That is, the supply, loan and PPA agreements should in place before the PDD is finalized, preventing developers from making sure their project is successfully registered under the CDM before making the decision to build it.

Biomass projects

Developers of biomass cogeneration projects typically manage the projects themselves, rather than contracting out project implementation and operations and maintenance through supply agreements as is commonly done for wind projects. The IRR analysis for biomass projects includes many more undocumented or poorly documented values. Biomass prices in particular have been erratic over the past years due to an absence of a developed supply market (Ghosh et al 2006), rainfall variability year-to-year⁹ and rising demand for biomass from pulp and paper mills and for electricity generation.¹⁰ Assumptions about future biomass prices affect the IRRs of biomass projects that purchase all or part of the biomass used for electricity generation from near-by farms.

I examine the effect of the assumed future price of biomass on the project IRRs of biomass projects in India.¹¹ Three registered and one proposed biomass projects purchase biomass from outside their facilities and make their investment analysis spreadsheets publicly available. These four projects use rice husk purchased on the market to supplement the biomass generated by each facility's own rice or sugar processing, and all are in Uttar Pradesh, the Indian state with the most large biomass CDM projects.

The investment analyses of these four projects forecast that future rice husk prices will be 2650, 1200, 1150 and 700 rupees per metric ton with annual escalation rates of 0%, 4%, 2% and 0% respectively. Increasing biomass prices by 300 rupees and increasing the escalation rate by

⁹ Raised in a number of interviews with developers and consultants of bagasse (sugar cane waste) cogeneration projects.

¹⁰ *ibid.*

¹¹ The idea for doing an analysis of biomass prices comes from Sivan Kartha from the Stockholm Energy Institute.

2%, relatively small changes compared to the variation of prices in these PDDs and those documented in various tariff orders and petitions,¹² decreases project IRR by more than CERs increase it in each of these four projects (see Table A-2 in the Appendix for the details of this analysis). These projects all started construction within a year and a half of one another, and the PDDs were written within a year of one another. So the timing of the project development decision and PDD submission does not explain the large variation in their assumptions about future rice husk prices. Biomass price is only one of many assumptions that can be varied by a developer who wishes to show a lower project IRR in their PDDs.

Hydropower projects

Additionality testing is inappropriate for large hydropower in India for three reasons: the development of hydropower is a government decision, large hydropower developers are guaranteed a specified return on their equity investment making an IRR analysis meaningless, and financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs.

Hydropower development is largely a government decision - The Government of India employs a central decision-making process to determine the development of its rivers, in recognition of rivers as a national resource with multiple competing uses – electricity, irrigation, flood control, fishing, etc. River development is determined through a government planning process involving a range of public and private actors. This planning process identifies potential hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private. The private sector participates in hydropower development mainly by responding to bids put out by state and central state-owned companies.

Additionality testing requires predictable indicators that a project would be built. The investment analysis is appropriate when a project would only be built if its financial returns are above a certain benchmark. The barrier analysis assumes that the building of a project could be predicted by the presence of a prohibitive barrier. Additionality testing is not meant to predict the decision-making of governments involving multiple considerations.

Developers of large hydropower projects in India are guaranteed a certain return on their equity investment - Developers of large hydropower projects (over 25 MW) in India are guaranteed a pre-determined return on their equity investment, typically 14% or 15.5%.¹³ The

¹² Uttar Pradesh's 2009 tariff order for biomass cogeneration projects assumes a 6% annual escalation rate in biomass prices (Uttar Pradesh Electricity Regulatory Commission. 2009. Draft "(Terms and Conditions of supply of power from Captive and Non-conventional Energy Generating Plants) Regulations, 09". , http://www.uperc.org/UPERC%20CNCE%20Order%20%20_Final.pdf and the biomass tariff suggested by the Central Electricity Regulatory Commission uses a 5% annual escalation rate (Central Electricity Regulatory Commission. 2009. (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations. The expected bagasse prices in Uttar Pradesh in these and other tariff orders and petitions vary between 740 and 2300. See also Uttar Pradesh Electricity Regulatory Commission. 2008. *THE MATTER OF: Suo-moto proceeding on procurement of power through competitive bidding and alternative fuel for use of bagasse based co-generation capacity during off-season*. <http://www.uperc.org/Order%20for%20CNCE%20Regulation%202008%20-%201st%20May%202008.pdf>

¹³ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

tariff the developer receives per kwh from electricity sales is calculated on a cost-plus basis and adjusted periodically to ensure that the developer receives the agreed return on equity based on their true costs and revenues. This means that most project costs are “passed through,” returned to the developer through the tariff. Therefore, unlike most electricity generation projects with a fixed tariff, the IRR of large hydropower does not increase if a project generates more electricity or has lower costs, since the tariff will be adjusted to ensure a fixed return on equity. In such a case, is project IRR a good measure for whether or not such a project would be built? Project IRR does vary among large hydropower projects in India, because the costs that determine the tariff differ somewhat from the costs included in the project IRR analysis. Figure 5 presents the differences between the costs that are typically used to calculate the tariff and project IRR.

One key difference between the way the IRR and tariff analyses address cost is that the tariff calculation takes into account loan interest payments whereas project IRR does not. Second, to incentivize efficient plant operation, operations and maintenance (O&M) costs are calculated as 2% of capital costs annually with an annual escalation rate in the tariff calculation, regardless of the actual costs.¹⁴ The IRR would use the actual expected O&M costs. Capital costs are not always fully passed-through, depending on a reasonability check by the appropriate electricity regulatory commission.

Figure 5 – Comparison of cost inputs used in the tariff calculation and the project IRR analysis for large hydropower projects

<p>The tariff calculation is based on:</p> <ul style="list-style-type: none"> Interest on loan capital & depreciation Interest on working capital Operations and maintenance expenses at a fixed 2% of capital costs with an annual escalation rate Return on equity, at 15.5% of capital costs 	<p>The IRR analysis is based on:</p> <ul style="list-style-type: none"> Actual capital expenses at the beginning of the project Interest on working capital Actual operations and maintenance expenses
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As a result, large hydropower projects with lower-than-average project IRRs are those that (1) are expected to have a higher ratio of O&M to capital costs such that a portion of the actual O&M costs are not passed through, (2) are judged by regulators to be built or managed inefficiently such that the full capital costs are not passed through,¹⁵ (3) are able to attract *better* loan terms, since loan interest payments are passed through in the tariff calculation, but are not included in project IRR calculations, (4) have longer construction times, which typically is the case with larger projects, projects built under more difficult geological conditions, or projects

¹⁴ For projects commissioned after April 2004

¹⁵ Interviews with hydropower consultants indicate that private hydropower developers that experience costs overruns are typically able to pass through the full actual costs through a higher tariff. Public companies can find it more difficult to get cost overruns passed through in full.

against which there is substantial public protest. Longer construction time lowers IRR because of the way IRR takes into account time. The IRR is the discount rate that could be applied to the project so that the present value of the project is zero, so costs and revenues in the early years of the project affect IRR more than later years. The longer the time between when the investment is made and revenues start to be generated the lower the present value of the project.

Only one of the above four reasons reflects the actual viability of a project and could potentially justify CDM benefits – projects with longer construction times. A high O&M to capital cost ratio and poor project management are not necessarily indicators that a project would not likely be built. *Better* loan terms lower the tariff and therefore also lower the calculated IRR, indicating a lower rather than higher likelihood that a project would be built. Therefore, when the tariff is determined on a cost-plus basis to achieve an agreed return on equity, an IRR analysis is not an appropriate indicator of whether a project would be built.

Investment analyses do not reliably predict project development and actual project costs - In India and throughout the world cost effectiveness has not been a good predictor of the development of large hydropower projects. Large hydropower is often built when it is not the least cost option (e.g. Paranjape & K.J.Joy 1995). Also, a financial assessment of a hydropower is especially difficult given its often large ecological impacts, the multiple competing uses of rivers, and the multiple people who benefit and are harmed by different uses that are difficult to weigh against one another. Further, even a simple financial analysis such as is performed in a CDM investment analysis, ignoring externalities and competing uses of the river, are notoriously inaccurate for large hydropower projects. Of the 81 hydropower projects surveyed for the World Commission on Dams report (World Commission on Dams 2000), the average capital costs were 21% over the predicted costs in real terms, while for some they were much higher. 30% of the projects surveyed by the World Commission on Dams experienced construction delays of a year or more.

For all of these reasons, the CDM's investment analysis does not accurately predict if a proposed large hydropower project would be built.

Is there an objective benchmark that predicts if a project would be built?

Even if the IRR analysis were relatively accurate, the benchmark would also need to reflect whether the project would likely be built for the investment analysis to be accurate. Since the CDM has a relatively small effect on the IRRs of CO₂ reduction projects, typically by 1%-5%, leading to projects being proven additional by even smaller IRR margins, the benchmark has to be reasonably accurate. The latest guidance from the CDM EB on the investment analysis offers four options for determining a benchmark: (1) benchmarks supplied by relevant national authorities (for project and equity IRR), (2) local commercial lending rates (for project IRR), (3) weighted average cost of capital (WACC) (for project IRR), and (4) required/expected returns on equity (for equity IRR).¹⁶ All of these have been used by some of the projects analyzed by this paper. The first option, a government-derived benchmark does not necessarily represent the decision-making of developers, lenders and equity providers. For example, the 16% benchmark commonly used in PDDs for wind projects in India is used by the government to determine promotional tariffs for independent power producers, but are not necessarily the benchmark expectation of investors. The second option, local commercial lending rates, can be too low a

¹⁶ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

benchmark since equity investors generally expect higher returns than the lending rate. WACC, the cost of capital to the developer, is composed of the lending rate for the debt portion, and the returns expected by the equity investors for the equity portion. The fourth option used for equity IRR is simply the expected returns of the equity provider. Of each of these possible benchmarks, the most accurate representations of developer and investor decision-making would be the last two, WACC for project IRR, and the returns expected by equity investors for equity IRR. This is because typically developers will not build a project if the returns are under their WACC and typical equity providers would not invest in a project if the expected returns of the project are under the returns they expect from their investment.

The question then is if the expected returns on equity can be accurately and objectively assessed. The latest CDM guidance on the investment analysis¹⁷ makes the following distinction. A project that could only be carried out by the project proponent, such as the retrofitting of an existing sugar factory or cement plant, would use the WACC specific to the specific company. A project that could be built by many companies, such as a stand-alone wind or small hydropower project, would assess the WACC or expected returns on equity for the whole industry. In the latter case, the expected return on equity would reflect the risk premium associated with the specific type of investment. Both cases have the same challenges. The returns expected by equity investors can be fairly subjective since it involves the assessment of the financial risk associated of the specific project, and an assessment of their other competing investment options at the particular time of the investment. The decision could also be influenced by a range of non-monetary factors or factors that are not easily incorporated into the IRR analysis. For example, it is difficult to assess the financial benefits to a company of the reliability offered by a captive generation unit. Investors might be interested in investing in a project with lower financial returns for a range of reasons, including wanting to invest in a good project in their home community or a community where they want political support, interest in the positive publicity that goes along with doing a green project, or doing business with a relative, etc. The possibility of determining a conservative industry-wide benchmark for expected returns on equity under which projects would most likely not be built for different industries is beyond the scope of this working paper. Challenges associated with this have been raised here.

Allowing the developer to choose among several acceptable benchmarks enables them to choose one that is more advantageous for demonstrating project additionality, rather than one that truly represents the decision that enabled the project to go forward. The Xiaogushan hydropower project (XHP) in China presents a good example of this.¹⁸ The project was registered as a CDM project on the basis of having an IRR under the government defined benchmark of 8% for power projects. However, the Asian Development Bank, in its evaluation of the project, describes the project as the least cost project in the entire province.¹⁹ It also states that the project is financially viable because its financial IRR (FIRR) of 7.5% “is compared against the post-tax company WACC of 4.53%. Since the FIRR is higher than the WACC, the XHP component is financially viable.”²⁰ While the developer argues in the PDD that the project is unviable because the expected IRR is under the government-defined benchmark, the Asian

¹⁷ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

¹⁸ I worked out this example together with independent television news producer and journalist Janet Klein.

¹⁹ Asian Development Bank. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Gansu Clean Energy Development Project*

²⁰ *ibid.*, p 16

Development Bank states that it decided to lend to the project because the IRR is over the WACC of the company.

5.3 Summary and discussion

Even the best case for an investment analysis – wind projects in India – in which all of the main inputs into the financial assessment are documented, there is still some room to vary assumptions within ranges equivalent to the effect of the CERs in some cases. For most other project types there is much more room for manipulation of cost inputs. The choice of the biomass price for biomass projects in India is one example. The hydropower example suggests that it is important to look at the specific conditions under which technologies are developed to determine if the investment analysis is appropriate for that specific technology. For several independent reasons, large hydropower in India is inappropriate for additionality testing. Multiple factors involved in project development decisions and the subjective nature of project risk assessment seem to preclude a single accurate benchmark for most projects that is meaningful within the relatively small improvements carbon credit revenues have on the IRR of CO₂ reduction projects. Both the IRR analysis and the benchmark IRR are adjustable in tandem. In conclusion, an accurate project-by-project additionality test is impractical for CO₂ reduction projects, and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

6. The CDM has little influence on project development: the effects of uncertainty and the long CDM registration process

Even if the CDM is unable to filter out business-as-usual projects, does it at least enable projects to go forward that otherwise would not? This section explores how the combination of uncertainty and the long registration application process compromises the effects the CDM could have on unviable or marginally viable projects (the types of projects the CDM is designed to support).

6.1 Risks associated with CDM registration and CER value

The CDM is anticipated to improve the financial returns, measured in terms of IRR, of the projects analyzed for this paper by 1% to 6% according to their PDDs. The CDM typically does so, not through assured upfront payments directly providing project financing, but as an additional revenue stream through the lifetime of the project. In the small proportion of cases in India when CER buyers do offer upfront payments to the project developer, these payments come at a substantial discount per CER generated by the project, often between 40% to 75% of the spot market price for carbon dioxide projects, almost always signed after the project has been successfully registered, and only for credits to be generated up through 2012. The CER revenue stream involves a number of uncertainties, which diminish the value of the CERs at the time that development, lending and investment decisions are being made:

Validation risk: Validators reported at the end of September 2009 that they cumulatively rejected 581 projects.²¹ This is compared with 2,188 projects that have been submitted for registration with positive validations, putting the risk of a negative validation at approximately 21%. We do not know the total number of projects that received positive validations but which have not yet been submitted for registration, implying the validation risk is lower than 21%. On the other hand, validators regularly decline validation requests when they believe the project will most likely not pass validation, implying a higher validation risk for projects that start construction before contracting a validator.

Registration risk: Approximately 5.5% of all projects submitted for registration were rejected by the CDM Executive Board, and at present another 7% are undergoing a review process after not being accepted upon submission.

CER price risk: Once a project is registered, there is uncertainty regarding the value the carbon credits will have once issued. To give some sense of CER price variability, between January 2007 and October 2009, secondary CER prices fluctuated between a high of 23 Euro in June 2008 to a low of 11.5 Euro in October 2009.²² China is mitigating some portion of the CER price risk by implementing a minimum CER price for primary CERs purchased from CDM projects in China.²³

CER value post-2012: At the time that this paper was written, we still did not know the structure of the post-2012 regime and how CER credits can be used under it. There is much uncertainty about the value these credits will have post-2012.

In late 2006 a bank representative expressed his expectation that over time, as banks become more familiar with the CDM, and as more experience is gained with the registration of different types of CDM projects, that his and other banks would start to take carbon credits into account in their loan appraisals. By 2009, the uncertainties associated with the CDM have increased, rather than decreased. Interviewees in 2009 expressed frustration with the increased complexity and time involved in the CDM application process, their perception that the EB's efforts to strengthen the system has led to frequent changes in the CDM requirements and rules, and that the EB is inconsistent and arbitrary in their decisions to reject and review projects. An increase in the number of rejections and reviews, especially over the last year, has also increased uncertainty and risk.

6.2 What does the timing of project development and the CDM application process indicate about the influence the CDM is having?

In light of this uncertainty, the order in which project developers start project construction and submit their projects for CDM validation and registration provides some insight into the effects the CDM is actually having on project development decisions. The process of submitting a project for registration under the CDM, from the start of validation through registration, was seventeen and a half months on average for all CDM projects registered since

²¹ Data taken from UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009
<http://www.cdmpipeline.org/>

²² CER prices are taken from PointCarbon's CDM & JI Monitor. Secondary CERs are CERs that were already purchased from the project developer, and are being sold for a second time, often to the end user of the credit.

²³ China's CER price floor is 8 Euro. Prices of CERs bought directly from the developer, called primary CERs, are below those of secondary CERs because of their additional risks.

the beginning of 2008.²⁴ It typically takes at least another year before the first credits are issued. Developers must either wait over a year to assure that their projects are successfully registered under the CDM before going forward with the projects, or accept the risk that their projects will not be successfully registered when deciding to go forward with the project. A commonly expressed sentiment among developers was that they cannot put their project on hold for the long CDM review period since it would be too disruptive to the project to do so.

As of October 1, 2009, approximately three-quarters of all registered CDM projects were operational at the time they were successfully registered under the CDM.^{25 26} This means that a higher proportion had started construction before registration. Further, 66 out of the 70 projects I analyzed for this paper started construction before the beginning of the 30-day public comment period, which typically happens in the first few months of the validation process.²⁷ This indicates that many developers start construction, including acquiring project financing, signing a power purchasing agreement with the government electricity utility, etc., before starting the validation process.

This timing indicates that project developers are not treating the CDM as a part of the necessary financing needed to go forward with a project, and are willing to accept the risk that their projects would not receive CDM revenues. This timing also means that developers probably do not see the CDM as important in helping them acquire a loan or attract investment equity, for if they did, many more developers would start the CDM application earlier, so that if they run into trouble attaining a loan or attracting investment, a positive validation or registration under the CDM could give a boost to the perceived viability of the project. This does not necessarily prove that the CDM is not having an effect on project development decisions. Certainly developers, lenders and investors could be taking the expected but uncertain revenues from the CDM into account when evaluating the viability of a project. The timing does indicate that revenues generated through the CDM are at best having a weak effect. This effect could be strengthened if CER revenues were more certain, and/or if the CDM application process were much shorter.

Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. The uncertainty at that time regarding whether the CDM would exist as a working mechanism, or how it would work when it did, makes it extremely unlikely that the

²⁴ Calculated from the Risoe CDM Pipeline database as the difference between the “date of registration” and the “comment start” date. The comment start date is the date when the validator began the 30-day public comment period. The public comment period generally comes within the first few months of the validation process. Prior to the start of validation, the developer must write the PDD, which involves additional time.

²⁵ Using data from the UNEP Risoe CDM pipeline database, as of October 1, 2009, 79% of all registered CDM projects have “Credit start” dates equal to, or earlier than, the “Date of registration.” A review of over one hundred PDDs confirms that almost all projects were commissioned on or before the credit start date, suggesting that it is reasonable to estimate that at least three-quarters of all projects were completed at the time of registration.

²⁶ These projects are expected to produce 56% of CERs through 2012 if all registered CDM projects generate the number of credits predicted in their PDDs. The reason the percentage of credits (56%) is lower than the percentage of projects (79%) is that most of the projects that are expected to generate the most CERs – HFC and N₂O projects – are expected to start generating credits at least several months after their date of registration and so are not included in these percentages.

²⁷ The construction start date was taken from the PDDs. The beginning of the 30-day public comment period is listed in the UNEP Risoe CDM pipeline database as the “comment start” date. Typically the validator puts the PDD up for the public comment period in the first few months of validation.

CDM had much effect on these development decision. Two of these projects were registered within the last year.

The claim that the CDM is having very little effect on project development is also supported by the interview responses mentioned above. Particularly, banks seem not to take CERs into account in their decisions to lend to a project because of the uncertainties associated with CDM registration and CER generation. Consultants and developers commonly describe CER revenues as “cream on the top,” and describe developers as building projects on their own merits, not because of a small and uncertain benefit from CER sales.

6.3 Discussion

A high proportion of the risk, time and cost of the CDM application process is associated with additionality testing. PDD consultants and validators describe that a large portion of the time spent writing the PDD and validating the project are devoted to the additionality section. Additionality is the cause of most reviews and rejections by the EB, and is also the most common reason projects do not pass validation.²⁸

Project-by-project additionality testing adds time and uncertainty to the CDM application process, compromising the ability for CERs to influence project development decisions. Additionality testing is also only effective at filtering out some of the most clearly non-additional projects. Therefore, another more effective and predictable means of targeting projects and activities that actually reduce emissions is necessary.

7. Taking a step back: The fundamental structure of the CDM, in certain other ways, leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, a number of other structural flaws also contribute to the over-generation of credits and weaken the effectiveness of the CDM at supporting projects in real need of support.

Supporting projects in the wrong order - In the power sectors of India, China and other countries, plants are often planned for many years before they are actually built. Hydropower and wind sites are often developed in the order of their attractiveness in terms of resource availability, proximity to demand centers, etc. The Indian government is actively supporting renewable energy and energy efficiency mainly for energy security reasons. From the perspective of most effectively developing these sectors, it makes sense to accelerate the pace at which plants are built, building the most cost effective ones first and supporting current domestic efforts to do so. Instead, the CDM is structured to change the order in which plants are built. Plants that are cost effective are considered “non-additional” while only plants that are less desirable are eligible.

Trade off between project viability and the over-generation of credits - The CDM should result in reductions in emissions in a developing country at least as large as the credits it generates. Once registered, CDM projects are allowed to generate credits for 10 years, if they choose the single credit period option, or 21 years if they choose the 7-year crediting period and renewal

²⁸ Interviews with validators

option. This means that in theory, projects should only register under the CDM if they most likely would not otherwise have been developed for the full crediting period – 10 or 21 years. This would support the development of a portfolio of undesirable projects – the problem mentioned just above. In practice, the PDD requires that projects be tested for additionality at the time of validation only.²⁹ Projects are therefore able to generate credits for 10 or 21 years even if they would have been built within that period, producing more credits than actually emissions avoided by the CDM project.

Improving the profitability of harmful projects - Crediting emissions reductions rather than charging emissions producers such as through a carbon tax could improve the profitability of projects with negative environmental and social impacts. Examples include many large hydropower projects, clean coal, and HFC destruction in HCFC-22 production facilities. HFCs, a potent greenhouse gas (GHG) regulated under the Kyoto Protocol, is a byproduct in the production of HCFC-22, a temporary substitute for CFCs as a refrigerant. Due to the very high global warming potential of HFCs – 11,700 times that of CO₂ – the value of the CERs generated from HFC reduction projects can exceed the profits from the production of HCFC-22 itself, making HCFC-22 production profitable even without selling the HCFC-22 (Wara & Victor 2008). HCFC-22 is an ozone depletor being phased out under the Montreal Protocol, 5% as potent in depleting the ozone layer as CFCs. An international agreement, with financial support to developing countries, would be a more appropriate way to reduce HFC production from HCFC-22 plants than the current CDM process, which overpays the cost of the HFC burning equipment by 47 times (Wara & Victor 2008). Regulations are in place preventing CDM credits from being generated by new HCFC-22 production facilities, or the expansion of existing ones. Still, the CDM creates substantial disincentives for HCFC-22 plant phase out, in direct contradiction with the goals of the Montreal Protocol.

Perverse incentives - One of the early criticisms of the CDM is that it could create perverse incentives for government or the private sector to refrain from implementing policy and taking action to reduce emissions. The need to measure actual emissions against a baseline – a future scenario describing what would likely have happened without the CDM – creates incentives to maintain a high baseline in order to later generate higher amounts of credits per project. Going back to the HCFC-22 example, if a country imposes regulation requiring HCFC-22 production facilities to destroy the HFC gas byproduct, facilities might no longer be able to generate the substantial income from the sale of carbon credits, causing a significant disincentive for such regulation. Of concern is the extent to which the CDM is impeding decarbonization because of perverse incentives that dissuade governments from enacting climate-friendly policies.

Limited in scope - The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated, and excludes project types which may have a higher GHG abatement potential at lower cost, but for which emissions reduction estimations are especially complex or uncertain. The CDM is not structured to support many efforts necessary to decarbonize sectors and affect a large-scale deployment of clean technologies – policies, R&D, demonstration projects, information dissemination, etc, because measuring emissions reductions from these efforts may be difficult or infeasible. The dissemination of technologies, such as

²⁹ This decision was clarified in the report from Executive Board Report 43, from the 43rd meeting of the CDM Executive Board, 22 - 24 October 2008, http://cdm.unfccc.int/EB/043/eb43_repan13.pdf

bagasse cogeneration in India, can be limited by multiple barriers requiring a number of different and parallel support efforts simultaneously and over time, many of which could not be supported through a project-based offsetting mechanism (Haya et al 2009). Efforts to affect sectoral change are often best done in the context of an integrated planning process in which multiple goals and interests are addressed together (Halsnaes et al 2008). Revenues from the generation of carbon credits could be only one part of a much larger set of support efforts for both sectors and specific technologies.

8. The large-scale use of offsetting credits poses challenges to near and long term climate change mitigation

Even if we manage to design an international offsetting mechanism that effectively reduces emissions and accurately credits them, what effects does large scale offsetting have on global efforts to mitigate climate change over the next decades? Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, still corresponds with a 2.0-2.4 degree Celsius temperature increase (Box 13.7 from Gupta et al 2007, Table SPM.6 from Intergovernmental Panel on Climate Change 2007). These scenarios correspond with reductions in developing countries by 15% to 30% below business-as-usual growth projections by 2020 (Höhne & Ellermann 2008). Even deeper reductions would be needed globally if we wish to have a high likelihood, rather than an almost 50% chance, of not exceeding a two degree increase. Further, since these scenarios were published, additional research suggests that climate sensitivity (the increase in radiative forcing resulting from the increase in GHGs in the atmosphere) is higher, and feedback effects even greater than the assumptions used to produce the IPCC scenarios (McMullen & Jabbour 2009).

Industrialized countries are proposing high levels of offsetting post-2012, which if used, would put these countries far away from the 25%-40% reductions by 2020 from the IPCC scenarios. At the time this paper was written, the EU was proposing to cut its emissions by 30% below 1990 levels by 2020 within the context of an international agreement, allowing 68% of those reductions to be met through international offsets.³⁰ If all of these offsets are used, the EU would achieve a less than 17% reduction compared to 1990 levels by 2020. In the US, a prominent draft climate bill, the Waxman-Markey American Clean Energy and Security Act of 2009,³¹ would require the US to cut its emissions to 4% below 1990 levels by 2020. This bill allows up to two billion tons of CO₂ as offsets, equal to 28% of its 2005 emissions, allowing a half to three-quarters of these, depending on the availability of domestic offset credits, to be from international sources. The international portion, if used in full, would allow the US to postpone making any reductions in its emissions from current levels until 2020 to 2024. This postponement would be even longer if some portion of domestic offsets is non-additional.

Two justifications are commonly given for high quantities of offsets. The first is simple market efficiency. Trade in emissions reductions allows industrialized countries to reduce

³⁰ Hanley N. 2009. *EU Climate and Energy Package, December 2008*. Presented at the Energy and Resources Group, University of California, Berkeley. *March 18*. The package recommended 50% of all reductions in the ETS, covering approximately 40% of EU emission, can be met with foreign credits and 80% of reductions in non-ETS sectors can be met with foreign credits.

³¹ <http://www.govtrack.us/congress/bill.xpd?bill=h111-2454>

emissions less expensively than if they were required to reduce them domestically. Second, by providing low cost compliance options, offsets help bring buy-in from domestic industries, making it easier and more likely for industrialized countries to accept deeper targets than they would have otherwise.

However, large-scale access to these potential lower-cost compliance options also introduces risk to present mitigation efforts and would most likely make climate change mitigation more difficult in the future. First, domestic reductions are more certain than international offsets.³² Any country has more knowledge about and control over activities within its own borders than it does for projects and activities which it funds elsewhere. Also, measuring emissions, as is done in a cap-and-trade program, is easier than measuring reductions in an offsetting program, as described in detail above. As such, offsets introduce various uncertainties regarding the amount of emissions reductions they actually represent. Any offsetting in developing countries, whether it is project-based or sector-based, involves measuring emissions against a BAU growth scenario, which is inherently uncertain, and politically difficult to set at a low level.

Second, cap-and-trade weakens incentives for innovation by allowing a larger portion of compliance to be met with existing and low cost technologies (Driesen 2003). Decarbonization to 80-95% below 1990 levels by 2050 in industrialized countries will require major shifts in all high emitting sectors. Transportation, the electricity sector, buildings, and agriculture all involve complex systems. Major shifts in each of these sectors requires time to allow for changes in behavior and in support industries, for experimentation and learning, research, development and deployment, etc.

The high level of offsets allowed could easily place the majority of global reductions up to 2020 in developing rather than industrialized countries. In the context of meeting the global reductions suggested in the IPCC scenarios, if 50% of all Annex 1 reductions are made through offsets (remember that the EU and the US are proposing substantially higher than that as upper limits) and that these offset projects are performed in addition to the suggested 15%-30% decrease from BAU in developing countries, then around 70% of all global reductions through 2020 would likely come from developing countries rather than the high per capita emitters.³³

If industrialized countries postpone domestic reductions as they are proposing through the use of offsets, they are either committing to steeper annual reductions in the future, or to long-term inequalities in emissions in the North and the South. Both options make future cooperation more difficult. In industrialized countries, a gradual migration of infrastructure is likely to be less costly than rapid transitions that could require retiring technology and infrastructure before the end of their lifetime. If the costs of mitigation are expected to be high, there will be more resistance from industry.

In addition, a high future dependence of offset credits from developing countries poses compliance risks on industrialized countries. The further actual domestic emissions are in an industrialized country from their targets for a given commitment period through the help of offset credits, the harder it will be for that country to commit to meaningful reductions in the following period. Large quantities of offsets might make it easier for industrialized countries to

³² Here offsets refer to credited emissions reductions generated by any activity whose emissions are not capped under a cap-and-trade program.

³³ Reductions are defined here as reductions from the Kyoto Protocol caps for industrialized countries, and reductions from BAU in developing countries.

take on deeper commitments now, but could also make it harder for them to accept deeper targets in the future.

We live in a world with a widely shared linear view of development and progress (Norgaard 1994). Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of consumption from the North. The discourse of development used by the World Bank is also used by country governments, and is disseminated through participants in and those affected by World Bank projects. Developing country citizens have learned that they are “backwards” and “underdeveloped” (Escobar 1995, Gupta 1998). Rural electrification has allowed more and more people to view western lifestyles on TV, and TV commercials spreading a culture of consumerism and awareness of not having (Jacobson 2004). Development in India is highly status driven – beyond getting out of poverty is a pursuit of symbols of high status, such as a big car and a new cell phone. In a world dominated by a single vision of “progress” sustainability requires changing the image of what “developed” means. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

Advanced developing countries are being asked to join the global community in accepting obligations to mitigate their emissions below BAU growth projections. Will developing countries commit to controlling the growth in their already low per capita emissions if it is clear that there is relatively little willingness in the industrialized world to reduce their much higher per capita emissions? Developing countries will need to make voluntary reductions before it is fair, given how quickly we need to reduce globally. This can happen only in a regime built on trust and mutual cooperation. Politically, it will be unlikely that developing countries will take calls for global cooperation seriously, if industrialized countries do not take on commitments to curb their own emissions as prescribed by the IPCC.

9. Discussion and conclusions

Industries in industrialized countries are putting pressure on their governments to provide options for controlling costs of compliance with post-2012 emissions limits. The CDM is currently seen as a legitimate way to do so. The CDM also provides a way to engage the private sector in climate change mitigation in developing countries. The private sector is seen as well poised to find efficient and innovative options for reducing emissions, while avoiding some of the concerns over funds – corruption, lack of accountability, conditionality and traditionally donor-weighted decision-making. There is also an interest in taking advantage of existing institutions, rather than disbanding them and starting anew. The CDM was promoted with numerous trainings, workshops and promises, and has attracted many new players and new interest into the clean energy, energy efficiency and other low-emitting industries in India and elsewhere. Admitting the CDM was largely a failure could dampen interest in the next instrument.

Researchers and policy-makers have sought ways to reform the CDM to retain these benefits while improving its environmental integrity. In weighing the pros and cons of various options, we need to honestly assess the possibility of improving the environmental integrity of the CDM as a project-based offsetting mechanism, as well as what we need to do in the next commitment period to be on a path towards a high likelihood of not exceeding a global two degrees temperature increase.

A purpose of this paper is to examine the possibility of substantially improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism. This paper shows that reasonably accurate project-by-project additionality testing is infeasible given the subjectivity involved in project development, investment and lending decisions. The need to do a test that is fundamentally difficult and inaccurate is disabling the CDM from being able to support truly additional projects, because of the complexity, uncertainty and time it adds to the CDM application process. As a result, the majority of CDM projects, and a large majority of CDM CO₂ reduction projects, are non-additional, evidenced by a range of analysis presented in this paper. Beyond additionality, the CDM is structured to either over-credit, or support a portfolio of projects that would otherwise be unviable for 10 or 21 years. Neither are good options. Because of the challenge of measuring emissions reductions from specific projects, the CDM is unable to support many measures needed, and sometimes more cost effective, for the deployment of technologies and decarbonization of sectors, such as policy, research and development, demonstration projects, and information dissemination. The CDM can also have the opposite effect, creating perverse incentives against the implementation of policy and for delaying the implementation of projects so that developers are able to maintain a high baseline against which to prove additionality and generate CERs. Even if the environmental integrity of the mechanism were ensured, large scale offsetting introduces various challenges to global climate change mitigation efforts over the next decades, especially considering the very weak post-2012 targets being proposed by industrialized countries.

Any post-2012 offsetting program will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

This could possibly be accomplished through small, targeted offsetting programs designed to help decarbonize specific sectors and promote specific technologies. Such programs could be custom designed through industrialized-developing country partnerships, at national or sub-national levels, to address what is needed to control emissions and promote technologies in their specific local contexts in line with domestic priorities and the expertise the industrialized country can offer. As opposed to the current CDM, such programs can involve multiple coordinated components, some credited and some not credited, that work together to address the barriers and support needs facing a technology or a sector. These programs would require a commitment to cooperate over many years. Additionality would still be a concern for such a program but would be more easily managed than with the CDM. Under the CDM, developers initiate projects, and the CDM EB and other CDM governance bodies mainly respond when projects and methodologies are submitted to them. As described above, it is very difficult to distinguish additional from non-additional projects individually. In contrast, under the offsetting program suggested here, the administrators of the program actively initiate projects and programs based on analysis as to how their involvement could lower emissions.

Experience so far with the CDM does not bode well for the political feasibility of such an approach. We have seen little indication that countries will agree to an offsetting mechanism that is small enough, targeted enough, and with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. So far offsetting has not been effective and imposes uncertainty on global climate change mitigation efforts. Attention must be refocused on reductions in countries with emissions caps, with non-

credited support for mitigation efforts in developing countries. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

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APPENDIX: Figures and tables

Figure A-1: The CDM Project Pipeline Step-by-Step

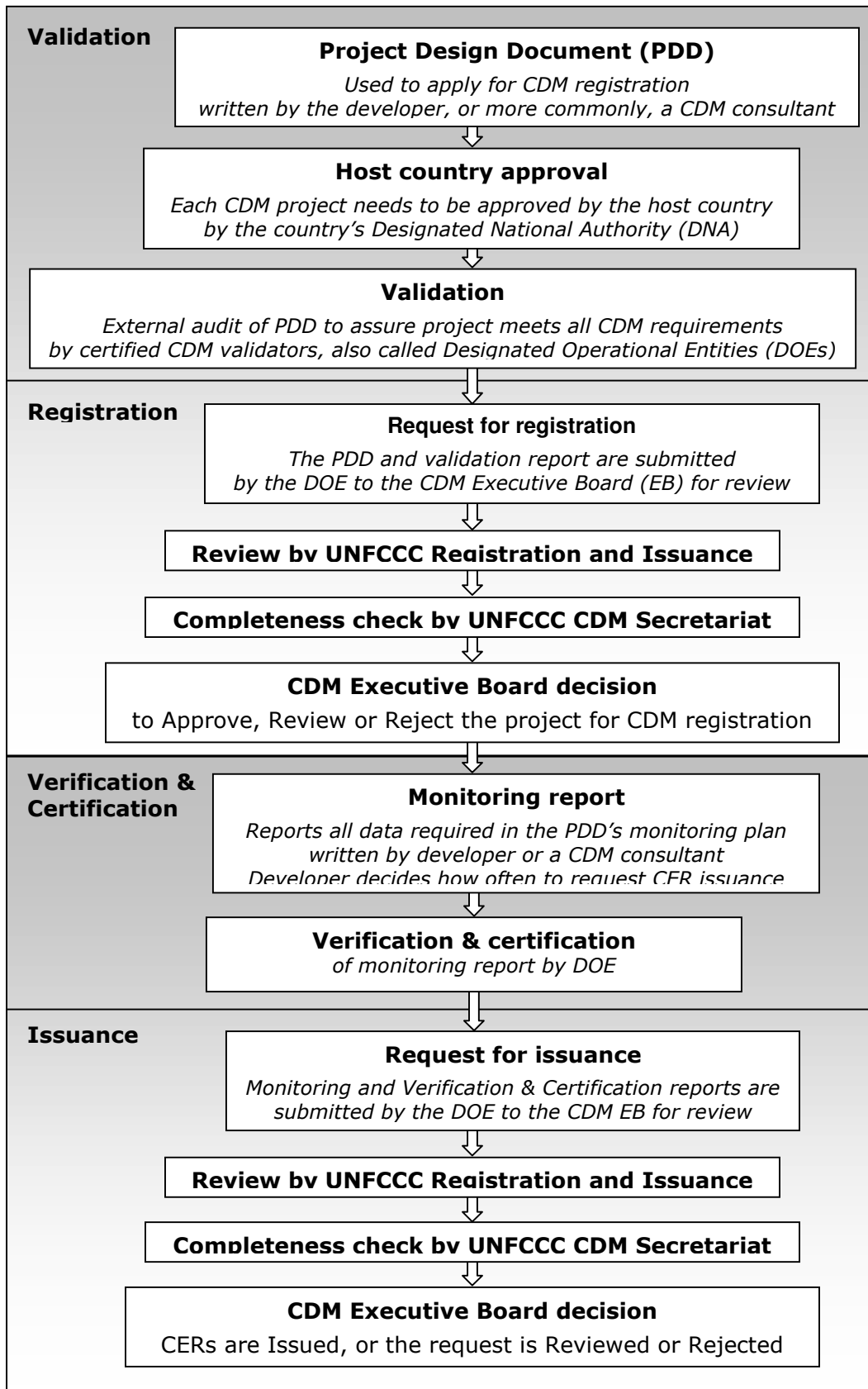


Table A-1 – Effects of the choice of post-PPA tariff and a deration rate on wind project financial returns

Project name	State in India	PPA length (years)	Tariff in year 1 (rp/kwh)	Tariff escalation rate? (rp/yr)	Tariff after end of PPA (rp/kwh)	Tariff escalation rate after end of PPA?	Deration rate?	Change in IRR from	
								Lower tariff 1 rs/kwh after end of PPA or increase to last PPA year ^b	5% deration rate in year 11
Bundled wind energy power projects (2004 policy) in Rajasthan	Rajasthan	13	3.25	0.06 through year 9	3.79 - same as last PPA year	--	--	-0.80%	
22.5 MW grid connected wind farm project by RSMML in Jaisalmer	Rajasthan	10	3.32	0.06	3.92 - same as last PPA year	--	--	-1.12%	
75MW wind power project in Maharashtra by Essel Mining Industries Limited	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.26%	
Wind power project by GFL in Gudhepanchani	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-0.49%	
40 MW Grid Connected Wind Power Project	Maharashtra	13	3.5	0.15	3.89	2.50%	--	0.71%	
Wind Electricity Generation Project	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.07%	
NSL 27.65 MW Wind Power Project in Karnataka	Karnataka	?? ^a	3.1	--	3.1	--	--	-2.20%	
Tungabhadra wind power project in Karnataka	Karnataka	10	3.4	--	Varies, 1.89 is average	--	--	2.03%	
Enercon Wind Farm (Hindustan) Ltd in Karnataka	Karnataka	10	3.4	--	Varies, 1.82 is average	--	--	2.23%	
29.7 MW Wind Power project in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.52%	
Wind power project by HZL in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.59%	
42.5 MW Wind Power Project by VRL Logistics Ltd. In Karnataka State	Karnataka	10	3.4	--	3.06	--	-5% in year 11	0.90%	-0.31%
24.8 MW Wind power project by Belgaum Wind Farms Private Ltd. in Gadag, Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.46%	
150 MW grid connected Wind Power based electricity generation project in Gujarat	Gujarat	13	3.37	--	3.5	--	--	-0.81%	

^a The PPA length is not mentioned in the CDM project documentation. This analysis assumes a 10 year PPA, the same as the PPAs for the other projects in Karnataka.

^b Values in boldface indicate cases where the developer chose a post-PPA tariff lower than the tariff in the last year of the PPA. For this analysis, the post-PPA tariffs of these projects are brought up to the tariff in the last PPA year, rather than reduced an additional one rupee

Table A-2 – Effects of biomass price on biomass project financial returns

Project name	CDM Status	PDD Date	Start project construction	Rice husk price in first year Rs./ton	Rice husk price annual escalation rate	Change in IRR or DSCR ^a		
						From CDM	+200 Rs./ton & + 2% esc rate in rice husk prices	+300 Rs./ton & + 2% esc rate in rice husk prices
Rice husk based Co generation project at Dujana unit of KRBL Limited	Registered	Jan-08	Oct-05	2650	0%	0.45	-0.41	-0.53
15 MW Biomass Residue Based Power Project at Ghazipur	Requesting registration	Nov-08	Dec-06	1200	4%	7.86%	<-10%	<-10%
DSCL Sugar Ajbapur Cogeneration Project Phase II	Registered	Feb-07	May-05	1150	2%	7.11%	-7.91%	-10.70%
KM RE project	Registered	Jan-07	Feb-06	700	0%	8.07%	-5.83%	-8.34%

^a DSCR (Debt Service Coverage Ratio) is a common financial metric used by banks to assess loan applications. A DSCR of less than one means that annual project revenues are less than the annual debt service. Here, the first project uses DSCR to measure project viability, and the other three use project IRR.

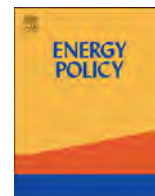
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Addressing carbon Offsetters' Paradox: Lessons from Chinese wind CDM

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HIGHLIGHTS

- We investigated 143 Chinese wind CDM projects by the eruption of the additionality controversy.
- We examined the application of additionality in the Chinese wind power market.
- We drew implications for the design of effective global carbon offset policy.
- The underlying structural flaws of CDM, the Offsetters' Paradox, was discussed.
- We charted a reform path that can strengthen the credibility of global carbon markets.

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ABSTRACT

The clean development mechanism (CDM) has been a leading international carbon market and a driving force for sustainable development. But the eruption of controversy over offsets from Chinese wind power in 2009 exposed cracks at the core of how carbon credits are verified in the developing economies. The Chinese wind controversy therefore has direct implications for the design and negotiation of any successor to the Kyoto Protocol or future market-based carbon regimes. In order for carbon markets to avoid controversy and function effectively, the lessons from the Chinese wind controversy should be used to implement key reforms in current and future carbon policy design. The paper examines the application of additionality in the Chinese wind power market and draws implications for the design of effective global carbon offset policy. It demonstrates the causes of the wind power controversy, highlights underlying structural flaws, in how additionality is applied in China, the Offsetters' Paradox, and charts a reform path that can strengthen the credibility of global carbon markets.

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1. Introduction

The clean development mechanism (CDM) set by Kyoto Protocol is the leading international carbon market which allows developed countries to meet their mitigation commitments by financing emission reductions in the developing world (UNFCCC, 1997). Project based CDM is seen as an important mechanism to achieve global sustainable development by fostering clean energy development in developing countries and cost-effective reduction of greenhouse gasses in developed countries (Olsen, 2007), and typically allows for nations with emissions commitments to invest in greenhouse gas mitigation projects in host countries without commitments.

International carbon finance has provided a significant boost to Chinese wind development. China's installed wind capacity has been growing at an unprecedented pace, the total installed capacity has reached 75.5 GW as of the end of 2012 (CWEA, 2013). CDM first provided finance for Chinese wind in 2005, and we estimate that about 32% of China's total wind capacity of 25.1 GW has benefited from CDM finance through 2009 (CREIA, 2009).

One of the central criteria used to evaluate CDM projects is "additionality", which is defined as carbon offset payments result in "real" emissions mitigation that "would not have happened otherwise" (UNFCCC, 2006). Controversy over the CDM projects is not new. There have been concerns about the additionality and the economically efficiency of industrial gas projects, for example trifluoromethane (HFC-23), which is inexpensive to cut but received payments via the CDM which may have been many times more valuable than the gas being produced, creating perverse incentives. Scholars have argued that such projects therefore

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undermine the effectiveness of CDM (Wara, 2007). But other types of projects, such as renewable energy projects, are usually viewed as comparatively higher quality with lower risk of “non-additionality” or economic inefficiency.

The questionable additionality of many CDM projects has become a central issue in the CDM discussion (Paulsson, 2009). Haya (2010) examined hydro CDM projects in India, and found that there is no accurate verifiable indicator of whether CO₂ reduction projects would be built without the CDM. Those concerns raise the incentive problems created by asymmetric information, include adverse selection and moral hazard, in the offset markets (Bushnell, 2010). However, the implementation of CDM in China is less discussed, and the impact of how and whether CDM might interface with domestic policy and regulatory regimes is not seen in the existing literature.

However, this issue came to a head when the CDM Executive Board (CDM EB) shocked the carbon market by forcing an unprecedented review of whether Chinese wind projects satisfied UNFCCC additionality requirements and then rejected 10 Chinese wind CDM from registration in 2009 (CDM EB, 2009a, 2009b). CDM investors were shocked as the safest CDM bet became the riskiest; the Chinese stakeholders publicly attacked the UN's oversight of carbon markets and criticized the decision “unfair” and “non-transparent” (10 Chinese Wind Power Project, 2009); and the CDM EB prepared itself for an unprecedented fight over how carbon offsets could be verified in the world's largest CDM market. In 2010, the EB's 52nd meeting saw two of the ten wind projects registered after clarification, but the remaining eight projects were rejected (CDM EB, 2010). We call the controversy along the additionality of Chinese wind CDM project the “Chinese wind controversy” (controversy for short).

Additionality is the concept employed to verify that credits for carbon reductions are not payments for business as usual (BAU) (UNFCCC, 2001). Additionality is at first glance a simple counterfactual, but proving a counterfactual is not easy (Haya, 2010; Schneider, 2009; Sutter and Parreño, 2007; Wara and Victor, 2008). The CDM's “additionality tool” attempts to do this by comparing the financial returns of all possible investments, with the logic that businesses will invest in the projects with the highest projected internal rate of return (IRR) (CDM EB, 2008). Project developers wishing to receive CDM credits must demonstrate that the proposed CDM activity is not the most profitable (has lower IRR) when compared to a BAU investment scenario (which might be a coal plant in China, for example), but that with CDM finance it becomes competitive with the alternative investments. Two conditions are necessary for the IRR comparison to be a credible indicator of additionality: (1) the selected baseline that wind is compared to must represent actual BAU in the relevant market, and (2) IRR must be a credible indicator of behavior and investment patterns in the relevant market. As we will show, there are serious problems meeting either of these conditions for Chinese wind because of the complex structure of China's power market.

At the center of the controversy was the concern that the Chinese government might be manipulating power tariffs in order to guarantee additionality and subsidize domestic renewable energy development with carbon finance. If it were, the credibility of the CDM in its largest market would be crippled. It is important to note that the challenges of CDM project validation in China are relevant in most of the developing world. A solution to the controversy is therefore imperative – not just for CDM investment in China – but for preserving the credibility of offsets as a global mitigation regime. In addition to EU Emission Trading Scheme (ETS), the major carbon offsets buyer, national or sub-national schemes are already in place in Australia, New Zealand, Japan, the U.S., Switzerland and Canada, and are planned in South Korea and Brazil (Promethium Carbon, 2013). China has also opened its pilot carbon trading program in June 2013. The

potential for these programs to allow international credits as offsets in national or sub-national carbon pricing schemes and to meet mitigation targets are under discussion. The lessons and experiences from CDM will be essential in the development of standards and procedures among those emerging carbon policies and ETSs around the world.

Yet despite the best efforts of developers, Designated Operational Entities (DOEs), and the EB to address this problem, a comprehensive solution has so far remained elusive. In trying to decide whether the Chinese government was setting artificial power tariffs to “game” additionality, the EB initially suggested a rule which would compare power tariffs for new projects to the highest historical tariffs. Thus if new tariffs were significantly below historical tariffs, the thinking was that this could be an indication of manipulation. However such approaches are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005, and there exist numerous market-based reasons for altering the tariffs. Thus applying the “additionality tool” to compare power tariffs for new projects to the highest historical tariffs are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005 (CDM EB, 2008; CREIA, 2009; Li and Gao, 2008), making such comparisons obsolete in a rapidly changing market. The wind industry of 2005 looks very little like the wind industry of 2012. But more importantly, focusing so narrowly on the question of historical tariffs risks missing the forest for the trees. One central question and challenge to solve the Chinese wind controversy is how can the CDM reliably separate the impact of domestic regulations and policies from that of international carbon finance?

The paper addresses this essential question, utilizing a detailed analysis of all Chinese wind projects registered through 2009 when this controversy erupted. First, we demonstrate the structural dependency of IRR-based additionality in state-controlled power sectors on host country regulators. This dependency simultaneously gives host countries control of additionality outcomes while preventing additionality verification by the UN, and is a major cause of such problems. Second, we argue that the available evidence does not suggest that China games the CDM. Finally, we argue that the CDM must upgrade its policy to deal with the reality of power markets where additionality is inherently impacted by domestic policy. However, this challenge presents a paradox for climate policy makers that must be weighed carefully.

2. Data and methods

Data used in this paper was extracted and compiled by the authors from the project design documents (PDDs), investment analysis spreadsheets, and validation reports which are used for CDM project registration provided through the UNFCCC CDM official website (<http://cdm.unfccc.int/Projects/projsearch.html>). PDDs are the key documents involved in the validation and registration of CDM project activities submitted by project developers and validated by DOEs. Key project-based data, including the power tariff, investment costs, IRR with and without CDM, and sensitivity analyses, from all registered PDDs was manually entered to a database and adjusted for consistency of currencies, exchange rates over time, and tax policies. The basic statistics of studied wind CDM projects are presented in Table 1. One hundred forty three projects in total were included and analyzed, representing all Chinese wind CDM projects registered through the end of 2009. Sixty seven projects did not provide complete data in their sensitivity analysis in their PDDs, the authors calculated the sensitivities by extrapolating available data on percentage changes of IRR with changes of power tariff and investment costs.

Table 1

Basic statistics of the studied wind CDM projects.

Key variables	Mean	Max	Min	SD	Sensitivity
IRR with CDM	9.04%	11.87%	7.24%	0.0075	
IRR without CDM	6.40%	8.43%	4.24%	0.0070	
Power tariff (RMB/kWh)	0.5443	0.7600	0.3521	0.0973	11.35%
Investment cost (RMB/MW)	9,549,846	18,071,400	2,358,885	1,488,498	12.03%

3. Key findings

3.1. *Additionality is highly dependent on domestic regulation*

If China were manipulating power tariffs to game the CDM, it would only be possible because the current design of additionality gives them that power. The structural dependency of additionality on Chinese regulators can be clearly demonstrated as follows. Additionality for Chinese wind is largely determined by IRR comparisons of CDM projects to the 8% baselines given in the “Internal Notice on New Project Feasibility Assessment” by the [State Power Corporation \(2002\)](#). And our analysis shows that the single largest factor determining Chinese wind project IRR is the power tariff, in fact the data shows that on average, an 11.35% increase of the power tariff will make Chinese wind farms non-additional while China’s average on-grid power tariff had already increased from 0.3175 to 0.3676, 15.78% increase from 2006 to 2009 ([SERC, 2010, 2007](#)). There have been four major phases in the development of the Chinese wind power tariff system. In the first phase (1986–1993), wind power developments were funded by overseas aid funds and the tariff paid was less than 0.3 RMB/kWh, similar to that for coal-fired plants. In the second phase (1994–2003), the tariff was proposed by local governments and approved by the central government. During this period prices ranged from the relatively low price of 0.3 RMB/kWh up to 1.2 RMB/kWh. In the third phase, from 2003 to 2009, tariffs were decided by a concession process. Projects larger than 50 MW or in special wind-rich areas used this system (projects less than 50 MW were still subject to tariffs appointed by local regulatory decree), in which they submitted bids to the NDRC that included a proposed power tariff and the proposed share of domestically manufactured turbines. NDRC then approved the winning projects. The concession system ended in late 2009 when the NDRC established the “regional flag price” system, which set a single wind power price in major regions that functions like a feed-in tariff. These mandated prices are derived from the principle of “cost+reasonable return (with consideration of available wind resources)” ([CREIA, 2009](#); [NDRC, 2009](#)). The power tariff in those stages is highly dependent to China’s National or Local Development and Reform Commission. Thus the current design of the additionality test makes the Chinese government the most important arbiter of additionality – whether it wants to be or not – because IRR-based additionality is by design a function of NDRC power pricing.

This would not be a problem if China had market-based power pricing that could be validated by CDM regulators because power prices, and thus IRRs, would be a function of market pricing rather than regulatory decree. In this case IRRs would be a reliable indicator of project viability. But China’s power sector is not fully market-oriented. Unlike in liberalized power markets where prices are the result of bids and offers subject to some regulatory constraints, Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs). Wind is no exception. NDRC is directly determining wind tariffs based on its judgment of appropriate IRR as is China’s sovereign right. In fact, the official NDRC pricing

policy of “cost+reasonable return with consideration of available wind resources” explicitly indicates that the NDRC is determining the “reasonable return” through the tariff. But NDRC does not specify what the appropriate return is or how it is determined which again is China’s right, but a problem for CDM. In this context it is nearly impossible to know whether China is gaming the process or not. IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime.

Further, where more market-based pricing mechanisms have been tried, outcomes have been distorted by the presence of major SOEs that are not always motivated by market-based incentives. Investment and operations decisions in the power sector can be more sensitive to politics than profit, and politically driven losses are subsidized from the state balance sheet. In 2008 the “Big 5”, the largest SOE power producers including Huaneng, Datang, Huadian, Guodian, and China Power Investment, alone lost 40 billion RMB because raw coal was worth more than tightly capped power prices and generators were forced to run at a loss, which they wrote off as a “policy loss” that the government would make whole ([He and Morse, 2010](#)). Wind investment and pricing has been afflicted by a similar phenomenon. The national “concession system” for establishing wind power prices, which tried bidding by developers to establish tariffs five times from 2003–2009, certainly helped China move some projects closer to a market-based price discovery mechanism. But major SOEs were known to bid below-market prices in order to win projects and meet central government renewable energy quotas. Accordingly, observers have noted that the tariff outcomes of the concession system were artificially depressed and prices were low enough to discourage investment from private, non-SOE investors ([Li and Gao, 2008](#)). These distorted concession prices heavily influenced the setting of current regional feed-in tariffs ([NDRC, 2009](#)).

3.2. *No evidence of manipulation in China’s wind case*

The empirical analysis of power data for all CDM wind projects in China shows no obvious evidence of dramatic changes in pricing policy that might reveal deliberate price manipulation by the NDRC. While the design of current additionality policy creates the opportunity for manipulation without a way of proving it, the available evidence does not directly suggest that the Chinese government is in fact gaming the CDM. [Figs. 1 and 2](#) below show the trend in Chinese power tariffs granted to registered CDM wind projects since the inception of the CDM in China, and most projects were registered until late 2009. Though policies have changed, prices have not dramatically shifted lower. The single tariff granted higher than 1 RMB/kWh is an offshore wind project and therefore received an exceptional tariff. All tariffs discussed here exclude VAT. It should also be noted that the Chinese feed-in tariff for wind is roughly 1.5 times higher than the average tariff for on-grid power; the average price granted to CDM wind projects was 0.5443 RMB/kWh (excluding VAT), and the average on-grid power price was 0.36034 RMB/kWh in 2008 ([SERC, 2009](#)). The average wind tariff (excluding VAT) for the 10 rejected wind projects is 0.5094, compared to 0.5443 of the total average. Those projects locate in Inner Mongolia, Heilongjiang, Liaoning and

Xinjiang, which have the best wind resources thus are granted lower on-gird wind prices set by NDRC (2009). The average IRR without CDM for those projects is 6.39%, IRR with CDM is 9.99%, and CDM would make 3.6% difference.

Table 2 shows the average wind tariff of the projects registered in a year decreased 5.8% from 2006 to 2008, then increased 3.7% in 2009, an overall 2.3% decrease from 2006 to 2009. At the same time, the reported average wind investment cost had grown 6.2% from 2006 to 2009, which is not consistent with what reported in the industry that the wind investment cost started to fall in 2008 due to the localization of manufacture and economy of scale (Li et al., 2010). As the total wind capacity in China has risen, absolute subsidies for Chinese wind projects have increased dramatically. Total subsidies paid by the Chinese government have rocketed from 229.29 million RMB in 2003 to 2379.94 million RMB in 2008 (CREIA, 2009). However, on a per-MW basis, those subsidies have mostly decreased from 0.4 million RMB in 2003 to 0.2 million RMB in 2008, half of that five years ago.

4. Implications for climate policy

We have shown the additionality test dependent on an IRR generated from Chinese power prices. This problem is not limited to Chinese wind – it applies for almost all renewable energy

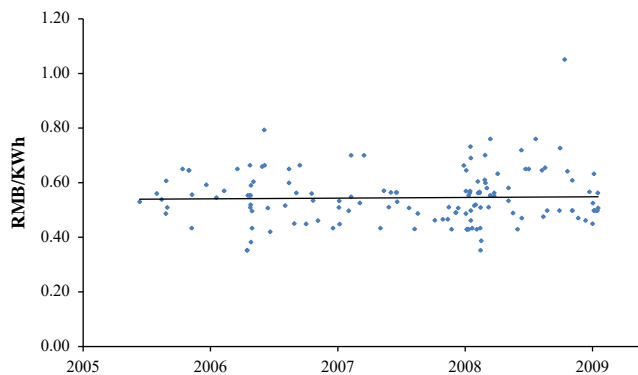


Fig. 1. Wind tariff by registration date for CDM projects.

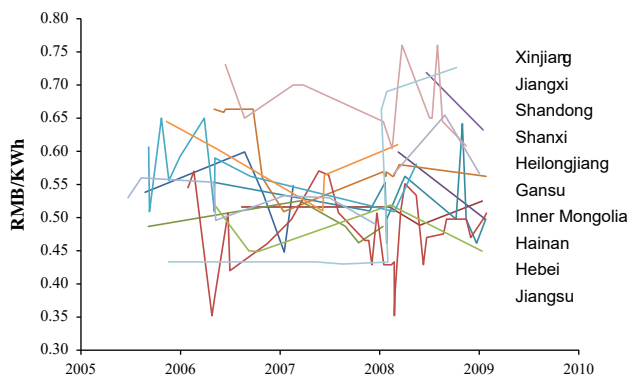


Fig. 2. Wind tariff by province for CDM projects, Note: The provinces are appeared in the order of their 2009 tariffs.

Table 2 Average wind tariff and investment cost of registered wind CDM projects by year.

Year	2006	2007	2008	2009
Average project power tariff (RMB/kWh)	0.5613	0.5355	0.5288	0.5485
Average wind investment cost (million RMB/MW)	8.96	8.81	8.99	9.51

projects in developing countries with state controlled power sectors – and thus could damage the credibility of the CDM (Haya, 2010; Victor, 2011; Wara, 2007). Reform is necessary to use additionality metrics that are less dependent on domestic regulators. Possible reforms in the near term might contemplate using an enhanced barrier analysis that phasing out easy investment projects, interacting with NDRC to better understand domestic pricing policy so to make more transparent and sound observation of the pricing dynamics, or using a more credible baseline that reflect the evolution of China’s changing power sector (He and Morse, 2010). This could be challenging as the projects involve multiple technologies in multiple countries, however, a more transparent, credible baseline will apply immediate improvement to the mechanism. In the long-term, offset policy needs to be agnostic to market structure in developing country power sectors. The thinking on new market mechanisms (NMMs), for example sectoral approaches and program of activities that decouple the host entity from specific activities or policies, mitigates the additionality tests by building a sectoral baseline (Aasrud et al., 2009; IGES, 2013). The NMMs issue allowances based on a sectoral ex-ante, no-lose targets, with penalty for missing target, thus make incentives more compatible.

Even if reforms eliminated the dependency of additionality on domestic power pricing decisions, a more difficult question remains. How should additionality account for the impact of broader changes in domestic policy over time? China’s wind power polices have changed dramatically since 2003, making additionality a moving target (Li and Gao, 2008). “E+/E-” policies were introduced to provide clear rules on how to treat domestic policies impact emissions, “E+” policies increase emissions, “E-” policies reduce them (CDM EB, 2009c). “E+/E-” policies refers to clarifications on the consideration of national and/or sectoral policies and circumstances to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that have impact the host country’s contributions to the ultimate carbon mitigation (CDM EB, 2009c). But they were not designed to accommodate complex issues like Chinese feed-in tariffs where subsidies are embedded within a complicated, state-controlled power pricing regime (Morse et al., 2010; Peng, 2011).

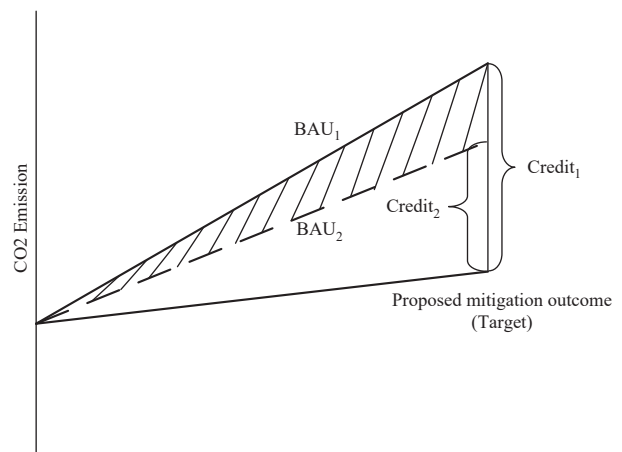


Fig. 3. The Offsetters' Paradox.

Carbon policy must craft rules for the entire CDM that segregate the impact of evolving domestic policy from the impact of carbon finance when judging additionality. Unfortunately, this challenge presents a paradox for policy makers. On one hand, including domestic subsidies in the additionality calculation creates perverse incentives for the host country by making projects less eligible for CDM and therefore discouraging policies that would jeopardize CDM revenues. On the other hand, ignoring these subsidies assures crediting for business as usual projects, which reduces the integrity of global emissions caps (Morse and He, 2010).

This problem applies in nearly any situation where additionality is the central principle because additionality by definition compares a baseline of BAU to a lower emissions trajectory. As shown in Fig. 3, if credits are given for the difference between BAU₁ and target trajectories, any domestic policy that lowers baseline emissions to create BAU₂ reduces carbon payments, and therefore disincentivizes domestic emissions-reducing policies that would shift BAU₁ to BAU₂. Alternatively, if the offset mechanism attempts to solve the perverse incentive problem by crediting against BAU₁ instead of BAU₂ and ignores the domestic mitigation policy, then carbon offsets pay for what would have happened anyway as the shaded area depicts. We call this fundamental tension of additionality the Offsetters' Paradox. Post-CDM offset policy will need to directly confront this problem and decide how to strike an appropriate balance. This will become increasingly important as negotiators push for Nationally Appropriate Mitigation Actions (NAMAs) of developing countries that give domestic policy an even larger role in international climate policy.

5. Conclusion

The analysis presents additionality's dependence on domestic regulators in the near-term and draws an uneasy line between creating perverse incentives and crediting for BAU in the longer-term. The controversy over the additionality of Chinese wind offers key lessons for how the world can design, validate, and implement carbon offsets. This calls into question the integrity of the global carbon cap set under the second commitment period of the Kyoto Protocol. Post-2012 carbon policy should confront these imperfections and seek to reduce them by addressing the type of failures exposed by the Chinese wind controversy. Short-term reforms can immediately make project approval more credible and expeditious. Longer-term, mechanisms that are agnostic to market structure and independent of domestic regulators offer a better chance for avoiding controversy and proving the viability of carbon markets as a sound mitigation regime. Finally, the designs of offset mechanisms and linking of different trading schemes need to directly confront the Offsetters' Paradox because ignoring it will ultimately undermine the ability of the market to function.

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MEASURING THE CLEAN DEVELOPMENT MECHANISM'S PERFORMANCE AND POTENTIAL

Michael Wara^{*}

The Clean Development Mechanism (CDM) of the Kyoto Protocol is the first global attempt to address a global environmental public goods problem with a market-based mechanism. The CDM is a carbon credit market where sellers, located exclusively in developing countries, can generate and certify emissions reductions that can be sold to buyers located in developed countries. Since 2004 it has grown rapidly and is now a critical component of developed-country government and private-firm compliance strategies for the Kyoto Protocol. This Article presents an overview of the development and current shape of the market, then examines two important classes of emission reduction projects within the CDM and argues that they both point to the need for reform of the international climate regime in the post-Kyoto era, albeit in different ways. Potential options for reforming the CDM and an alternative mechanism for financing emissions reductions in developing countries are then presented and discussed.

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INTRODUCTION

Global warming is one of the most difficult and important environmental challenges facing the international community. To date, the most substantial effort to address climate change is the Kyoto Protocol (Protocol).¹ Although not ratified by the United States and only recently by Australia,² the Protocol was signed and ratified by every other large developed country and entered into force on February 16, 2005.³ It is likely the largest and most expensive international effort to combat a global environmental commons problem.

The Protocol is a highly innovative international agreement as it both incorporates and allows for numerous trading mechanisms. These flexibility mechanisms were inserted into the text during the negotiation process at the insistence of the United States, its most prominent nonsignatory.⁴ They are quickly becoming, if they have not already become, the preeminent examples of attempts to address an international environmental problem using market-based approaches.

The United States and the international community are at a critical juncture in the effort to address the problem of climate change. Although the United States declined to join the Protocol, regulations to control carbon dioxide (CO₂) emissions are currently being developed by a coalition of seven

1. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22, available at <http://unfccc.int/resource/docs/cop3/07a01.pdf> [hereinafter Kyoto Protocol].

2. *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, N.Y. TIMES, Dec. 4, 2007, at A8, available at <http://query.nytimes.com/gst/fullpage.html?res=9800E7DF1E3BF937A35751C1A9619C8B63>.

3. United Nations Framework Convention on Climate Change, Kyoto Protocol: Status of Ratification, http://unfccc.int/essential_background/kyoto_protocol/status_of_ratification/items/2613.php (last visited June 5, 2006) [hereinafter Kyoto Protocol Status]. The Kyoto Protocol entered into force on the ninetieth day after at least fifty-five parties to the Convention, including Annex 1 parties accounting for at least 55 percent of total 1990 carbon dioxide emissions ratified the treaty. Kyoto Protocol, *supra* note 1, art. 25 § 1.

4. Daniel Bodansky, *Bonn Voyage: Kyoto's Uncertain Revival*, NAT'L INTEREST, Fall 2001, at 5.

northeastern states,⁵ by California,⁶ and are proposed in multiple bills in the U.S. Senate.⁷ In addition, many U.S. firms will be forced to comply with the Protocol in their international operations. Finally, the Protocol is set to expire at the end of 2012, and negotiations for a future global warming treaty, including market-based components, are therefore underway.⁸

The effort to curb global warming will be difficult and costly. Sustaining necessary political support and expenditure will require that policies implemented to achieve climate stabilization are both environmentally sound and cost effective. This Article aims to contribute to the success of this effort by presenting a critical empirical analysis of the current market for greenhouse gases (GHGs) under the Protocol and suggesting possible reforms. It is highly likely that any future global warming treaty will include market-based solutions; all current examples of climate regulation incorporate market-based mechanisms, and such mechanisms may result potentially in substantial cost savings.⁹ These markets for pollution, if they are to succeed in accomplishing a future treaty's environmental goals, must both incorporate the successes and eliminate the shortcomings of previous efforts. Given the rapid development of the Protocol's GHG markets over the last three years and the incipient negotiations over a future treaty, the time is ripe for an analysis that attempts to identify the successes and the failures of the initial experiments in GHG emissions trading.

The Clean Development Mechanism (CDM), a market-based emissions trading mechanism created under the auspices of the Protocol,¹⁰ certifies GHG emission-reduction credits generated by projects in the developing world that can be sold to emitting developed countries facing compliance obligations under the treaty. Payment for the credit is intended to fund the

5. The coalition includes Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. Memorandum of Understanding From the Regional Greenhouse Gas Initiative *passim* (Dec. 20, 2005), http://www.rggi.org/docs/mou_12_20_05.pdf [hereinafter RGGI Memo].

6. MKT. ADVISORY COMM., CAL. AIR RES. BD., RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA, at iv-v (2007), available at http://www.climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF.

7. The most prominent federal proposal to reduce U.S. greenhouse gases (GHG) emissions, which includes a market for GHG emissions, is America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007).

8. The Bali Action Plan lays out a path for negotiation of a post-Kyoto framework. See United Nations Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali, Indon., Dec. 3–15, 2007, *Decision 1/CP.13: Bali Action Plan*, U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3> [hereinafter *Bali Action Plan*].

9. Kyoto Protocol, *supra* note 1, arts. 6, 12, 18; RGGI Memo, *supra* note 5; America's Climate Security Act of 2007, S. 2191, §§ 2101–2503.

10. Kyoto Protocol, *supra* note 1, art. 12, § 1.

cost of reducing GHG emissions, thereby facilitating developing-country participation in the international climate regime and assisting in the achievement of sustainable development.¹¹ All emissions reductions certified under the CDM are supposed to be voluntary, real, and additional to any that would occur in the absence of the credit system.¹²

The CDM is the first attempt to address a global atmospheric commons problem using a global emissions trading market.¹³ Over the past three years, the CDM has developed the shape that it will likely have during the first commitment period of the Protocol.¹⁴ The goal of this Article is both to describe this broad outline and to use it to inform the design of future treaty architectures and administrative legal regimes¹⁵ aimed at the control of GHG emissions and global warming.

This analysis builds both on legal scholarship that first identified the potential of emissions trading regimes to reduce the costs of providing environmental goods,¹⁶ and on a relatively extensive body of legal scholarship analyzing the results of attempts to design and to implement emissions trading markets. Empirical work on emissions trading markets has focused on the strategic behavior of market participants,¹⁷ the complicated role of the regulator,¹⁸ environmental justice problems caused by emissions trading markets,¹⁹ and the difficulty of monitoring certain air pollutants necessary for

11. *Id.* art. 12, § 2.

12. *Id.* art. 12, § 5.

13. In contrast, the Montreal Protocol utilized a fund contributed to by developed countries to pay for the cost of emissions reductions of ozone-depleting substances in developing countries. See The Montreal Protocol on Substances That Deplete the Ozone Layer art. 10, *opened for signature* Sept. 16, 1987, 1522 U.N.T.S. 28, available at <http://www.unep.org/OZONE/pdfs/Montreal-Protocol2000.pdf> [hereinafter Montreal Protocol].

14. The first commitment period extends from January 1, 2008 to December 31, 2012. Kyoto Protocol, *supra* note 1, art. 3.1.

15. Regarding the emergence of a body of international administrative law, see Benedict Kingsbury et al., *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15 (2005).

16. Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1341–51 (1985).

17. David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 310 (1998); Gary C. Bryner, *Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading*, 17 TUL. ENVTL. L.J. 267, 291 (2004).

18. Lesley K. McAllister, *Beyond Playing “Banker”: The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 312–13 (2007).

19. Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Injustice: Los Angeles’ Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL’Y F. 231, 252 (1999); James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 628–29 (2000).

emissions trading.²⁰ To date, however, these analyses have focused on domestic markets. International markets, because they involve both an international regulator as well as developing-country governments and firms, are likely to present both similar and unique challenges.

The CDM was designed around the insight that the marginal cost of emissions reductions in developing, and especially rapidly developing, countries would be less than those faced by developed nations.²¹ The basis for this insight was that the cost of building more efficient, lower-GHG-emitting industrial and energy facilities in the developing world would be far lower than the cost of prematurely retiring or retrofitting existing developed-world capital stock.²² By means of the CDM, GHG emissions reductions could occur in the developing world that would otherwise have occurred in the developed world at far higher cost.²³ The expectation was that by putting a price on GHG emissions in the developing world and by linking that price to developed-world cap-and-trade markets for CO₂, costs of compliance with the Protocol in the developed world could be significantly reduced. This Article will show that what has in fact occurred is something far different: (1) the CDM has primarily proffered an exchange of CO₂ emissions reductions in the developed world for reductions of various non-CO₂ gases in the developing world; (2) substantial strategic behavior has occurred, aimed at manipulating baselines in order to increase the number of offsets created; and (3) as participation in the energy sectors of developing countries has deepened, the regulatory challenge faced by the CDM Executive Board in determining whether a project's reductions are "additional to any that would occur"²⁴ in its absence has become deeply problematic.

The CDM in its current form is, from an environmental perspective, highly imperfect. It is nonetheless creating both powerful political institutions and stakeholders interested in maintaining the current system or something similar.²⁵ Given the relatively poor performance, at least initially,

20. Drury et al., *supra* note 19, at 280–81; Thomas O. McGarity, *Missing Milestones: A Critical Look at the Clean Air Act's VOC Emissions Reduction Program in Nonattainment Areas*, 18 VA. ENVTL. L.J. 41, 57 (1999).

21. See Michael A. Toman, Richard D. Morganstern & John Anderson, *The Economics of "When" Flexibility in the Design of Greenhouse Gas Abatement Policies 2–3* (Resources for the Future, Discussion Paper No. 99-38-REV, 1999).

22. Prepared Testimony of Janet Yellen, Chair, Council of Economic Advisors Before the House Commerce Committee Energy and Power Subcommittee (Mar. 4, 1998), *reprinted* in FED. NEWS SERVICE, Mar. 4, 1998, at 5.

23. Toman, Morganstern & Anderson, *supra* note 21, at 2–3.

24. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

25. See for example, the membership of the International Emissions Trading Association, a strong CDM supporter which includes many of the largest global financial institutions.

of other markets for atmospheric pollution, the imperfect performance of the CDM is not entirely surprising and should not be a reason to abandon the system. The CDM is failing as a market because its rules, rather than producing real reductions, have accounting loopholes that allow participants to manufacture GHG credits at little or no cost beyond the payment of consultants necessary to surmount the necessary regulatory hurdles. Further, although it is supplying credits to developed signatories of the Protocol at prices less than they would otherwise be, the CDM is an excessive subsidy that represents a massive waste of developed-world resources. It is too late to change the structure of the CDM to address its shortcomings prior to the end of the first commitment period.²⁶ The overarching aim of this Article is to argue that in the period after 2012, both the financial resources devoted to the current CDM architecture and the additional resources likely to be added as developed-world commitments to cut GHGs deepen, might be far more efficaciously allocated in the international effort to stem global warming.

Such reform need not compromise the notable success of the CDM as a political mechanism. The CDM has produced remarkable participation in the developing world. Participation has been most active in countries with relatively high rates of economic growth. In other words, the developing countries whose efforts are most needed to help resolve the global warming problem are the same countries that have been engaged. At the same time, this has created political difficulties within developed countries where the subsidy of nations such as China and India is unpopular and hard to justify given their high rates of growth. Relative levels of developing-world participation and benefit from the CDM have also created tensions among the signatories to the Protocol²⁷ because of the growing perception that the distribution of credit revenues is extremely inequitable; most of the funds flow to a few relatively well-off developing countries.

Two tracks for reform seem possible. One option is to address the current regime's shortcomings while maintaining its basic structure in the post-2012

International Emissions Trading Association, Membership, <http://www.ieta.org/ieta/www/pages/getfile.php?docID=556> (last visited July 15, 2008).

26. The Kyoto Protocol's First Commitment Period, the interval of time during which developed-world parties to the treaty must comply with quantified emissions limits, extends from 2008 to 2012. Kyoto Protocol, *supra* note 1, art. 3.

27. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Bali, Indon., Dec. 3-15, 2007, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol in Its Third Session, Held in Bali From 3 to 15 December 2007*, ¶ 36, at 11, U.N. Doc. FCCC/KP/CMP/2007/9 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cmp3/eng/09.pdf>; see also, United Nations Framework Convention on Climate Change, The Nairobi Framework-Catalyzing the CDM in Africa, http://cdm.unfccc.int/Nairobi_Framework/index.html (last visited Mar. 31, 2008).

climate regime. This would involve strengthening the administrative procedures within the CDM in order to increase the certainty that projects are producing real reductions that are additional to any that would have occurred without the program. This reform would have to be accomplished without increasing transaction costs or project risks to such an extent that participation in the scheme was reduced below a useful level. The second option would discard the market-based approach of the CDM and adopt a fund-based approach best exemplified by the Montreal Protocol's Multilateral Fund.²⁸ While a fund approach would not necessarily solve all of the problems associated with the CDM, and might create new and as yet unforeseen difficulties, it would improve the efficiency of the system and likely increase its environmental effectiveness.

In Part I, I will first briefly introduce the Kyoto Protocol and the Clean Development Mechanism. I will then present in Part II a description of the current state of supply to the CDM market, followed in Part III by a story of the participation of a particular highly specialized industry that produces small quantities of a very potent greenhouse gas. Part IV explains how the underlying structure of the market has incentivized this particular industry to generate large numbers of CDM credits and thus to dominate the first phase of market growth. I will also tell a second story in Part V about the challenges presented by the recent dramatic increase in the level of CDM participation by China's energy sector. Here, the interaction between international regulators and a state-regulated industry is leading to attempts to generate large numbers of credits for behavior that would have occurred even in the absence of the CDM. Finally, in Part VI I will conclude by sketching out two possible futures for international emissions trading between developed and developing countries that incorporate lessons from the unforeseen problems of the first three years of emissions crediting under the CDM.

I. THE KYOTO PROTOCOL AND THE CLEAN DEVELOPMENT MECHANISM

A. The Kyoto Protocol

The international agreements aimed at controlling greenhouse gas emissions are hierarchically structured. The most general and overarching agreement, known as the United Nations Framework Convention on Climate Change (UNFCCC or Convention), adopts as its goal the stabilization

28. Montreal Protocol, *supra* note 13, art. 10, § 3.

of GHG concentrations in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system.²⁹ The UNFCCC has been signed and ratified by 192 countries,³⁰ including all major emitters of greenhouse gases.³¹ Although its goal is ambitious, the UNFCCC contains no provisions that compel action to accomplish it. Rather, it lays out a process through which various protocols containing more specific commitments might be negotiated.³² The first of these protocols was negotiated at Kyoto in 1997.³³ The Kyoto Protocol (Protocol), as it has come to be called, establishes binding caps on emissions for developed nation parties and parties with economies in transition (Annex B parties or Annex B nations).³⁴ These caps are limits on emissions of GHGs during the 2008–2012 period.³⁵ The caps are set as reductions below each party's 1990 emission level³⁶ of six GHGs: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).³⁷ Emission reduction commitments specified by the Protocol are typically 5 to 8 percent below the 1990 emissions baseline, although some parties successfully negotiated a commitment of no reduction, or even an increase

29. United Nations Framework Convention on Climate Change, New York, U.S., May 9, 1992, art. 2, U.N. Doc. FCCC/Informal/84, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> [hereinafter UNFCCC Convention].

30. United Nations Framework Convention on Climate Change, Status of Ratification, http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (last visited July 15, 2008).

31. Compare United Nations Framework Convention on Climate Change, Status of Ratification, available at http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_conv_rat.pdf (last visited Apr. 3, 2006), with UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003 SUBMITTED TO THE U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, KEY GHG DATA 21, 92–94 (2005), available at http://unfccc.int/resource/docs/publications/key_ghg.pdf. I define major emitters of greenhouse gases somewhat arbitrarily as those nations emitting more than 500 million metric tons (Mt) of CO₂ or its equivalent in other GHGs (CO₂) per year. As of their latest reports of GHG emissions to the United Nations Framework Convention on Climate Change (UNFCCC), this list included Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, the Russian Federation, Ukraine, the United Kingdom of Great Britain and Northern Ireland, the United States, and collectively, the European Union. *Id.*

32. UNFCCC Convention, *supra* note 29, at arts. 7, 17.

33. Kyoto Protocol, *supra* note 1, at art. 28.

34. *Id.* art. 3. Note that not all Annex I nations of the UNFCCC adopted commitments as specified in Annex B of the Kyoto Protocol. The most notable of these are the United States and Australia. This Article will use the terminology “Annex B” nation or party to refer to a signatory that did adopt such a commitment. These nations are sometimes referred to as Annex I nations or parties.

35. This period is commonly referred to as the “commitment period” or the “first commitment period.” *Id.*

36. *Id.* art. 3, annex B.

37. *Id.* annex A.

above the baseline.³⁸ Additionally, different levels of economic growth or stagnation since 1990 mean that while some Annex 1 nations face steep cuts, others actually have excess allocations.³⁹

The Protocol includes various flexible mechanisms aimed at reducing the cost of compliance for Annex B parties.⁴⁰ These include provisions allowing parties to trade their allowable emissions (assigned amount units or AAUs)⁴¹ as long as such trading is supplemental to domestic actions.⁴² Also included are provisions allowing Annex B parties to pay for additional emissions reductions within other Annex B parties and then credit them against their own assigned amount units.⁴³ This plan is known as Joint Implementation (JI).⁴⁴ Finally, Annex B parties may pay for emissions reductions within developing (non-Annex B) parties and also credit these against their commitments under the Protocol. The purchasing Annex B nation may then credit these emissions reductions against its assigned amount units. This provision is known as the Clean Development Mechanism (CDM).⁴⁵

The Protocol was ratified by a sufficient number of nations representing a sufficient proportion of global GHG emissions to enter into force,⁴⁶ but it

38. These nations include Australia (108 percent), Iceland (110 percent), New Zealand (100 percent), Norway (101 percent), Russia (100 percent), and Ukraine (100 percent). *Id.* annex B.

39. Compare *id.*, with United Nations Framework Convention on Climate Change, Total Aggregate Greenhouse Gas Emissions of Individual Annex B Parties, 1990–2003, http://ghg.unfccc.int/graphics/graph1_05.gif (last visited Apr. 6, 2006). The Annex B parties with the most headroom are Russia and Ukraine. To date, no nation has purchased assigned amount units (AAU's) from either nation, although there is much discussion of this compliance option. Another nation whose compliance was made far easier by the chosen baseline is Germany. Germany's allocation includes that of the former East Germany, where heavy industry and power demand collapsed after unification. This led to a large decrease in emissions relative to allocation, making the unified Germany's and hence the European Community's compliance challenge much more tractable. See WOLFGANG EICHHAMMER ET AL., GREENHOUSE GAS REDUCTIONS IN GERMANY AND THE UK—COINCIDENCE OR POLICY INDUCED? AN ANALYSIS FOR INTERNATIONAL CLIMATE POLICY 1 (2001), available at <http://publica.fraunhofer.de/eprints/N-6386.pdf>.

40. Lawrence H. Goulder & William A. Pizer, *The Economics of Climate Change*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 10 (Steven Durlauf & Lawrence Blume eds., 2d ed. 2005), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=869644.

41. Indeed, the structure of the agreement is essentially a cap-and-trade system in which AAUs are freely allocated permits to emit that can then be traded between parties via a common registry, administered by the UNFCCC Secretariat. Kyoto Protocol, *supra* note 1, art. 3 ¶ 7.

42. *Id.* art. 17.

43. *Id.* art. 6.

44. Joanna Depledge, *Tracing the Origins of the Kyoto Protocol: An Article by Article Textual History*, 61, 64, delivered to the UNFCCC, U.N. Doc. FCCC/TP/2000/2 (Nov. 25, 2000), available at <http://unfccc.int/resource/docs/tp/tp0200.pdf>.

45. Kyoto Protocol, *supra* note 1, art. 12.

46. *Id.* art. 25 (At least 55 parties to the Protocol representing at least 55 percent of 1990 emissions of GHGs must ratify for the treaty to enter into force.); Kyoto Protocol Status, *supra* note 3.

was not ratified by either the United States or Australia.⁴⁷ It now appears at least possible, if not likely, that one Annex B party, Canada, will either withdraw or fail to comply with the Protocol, while another, Australia, may now join the treaty.⁴⁸ In order to induce a sufficient number of Annex B parties to ratify the treaty, significant concessions were made to particular parties. Notably, the Russian Federation and Ukraine were allowed to join the Protocol with commitments of a zero percent reduction below 1990 levels, although by the time of the negotiations their actual emissions were already far below the 1990 baseline because of the post-Soviet economic contraction.⁴⁹ These nations were able to join the Protocol without fear of facing emissions reductions and with the prospect of future sale of their excess AAU's to countries facing a commitment requiring actual cuts in emissions.⁵⁰

Before and after its entry into force, the Protocol has faced severe criticism: It has been criticized for doing little to combat global warming;⁵¹ for being economically inefficient in requiring nations to reduce emissions too quickly;⁵² for utilizing absolute emissions caps rather than emissions intensity targets or a carbon tax;⁵³ and for not committing the largest developing nations, most notably China and India, to binding emissions

47. *Id.*

48. Both changes are due, of course, to a change in government. In Canada, the election of a conservative government in 2006 led to a reevaluation of Canada's efforts on climate. In Australia, subsequent to the 2007 election, Prime Minister Kevin Rudd's first action was to ratify the Protocol. See, Doug Struck, *Canada Alters Course on Kyoto*, WASH. POST, May 3, 2006, at A16; *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, *supra* note 2.

49. David G. Victor et al., *The Kyoto Protocol Emission Allocations: Windfall Surpluses for Russia and Ukraine*, 49 CLIMATIC CHANGE 263, 264 (2001).

50. ALAIN BERNARD ET AL., MIT JOINT PROGRAM ON THE SCI. & POL'Y OF CLIMATE CHANGE, REPORT NO. 98, RUSSIA'S ROLE IN THE KYOTO PROTOCOL 1-3 (2003), available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt98.pdf.

51. William D. Nordhaus, *Global Warming Economics*, 294 SCIENCE 1283, 1283-84 (2001).

52. Joseph E. Aldy et al., *Thirteen Plus One: A Comparison of Global Climate Policy Architectures*, 3 CLIMATE POL'Y 373, 391 (2003). For the argument that economically efficient greenhouse gas reduction trajectories differ little from business as usual in the short term but substantially in the long term, see Alan Manne & Richard Richels, *On Stabilizing CO₂ Concentrations—Cost-Effective Emission Reduction Strategies*, 2 ENVTL. MODELING & ASSESSMENT 251 (1997).

53. William Pizer, *The Case for Intensity Targets 1-2* (Resources for the Future, Discussion Paper No. 05-02, 2005). The case for setting intensity targets, which limit a country's CO₂ emissions per dollar of GDP, is a consequence of Weitzman's insight that when uncertainty exists as to costs of abatement and the slope of the marginal benefit of abatement curve for an environmental good is relatively flat, a tax rather than a quantity control leads to a superior welfare outcome. See William A. Pizer, *Prices vs. Quantities Revisited: The Case of Climate Change 3-4* (Resources for the Future, Discussion Paper No. 98-02, 1997); Martin L. Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUD. 477 (1974).

reductions.⁵⁴ Finally, its flexible mechanisms also have been criticized as dependent on counterfactuals, namely an emissions baseline, that is either unknowable or politically determined.⁵⁵ Reflecting this criticism, at least thirteen modified treaty architectures have been offered as alternatives or improvements for the post-2012 period.⁵⁶

The most common response to these criticisms is that the Protocol has been, since its negotiation in 1997, the only game in town when it comes to controlling the growth in global GHG emissions and mitigating future harms from global warming. Further, it has spurred the emergence and growth of institutions and capacities that will likely endure beyond its existence, albeit perhaps in altered and improved form. Some of the most notable diplomatic successes of the twentieth century were the result of a long series of negotiations and agreements. Institutions like the GATT and its successor, the WTO, and perhaps most of all, the European Union, that have ultimately delivered tremendous benefits to their members, began with modest and limited agreements. Members were not afraid to tinker with these institutions as they learned by doing. The Protocol has given birth to a whole set of institutions and has fostered capacity development both in the developed and developing world that will prove invaluable in ultimately overcoming the challenges presented by climate change.

This Article's aim is to take a close look at the actual, as opposed to the theoretical, outcome of one of the Protocol's most significant institutional creations—a global market for GHG emission credits. Most or all of the criticisms of the Protocol were made prior to the development of a substantial track record for the CDM and the other flexible mechanisms, so these criticisms were of necessity theoretical in nature. Although to date there has been little use of JI and no sale and purchase of AAUs, there has been an explosion of activity within the CDM that now provides a basis for an empirical critique of the Protocol. This critique aims not to undermine the rationale for the Protocol, but to understand how, in the next phase of the international effort to avoid “dangerous anthropogenic interference”⁵⁷ with the world's climate, trading can accomplish more than it has or is likely to under the Kyoto regime.

54. Prepared testimony of Janet Yellen, *supra* note 22, at 4; Letter From George W. Bush, President of the U.S., to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), <http://www.whitehouse.gov/news/releases/2001/03/20010314.html>. Since developing nations are involved in the Kyoto Protocol through the CDM, this criticism is the extent of their involvement. Kyoto Protocol, *supra* note 1, art. 12.

55. Chi Zhang et al., *Carbon Intensity of Electricity Generation and CDM Baseline: Case Studies of Three Chinese Provinces*, 33 ENERGY POL'Y 451 (2005).

56. Aldy et al., *supra* note 52, at 373.

57. UNFCCC Convention, *supra* note 29.

B. Clean Development Mechanism

1. Structure of the CDM

The CDM is a market-based approach to the problem of global warming. It allows buyers, who may be Annex B parties or firms within Annex B nations, to purchase credits from emission reduction projects carried out in non-Annex B nations. The CDM builds on experience derived from various regional markets for atmospheric pollutants, most notably the United States' experience with emissions trading under the Clean Air Act.⁵⁸ The developing country (non-Annex B) firms that are sellers of Certified Emission Reductions (CERs), the currency of the CDM system, have no limit to the mass of GHGs that they may emit under the Protocol. This absence of a cap on emissions for designated parties necessitates a far more complex design than had been attempted for most previous pollution markets. Adding further complexity to the program is the fact that the CDM is the first atmospheric pollutant trading program that covers multiple gases and allows conversion between them through the medium of its common currency, CERs.

Further, the CDM is a project-based system. It accomplishes its objectives at the microlevel of individual emission reduction projects that are each validated by designated third party verifiers and then registered by the mechanism's governing body, the CDM Executive Board (CDM EB), as eligible for crediting. Each project wishing to participate in the CDM must prepare a Project Design Document (PDD) that explains in detail how its future emissions reductions will be voluntary, real, additional, and will not induce leakage. It must also either utilize a previously approved monitoring methodology that explains in detail how it will monitor emissions reductions made by the project or propose a new methodology. Voluntary emissions reductions are not compelled by national or provincial law or regulation. Real emissions reductions are monitored with sufficient care to ensure that they actually occur. Additional emissions reductions are those that are in addition to any that would have occurred absent the CDM subsidy. Leakage of emissions occurs when emissions reductions that would have occurred from a CDM project absent the CDM subsidy are displaced to another location because of the subsidy.

58. Prepared testimony of Janet Yellen, *supra* note 22, at 12; see also Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109, 151–53 (1989) (detailing the successes and disappointments of the EPA program and suggesting that many of the program's failings stemmed from regulators' need to satisfy multiple constituencies with divergent objectives).

All four of these concepts require that a hypothetical baseline of emissions be defined for each project, and in the case of leakage, the world outside the project. This baseline represents the timeline of emissions that would have occurred absent the subsidy provided by the CDM (and thus absent the emission reduction project). It is an attempt to estimate the counterfactual of typical levels of emissions in a world without CDM. The CDM project baseline is described in terms that vary by project type. Nevertheless, several common variables can be seen in most PDDs.⁵⁹ Project proponents often describe the regulatory baseline, that is, the emissions permitted by local law and regulation.⁶⁰ They also often describe the financial baseline, which is the lack of an adequate return on investment without the benefit of the CDM subsidy.⁶¹ They often describe typical technologies applied by the type of project in the PDD and how the CDM-subsidized project exceeds these local standards.⁶² Finally, they sometimes must describe a sectoral or national baseline for installations of the project type.⁶³ Ultimately, the CDM project proponents must quantify, third party verifiers must check, and the CDM EB must certify the hypothetical emissions that would have occurred in the future without the CDM project subsidy.

Project proponents and environmental regulators do not live in a world without CDM. As will be shown below, they have acted strategically in order to maximize many projects' baselines and so maximize the potential for the generation of CER revenues. The fact that most industries involved in CDM projects are already highly regulated makes this strategy attractive

59. PDDs follow a standardized format that includes a general description of the project, a description of how the baseline for the project is determined, a specification of the duration of the project, an explanation of how the project's emissions reductions will be monitored, a quantitative estimate of the project's emissions reductions, a discussion of any other environmental effects of the project, and finally a synthesis of comments on the project by local stakeholders. CDM Executive Bd., UNFCCC, *Guidelines for Completing the Project Design Document (CDM-PDD), The Proposed New Methodology: Baseline (CDM-NMB) and the Proposed New Methodology: Monitoring (CDM-NMM)* (Version 04, 2005), available at http://cdm.unfccc.int/Reference/Documents/GuideL_Pdd/English/Guidelines_CDM_PDD_NMB_NMM.pdf.

60. See, e.g., CDM PROJECT DESIGN DOCUMENT OF THE REPUBLIC OF NORTH KOREA: HFC DECOMPOSITION PROJECT IN ULSAN 20 (2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/FS_302727382.

61. See, e.g., CDM PROJECT DESIGN DOCUMENT: ZHANGBEI MANJING WINDFARM PROJECT 9-11 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/5X09Y9XLJO28P4KEA4GNSWG275CF5T>.

62. See, e.g., CDM PROJECT DESIGN DOCUMENT: EQUIPAV BAGASSE COGENERATION PROJECT (EBCP) 13-14 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/PL0URYPVKVZOV8TIW2MI8EG1Y3CBM1>.

63. See, e.g., CDM PROJECT DESIGN DOCUMENT: WASTE HEAT BASED 7 MW CAPTIVE POWER PROJECT 35 (2006), available at <http://cdm.unfccc.int/UserManagement/FileStorage/6WOJFJIP40XRP77Y7M83R6UVYCBLL>.

and easy to implement. An environmental regulator faced with the choice of preventing an emission with a costly domestic regulation⁶⁴ or by means of the CDM will have obvious political incentives for selecting the international program over new domestic regulation.⁶⁵

The end product of the CDM process is the issuance by the CDM EB of an emission offset to the project participants. This offset can then be sold to an Annex B nation or a party within one that has obligations under the Protocol. The offset, called a certified emission reduction or CER, assuming that certain CDM facilities are established, may be used by Annex B countries in lieu of emissions reductions within their territories in order to meet their targets under the Protocol.⁶⁶ Private parties that are assigned emissions allowances by their governments may also purchase CERs and use them as permits to emit in excess of their assigned allocations, or as an alternative to purchasing allocations from other participants in their domestic market. The European Union and Japan will likely be the major purchasers of CERs during the first commitment period.⁶⁷

The official public process leading to the production of CERs by a CDM project begins with the submission of a PDD to the CDM EB for a period of public comment. This comment process is a part of a project's validation by an independent Designated Operational Entity (DOE).⁶⁸ The project must also receive approval from its host country's Designated National Authority (DNA), typically the host country's environmental ministry, before being submitted for registration to the CDM EB.⁶⁹ Once registered, a project must submit monitoring reports providing data to show how many CERs have actually been generated during a particular period. These reports must be

64. It is costly both from the perspective of total societal costs and from the perspective of allocation of regulator personnel and funding.

65. The incentive not to regulate created by the CDM led the CDM EB to adopt rules specifying the dates after which a new regulation must be taken into account. CDM Executive Bd., UNFCCC, *Twenty-Second Meeting Report, Annex 3: Clarifications on the Consideration of National and/or Sectoral Policies and Circumstances in Baseline Scenarios* (Version 02, 2005), available at http://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

66. Kyoto Protocol, *supra* note 1, art. 12, § 3(b).

67. POINT CARBON, CARBON 2006: TOWARDS A TRULY GLOBAL MARKET 5 fig.2.1 (2006), available at http://www.pointcarbon.com/wimages/Carbon_2006_final_print.pdf. Canada was also likely to have been an important purchaser of Certified Emission Reductions (CERs), but actions by its recently elected conservative government have made it doubtful that it will comply with the Protocol. See Doug Struck, *Canada Alters Course on Kyoto: Budget Slashes Funding Devoted to Goals of Emissions Pact*, WASH. POST, May 3, 2006, at A16.

68. U.N. ENV'T PROGRAM, LEGAL ISSUES GUIDEBOOK TO THE CLEAN DEVELOPMENT MECHANISM 32-34 (2004), available at <http://cd4cdm.org/Publications/CDM%20Legal%20Issues%20Guidebook.pdf>.

69. *Id.*

both consistent with the monitoring plan spelled out in the project's PDD and verified and certified by a DOE.⁷⁰ At that point, the CDM EB will issue CERs into a project participant's account.⁷¹ These CERs will eventually be transferable to a buyer who establishes an account with the International Transaction Log, a yet to be constructed database of Kyoto Protocol GHG accounts.⁷²

2. Goals of the CDM

The CDM was created for three reasons. First, it aims to accomplish the overarching goals of the Framework Convention. Second, it aims to encourage sustainable development in non-Annex B nations. Third, the CDM is intended to reduce the cost of compliance with the Protocol for Annex B nations.⁷³

The CDM is intended, according to the Protocol, to help in accomplishing the Convention's goal of "prevent[ing] dangerous interference" with the climate system.⁷⁴ It aims to do this by assisting developing countries to reduce their emissions of GHGs. Thus, the CDM is significant, and indeed the only way in which non-Annex B signatories to the Protocol will contribute toward achieving the Protocol's goals. A realistic hope for the CDM is that by providing non-Annex B nations with financial incentives for low-carbon intensity development, they might be nudged, however slightly, onto more climate-friendly trajectories.

The second CDM objective—sustainable development—is left largely undefined by the Protocol or the implementing directives of later conferences of the parties.⁷⁵ To the extent that the provision has teeth, it is given them by the requirement under the CDM that the host country DNA of a project must certify that the project meets the DNA's standards of sustainability.⁷⁶ Although some DNAs have prioritized particular types of projects, they have not rejected other types that would otherwise be capable of producing CERs.⁷⁷

70. *Id.*

71. *Id.*

72. UNFCCC, Subsidiary Body for Sci. & Tech. Advice, Twenty-Second Session, Bonn, F.R.G., May 19–27, 2005, *Checks to Be Performed by the International Transaction Log*, at 3–4, U.N. Doc. FCCC/SBSTA/2005/INF.3 (May 13, 2005), available at http://unfccc.int/files/meetings/unfccc_calendar/pre-sessional/application/pdf/inf03.pdf.

73. Kyoto Protocol, *supra* note 1, art. 12.

74. *Id.* art. 12, § 2.

75. *Id.* art. 12, § 2; U.N. ENV'T PROGRAM, *supra* note 68, at 49.

76. U.N. ENV'T PROGRAM, *supra* note 68, at 49.

77. China's official CDM policy favors renewable energy, energy efficiency, and methane capture projects, but the Chinese DNA has approved numerous other types of projects. See Office of Nat'l Coordination Comm. on Climate Change, *Measures for Operation and Management of Clean*

The third CDM goal—lowering the cost of compliance for Annex B parties—was thought possible for two reasons. First, the majority of new energy capacity to be built up during the First Compliance Period will be located in the developing world where rates of economic growth are highest and energy infrastructure is least developed.⁷⁸ Also, the relative cost of prematurely retiring high-carbon-emission intensity power plants is significantly higher than building new low- or zero-carbon emission energy capacity. Thus, if the CDM could be used to subsidize the substitution of new, clean power capacity in the developing world for the premature retirement of old, dirty power capacity in the developed world, it could substantially lower the cost of treaty compliance. Further, such a substitution would not change the environmental outcome, because the location at which an emission reduction of a particular quantity of CO₂ takes place has no impact on the environmental benefit—lower atmospheric greenhouse gas concentrations.⁷⁹ However, as will be shown in our first story about CDM implementation, a substantial proportion of the emissions reductions generated by the CDM are not of this type and are in reality extremely inefficient in terms of the cost of the subsidy compared to the cost of environmental benefits obtained. Our second story regarding CDM implementation will take a close look at the fraction of emissions reductions created by construction of new electric-generating capacity and will show that it is increasingly difficult to tell which CDM projects are producing emissions reductions additional to those that would have occurred in the baseline, and which are claiming credit for nonadditional, anyway credits.

II. RAPID DEVELOPMENT OF THE CLEAN DEVELOPMENT MECHANISM SINCE 2004

The CDM project pipeline began operation in December of 2003, when the first project was accepted for public comment and validation. In

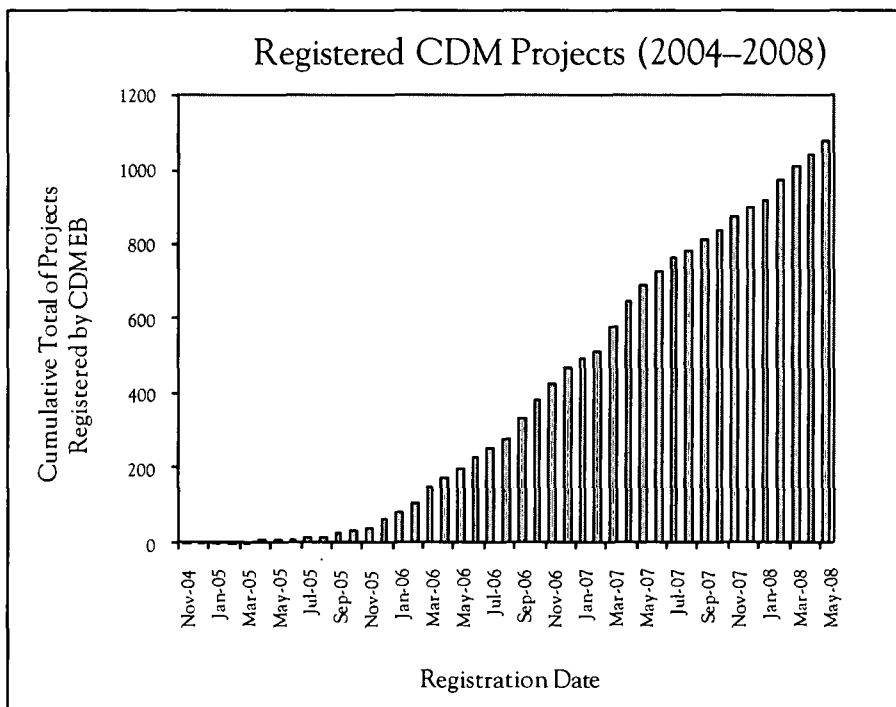
Development Mechanism Projects in China, art. 4 (Nov. 21, 2005), available at <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905>.

78. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2007, at 61 (2007), available at [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2007\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2007).pdf).

79. Because CO₂ is a well-mixed atmospheric gas with a long residence time, the extent to which it causes environmental harm is a function of its concentration in the atmosphere rather than the rate at which it is being added at any one time. William D. Nordhaus, *Life After Kyoto: Alternative Approaches to Global Warming Policies* 6 (Nat'l Bureau of Econ. Research, Working Paper No. 11889, 2005), available at <http://www.nber.org/papers/W11889.pdf>.

November of 2004, the first project was registered by the CDM EB.⁸⁰ Finally, in October 2005, the first CERs were issued to a project participant's account.⁸¹ Since then, there has been extremely rapid growth in the number, type, and total volume of emissions reductions in the CDM pipeline. Figure 1 shows the number of projects completing the registration process by month since the CDM began its activities. Beginning in the second half of 2005, the registration process picked up significant steam so that by the end of 2007, there were 895 projects registered and able to produce CERs for sale in the carbon market.

FIGURE 1: NUMBER OF PROJECTS REGISTERED BY THE CDM EXECUTIVE BOARD SINCE DECEMBER 2003, WHEN PDDs FIRST ENTERED THE CDM PIPELINE⁸²



80. See UNFCCC, Project 0008: Brazil NovaGerar Landfill Gas to Energy Project, <http://cdm.unfccc.int/Projects/DB/DNV-CUK1095236970.6> (last visited Apr. 30, 2008).

81. See UNFCCC, CERs Issued, http://cdm.unfccc.int/Issuance/cers_iss.html (last visited July 15, 2008).

82. Data for Figure 1 comes from UNEP Risø Centre, UNEP Risø CDM/JI Pipelines Database and Analysis, <http://www.cdmpipeline.org/publications/CDMpipeline.xls> (last visited May 2, 2008). As of November 1, 2007, there were 827 projects registered by the CDM EB.

It was not until November of 2005 that the volume of CO₂ reductions deliverable by registered CDM projects to the end of the First Commitment Period began to grow large enough to play a significant role in Protocol compliance for Annex B parties. From the last quarter of 2005 to the present, the potential CDM supply has grown at a breakneck pace. By January 1, 2008, more than 1150 million tons (Mt) CO₂ equivalent (CO₂e)⁸³ had been registered for delivery via the CDM by the end of the first compliance period (see Figure 2).⁸⁴ Another pattern emerging from the project registrations that have occurred is the dominance of large projects in the CDM. As seen in Figure 2, a small number of very large projects dominate the supply of CERs from registered projects. In fact, the 45 largest projects (5 percent of the total number) represent 64 percent of the total supply to the end of the First Commitment Period.⁸⁵

The trend of large projects dominating supply holds for the CDM pipeline as a whole, including projects registered, projects for which registration has been requested, and projects that have entered the validation stage. As of this writing, there are more than 2800 projects in the CDM pipeline that will eventually, if all are registered and deliver reductions as promised in their PDDs, supply more than 2600 Mt CO₂e to the market for Protocol compliance instruments.⁸⁶ This amount represents approximately 2.8 percent of Annex B 1990 GHG emissions for each year of the First Commitment Period.⁸⁷

83. The standard measure of greenhouse gas reduction under the Protocol is 1 ton CO₂e. It is the mass of any one of the six Kyoto gases equal to the 100-year global warming potential (GWP) of one ton of CO₂. GWP is defined as the time integrated radiative forcing from the release of 1 kg of a trace substance to 1 kg of CO₂. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) & TECH. & ECON. ASSESSMENT PANEL, SAFEGUARDING THE OZONE LAYER AND THE GLOBAL CLIMATE SYSTEM: ISSUES RELATED TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS 385 (2005), available at http://www.ipcc.ch/pdf/special-reports/sroc/sroc_full.pdf [hereinafter IPCC].

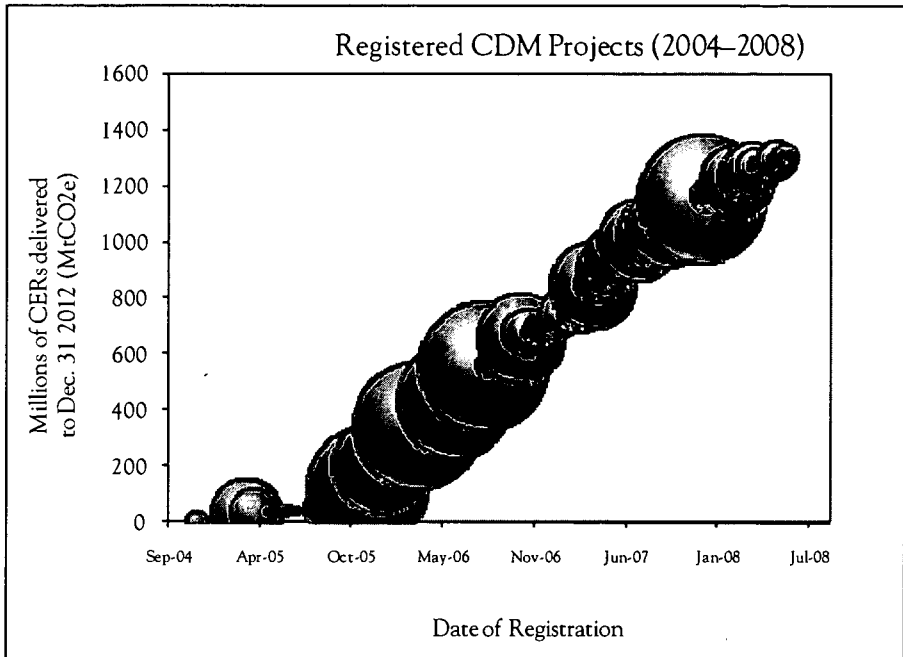
84. See UNEP Risø Centre, *supra* note 82.

85. *Id.*

86. See UNFCCC, CDM Statistics, <http://cdm.unfccc.int/Statistics/index.html> (last visited Jan 7, 2008). I count a project as in the CDM pipeline if it has advanced to the public comment phase of validation. UNFCCC, Validation Projects, <http://cdm.unfccc.int/Projects/Validation> (last visited July 15, 2008).

87. See UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003, *supra* note 31, at 15. Dividing the 2600 Mt CO₂e estimate for production of credits by 5 provides an annual estimate of supply during the First Commitment Period of 520 Mt CO₂e/year. Annex B GHG Emissions in 1990, not including credits for land use, land use change, and forestry, were 18,372 Mt CO₂e. Thus the CDM will provide 520/18,372 or 2.8 percent of Annex B 1990 GHG emissions.

FIGURE 2: PROJECTS REGISTERED IN TERMS OF CER SUPPLY PROJECTED BY END OF FIRST COMMITMENT PERIOD⁸⁸



Projects yet to be registered or yet to even enter the CDM pipeline face a diminishing probability of generating credits as the end of the First Commitment Period draws closer. The flow of projects is likely to diminish over time unless agreement is reached as to the future of the CDM in the post-2012 climate treaty architecture. The shorter the interval before the end of the First Commitment Period, the less money there is to be made from CERs and so the transaction costs associated with registration and monitoring loom larger.⁸⁹ Without certainty about the shape of any future UNFCCC-based trading program or subsidy, financial incentives to invest with post-2012 in mind are absent.⁹⁰ Even for the 2008–2012 market, there is significant

88. Data for Figure 2 comes from UNEP Risø Centre, *supra* note 82. The y-axis shows the total credits promised by December 31, 2012 of CERs to the carbon market from CDM projects; the size of each bubble shows the relative size of the particular project. This figure shows projects registered by November 1, 2007.

89. ERIC HAITES, ESTIMATING THE MARKET POTENTIAL FOR THE CLEAN DEVELOPMENT MECHANISM: REVIEW OF MODELS AND LESSONS LEARNED 63–64 (2004), available at <http://carbonfinance.org/docs/EstimatingMarketPotential.pdf>.

90. *Id.*

demand (and hence price) uncertainty because of the possible competition of CDM with both JI project-based reductions and outright purchases of AAUs from Russia, Ukraine, and the remainder of Eastern Europe.⁹¹ Whether these alternative supplies of AAUs and JI credits are sought out by Annex B parties depends on the costs of domestic compliance, the price of CERs, and other political considerations.⁹²

III. CURRENT SUPPLY OF CERs IN THE CDM PIPELINE BY PROJECT TYPE

The original intent of the CDM was to spur development of low-carbon energy infrastructure in the developing world both through achievement of sustainable development goals and substitution for early retirement of expensive, high-carbon energy infrastructure in the developed world.⁹³ It comes as a surprise, then, to find then that the CDM pipeline bears only a partial relationship to this vision. Instead, the subsidy provided by purchase of CERs to date will largely ensure that high GWP industrial gases such as trifluoromethane (HFC-23) and N₂O as well as CH₄ emitted by landfills and confined-animal-feeding operations (CAFOs) in non-Annex B nations are captured and destroyed. The very large projects dominating the supply of CERs are confined primarily to two relatively obscure industries—adipic acid and chlorodifluoromethane (HCFC-22) production. Adipic acid is the feedstock for the production of nylon-66 and releases abundant N₂O as a production byproduct.⁹⁴ HCFC-22 has two major applications. It is one of two major refrigerants that was phased in to replace the CFC's under the auspices of the Montreal Protocol to Protect on Substances that Deplete the Ozone Layer.⁹⁵ HCFC-22 is also the primary feedstock in the production

91. Russia was granted significant excess AAUs in negotiations leading up to its accession to the Protocol as an inducement to join. SCOTT BARRETT, ENVIRONMENT AND STATECRAFT: THE STRATEGY OF ENVIRONMENTAL TREATY-MAKING 372–73 (2003). This concession, when combined with the post-Soviet economic contraction, leaves Russia with significantly lower actual emissions than its assigned amount under the Protocol. POINT CARBON, *supra* note 67, at 8; Victor et al., *supra* note 49, at 263. Ukraine and the remainder of Eastern Europe also have excess AAUs due to economic contraction. *Id.*

92. See discussion *infra* Part VI.

93. See discussion *infra* Part I.B.2.

94. R.A. Reimer et al., *Adipic Acid Industry—N₂O Abatement: Implementation of Technologies for Abatement of N₂O Emissions Associated With Adipic Acid Manufacture*, in NON-CO₂ GREENHOUSE GASES: SCIENTIFIC UNDERSTANDING, CONTROL AND IMPLEMENTATION 347, 347 (J. van Ham et al. eds., 2000).

95. A. MCCULLOCH, INCINERATION OF HFC-23 WASTE STREAMS FOR ABATEMENT OF EMISSIONS FROM HCFC-22 PRODUCTION: A REVIEW OF SCIENTIFIC, TECHNICAL AND ECONOMIC ASPECTS 2 (2005), available at http://cdm.unfccc.int/methodologies/Background_240305.pdf.

of PTFE,⁹⁶ more commonly known by its Dupont brand name, Teflon. HCFC-22 production inevitably produces HFC-23 as an unwanted byproduct.⁹⁷ These two relatively small industries represent nearly 55 percent of the supply of issued CERs in the CDM to date.⁹⁸

Contrary to ex-ante predictions, CO₂-based projects, including renewable energy, fuel switching from coal to gas, demand side energy efficiency, waste heat capture, and cement process modification account for less than half of the CER supply to 2012. Renewable energy projects alone account for 28 percent. Nineteen HFC-23 capture projects at HCFC-22 production facilities and three projects that capture the N₂O made as a byproduct of adipic acid or nitric acid production account for the third of the pipeline composed of high GWP industrial gas reduction projects. Finally, CH₄-capture and flaring projects, mostly located at large landfills, coal mines, and CAFOs, account for another 19 percent. Moreover, because the HFC-23, N₂O, and to a lesser extent, CH₄, projects are typically of larger size than the renewable energy projects, they are more likely to overcome the transaction costs associated with registration and production of CERs than the smaller hydro, wind, and biomass energy projects that compose the CDM's renewable portfolio.⁹⁹

To date, relatively small numbers of CERs have actually been issued. This slow trickle will likely turn to a flood in the coming years as registered projects begin submitting monitoring reports to the CDM EB. In order for the issuance of a CER to occur, a third-party monitor must audit a CDM project and certify that monitoring of the emissions reductions was adequate to ensure that they actually occurred.¹⁰⁰ Submission of this report to the CDM EB results in the issuance of CERs to that project participant's account.¹⁰¹ The first CERs were issued by the CDM EB in late October 2005.¹⁰² As of January 1, 2008, only 103 million CERs have been issued and deposited into project participant accounts.¹⁰³ The fact that more than half of these issuances are to HFC-23 abatement projects (55 percent) is likely due to the superior financial and logistical capacity of these projects relative to either the CH₄ or renewable-energy projects. The pattern most evident in the early issuances of CERs is the dominance of large over small projects in terms of actually

96. *Id.*

97. *Id.*

98. UNEP Risø Centre, *supra* note 82.

99. HAITES, *supra* note 89, at 45.

100. U.N. ENV'T PROGRAM, *supra* note 68, at 38–39.

101. *Id.* at 39.

102. UNFCCC, *supra* note 81.

103. This amount represents less than 10 percent of CERs promised by registered projects for delivery to 2012. *Id.*

producing emissions reductions. Early issuance shows once again that the barrier represented by transaction costs is more substantial for small CDM projects. As discussed above, the classes of small and large projects are largely coextensive with the CO₂ projects versus the N₂O, HFC-23, and to a lesser extent CH₄ projects.

Contrary to theory and expectation, the CDM market is not a subsidy implemented by means of a market mechanism by which CO₂ reductions that would have taken place in the developed world take place in the developing world. Rather, most CDM funds are paying for the substitution of CO₂ reductions in the developed world for emissions reductions in the developing world of industrial gases and methane. Indeed, the industrial gas emissions that account for one third of CDM reductions do not even occur in the developed world, not because of an absence of adipic acid or HCFC-22 manufacture, but because Annex B industries, after recognizing the threat posed by these emissions and the low cost of abating them, have opted to voluntarily capture and destroy them.¹⁰⁴

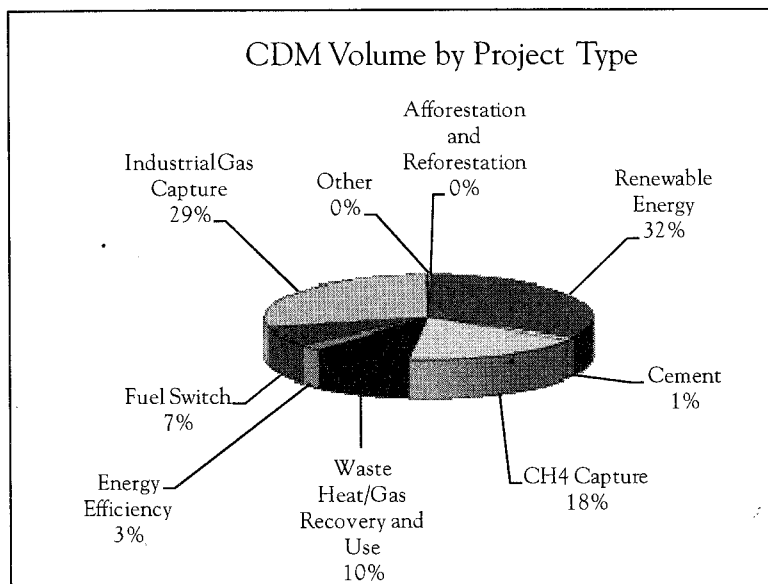
While renewable energy projects do make up 1600 out of 2647 (60 percent) projects in the CDM project pipeline, they account for only 28 percent of the emissions reductions produced. It is important to note that a significant proportion of the CERs generated by biomass power projects are from the CH₄ emissions that are avoided because biomass is burned rather than allowed to biodegrade.¹⁰⁵ Much of the publicity surrounding the CDM has emphasized the number of renewable energy projects sponsored by the CDM while neglecting the relative volume of emissions,¹⁰⁶ hence CERs produced and the relative scale of subsidy provided to various sectors. This emphasis provides a false picture of the true subsidy flows being generated by the international market for carbon (see Figure 3).

104. MCCULLOCH, *supra* note 95, at 18; Reimer et al., *supra* note 94, at 349.

105. Anaerobic digestion of crop residues leads to significant emission of CH₄ that is prevented by collection and use of the waste as a fuel. Many biomass energy projects claim this emission reduction in addition to the fossil-fuel-based energy avoided. See, e.g., CDM PROJECT DESIGN DOCUMENT: CAMIL ITAQUI BIOMASS ELECTRICITY GENERATION PROJECT 7-9 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/7Q7IH03DPAA2EL4SA8AM415CKQ7502>.

106. Compare *infra* fig. 3, with UNFCCC, Registration: Distribution of Registered Project Activities by Scope, <http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html> (last visited May 4, 2006), and The World Bank, Carbon Finance Unit, About World Bank Carbon Finance Unit, <http://carbonfinance.org/Router.cfm?Page=About&ItemID=24668> (last visited May 4, 2006).

FIGURE 3: FRACTION OF CERS SUPPLIED TO 2012 BY PROJECT TYPE FOR ALL PROJECTS CURRENTLY IN THE CDM PIPELINE¹⁰⁷



It is clear that the CDM has induced market participants to produce a large number of emissions reductions in the developing world for sale to those nations with quantified emissions reductions under the Protocol. However, to evaluate whether the CDM as actually realized is a success, more information is required: One must also ask whether Annex B nations get their money's worth. To answer this question, Part IV will examine HFC-23 projects and energy projects in the CDM.

IV. STRATEGIC MANIPULATION OF BASELINES: THE CASE OF HFC-23 ABATEMENT PROJECTS IN THE CDM

A. HFC-23 is a High GWP Byproduct of HCFC-22 Manufacture

Our first story concerns both the strategic behavior on the part of proponents of HFC-23 capture projects, an important class of large projects within the CDM, and the responses of the CDM EB to these attempts to inflate credit issuance. These emission reduction projects are an important component of the emissions market's initial rapid growth. There are

107. Data current as of Dec. 4, 2007. UNEP Risø Centre, *supra* note 82.

nineteen HFC-23 capture projects currently participating in the CDM.¹⁰⁸ These projects consist of the capture and destruction of HFC-23 produced as a byproduct of HCFC-22 manufacture.¹⁰⁹ The primary use of HCFC-22 is as a refrigerant, although its use as a feedstock for fluoroplastics such as PTFE is also significant and growing.¹¹⁰ For every 100 tons of HCFC-22 produced, between 1.5 and 4 tons of HFC-23 are produced.¹¹¹ This group of emission reduction projects have played an important role in shaping the early CDM emissions market and, because of their substantial market share, in determining its environmental performance.

An understanding of the incentives faced by creators of HFC-23 abatement projects must begin with an understanding of the atmospheric chemistry of HFC-23, because this chemistry lies at the heart of what makes them successful CDM projects. HFC-23 is an extremely potent and long-lived greenhouse gas. Its one-hundred-year GWP is 11,700.¹¹² As a consequence of this high GWP and the rules of the CDM, which convert the other six Protocol gases to CO₂e and hence CERs using their GWPs, 1 ton of HFC-23 abated is considered equivalent to 11700 tons of CO₂. In other words, for every kilogram of HCFC-22 produced, between 15 and 30 g of HFC-23 is produced, and potentially captured and destroyed. This 15 to 30 g of HFC-23 is equivalent to 175 to 350 kg of CO₂, or 0.175 to 0.350 CERs.

Although approximately half of HCFC-22 production occurs in the developed world,¹¹³ there are essentially no byproduct emissions of HFC-23 there because major producers have voluntarily adopted measures to capture and destroy it.¹¹⁴ Participation in voluntary abatement programs was substantial but not universal by 2005.¹¹⁵ The situation in the developing world was, prior to CDM, quite different. There, HCFC-22 manufacturers vented all HFC-23 produced to the atmosphere.¹¹⁶ One market analyst predicts that global HCFC-22 production will grow by 6 to 7 percent per year until 2020 and by 16 percent per year in the developing world.¹¹⁷ Thus,

108. This figure is as of Jan. 1, 2008. UNEP Risø Centre, *supra* note 82.

109. CDM Executive Bd., UNFCCC, *Revision to Approved Baseline Methodology AM0001: "Incineration of HFC 23 Waste Streams" 1* (Version 03, 2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/AM0001_version3%20.pdf.

110. MCCULLOCH, *supra* note 95, at 4.

111. *Id.* at 10.

112. *Id.* at 21.

113. *Id.* at 4.

114. *Id.* at 18, 21.

115. IPCC, *supra* note 83, at 409.

116. MCCULLOCH, *supra* note 95, at 4.

117. *Id.*

reducing non-Annex B emissions of HFC-23 should be a goal of any treaty aimed at curbing GHG emissions.

Non-Annex B manufacturers of HCFC-22 have, to a remarkable extent, become participants in the CDM. Developing world production of HCFC-22 in 2005 was approximately 237,000 metric tons.¹¹⁸ Assuming a 3 percent HFC-23 production rate, which has been fairly typical for the 19 HCFC-22 plants participating in the CDM,¹¹⁹ this equates to a production of 83 million CERs per year.¹²⁰ Taken together, the PDDs of the nineteen HCFC-22 plants estimate that they will produce 81.8 million CERs per year. Using these estimates, it would appear that essentially all developing world HCFC-22 production, as of 2005, is currently participating in the CDM. This is a remarkable achievement for the CDM and begs the question of how a financial mechanism was able to achieve near total market penetration in an industry so quickly. An examination of the economics of HCFC-22 abatement and HFC-23 capture explains that the reasons may have as much to do with the perverse incentives created by the carbon market as with an ability to identify low cost emissions reduction opportunities.

B. The Perverse Incentives of HFC-23 Abatement as a CDM Project

The economics of HFC-23 projects create incentives for strategic behavior that, if left unchecked, would undermine the environmental efficacy of the CDM (see Table 1). Consider the 1 kg of HCFC-22 produced by a CDM project that the calculation above showed to be equivalent to 0.35 t CO₂ or 0.35 CERs. At current market prices of €10/CER,¹²¹ the production of 1 kg of HCFC-22 will produce a subsidy of €3.51. The cost of HFC-23 abatement is estimated to be on the order of €0.09/kg HCFC-22.¹²²

118. *Id.*

119. See UNEP Risø Centre, *supra* note 82. The average HFC-23/HCFC-22 ratio of the first 10 plants is 2.99± 0.58 (data on file with author).

120. $237,000 \text{ Mt HCFC-22} * 0.03 = 7110 \text{ Mt HFC-23}$; $7110 \text{ Mt HFC-23} * 11700 = 83,187 \text{ Mt CO}_2\text{e}$.

121. Data collected from publicly available reported trades of CERs is used to create this estimate. Note that the pricing of CERs is dependent upon when in the regulatory process they are sold. Most sales occur prior to registration of a project, let alone monitoring, verification, and issuance of promised CERs. These forward contracts for CERs are termed "primary CER" sales. Primary CER prices reflect validation, registration, credit, and country risk. Issued CERs, termed "secondary CERs" trade at approximately 80 percent of EU ETS allowance prices. This price spread is expected to decrease substantially once the interconnections required for trading are established between the CDM registry and the EU ETS registry.

122. MCCULLOCH, *supra* note 95, at 12. This value is derived assuming an 8 percent return on the investment in destruction facilities (€240,000/year) plus €200,000 operating expenses and a

Thus, the net from subsidy minus abatement costs to an HCFC-22 producer is approximately €3.41/kg HCFC-22. This subsidy compares quite favorably with the wholesale price for HCFC-22, which as of the fourth quarter of 2005 was approximately €1.60/kg.¹²³ A developing world producer of HCFC-22 can earn more than twice as much from its CDM subsidy as it can gross from the sale of its primary product. Even when CER prices were only half of their current value, HCFC-22 manufacturers found these calculations to be a compelling incentive to enter the CDM process.¹²⁴ Given these incentives, it is perhaps not a tremendous surprise that participation in the CDM by the non-Annex B based HCFC-22 industry is nearly universal.

TABLE 1: ESTIMATING THE VALUE OF THE CDM SUBSIDY
TO HCFC-22 PRODUCERS

Step 1: Calculate CO ₂ e produced by 1 kg HCFC-22	1 kg HCFC-22 → 0.03 kg HFC-23 0.03 kg HFC-23 * 11700 = 351 kg CO ₂ e = 0.351 t CO ₂ e
Step 2: Estimate gross subsidy	0.351 t CO ₂ e * €10/CER = €3.51 Gross subsidy per kg HCFC-22 = €3.51
Step 3: Estimate the cost per kg HCFC-22 (calculations are for a facility capable of capturing and destroying 200 t HFC-23/year)	€3,000,000 investment at 8% interest + €200,000 per year operating costs = €590,000 per year cost.
Step 5: Calculate the cost per kg HCFC-22	€590,000/200 t HFC-23 = €2950/t HFC-23 €2950/t HFC-23 * 3% HFC-23 = €88.5/t HCFC-22 €88.5/t HCFC-22 * 1 t/1000 kg = €0.09 Cost of subsidy per kg HCFC-22 = €0.09
Step 6: Calculate the net CDM subsidy	€3.51 - €0.09 = €3.42/kg HCFC-22

The perverse incentives created by the economics of HFC-23 capture CDM projects were, from a very early stage, a point of controversy.¹²⁵ The CDM methodology, without which HFC-23 projects could not advance to registration, went through several rounds of revision because of fears that

production rate of 200 t HFC-23 per year, equivalent to 6666 t HCFC-22 per year, and a 3 percent HFC-23 production rate.

123. Telephone Interview With Mack McFarland, Environmental Fellow, DuPont Fluoroproducts (Fall 2005) [hereinafter McFarland Interview].

124. Should primary CER prices fall from their current highs of €10 due to the fall in the value of ETS permits, HFC projects will remain economically attractive.

125. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (June 3, 2004), available at http://cdm.unfccc.int/methodologies/inputam0001/letter_Dupont_03/June04.pdf [hereinafter Jacob].

HCFC-22 manufacturers would produce gas simply to generate CERs, thereby diluting the CDM's currency, at least in terms of its environmental effectiveness.¹²⁶ Recall that a key requirement of CERs is that they be "additional to any that would have occurred in the absence of the project activity."¹²⁷ The economics of HFC-23 projects are a *reductio ad absurdum* of this requirement. It is quite likely that no capture of HFC-23 would occur without the CDM. On the other hand, with the CDM, HCFC-22 factories have very strong incentives to create extra HFC-23 specifically to capture and destroy it. Indeed, merely by capturing what they would have made anyway, a manufacturer can triple revenues and, based on the cost estimates presented above, more than triple profits.

C. Imperfect Regulatory Compromise for HFC-23 Plants in the CDM

To deal with the perverse incentives to overproduce HCFC-22 in order to capture and destroy HFC-23, the CDM EB decided to approve only those projects involving previously existing HCFC-22 production capacity.¹²⁸ New plants or added capacity are not currently allowed into the CDM.¹²⁹ In order to qualify for registration, a plant must have been in operation and able to supply both HCFC-22 and HFC-23 production data for at least three years in the 2000 to 2004 period.¹³⁰ This prerequisite creates the obvious problem of incentivizing the capture and destruction of HFC-23 that is emitted incidental to the 16 percent annual growth of HCFC-22 production predicted to occur in the developing world.¹³¹ The Conference of the Parties has asked for guidance on new plant and added capacity from the Subsidiary Body for Scientific and Technical Advice of the UNFCCC.¹³²

Even with these relatively restrictive rules on eligibility, there is circumstantial evidence and very good reason to suspect that HCFC-22 manufacturers participating in the CDM have behaved strategically to direct a greater share of the subsidy to themselves by artificially inflating their

126. On the concept of tradable emissions permits as a property right, see Hahn & Hester, *supra* note 58, at 110, 117; on the concept of tradable emissions permits as a currency, see David G. Victor et al., *A Madisonian Approach to Climate Policy*, 309 *SCIENCE* 1820 (2005).

127. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

128. CDM Executive Bd., *supra* note 109, at 3.

129. *Id.* at 1.

130. *Id.*

131. MCCULLOCH, *supra* note 95, at 4.

132. *Summary of the Twenty-Second Sessions of the Subsidiary Bodies of the UN Framework Convention on Climate Change: 19–27 May, 2005*, *EARTH NEGOTIATIONS BULL.* (Int'l Inst. For Sustainable Dev., New York, N.Y.), May 30, 2005, at 5, available at <http://www.iisd.ca/download/pdf/enb12770e.pdf>.

base-year production in two ways. First, the fraction of HFC-23 produced by the production of HCFC-22 can be reduced by modification of the conditions under which chemical synthesis occurs. Dupont has consistently produced, in its United States HCFC-22 plant, HFC-23 byproduct percentages as low as 1.3 percent.¹³³ Developing-country manufacturers have not been able to achieve such rates of HFC-23 production, with reported rates between 2 and 4 percent. The economics of HCFC-22 production in the absence of a CDM subsidy dictate that HFC-23 production should be minimized because it is a waste product costing both energy and materials.¹³⁴ For this reason, almost all plants have historically monitored their HFC-23/HCFC-22 ratio in order to optimize productivity of HCFC-22.¹³⁵

Dupont argued in comments presented to the CDM EB that the crediting methodology for HFC-23 projects should be limited to crediting global best practice—the Dupont value. CDM project proponents responded that their plants lacked necessary capacity and could not be expected to perform with the same efficiency as those in the developed world. Presented with these conflicting arguments, the CDM EB forged a crude compromise. The CDM methodology eventually approved for HFC-23 abatement set 3 percent as the maximum percentage of HFC-23 byproduct allowable in the baseline data of a participating plant, a rough average of reported developing world values.¹³⁶ The average of all reported baseline data from the nineteen participating plants is 2.99 percent—very close to the maximum allowable value.¹³⁷ This suggests that even if the project participants were not actually aiming for the 3 percent sweet spot that would minimize their production costs (due to wasted feedstocks) but maximize their CDM subsidy (due to more CERs for a given production rate of HCFC-22), they were certainly not as concerned with minimizing this percentage as developed-world manufacturers who are not eligible for the CDM subsidy. Furthermore, the presence of the CDM and the prospect that crediting may ultimately be allowed for new plants removes any incentive to improve capital stock or process at existing

133. Jacob, *supra* note 125.

134. IPCC, *supra* note 83, at 394, 396.

135. Jacob, *supra* note 125.

136. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (Oct. 2, 2004), available at <http://cdm.unfccc.int/methodologies/inputam0001>.

137. It is important to note that at the time the CDM EB made its decision, it had data only from two HCFC-22 plants. Compare, UNFCCC, AM0001: Incineration of HFC 23 Waste Streams—Version 5.2, <http://cdm.unfccc.int/methodologies/DB/0MKGF12PM6TSNFNJZUESTSKG581HN6/view.html> (last visited May 2, 2008) (showing approval of Version 3 of AM0001 on May 13, 2005), with UNEP Risk Centre, *supra* note 82 (showing the public comment phase of the third HFC-23 project beginning on June 5, 2005).

plants, or to invest extra capital in state of the art facilities. Rather, it encourages construction of inefficient plants in order to create a high baseline and maximize potential for future CDM revenues.

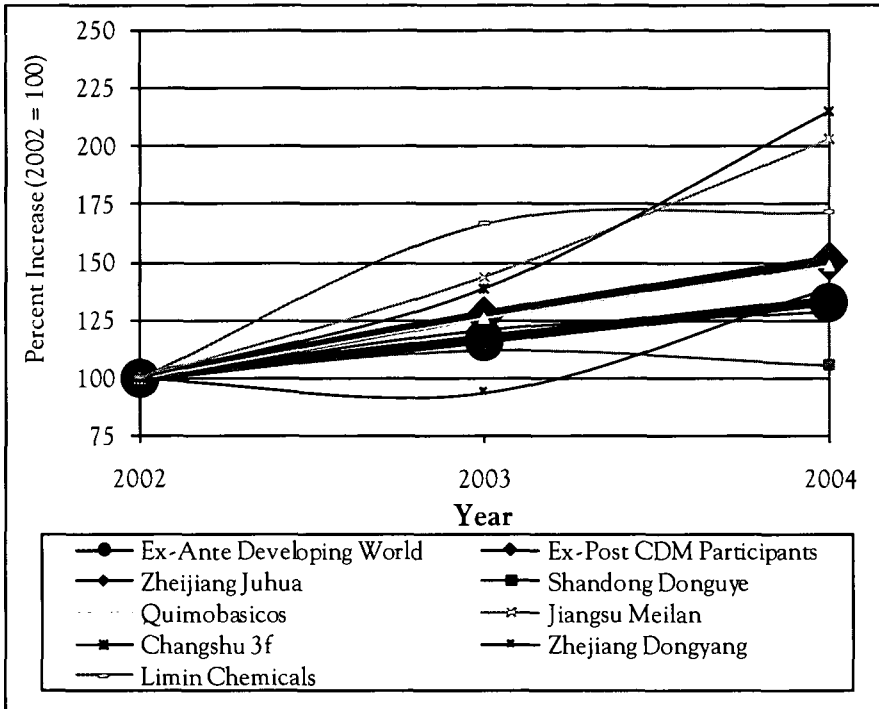
Second, at least some of the HCFC-22 plants participating in the CDM appear to have ramped up production during the baseline period (2000–2004) far beyond expected growth in the sector (15 percent per annum). Figure 4 shows baseline data supplied by plants participating in the program compared with the predicted growth rate for the industry over the 2002–2004 period.¹³⁸ Most plants exceeded the growth rates predicted for the developing-world industry as a whole. The increases in HCFC-22 production among the developing-world manufacturers led to a CDM participant production growth rate of 50 percent rather than 33 percent, as had been predicted *ex-ante* by market analysts.¹³⁹ Whether these plants increased production because of demand for HCFC-22 or in anticipation of higher CER revenue is impossible to say given existing publicly available information. Nevertheless, circumstantial evidence suggests that, rather than building new plants, HCFC-22 manufacturers elected to add capacity at existing plants during the CDM baseline period in order to take advantage of the CDM subsidy.¹⁴⁰

138. For predicted growth rates, see MCCULLOCH, *supra* note 95, at 4; production data for individual HCFC-22 plants on file with author.

139. *Id.*

140. Adding capacity at some existing plants would have been relatively simple because some developing-world plants are swing plants, able to shift configuration to produce a number of different halocarbon gases. With advance knowledge of the CDM and even a forecast price signal of \$3 to \$5, shifting to near constant HCFC-22 production and away from other halocarbons would have made sense during the baseline period. See TECH. & ECON. ASSESSMENT PANEL, U.N. ENV'T PROGRAM, RESPONSE TO DECISION XVIII/12: REPORT OF THE TASK FORCE OF HCFC ISSUES (WITH PARTICULAR FOCUS ON THE IMPACT OF THE CLEAN DEVELOPMENT MECHANISM) AND EMISSIONS REDUCTION BENEFITS ARISING FROM EARLIER PHASE-OUT AND OTHER PRACTICAL MEASURES 51–55 (2007), available at http://ozone.unep.org/teap/Reports/TEAP_Reports/TEAP-TaskForce-HCFC-aug2007.pdf.

FIGURE 4: PERCENTAGE INCREASES AT HCFC-22 PLANTS REPORTING MULTIPLE YEARS OF BASELINE DATA RELATIVE TO EX-ANTE ANALYST PREDICTIONS FOR THE INTERVAL¹⁴¹



In response to the windfall profits enjoyed by their domestic HCFC-22 producers as a result of the CDM, China has imposed a 65 percent tax on CER revenue generated by HFC-23 projects.¹⁴² Revenues from this fund, currently in excess of \$2 billion, are to be devoted to sustainable development, although none have yet been dispersed. In this way, as had been predicted by the critics of the CDM's baseline concept, Chinese environmental regulators, rather than create regulations that would eliminate a CDM project's eligibility, have acted to extract a substantial portion of the subsidy-derived rent. This tax reduces the CERs income to only 60 percent of that derived from the sale

141. The ex-ante developing world growth rate is 16.5 percent. The ex-post CDM participant growth rate is 25 percent. The thick lines show ex-ante (filled circles) and the average CDM participant (filled diamonds) rates of production growth.

142. Office of Nat'l Coordination Comm. on Climate Change, *supra* note 77, art. 24.

of HCFC-22. However, at prices greater than €15, even with a 65 percent tax, it will again make sense to produce gas solely for CER revenue.¹⁴³

The CDM provides perverse economic incentives to HCFC-22 producers that have led to a large fraction of the CER supply being produced by HFC-23 abatement. Even if some fraction of these reductions are voluntary, real, and additional, they still may not be the best use of Annex B resources for addressing non-Annex B GHG emissions. To abate all developing-world HFC-23 emissions would cost approximately \$31 million per year.¹⁴⁴ Instead, by means of a CDM subsidy, the Annex B nations will likely pay between €250 and €750 million to abate 2005 non-Annex B HFC-23 emissions.¹⁴⁵ This is a remarkably inefficient path to an environmental goal.

The case of HFC-23 capture projects, which currently account for nearly 22 percent of the CERs expected for delivery by 2012, illustrates both the success and some fairly significant problems with the CDM market. On one hand, the CDM was successful in identifying a class of emitters with very low marginal abatement costs and inducing near total sectoral abatement. On the other hand, it appears quite likely that the sector is also gaming the system by modifying its behavior in order to generate extra credits that can then be sold to developed countries with compliance obligations. Because of the inherent information asymmetries, the regulator has had a very difficult time, and indeed has not genuinely tried, dealing with these problems. It is not clear under the current system how it could. At the same time, because of the limitation on eligibility for old plants, the problems associated with HFC-23 for the CDM are to some extent limited. It is worth noting, however, that what saves the CDM from being awash in CDM credits does not help the environment. Recent press reports indicate incredibly high rates of growth in the HCFC-22 market, including the construction of new plants. Until these plants are included in the CDM or some other climate regime, they will emit their HFC-23 byproducts into the atmosphere.¹⁴⁶

143. A €15 CER price, taxed at 65 percent will net €1.60 after abatement costs and tax per kg HCFC-22 produced. The market price for HCFC-22 is approximately €1.60. See McFarland Interview, *supra* note 123.

144. MCCULLOCH, *supra* note 95, at 21.

145. 80 Mt CO₂e * €5 = €400,000,000; 80 Mt CO₂e * €20 = €1,600,000,000.

146. At recent climate negotiations, China has been arguing for and the EU against inclusion of new plants and additional capacity in the CDM. At this point, no agreement has been reached as to how to incorporate them into the CDM. Keith Bradsher, *Use of Air-Conditioning Is Widening the Hole in the Ozone Layer*, N.Y. TIMES, Feb. 23, 2007, at C1.

V. ANYWAY CREDITS IN CHINA'S POWER SECTOR

The most recent development in the CDM is the entry of important components of the Chinese electricity sector into the market. Early CDM power projects were mostly small power plants utilizing run-of-river hydro or biomass combustion technologies, mostly with nameplate capacity below 25 megawatts (MW). Recently, that picture has changed dramatically with the entry of significant numbers of large hydro¹⁴⁷ and natural-gas-fired power projects into the project pipeline. These projects present extremely challenging regulatory decisions to the CDM EB because it must decide which projects would or would not have gone forward without the carbon finance funds. Answering the question of whether projects are additional or would have happened anyway is always challenging, but is made particularly difficult by two factors: The energy sector in China is heavily regulated and primarily owned by the Government or state-owned entities, and participation rates by several elements of the sector is near 100 percent. On one hand, this outcome is to be applauded because modifications to the development path of the non-Annex B energy sector were a key goal for the CDM. However, this emerging result also raises important questions regarding the assumptions underlying the CDM as well as its potential for growth beyond 2012. The following section sheds light on these issues by telling the story of recent attempts by natural-gas-fired power plants to generate credits under the CDM.

A. Natural-Gas-Fired Power in China

Ultimately, if the problem of global climate change is to be effectively addressed, the methods by which electricity is generated both in the developed and the developing world will have to change. Currently, most electricity is generated via large coal-fired generating stations.¹⁴⁸ This is because large coal-fired generating stations are, at present, the lowest cost supplier of electricity, particularly in countries like the United States, China, and India,

147. For a discussion of the participation of large hydro in the CDM that reaches similar conclusions for that sector, see BARBARA NAYA, FAILED MECHANISM: HOW THE CDM IS SUBSIDIZING HYDRO DEVELOPERS AND HARMING THE KYOTO PROTOCOL 4-5 (2007), available at http://www.internationalrivers.org/files/Failed_Mechanism_3.pdf.

148. ENERGY INFO. ADMIN., *supra* note 78, at 62; Gerard Wynn, *U.N. Talks Will Not Decide on New HFC Incentives*, REUTERS, Dec. 8, 2007, available at <http://www.reuters.com/article/latestCrisis/idUSL08166304>.

where coal supplies are abundant.¹⁴⁹ Thus, developing both short-term and long-term alternatives to coal-fired generation capacity is critical to mitigating the impacts of climate change. In China, where new capacity is being added at an extremely high rate in order to meet surging demand for electricity, short-term alternatives are especially important.¹⁵⁰

One currently available alternative to the large coal-fired generating station that is superior from a GHG emissions perspective is large power plants that utilize combined cycle gas turbines (CCGT) technology. These plants are superior from a climate perspective because they produce substantially less CO₂ per MW hour (MWh) of electricity than typical coal-fired power plants.¹⁵¹ In addition, CCGTs emit substantially lower quantities of particulate matter, soot, sulfur oxides, and nitrogen oxides per unit of power produced than do coal-fired power plants, because the fuel they burn is cleaner and combustion is more complete.¹⁵² This cleaner emission makes them extremely appealing for new baseload generation to developing countries that have severe local air pollution concerns. It is for this reason that California in-state baseload generation, in contrast to the United States as a whole, is largely via CCGT.

Even with these environmental advantages, natural-gas-fired power has struggled to gain a foothold in developing countries because of the different underlying prices of coal and natural gas.¹⁵³ Capital costs and construction times are generally far higher for coal than for natural gas, while the reverse is true for fuel prices. Thus, while a coal plant requires significant upfront investment, it is relatively cheap to operate compared to a CCGT plant, which is cheap to build but costly to operate. Overall, the higher fuel costs

149. These three are also the countries with the greatest current and future impacts on climate, precisely for the reason that they are large and generate most of their electricity using coal-fired power plants. ENERGY INFO. ADMIN., *supra* note 78, at 62.

150. China built 114 GW of new fossil-fuel-fired generating capacity in 2006 and is on track to build 95 GW of new fossil-fuel-fired generating capacity in 2007. For comparison, the UK electricity grid has a capacity of 75 GW, and the California Independent System Operator administers 46.5 GW. Both of these grids were built out over decades. Keith Bradsher, *China's Green Energy Gap*, N.Y. TIMES, Oct. 24, 2007, at C1; Envtl. Energies Tech. Div., Lawrence Berkeley Nat'l Lab., *Current Energy: Supply of and Demand for Electricity for California*, <http://currentenergy.lbl.gov/ca/index.php> (last visited July 15, 2007).

151. On average, a subcritical coal-fired power plant produces CO₂ at a rate of 0.92 metric tons CO₂ per MWh while a CCGT has a carbon intensity of 0.35 metric tons CO₂ per MWh. Mike Jackson et al., *Greenhouse Gas Implications in Large Scale Infrastructure Investments in Developing Countries: Examples From China and India* (Stanford Program on Energy & Sustainable Dev., Working Paper No. 54, 2006), available at http://iis-db.stanford.edu/pubs/21061/China_and_India_Infrastructure_Deals.pdf.

152. ENERGY INFO. ADMIN., *supra* note 78, at 62.

153. *Id.*

of gas swamp the higher capital costs of coal. This outcome is especially true in China where coal's capital costs are relatively lower, and CCGT's relatively higher, than global averages.¹⁵⁴ These economics have made gas and the CCGT simultaneously attractive to foreign investors and unattractive to government-controlled power sectors like China's.

In China, these contrasting environmental and economic dynamics have played out via substantial state control of the power sector in ways that have encouraged construction of new CCGT power plants, and at the same time have created substantial uncertainties for their operation. On one hand, the state intervened to insure construction of the West-East Pipeline, opening up a major supply of new gas for the eastern provinces where demand is greatest.¹⁵⁵ Financial viability of this project was assured by take-or-pay contracts for natural gas between the pipeline and the proposed new CCGT's in the coastal provinces.¹⁵⁶ State-owned enterprises are also in the process of constructing multiple new liquefied natural-gas facilities to serve the coastal provinces.¹⁵⁷ In addition, as part of China's eleventh five-year plan, the National Development and Reform Commission, which sets tariffs on China's two electricity grids,¹⁵⁸ is charged with developing the gas industry in an effort to reduce pollution.¹⁵⁹ Although its high costs might make it seem unattractive, the environmental and energy security benefits of increased utilization of gas-fired power have meant that China plans to build twenty-three CCGT power plants between 2005 and 2009, with a combined nameplate capacity of more than 18 GW.¹⁶⁰

154. In China, because the critical components for coal-fired power plants are produced domestically while those for CCGT must be imported, capital cost for subcritical coal-fired power plants may actually be lower than for CCGT. *Id.*; INT'L GAS UNION, GAS TO POWER-CHINA 15 (2005) (on file with author).

155. People's Republic of China, China Factfile: Key National Projects, http://english.gov.cn/2006-02/08/content_182600.htm (last visited July 15, 2008).

156. This support was critical, because in the absence of a well-developed residential and commercial distribution network and demand for gas, a complete pipeline would have insufficient customers to whom it could sell its gas. INT'L GAS UNION, *supra* note 154, at 5, 9.

157. *See id.* at 5.

158. *Id.* at 16.

159. NAT'L DEV. & REFORM COMM'N, PEOPLE'S REPUBLIC OF CHINA, THE OUTLINE OF THE ELEVENTH FIVE-YEAR PLAN FOR NATIONAL ECONOMIC & SOCIAL DEVELOPMENT OF THE PEOPLE'S REPUBLIC OF CHINA, ch. 3: Optimizing and Upgrading Industrial Infrastructure, http://en.ndrc.gov.cn/hot/t20060529_71334.htm (last visited July 15, 2008).

160. For comparison, the entire California Independent System Operator manages 46.5 GW of nameplate capacity. Compare Envtl. Energies Tech Div., *supra* note 150, with INT'L GAS UNION, *supra* note 154, at 2.

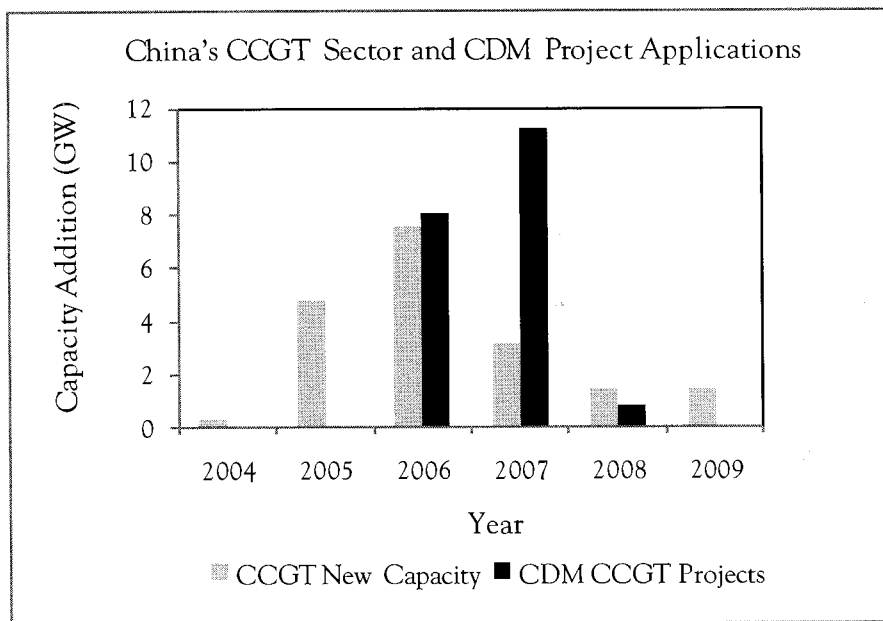
B. Natural-Gas-Fired Power as a CDM Project

Because the primary sources of power to the Chinese electrical grid are subcritical coal-fired power plants and most new builds are either subcritical or supercritical coal,¹⁶¹ construction of a CCGT instead of a coal-fired power plant arguably represents a reduction of GHG emissions. As described in the previous section, the economics in China do not favor the decision to build a CCGT rather than a subcritical coal power plant. Nevertheless, this choice would have clear climate benefits. If such a decision could be influenced by the potential supply of funds from the sale of carbon credits, equal to the difference in GHG emissions between the alternatives, crediting as a CDM project would be possible. Such thinking led to the submission and approval of just such a CDM methodology in mid-2006, called the Baseline Methodology for Grid Connected Electricity Plants Using Natural Gas (AM0029).¹⁶²

161. Subcritical coal-fired power plant boilers operate at temperatures and pressures below the critical point for water—the point at which water no longer turns into steam when heated but instead decreases in density. Supercritical plants operate above this point and as a result achieve significantly higher heat rates and efficiency than is possible for subcritical plants. See World Coal Inst., *Supercritical & Ultra-Supercritical*, <http://www.worldcoal.org/pages/content/index.asp?PageID=421> (last visited Mar. 31, 2008).

162. CDM Executive Bd., UNFCCC, *Approved Baseline Methodology AM0029: "Baseline Methodology for Grid Connected Electricity Generation Plants Using Natural Gas"* (Version 01.1, 2006), available at [http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_KTKZTS1HEG4\)BIETV74WMLZY10061X](http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_KTKZTS1HEG4)BIETV74WMLZY10061X).

FIGURE 5: CONSTRUCTION OF COMBINED CYCLE GAS TURBINE POWER PLANTS IN CHINA AND APPLICATIONS FOR CREDITING UNDER THE CDM BY NAMEPLATE CAPACITY (2004–2009)¹⁶³



By the end of 2007, twenty-four CCGT projects, representing essentially all power plants actually being built (as opposed to planned) in China between 2005 and 2010, had applied under the methodology to claim credit for the difference between their emissions and the baseline established by AM0029 (see Figure 1).¹⁶⁴ All plants built or under construction since 2005 are arguing that they would not have been built but for the CDM. This argument, when presented on a project-by-project basis, sounds plausible. It is only when the comparison between total project applications and the entire natural-gas-fired power sector is made, and the two are found to be roughly equivalent, that it becomes problematic.

163. The total CCGT builds equal 18.4 GW while applications for CDM crediting so far equal 17.6 GW.

164. Planned CCGT power plant builds during the 2004–2009 interval equal 18.37 GW. INT'L GAS UNION, *supra* note 154, at 3. CDM applications to the end of 2007 for crediting of plants entering operation between 2005 and 2008 equal 17.59 GW, UNEP Risø Centre, *supra* note 82.

Of the 24 Chinese CCGT CDM projects currently proposed, six have been registered¹⁶⁵ and a further three have requested registration but the CDM EB has required corrections after review.¹⁶⁶ Registration is automatic eight weeks after it is requested unless a project participant or at least three members of the CDM EB submit a Request for Review (RFR) of the project.¹⁶⁷ An RFR is then considered by the full CDM EB at its next meeting. Decisions on whether to grant review and on the scope of review are then made.¹⁶⁸ To date, all requests for review on Chinese CCGT CDM projects by CDM EB members list concerns about additionality as a reason for the RFR.¹⁶⁹ In other words, the CDM EB members requesting review are concerned that these projects would have been built even in the absence of the CDM, and that any emissions reductions claimed by them would not be in addition to what would have occurred in its absence.

165. Six Chinese CCGT CDM projects have been registered as of July 1, 2008. Five of the six were registered only after Requests for Review by the CDM EB and subsequent corrections. UNFCCC Project 1320: Beijing Taiyanggong CCGT Trigereneration Project [hereinafter UNFCCC Project 1320], <http://cdm.unfccc.int/Projects/DB/SGS-UKL1188570070.22> (last visited Jul. 1, 2008); UNFCCC Project 1343: Xiaoshan Power Plant's NG Power Generation Project of Zhejiang Southeast Electric Power Co., Ltd. [hereinafter UNFCCC Project 1343], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189665775.96> (last visited Jul. 1, 2008); UNFCCC Project 1344: Zhejiang Provincial Energy Group Zhenhai Natural Gas Power Generation Co., Ltd.'s NG Power Generation Project [hereinafter UNFCCC Project 1344], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189684459.76/view> (last visited Jul. 1, 2008); UNFCCC Project 1227: Yuyao Electricity Generation Project Using Natural Gas [hereinafter UNFCCC Project 1227], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1183455647.94> (last visited Jul. 1, 2008); UNFCCC Project 1304: Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant [hereinafter UNFCCC Project 1304], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1187936755.18> (last visited Jul. 1, 2008); UNFCCC Project 1373: Beijing No.3 Thermal Power Plant Gas-Steam Combined Cycle Project Using Natural Gas [hereinafter UNFCCC Project 1373], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1191500853.33> (last visited Jul. 1, 2008).

166. Three projects are currently being revised after the CDM EB required a review of their registration request and corrections. UNFCCC Project 1381: Shanghai Baoshan Grid Connected Natural Gas Combined Cycle Power Plant Project [hereinafter UNFCCC Project 1381], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1192083874.4> (last visited Jul. 1, 2008); UNFCCC Project 1243: Sulige Natural Gas Based Power Generation Project [hereinafter UNFCCC Project 1243], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1184339707.46> (last visited Jul. 1, 2008); UNFCCC Project 1368: Qinghai Ge-ermu Gas Turbine Power Plant Project [hereinafter UNFCCC Project 1368], <http://cdm.unfccc.int/Projects/DB/BVQI1191062063.0> (last visited Jul. 1, 2008).

167. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Montreal, Can., Nov. 28–Dec. 10, 2005, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on Its First Session, Held at Montreal From 28 November to 10 December 2005, Addendum: Part Two: Action Taken by the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol at Its First Session*, 15, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006), available at <http://unfccc.int/resource/docs/2005/cmp/eng/08a01.pdf>.

168. *Id.*

169. UNFCCC, Project 1343, *supra* note 165; UNFCCC, Project 1320, *supra* note 165; United Nations Framework Convention on Climate Change, *supra* note 167, at 14, 16–17.

In its review of these projects, it is not at all clear that the CDM EB will be able to address the fact that, taken together, current applications for crediting under the CDM of natural-gas-fired power in China imply that no CCGT builds would occur in the absence of carbon finance. Because review is on a project-by-project basis and is limited to determination that the project documents are in compliance with the AM0029 methodology, this is likely beyond the scope of review.¹⁷⁰ The AM0029 methodology determines a project's additionality by reference to a financial calculation comparing the costs of CCGT to alternative options, and by an analysis of whether the project is common practice.¹⁷¹ The investment analysis treats projects as if they were operating in a deregulated, competitive, power generation sector, rather than in a state-controlled or partially deregulated power sector. The common practice analysis, in the context of a coal-dominated energy sector such as China's, is easy to overcome. Neither takes into account the relevant national priorities for energy development that have been set by the China. Thus, the review of CCGT projects is likely to find them to be additional to what otherwise would have occurred, not because this is in fact the case, but rather because the review is constrained by the procedures of the CDM from asking the right questions about the projects.

The decisions made regarding these projects are likely to set an important precedent that could have far-reaching consequences for the CDM in light of another recently approved methodology. In the fall of 2007, the CDM EB approved, after significant controversy, a methodology for crediting supercritical and ultra-supercritical coal-fired power plants for emissions reductions relative to a grid primarily composed of subcritical coal-fired plants (ACM0013).¹⁷² This methodology is very similar to AM0029 with regard to its additionality test,¹⁷³ but will apply to a substantially larger number of power plants both in China and the rest of the developing world. In 2006 and 2007, China built more than 200 GW of new fossil-fuel-fired power plants. China has begun telling power companies that they should choose to

170. A request for review must relate to a project's failure to comply with a specific validation requirement. See United Nations Framework Convention on Climate Change, *supra* note 167, at 15, 54, 55. Validation requirements relevant to the additionality determination are defined in terms of compliance with an approved methodology, such as AM0029. *Id.* at 14, 16–17.

171. See CDM Executive Bd., *supra* note 162, at 3.

172. CDM Executive Bd., UNFCCC, *Approved Consolidated Baseline and Monitoring Methodology ACM0013: "Consolidated Baseline and Monitoring Methodology for New Grid Connected Fossil Fuel Fired Power Plants Using a Less GHG Intensive Technology"* (Version 01, 2007), available at http://cdm.unfccc.int/EB/034/eb34_repan02.pdf.

173. Compare CDM Executive Bd., *supra* note 162, at 3, with CDM Executive Bd., *supra* note 172, at 4.

build supercritical rather than subcritical plants because they use 10 percent less coal.¹⁷⁴ As China shifts from subcritical to supercritical and ultra-supercritical coal-fired generation technology, the potential for the generation of large numbers of CERs that do not correspond to any kind of behavioral change appears possible.

The AM0029 methodology and near 100 percent participation of CCGT power plants in China together have placed the CDM EB in an untenable position. On one hand, natural-gas-fired power is a climate friendly alternative to coal, whose development should be encouraged and fostered by the climate regime. Further, a program to encourage developing-country participation in the global climate change regime would strive to achieve 100 percent participation rates within developing country electricity sectors. On the other hand, it appears that the CDM, because it functions at a project rather than a sectoral level, is likely giving credit for activities that would have occurred without it. These “anyway” credits are especially important given that the CDM credit, “anyway” or not, can be sold to Annex B parties in order to reduce the extent to which they cut their own emissions.

VI. REFORM OF THE POST-2012 REGIME

The parties to both the Kyoto Protocol and the UNFCCC are now considering what to do to accomplish the goal of the UNFCCC after the first compliance period ends in 2012.¹⁷⁵ Global carbon trading is likely to play a role in any future architecture. At the same time, the U.S. Senate is considering proposals for an economy-wide cap-and-trade program for GHGs that would allow extensive utilization of international carbon credits.¹⁷⁶ Thus, consideration of how to improve the performance of the CDM is critical from both a domestic and an international perspective.

This description of the current and likely future state of the CDM is meant to point out that, before we assume that expansion of the current offset trading market is the appropriate route for engaging with developing countries, it is worth looking at the empirical evidence from the trading program as it exists now. That evidence, as detailed in the two examples above, suggests that the CDM is leading to widespread strategic behavior. In the case of the HFC-23 projects, the incentives created by the CDM are

174. Bradsher, *supra* note 150.

175. Bali Action Plan, *supra* note 8.

176. For example, the Lieberman-Warner Bill would allow 15 percent of a covered facility's compliance obligation to be met with international allowances or credits. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2501 (2007).

leading to undesirable behavior in the name of claiming credit. HFC-23 projects appear to be creating extra GHGs in order to claim credit for their capture and destruction even as they do capture and destroy some emissions that would have contributed to climate change. In the case of the CCGT projects, the incentives created by the CDM are likely leading to no change in behavior except for widespread claims for credits. Furthermore, procedures for project regulation likely limit the CDM EB from examining the issues most central to whether the projects are producing additional emissions reductions.

In addition, both cases present severe information challenges for the regulator. The rules of the game in the CDM systematically create incentives for project proponents to manipulate the transfer of information to the CDM EB while providing it with essentially no other information-gathering resources. In the case of HFC-23, the CDM creates strong incentives for project proponents to conceal the extent to which process efficiencies might lower their GHG production rate. In the case of the CCGTs, the system creates strong incentives for project proponents to misrepresent the motivations for their choice of power plant technology. Unlike in a natural market, buyers of CDM credits have no incentive to disclose information they have regarding projects. Their incentive, just like the generators of credits, is to facilitate the approval of projects and the issuance of credits. This informational problem is particularly acute because the CDM EB is called upon to make decisions requiring technical expertise across a wide array of both countries and industries.

The CDM set three goals: to produce sustainable development, to help developing countries accomplish the objective of the UNFCCC, and to reduce the costs of compliance for parties with quantitative targets.¹⁷⁷ The evidence presented above points to the possibility that the CDM is accomplishing these goals, but only to a limited extent. In one case, strategic but legal behavior is leading to the creation of extra GHGs in conjunction with emissions that would have occurred in order to generate a mix of additional and anyway credits. In another case, strategic disclosure of information and limitations on the scope of review will potentially lead to wholesale crediting of behavior that would have occurred anyway. Both indicate a need to consider reform, either by improving the CDM or by replacing it with an alternative mechanism for developing-country engagement.

177. Kyoto Protocol, *supra* note 1, art. 12.

A. Reforming the CDM

Limited reforms to the existing CDM structure might improve its ability to detect and deter strategic behavior by participants. Under the current regime, the third party verifiers charged with validating project applications face unavoidable conflicts of interest when it comes to substantive review of project proponents' claims. These DOEs are currently paid by the project proponents and face a competitive business environment.¹⁷⁸ One potential reform measure might be to include the costs of third-party verification in CDM project application fees. The CDM EB would then have adequate resources to contract directly with DOEs, who would have incentives to disclose as much as possible regarding CDM projects to avoid loss of business. Another reform possibility is to clarify that DOEs are responsible for checking not only that a project's additionality analysis is performed consistently with the applicable CDM procedures, but also that key facts and assumptions underlying it are accurate.¹⁷⁹ Standardized accounting procedures might also be specified in order to limit the extent to which creative accounting is used to argue that projects would not have gone forward without the sale of carbon credits.¹⁸⁰ Finally, under the current regime, project proponents must "take[] due account"¹⁸¹ of comments received by the public during the validation process. All of these incremental reforms would likely reduce the extent to which project proponents can game the system, increase the incentives that DOEs have for monitoring strategic behavior, and help to simplify the extremely difficult regulatory choices with which the CDM EB is often faced. These procedures might, to a great extent, help to deal with the HFC-23 case.

Nevertheless, they do not resolve the issue of how to separate additional from nonadditional projects in regulated and state-owned industries like the Chinese energy sector. Ultimately, this issue looms larger than any other because of the emissions associated with the explosive growth in the Chinese and Indian economies. Fully addressing it will likely require transforming the CDM into a system that can deal directly with the actors that matter most in these industries—the government policy makers that set energy development priorities.

178. LAMBERT SCHNEIDER, IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT 56 (2007), available at http://assets.panda.org/downloads/oeko_institut_2007_is_the_cdm_fulfilling_its_environmental_and_sustainable_developme.pdf.

179. *Id.* at 55.

180. *Id.* at 59.

181. United Nations Framework Convention on Climate Change, *supra* note 167.

B. Border Controls for CERs

If agreement on incremental reform proves impossible, but individual Annex B nations still want to improve the quality of the CDM market, they can do so, albeit at the cost of some market fragmentation. Nations are not required to purchase, or to allow private entities within their borders to purchase, CERs for compliance purposes. This is an option that Europe has chosen to adopt and it is one that Europe, or a future U.S. program could utilize to encourage the kind of CDM that all had hoped for, and to discourage the accounting gimmicks and oversubsidization that are present within the current market. The Linking Directive of the European Commission lays out the rules by which CERs may be imported into the EU Emissions Trading Scheme (ETS).¹⁸² It would be easy for the European Commission to modify this directive to enable additional review of CERs before their use is allowed in the EU. Currently, the Linking Directive already specifies special import criteria for CERs created by large hydro projects.¹⁸³ The United States, if it passes climate legislation including a cap-and-trade system with provision for use of international offsets, could also implement additional review of projects. Because the European ETS currently is the largest consumer of these credits, as the United States would be if it were to adopt such legislation, it has significant influence over the market. Were either country to enact CER standards tougher than mandated by the CDM EB, these standards would likely be adopted by all project proponents in order to allow sale of their credits into key markets. To some extent, this might lead to market fragmentation, with separate prices developing for EU- or U.S.-qualified CERs, but fragmentation is already a hallmark of carbon markets.¹⁸⁴

C. An Alternative to the CDM

Ultimately however, without radical reform of the incentive structure facing market proponents, the accounting tricks illustrated by the HFC-23 and CCGT examples are unlikely to be eliminated entirely. At the same time, simply eliminating the CDM without replacing it with an alternative method for engaging developing countries is unwise. It would leave many

182. Council Directive 2004/101 Amending Directive 1003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, in Respect of the Kyoto Protocol's Project Mechanisms, 2004 O.J. (L 338) 18 (EC).

183. CERs derived from hydro projects larger than 20 MW must insure that these dams meet the criteria specified by the World Commission on Dams. *Id.* at 21.

184. And fragmentation is not necessarily a bad thing. It can promote faster learning and evolution of effective trading structures. Victor et al., *supra* note 126, at 1820.

low-cost reduction opportunities on the table, increase costs for developed-nation emitters in the short term, and both delay and increase the cost of eventual acceptance of caps by developing countries.

There is an alternative. The international community has significant experience in compensating developing countries for the reduction of dangerous atmospheric emissions in another context. The Multilateral Fund of the Montreal Protocol has been very successful at accomplishing the phase out of the most harmful ozone depleting substances (ODSs).¹⁸⁵ This fund has operated on the principle that developed nations should pay any additional costs incurred by developing countries in transitioning away from ODSs to new, ozone-friendly chemicals.¹⁸⁶ Under a future climate change protocol, this model could be adopted for the purposes of engaging developing-country sectors that are state-controlled or particularly subject to gaming while still allowing for use of the CDM in some sectors. Alternatively, a climate fund could completely supplant the CDM as the major tool for engagement with developing countries.

A climate fund might have numerous advantages over the CDM. Agreed incremental costs or a reverse auction could generate a marginal cost-abatement curve for applicants to the fund. The climate fund could then invest in projects with the lowest marginal abatement cost until its resources were exhausted. Price setting via a reverse auction would encourage low-cost reduction opportunities to surface without having to pay them substantially more than the costs of abatement, as occurs in the current system. Inframarginal rents would thus be reduced.

Another advantage of this approach is that state-managed sectors, like electric power in China, may be more effectively addressed by direct discussions with governments about priorities and costs rather than through the distorting filter of State Owned Entities. Further, low-cost emissions reduction opportunities such as building standards and avoiding deforestation, which require state intervention and regulation, can be accessed.¹⁸⁷ Finally, transaction costs of emissions reductions would likely be reduced because project proponents would not have to prove that their project would not have gone forward without the sale of carbon credits.

A climate fund approach could also continue to fulfill the function of cost control for Annex B nations that have committed to caps on their GHG

185. RICHARD ELLIOT BENEDICK, *OZONE DIPLOMACY* 265–68 (1998).

186. *Id.* at 254–65.

187. Emissions reductions must be voluntary to qualify under the CDM. Voluntary has been interpreted by the CDM EB to mean not caused by domestic law or regulation. Kyoto Protocol, *supra* note 1, art. 12.

emissions. GHG abatement in the developing world with resulting emissions reductions could be credited to Annex B countries based on their contributions to the fund or an alternative agreed upon metric. In this way, cost control would be at the national level rather than at the firm level as in the EU ETS. A nation participating in the fund could simply reduce the scarcity of permits and hence their price in its cap-and-trade system rather than, as now, allowing covered entities to surrender CDM credits in lieu of domestic tradable permits.

Perhaps the biggest advantage of this type of fund would be that it reduces the incentives of firms and governments to misrepresent their business-as-usual emissions and costs to the regulator. Under the current system, the more a project proponent can inflate its baseline, the more money there is to be made. Under a climate fund in which nations agree on incremental costs or allow a reverse-auction to establish them, firms and regulators would have at least some incentive to report a more accurate estimate of their emissions and costs. In a context in which emission reduction projects are competing for a limited pool of emissions reduction funds and where the odds of receiving payment for an activity increase as the costs of marginal abatement fall, sellers of credits have an incentive to report the lowest costs for emissions reductions that they can reasonably deliver.

The incentives created by this type of system are admittedly imperfect—governments or firms might still attempt to inflate baselines in order to lower marginal costs of abatement. The advantage, though, is that the fund manager would have information from other bidders with similar projects on the costs of abatement. The odds of collusion among governments or individual emitters in order to systematically misrepresent abatement costs or baselines are lower than the odds of such misrepresentation by individuals within the current system.

A climate fund would address many of the defects of the current system. It would allow direct engagement with domestic regulators in developing countries and an honest discussion regarding policy baselines. It would potentially reduce the costs of emissions reductions through a utilization of a reverse auction price-setting mechanism rather than allowing prices to be set by the cost of emissions reductions in developed-country cap-and-trade markets. Finally, it would likely modify the incentives facing project proponents and so lead to a better information transfer to the fund manager than is currently in the CDM. Nonetheless, it would almost certainly have its own problems. No system as complicated as the global carbon market, or a global climate fund, is likely to operate flawlessly or avoid all unintended consequences.

CONCLUSION

Climate change is a long-term problem that requires long-term solutions. Active, broad engagement of both developed and developing countries is absolutely essential for success. The preceding analysis has illustrated that the global carbon market does not live up to its current hype. Too often, market participants behave strategically to generate credits for activities that do not merit them. At the same time, the analysis shows that the incentives produced by the global carbon market do indeed have the potential to induce significant participation on the part of developing nations in the global effort to combat climate change.

The challenge for the international community is to maintain this active participation while honestly facing up to the flaws in the CDM. If it can manage this, a more environmentally effective system is possible. Moving forward, and as developed-world investment in developing-country climate mitigation increases, more effective methods must be developed. Either the CDM needs significant reform, major buyers of CERs should adopt domestic controls that raise crediting standards, or an alternative mechanism such as a carbon fund should be devised to engage the developing world in fighting climate change.



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Co-benefits and additionality of the clean development mechanism: An empirical analysis

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ABSTRACT

The Clean Development Mechanism (CDM) allows industrialized countries to comply with the Kyoto Protocol by using carbon offsets from developing countries. There are two puzzles within this carbon market: additionality (the proposed activity would not have occurred in its absence) and co-benefits (the project has other environmental benefits besides climate mitigation). This paper proposes an econometric approach to evaluate the CDM effect on sulfur dioxide emission reductions and assess its additionality indirectly. Our empirical model is applied to China's emissions at the prefecture level. We found that the CDM does not have a statistically significant effect in lowering sulfur dioxide emissions. This result casts doubt on additionality of these CDM activities, that is, they would have happened anyway.

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1. Introduction

The Clean Development Mechanism (CDM) is a project-based carbon market which enables industrialized countries to reduce costs of compliance with the Kyoto Protocol by implementing climate mitigation projects in developing countries. The CDM has been successful in mobilizing the investment of public and private sectors from both developed and developing countries for reducing greenhouse gas (GHG) emissions. By the year 2009, there were more than 4200 projects in the pipeline that are expected to reduce GHG emissions by more than 2900 million metric tons of carbon dioxide equivalent (CO₂e) by the end of 2012. The CDM emission reduction is not trivial, in that it is around 40% of the U.S. emissions in 2007.¹

The CDM is nonetheless facing mounting criticism, in which the most serious challenge is its environmental integrity [1–3]. Since there are no emission caps for developing countries, the usefulness of the CDM hinges on whether the proposed project would have occurred in its absence. This assessment is known in the literature as additionality. Lack of rigorous criteria to establish additionality, however, may result in some projects receiving an excess of carbon credits. Even worse, some “business-as-usual” (BAU) activities might be wrongly registered as CDM projects. In this case, the credit buyers' increased emissions may not be fully offset by real emission reductions in the CDM activity. This may jeopardize on the effectiveness of the international emission trading system [4].

Another criticism is that the CDM insufficiently promotes sustainable development, although it is stipulated as one of its dual goals in the Kyoto Protocol [5,6]. The CDM is expected to improve environmental quality in host countries because

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¹ Source: The CDM project statistics are from <http://cdm.unfccc.int/index.html>. The U.S. emissions data are from “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007” available at <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

GHG emission reductions may also lower emissions of other pollutants such as sulfur dioxide (SO₂). The so-called co-benefit is one of the major reasons for developing countries to be involved in climate mitigation. However, while there is a price for CO₂, the local pollutants may not be monetized. Since the carbon market is only responsive to price signals, CDM developers have limited interest in generating other benefits besides carbon credits.

Additionality and co-benefits are two puzzles within this carbon market. Little is known empirically about whether the CDM has achieved these two goals. A major barrier for empirical studies is that the GHG emission data is not reported at the subnational level in developing countries. We address this problem by exploiting the connections between GHG and its co-pollutant emission reductions. To our knowledge this is the first paper that simultaneously evaluates additionality and co-benefits. Furthermore, the proposed econometric framework is not just applicable to the CDM. It has the potential to contribute to emerging policy debates about other baseline-and-credit programs such as voluntary carbon markets and energy efficiency credits.

As for the co-benefits of the CDM, we focus on sulfur dioxide (SO₂) emission reductions because of its broad environmental and health impacts.² Emissions of sulfur dioxide and GHGs are closely correlated with fossil-fuel use [8]. A separate analysis of either pollutant may not be able to provide a sufficient analytical framework [9]. More importantly, since GHG data are not widely available, SO₂ abatement may be useful for inferring GHG emission reductions. The rationale is that if fossil-fuel power generation is replaced by renewable energy, both CO₂ and SO₂ emissions will be reduced. If there is no observed change in SO₂ emissions, the efficacy of the CDM to reduce CO₂ would be called into question. Note that our additionality test is conditional on non-zero co-benefits. Therefore, we are not able to assess additionality for those projects that do not reduce sulfur emissions.

The econometric framework is an extension of the literature that investigates the determinants of SO₂ emissions [10–15]. Our model is adapted from, without relying on, the environmental Kuznets curve (EKC). Realizing that the classical polynomial EKC model may be too restrictive [16], we apply a fixed-effect semiparametric model that does not specify the functional form between emissions and income.

Our model augments a typical specification of SO₂ emissions through the inclusion of a policy variable reflecting CDM activities (measured by carbon credits). Identification of the causal effect of a CDM project is achieved through the inclusion of fixed effects, as well as the fact that CDM activities are determined well in advance of current SO₂ emissions because CDM approval is a lengthy process. Project developers have to wait at least one year between public comments and registration. The fixed effects capture resource endowment and industrial base, both of which are critical in the selection of CDM projects. Because resource endowment and industrial base change slowly, they can be regarded as fixed over the sample period. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

In this paper, we estimate the effect of the CDM in reducing SO₂ emissions at China's prefecture level. China is the world's largest GHG and SO₂ emitter. It is also the dominant player on the CDM market. The prefecture is the most disaggregated administrative unit that documents SO₂ emissions consistently, and this unit of analysis provides sufficient cross-sectional and temporal variation. Our econometric model shows no empirical support that the CDM has led to lower SO₂ emissions. This finding casts doubt on additionality—specifically, that these project activities would have happened without the CDM.

2. Background and data

We first briefly discuss some key issues in the Clean Development Mechanism, including the baseline and co-benefits. We then discuss the CDM activities in China. Finally, we present the data set used in our study.

2.1. Key issues in the CDM

The Clean Development Mechanism is the only “flexible mechanism” under the Kyoto Protocol that engages developing countries in climate mitigation.³ Because the marginal abatement costs in developing countries are lower than those of developed ones, the CDM helps the latter to reduce their costs of compliance with emission reduction commitments. Reciprocally, the host countries can benefit from financial assistance, technology transfer, and non-GHG emission reductions.

The CDM employs a baseline-and-credit program. It is distinguished from the cap-and-trade system by the fact that there are no explicit caps for carbon credit suppliers.⁴ Theoretically, these two systems are numerically equivalent if the baseline implies the same level of caps. Since the baseline describes a hypothetical emission scenario that would have occurred without the project, how to construct a baseline becomes the central problem of the CDM. Project developers

² It is worth noting that reducing SO₂ emissions may have an unintended consequence on global warming. Its product sulfate aerosol, a major component of atmospheric brown clouds (ABCs), has a climate cooling effect by reflecting visible solar radiation [7].

³ The other two are emission trading (ET) and joint implementation (JI) among annex I countries. The ET is an allowance-based carbon market while the CDM and the JI are project based.

⁴ According to the principle of “common but differentiated responsibility”, annex I countries (industrialized countries and economies in transition) are subject to quantified emission limitation and reduction commitment while developing countries have no emission caps.

have incentives to overstate BAU emissions to maximize credits. Even worse, some projects that would have occurred otherwise might enter the CDM pipeline and hence additionality requirements are violated.

In order to avoid awarding carbon credits to projects that would have happened anyway, the CDM Executive Board (EB) has set rules to determine additionality.⁵ This overarching additionality framework consists of four steps: (1) identification of alternatives to the project activity, (2) investment analysis to demonstrate the proposed activity is not the most economically or financially attractive, (3) barrier analysis, and (4) common practice analysis. Although official criteria have been designed for assessment purposes, their implementation is highly subjective and often lacks documented evidence to substantiate additionality [17]. Overall, the methodology does not achieve its intended objective of establishing a valid counterfactual.

The CDM is supposed to achieve dual goals: lowering abatement costs and promoting sustainable development. As for the first objective, the certified emission reductions (CERs), being equal to one metric ton of CO₂e, consistently sell at a discount to the European Union Allowances (EUAs).⁶ However, when it comes to the sustainability goal, some argue that its role is largely marginalized [5]. The carbon market cannot optimally allocate resources for non-monetized sustainability. The low-cost emission reduction projects are not necessarily aligned with the sustainability priority in the host countries. Examples include industrial gas projects such as hydrochlorofluorocarbons (HFCs) and nitrous oxide (N₂O). These projects can generate large volumes of CERs at low costs, but they have very little sustainability benefit other than climate change.

The controversial industrial gas projects are gradually being phased out due to the saturation of project opportunities and stringent regulations. Renewable energy and energy efficiency have become the mainstream project types. These projects have strong co-benefits beyond climate mitigation. Fig. 1 shows a breakdown of CDM projects by types. For example, renewable power replacing fossil-fuel power plants will reduce not only GHGs, but also other air pollutants such as sulfur dioxide, nitrogen oxide, and particulates. As long as the CDM activities of these types are additional, we should be able to observe associated co-benefits.

2.2. The CDM in China

China is the biggest supplier on the primary CDM market. It accounts for 35% of registered projects and 59% of expected annual reductions as of 2009. The concentration of the market is mainly due to abundant opportunities for emission reductions. China has risen to become the world's largest GHG emitter since 2007 and the momentum will likely be maintained in the future.⁷ According to Auffhammer and Carson [18], the projected increase in China's emissions out to 2010 is several times larger than the amount reduced in Kyoto Protocol. In addition to total emissions and the size of industrial base, factors that attract foreign direct investment (FDI) also increase the flow of international carbon credit investment. In this regard, economies of scale and the business environment all contribute to China's market share [19].

China's preference for the CDM is aligned with its national strategy in energy and climate change [20]. According to China's National Climate Change Program, energy efficiency and renewable energy supplies are top priorities in climate mitigation [21]. Specifically, industrial and residential energy efficiency, hydro power, coal-bed/mine methane, bio-energy, wind, solar, and geothermal energy are all actively supported. These project types account for the majority of the CDM activities.

Environmental pollution is another incentive for China to be engaged in the CDM. Coal is the dominant fuel source in China's primary energy consumption. According to China's Statistical Yearbooks, its share has varied between 66% and 76% over the last two decades. Emissions of SO₂, NO_x, and particulates from coal consumption have created severe environmental and health problems. It is estimated that SO₂ caused over 213 billion Chinese Yuan (CNY) in health damage in 2003 [22].⁸ Another study finds that acid rain, which is mainly caused by SO₂ emissions from fossil fuel use, causes 30 billion CNY in crop damage and 7 billion CNY in building damage [23]. The expectation that the CDM helps reduce local and regional air pollutants besides GHGs makes participation even more attractive for China.

2.3. The data

In this paper, the unit of analysis is a prefecture. A prefecture, literally translated as a region-level city, is an administrative unit ranking immediately below a province and above a county. It typically includes both urban and rural areas. A prefecture is the most disaggregated level that consistently documents economic and environmental data and information. The economic data are from China's City Statistical Yearbooks (2000–2008). China has 333 prefectures, of which 287 are covered by the Yearbooks. The prefectures that are not included are those with low economic significance. On average a prefecture had a population of 4.27 million, an area of 16,448 square kilometers, and a GDP of 112.5 billion Chinese Yuan (CNY) in 2008. Table 1 reports summary statistics for the variables used in our analysis.

⁵ Source: "Tool for the demonstration and assessment of additionality" by the CDM-EB, available at http://terrass.pbworks.com/f/Additionality_tool.pdf.

⁶ The prices of CERs and EUAs are available at the European Climate Exchange <http://www.ecx.eu/>. The discount on the primary CDM market is greater than the secondary market. The primary market discount reflects the risks of CER issuance. The secondary market discounts may reflect that CERs are not completely fungible to EUAs.

⁷ Source: "CO₂ Emissions from Fuel Combustion 2009 Highlights" by the International Energy Agency. Available at http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2143.

⁸ 1 U.S. Dollar ≈ 6.8 Chinese Yuan in 2009.

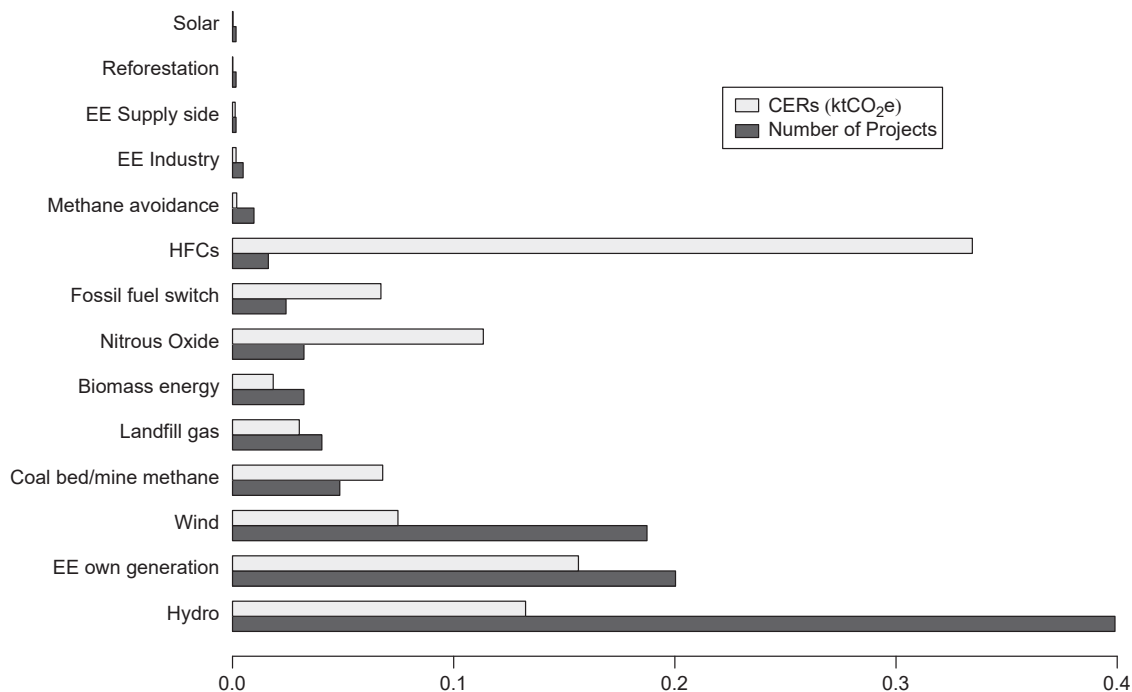


Fig. 1. Shares of CDM projects by types.

Table 1
Summary statistics.

Variable	Definitions	N	Mean	Std dev	Min	Max
SO2P	SO ₂ emitted by power plants (10 ⁵ ton)	831	0.42	0.63	0.00	4.63
SO2T	SO ₂ generated by all industries (10 ⁵ ton)	1711	1.12	1.46	0.00	13.09
SO2E	SO ₂ emitted by all industries (10 ⁵ ton)	1711	0.66	0.72	0.00	7.91
GDPPC	GDP per capita (10 ⁵ CNY)	2239	0.17	0.22	0.02	3.42
POPDEN	Population density (10 ⁻¹ /km ²)	2243	0.42	0.40	0.00	11.56
EE	Industrial output/electricity use (100 CNY/kWh)	2223	0.20	0.48	0.01	21.09
KL	Fixed asset investment/number of employees (10 ⁵ CNY)	2243	0.74	0.62	0.00	7.19
ESPC	Expenditure on education and R&D per capita (10 ³ CNY)	2239	0.24	0.29	0.00	4.96
FDIR	FDI as a ratio of fixed asset investment (10 ⁻²)	2161	0.90	1.53	0.00	32.74
CCO2	Prefecture-level CERs (10 ⁶ ton)	2296	0.55	2.49	0.00	41.64
PCO2	Province-level CERs (10 ⁶ ton)	2296	0.63	1.39	0.00	8.07
GCO2	Grid-level CERs (10 ⁶ ton)	2296	0.23	0.49	0.00	2.83
HYDRO	Hydropower CERs (10 ⁵ ton)	2296	0.09	0.62	0.00	9.07
WIND	Wind energy CERs (10 ⁵ ton)	2296	0.08	0.67	0.00	16.66
ENERGY	Energy efficiency CERs (10 ⁵ ton)	2296	0.20	1.66	0.00	34.95
OTHER	Other CERs (10 ⁵ ton)	2296	0.11	1.19	0.00	41.24

Notes: All monetary values are real values.

We have two sources of data for SO₂ emissions. First, information on SO₂ emissions from power plants is provided by the Institute of Air Pollution Control at the Tsinghua University. The emission data are generated from their internal database of national power plant inventory; this detailed data set has not been used in the economics literature studying SO₂ emissions in China. Although the data are only available in 2000, 2005, and 2007, it covers a period before and after CDM activities, which enables us to identify the CDM effect in a difference-in-difference framework.

Second, the Yearbooks have documented SO₂ emissions from all industries during 2003–2008. Although SO₂ emissions before 2003 were also reported, their measurement was inconsistent with those after 2003 so they are not used. The power and heating industry accounts for about 60% of total emissions. Two industrial SO₂ variables are used in the analysis: the amount of SO₂ generated and the amount of SO₂ released into the atmosphere. The two variables are related by the following equation:

$$\text{SO}_2 \text{ emitted} = \text{SO}_2 \text{ generated} - \text{SO}_2 \text{ removed.}$$

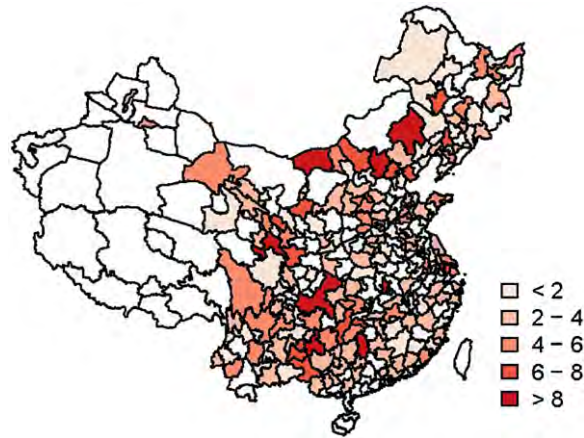


Fig. 2. CDM activities in China by the number of projects.

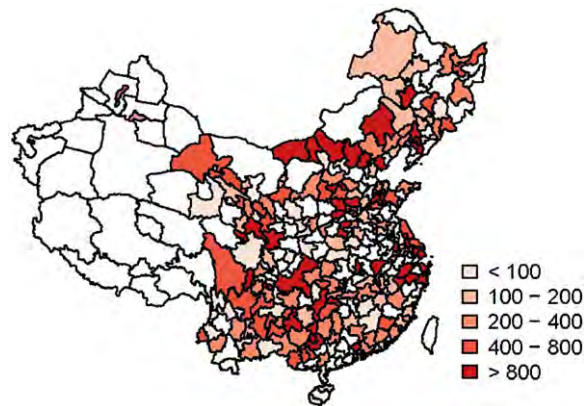


Fig. 3. CDM activities in China by CERs (10^3 ton).

We analyze industrial emissions because the CDM also affects non-power SO_2 emissions, which is the so-called “leakage effect.” Although a CDM project can reduce emissions within the boundary (power sector), it may cause additional emissions elsewhere. For example, the construction and operation of CDM projects may boost local economic activities and increase emissions out of the boundary.

The CDM data are from the United Nations Framework Conference on Climate Change (UNFCCC), which maintains a database that includes project design documents (PDDs) for every registered project. Only the projects in China that were registered before 2008 are used because of the constraint posed by the economic and emission data. The United Nations Environmental Program (UNEP) Risoe Center provides a compiled list of all CDM projects.⁹ The first CDM project in China was a wind farm in the Liaoning Province which started in 2003. The credit start date is used to match the economic data because this is the time when the project starts emission reductions. As of 2008, 191 prefectures in all provinces except Tibet had CDM activities. The locational distributions of the CDM projects are depicted in Figs. 2 and 3.

3. Empirical strategy

The emission reduction of a CDM project is measured by the difference between the baseline emissions and the project’s real emissions. A baseline is a scenario that represents GHG emissions in the absence of the CDM. Let t index time and k index pollutant. Let y denote the project emission, y^* denote the baseline emission, and r denote the emission reduction. A project’s emission reduction is

$$r_{kt} = y_{kt}^* - y_{kt}. \quad (1)$$

Note that the emission reduction is positive only if its emission level is below the baseline. While it is straightforward to monitor a project’s real emissions, it is tricky to determine what the emissions would otherwise be. Different baselines

⁹ Source: <http://www.cdmpipeline.org/>.

may imply significantly different amounts of emission reductions. In this section, we present two approaches that can be used to construct emission baselines.

3.1. Engineering model

Most CDM activities replace fossil-fuel power generations by delivering electricity generated from renewable energy sources. Hence the emissions reduction attributed to a CDM project is the avoided emissions of the displaced power plants/units. Instead of identifying the exact source of displaced generations, a grid-level emission baseline can be used to quantify the emission reduction

$$r_{kt} = e_t f_{kt}^{\text{grid}} - l_{kt}. \quad (2)$$

In this form, e is the net electricity supply by the CDM project (MWh), f_{kt}^{grid} is a grid-level emission factor (ton/MWh), and l is the leakage. The leakage is the increased emissions attributable to CDM activities that occur outside the project boundary. For renewable energy projects, there are no emissions and leakage is often treated as zero.

One method to calculate the emission factor is the operating margin (OM). The OM assumes that it is the electricity from marginal power plants that is displaced. A marginal plant is defined as the power plant on the top of the grid system dispatch order without CDM activities. It is apparent that the OM measures the short-run effect of CDM activities. The CDM Executive Board suggests the operating margin emission factor can be calculated by generation-weighted emissions from all grid-tied power plants excluding low-cost and base-load plants/units.¹⁰

Another method is to use the build margin (BM) emission factor. It assumes that CDM activities delay or cancel the construction of new power plants/units. The BM can be calculated in the same ways as the OM, except that a different sample of power plants is used. In general, the newly built plants are equipped with better technology and thus emit fewer pollutants than existing plants. This implies that the build margin is normally smaller than the operating margin.

In this section, we outline an engineering model that can be used to compute emission factors. This model is based on the simple OM method since it is widely used in CDM project designs. The grid-level emission factor is calculated by

$$f_{kt}^{\text{grid}} = \frac{\sum_{\text{plant}} e_t^{\text{plant}} f_{kt}^{\text{plant}}}{\sum_{\text{plant}} e_t^{\text{plant}}}, \quad (3)$$

where f_{kt}^{plant} is a plant-level emission factor. It is worth noting that not all power plants/units in the grid are included in the calculation. The project developers, following guidelines in host countries, propose how to select the sample. The proposed baseline needs to be validated by independent audits.

If multiple fuels are involved, the plant-level emission factor is then

$$f_{kt}^{\text{plant}} = \frac{\sum_{\text{fuel}} c_t^{\text{fuel}} \nu_t^{\text{fuel}} f_{kt}^{\text{fuel}} (1 - \lambda_{kt})}{e_t^{\text{plant}}}. \quad (4)$$

In this form, c is the amount of fuel consumed (mass or volume unit), ν is the energy content (GJ/mass or volume unit), and λ is the fraction of pollutants removed. Carbon capture and storage (CCS) can remove CO₂ but it is not yet commercialized, so that $\lambda_{\text{CO}_2} = 0$. As for SO₂ emissions, all new and existing coal-fired power plants in China are required to install flue gas desulfurization (FGD) equipment. The average removal rate in 2008 is around 78.7%.¹¹

In calculating emission factors, either the *ex ante* or *ex post* approach is allowed. All CDM projects in China employ *ex ante* information to establish the baseline because it reduces the risks of carbon credit generation. The most recent available information of already built power plants/units is included in the sample group (three years before the submission of PDDs). In addition, the emission factor is generally fixed or adjusted according to a predetermined rate during the project crediting period.

According to Eqs. (2)–(4), it is apparent that there is a connection between CO₂ and SO₂ emission reductions. To simplify this illustration, suppose that a renewable energy project with zero leakage delivers electricity to a grid. The grid's baseline emissions can be characterized by average emission factors f_{SO_2} and f_{CO_2} , as well as average the SO₂ removal rate λ_{SO_2} . The ratio of emission reductions for these two pollutants is then

$$\frac{r_{\text{SO}_2}}{r_{\text{CO}_2}} = \frac{f_{\text{SO}_2} (1 - \lambda_{\text{SO}_2})}{f_{\text{CO}_2}}. \quad (5)$$

In this form, if all parameters are known, we can use CO₂ emission reductions to estimate the abatement of SO₂ emissions.

Note that Eq. (5) is greatly simplified. When the engineering approach is used to estimate SO₂ emission reductions, the emission factors take into account multiple plants and multiple fuels. The emission factors of China's power industry are adapted from Cao and Wang [24] and are reported in Table 2. In this table, the combined margin (CM) is just a simple average of the operating margin and the build margin.

¹⁰ Source: "Tool to calculate the emission factor for an electricity system (October 2009)". Available at <http://cdm.unfccc.int/methodologies/PAmethodologiesapproved.html>.

¹¹ Source: "Emission Reductions of Power Plants in 2008" by the State Electricity Regulatory Commission. Available at www.serc.gov.cn/ywdd/200911/W020091102328545684394.doc.

Table 2
Emission factors for China's power industry.

Grid	CO ₂			SO ₂		
	OM	BM	CM	OM	BM	CM
North	1.007	0.780	0.894	0.009	0.002	0.006
Northeast	1.129	0.724	0.927	0.007	0.002	0.004
East	0.882	0.683	0.783	0.007	0.002	0.005
Central	1.126	0.580	0.853	0.013	0.002	0.008
Northwest	1.025	0.643	0.834	0.010	0.002	0.006
South	0.999	0.577	0.788	0.009	0.002	0.005
Hainan	0.815	0.730	0.773	0.007	0.002	0.005

Notes: Unit: ton/MWh. The CO₂ emission factors are from "Emission Factors of China's Regional Electricity Grid 2009" published by China's National Development and Reform Commission. Available at http://qhs.ndrc.gov.cn/qjtzjz/t20090703_289357.htm. The SO₂ emission factors are from Cao and Wang [24].

3.2. Econometric identification

The engineering approach can be used to quantify co-benefits if CO₂ emission reductions are real (or additional). However, if we only observe carbon credits instead of real emission reductions, this approach is correct only if the carbon credits are issued based on an appropriate baseline. An exaggerated baseline results in overallocated carbon credits and exaggerated co-benefits. To estimate co-benefits without assuming that carbon credits reflect real emission reductions, we propose an econometric approach in this section.

An alternative treatment of Eq. (5) is to regard the emission ratio as a parameter. If CO₂ and SO₂ emission reductions are known, this parameter can be estimated by regression analysis. Let $\sigma \equiv f_{SO_2}(1 - \lambda_{SO_2})/f_{CO_2}$, then Eq. (5) is rewritten as

$$r_{SO_2} = \sigma r_{CO_2}. \tag{6}$$

However, this model is not estimable because emission reductions in CO₂ and SO₂ are not directly observable.

Suppose that a CDM project receives a credit of c_{CO_2} , while the real emission reduction is $r_{CO_2} = \rho c_{CO_2}$, where ρ is an unknown parameter. If the project is awarded more than what it actually reduces, then $\rho < 1$. If $\rho = 1$, then the carbon credit issuance is fair. If $\rho > 1$, it means that the emission baseline is too conservative. According to Eq. (6), the reduction in SO₂ emissions is $\sigma \rho c_{CO_2}$. The relationship between SO₂ emission reductions and carbon credits is

$$r_{SO_2} = \sigma \rho c_{CO_2}. \tag{7}$$

In this form, the empirical challenge is that the SO₂ emission reductions attributed to the CDM activities are not directly observable. According to Eq. (1), SO₂ emission reductions are estimated by the difference between baseline and real emissions. Combining Eqs. (1) and (7) and denoting $\gamma \equiv -\sigma \rho$, we obtain

$$y_{SO_2} = y_{SO_2}^* + \gamma c_{CO_2}. \tag{8}$$

Eq. (8) can be used to evaluate the effectiveness of the CDM on SO₂ emission reductions. It also provides an indirect test for additionality. Based on the engineering model, σ can be estimated and used as the prior information. If $-\gamma < \sigma$ or equivalently $\rho < 1$, it suggests that there is an over-issuance of the carbon credits. Even worse, if $\gamma = 0$, it implies that the CDM activities may not be additional at all. Note that our argument is based on the assertion that $\sigma \neq 0$. Since we have excluded all industrial gas projects that have zero co-benefits, the assumption is true for all other projects. The argument is supported by the environmental engineering studies, for example Aunan et al. [8].

Let i index prefecture ($i = 1 \dots n$) and t index year ($t = 1 \dots T$). The baseline emission $y_{SO_2}^*$ is modeled as

$$E(y_{it}^* | w_{it}, x_{it}, u_i, v_t) = m(w_{it}) + x'_{it} \beta + u_i + v_t.$$

The pollutant subscripts are ignored to reduce notational clutter. According to Eq. (8), the CDM effect is additive and proportional to the project scale, which implies that

$$E(y_{it} | w_{it}, x_{it}, c_{it}, u_i, v_t) = m(w_{it}) + x'_{it} \beta + \gamma c_{it} + u_i + v_t. \tag{9}$$

In this form, w_{it} is income measured by real GDP per capita (GDPPC), $m(\cdot)$ is a flexible function that we define below, and x_{it} includes prefecture- and time-variant control variables other than income. The prefecture fixed effects u_i controls for time invariant unobservables such as resource endowment, industrial base, and institutional capacity. The time effect v_t controls for unobserved trends such as national emission regulations and technological progress as well as year-specific shocks to emissions.

The causality of the regression follows that if the CDM decreases fossil fuel consumption, SO₂ emissions will also be reduced since sulfur emissions result from energy use. A CDM project is determined before the current SO₂ emissions because its approval is a lengthy process. Project developers have to wait at least one year from public comments to registration. In addition, the selection of the CDM projects hinges on resource endowment and industrial base. Hydro, wind, solar, coal-bed methane, and biomass projects depend on the abundance of their respective natural resources. The

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

remaining energy efficiency projects depend on the industrial base and the energy intensity of the economy. Because resource endowment and the industrial base change slowly, they can be regarded as the fixed effects. Energy intensity can also be controlled for. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

The included explanatory variables are widely used in the empirical studies that investigate the determinants of SO₂ emissions (see [13] for a review). The causal relationship of income and pollution is a concern [15]. The argument that income causes emissions is fully discussed in Antweiler et al. [11]; changes in real income have contemporaneous effect on pollution, but environmental policies that determine pollution level respond to income levels slowly. To further address this issue, we use lagged income to replace current income in the robustness checks as is suggested by the growth literature.

In the set of control variables x_{it} , population density (POPDEN) is a measure of land area per capita. This demographic is a determinant of pollution but it responds to pollution slowly because migration takes time to realize. In addition, residential migration is constrained by the family register system (*hukou*) in China. Energy efficiency (EE) is a measure of real industrial output per kilowatt of electricity use. Pollution is a consequence of energy use and so it hinges on the energy intensity. The capital-to-labor ratio (KL) is defined as a ratio of fixed asset investment to number of employees. The inclusion of KL controls for the factor endowment effect. Both EE and KL enter the model with a quadratic term to account for nonlinearity. Expenditure on education and R&D per capita (ESPC) controls for the knowledge and technology effect. The empirical decomposition of pollution into scale, composition, and technique effects is attributed to Antweiler et al. [11].

We also include FDIR, which a ratio of foreign direct investment (FDI) as a share of fixed asset investment. The endogeneity of this trade variable might be a concern. According to Frankel and Rose [14], geographical variables can be used as instruments for endogenous trade based on trade theory. However, this approach is not applicable to panel data, because these instruments are time invariant. In any case this particular instrumental variable approach is not superior to a panel method that uses individual fixed effects to control for geographical attributes. In addition to the prefecture effects, we use subnational time dummies to control for time-variant unobservables that may be correlated with both FDI and emissions.¹²

3.3. Specification and estimation

The classical environmental Kuznets curve (EKC) model posits an inverted-U relationship between income and pollution [10]. It claims that emissions increase with income at an early development period and then decrease after passing some income thresholds. Although the EKC model has many limitations [12,13,15], it provides a basic structure to predict pollution at the aggregate level. Although our approach does not rely on the EKC framework, it motivates us to specify a nonlinear income–emission relationship.

A prefecture is the unit of analysis in this paper, but the CDM activity does not necessarily replace carbon-intensive generators in the same prefecture. It may replace generators in the same province or even in the same grid. It is therefore important to incorporate the spillover effect in a spatially explicit model. Following the approach proposed by Duflo and Pande [25], we incorporate the effects of the CDM activities in adjacent areas.

With the above two assumptions, our parametric regression is specified as

$$y_{it} = \alpha_1 w_{it} + \alpha_2 w_{it}^2 + \alpha_3 w_{it}^3 + \alpha_4' \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}. \quad (10)$$

In this form, c_{it}^c designates prefecture-level carbon credits generated from the CDM activities. c_{it}^p designates carbon credits in the same province excluding c_{it}^c . c_{it}^g designates carbon credits in the same grid excluding c_{it}^p , and α , β , and γ are parameters to be estimated. ε_{it} is an error term which captures deviations between actual and estimated baselines emissions. Under the assumption of strict exogeneity, its mean is zero conditional on the observables and the fixed effects.¹³

Although a cubic term is included to accommodate more curvatures in Eq. (10), the polynomial specification is still very restrictive. Millimet et al. [16] suggest that a semiparametric model is more appropriate because the parametric model is rejected by their specification test. We generalize their model to accommodate CDM activities and other variables. Specifically, we propose a semiparametric partially linear model, in which the conditional mean of SO₂ emissions has an unknown relationship in income and is linear in other variables. The semiparametric model is then

$$y_{it} = m(w_{it}) + \alpha_4' \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}, \quad (11)$$

where $m(w_{it})$ is a smooth function that is unknown to the researcher. For simplification, the above model can be written as

$$y_{it} = m(w_{it}) + z_{it}' \pi + u_i + \varepsilon_{it}, \quad (12)$$

where z_{it} includes all time-variant explanatory variables other than income w_{it} . The time effects are lumped into z_{it} as dummy variables. To estimate the above model, we can use the first difference or de-meaning to cancel out fixed effects.

¹² To further address the concern of endogenous FID, we have estimated all models without FDI. These additional robustness checks do not change our results.

¹³ Our identification strategy rests on the timing of the CDM application process in light of the strict exogeneity requirement. If CDM is related to past unobserved determinants of baseline emissions, the results will be biased.

A first difference of Eq. (12) leads to

$$\Delta y_{it} = \Delta m(w_{it}) + \Delta z'_{it} \pi + \Delta \varepsilon_{it}. \tag{13}$$

The profile-kernel method proposed by Henderson et al. [26] is employed to estimate the differenced partially linear panel data model. This approach shows that a consistent estimator of π is given by

$$\hat{\pi} = \left(\sum_{i=1}^n \Delta \ddot{z}_i \Omega^{-1} \Delta \ddot{z}_i \right)^{-1} \left(\sum_{i=1}^n \Delta \ddot{z}_i' \Omega^{-1} \Delta \ddot{y}_i \right). \tag{14}$$

In this form, $\Omega = \text{cov}(\Delta \varepsilon_{it}, \Delta \ddot{z}_{it} = \Delta z_{it} - (\hat{m}_z(w_{it}) - \hat{m}_z(w_{it-1})))$ and $\Delta \ddot{y}_{it} = \Delta y_{it} - (\hat{m}_y(w_{it}) - \hat{m}_y(w_{it-1}))$. $m_z(w)$ (or $m_y(w)$) represents estimates from a nonparametric regression of z (or y) on w alone. This estimator in (14) is \sqrt{n} -consistent, and the asymptotic variance can be estimated by

$$\text{Avar}(\hat{\pi}) = \frac{1}{n} \sum_{i=1}^n \Delta \ddot{z}_i \hat{\Omega}^{-1} \Delta \ddot{z}_i.$$

A consistent estimator of the variance-covariance matrix Ω is

$$\hat{\Omega} = \hat{\sigma}_v^2 (I_{T-1} - e_{T-1} e'_{T-1}).$$

In this form, I is an identity matrix, e is a vector of ones, and σ_v^2 is estimated by

$$\hat{\sigma}_v^2 = \frac{1}{2n(T-1)} \sum_{i=1}^n \sum_{t=2}^T (\Delta \ddot{y}_i - \Delta \ddot{z}_i' \hat{\pi})^2.$$

With a consistent estimate of π , let $\hat{y}_{it} = y_{it} - z_{it}' \hat{\pi}$. With this model (12) can be converted to a nonparametric fixed effect regression

$$\hat{y}_{it} = m(w_{it}) + u_i + \varepsilon_{it}. \tag{15}$$

Multiple methods are available to estimate this model including the series method and the profile-kernel method [27,28]. We utilize the nonparametric iterative kernel estimator proposed by Henderson et al. [26] because it accounts for the variance structure and semiparametric efficiency. The estimation is implemented in Matlab. The code is available upon request.

4. Results and discussion

4.1. Engineering results

First, we estimate the effect of CDM activities in reducing SO₂ emissions by means of the engineering approach. The grid-specific combined margin emission factors are used, which is a simple average of the operating margin and the build margin. The combined margin is shown in Table 2. We report the resulting grid-level emission reductions from the CDM activities in Table 3. The emission data are for 2005, which is the most recent available information. The CO₂ data are also included for comparison. The figures show that the CDM activities are expected to reduce 35.8 million tons of CO₂ annually, which is about 1.6% of total emissions from all grids in 2005. In terms of SO₂ emissions, they are expected to reduce 0.27 million tons annually, or 1.4% of 2005 emissions from all grids. According to the national data, σ is estimated to be 0.0076 ton-SO₂/ton-CO₂, which implies that one ton of CO₂ emission reduction will lower SO₂ emissions by 0.0076 ton at the grid level.

Table 3
Annual emission reductions by hydro and wind CDM activities.

Grid	CO ₂		SO ₂	
	Emissions	Reductions	Emission	Reductions
North	651.753	6.820	5.812	0.039
Northeast	207.338	3.100	1.089	0.012
East	499.415	2.002	4.037	0.011
Central	360.321	7.655	3.938	0.087
Northwest	147.440	7.131	1.365	0.067
South	310.883	9.077	2.543	0.055
Hainan	5.999	0.021	0.048	0.000
All	2183.877	35.805	18.848	0.272

Notes: Unit: million tons/year. The emissions data are for 2005. The reductions data are based on CDM projects registered before 2008. Only small hydro and wind power projects are included.

It is worth noting the engineering estimate does not have an associated standard error. The parameters that we are using, mostly from the literature and official documents, only report the mean values instead of confidence intervals. Another important point is that only small hydro power and wind power projects are included in the analysis, because they have zero emissions. These two project types account for 59% of total registered projects as of 2008. CDM activities other than industrial gas projects can also reduce SO₂ emissions. However, their own emissions need to be taken into account. If other project types are included, the estimated coefficient would be smaller than the current estimate.

The engineering approach assumes that the BAU emissions can be extrapolated from the *ex ante* information. Specifically, the baseline is calculated by using present and past emission factors of existing power plants. This approach reduces risks for project developers because the expected carbon credits are known in the future. However, uncertainties arise in the environmental integrity because the static baseline does not make adjustment for future changes. Most CDM projects use static baselines. Even if a “dynamic” baseline is used, the adjustment is linear and the slope is predetermined [29,30]. In a fast changing economy, this methodology does not perform well. For example, if renewable energy increases exponentially as is observed in some developing countries, the engineering baseline would set the BAU emissions too high and lead to an inflation of carbon credits.

4.2. Econometric results

In this section, we present the results for the econometric models that use *ex post* information to evaluate the CDM's co-benefits on sulfur emissions. We estimate the parametric model (10) and the semiparametric model (11) using the prefecture-level data in China. The CDM effect on power generation is the focus of this study, which determines if the CDM has co-benefits and additionality within the power sector. The semiparametric model is our preferred specification because of its flexibility, while the parametric model is used for comparison purpose. The estimates of central interest are the coefficients for carbon credits at the prefecture level (CCO₂), province level (PCO₂), and grid level (GCO₂). The estimation results are reported in Table 4. A Wald test of model 1.2.1 for the joint significance of the CDM effect results in a *p*-value at 0.99, which rejects the null hypothesis that the CDM reduces SO₂ emissions. A joint test of the parametric model 1.1.1 leads to the same conclusion.

It is interesting to test the econometric estimate against the engineering estimate. If the CDM activities receive a fair amount of carbon credits, both estimates should be close. Since the econometric models are estimated using the prefecture-level data, the CDM effect needs to be aggregated to the grid level to be compared with that of the engineering model.¹⁴ The test results show that we fail to reject the null hypothesis that engineering and econometric estimates are being equal. The fact that we are not able to rule out co-benefits and additionality is at odds with the previous result. This is likely because the data do not provide precise enough estimates to distinguish between two vastly different hypotheses.

Although the treatment effect is insignificant, the sign of the estimate is still interesting. If CDM activities have lowered sulfur dioxide emissions, the coefficients of carbon credits should be negative. However, the estimates for provincial and grid CERs are positive. This may be explained by the fact that fossil-fuel power plants are built to match with renewable power generation. For example, wind power is highly variable in electricity output at different time scales. Additional power plants are needed to stabilize intermittent power supply and safeguard against blackouts. The coal-fired power is often used as a backup because of its availability and reliability. It is possible that the CDM helps ramp up thermal power capacity as it promotes wind farms. In this case, the effect of the CDM activity – a combination of wind and coal-fired power – hinges on the baseline scenario. If the baseline is coal-fired power, the CDM reduces emissions unambiguously. If the baseline is renewable power, the CDM actually increases emissions. If the baseline is a wind–coal combination, the CDM has no effect at all. In all other cases, the CDM has an uncertain effect in emission reductions. Table 7 summarizes the hypothetical effect of the CDM activity under different baseline scenarios.

The econometric results suggest that the CDM activities in China are not effective at reducing SO₂ emissions, and therefore cast doubt on additionality. That is, without the compensation of carbon credits, these projects may still have occurred. There is some evidence to support this hypothesis. As of 2008, the cumulative installed capacity of wind power in China was 12,152.79 MW, of which 11,389.58 MW was installed during 2005–2008.¹⁵ In the same period, the CDM wind farms generated a total capacity of 5154.92 MW. This suggests that about 55% of wind power projects have been built without the assistance of the CDM. During a recent CDM-EB meeting in December 2009, 10 of China's wind power CDM projects were not approved. The decision was made on the grounds that these projects do not meet the additionality requirement.

This is not to say that project developers intentionally manipulate additionality requirements. Rather, it is the current CDM baseline methodology that fails to predict future emissions in a fast changing economy. China's central planners made the same mistake as they set a 2010 wind power target of 5000 MW in the Renewable Energy Planning Report of 2007. In fact, in the same year that the Plan was published, China's total capacity reached 5906 MW. The rapid growth of

¹⁴ The null hypothesis $\gamma_1 + \gamma_2 + \gamma_3 = \sigma$ is tested. The engineering estimate is the grid level reduction in SO₂ from a carbon credit unit. So, we need the econometric estimate of a grid level reduction. If a carbon credit is issued in prefecture *i*, then CCO₂ goes up by one unit and SO₂ changes in *i* by γ_1 . But, then SO₂ changes in each other prefecture in the same province by γ_2 , and in each other prefecture in the grid, but outside the province, by γ_3 .

¹⁵ Source: “China Wind Power Installed Capacity Statistics 2008” by the China wind power Association. Available at www.cwea.org.cn/upload/20090305.pdf.

Table 4Regression results: dependent variable-SO₂ emitted by power plants.

	Parametric models			Semiparametric models		
	1.1.1	1.1.2	1.1.3	1.2.1	1.2.2	1.2.3
GDPPC	2.995*** (0.741)	2.270*** (0.760)	1.424*** (0.763)			
GDPPC ²	-2.910*** (0.825)	-2.305*** (0.849)	-1.785*** (0.828)			
GDPPC ³	0.740*** (0.233)	0.593*** (0.239)	0.491*** (0.232)			
POPDEN	0.139 (0.125)	0.148 (0.143)	0.181 (0.136)	0.178 (0.128)	0.165 (0.121)	0.278** (0.118)
EE	0.625*** (0.237)	0.528*** (0.233)	0.350*** (0.222)	0.618** (0.265)	0.536** (0.252)	0.526** (0.258)
EE ²	-0.384** (0.167)	-0.371** (0.165)	-0.230** (0.157)	-0.340* (0.187)	-0.324* (0.179)	-0.325* (0.180)
K/L	0.281** (0.136)	0.164** (0.136)	0.007** (0.150)	0.394*** (0.097)	0.251* (0.132)	0.642*** (0.127)
(K/L) ²	-0.107* (0.057)	-0.063* (0.058)	-0.015* (0.059)	-0.126*** (0.046)	-0.088 (0.054)	-0.232*** (0.051)
ESPC	-0.084 (0.111)	-0.091 (0.109)	-0.064 (0.113)	-0.019 (0.079)	-0.063 (0.082)	0.070 (0.081)
FDIR	0.001 (0.009)	-0.005 (0.009)	-0.010 (0.010)	0.003 (0.010)	-0.006 (0.009)	-0.007 (0.010)
CCO ₂	0.007 (0.064)	0.014 (0.062)	-0.051 (0.057)	-0.000 (0.072)	0.025 (0.067)	-0.021 (0.063)
PCO ₂	0.005 (0.020)	0.007 (0.027)		0.002 (0.023)	-0.013 (0.030)	
GCO ₂	-0.001 (0.009)			0.002 (0.010)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 758. The SO₂ emission data for power plants are only available for 2000, 2005, and 2007. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

wind power is partially explained by the favorable on-grid power tariff. It also reflects the fact that state-owned power companies have attempted to grab market share without cost considerations [31]. If this is true, it shows that wind power projects are still not the most economically or financially attractive. Under the current additionality criteria, wind projects should still qualify as CDM activities.

Our model sheds some insight on the environmental Kuznets curve. The estimated coefficient is highly significant for all parametric models. The result supports a nonlinear relationship between SO₂ emissions and income. However, the relationship is not an exact inverted U-shape because the coefficient for the cubic term is significantly different from zero. Instead, the pollution-income relationship is better described by an N-shape curve. The semiparametric model does not specify the functional form. The nonparametric estimate of the relationship is depicted in Fig. 4. The solid line is $\hat{m}(w)$ estimated by the iterative kernel method. Two dashed lines outline a 95% confidence interval for each point estimate.

A visual inspection of Fig. 4 shows that there are multiple maxima and minima in the environmental Kuznets curve. This implies that the parametric model is misspecified because the cubic model only has one local maximum and one local minimum. A formal specification test is needed to show that the semiparametric model performs better. This can be implemented by the bootstrapping method proposed by Henderson [26]. However, since different specifications produce the same qualitative results for the policy variables, we leave this specification test for future research.

The econometric model also yields reasonable estimates for other parameters. The coefficient for population density (POPDEN) is positive but it is not statistically significant. It may be a net effect of: (1) fossil-fuel power generation is located close to demand factors such as population centers and (2) pollution is more regulated in population centers because of public health concerns. Energy efficiency (EE) has a significant nonlinear effect on power SO₂ emissions. At first, as the industrial output per kilowatt increases, demand for electricity as well as emissions climb. After some threshold, improving energy efficiency will lower the demand for electricity and hence SO₂ emissions. The capital-to-labor ratio (KL) has a significant nonlinear effect as well. If the capital endowment is low, increasing capital can cause more constructions of power plants and induce more SO₂ emissions. However, if the capital endowment is large enough, an increasing capital-to-labor ratio leads to lower emissions because of investment in capital-intensive cleaner industry or pollution abatement. The investment in education and R&D per capita (ESPC) reduces SO₂ emissions but the effect is not significant. The level of foreign direct investment (FDIR), which is measured as a ratio of FDI to fixed asset investment, has an ambiguous effect on

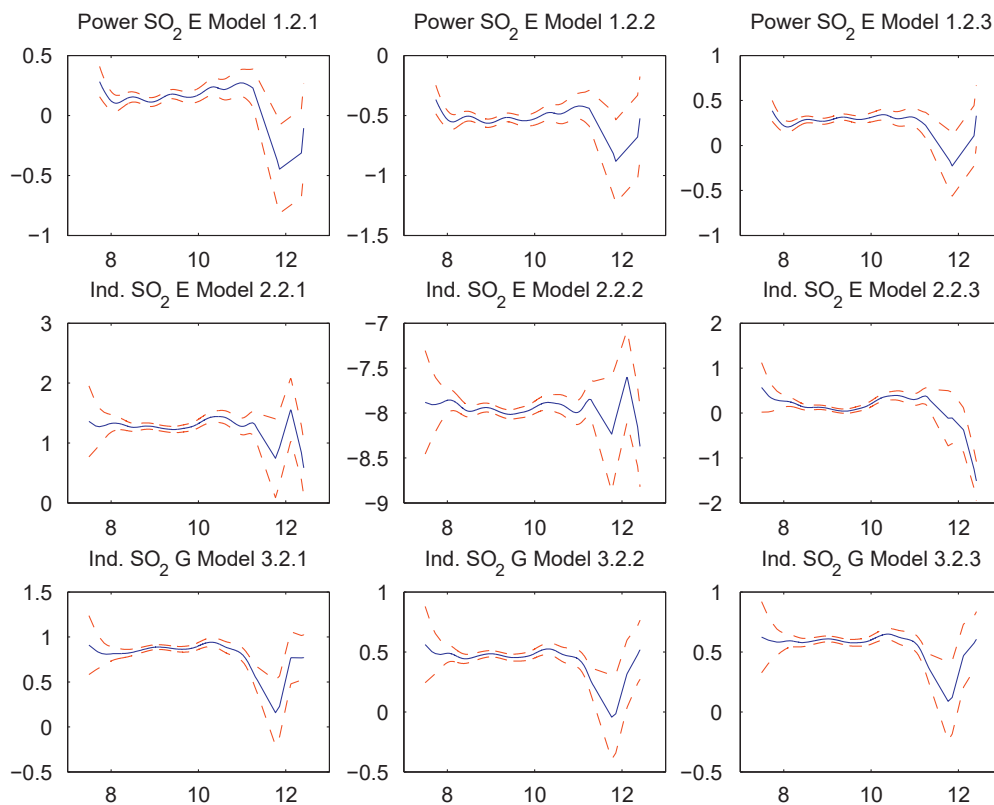


Fig. 4. Nonparametric estimate of the pollution–income relationship $m(w)$.

emissions. Its estimate is statistically insignificant. The insignificant effect of FDI might be due to a complex interaction between the “pollution haven” effect and the “gain from trade” effect [11,32,33].

5. Robustness checks

The first robustness check is concerned with the dependent variable. Besides power generation, we also evaluate the CDM effect on SO_2 emitted (SO2E) and generated (SO2T) by all industries. The CDM effect on all industries is not necessarily the same as that of the power sector because of the spillover or leakage effect. Estimation results for industrial SO_2 emissions are reported in Table 5. The semiparametric specification is still preferred because of its flexibility. For the main specification 2.2.1, the p -value of the Wald test for the joint significance of the CDM effect is 0.21, so that we cannot reject the null hypothesis of no effect at the 90% confidence level. The empirical results do not support the notion that CDM activities reduce total industrial SO_2 emissions.

As for SO_2 generated from all industries, the coefficients for CCO2, PCO2, and GCO2 are positive as is shown in Table 6. The Wald test for model 3.2.1 has a p -value less than 0.01, which means that the null hypothesis of no effect is rejected at the 99% confidence level. This result suggests that the CDM has increased SO_2 generated by all industries. This can be explained by the leakage effect. An increase in pollution induced by CDM activities outside the project boundary could fully offset the effect within the boundary. The magnitude of the CDM effect is the greatest at the prefecture level and the weakest at the grid level. This is sensible, because the leakage effect comes from project construction and operation, and thus the prefecture that hosts the projects undergoes the major impact.

To address the concern that locational and time-varying unobservables may affect CDM projects and SO_2 emissions simultaneously, we include province-by-time and grid-by-time dummies. When subnational time dummies are included, the time effects are not necessary because of multicollinearity. It is also worth noting that provincial CERs are almost absorbed by the province-by-time dummies. Note that PCO2 is defined as the difference between provincial and prefecture CERs. Because provincial CERs are much larger than prefecture CERs, prefectures within the same province have very little variation in PCO2. Including both PCO2 and province-by-time dummies causes the data matrix to be close to singularity. This is also true for the grid-by-time dummies. Therefore, when the grid-by-time dummies are present, the grid CERs are removed for identification purpose; when the province-by-time dummies are present, both grid and provincial CERs have to be removed.

Our empirical results are robust to the inclusion of the subnational time effects. For the emissions from power plants, the CDM effect is still insignificant with additional dummies. Other parameters yield the same qualitative results. A notable

Table 5Regression results: dependent variable-SO₂ emitted by all industries.

	Parametric models			Semiparametric models		
	2.1.1	2.1.2	2.1.3	2.2.1	2.2.2	2.2.3
GDPPC	0.933 (0.803)	0.960 (0.849)	1.133 (0.824)			
GDPPC ²	-1.359* (0.764)	-1.397* (0.801)	-1.492* (0.753)			
GDPPC ³	0.368* (0.199)	0.380* (0.206)	0.402* (0.191)			
POPDEN	-0.167 (0.199)	-0.160 (0.201)	-0.091 (0.182)	-0.009 (0.156)	-0.009 (0.151)	-0.016 (0.142)
EE	0.075 (0.233)	0.044 (0.236)	-0.049 (0.223)	0.083 (0.205)	0.008 (0.206)	-0.060 (0.206)
EE ²	-0.213 (0.163)	-0.176 (0.165)	-0.149 (0.152)	-0.204 (0.145)	-0.152 (0.143)	-0.144 (0.140)
K/L	0.316*** (0.093)	0.290*** (0.095)	0.292*** (0.104)	0.460*** (0.065)	0.342*** (0.080)	0.275*** (0.087)
(K/L) ²	-0.098*** (0.025)	-0.094*** (0.026)	-0.093*** (0.025)	-0.132*** (0.019)	-0.109*** (0.021)	-0.097*** (0.021)
ESPC	-0.051 (0.104)	-0.072 (0.106)	-0.122 (0.104)	-0.054 (0.070)	-0.108 (0.072)	-0.176*** (0.068)
FDIR	-0.035 (0.022)	-0.049 (0.023)	-0.007 (0.025)	-0.047** (0.019)	-0.038** (0.019)	-0.026 (0.022)
CCO ₂	-0.032 (0.038)	-0.035 (0.038)	-0.022 (0.036)	-0.028 (0.034)	-0.031 (0.033)	-0.046 (0.031)
PCO ₂	0.009 (0.012)	0.010 (0.014)		0.007 (0.009)	0.009 (0.012)	
GCO ₂	-0.006 (0.004)			-0.007 (0.004)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1608. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

difference is that the coefficient for population density is now significantly positive. For SO₂ emitted by all industries, there is no significant CDM effect either. However, including provincial time dummies makes the parameter for FDI insignificantly negative and that for ESPC significantly negative. Subnational time dummies do not change the qualitative results for SO₂ generated by all industries. Similar to the previous case, the significance of the FDI effect disappears with subnational dummies, which suggests that locational differences that affect FDI may be time variant [33].

The causality of the pollution–income relationship is another concern. According to the growth theory, lagged income can be used as an instrument for current income [14]. Because the income parameters are not our focus, we adopt the reduced form strategy and use lagged GDP per capita as a regressor. Since the model yields very similar results to the one that uses current income, we do not report the full estimation results here, but they are available upon request.

The last robustness check is to separate out the treatment effect by project types. The CDM is divided into four categories: hydropower (HYDRO), wind energy (WIND), energy efficiency (ENERGY), and other activities (OTHER). Table 1 reports the summary statistics for these variables. Our specification includes province-by-time dummies. The estimation results support our main conclusion. For power plants, none of the parameters for CERs yields significant results. The CDM effect on industrial SO₂ emissions is also insignificant. As for SO₂ generated by all industries, the only significant effect is that the energy efficiency projects increase SO₂ generation. Results for these regressions are also available upon request.

6. Conclusion

Utilizing the relationship that CO₂ and SO₂ are co-pollutants of fossil-fuel combustion, we propose an econometric approach to evaluate the co-benefits of the Clean Development Mechanism and indirectly assess its additionality. Using China's prefecture-level economic and emission data, we find that the CDM does not have a statistically significant effect on SO₂ emissions. Our empirical findings contradict the results predicted by the engineering model. It thus casts doubt on the additionality assumption on which the engineering model is based. These results lend support to the previous conjectures that some CDM activities would have happened anyway.

Nevertheless, our paper is limited by the available data. We only include the registered CDM projects, while there are many more in the pipeline. If all these projects are eventually approved and implemented, it is possible that some non-negligible co-benefits will be observed. At present, the number of projects is relatively small, and the time period is

Table 6
Regression results: dependent variable-SO₂ generated by all industries.

	Parametric models			Semiparametric models		
	3.1.1	3.1.2	3.1.3	3.2.1	3.2.2	3.2.3
GDPPC	5.921*** (1.300)	5.758*** (1.362)	6.367*** (1.436)			
GDPPC ²	-3.128** (1.231)	-3.087** (1.280)	-3.443** (1.311)			
GDPPC ³	0.493 (0.320)	0.496 (0.329)	0.563 (0.332)			
POPDEN	0.574* (0.318)	0.522* (0.319)	0.619* (0.315)	-0.045 (0.301)	-0.135 (0.289)	-0.016 (0.283)
EE	0.010 (0.376)	-0.057 (0.380)	0.024 (0.390)	0.112 (0.402)	-0.172 (0.400)	0.141 (0.414)
EE ²	-0.054 (0.262)	-0.012 (0.264)	-0.051 (0.264)	-0.029 (0.282)	0.072 (0.276)	-0.112 (0.280)
K/L	0.265* (0.155)	0.309* (0.157)	0.091* (0.187)	0.476*** (0.129)	0.282* (0.161)	0.280 (0.182)
(K/L) ²	-0.191*** (0.042)	-0.203*** (0.042)	-0.181*** (0.045)	-0.173*** (0.037)	-0.145*** (0.041)	-0.159*** (0.043)
ESPC	0.114 (0.166)	0.085 (0.169)	0.095 (0.179)	0.488*** (0.135)	0.340** (0.140)	0.460*** (0.137)
FDIR	-0.009 (0.038)	-0.009 (0.039)	-0.021 (0.046)	-0.077** (0.039)	-0.028 (0.040)	-0.031 (0.049)
CCO ₂	0.187*** (0.061)	0.185*** (0.061)	0.134*** (0.063)	0.202*** (0.066)	0.188*** (0.064)	0.190*** (0.062)
PCO ₂	0.043** (0.019)	0.022** (0.023)		0.033* (0.018)	0.023 (0.024)	
GCO ₂	0.015** (0.006)			0.004 (0.005)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1557. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

Table 7
Hypothetical effect of the CDM activity under different baseline scenarios.

Baseline scenario	Effect of the CDM activity (wind+coal)	
	SO ₂ emitted	SO ₂ generated
Wind/other renewable energy	+	+
Wind+coal	0	0
Natural Gas	±	±
Coal	-	-
Other combinations	±	±

Notes: The CDM activity is building a wind farm. A companion coal-fired power plant is built for backup supply. Each baseline scenario generates the same electricity output.

relatively short for the CDM to make a difference. Methodologically, our micro-econometric approach is appealing for further tests of additionality, since project-level information is also available. We leave this for future research.

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Perverse effects of carbon markets on HFC-23 and SF₆ abatement projects in Russia

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Carbon markets are considered a key policy tool to achieve cost-effective climate mitigation^{1,2}. Project-based carbon market mechanisms allow private sector entities to earn tradable emissions reduction credits from mitigation projects. The environmental integrity of project-based mechanisms has been subject to controversial debate and extensive research^{1,3–9}, in particular for projects abating industrial waste gases with a high global warming potential (GWP). For such projects, revenues from credits can significantly exceed abatement costs, creating perverse incentives to increase production or generation of waste gases as a means to increase credit revenues from waste gas abatement^{10–14}. Here we show that all projects abating HFC-23 and SF₆ under the Kyoto Protocol's Joint Implementation mechanism in Russia increased waste gas generation to unprecedented levels once they could generate credits from producing more waste gas. Our results suggest that perverse incentives can substantially undermine the environmental integrity of project-based mechanisms and that adequate regulatory oversight is crucial. Our findings are critical for mechanisms in both national jurisdictions and under international agreements.

The Kyoto Protocol's project-based mechanisms, the Clean Development Mechanism (CDM) for emission reductions projects in developing countries and Joint Implementation (JI) for projects in industrialized countries, provided industrialized countries flexibility in meeting their greenhouse gas (GHG) reduction commitments. Numerous sub-national and national jurisdictions are implementing similar mechanisms around the world, often in combination with emissions trading schemes².

Projects abating waste gases with a high global warming potential (GWP) can generate large volumes of emission reductions at low abatement costs^{1,15}. Under the CDM, the two largest waste gas project types—incineration of hydrofluorocarbon-23 (HFC-23) from hydrochlorofluorocarbon-22 (HCFC-22) production and destruction of nitrous oxide (N₂O) from adipic acid production—account for only 0.3% of the registered projects but generated about half of the 1.5 billion emission reduction credits issued so far¹⁶. For such projects, revenues from credits can significantly exceed GHG abatement costs and, in some instances, the costs of producing the main product^{10,11}. This can create perverse incentives for plant operators to increase production or waste generation beyond levels that would occur in the absence of crediting^{12–14,17}. If more waste gas is generated owing to the incentives from crediting, emission reductions are overestimated; the emissions baseline is inflated compared to the emissions that would actually occur without crediting, and, in consequence, excess credits are issued.

Such perverse incentives can be avoided through appropriate safeguards in methodological standards for the calculation of emission reductions, mainly by capping the amount of production

and waste generation to historically observed levels or conservative benchmarks for the purpose of calculating emission reductions. Under the CDM, safeguards to prevent perverse incentives were gradually introduced and strengthened over time, following observations that the initial safeguards may not have been adequate^{13,14,18}. Whereas the CDM requires using internationally agreed standards and international approval for registering projects and issuing credits, JI allows using a project-specific approach for calculating emission reductions, and either the host countries or the international Joint Implementation Supervisory Committee (JISC) execute regulatory oversight. Under host country oversight, countries can largely establish their own rules for approving projects and issuing credits without international oversight. The host country can determine whether it deems emission reductions as additional. Under international oversight, the JISC oversees project approval and issuance of credits.

This Letter assesses perverse incentives in the context of JI. We evaluate JI projects that incinerate high GWP waste gases, as these project types were particularly vulnerable to perverse incentives under the CDM. Four such projects were registered under JI, all of them under host country oversight. They account for 54 out of the 863 million credits issued to the 604 JI projects registered as of 1 April 2015 (ref. 16). The four projects involve five plants: two hydrochlorofluorocarbon-22 (HCFC-22) and two sulphur hexafluoride (SF₆) production plants in Russia, and one trifluoroacetic acid (TFA) production plant in France. The production of HCFC-22 generates hydrofluorocarbon-23 (HFC-23) as an unwanted waste gas; in the production of SF₆ a waste stream of SF₆ is generated at rectification; and the production of TFA generates various unwanted fluorinated waste gases. The amount of waste gas generated depends on the production level of the main product—HCFC-22, SF₆ and TFA—and the waste generation rate, which is defined as the quantity (mass) of waste gas generated per quantity (mass) of product produced¹⁴. The waste generation rate depends on factors, such as plant design, product purity requirements, and degree of process optimization¹⁹. In the absence of regulations, incentives, or voluntary commitments by the industry, the waste gases are usually vented to the atmosphere. The five registered JI plants capture and incinerate these waste gases (see Supplementary Documentation).

The plant in France aimed to address perverse incentives by capping the emission reductions to the historical emissions of the installation. However, data on historical and monitored production and waste gas generation are not available to assess whether the cap adequately prevented perverse incentives.

Three plants in Russia initially applied caps on the production and waste generation rate to avoid perverse incentives, drawing upon CDM standards. In the second quarter of 2011, the plant operators decided to retroactively change the way emission reductions

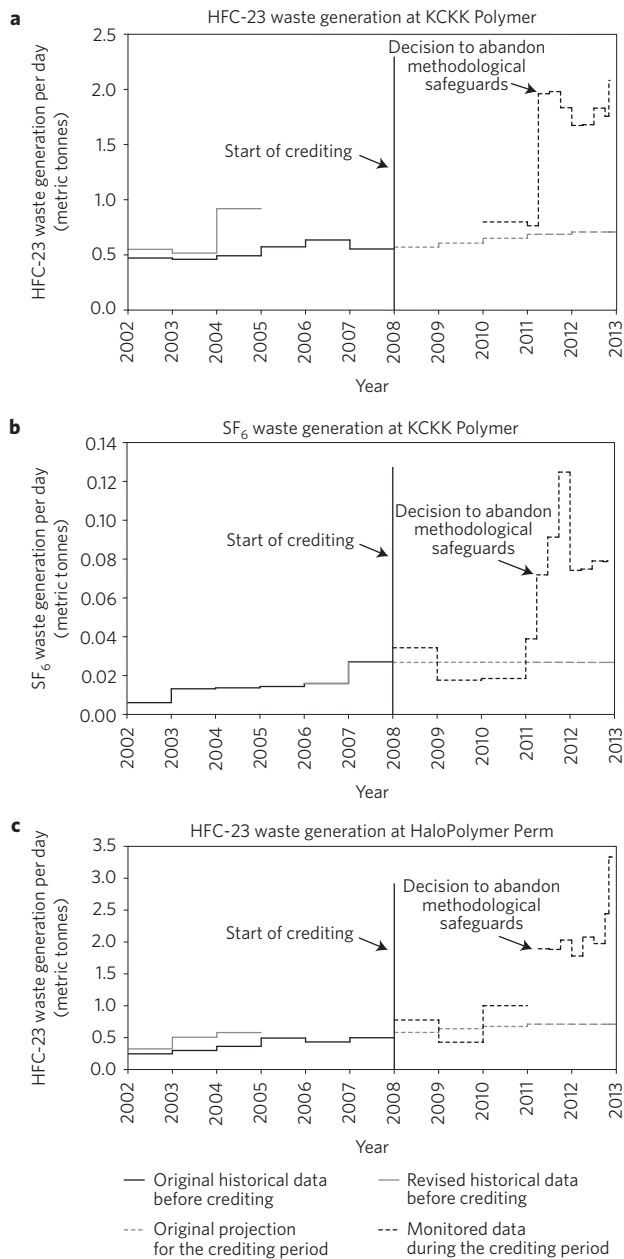


Figure 1 | HFC-23 and SF₆ waste generation at three plants in Russia. **a**, HFC-23 waste generation at the KCKK Polymer plant. **b**, SF₆ waste generation at the KCKK Polymer plant. **c**, HFC-23 waste generation at the HaloPolymer Perm plant. Waste generation increased in all three plants beyond previously reported levels when plant operators decided in 2011 to abandon methodological safeguards to prevent perverse incentives.

are calculated as of 1 January 2010, removing the caps and crediting all waste gas destroyed. Moreover, data and information provided in the original project documentation was considered incorrect, or not applicable, and replaced (see Supplementary Information). Figure 1 shows that waste gas generation increased in all three facilities to unprecedented levels compared to both historical and originally projected levels, after abandoning methodological safeguards in 2011.

The project at the fourth plant in Russia was developed and approved in 2011/2012 and claimed credits retroactively as of 1 January 2008. The project did not apply any methodological safeguards to avoid perverse incentives; all waste gas destroyed was credited. For the period 2008 to 2010, for which data on both

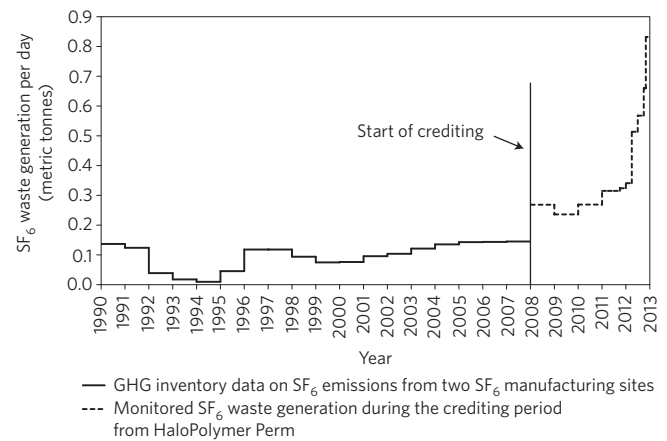


Figure 2 | SF₆ waste generation at the HaloPolymer Perm plant. The GHG inventory data includes emissions from both SF₆ production plants in Russia (KCKK Polymer and HaloPolymer Perm). After the start of crediting, the waste generation from HaloPolymer Perm increased beyond historical emission levels reported in the Russian GHG inventory from both plants.

SF₆ production and SF₆ waste generation are available, the average waste generation rate was 16.9%, which considerably exceeds the default value of 0.2% suggested by the Intergovernmental Panel on Climate Change (IPCC; ref. 20) or the average historical waste generation rate of 2.0% observed at the KCKK Polymer plant. A comparison with GHG inventory data reported by Russia to the United Nations Framework Convention on Climate Change (UNFCCC; ref. 21) shows that waste generation significantly increased with the implementation of the JI project (Fig. 2). Before project implementation, the GHG inventory emissions from SF₆ manufacturing—which cover both SF₆ plants and which may not only include waste gas emissions from SF₆ production but also emissions from handling of SF₆ at the production site, and thus represent the upper end of the possible range—varied between 4 and 53 tonnes of SF₆ over the period 1990 to 2007, whereas after project implementation the plant reported an average annual waste gas generation of 117 tonnes of SF₆.

The abrupt increase occurred in all four plants exactly at the point in time when plant operators could generate (more) credits by producing more waste gas, and higher levels of waste generation were sustained thereafter. The increase in waste generation is mostly attributable to an increase in the waste generation rate, and not in production levels (see Supplementary Information). There was also no reporting of any changes in plant capacity, design, or product specifications which might have affected the waste generation rate. Without credit revenues, plant operators would have economic incentives to reduce rather than increase waste generation^{13,14}.

Absent methodological safeguards to prevent perverse incentives, increasing waste gas generation beyond levels that would occur in the absence of crediting leads to excess issuance of credits. The extent of such over-crediting is uncertain; it depends on how much waste gas the plants would otherwise have generated. We assess the magnitude of over-crediting using three scenarios to estimate the plausible range of waste gas generation that would have occurred in the absence of crediting (see Methods). We conclude that, in the periods where methodological safeguards were not applied, about 28 to 33 million credits were issued in excess, corresponding to 66 to 79% of the credits issued for these periods.

Several lessons can be learned from this analysis. First, although previous research indicated that perverse incentives affected plant operations, the extent and implications were more confined^{13,17,18}. Our results suggest that perverse incentives arising from project-based mechanisms can have rather substantial adverse impacts on environmental integrity, with about two-thirds of the credits

being issued in excess in periods when no safeguards were applied. Second, regulatory oversight by the host country alone may not be sufficient to ensure environmental integrity. Under the Kyoto Protocol, Russia had no incentives to ensure environmental integrity of JI projects; it had an emissions target well above its actual emissions and could issue credits from its emissions budget without repercussions for meeting its target. For the three plants in Fig. 1 the methodological safeguards were removed at a point in time when perverse incentives from HFC-23 CDM projects received wide media and policymaker attention, leading ultimately to a ban of HFC-23 credits under the EU's emissions trading scheme and a revision of the applicable methodological standard under the CDM (refs 14,22). Third, the Accredited Independent Entity (AIE) performing the relevant auditing functions—Bureau Veritas Certification—did not address the perverse incentives. Although AIEs were accredited by the JISC, the projects were implemented under oversight by the host country, in which case the JISC did not assess the performance of auditors or apply any sanctions in cases of non-performance. Finally, we note a lack of transparency, with project information being only partially publicly available.

These lessons are critical for both ongoing international discussions on the review of JI and market-based mechanisms under the new climate agreement, as well as the growing use of domestic carbon markets around the world. Our findings confirm earlier research that project-based mechanisms are exposed to significant risks of over-crediting, for example, due to the information asymmetry between project operators and auditors or regulators^{4,5,7,8}. If crediting mechanisms are further pursued, it is essential that adequate international oversight be executed for any mechanisms involving international transfer of credits, that methodological standards be internationally accepted and include appropriate safeguards to prevent perverse incentives, that mechanisms monitor the performance of auditors and apply effective sanctions in the case of non-performance, and that information on credited activities is transparent and publicly accessible.

Methods

Methods and any associated references are available in the [online version of the paper](#).

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Author contributions

L.S. evaluated the data and analysed the results. L.S. and A.K. wrote the paper.

Additional information

Supplementary information is available in the [online version of the paper](#). Reprints and permissions information is available online at www.nature.com/reprints. Correspondence and requests for materials should be addressed to L.S.

Competing financial interests

L.S. is member of the CDM Executive Board under the Kyoto Protocol.

Methods

Data on production and waste gas generation was gathered from project design documents (PDDs) and monitoring reports, published by the UNFCCC (<http://ji.unfccc.int>) and the Russian Registry of Carbon Units (<http://www.carbonunitsregistry.ru>), and audited by AIEs. The monitoring and verification reports publicly available are incomplete for four out of the five plants: for HFC-23 and SF₆ abatement at KCKK Polymer, the first and second monitoring report covering the years 2008 and 2009 are lacking. For HFC-23 abatement at HaloPolymer Perm, the first, second and fourth monitoring report, covering the years 2008 and 2009 and the period 1 January to 31 March 2011, are lacking, as well as the fourth verification report for the period 1 January to 31 March 2011. Moreover, as of 1 January 2012, HaloPolymer Perm reports only HFC-23 incineration but no longer HFC-23 generation. We conservatively assume that all HFC-23 generated was incinerated. If HFC-23 was partially vented or sold, the actual HFC-23 generation in 2012 would be even higher than presented in Fig. 1. Finally, monitoring reports are not publicly available for the plant in France.

Project-based mechanisms generally calculate emission reductions by comparing an emissions baseline with monitored project emissions and adjusting for any indirect upstream or downstream leakage emissions occurring as a result of the project:

$$ER = BE - PE - LE$$

where ER are the emission reductions, BE are the baseline emissions, PE are the project emissions and LE are the leakage emissions (all expressed as metric tonnes of CO₂ equivalent). Whereas project emissions can in most cases be directly measured, baseline emissions are estimated based on a counterfactual, hypothetical scenario. Baselines often aim to reflect the emissions level that would most likely occur if the project was not implemented, but could also be set at a lower, more conservative level—for example, to address uncertainties or to prevent perverse incentives. Over-crediting, or excess issuance of credits, occurs if the estimated baseline is higher than the emissions level that would occur if the project was not implemented (or if project or leakage emissions are underestimated).

Absent methodological safeguards, the four projects determine baseline emissions as the observed waste gas generation, that is, assuming that the same amount of waste gas would be generated and emitted in the absence of crediting. We estimate the extent of excess issuance of credits as the difference between the claimed baseline emissions (BE_{claimed}) and different assumptions on plausible baseline emission levels (BE_{plausible}):

$$E = BE_{\text{claimed}} - BE_{\text{plausible}}$$

where E are the credits issued in excess, BE_{claimed} are the baseline emissions specified in the monitoring reports of the plants and BE_{plausible} is our estimate of the plausible range of baseline emissions (both expressed in metric tonnes of CO₂ equivalent).

We use three scenarios to reflect the range of plausible baseline emissions (BE_{plausible}). For the three plants in Fig. 1, historical data on waste generation is available. We estimate the magnitude of over-crediting over the period 1 April 2011 to 31 December 2012, when methodological safeguards were not applied, assuming that the three facilities would have produced the same amount of waste gas per day as before the start of crediting, as during the crediting period before their decision to abandon the methodological safeguards, or as originally projected when the project was approved. The credits issued in excess would amount to 19.7, 17.3, or 17.6 million, respectively, corresponding to 69%, 61%, or 62% of the 28.3 million credits issued to the three facilities over that period.

For SF₆ abatement at HaloPolymer Perm in Fig. 2 the magnitude of over-crediting is more uncertain because historical data is not available. We determine plausible baseline emission levels based on the SF₆ production and a range of plausible assumptions on the waste generation rate:

$$BE_{\text{plausible}} = P_{\text{SF}_6} \times w_{\text{SF}_6} \times \text{GWP}_{\text{SF}_6}$$

where P_{SF_6} is the SF₆ production at the plant (in metric tonnes of SF₆), w_{SF_6} is the waste generation rate expressed as metric tonnes of SF₆ waste gas generated per metric tonnes of SF₆ produced, and GWP_{SF_6} is the global warming potential of SF₆ valid for the first commitment period under the Kyoto Protocol (metric tonnes of CO₂ equivalent per metric tonnes of SF₆). We estimate the magnitude of over-crediting for the period 2008 to 2012 when methodological safeguards were not applied. For the period 2008 to 2010 we use the SF₆ production data reported by the plant. For 2011 and 2012, SF₆ production data is not reported; we conservatively assume that the plant would operate at its maximum production capacity. We use three scenarios to estimate the plausible range of the waste generation rate, assuming that the plant would have operated at a waste generation rate of 0.2%, as suggested by the IPCC, 2.0%, as observed before crediting at the KCKK Polymer SF₆ production plant, or 3.8%, as approximated based on SF₆ emissions data reported in the Russian GHG inventory (see Supplementary Information). The credits issued in excess would amount to 13.5, 11.9, or 10.2 million, respectively, corresponding to 99%, 87%, or 75% of the credits issued over that period.

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
 FOURTH APPELLATE DISTRICT, DIVISION ONE

<p>SIERRA CLUB, Petitioners and Respondents,</p> <p style="text-align: center;">v.</p> <p>COUNTY OF SAN DIEGO, Defendant and Appellant.</p>	<p>Case No. D075478</p>
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San Diego County Superior Court, Case Nos. 37-2018-00014081-CU-TT-CTL, 37-2018-00013324-CU-TT-CTL, No. 37-2012-00101054-CU-TT-CTL

The Honorable Timothy Taylor, Judge

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Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

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INTRODUCTION

The California Attorney General respectfully submits this brief as amicus curiae in support of Petitioners and Respondents Sierra Club¹ and Golden Door Properties (collectively, Respondents) pursuant to Rule 8.200(c)(7) of the California Rules of Court. This brief is submitted in the Attorney General's independent capacity and not on behalf of any State agency or entity.

At issue in this case is San Diego County's (County) revised Climate Action Plan (CAP), which was adopted to mitigate greenhouse gas (GHG) emissions from the County's 2011 General Plan Update, and the CAP's accompanying Supplemental Environmental Impact Statement (SEIR). The Attorney General has long advocated the use of local climate action plans, or other GHG reduction plans, to address GHG emissions. Such plans allow cities and counties to analyze impacts and identify mitigation opportunities at the programmatic level that may be lost on project-by-project review.² The County's decision in 2011 to address mitigation of GHG emissions from future development through a CAP was an important step in the right direction from a legal, policy, and environmental standpoint. However, the County's CAP cannot provide adequate

¹ Sierra Club files with Respondents Center for Biological Diversity, Cleveland National Forest Foundation, Climate Action Campaign, Endangered Habitats League, Environmental Center of San Diego, and Preserve Wild Santee.

² See, e.g., AR 11:8602-8610 (Attorney General's Comment Letter on San Diego County General Plan Update Draft Environmental Impact Report (August 31, 2009)); Attorney General's Comment Letter on Tulare County General Plan and Recirculated Draft Environmental Impact Report (May 27, 2010); Attorney General's Comment Letter on City of Pleasanton's Proposed General Plan Update and Final Environmental Impact Report (May 8, 2009), available at <https://oag.ca.gov/environment/ceqa/letters>.

mitigation as required by the California Environmental Quality Act (CEQA). Instead, its heavy, unfettered use of offsets allows status quo development to continue, locking the County into increased local emissions that work against the State’s long-term GHG reduction targets.

This amicus brief supplements the Respondents’ briefs by explaining why reducing vehicle use, referred to as vehicle miles traveled (VMT), is crucial to achieving the State’s climate objectives. Reducing VMT requires cities and counties to engage in forward-thinking and innovative land use planning. The County’s failure to meaningfully address VMT in the CAP will interfere with the region’s ability to achieve needed infrastructure changes consistent with long-term climate objectives, and ultimately prevents the CAP from serving as legally adequate mitigation. Moreover, the lack of limits, standards or other criteria for the CAP’s use of offsets, allows developers to avoid making crucial onsite reductions and instituting measures to reduce vehicle use, rendering the CAP unenforceable.

Further, the SEIR for the CAP hides the inconsistencies with State and regional climate objectives from the public by failing to disclose or analyze these conflicts, in violation of CEQA. The County also violates CEQA by not considering compact growth alternatives that reduce VMT, and by failing to analyze impacts of increased VMT on air quality or environmental justice communities. This amicus brief aims to provide guidance on how the County and other local entities can create GHG reduction plans that reduce VMT, adopt enforceable programmatic mitigation for land use development, and as the California Supreme Court requires, do their part to ensure that their CEQA analysis “stays in step” with State climate objectives. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 3 Cal.5th 497, 519 [hereafter *SANDAG*].)

STATEMENT OF INTEREST

The Attorney General, as the State’s chief law enforcement officer, has a duty to ensure that the State’s laws are appropriately enforced and a duty under the Government Code to protect the environment and natural resources of California. (Cal. Const., art. V, § 13; Gov. Code, §§ 12600-12612; *D’Amico v. Bd. of Medical Exam’rs* (1974) 11 Cal.3d 1, 14-15.) The Attorney General has a particular interest in ensuring the proper interpretation of CEQA and of the regulations implementing CEQA (Cal. Code Regs., tit. 14, § 15000 et seq. [CEQA Guidelines]). The Attorney General also has a unique role with respect to actions concerning pollution and adverse environmental effects that could affect the public or the natural resources of the State. (Gov. Code, §§ 12600-12612.) Government Code section 12600 specifically provides that “[i]t is in the public interest to provide the people of the State of California *through the Attorney General* with adequate remedy to protect the natural resources of the State of California from pollution, impairment, or destruction.” (Emphasis added.)

The California Attorney General has actively participated in CEQA litigation regarding GHG emissions and climate change impacts at the local level. In 2006, the Attorney General’s Office submitted its first comment letter arguing that climate change is an environmental impact that must be addressed under CEQA. Ultimately, the Attorney General’s position was codified in 2007 with the passage of Senate Bill 97 (Pub. Resources Code, § 21083.05) and is reflected in CEQA’s implementing regulations (CEQA Guidelines § 15064.4). In submitting this amicus brief, the Attorney General furthers its efforts to ensure that CEQA is enforced in a way that discloses impacts from land use development plans and projects, and ensures the consistency with State laws and policies.

ARGUMENT

I. THE COUNTY'S CLIMATE ACTION PLAN IS INADEQUATE MITIGATION FOR GHG IMPACTS ANTICIPATED UNDER THE COUNTY'S GENERAL PLAN UPDATE

The CAP, by incorporating mitigation measure GHG-1 (referred to in this brief as the Offset Provision, or Provision),³ allows future development requesting a general plan amendment in the County to mitigate emissions largely through the purchase of carbon offsets. Carbon offsets represent discrete GHG reduction events that take place offsite of a proposed development, and, in many cases, outside of the County entirely. While offsets can be a positive part of a robust and comprehensive GHG emissions plan, the Offset Provision relies almost exclusively on offsets to the exclusion of long-term, carbon-efficient planning. The Provision does not, for example, require or incentivize developers to locate projects in already dense, urban areas to limit residents' daily vehicle trips.

As a consequence, and as discussed in detail in the Respondents' briefs, the CAP will foreseeably increase vehicle use in the County, creating inconsistencies with Senate Bill 375 (SB 375), a State law designed to reduce vehicle-related GHG emissions through smart growth land use planning and transportation design. (Gov. Code §§ 65080 et seq.; see also *Sierra Club Br.* at 62-70; *Golden Door Br.* at 75-82.)⁴ The CAP

³ The County insists that the Offset Provision is not a part of the CAP but a part of the SEIR for the CAP. (*County Reply Br.* at 21.) However, given that the Offset Provision is discussed in the CAP, is a mitigation measure adopted to reduce the CAP's impacts below the threshold of significance, and that CEQA mandates that agencies consider "the whole of an action," this brief considers the CAP and the Offset Provision to be part of the same action under CEQA. (CEQA Guidelines § 15003, subd. (h); see also AR 1340:58761.)

⁴ Since the approval of the CAP, several new general plan amendment projects using offsets to mitigate GHG emissions have been approved. (CT 10:2385-87; CT 13:3300; see also *Sierra Club Br.* at 18; (continued...))

will also conflict with the sustainable communities strategy developed by the regional transportation planning body, the San Diego Association of Governments (SANDAG) to comply with SB 375's targets (hereafter SANDAG Plan). (Sierra Club Br. at 62-70; Golden Door Br. at 75-82.)

Ultimately, the CAP in its current form will perpetuate current sprawling development patterns, which will impede the ability of the region and State to reach their long-term climate objectives. This is particularly concerning because of the crucial role of local governments in obtaining important VMT reductions. Moreover, the County cannot avoid implementing necessary compact land use development designed to reduce vehicle use entirely by adopting the Offset Provision, which in addition to increasing VMT, requires no meaningful standards or criteria to ensure enforceable GHG reductions. Thus, the CAP is inadequate mitigation for the impacts of the 2011 General Plan Update.

A. Sustainable, Long-Term GHG Reductions Cannot Be Achieved Without Addressing Vehicle Miles Traveled

The County asserts that so long as GHG reductions are being achieved somewhere, by some means, for some period of time, the CAP serves its mitigative purpose. (County Opening Br. at 48 [hereafter County Br].) Not only is this position incorrect, it reveals a deep misunderstanding of the importance of VMT reductions to meeting not only the goals in relevant

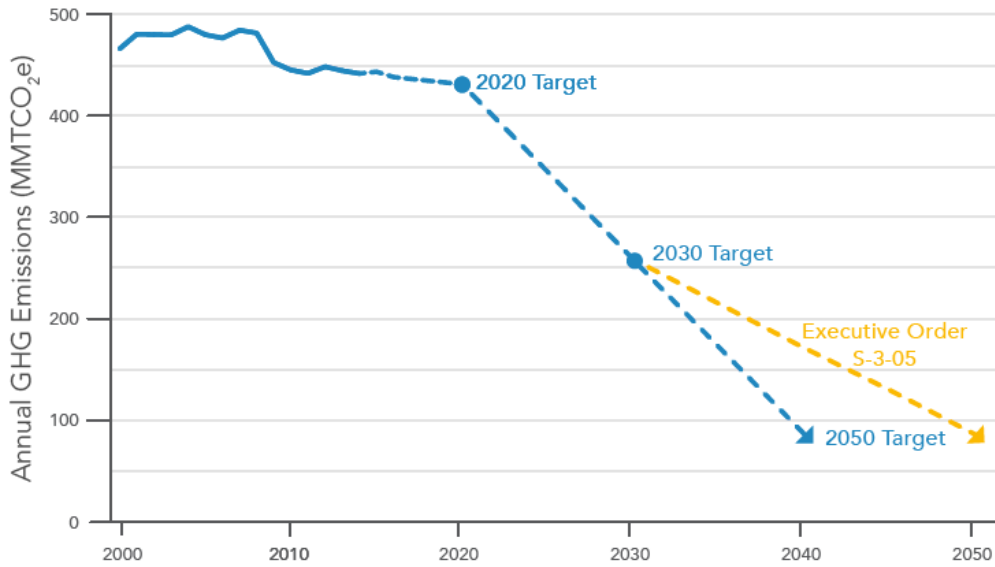
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Golden Door Br. at 50-51.) All are large-scale housing projects located well outside of urban centers that will increase VMT. For example, the Harmony Grove Village South project, which was recently approved by the County, will increase vehicle miles traveled by 11.5 million miles annually. (CT 10:2451 [Harmony Grove Village South Draft Final Environmental Impact Report (May 2018) p. 2.7-17].) Similarly, the Newland Sierra project will increase vehicle use by 294,804 miles *daily*. (CT 15:3918; see also Newland Sierra Final Environmental Impact Report (June 2018) p. 2.7-38].)

State and regional programs and plans, but also California’s larger climate objectives. Without significant VMT reductions across the State, California simply will not be able to achieve its GHG reduction targets.

A review of California’s climate laws reveals that reducing vehicle use is a crucial element of California’s policy and regulatory framework to reduce the State’s GHG emissions and the consequences of extreme changes in climate. California took the lead in reducing GHG emissions by enacting the Global Warming Solutions Act of 2006, also known as AB 32, which set the State’s original target of reducing GHG emissions to 1990 levels by 2020. (Health & Saf. Code, §§ 38500 et seq.) In 2016, California passed Senate Bill 32 (SB 32), which set a target of reducing GHG emissions 40 percent below 1990 levels by 2030. (*Id.* at § 38566.) Looking further to the future, Executive Order S-3-05 sets a goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. (Governor’s Exec. Order No. S-3-05 (June 1, 2005).)

As required by AB 32, the California Air Resources Board (Air Resources Board) developed the Scoping Plan, which outlines a framework of GHG reduction strategies and a path for the State to meet AB 32’s 2020 targets, and, as updated in 2017, SB 32’s 2030 targets. (Health & Saf. Code, § 38561; AR 1026:55038 [Air Resources Board, 2017 Scoping Plan (2017) p. ES 3, hereafter Scoping Plan].) The Scoping Plan emphasized that the State’s reduction “targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in line with California’s role in stabilizing global warming below dangerous thresholds.” (*Ibid.*) Represented graphically, our climate challenge is significant:

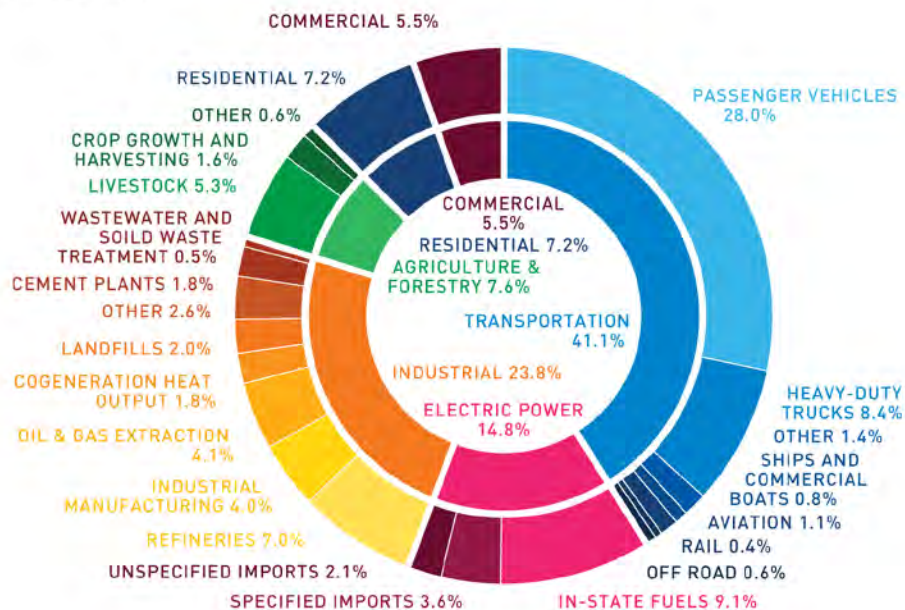


(*Id.* at 55071 [Scoping Plan at p. 18, fig. 5, “Plotting California’s Path Forward”].)

Within this significant undertaking to reduce GHGs, emissions from transportation represent a particular challenge. Transportation is the largest source of GHG emissions in the State, totaling almost half of statewide GHG emissions. (AR 1026:55063 [Scoping Plan at p. 10].)

Figure 2. Greenhouse Gas Emissions by Source

CALIFORNIA, 2017



(Next 10, California Green Innovation Index (2019),⁵ p. 7 [data source: Air Resources Board, California Greenhouse Gas Inventory – By Sector and Activity (2019)].)

In light of these significant transportation emissions, the Scoping Plan specifically noted that reductions in VMT are necessary to achieving California’s 2030 targets and “must be a part of any strategy evaluated in the [Scoping] Plan.” (AR 1026:55128 [Scoping Plan at p. 75].) In fact, the Air Resources Board has emphasized that “California *cannot* meet its climate goals without curbing growth in single-occupancy vehicle activity.” (Air Resources Board, 2018 Progress Report, California’s Sustainable Communities and Climate Protection Act (2018) p. 28, hereafter Progress Report [emphasis added].)⁶

⁵ Available at <https://www.next10.org/publications/2019-gii>.

⁶ Available at <https://ww2.arb.ca.gov/resources/documents/tracking-progress>.

Implementation of SB 375 is a primary strategy identified in the Scoping Plan to reduce GHG emissions from the transportation sector. (AR 1026:55154 [Scoping Plan at p. 101].) SB 375 aims to achieve GHG reduction goals specifically by reducing regional GHG emissions from light duty vehicles through coordinated land use transportation planning. (Gov. Code, § 65080 subd., (b)(2)(B)(vii).) Under SB 375, regional planning organizations develop plans to achieve the GHG reduction targets set by the Air Resources Board. (*Id.* at § 65080.) These regional plans, or sustainable communities strategies, integrate “land use, transportation, and housing planning” to reduce emissions from driving, curtail traffic, preserve natural resources, reduce air pollution, and expand clean transportation options. (Progress Report at p. 16.) In order to meet the intent of SB 375, these regional plans should achieve their emissions targets “predominantly through strategies that reduce [VMT].” (AR 22:20413 [Air Resources Board, Final Staff Report on the Proposed Update to the SB 375 GHG Emissions Reduction Targets (Oct. 2017) p. 19].)

SANDAG’s sustainable communities strategy was created to be consistent with this intent. The SANDAG Plan specifies that GHG reductions are to be achieved through land use planning methods that are designed to reduce vehicle miles traveled, including “using land in ways that make developments more compact, conserving open space, and investing in a transportation system that provides people with alternatives to driving alone.” (AR 430:39941.) Indeed, one of the “five building blocks” of the SANDAG Plan is to implement “policies and other measures designed to reduce the number of miles that people travel in their vehicles.” (*Id.* at 39870.) Thus, the County’s assertion that the SANDAG Plan does not require reductions in VMT is directly contradicted by the plain language of the document.

Moreover, the SANDAG Plan emphasizes that achieving GHG reductions through more compact development designed to reduce vehicle use is important for numerous reasons. Specifically, the SANDAG Plan discusses how smart growth land development decreases air pollution, preserves open space and agricultural land, improves water quality, and promotes healthier lifestyle choices, among other benefits. (AR 430:39934-35; see also AR 1026:55117, 55127 [Scoping Plan at pp. 64, 74] [noting that compact development that reduces VMT also demands less energy per capita, preserves natural and working lands, uses less water per capita and encourages physical activity].)

Thus, VMT reduction is an integral part of California’s climate laws and policies, as well as the SANDAG Plan. The CAP’s Offset Provision allows the County and future development projects to avoid consideration of whether the proposed project is properly located, sufficiently dense, and adequately supported by existing infrastructure, services, and public transportation. (See *Golden Door Br.* at 76-81; *Sierra Club Br.* at 62-70.) In this way, the CAP allows VMT-inefficient projects to continue to be built, locking the County into emissions for decades to come.

B. Local Governments Have an Essential Role to Play in Meeting the State’s Climate Objectives, Including Reducing Vehicle Miles Traveled

By failing to place any meaningful limitations or criteria for offsets, and by not requiring developers to make reductions in VMT, the County is effectively abdicating its land-use planning role. But local governments are necessary partners in reducing GHG emissions from land use and transportation. As the California Supreme Court has recognized, “[l]ocal governments ... bear the primary burden of evaluating a land use project’s impact on greenhouse gas emissions.” (*Ctr. for Biological Diversity v. Cal. Dep’t of Fish and Wildlife* (2016) 62 Cal.4th 204, 230.) The Scoping Plan

also emphasizes that local governments are critical players in achieving the State’s climate stabilization goals. (AR 1026:55150 [Scoping Plan at p. 97]; see also *id.* at 55072, 55115, 55125, 55140, 55144, 55150-55155 [pp. 19, 62, 72, 87, 91, 97-102].) In particular, the Scoping Plan relies on local governments to achieve reductions from land use planning and transportation, and states that local governments “can develop land use plans with more efficient development patterns that bring people and destinations closer together in more mixed-use, compact communities that facilitate walking, biking, and use of transit.” (*Id.* at 55150 [Scoping Plan at p. 97].) Because of this unique position, local government actions to combat severe changes in climate can in many cases be more effective, less costly and provide more environmental and economic co-benefits than regulating at the State level. (*Ibid.*)

In recognition of the important role that local jurisdictions have in GHG reductions and land use planning, many local jurisdictions have developed program-level GHG emissions reduction plans, such as CAPs. These plans outline city-, county- or regional-level frameworks that detail the specific actions a local agency will implement to reduce GHG emissions to a specified emissions level that is consistent with the State’s long-term climate objectives. (Governor’s Office of Planning and Research, General Plan Guidelines (2017) p. 226-229.)⁷ CAPs, when done correctly, provide a comprehensive approach to reducing GHG impacts on the local level and allow the local government to disclose, analyze, and mitigate impacts that may not be sufficiently analyzed and mitigated if projects are only reviewed one at a time. (*Id.* at 223.)

⁷ Available at http://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf.

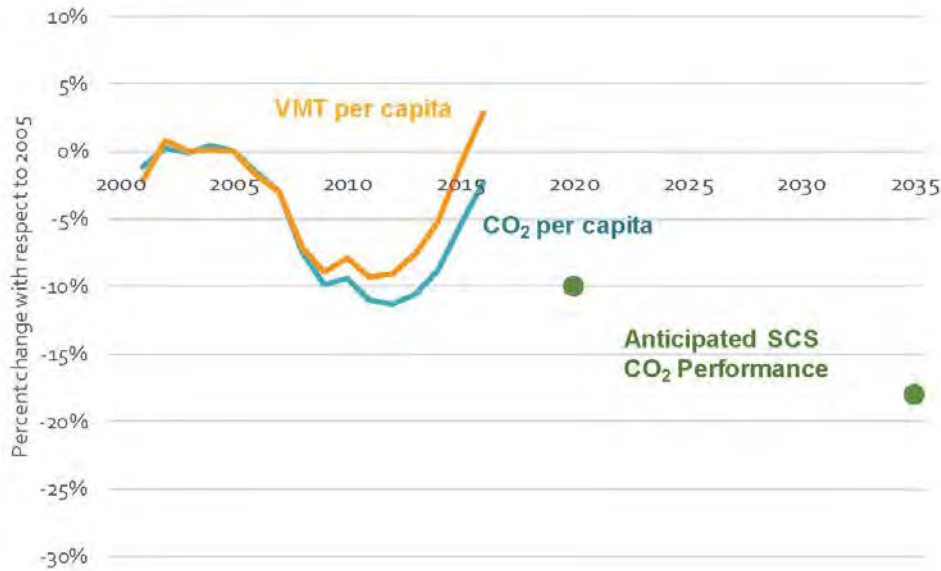
One of the key benefits of a properly prepared CAP is its ability to integrate GHG reductions with land use development plans. (General Plan Guidelines at pp. 222-224.) For example, by developing a CAP alongside a region’s general plan, a jurisdiction can consider methods of GHG reduction not available on a project-by-project-basis, such as zoning for compact development to decrease reliance on vehicles. (*Ibid.*) Moreover, the CEQA Guidelines allow well-designed CAPs that are consistent with State and regional climate goals to “streamline” future projects – meaning that future projects that comply with the CAP can appropriately reduce their GHG emissions to less than significant. (CEQA Guidelines § 15183.5, subd. (b).) This can allow local entities to more easily approve needed development, such as additional housing, or low-income housing, in existing, compact communities that reduce VMT.⁸ Thus, well designed CAPs provide excellent opportunities to achieve long term GHG reductions through dense development and can complement regional sustainable communities strategies’ and SB 375’s VMT reduction goals.

SB 375, too, relies on local planning innovation and leadership. The goals of regional sustainable communities strategies, including the SANDAG Plan, cannot be achieved if the County and other local entities operate with no regard for the compact growth principles. Recent data on compliance with SB 375 reflect this important point. In November 2018, the Air Resources Board released its 2018 Progress Report pursuant to SB 150,⁹ a State law that requires the preparation of a report every four years analyzing the progress made under SB 375. (Progress Report at p. 3.) The

⁸ The County claims that Petitioners are attempting to prevent all development in San Diego County. (County Reply Br. at 9-10.) However, had the County developed an adequate CAP, it could have actually *facilitated* dense development.

⁹ Gov. Code § 65080, subd. (b)(2)(J)(iv).

Progress Report found that despite the preparation of sustainable community strategies designed to comply with SB 375 by all the regional planning organizations, actual GHG emissions and VMT per capita have not declined, and California is not on track to meet its SB 375 targets. (*Id.* at 22.) In fact, VMT per capita and carbon dioxide emissions per capita are increasing¹⁰:



Source: CDTFA, U.S.EIA, U.S. EPA, CARB

(*Id.* at 23.)

The wide gap between the actual, measured VMT per capita and the targets of the sustainable community strategies reflects, among other things, that the regional plans are “not being implemented as envisioned.” (Progress Report at p. 24.) Further, the Progress Report warns that continued growth of urban sprawl could create barriers to achieving the compact land use patterns outlined in the regional plans. (*Id.* at 52.) The

¹⁰ CO2 and VMT in the chart calculated based on California Department of Tax and Fee Administration gasoline fuel sales data.

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Air Resources Board advised that “structural changes and additional work by all levels of government are still necessary to achieve State climate goals and other expected benefits.” (*Id.* at 7.) This includes the County.

Thus, neither the State nor the San Diego region can achieve their climate goals if local entities, such as the County, persist in expanding urban sprawl, and consequently VMT. The County cannot disregard VMT reductions in the CAP without creating potentially significant and long-lasting impacts on the region’s ability to comply with the SANDAG Plan, SB 375 and consequently, California’s 2050 goals. These foreseeable conflicts with State and regional laws and plans prevent the CAP from adequately mitigating the impacts of the General Plan Update.

C. Offsets Are Not a Substitute for Efficient, Long-Term Land-Use Planning and Carbon-Efficient Project Design

GHG offsets can be a valuable and useful tool for achieving additional reductions that cannot be attained through onsite or VMT reduction measures alone. (AR 1026:55155 [Scoping Plan at p. 102].) For example, where a properly sited project has agreed to implement all feasible design changes and on-site mitigation, but will still have significant GHG emissions, it may be appropriate to consider the purchase of rigorously quantified and verified offsets to further reduce the project’s impacts. But in the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. These disadvantages, combined with the lack of any adequate criteria to ensure enforceability of the offsets purchased in this case, conspire to make the CAP ineffective and unreliable as a mitigation measure for the General Plan Update.

The Offset Provision provides only vague pronouncements and little accountability.¹¹ It does not require any minimum amount of reductions to be made onsite before a project applicant can turn to offsets. (AR 38:22771.) In fact, the only standard that the Offset Provision requires is the satisfaction of the County and the Director of Planning and Development Services (PDS) that onsite reductions were considered first before turning to offsets. (*Ibid.*) Without any measurable guidance or standard for what “feasible” onsite reductions are, it is unclear how much onsite reduction will actually be required of future general plan amendment projects. What is clear, however, is that the County has recently approved developments using mitigation measures nearly identical to the Offset Provision that achieve onsite reductions for a very small portion of overall emissions. For example, the approved Newland Sierra project mitigates a staggering 82 percent of its emissions with offsets. (AR 22:18678.)

The Offset Provision also states that if offsets are used, the project “shall first pursue offset programs locally within unincorporated areas of the County of San Diego to the extent such carbon offset credits are available and financially feasible, as reasonably determined by the Director of PDS.” (AR 38:22772.) Again, the County provides no detail as to what “financially feasible” means, nor what criteria the Director of PDS will use to make its determination. Further, the evidence in the record shows that there are few carbon credits available within the County, meaning that most offset purchases

¹¹ Like all mitigation under CEQA, any mitigation measure that utilizes offsets must be enforceable. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments.” (CEQA Guidelines § 15126.4, subd. (a)(1)(D).) “The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded.” (*Lincoln Place Tenants Assn. v. City of Los Angeles* (2007) 130 Cal.App.4th 1491, 1508 [citing Pub. Resources Code, § 21002.1].)

will inevitably occur outside of the County. (AR 38:23110-11.) Once all “available and financially feasible” in-County offsets have been considered, the Offset Provision allows projects to turn to out-of-county offsets. (*Id.* at 22771.) While the Provision requires that developers should prioritize in-state and in-country offsets (again without minimum amounts of reduction achieved by in-state or in-country offsets), it ultimately permits projects to purchase international offsets as well, unrestricted by any geographic boundaries. (*Ibid.*) This lack of meaningful criteria or limitations renders the Offset Provision unenforceable.

Moreover, the County’s attempts to justify the Offset Provision lack merit. The County asserts that the CAP’s allowance of offsets is no different than the use of offsets by the Air Resources Board’s Cap and Trade program.¹² (County Br. at 32-33.) This is untrue. Unlike the Offset Provision, offsets used in the Air Resources Board’s Cap and Trade Program are subject to detailed compliance protocols that were developed pursuant to the State’s public rulemaking process. (Cal. Code Regs., tit. 17, § 95972.) Further, and of critical importance, these requirements only allow offsets to comprise a maximum of 8% of any compliance entity’s compliance obligation.¹³ (*Id.* at § 95854, subd. (b).)

The County further argues that the Offset provision is no different than the use of offsets for the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, which the Scoping

¹² The County also concludes that because the Air Resources Board did not comment on the EIR, that the Board does not find the Offset Provision problematic. (County Br. at 49.) However, the County has provided no evidence to support this conclusion.

¹³ With the passage of Assembly Bill 398 in 2017, this maximum percentage has been further reduced to 4% of emissions from 2021-2025 and 6% for emissions from 2026-2030. (Assem. Bill No. 398 (2017-2018 Reg. Sess.) § 4(c)(E)(i).)

Plan identified as an example of a development project that will help the State meet its climate goals. (County Br. at 33 citing AR 1026:55154-55155 [Scoping Plan at pp. 101-2].) This is also untrue. The Newhall Ranch development required more than 50% of offsets to be local and limited international offset purchases to 20%. (AR 22:19785, 19796.) Moreover, offsets were only permitted after very extensive onsite reductions and measures to reduce VMT were implemented. (*Id.* at 19645-56.) Thus, the County cannot rely on the Newhall Ranch development to justify the shortcomings of the Offset Provision.

Crucially, what regional and State plans to reduce VMT require, and what the County cannot achieve through offsets, is long-term structural change. While the Offset Provision results in the purchase of GHG reductions for a 30-year lifespan, building in structural urban sprawl throughout the County will create GHG emissions far beyond 2050. (AR 38:22770, 24183.) Under the Offset Provision, rather than achieving the low-carbon 2050 that California’s climate laws and plans envision, the San Diego Region will see a sharp *increase* in GHG emissions around 2050, when recently approved projects’ 30-year offsets will expire. (AR 1026:55128; see also CT 15:3907, CT 10:2458 [reflecting that both the Newland Sierra and Harmony Grove Village South projects purchased offsets for a 30 year period].)

In order to truly be able to reach its 2050 goals, California, and particularly the local governments who manage land use throughout the State, must make the hard infrastructure changes needed to create dense communities that are not heavily reliant on vehicle use for travel. Despite this, the CAP ignores VMT reductions in favor of providing an easy solution for developers that kicks the can down the road and saddles a future generation of Californians with the costs of climate change. The County attempts to characterize the Offset Provision as an “additional burden”

on developers seeking a general plan amendment. (County Reply Br. at 10.) In reality however, it is an attempt to provide a backdoor for developers to purchase CEQA compliance while avoiding the difficult work that achieving our 2050 goals will require. As a result, the CAP's Offset Provision cannot deliver the same level of reliable, verifiable, substantial, and long-term GHG emissions reductions that active planning by the County, and smart project design by developers, can. Moreover, the County cannot assert consistency with SB 375 and the SANDAG Plan while the Offset Provision stands in its current form.

For these reasons, the CAP cannot serve as adequate mitigation for the General Plan Update.

II. THE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE CLIMATE ACTION PLAN FAILS AS AN INFORMATIONAL DOCUMENT UNDER CEQA

“The fundamental purpose of an EIR [pursuant to CEQA] is ‘to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment.’” (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 [citing Pub. Resources Code, § 21061].) An EIR serves as “‘an environmental alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.” (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392 [citation omitted].) In conducting an EIR for broader planning documents, the California Supreme Court has emphasized that planning agencies “must ensure that CEQA analysis stays in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG, supra*, 3 Cal.5th at p. 519.)

Here, where the CAP will create foreseeable VMT increases that will lock in emissions in the County long into the future, the County is obligated to disclose these environmental changes to the public. Instead, the SEIR provides no analysis of the CAP's foreseeable conflicts with regional and State plans calling for land use planning decisions that reduce VMT, nor the air quality and environmental justice impacts that will also follow from increased VMT. This prevents the public and other agencies from adequately understanding how the CAP could impact future land use development, public health, and communities in the region. Moreover, the SEIR does not consider any alternatives that would reduce VMT in the region, and thus minimize the significant impacts created by the Offset Provision. For these reasons, the SEIR violates CEQA.

A. The County Did Not Adequately Evaluate Conflicts with the SANDAG Plan and SB 375

Despite the Offset Provision's inconsistency with the SANDAG Plan and SB 375, the SEIR offers no analysis of these conflicts. This directly contravenes CEQA's requirements. The CEQA Guidelines require that EIRs "shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans... [including] regional transportation plans." (CEQA Guidelines § 15125, subd. (d).) Further, "[i]f a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed" (*Id.* at § 15126.4, subd. (a)(1)(d).) While such impacts can be discussed "in less detail than the significant effects of the project as proposed," the impacts of mitigation measures cannot be ignored. (*Ibid.*) In addition, any inconsistency with the SANDAG Plan or SB 375 would strongly suggest that the CAP will work against the State's overarching environmental objective: to reduce statewide emissions of GHGs by 2050 to a level that is consistent with

climate stabilization (80 percent below 1990 levels). (AR 1026:55152 [Scoping Plan at p. 99].)

In contrast to CEQA’s mandates, the SEIR does not even acknowledge that the Offset Provision will foreseeably result in increased VMT, let alone provide a complete analysis of its consistency with the SANDAG Plan. (County Br. at 46-49; AR 38:22773-4.) Instead, the County argues that it need not evaluate its consistency with the SANDAG Plan because the County is “not required to make its ‘land use policies and regulations, including its general plan ... consistent with the [SANDAG Plan] or an alternative planning strategy.’” (County Br. at 47, citing Gov. Code, § 65080, subd. (b)(2)(J).) However, this explanation is irrelevant to whether the County has complied with CEQA. CEQA is a document of public disclosure and accountability, meant to provide the public, along with other government agencies, information on how the County’s actions may impact the environment, and other land use plans. (See *Ctr. for Biological Diversity v. Cnty. of San Bernardino* (2010) 185 Cal.App.4th 866, 882.) Here, the Offset Provision will foreseeably impact the ability of the region to meet its VMT reduction goals under the SANDAG Plan – an impact that could have regional environmental consequences long into the future. CEQA requires that the SEIR must discuss and analyze those impacts, even if, as the County argues, it does not have to make its General Plan Update consistent with the SANDAG Plan. It must, under CEQA, disclose and discuss the inconsistency.

The County’s other attempts to justify its lack of analysis are similarly unavailing. First, the County states that the SANDAG Plan does not require reductions in VMT, and that reducing GHG emissions with offsets is consistent with the SANDAG Plan and SB 375. (County’s Br. at 48.) However, as discussed above, SB 375 and the SANDAG Plan both require GHG reductions through land use changes designed to reduce VMT, and so

the County cannot achieve consistency with the goals of these laws and plans with a CAP that increases VMT. Second, the County claims that other provisions of the CAP and the General Plan Update will reduce VMT, and so it need not discuss any increases caused by the Offset Provision. (*Id.* at 46-47; AR 1340:58773-78, 58780-88.) However, the County fails to explain how the CAP measures it discusses, none of which prevent or reduce VMT from new residential development projects in unincorporated land, will prevent the increases in VMT caused by the Offset Provision. Moreover, the County does not address how provisions in the General Plan Update will minimize VMT increases caused by general plan *amendments*, which, by definition, do not conform to the General Plan's requirements.

Finally, the County argues that consistency with SB 375 and the SANDAG Plan will be considered by future GPA projects and that the development of future general plan amendments is too speculative to be analyzed now. (County's Br. at 48, 50.) However, the environmental review of future projects does not relieve the County of its requirement evaluate the Offset Provision's consistency with the SANDAG Plan and SB 375 under CEQA. (CEQA Guidelines § 15125, subd. (d).) Further, CEQA requires that the County consider the impacts of *foreseeable* general plan amendment projects. (Pub. Resources Code, § 21065.) At the time the SEIR was drafted, the County identified numerous pending general plan amendment projects, many of which had published climate changes analyses as part of draft or final EIRs, and analyzing their foreseeable use of offsets would have required no speculation. (AR 38:22490-92.)

Thus, the SEIR's failure to disclose and analyze the inconsistency of the Offset Provision with SB 375 and the SANDAG Plan (and thereby with the State's long-term climate objectives) violates CEQA.

B. The County Did Not Analyze Air Quality or Environmental Justice Impacts from Increased VMT

Transportation is a major source of air pollution statewide and can produce impacts such as “smog forming and toxic air pollutants. (AR 55100, 55127 [Scoping Plan at pp. 47, 74].) As the Scoping Plan acknowledges, “[a]ir pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease and early death.” (*Id.* at 55127 [Scoping Plan at p. 74].) In particular, these adverse health outcomes disproportionately impact “vulnerable populations such as children, low income communities and communities of color,” referred to in this brief as environmental justice communities.¹⁴ (*Ibid.*) By increasing vehicle use, the CAP will foreseeably increase tailpipe emissions that contribute to poor air quality and disproportionate health impacts on environmental justice communities in the County. Yet, the County offers no analysis in the SEIR of these impacts, and consequently prevents the public from understanding the full environmental consequences of the CAP. “A sufficient discussion of significant impacts requires not merely a determination of whether an impact is significant, but some effort to explain the nature and magnitude of the impact.” (*Sierra Club v. City of Fresno* (2018) 6 Cal. 5th 502, 519.) The County’s lack of analysis violates CEQA.

C. The County Did Not Adequately Consider Alternatives that Would Prioritize Density

CEQA requires that lead agencies consider “a range of reasonable alternatives to the project.” (CEQA Guidelines § 15126.6, subd. (a).) “[T]he discussion of alternatives shall focus on alternatives to the project or

¹⁴ The Government Code defines “environmental justice” as the “fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws regulations and policies.” (Gov. Code, § 6540.12, subd. (e).)

its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.” (*Id.* at § 15126.6, subd. (b); see also *Ctr. for Biological Diversity v. Cnty. of San Bernardino, supra*, 185 Cal.App.4th. at p. 882-83.) Here, despite extensive evidence presented in comments on the SEIR that the Offset Provision would create significant increases in VMT and conflict with the regional SANDAG Plan and SB 375, the County did not even consider an alternative that would limit sprawl and prioritize development in dense, urban areas. (See AR 38:22953-23034; see also AR 22:18424-25, 18440-41.)

The County asserts that it is not required to consider “every imaginable project alternative.” (County’s Br. at 52 [citing *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 354].) However, consideration of an alternative that would reduce VMT and prevent urban sprawl that could impact the whole region is patently reasonable and already envisioned by the SANDAG Plan. (See CEQA Guidelines § 15126, subd. (f) [“The range of alternatives required in an EIR is governed by a ‘rule of reason’ ... alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.”].) Moreover, this appellate district has recently found that a plan to reduce GHG emissions which failed to include an alternative that would “significantly reduce total [VMT]” was inadequate. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 17 Cal.App.5th 413, 436 [noting that “the state’s efforts to reduce greenhouse gas emissions from on road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced.”].) The County’s failure to consider an alternative that would prioritize density and other

carbon-efficient development strategies results in inadequate environmental review.

Thus, for these reasons, the SEIR violates CEQA.

CONCLUSION

The Superior Court's judgment should be affirmed.

Dated: October 29, 2019

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Per California Rule of Court § 8.204(c), I certify that this brief uses a
13 point Times New Roman font and contains 6,844 words.

Dated: October 29, 2019

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Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)


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- b. My electronic service address is (*specify*): debra.baldwin@doj.ca.gov
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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

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APP-009E – Item 4

Sierra Club, et al. v. County of San Diego

Fourth Appellate District, Division 1

Case No. D075478

Appeal From the Superior Court of San Diego

Case Nos. 37-2018-00014081-CU-TT-CTL

37-2018-00013324-CU-TT-CTL

37-2012-00101054-CU-TT-CTL

On October 29, 2019, based on a court order or an agreement of the parties to accept service by electronic transmission through TrueFiling, I caused the foregoing document described as:

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in this action to be sent to the persons at the electronic addresses listed below.

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This page last reviewed February 15, 2018

Offset Project Registries

Background

The Cap-and-Trade Regulation allows ARB to approve Offset Project Registries to help administer parts of the Compliance Offset Program. Offset Project Registries must meet specific regulatory criteria to be approved under the Regulation. Offset Project Registries will help facilitate the listing, reporting, and verification of offset projects developed using the Compliance Offset Protocols, and issue registry offset credits. Registry offset credits **cannot** be used for compliance with the Cap-and-Trade Program. Registry offset credits must be converted to ARB offset credits to be eligible for use in the Cap-and-Trade Program.

List of ARB Approved Offset Project Registries

All offset projects developed under an ARB Compliance Offset Protocol must be listed with an ARB approved Offset Project Registry. Offset Project Registries will help facilitate the listing, reporting, and verification of compliance offset projects, and issue registry offset credits. A list of approved Offset Project Registries can be found below.

- [American Carbon Registry \(ACR\)](#)
- [Climate Action Reserve \(CAR\)](#)
- [Verra](#) (formerly Verified Carbon Standard)

Guidance and Frequently Asked Questions (FAQs) for Offset Project Registries

ARB has developed guidance for Offset Project Registries. This guidance is intended to help Offset Project Registries and other offset program participants understand the role of the Offset Project Registries and how they interact with ARB and Offset Project Operators. In addition, ARB will develop Frequently Asked Questions (FAQs) that will be continuously updated as answers to specific questions are established. FAQs will be developed for general issues around Offset Project Registries.

- ***(Coming Soon!) Guidance for Approved Offset Project Registries***
- ***(Coming Soon!) FAQs on Offset Project Registry Related Issues***


Forms Made Available by Offset Project Registries

ARB has developed forms for use in the Compliance Offset Program. These forms may be used by program participants for submitting information related to listing, reporting, verification, and issuance of ARB offset credits. ARB will make all forms available on the [Compliance Offset Program Forms web page](#). In addition, each approved Offset Project Registry will make all forms available on its own public web page.

Application for Potential Offset Project Registries

Offset Project Registries must be approved by ARB to perform registry services under ARB's Compliance Offset Program. To become approved, potential Offset Project Registries must submit an

application and meet the requirements for education and experience as defined in section 95986 of the Regulation.

- The application below must be completed and submitted to ARB to begin the Offset Project Registry application process. If the applicant satisfies all the requirements of the regulation, they will be notified of the dates and times of approved ARB Compliance Offset Program and Compliance Offset Protocol training classes. Upon successful completion of training classes by Registry Staff the Executive Officer may approve the Offset Project Registry. Submission of this form and checking the appropriate box in Part IV will also suffice for applying to be an Early Action Offset Program.
- [Application for Offset Project Registry Approval](#) 

For questions or comments, please contact Stephen Shelby at (916) 327-8228 or via email at sshelby@arb.ca.gov.



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MISSION STATEMENT

Our mission is to provide a trusted source of high quality California-based greenhouse gas credits to keep investments, jobs, and benefits in-state, through an Exchange with integrity, transparency, low transaction costs and exceptional customer service.

CORE VALUES AND OPERATING PRINCIPLES

Quality California Credits: Participating air districts will only quantify credits for projects in California that follow protocols approved by the CAPCOA Board. Properly trained or certified air district staff or individuals that are CARB- certified, if applicable, will provide third-party verification of credit projects.

Collaboration: Participating air districts will work together to create and maintain an Exchange bulletin board that lists all available credits registered under respective air districts.

Integrity: The Exchange services will be provided with the utmost integrity so our customers can be confident that the credits they are providing, purchasing, or using are of the highest quality possible.

Security: The Exchange will be built with stringent measures to ensure that projects and trades are tracked carefully so credits are accurately issued and are used (or retired) only one time.

Transparency: Information on all aspects of the Exchange will be fully disclosed and easy to obtain to foster trust and respect.

Low Transaction Costs: The Exchange will seek to keep transaction and other costs as low as possible.

Excellent Customer Service: The Exchange, through its local air district network, will provide outstanding customer service to be responsive to customers needs and suggestions.

ABOUT US

Welcome to the CAPCOA GHG R_x. This site provides information on GHG credit projects within participating air districts. Credits available under the Exchange may be used to mitigate GHG emissions for CEQA or NEPA purposes or other applicable uses.

SEARCH PROJECT BY

Air District	<input type="text" value="Choose"/>	Project Type	<input type="text" value="Choose"/>
Project ID	<input type="text" value="Choose"/>	Project Name	<input type="text" value="Choose"/>
		<input type="button" value="Search"/>	<input type="button" value="Clear"/>

GHG CREDIT AVAILABILITY

Air District	GHG Credit Available MtCO ₂ e
	Achieved Prospective

GHG FUNDING OPPORTUNITIES

Click [here](#) for GHG grants and funding opportunities

GHG BULLETIN BOARD

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CAPCOA Greenhouse Gas Reduction Exchange (GHG R_x)

Home Back

SEARCH PROJECT BY

Air District Choose Project Type Choose Project ID Choose Project Name Choose Search Clear Show All Transactions

Search results for projects by

ID	Name	Developer	Description	Additionality	Credit Issuance	Pictures	Location Notes	Project Location
No records to view								

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Hydropower in the CDM:

Examining Additionality and Criteria for Sustainability

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http://erg.berkeley.edu/working_paper/index.shtml

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Executive Summary

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies. Hydropower makes up 30% of all carbon offsets projects registered under the Kyoto Protocol's Clean Development Mechanism (CDM) – just over 1000 projects as of 1 September 2011, the most of any project type. Hydropower also often has negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. This means that effective criteria to ensure that accepted CDM hydropower projects generate new and additional emissions reductions and do not cause substantial social and environmental harm is critical. Otherwise, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual projects that do not represent real emissions reductions, and risks transferring costs of climate change mitigation from polluters in the North to poor communities in the South.

This paper examines means for filtering CDM projects that have high likelihoods of generating real and new (additional) emissions reductions, and of avoiding substantial adverse social and environmental impacts. We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects, and on the Least Developed Countries (LDCs) which are the only host countries from which the European Union (EU) will accept CDM carbon credits for projects registered post-2012. We also evaluate the EU's assessment of compliance with World Commission on Dams (WCD) guidelines, a requirement for all large hydropower projects that wish to sell carbon credits into the European Emissions Trading Scheme.

ADDITIONALITY

The CDM requires each approved project to be 'additional': that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country.

Most large and small hydropower project proponents use the *Additionality Tool's investment analysis* to prove additionality, generally viewed as having the most potential to be accurate if performed well. The investment analysis is used to show that a project is not financially viable without additional funding available through the sale of carbon credits. The CDM's *Additionality Tool* also requires a common practice assessment as a credibility check; if a technology type is common practice, the proposed CDM project is not eligible for CDM crediting unless it can be shown to be "essentially distinct" from other similar projects in the same region.

Our analysis of factors that influence hydropower development decisions suggest the following conclusions:

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

2

Large hydropower should be excluded from the CDM in all countries because it is common practice, unlikely to be additional and additionality testing is inaccurate.

Large hydropower is a conventional technology that is being built in large quantities worldwide without carbon credits and should be considered common practice. China and India, the two countries with most hydropower CDM projects, have aggressive targets for building out their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal.

Furthermore, additionality testing is inherently inaccurate for large hydropower. First, financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. In China, India, the LDCs and other countries, the government plays a dominant role in deciding how much and which hydropower projects are built; additionality testing is not meant to predict the planning processes of governments that take into account many factors other than those directly related to cost. The interest in building large hydropower in China, India and other countries supersedes the relatively small effect CDM carbon credits have on hydropower project financial return. Second, uncertainty in investment analysis inputs – particularly in the viability benchmark, expected capital costs, and cost and production risk – allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developers, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test in those areas. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower projects to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size, location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for project types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. At present, by allowing the boundaries of the assessment to be defined narrowly, and “essentially distinct” to be defined broadly, practically any project can be shown to not be common practice. Projects under construction and projects in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM

project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

SUSTAINABILITY CRITERIA

Hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. The World Commission on Dams (WCD), established in 1998 in response to growing public scrutiny of large dams, developed a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.

To address concerns that hydropower projects can have serious environmental and social impacts the EU requires all credits from CDM hydropower projects larger than 20 Megawatts (MW) sold in the EU Emissions Trading Scheme to meet World Commission on Dams environmental and social standards, but similar standards are not required by the CDM itself.

Shortcomings in the EU’s assessment of WCD compliance

While the EU took a laudable step to operationalize the WCD guidelines, the current rules in many instances do not go far enough. Below we outline the shortcomings we find in the EU’s assessment of WCD compliance.

Inherent conflicts of interest in WCD compliance evaluations. The WCD requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. In our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation. We recommend:

- The Designated National Authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

Weak guidelines for and evaluation of stakeholder involvement. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior

and informed consent'. But the EU guidelines do not require mutual agreement of key issues such as compensation packages with all recognized adversely affected people; they had merely to be planned 'in consultation' with affected people. Furthermore, the proof of 'free, prior and informed consent' from indigenous or tribal peoples is not required. We recommend:

- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

Uneven access to compliance reports. Member States are required to provide publicly accessible information on projects that have been approved. We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. We recommend:

- EU member states should be required to provide online access to compliance reports and other relevant project information.

Only large hydropower projects must comply with WCD guidelines. Categorizing hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. We recommend:

- All hydropower projects, large and small, should be required to meet WCD criteria.

CONCLUSION

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on those communities that most vulnerable to the impacts of climate change. Excluding large and some small hydropower projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate change mitigation goals.

¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

Barbara Haya² and Payal Parekh³

Abstract

This paper examines the effectiveness of additionality and sustainability criteria being applied to hydropower projects applying for carbon crediting under the Kyoto Protocol's Clean Development Mechanism (CDM). We examine the conditions under which hydropower development decisions are commonly made, with a focus on China and India where the majority of CDM hydropower projects are hosted. We find that the CDM is having little effect on large hydropower development, and that the basic conditions needed for an accurate additionality assessment are not met. In particular, non-financial factors such as energy security heavily influence decisions to build large hydropower, and uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they actually are. Further, large hydropower and some small hydropower are being built in large quantities worldwide, are heavily supported by governments, and therefore should be considered common practice and ineligible for CDM crediting. We recommend that large hydropower be excluded from the CDM, and that small hydropower be accepted only in places where it is not already being built. The second part of this paper examines the European Union's (EU's) assessment of compliance of hydropower projects with World Commission on Dams (WCD) guidelines. We identify several shortcomings including auditor conflicts of interest, weak guidance for the assessment of public consultations, lack of documented acceptance of projects by project-affected persons, and insufficient access to compliance reports by the general public. We provide concrete recommendations to strengthen the EU's assessment of WCD compliance.

1 INTRODUCTION

The Kyoto Protocol's Clean Development Mechanism (CDM) allows industrialized countries (Annex 1) to partially meet their Kyoto Protocol commitments by reducing emissions in developing countries (non-Annex 1) and using the resulting emissions reduction credits towards their Kyoto targets. The CDM plays a pivotal role in the international climate change regime helping emitters in industrialized countries lower their costs of compliance and providing funds for renewable energy, energy efficiency and other emissions reducing activities in developing countries. An appeal of the CDM is efficiency – the CDM is designed to create a more global market for emissions reductions, allowing regulated emitters to reduce emissions wherever in the world it is least expensive to do so. However, critics of the CDM have

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challenged the program's efficiency claims, arguing that large numbers of CDM projects are generating credits that do not represent real additional emissions reductions (He & Morse 2010, Lazarus & Chandler 2011, Michaelowa & Purohit 2007, Schneider 2009, Wara & Victor 2008) and do not contribute to sustainable development (Boyd et al. 2009, Schneider 2007).

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies (Kumar et al. 2011). Hydropower makes up 30% of all registered CDM projects, just over 1000 projects (CDM/UNEP Risoe 1. Sept. 2011), the most of any project type. This means that the criteria applied to proposed CDM projects to ensure that accepted projects generate new and additional emissions reductions must be accurate and effective. If they are not, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual development of a conventional technology.

In addition, hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. To address this, the European Union (EU) requires all credits from CDM hydropower projects sold in the EU Emissions Trading Scheme (EU-ETS) to meet World Commission on Dams (WCD) environmental and social standards, but similar standards are not required by the CDM itself.

The analysis in this paper centers around a practical policy question – how to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts? We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects (CDM/UNEP Risoe 1. Sept. 2011), and on the Least Developed Countries (LDCs) which are the only host countries from which the EU will accept CDM carbon credits (Certified Emissions Reductions – CERs) for projects registered post-2012. We focus the assessment of sustainability criteria on the World Commission on Dams guidelines and the EU's assessment of WCD compliance.

Section 2 provides background information on different types of hydropower and a summary of the hydropower projects in the CDM. Section 3 examines the additionality of large and small hydropower projects, and the accuracy of additionality testing in the case of hydropower. Section 4 describes the common social and environmental impacts of hydropower projects of different sizes and types. Section 5 discusses World Commission on Dams (WCD) guidelines created to minimize adverse impacts from dams and the EU's assessment of WCD compliance. Section 6 presents our conclusions and recommendations.

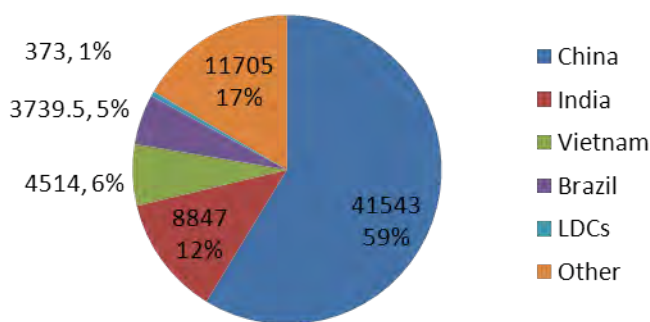
2 ABOUT HYDROPOWER AND CDM HYDROPOWER PROJECTS

There are over 37,000 large dams listed in the World Register of Dams, a database maintained by the International Commission on Large Dams (ICOLD), which defines a large dam as one with a height of at least 15 m from the foundation. No reliable data exist for the number of small dams worldwide (Anisfield 2010). Dams are built primarily for irrigation purposes. Hydropower, domestic and industrial use, and flood control (in descending order of use) are the other main reasons for building dams. During the 1990s, the majority of financial investments in dams were for hydropower projects (WCD 2000).

Currently hydropower is the largest source of non-fossil fuel electricity globally. In 2008 hydropower accounted for 16% of electricity supply worldwide with an installed capacity of 926 Gigawatts (GW), producing 3,551 billion kilowatt hours per year (Kumar et al 2011). Its growth is expected to continue in part due to its low carbon emissions.

China, Brazil and India are the 1st, 2nd and 6th largest hydroelectricity producer countries with installed capacities of 200, 84 and 38 GW, respectively (IJHD 2010). Hydropower constitutes 15.5 and 17.5% of the domestic grid in China and India, while it accounts for 84% of Brazil’s domestic electricity production (IJHD 2010). We highlight these three countries, because they represent over 75% of the hydropower projects in the CDM pipeline (Figure 1).

Figure 1: Total Installed Capacity (MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011).

2.1 SIZE CLASSIFICATIONS

While dams of all purposes are usually classified as large or small based on dam wall height, hydropower dams are usually classified by installed capacity (megawatts - MW). Hydropower dams can vary tremendously in size. In the CDM for example, the smallest project is 0.1 MW (Bhutan) whereas the largest is 1200 MW (Brazil). There is no consensus for setting the size threshold (Egré and Milewski 2002). For example, Sweden classifies a hydropower plant as large if its installed capacity exceeds 1.5 MW (European Small Hydro Association 2010), while in Canada and China the cut-off is 50 MW (Natural Resources Canada 2009, Ministry of Water Resources – China 2002). Defining hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). This is because hydropower is site specific (Kumar et al 2011, McCully 2001) and definitions of categories by government agencies are chosen to match local energy and resource management needs (Kumar et al 2011).

The CDM considers all renewable energy including hydropower projects with an output capacity up to 15 MW (or appropriate equivalent) small (Decision 17/CP.7, paragraph 6(c)). The EU Linking Directive on the other hand, considers hydropower with an installed capacity greater than 20 MW large (Directive 2004/101/EC, article 11a (6)).

2.2 RUN-OF-RIVER VERSUS RESERVOIR HYDROPOWER PLANTS

The two main types of hydropower are run-of-river (RoR) and reservoir (Figure 2 and Figure 3). Depending on the hydrology and topography of the watershed, both types can be large or small (Kumar et al 2011).

A reservoir hydropower plant stores water behind a dam for times when river flow is low, resulting in power generation that is more stable and less variable than RoR plants (Figure 3). Often the reservoir is an artificial lake located in an inundated river valley. In mountainous regions, existing high latitude lakes are sometimes turned into (larger) reservoirs. Reservoir hydropower plants can have major environmental and social impacts due to the flooding of land for the reservoir.

Figure 2: Schematic diagram of a Run-of-River hydropower plant

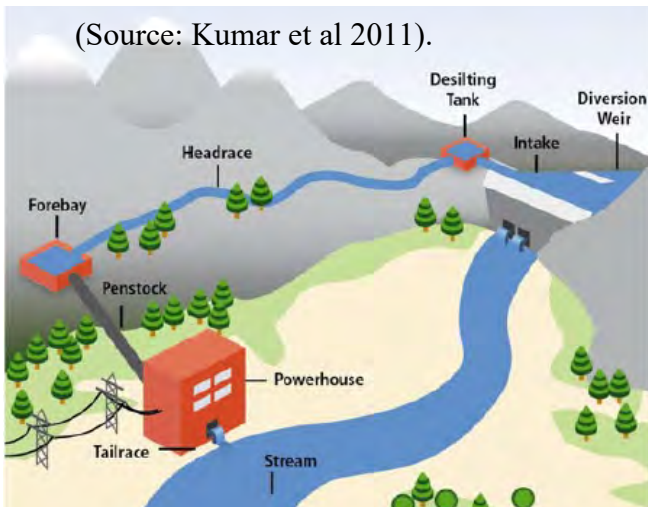
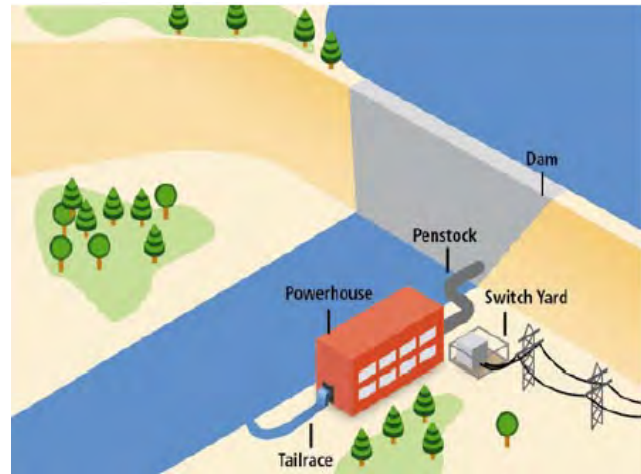


Figure 3: Schematic diagram of a reservoir hydropower plant

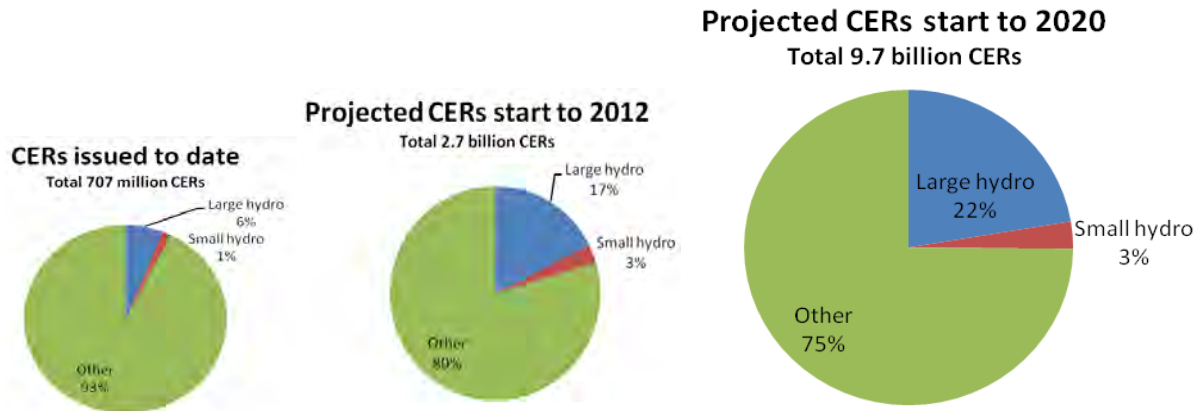


A RoR plant primarily draws energy from the available flow of the river (Kumar et al 2011), taking advantage of the natural elevation drop of a river. Therefore it is suitable for streams or rivers that have a minimum flow all year round or those that are regulated by a larger dam and reservoir upstream (Raghunath 2009). Water is diverted into a penstock or pipe and channeled to the turbine and then returned to the river (Figure 2). The elevation difference between the intake and the powerhouse provides the kinetic energy needed to power the turbine and produce electricity. The longer the diversion, the higher the environmental impacts can be. Power generation tends to be variable at RoR plants, depending on the extent of storage and the natural fluctuations in seasonal flow (Kumar et al 2011). RoR plants have either no storage or short-term storage; such reservoirs are usually smaller than those of reservoir hydro power plants. Yet RoR reservoirs can be quite large and there is no maximum size specified for RoR reservoirs above which they would be considered a reservoir hydro power plant. RoR dams can be ten to twenty meters high and can have gates to allow for water storage (McCully 2001). Impacts of RoR and reservoir hydropower plants are discussed in more detail in Section 4.

2.3 HYDROPOWER IN THE CDM

Hydropower is the most prevalent project type in the CDM pipeline (under validation and registered) comprising 26% of all projects. Hydropower accounts for 7% of CERs issued to date; it is expected to generate 20% of all CERs by 2012 and 25% by 2020 (CDM/UNEP Risoe August 1st 2011, see Figure 4). Hydro projects can register under the CDM either as small scale projects (<15 MW) or as large scale projects (>15 MW).⁴ While there are more small hydro projects (≤ 15 MW) in the CDM pipeline, larger projects account for over 80% of CERs from hydropower generated by 2012 and for over 85 % in 2020 (Figure 4; CDM/UNEP Risoe 1. August 2011).

Figure 4: Percentage of CERs from large and small hydropower in 2011, 2012 and 2020



Although hydropower is the most prevalent project type in the CDM, they are located in a small number of countries. Almost 90% of all hydro projects in the CDM pipeline are located in China, India, Vietnam and Brazil, countries considered emerging economies. Three of the four countries (China, India, and Brazil) are ranked within the top ten hydroelectric producing countries globally (IJHD 2010). China is expected to generate the most credits from small and large hydro (Figure 5, Figure 6, Figure 7, Figure 8). In contrast, less than 1% of registered projects are hosted in Least Developed Countries (LDCs).

⁴ Large hydro projects primarily (99%) use methodology ACM0024, which was developed for grid-connected electricity generation from renewable sources. All small hydro projects use the AMS-I.D.4 methodology, which was developed for grid-connected renewable electricity generation for small projects. Some small scale projects use AMS-I.A.4 or AMS-I.F.4 in conjunction with AMS-I.D, which account for electricity generation by the user; and captive use and mini-grid, respectively.

Figure 5:
Number of Registered Small Hydro (15 MW or less) by Country

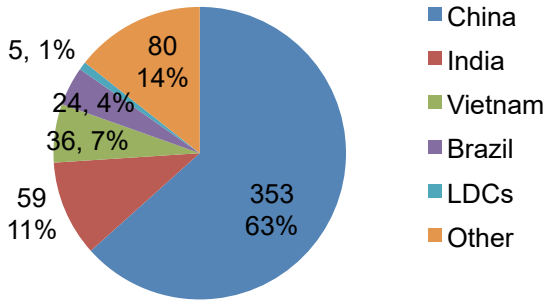


Figure 6:
Number of Registered Large Hydro Projects (> 15 MW) by Country

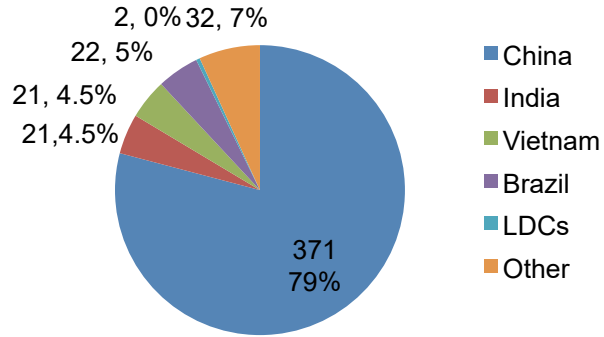


Figure 7:
Small Hydro Projects (15 MW or less) in the CDM Pipeline by Country

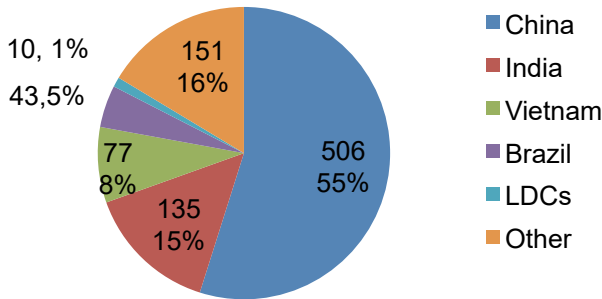
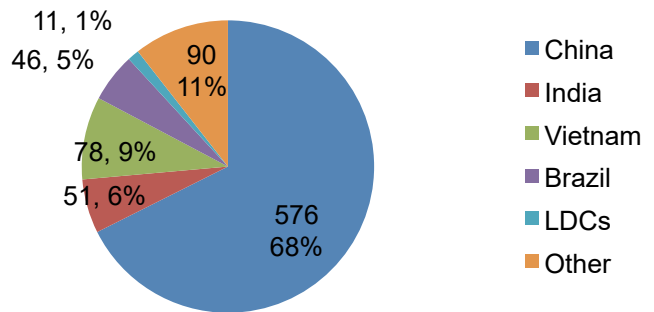


Figure 8:
Large Hydro Projects (> 15 MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011; Rejected and Withdrawn projects are not included).

3 EVALUATING THE ADDITIONALITY OF HYDROPOWER CDM PROJECTS

The CDM requires that a project prove that it is ‘additional’: that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country. Verifying that an activity is additional is difficult because it involves assessing the considerations of a project developer under a counterfactual scenario in which there was no CDM.

The “Tool for the demonstration and assessment of additionality,”⁵ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* has three basic steps. The project proponent must:

- identify alternatives to the project activity.
- conduct an investment analysis and/or a barrier analysis to prove the project would not otherwise proceed.
 - The investment analysis demonstrates that a project is not financially attractive without CER revenues.
 - The barrier analysis documents barriers that would prevent the project from going forward without the additional support from CER sales.
- undertake a common practice analysis as a “credibility check” to filter out project activities that are already commonly implemented.

In order to probe whether additionality testing is able to effectively filter out non-additional hydropower projects if performed more rigorously, we examine whether the conditions under which hydropower development decisions are being made are conducive for additionality testing.

Most large and small hydropower project proponents use the investment analysis to prove additionality, either alone or in combination with the barrier analysis. Most attention placed on improving project-by-project additionality testing focuses on improving the accuracy of the investment analysis, viewed as having the most potential to be accurate if performed well.

Two conditions are necessary for the investment analysis to be accurate: (1) Financial return must be a good predictor of whether a project will be built. And (2) an investment analysis must accurately and verifiably reflect the real financial considerations of key project decision-makers. We explore whether these two conditions are true for hydropower, and then examine whether large and small hydropower meet the CDM’s requirement that projects not be common practice.

⁵ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

3.1 IS FINANCIAL RETURN A GOOD PREDICTOR OF HYDROPOWER DEVELOPMENT?

In this section, we examine how large hydropower development decisions are being made with a focus on China, India and the LDCs to assess whether financial return is a good predictor of hydropower development and the likely influence of the CDM on hydropower development decisions.

3.1.1 Large hydropower in China

China's *Middle and Long Term Development Plan for Renewable Energy* calls for a doubling of China's hydropower capacity from around 150 GW to 300 GW between 2007 and 2020 (NDRC 2007). This hydropower expansion, in the country that already has the world's largest hydropower capacity, is unprecedented in its scale. Much of this growth is expected to come from the large and largely untapped hydropower capacity in the southwest of the country.⁶ Plans include a series of large back-to-back reservoirs along western rivers such as the Lancang and the Nu as a part of China's Great Western Development campaign. Much of the electricity from these dams will be brought to meet electricity demand in population and industrial centers in China's east (Magee & McDonald 2009).

China is heavily promoting hydropower and renewable energy as a way to decrease its reliance on coal. The high proportion of coal on China's grid (78% in 2009) is of concern because of increasing coal prices, growing reliance on imports and air quality impacts (Kahrl et al 2011). China has identified hydropower as the most important replacement of coal in terms of its percentage of power on the grid (ibid). There is also strong interest in hydropower development at the provincial and local government levels because of its potential to support local economic growth (ibid) and to ensure adequate electricity supply to attract industry.^{7 8}

Government in China plays a large role in determining how much and which hydropower is developed. The central government sets national goals for the sector as a whole, most importantly through its five-year plans. The government controls the amount of hydropower that is built by setting the tariffs for hydropower projects, which are set by China's National Development and Reform Commission (NDRC) on a project-by-project basis (Kahrl et al 2011). Despite steps China has taken towards introducing competition into its power sector through a series of reforms, the tariff-setting process maintains a top-down approach to carrying out policy objectives (ibid). The Chinese government also supports hydropower development by providing access to low-interest loans (Bogner & Schneider 2011).

Further, China's hydropower sector is predominantly state-owned. China's large hydropower development (defined in China as greater than 250 MW) is allocated to "the big five" – the five large state-owned companies that were created when China's monopoly state-

⁶ Shanghai Daily, (January 6, 2011). *China Ready for Flood of Hydropower*. (<http://business.globaltimes.cn/industries/2011-01/609534.html>, accessed 3 November 2011)

⁷ Interview with Kristen McDonald, on 9 October 2011

⁸ In the last five-year plan, China did not meet its goal for hydropower approvals, but this was due to tensions within the government between the Premier and the Ministry of Water on the one hand which rejected projects based on their expected environmental impacts, and the local governments and hydropower developers on the other which wish to build these projects (Magee & McDonald 2009), considerations that would not be influenced by the CDM. Hydropower in the CDM: Examining Additionality and Criteria for Sustainability 8

owned power company was broken up in 2002. Medium hydropower, defined as between 50 and 250 MW, is typically built by companies owned by some combination of subsidiaries of the big five, municipalities, and banks and private investors.⁹ These hydropower developers sell their power to the two state-owned grids, or less frequently to municipalities.¹⁰ Most banks in China are state-owned (Naughton 2007). Sinohydro, China's national hydropower developer, built around 65% of China's hydropower capacity.¹¹ State-owned enterprises in China generally do not lack capital resources or access to debt financing on good terms and receive various other forms of government support.¹²

Within this context, it seems highly unlikely that the CDM can lead to additional hydropower development in China. The government has a strong interest in supporting large scale hydropower development and has the means to effectively carry those goals forward. China's interest in building large hydropower supersedes the relatively small effect CERs have on hydropower project return. The investment analysis with its sole focus on financial return measured against a clear viability benchmark is not predictive of how large and medium hydropower development decisions are being made in China, given the range of consideration being made by government in China at all levels of decision-making.

3.1.2 Large hydropower in India

India is also expanding its power sector very quickly to meet soaring power demand and chronic power shortfalls. It anticipates quadrupling its electricity supply between 2005 and 2030, a tremendous undertaking. It intends to do so through pursuing all fuel options (Planning Commission of the Government of India 2006). India's Eleventh Five Year Plan called for 16.5 GW of hydropower to be built between 2007 and 2012 (Planning Commission of the Government of India 2008). The Central Electricity Authority recommends that 30 GW be pursued during the twelfth five year plan between 2012 and 2017 (Central Electricity Authority 2008).¹³

Hydropower is viewed as an attractive source of power because it is a domestic resource without the energy security concerns of coal and natural gas, a serious concern for India since it expects imports of coal and natural gas to increase in the future (Planning Commission of the Government of India 2006). Hydropower is also considered the best option for providing peak power (Planning Commission of the Government of India 2006).

In India, river development is determined through a government planning process involving a team of public and private actors. This planning process identifies potential large hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private (Central Electricity Authority 2008). These plans follow India's five-year planning cycle. The private sector is involved in hydropower development by participating in the planning process, and by responding to bid requests put out by national- and state-owned power companies.

⁹ Interview with Kristen McDonald, on 9 October 2011

¹⁰ *ibid*

¹¹ <http://www.hydrochina.com.cn/English/pages/aboutus/brief.jsp>, accessed 17 October 2011

¹² Interview with Kristen McDonald, on 9 October 2011, and noted in a number of CDM application documents for hydropower projects in China that are built by privately owned hydropower developers.

¹³ With the expectation that 25 GW is feasibly attainable.

Additionality testing is not meant to predict the planning decisions of governments, which consider a wide range of factors in their planning process beyond those directly related to cost. In the case of Indian hydropower, the planning commission takes into account energy security concerns, displacement of people, the need for peak power, and the competing uses of rivers for irrigation and flood control, all concerns that are not easily monetized and integrated into an investment analysis with a reliable benchmark (Central Electricity Authority 2008).

The Indian government has mapped out its hydropower resources by river basin, ranking the attractiveness of potential hydropower sites (Central Electricity Authority 2008). This ranking contributes to the decision of which plants will be built in what order. When hydropower sites are mapped out and ranked for future development, the most influence the CDM might have on planning decisions is to accelerate the pace at which some hydropower facilities are being built, not whether they are built at all, perhaps justifying only a few years of credits for some projects if the acceleration effect is discernible. This would be true for many countries in addition to India and China that have assessed potential hydropower sites with the intention of expanding their hydropower capacity.

The effect of CDM revenues on India's planning process is not clearly apparent. Neither India's 11th Five Year Plan nor its 12th Hydropower Plan mention the CDM or carbon credits as a factor in its decisions to support and develop hydropower and renewable energy (Central Electricity Authority 2008, Planning Commission of the Government of India 2008: Chapter 10-Energy). The few times the CDM is mentioned, it is only mentioned to highlight India's contribution to global climate change mitigation efforts, rather than as a factor helping India develop its hydropower resources (Planning Commission of the Government of India 2006).

The CDM is also unlikely to have much influence on private sector involvement in hydropower development in India. The tariff paid to hydropower developers per kilowatt hour produced is calculated on a cost-plus basis for each hydropower facility and is adjusted periodically to ensure that the developer receives a pre-agreed return on equity based on their true costs and power output. This return on equity investment is typically 14% or 15.5%.¹⁴ This means that most project costs are "passed through," since they are returned to the developer through the tariff. Therefore hydropower developers take little of the risk that there will be cost overruns during construction, or that less power will be produced than expected. As a result, the financial return to a large hydropower developer varies only minimally between projects. When the tariff is determined on a cost-plus basis per project, a financial return analysis has little meaning, and is not an appropriate indicator of whether a project would be built. Since tariffs are set to guarantee each developer a pre-determined return on their equity investment, the investment analysis is not meaningful in distinguishing the feasibility of individual hydropower projects.

3.1.3 Hydropower in general, with a focus on the Least Developed Countries (LDCs)

¹⁴ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

Of the twelve hydropower projects above 10 MW in the CDM pipeline (both registered and in the validation stage) in LDC countries, all but two document direct government involvement in the project in their CDM application documents (project design documents – PDDs).¹⁵

As our description of hydropower decision-making in China and India show, decisions to build hydropower are complex and political, and involve a range of considerations beyond those directly influencing cost. Large hydropower is often treated in a similar manner to mining; rivers are an exploitable resource that the government can use as political currency, giving the right to build a facility to public and private entities.

Government involvement, including through international, bi-lateral lending agreements and loan guarantees, is also common with hydropower development due to its nature as an infrastructure project, large upfront capital requirements, and high levels of uncertainty and risk associated with its construction costs and electricity output. Lending decisions can be based on political rather than purely financial grounds. For example, Chinese banks provide loans to Chinese hydropower development in Africa often as a part of much larger agreements for trade and investment between itself and the African country (Bosshard 2008).

Almost half of all hydropower plants with dams greater than 15 meters in height worldwide are considered multipurpose.¹⁶ These dams can be used for irrigation, flood control and/or other services in addition to electricity generation. Quantifying the benefits of these other uses, such as by attributing a portion of project capital costs to these other purposes, is far from straightforward. Benefits from other project uses are not commonly quantified in investment analyses for CDM hydropower projects. This means that hydropower CDM projects that serve multiple purposes can appear to be less cost effective than they actually are if benefits from other uses are left out of the investment analysis or are given a low value.

The influence of non-financial factors in hydropower development decisions is evidenced by the fact that large hydropower projects are typically more costly than predicted, sometimes by more than double (World Commission on Dams 2000: chapter 2), yet decisions to build large hydropower projects are repeatedly approved by governments as well as international and bi-lateral finance institutions based on low cost estimates.

Certainly cost affects the decision to build a large hydropower project, but given the relatively small effect of CERs on project return and the range of influences on project development beyond cost factors, the effect of CERs is in the noise and is not predictive of project development.

3.1.4 Small hydropower

Small-scale hydropower facilities, with their smaller electricity output and financial requirements, typically draw less political interest, involve different decision-making processes

¹⁵ Six are built directly by government developers, one was built by private developers responding to requests for proposals from the government, and one project mentions a government loan guarantee. One was a part of a larger economic, cultural and technical science cooperative agreement between the governments of Lao and Vietnam, and another involved an agreement to sell electricity from the project in Myanmar into the Chinese grid.

¹⁶ International Commission on Large Dams (ICOLD), Register of Dams, General Synthesis (http://www.icold-cigb.org/GB/World_register/general_synthesis.asp, accessed 3 November 2011)

and government support, and are more likely to be initiated by private sector actors compared to large hydropower. In some countries, like India and China, small hydropower formally involves different tariff-setting and planning processes. With regard to additionality testing, small-scale hydropower shares some features of large hydropower and some emerging technologies like wind, depending on location and size.

Many of the factors that make large hydropower a political decision are less important with small hydropower, including the importance for meeting electricity demand, potential for corruption, scale of the financial risk, and involvement of international lending institutions.

Both India and China actively support the development of small hydropower, defined as less than 25 MW in India, and less than 50 MW in China. Already in 2009 China had 55 GW of hydropower capacity, the most in the world. China's 2007 Renewable Energy Plan defined a goal of expanding China's small hydropower capacity to 75 GW by 2020. China is promoting small hydropower with a combination of tax benefits and dedicated and low interest loans, technical training and preferential tariffs (Jiandong 2009). Instead of defining the tariff for each project individually as is done with large hydropower, provinces should define preferential tariffs that are paid to private developers that choose to build small hydropower projects. China has a strong interest in supporting small hydropower, considered the best means for extending electrification to 100% of households, a priority goal of the government (Jiandong 2009). About one-third of China's counties rely on small-scale hydropower as their main power generation source (International Energy Agency 2007).

India also has goals to provide full rural electrification (Planning Commission of the Government of India 2006); small hydropower is viewed as an important way to provide electricity access to remote areas.¹⁷ India's 12th five year plan includes a goal of increasing its small hydropower capacity from just under three GW at the beginning of 2011 to around six GW in 2017.¹⁸ The Government of India has instructed the states to set preferential tariffs for small hydropower tariffs (Central Electricity Regulatory Commission 2009) and offers financial incentives including capital subsidies (Ministry of New and Renewable Energy 2009).

In both India and China, the preferential tariffs set at the state and province level mean that any approved hydropower project will receive that tariff, regardless of its costs.¹⁹ In this context, as opposed to cost-plus tariff determinations for large hydropower in both countries, the CDM could improve the financial returns of a project and could potentially spur more development. Still, the challenges with assessing the additionality of small hydropower are not unlike those of large hydropower. By setting goals for small hydropower development, defining promotional tariffs, and creating incentives the Chinese and Indian governments are substantially affecting the amount of small hydropower built. He and Morse (2010) describe how, by setting the tariff for wind, the Chinese government in effect decides what wind projects are additional and not additional. The same argument applies to small hydropower in both India and China. If the government does not see enough small hydropower being built, it can raise the incentives, or

¹⁷ From the Government of India, Ministry of New and Renewable Resources web site, <http://www.mnre.gov.in/>, accessed 19 October 2011

¹⁸ *ibid*

¹⁹ In practice this is not always the case. Tariffs for many of the small hydropower projects registered under the CDM in both China and India are set in the same way as they are for large hydropower.

if it sees that small hydropower is being built quickly, it can lower its incentives and invest those funds elsewhere.

This discussion suggests that the CDM is more appropriate for small hydropower in countries where the government is investing fewer financial resources to incentivize the development of small hydropower and where small hydropower would not be considered common practice (discussed below in Section 3.3). Ensuring small hydropower projects accepted for crediting have high likelihoods of being additional will also depend on the accuracy of the investment analysis for this technology (discussed in the next section).

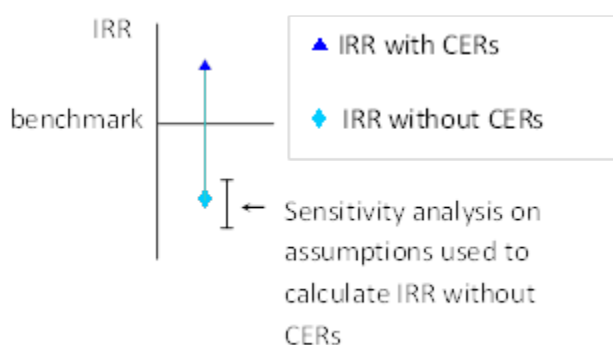
3.2 IS THE INVESTMENT ANALYSIS ACCURATE AND VERIFIABLE FOR HYDROPOWER PROJECTS?

In this section we assess the accuracy and verifiability of the inputs that go into the investment analysis. We first provide a more detailed description of the investment analysis, and then assess the level of uncertainty in two major investment analysis inputs – the benchmark and project capital costs.

3.2.1 The Additionality Tool's investment analysis

The investment analysis is used to show that a project is not financially viable without carbon credits. A benchmark is determined that represents the threshold financial return, or hurdle rate, defining whether the project would likely go forward. For renewable energy and hydropower projects, the benchmark is most commonly defined in terms of project or equity internal rate of return (IRR).²⁰ If the expected financial return of the project is below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. The financial assessment is tested with a sensitivity analysis of the most important cost and revenue inputs. It is optional to show that CERs bring the financial return of the project above the benchmark. Figure 1 illustrates the investment analysis for a project that is additional and uses IRR as the metric used to assess project financial return.

Figure 9: The Investment Analysis



3.2.2 Examination of the benchmark

Hydropower developers have used all four options recommended by the CDM Executive Board in their latest guidance on the investment analysis²¹ to determine the viability benchmark in their CDM application document. These four options are: (1) Local commercial

²⁰ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial return.

²¹ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

lending rates (for project IRR), (2) weighted average cost of capital (WACC)²² (for project IRR), (3) required/expected return on equity (for equity IRR), and (4) benchmarks supplied by relevant national authorities if the validator can validate their applicability (for both project and equity IRR).²³ Chinese hydropower developers almost exclusively use the fourth option, benchmarks supplied by the government. In India, most use the second option – the weighted average cost of capital (WACC).

Calculation of WACC typically involves a combination of two values – the cost of debt, and the expected return on equity investment, which is estimated with a market analysis. Following CDM Executive Board guidance in 2008 (CDM Executive Board 2009), hydropower projects registered in India in the last two years commonly calculate the expected return on equity using the Capital Asset Pricing Model (CAPM). CAPM estimates the equity return required by investors from a project as a risk free rate (e.g. government securities), plus a risk premium that takes into account the higher expected IRR needed to counterbalance the risk associated with the particular project type. CAPM uses the following formula based on historical return on equity:

$$\text{investor expected return} = \text{risk free rate} + (\text{market rate} - \text{risk free rate}) * \text{beta}$$

where government securities are typically used for the risk free rate, the market rate is the rate of return from the stock market generally, and beta captures the correlation between the fluctuation of the value of stocks in the specific industry of the project being analyzed and the stock market generally. For example, the milk industry should have a low beta, since purchases remain relatively steady regardless of the state of the economy, but luxury goods have high betas, since their purchase rates increase and decrease according to the state of the economy. In other words, beta indicates if hydropower investments are more risky or less risky than the stock market in general.

The risk free rate is fairly straightforward – this is the rate of return on investments that have very low risk, such as government bonds. The market rate and beta are both less straightforward, and values have differed considerably among the CDM applications of similar projects in a single country.

The CAPM model, while considered one of the most reliable ways of determining expected return on investment, is very dependent on assumptions used. We provide a simple example to illustrate this. Bhilangana III, a 24 MW hydropower project in India registered under the CDM in 2011, defines their viability benchmark using WACC. The interest rate on their debt is taken as the prime lending rate from the Reserve Bank of India as 9.62% at the time the development decisions was made. The CAPM model is used to estimate the expected investment return.

We examine just one of the inputs into the CAPM model – the market rate, which is the expected return of the stock market. The developers of Bhilangana III calculate the market rate as the average annual percentage increase on stock market values of the top 500 companies on

²² Weighted Average Cost of Capital (WACC) is the cost of capital to the project developers, normally combining two components: the costs of a loan (loan interest rates) and the costs of equity (return on equity required by an equity investor).

²³ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

the Bombay stock exchange (BSE 500) between February 1999 and February 2006. The choice of end date is the month that the investment decision was made. They chose the beginning date, February 1999, as the year of inception of BSE 500. The benchmark derived is 13.18%. If instead, February 2000 had been the first year with available BSE 500 data, the market rate would have been 3% lower, generating a benchmark WACC as 10.11%. The IRR of the project without carbon credits is calculated as 10.49%. The IRR of the project would have been above the benchmark and the project would not have been considered non-additional if the market return calculation started in February 2000 instead of February 1999, an arbitrary choice.

Other hydropower projects registered in India around the same time calculate benchmarks that range from 11.0% to 15.8% using the same method, by choosing different CAPM model parameters.

3.2.3 Examination of IRR analysis

We start this discussion with wind power development in India – a best case technology for an accurate IRR analysis – and then draw a comparison with hydropower. Wind power in India is a best case for an accurate IRR analysis because almost all investment analysis inputs are recorded in legal agreements before construction starts. Wind development in India involves a supply agreement between a wind developer and an investor whereby all of the major costs are agreed in formal documents before construction starts. In addition, most states in India publish their wind power tariffs paid to the project owner per kilowatt hour produced that would apply to all new wind development. Even so, for the majority of large wind projects registered in India, the choice of assumption about one cost input that is not pre-determined in the majority of cases – the tariff after the end of the first power purchasing agreement – can affect expected project financial return by around the same amount as expected increase by carbon credits (Haya under preparation). This means that wind power developers have some leeway to choose investment analysis inputs that could show that a feasible wind project is infeasible.

An investment analysis for a hydropower project involves much more uncertainty than for a wind project. For one, from the perspective of the project investor, the costs contained in wind project supply agreement are the actual costs that will be paid to the wind manufacturer. For a hydropower project, the capital costs documented in documents cited in the CDM project applications (Detailed Project Reports, feasibility studies, techno-economic clearance report, loan agreements, etc.) are best estimates. Actual costs can be less or more than what is written in these documents. Cost predictions for a single project often vary between project documents for a single project as cost estimates are revised over time. Hydropower is notorious for large cost overruns, but also in some instances has been less expensive than predicted (World Commission on Dams 2000). In addition, the perceived risk of cost overruns or project underperformance certainly influence project development decisions, but is not recorded in a citable document.

Further, as discussed above, there are many benefits of hydropower that are not easily quantified in an investment analysis, but when not quantified lead to a project appearing less cost effective than it actually is. Such benefits include energy security, the flexibility of being able to be used for base load and for peak load, and other uses for multi-purpose dams.

The investment analysis is accurate to the extent that developers report the same cost and revenue assumptions and benchmark in their CDM applications as they use in their internal decision-making. Uncertainty in investment analysis inputs enables a range of possible values,

from which the project proponent could choose strategically to show the project is less viable than it may actually be. This analysis of ranges of acceptable benchmarks and capital cost estimates shows that in the case of hydropower there is substantial room to choose assumptions.

3.2.4 More evidence that the IRR analysis is not filtering out non-additional projects

The timing of the start of project construction of CDM hydropower projects provide additional evidence that many non-additional hydropower projects are currently registered under the CDM. The *starting date of the project activity* documented in each PDD gives the date when project construction started or otherwise when “real action of a project activity begins/has begun” (CDM Executive Board 2008). Starting dates for 16% of all registered hydropower projects (180 projects) were prior to when the Kyoto Protocol entered into force on February 16, 2005.²⁴ Of these, 60% were registered in 2007 or later. The starting dates of 89% of all registered hydro projects were before the start of the validation process (start of the public comment period) indicating that certainty about a positive validation or registration was not needed for the decision to build the project to be made.²⁵

3.3 WHEN SHOULD HYDROPOWER BE CONSIDERED COMMON PRACTICE?

The *Additionality Tool's* common practice assessment provides a “credibility check” on the investment and barrier analyses. The common practice assessment requires discussion of activities that are in operation and are similar to the proposed CDM project in terms of location, technology and scale. As per the *Additionality Tool*, if similar activities are “widely observed and commonly carried out,” the developer must explain “essential distinctions” between the proposed project and other similar activities in terms of financial attractiveness or the presence of barriers. Projects in the CDM pipeline are excluded from the comparison.

3.3.1 Is hydropower common practice?

Worldwide hydropower is a conventional technology. Around 8,700 hydropower projects with dams at least 15 meters in height²⁶ and an uncounted number of smaller dams produce 16% of global electricity supply (Kumar et al 2011). As discussed above, hydropower is common practice in China and India. In Vietnam, with the third largest number of hydropower CDM projects, 36% of the country’s electricity production is from hydropower.²⁷ In Brazil, the country with the fourth largest number of proposed and registered CDM projects, 84% of the country’s electricity generation is from hydropower.²⁸ Hydropower is a mature technology, which has played an important part in electricity generation since the beginning of electricity generation.

The extent to which small and micro hydropower is common practice is less clear than for large hydropower and would need to be assessed for different size classes for each country,

²⁴ The starting dates for all registered CDM projects and projects in the validation stage are listed in IGES Institute for Global Environmental Strategies (IGES). 2011. IGES CDM Project Database. Japan: 1 September 2011

²⁵ The start of the public comment period is listed in the same database.

²⁶ Listed in the World Register of Dams, a database maintained by International Commission on Large Dams (ICOLD)

²⁷ International Energy Agency website http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=VN, accessed 21 October 2011

²⁸ US Energy Information Administration website <http://www.eia.gov/countries/cab.cfm?fips=BR>, accessed 21 October 2011

and if appropriate for different states or provinces. As mentioned above, small hydropower is defined differently in different countries, and typically attracts less government interest and government involvement than large hydropower. But small hydropower is already common practice in some countries. For example, China's small hydropower should be considered common practice due to the capacity that already exists in the country, and China's plans to continue to build small hydropower as the main way to meet China's rural electrification goals.

3.3.1 How common practice is being assessed

In China, 739 hydropower projects in China passed the common practice assessment and were successfully registered under the CDM. Many of them passed the test by defining "similar" projects narrowly, and then describing how the proposed CDM project faces more hardship in at least one way compared to each of the projects that are still considered similar to it. For example, Longjiang 240 MW Hydropower Project in Yunnan Province (CDM ref #4859) in China's southwest noted eleven medium-sized hydropower projects (50-300 MW) that started construction in the province after 2002 (when structural changes were made to China's electric power sector) and were in operation by 2008 (narrowly defined assessment boundaries). Of these eleven projects, seven projects are excluded from the analysis because they are in the CDM pipeline, registered under a voluntary offsets program, or sold power to a different grid within China. The following essential distinctions are then described between the proposed CDM project and the four remaining "similar" projects: the proposed CDM project expected lower financial return compared to one project, was offered a lower tariff compared to two projects, and expected a higher cost per kilowatt compared to the last similar project. Other reasons commonly used by Chinese hydropower project developers to describe their projects as distinct include that the expected capacity factor is lower than for other projects, and that the project developer is a private sector developer while most hydropower is built by state owned enterprises with preferential treatment from the government. Each of these distinctions may indeed be factually true for a particular comparison between two projects. However, if a project is considered distinct if it less attractive than a similar project in only one way among many, it can always prove that it is distinct. By allowing "similar" to be defined so narrowly, and "essentially distinct" so broadly, practically any project can show it is not common practice, even if it is sitting in a sea of hydropower development.

It is important to mention one more problem with the way common practice assessments are carried out. If additionality testing were perfectly accurate, it would be appropriate to leave out other similar projects that are in the CDM pipeline from the common practice analysis. In China, well over half of all hydropower projects that came on line in 2007 are in the CDM pipeline (Bogner & Schneider 2011). If some of these projects are in fact non-additional, which we are arguing could easily be the case for a large proportion of them, then they would be incorrectly excluded from the common practice analysis and the effectiveness of the common practice test as a credibility check would be compromised.

Our assessment of how the common practice test is being applied to hydropower projects in China indicates that the common practice assessment is not being used in a meaningful way. The boundaries defining what projects are "similar" to the proposed CDM project must be judged conservatively in the conditions of the particular sector and technology. A change in the structure of a sector, such as the breakup of the national Chinese power company in 2002, should not mean that projects built after 2002 are dissimilar from those built before 2002, since

hydropower development was supported before and after the change in the sector. Projects under construction and other projects in the CDM pipeline should be included in the common practice assessment. If a technology is deemed common practice, then projects using that technology should be considered common practice without the ability to show that they are “essentially distinct” which has been shown to be easy to do and therefore not meaningful.

3.4 DISCUSSION

In examining the additionality of large hydropower CDM projects we find three main reasons why large hydropower does not meet the CDM’s additionality requirements:

- Financial return is not a good predictor of whether a project will be built because non-financial factors have a large influence on the decision to develop large hydropower projects.
- Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are. These first two points mean that the investment analysis is inappropriate and inaccurate for large hydropower.
- Large hydropower is a well-established technology that is heavily promoted by governments and therefore does not meet the requirement that CDM projects should not be common practice.

Small hydropower typically benefits from less political backing and is thus more likely to involve private developers for whom financial return is more predictive of the development decision. However, the investment analysis is unreliable for small hydropower for the same reason as for large hydropower – because of uncertainty in input values. In some countries small hydropower is already being built at substantial rates and therefore should not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be identified that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernable for those projects types to continue to be eligible for crediting.

4 SOCIAL AND ENVIRONMENTAL IMPACTS OF HYDROPOWER

4.1 ENVIRONMENTAL IMPACTS

Dams, interbasin transfers and diversion of water for irrigation purposes have resulted in the fragmentation of 60% of the world’s rivers (Revenga et al. 2000). In the following sections we summarize the main environmental impacts of hydropower plants.

4.1.1 Impacts by size and type of hydropower plant

It is difficult to correlate the damage caused by dams to their size or type, as the impacts depend on local conditions. Generally small dams for non-energy purposes are considered to be less environmentally damaging than large dams and hydropower dams, but there have been

fewer studies documenting the impacts of smaller dams (Kibler 2011) and run-of-river dams. Gleick (1992) found that small hydropower facilities in the United States (< 25 MW) tended to exert greater ecological cost per unit of electricity produced compared to larger projects. A comparison of small and large hydropower projects on the Nu River in China also found that small projects more adversely impacted habitats, water quality and hydrology on per megawatt basis, relative to large dams (Kibler 2011).

Also, small hydropower projects are subjected to fewer regulations and less scrutiny in many countries. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011) and therefore are subjected to fewer additional checks (Kibler 2011). Small projects are permitted as individual projects, therefore cumulative impacts of multiple dams within a watershed are not considered. While large projects in India are granted clearance from the central government and required to carry out an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006). Projects between 25 and 50 MW require clearance from the environmental entity of the state that the project is located in, while projects smaller than 25 MW do not require any permits (MOEF 2006).

Run-of-river hydropower plants are generally less damaging than reservoir power plants, because it is not necessary to flood large areas upstream of the project for storage. Yet in some cases run of river impacts can also be severe due to river diversion over long stretches of the river. Also there is no standard defining the maximum storage size allowed for a RoR plant. Thus there have been cases of developers taking advantage of this ambiguity to misclassify their project as RoR so that it appears more environmentally benign (McCully 2001).

4.1.2 Impact of reservoirs

Dams have major impacts on the physical, chemical and geomorphological properties of a river (McCully 2001, WCD 2000). Environmental impacts of dams have largely been negative (WCD 2000). Worldwide, at least 400,000 square kilometers have been flooded by reservoirs (McCully, 2001). Impacts of hydro power projects extend to the construction of the support infrastructure including the construction of roads and power lines (Egré and Milewski 2002). Other secondary impacts include clearing of land upstream by communities that have been displaced (WCD 2000, McCully 2001). Such clearing can lead to further loss of biodiversity and increases in erosion.

Large dams with reservoirs significantly alter the timing, amount and pattern of riverflow. This changes erosion patterns and the quantity and type of sediments transported by the river (WCD 2000, McCully 2001, Kumar et al 2011). Sedimentation rate is primarily related to the ratio of the size of the river to the flux of sediments (McCully 2001, Kumar et al 2011). The trapping of sediments behind the dam is a major problem (WCD 2000, McCully 2001, Kumar et al 2011). Every year it is estimated that 0.5 to 1% of reservoir storage capacity is lost due to sedimentation (Mahmood 1987). Trapping of sediments at the dam also has downstream impacts by reducing the flux of sediments downstream which can lead to the gradual loss of soil fertility in floodplain soils.

Dams can also lead to changes in temperature and chemistry of the water in the reservoir and downstream. These changes often create more favorable conditions for non-native species (Thomas 1998). For example, aquatic weeds such as water hyacinths and orange fern have

become problematic in tropical and African reservoirs (WCD 2000, McCully 2001). A rise in temperature and accumulation of nutrients in the reservoir can cause algal blooms (WCD 2000 McCully, 2001), which in turn can lead to anoxic conditions during decomposition. Increases in certain types of bacteria in reservoirs can lead to the release of mercury from sediments and lead to the bio-accumulation of mercury in fish, a common problem in reservoirs (WCD 2000, McCully 2001).

4.1.3 Impact of river diversion

While both RoR and reservoir types of hydropower dams may divert water, this is always the case with RoR plants, since they seek to increase kinetic energy with an increased head. The length of diversion can range from a few meters or less to kilometers (km). For example, the Teesta V RoR dam in northeastern India diverts water for a 23 km long stretch of the river (Neeraj et al 2010). Eventually the diverted water is returned to the river. There have been fewer studies documenting the impacts of RoR and diversion projects. Nevertheless impacts can be significant. Often downstream flows are reduced considerably or even completely eliminated during certain periods of time with sudden intervals of high flows (Englund and Malmqvist 1996, Kibler 2011). Such drastic variability in water flow impacts the structure of aquatic ecosystems often leading to a loss of biodiversity (Englund and Malmqvist 1996, Kibler 2011). A decrease in fish populations has been observed in dewatered reaches below diversions (Amodovar and Nicola 1999, Kubecka et al 1997, Anderson et al 2006). After long periods of little to no flow some species may not be able to recover and go extinct (Kibler 2011). Also, under normal conditions, increased sediment transport from low to intermediate flows provides a warning to aquatic organisms that high flows may follow. Abrupt changes from low to high flows obliterate this cue, making it difficult for organisms to respond to impending environmental changes (Kibler 2011).

4.1.4 Impact on fisheries

Dams and river diversion can impact freshwater, as well as marine fisheries. Estuarine and marine fisheries are dependent on estuaries and rivers as spawning grounds and the transport of nutrients from the river to the sea. For example, the productivity in Mediterranean coastal waters is lower due to the reduction of nutrients transported to sea because of the construction of the Aswan dam (Aleem 1972, Drinkwater and Frank 1994).

Migratory fish are especially vulnerable to the impacts of dam construction. Dams can prevent migrating fish such as salmon and eel to reach their spawn grounds (WCD 2000). A survey of 125 dams by the WCD reported that blocking the passage of migratory fish species has been identified as a major reason for freshwater species extinction in North America. Lower catch is a common side effect of dams and has been reported worldwide (WCD 2000). There have been cases where fishery production below a dam has increased due to controlled discharge of the sediments. For example at Tucurui Dam in Brazil there have been an increase in the productivity of the fishery, but there are fewer number of species found (WCD 2000).

4.1.5 Impacts of multiple dams

Few studies have analyzed the cumulative impacts of multiple dams on a particular river, but the WCD (2010) has documented some. Placing 24 dams on the Orange-Vaal River in South Africa has led to changes in temperature on almost two-thirds of the river (2,300 km), which

affects the habitat of flora and fauna. Cumulative impacts of multiple small dams is especially important, since multiple small dams are often built on one river and its tributaries to increase power output. An analysis of proposed small (< 15 MW) hydropower projects on the Salmon River in the United States found that the combined effect of the dams proposed on that river could exceed those associated with the sum of the effects of each single project on their own (Irving and Bain 1993). Further studies are needed to increase our understanding of the interplay between multiple small dams.

4.1.6 Greenhouse gas emissions from reservoirs

Freshwater reservoirs can emit substantial amounts of the greenhouse gases methane and carbon dioxide as organic matter submerged in a reservoir decays under anaerobic and aerobic conditions, respectively (St. Louis et al. 2000, Fearnside 2004, Giles 2006).

From the limited number of measurements, GHG emissions from hydropower reservoirs in boreal and temperate region are low relative to the emissions from fossil fuel power plants, but higher relative to lifecycle emissions from wind and solar power (Mäkinen and Khan 2010). Tropical reservoirs with high levels of organic matter and shallow reservoirs have higher emission levels (Soumis et al. 2005). A recent compilation of greenhouse gas emissions from reservoirs found a correlation between the age of the reservoir and latitude (Barros et al. 2011). Younger reservoirs and those in low latitudes are the highest emitters. For example, one study of four Brazilian dams in the Amazon, showed that the GHG emissions factor of the electricity produced by those hydropower dams exceed those from a coal-fired power plant (Fearnside 2004, Kemenes et al. 2007).

To account for these GHG emissions the CDM Executive Board uses a threshold criterion to determine the eligibility of hydroelectric plants for CDM projects. Table 1 below summarizes the thresholds.

Table 1: How GHG emissions from hydropower projects are treated under the CDM

(Source: Mäkinen and Khan 2010).

Power Density (W/m ²)	CDM Rules
< 4	Excluded from using currently approved methodologies
4-10	Allowed to use approved methodologies, but project emissions must be included at 90 g CO ₂ eq/kilowatt hour
> 10	Allowed to use approved methodologies and project emissions can be neglected.

Projects with low power densities (< 4 Wm²) are not explicitly excluded from the CDM, but developers of such projects would need to create a new methodology and gain approval in order to apply for registration under the CDM. We tested the thresholds on a number of tropical hydropower reservoirs and found that they are effective at preventing projects with high greenhouse gas emissions from entering the CDM pipeline and can also account for emissions from hydropower reservoirs with power densities lying in the middle range.

4.2 SOCIAL IMPACTS

Similar to other large infrastructure projects, dams have both negative and positive social impacts. The benefits of hydropower include electricity from a local resource that has negligible

GHG emissions in most cases, delivery of peak power, and the avoidance of the health and environmental impacts associated with fossil fuels, especially coal. Multipurpose dams can also reliably deliver water and flood control as well as other ancillary services. On the other hand, displacement, loss of livelihood, poorer health and loss of cultural heritage²⁹ are some of the worst impacts (WCD 2000, McCully 2001, Kumar et al 2011). Often groups that bear the social and environmental costs of dams are not the ones who reap the benefits. Poor, vulnerable groups such as rural populations, subsistence farmers, indigenous communities and ethnic minorities often bear a disproportionate share of the negative impacts, while the main beneficiaries are urban dwellers, commercial farmers and industries (WCD 2000).³⁰

4.2.1 Displacement

It is estimated that 40-80 million people have been physically displaced by dams worldwide (WCD, 2000). In India and China alone, 26-58 million people have been displaced between 1950-1990 due to dam projects (Fernandes and Paranjpye 1997). These figures do not include displacement from other factors such as construction of canals, powerhouses or project infrastructure. In-depth case studies of eight large dams on four continents by the WCD (2000) found that in each case the expected number of displaced persons was initially underestimated by 2,000 – 40,000 people. Among dams funded by the World Bank, 47% more people were displaced than initially estimated (WCD 2000). The WCD case studies show that downstream communities, landless peasants and indigenous people are often not counted as project-affected and therefore often do not receive compensation. The impacts for down-stream communities are often only clear after the dam comes into operation and often impacts worsen over time. (WCD 2000). Resettlement has mostly been involuntary and there has been little meaningful participation of those affected in the resettlement and rehabilitation process (Cernea 1999, Bartholeme et al. 2000, Scudder 2005). In the most extreme cases, violence has been employed to force eviction.³¹

Compensation usually only occurs once as a cash payment or in the form of an asset such as housing and/or land (Bartolome and Danklmeier 1999, WCD 2000b). Lands provided for resettlement are often resource-depleted and environmentally degraded areas (WCD 2000). The focus of resettlement programs is on physical relocation, rather than economic and social development (Cernea 2000, WCD 2000b). In China, almost half (46%) of those displaced are living in extreme poverty (Driver 2000). In India, 75% of people displaced by dams have not been rehabilitated³² (Cernea 2000). The larger the number of people displaced from a project, the less likely that resettlement will be adequate due to lack of enough suitable land (WCD 2000).

²⁹ The socio-cultural impacts of displacement by large dams on communities has been poorly documented because socio-cultural impacts are intangible, making them difficult to monetize (McCully 2001, Koenig and Diarra 2000, Pandey 1998). Displacement often results in the loss of sacred land and common property resources (Caspary 2007). A study of a village displaced by the Rengali Dam in eastern India found a breakdown in family and community structures (Behura and Nayak 1993). Alienation and marginalization are major risks for displaced communities (Cernea 1999).

³⁰ For example, although indigenous people are 8% of India's population, they comprise 60% of those displaced by dams there (WCD 2000a). Almost all of the large dams in the Philippines that have been built or proposed are on the land of indigenous people (WCD 2000a).

³¹ For example: Over 350 Maya Achi people were killed during the forced eviction at the Chixoy Dam Site in Guatemala (Stewart et al. 1996). Over 1,000 people of the Ngobe tribe have been forcibly removed from their homes due to construction of Changuinola Dam in Panama (UN 2009).

³² Rehabilitation refers to economic, social and psychological adjustment after displacement.

4.2.2 Health impacts

Impacts on human health from large dams include an increase in vector-borne diseases in tropical regions, lower water quality and food insecurity (WCD 2000). The edge of tropical reservoirs and irrigation canals provide ideal conditions for disease-vectors such as insects and snails. McCully (2001) has documented numerous examples of the spread of schistosomiasis³³ after the construction of dams. Increases in transmission of malaria due to the construction of reservoirs and irrigation canals in malaria-prone areas have also been reported (World Bank 1999). Other health impacts include the release of toxins by cyanobacteria³⁴ due to rapid eutrophication in new dams and the bioaccumulation of mercury in fish, which is released from soil by bacteria decomposing organic matter in the reservoir (WCD 2000).

4.3 CONCLUSION

While hydropower dams can produce power with low GHG emissions and can in the case of multi-purpose dams also deliver flood and irrigation control, the adverse social and environmental costs can be substantial, as we have described above. Such negative impacts are not compatible with the promotion of sustainable development, one of the core objectives of the CDM. Evidence indicates that on the whole the CDM has not effectively fulfilled its sustainability objective (Boyd et al. 2009, Schneider 2007). This seems to hold true for hydropower projects as well. There is much anecdotal evidence that some hydro projects have been registered under the CDM despite their significant negative impacts. Table 2 gives a few examples of such projects.

The increase in opposition to large dams in developing countries by projected-affected persons and their supporters has led to the development of frameworks and standards to analyze and minimize project impacts that are dam specific, most notably the World Commission on Dams (WCD) criteria and guidelines. In the next section we discuss how the EU has used the WCD criteria to screen hydro projects that sell CERs into the EU-ETS. We also include a discussion of how the EU's process could be improved to increase the effectiveness of the screening.

³³ Schistosomiasis or bilharzia, is a parasitic disease caused by trematode flatworms. Schistosomiasis causes damage to the bladder, kidneys, liver, spleen and intestines.

³⁴ Humans are affected with a range of symptoms including skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage.

Table 2: A selection of registered hydropower projects with considerable adverse impacts**Allain Duhangan Dam (192 MW), India, Approved May 2007**

The project has suffered from inadequate rehabilitation of affected villages and environmental violations. The Office of the Compliance Advisor/Ombudsman of the International Finance Corporation (2005) verified that the project developer had not ensured enough irrigation and drinking water for affected villages. The project was also temporarily halted and fined for violations of Indian forest conservation law due to illegal felling of trees, dumping of waste and road construction.³⁵

Bhilangana (22 MW), India, Approved January 2007

Affected villagers never consented to the project and actively opposed the project.³⁶ Villagers opposed to the project were jailed multiple times and 29 people were arrested in November 2006 were forced to sign a document stating that they would stop resisting the project.³⁷ Significant physical abuse by the police was reported.³⁸

Jorethang Loop (96 MW), India, Approved February 2008

A survey of the affected villages by an Indian NGO after the public hearing found that many villagers were not informed about the meeting (McCully 2008). Requests by villagers and NGOs of project documents including the environmental impact assessment were ignored by the project developer (McCully 2008).

Xiaoxi (135 MW), China, Approved December 2008

A field report commissioned by International Rivers³⁹ documented problems include the forced eviction of 7,500 people, a failure to restore pre-eviction incomes, arbitrary and inadequate compensation for resettlers, a lack of legal recourse for those who suffered losses, and a non-independent EIA process marred by conflict of interest.

El Chaparral (65 MW), El Salvador, Approved March 2010

The public consultation process has been criticized as being neither open nor transparent. Adverse impacts include the displacement of 10,000 families in three municipalities, habitat loss of endangered flora and flooding of archaeological artifacts. The dam has divided and destabilized the community between those in favor and those opposed.⁴⁰

Barro Blanco (29 MW), Panama, Approved January 2011

Although the dam site is in an area recognized by the Panamanian government as collective property of the Ngobe indigenous people, only members of non-indigenous population were consulted. The project developer has also been accused of human rights abuses. An investigation by the European Investment Bank into human rights abuses at the dam site resulted in the project developer retracting their loan request and only then applied for registration under the CDM.⁴¹

³⁵ <http://www.internationalrivers.org/en/blog/payal-parekh/cdm-changing-lives-worse>
Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

5 ASSESSING THE EUROPEAN UNION'S SCREENING CRITERIA FOR HYDROPOWER

In order to minimize the negative impacts of hydropower effective screening criteria are needed. Yet assessing and mitigating the social and environmental impacts of hydropower projects is difficult and complex at best. Deciding whether the benefits of constructing a hydropower plant outweigh the costs requires multiple factors to be considered and weighed. Many of the impacts such as loss of traditional ecological knowledge or biodiversity are difficult to monetize and compare against one another (Koenig and Diarra 2000, Pandey et al. 1998). A cost-benefit approach is also problematic in cases when those that bear the social and environmental costs of a dam are not the same as those who benefit. As shown in the previous section, neither size (installed capacity) nor type are effective predictors of environmental and social impacts of hydropower dams. Additionally, empirical data from which to draw robust relationships is sparse (Poff and Hart 2002). Therefore classifying environmental and ecological impacts of dams based objective criteria such as dam size or type is difficult because impacts are influenced by the interactions among natural processes, dam characteristics and management practices (Poff and Hart 2002).

In the following sections we discuss efforts that have been made to develop such screening criteria. We summarize the World Commission on Dams criteria and discuss how they have been implemented in the European Union. In our analysis on the effectiveness of such criteria we also highlight the Gold Standard stakeholder process and discuss how the evaluation and verification processes could be improved to strengthen the effectiveness of such screening criteria.

5.1 WORLD COMMISSION ON DAMS CRITERIA

In 1998 the International Union for the Conservation of Nature (IUCN) and the World Bank established the World Commission on Dams (WCD) in response to growing public scrutiny of large dams. The mandate given to the Commission was to

- *review the development effectiveness of large dams and assess alternatives for water resources and energy development; and*
- *develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.*

Dams and Development (WCD, 2000), the report of the commission includes a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among

³⁶ SANDRP Comments on Bhilangana PDD, see <http://www.internationalrivers.org/global-warming/carbon-trading-cdm/sandrp-comments-bhilangana-hydro-project-uttaranchal-india>

³⁷ Asian Human Rights Commission, available at <http://www.humanrights.asia/news/urgent-appeals/UP-164-2005>

³⁸ Ibid.

³⁹ <http://www.internationalrivers.org/en/node/3006>

⁴⁰ CESTA Letter to CDM Board on El Chaparral Hydroelectric Project, see <http://www.internationalrivers.org/en/am%C3%A9rica-latina/cesta-letter-cdm-board-el-chaparral-hydroelectric-project-el-salvador>

⁴¹ Letter to the CDM Executive Board, see <http://www.internationalrivers.org/node/6215>

stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.⁴²

The WCD criteria go beyond a simple Environmental Impact Assessment (EIA), as it creates a process meant to address the complex set of considerations involved in dam development decisions. These include the recognition that most dams have negative impacts, and that the distribution of costs and benefits among different sectors of society is often unequal. Seven strategic priorities based on principles of equity, efficiency, participatory decision-making, sustainability and accountability were defined. They are:

1. **Gaining Public Acceptance:** There must be public acceptance of the project by affected people. Indigenous and tribal communities should give free, prior and informed consent.
2. **Comprehensive Options Assessment:** All possible options for water and energy resource management should be considered. Social and environmental aspects should be weighted equally as financial and economic factors.
3. **Addressing Existing Dams and Hydroelectric Projects:** New projects should be considered only after existing projects are at maximal efficiency.
4. **Sustaining Rivers and Livelihoods:** Location of a new dam should be chosen so as to minimize adverse environmental and social impacts.
5. **Recognizing Entitlements and Sharing Benefits:** Projected affected persons must be adequately resettled and rehabilitated and mitigation strategies should be implemented to sustain ecosystems and livelihoods.
6. **Ensuring Compliance:** Compliance by the developer of regulations, guidelines and agreements must be ensured.
7. **Sharing rivers for peace, development and security:** There should be cooperation and agreement for dam construction on transboundary rivers.

The WCD developed a decision-making process with five stages in order to fulfill the priorities. They are 1. Needs assessment; 2. Selection of alternatives; 3. Project preparation; 4. Implementation of project; 5. Operation of project. A further set of 26 guidelines outlines how to assess options, plan and implement dams projects in order to fulfill identified criteria for each stage of decision-making.

This short summary of WCD substance and process criteria make it clear that WCD requirements are extensive and complex. In the next section we discuss how the EU has used these criteria for their requirements for large CDM hydro project that wish to sell their CERs into the EU-ETS.

5.2 THE EUROPEAN UNION'S WCD CRITERIA TO ASSESS CDM HYDRO PROJECTS

⁴² The World Commission on Dams was a multi-stakeholder body that established the most comprehensive guidelines for dam building. The twelve members of the Commission were drawn from industry, government, academia and civil society. The Commission created a 68 member Stakeholder Forum with participants on various sides of the dam debate that served as an advisory group to the Commission. To gather information and data for the assessment, the WCD organized four regional consultations, performed case studies of eight large dams on five continents, commissioned country studies of China and India, undertook 17 thematic reviews of a wide range issues from environmental to institutional issues and conducted a global survey of 125 dams in 56 countries to "cross-check" the findings of individual studies.

The EU-ETS, launched in 2005, covers about 50% of the EU's CO₂ emissions and is currently the largest cap-and-trade system in the world and also the largest buyer of CERs.⁴³ The EU has placed several restrictions on what types of CERs can be used in the EU-ETS. To address concerns that hydropower projects can have serious environmental and social impacts, the EU added additional requirements for projects larger than 20 MW:

[...] Member States shall, when approving such project activities, ensure that relevant international criteria and guidelines, including those contained in the World Commission on Dams November 2000 Report "Dams and Development A New Framework for Decision-Making", will be respected during the development of such project activities. (Article 11b(6) of the Linking Directive)

The issue of how and if to restrict the use of credits from CDM hydro projects was contentious and the opinions between Member States varied considerably.⁴⁴ The final document was approved in 2004 and requires WCD criteria to be met for hydropower plants that are larger than 20 MW.

The language of Article 11b(6) of the linking directive is vague. For example, the text states that Member States are obliged to comply with 'relevant' international criteria and guidelines, 'including' those contained in the WCD. Up until 2008 there was no harmonized approach in the EU and the requirements for large hydro projects were interpreted differently by each Member State and implemented with varying degrees of rigor. This raised doubts about the environmental and social integrity of CERs entering the ETS and led to uncertainty and fragmentation in the European CER market. Many carbon exchanges excluded CERs from large hydro for fear that individual EU member states may refuse to accept them. In other words, "there was a danger that mutual recognition by Member States of national project approval decisions might break down" (Scott, 2011).

While the WCD evaluation and criteria are very comprehensive (the report is several hundred pages long), they do not include an evaluation process that could be used to assess WCD compliance ex-post. In 2008, the EU launched an effort to do exactly that: operationalize and harmonize the WCD criteria for the evaluation of large CDM hydropower projects. The European Commission launched an ad-hoc process of 'voluntary coordination' of Member State regulation of large hydro projects. In late 2008, all 27 Member states adopted uniform guidelines on the application of the linking directive's hydropower requirements (EU, 2008a), and a common compliance report template (EU, 2008b). All EU Member States agreed to use these harmonized criteria as of 1 July 2009:

⁴³ The EU-ETS is linked to the CDM via its 'linking directive' (Directive 2004/101/EC). This makes it possible for installations covered under the EU-ETS to use a certain proportion of CERs to meet their emission reduction obligations. In the 2nd and 3rd trading periods (2008-2020), up to half of the EU-ETS emission reductions can be met by using CERs and credits from Joint Implementation (JI). About 277 million CERs have been surrendered in the EU-ETS to date. 2% of those credits have come from large hydro projects (Sandbag, personal communication). Total demand for CERs in the EU-ETS until 2020 is estimated to be around 2.7 billion. In the sectors not covered under the ETS, such as agriculture and transportation, it is the EU member states that can choose to purchase CERs to achieve compliance with European emission reduction obligations.

⁴⁴ Germany, the Netherlands, Sweden and Belgium pushed for the inclusion of WCD requirements whereas Spain, France, Portugal, Italy, Greece, Austria, Finland and Estonia were opposed. There was also controversy about the threshold (10 MW or 20 MW) and a particularly fierce debate was held over whether compliance with WCD standards should be mandatory or whether Member States should simply be required to take them into account. For a more detailed history on the negotiations around the linking directive, see Hægstad Flåm, 2007.

Once a project activity has received a Letter of Approval (LoA) from an investor country upon the submission and positive assessment of a validated Article 11b(6) Compliance Report, all Member States agree to accept CERs/ERUs from this project for use in their national registries under the EU ETS. (EU WCD guidelines, 2008)

This means that in addition to the CDM application materials required by the UNFCCC, project developers are required to submit an Article 11b(6) Compliance Report to the Designated National Authority (DNA) of the Member State. The Compliance Report must be validated by a Designated Operational Entity (DOE).

The *Guidelines on a common understanding of Article 11b (6) of Directive 2003/87/EC as amended by Directive 2004/101/EC*, as the guidelines are officially called, include nine pages of guidelines including background information on the linking directive and the WCD spells out the procedural and content requirements needed for compliance.

The template of the compliance report, called *Compliance Report Assessing Application Of Article 11 B (6) Of Emissions Trading Directive To Hydroelectric Project Activities Exceeding 20 MW* is 17 pages long and includes specific questions on the seven strategic priorities of the WCD to evaluate compliance, these include:

Section 1: Description of the project, includes questions on dam height, total submerged area, number of displaced inhabitants and information on related infrastructure being build (e.g. access roads).

Section 2: Assessment of compliance with the WCD criteria:

- 1. Gaining public acceptance**, includes questions on the number of people affected by the project, how stakeholders were identified, informed and involved in the in the decision-making process, and how compensation and benefit agreements correspond with the identified needs and rights of the stakeholders negatively affected upstream and downstream due to the project. It also includes a question on how transparency was ensured.
- 2. Comprehensive options assessment**, includes questions about the needs for hydropower, potential alternatives and reasons for project choice and site selection.
- 3. Addressing existing dams/hydroelectric projects**, includes questions on national monitoring requirements for social and environmental issues and questions about how social and environmental issues of existing dams have been resolved.
- 4. Sustaining rivers and livelihoods**, includes questions about impact assessment (environmental and social) and cumulative impacts.
- 5. Recognizing entitlements and sharing benefits**, includes questions about mitigation, resettlement and development plans and compensation packages.
- 6. Ensuring compliance**, includes questions about complying with relevant laws, regulations, agreements (including resettlement and compensation agreements) and about the legal nature of the compensation agreements.
- 7. Sharing rivers for peace, development and security**, includes questions about trans-boundary impacts

The EU took a laudable and important step in developing these two documents to operationalize the WCD guidelines. It is a difficult and complex task to come up with guidance and requirements that capture the criteria in a meaningful and yet implementable way. Although

the harmonization effort has led to a more uniform application of the WCD guidelines, it did not succeed in fully capturing the criteria set out in the WCD. The shortcomings of the implementation documents can probably at least partially be explained by the process that was used to develop the current guidelines and template. The process that led to the adoption of the EU's WCD guidelines and compliance report template was informal and notably lacked transparency and public consultation.⁴⁵ For example, neither the European Parliament nor direct representatives of dam-affected peoples were involved (Scott 2011).

In order to avoid or minimize harm of such complex projects as hydropower, the WCD requires that planning and implementation processes be based on effective and fair stakeholder involvement, participatory decision-making and accountability. The EU evaluation is a one-time, ex-post check to make sure that the process was carried out in a satisfactory manner. Ensuring WCD requirements have been met ex-post is difficult given the complexity of the processes, and the subjectivity involved with assessing whether the WCD strategic principles were met in a meaningful way. In the following section we suggest concrete improvements in EU's assessment of WCD compliance.

5.3 DISCUSSION OF THE EU WCD EVALUATION REQUIREMENTS

5.3.1 Independent evaluation of WCD criteria is needed

The WCD report requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment (Scott 2011, Herz and Schneider 2008). This process is also used under the UNFCCC for the validation and verification of CDM projects. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. The lack of independence of these auditors has been criticized as one of the fundamental flaws of the CDM process (see for example, Schneider 2009 and Schneider and Mohr 2010). In informal conversations with the authors, project developers freely admitted that it is quite simple to get a WCD validation from a DOE. Also in our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation.

The independence of the verifier is especially important if the assessment being made involves subjective judgments, as does the WCD evaluation. For example, while the WCD requires stakeholder participation at all stages of project development, evaluating the quality of that involvement can be quite subjective. The public consultation requirement can be deemed fulfilled even if community members were not properly informed of the impacts of the projects or given the opportunity to meaningfully express their opinions, or if opinions received are ignored when project design decision are made.

⁴⁵ There were no formal rules of procedure and no minutes of the various meetings were kept. The main actors included the European Commission and representatives from the Member States. A number of stakeholders were invited to participate, yet aside from 2 NGOs (International Rivers and WWF) these stakeholders were limited to carbon market participants, (project developers and consultants).

Recommendations on improving independent verification

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future verifier hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Verifier performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

5.3.2 Improving stakeholder involvement and evaluation of stakeholder involvement

Public consultations are difficult to conduct effectively even when those conducting them have the best of intentions of creating a participatory and informed decision-making process. Consultations are especially difficult to conduct effectively when there are power imbalances among members of the affected communities. Those who are more powerful often can more forcefully or effectively express their opinions (Mosse 1995, Rosenberg 2001) and the consultation leader must work to ensure a range of voices are heard.

Sound and thorough stakeholder involvement is especially important for hydro projects with their potential to cause serious harm to local ecosystems and communities. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior and informed consent’ (WCD 2000). The EU compliance report template asks project developers to report on a variety of issues involving the participation of stakeholders in the decision-making process, but it falls short of requiring that project developers demonstrate the acceptance of key decisions by them. The template for example asks: *Were compensation and benefit agreements planned in consultation with affected groups?* And: *Were the affected people satisfied with the compensation packages?* But the template does not require that compensation packages had to be mutually agreed with all recognized adversely affected people, but had merely to be planned ‘in consultation’ with affected people. Furthermore, the report template does not require proof of ‘free, prior and informed consent’ from indigenous or tribal peoples.

The stakeholder process under the UNFCCC has long been criticized for being inadequate. To address and potentially improve guidance and requirements for stakeholder involvement, the CDM Executive Board recently launched a public call for inputs on how stakeholder consultations could be improved. Nevertheless the CDM Executive Board has continued registering projects that were implicated in creating significant harm; for example the Board recently registered a project that has been linked with serious human rights abuses (Bajo Aguan #3197⁴⁶) and several other projects that have been criticized for inadequate stakeholder

⁴⁶ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1260202521.42/view> Also see: <http://www.fian.org/news/press-releases/united-nations-under-pressure-to-denounce-human-rights-abuses-in-carbon-offsetting-scheme>

consultations in the face of stiff local opposition to the project (for example Barro Blanco #3237,⁴⁷ and Rampur hydro-electric project #4568⁴⁸).

It seems that the EU should be legally required to guarantee transparency and public participation: The EU has ratified the UN/ECE Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). The Aarhus Convention is a multilateral environmental agreement that grants the public rights regarding access to information, public participation in decision making and access to justice.⁴⁹ Yet the EU's harmonized procedures for approval of hydro projects do not specify clear mechanisms for the public to participate in credit application decisions, as required by the Aarhus Convention.

Recommendations on improving stakeholder involvement

More detailed requirements on how to conduct and verify stakeholder consultations and how to resolve contentious issues are especially important because WCD compliance assessments involve subjective judgments. The guidelines for carrying out and auditing stakeholder consultations prepared by the Gold Standard⁵⁰ (GS) could serve as a template for examining whether stakeholder involvement has been adequate. The GS guidelines require two stakeholder consultations. The first meeting is similar to what the UNFCCC requires, but much more guidance for organizing the meeting and content to be covered during the meeting is provided by GS. The second meeting is an opportunity for stakeholders to give feedback on how their comments were incorporated. The developer is required to submit a report detailing the outcome of the stakeholder consultations. The Gold Standard furthermore requires a "No Harm" assessment, guided by the UNDP Millennium Development Goals. Human rights, labor standards, environmental protection, and anti-corruption are assessed. The project developer is required to assess the risk of breaching 11 safeguarding principles and identify mitigation measures. For example, respect of rights of indigenous people and no involuntary settlement are principles listed under for the human rights category.

- Verifiers should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.

⁴⁷ <http://cdm.unfccc.int/Projects/DB/AENOR1261468057.59/view> Also see unsolicited letter by CDM Watch to the CDM Executive Board: http://www.cdm-watch.org/wordpress/wp-content/uploads/2011/02/Unsolicited-letter_Barro-Blanco-PA-3237_March-2011.pdf.

⁴⁸ <http://cdm.unfccc.int/Projects/DB/BVQI1299859361.8/view> For more information see: <http://www.internationalrivers.org/node/1428>

⁴⁹ Article 1 of the Convention states:

In order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being, each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention.

Access to information: any citizen should have the right to get a wide and easy access to environmental information. Public authorities must provide all the information required and collect and disseminate them and in a timely and transparent manner.

Public participation in decision making: the public must be informed over all the relevant projects and it has to have the chance to participate during the decision-making and legislative process.

Access to justice: the public has the right to judicial or administrative recourse procedures in case a Party violates or fails to adhere to environmental law and the convention's principles. (Rodenhoff 2003).

- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

5.3.3 Improving access to compliance reports

According to the guidance document, ‘Members States are to provide publicly accessible information on projects that have been approved as fulfilling the requirements of Article 11(b)(6) as well as indicating the entities accepted to carry out a validation of the Compliance Report in each Member State.’

We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,⁵¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. Sweden for example stated “The principle of public access does not mean that all documents are available online, but made available on request.” (e-mail communication with Swedish Energy Agency).

Recommendations on access to compliance reports

The lack of web-access to the compliance reports makes it difficult for stakeholders in host countries to get information needed to evaluate if a project has been sufficiently assessed. This could easily be remedied by requiring DNAs to make all the compliance reports available online.

- The transparency rules should be further harmonized: Member states should be required to provide online access to compliance reports and other relevant project information.

5.3.4 Requiring all hydropower projects comply with WCD criteria

Currently only hydropower projects over 20 MW are required by the EU to meet WCD standards. As discussed earlier, the distinction based on size of installed capacity is not adequate to filter out projects that cause substantial environmental and social harm. Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011), resulting in fewer checks. While large projects in India are granted clearance from the Central Government and required an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006).

Recommendation on extending criteria

- Small hydropower projects providing credits to the EU should also comply with WCD requirements and procedures.

⁵¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

6 CONCLUSIONS

This paper evaluated the additionality of hydropower projects in the CDM and sustainability criteria applied to these projects. Hydropower makes up 30% of all registered CDM projects and is expected to deliver close to a quarter of all CERs by 2020 (UNEP Risoe CDM/JI Pipeline Analysis and Database, 1 September 2011). Our analysis shows that the CDM's *Additionality Tool* is not effective at filtering out non-additional hydropower projects. We also find weaknesses in the EU's assessment of compliance with WCD guidelines. In the following conclusions we summarize the policy changes we recommend in order to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts.

Large hydropower should be excluded from the CDM in all countries because it is unlikely to be additional and additionality testing is ineffective. Hydropower is already a conventional technology that is being built in large quantities worldwide without carbon credits. India and China, the two countries with most hydropower CDM projects, have aggressive targets for utilizing their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal. The interest in building large hydropower in both countries supersedes the relatively small effect CERs have on hydropower project financial return.

Furthermore additionality testing through the assessment of financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developer, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – because of uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for those projects types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. Projects under construction and projects

in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

Large and small CDM hydropower projects seeking to sell their CERs in the European Union should fulfill World Commission on Dams (WCD) sustainability criteria.

Since hydropower projects of all sizes and types can have substantial, and sometimes severe, negative social and environmental impacts, all hydropower projects should be evaluated for their social and environmental impacts. Further, small hydropower is usually subject to fewer regulations and scrutiny than large hydropower. It would therefore be prudent that the EU’s WCD criteria be expanded to include hydropower projects below 20 MW.

The EU’s assessment of WCD compliance should be further strengthened. The EU’s efforts to operationalize the WCD guidelines are commendable but current rules and procedures do not fully capture the criteria set out in the WCD. Shortcomings include auditor conflicts of interest, weak guidance for the assessment of public consultations, and insufficient access to compliance reports by the general public. The current EU WCD requirements could be strengthened as follows:

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.
- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.
- EU member states should be required to provide online access to compliance reports and other relevant project information.
- All hydropower projects, large and small, should be required to meet WCD criteria.

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on communities most vulnerable to the impacts of climate change. Excluding large and some small hydropower

projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate mitigation goals.

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Agrarian livelihoods under siege: Carbon forestry, tenure constraints and the rise of capitalist forest enclosures in Ghana

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ABSTRACT

Drawing on theoretical insights from agrarian political economy, and based on empirical research in the High Forest Zone of Ghana using in-depth interviews and participant observation, this paper examined the context-specific but often less highlighted impacts of REDD+-based carbon forest development activities on local agrarian livelihoods. We find that although REDD+ intends to align local communities to benefit financially for contributions to carbon forestry, its uptake in the Ghanaian context has created entry points for the displacement of smallholder farmers through unregulated profit-driven and restrictive plantation-style carbon forest activities. This yields landless smallholder farmers whose labour is craftily integrated into a capitalist carbon forestry regime as tree planters, with many others striving to reproduce themselves through exploitative sharecropping arrangements and corrupt 'backdoor' land deals. We emphasize that, 'more than carbon' accumulation engendered by REDD+ is fast moving beyond land grabs to a more complex dimension in which the labour and financial resources of marginalized groups are further appropriated by forest investors, and their relatively powerful counterparts in what we term *intimate exploitation*. Given the ongoing plight of smallholder farmers, particularly the multitude of 'hungry' migrant farmers who seek 'salvation' in the High Forest Zone, it is obvious that REDD+ is pushed at the expense of ensuring food security. To sustainably address current land-related agricultural production bottlenecks and empower local communities to directly benefit from REDD+, we recommend that rather than centralizing both carbon rights and land rights in the hands of the state and a few private investors, community forestlands should be returned to local people under community-led forest management approaches. Local control of both land and carbon stocks will promote sustainable coexistence of smallholder agriculture and carbon forestry.

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1. Introduction

The Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks (REDD+) initiative emerged to strategically align local communities in developing countries to benefit³ financially for contributions to climate change mitigation through community reforestation and enhancement of carbon stocks (Hiraldo & Tanner, 2011; Leach & Scoones, 2013; Lemaitre, 2011; Lyons & Westoby, 2014; Sunderlin

et al., 2014). Based on claims of robust economic returns and the promise of a 'new salvation' for biodiversity conservation and climate change mitigation, private sector investment in carbon forestry⁴ under the REDD+ has grown in importance across sub-Saharan Africa (SSA) over the last decade (Asiyanbi, Arhin, & Isyaku, 2017; Leach & Scoones, 2013). Designed purposely to support developing countries' REDD+ efforts, the Forest Investment Programme (FIP) is one of the three funding windows of the Climate Investment Fund (CIF). It provides scaled-up financing in the form of grants and low interest loans to developing countries through partner multilateral development banks (MDBs) to implement reforms outlined in national REDD+ plans (World Bank, 2015).

Ghana was selected as a pilot country for the FIP in 2010 with a grant of USD 50 million to support national REDD+ activities. Through coordination between government and the private sector,

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E-mail addresses: mkansang@uwo.ca (M.M. Kansanga), iluginaa@uwo.ca (I. Luginaah).¹ ORCID: 0000-0001-8566-396X.² ORCID: 0000-0001-7858-3048.³ Benefits broadly denote the direct or indirect incentives and payments that derive from actions associated with reducing emissions from deforestation and forest degradation.⁴ The process of 'conserving and enhancing forest carbon stocks, and trading these values in emerging carbon markets' (Leach & Scoones, 2013)

Ghana's REDD+ strategy focuses on rehabilitating degraded natural forests, supporting off-reserve forest plantation development and promoting climate-smart agriculture especially in cocoa growing areas in the High Forest Zone. Through the Dedicated Grant Mechanism (DGM) of the FIP, a National Executing Agency provides demand-driven grants to organizations for carbon forestry activities (World Bank, 2015). The strategy aims to stimulate private sector investment in carbon forest plantation development in both on-reserve and off-reserve areas in the High Forest Zone (Ministry of Lands and Natural Resources, 2014). Critical to the implementation of REDD+ in the Ghanaian context, however, are the crucial questions of how to adequately reconcile the interests of project financiers with those of forest communities and ultimately, how local communities can be aligned to benefit from carbon forestry.

Despite the promise that stimulating private sector investment in forest plantation development and carbon financing will yield sustainable benefits to local farming communities and enhance carbon stocks, the outcome of close to a decade implementation of REDD+ in Ghana is arguably the reverse (see Asiyambi et al., 2017; Saeed, McDermott, & Boyd, 2018). In this paper, we analyse the political economy of REDD+ in Ghana by examining how private sector entry into the carbon forest development trajectory has influenced local farming livelihoods. Drawing on the experiences of smallholder farmers in the High Forest Zone where forest community lands are massively targeted for carbon forest plantation development, we interrogate how corporate penetration in the carbon forestry sector has engendered 'new' agricultural land access and labour relations that are detrimental to smallholder agriculture. This analysis contributes to the broader debate on the rise of transnational corporations (TNCs) in global resource management and agriculture, and the resultant 'depeasantization' of rural populations (Makki, 2012; Weis, 2007). From our choice of methodology, we contribute to the literature by 'telling the smallholder story, the smallholder way'.

Against the universalized claim that REDD+ will improve land tenure security in local farming communities in developing countries (Corbera, Martin, Springate-Baginski, & Villaseñor, 2017; Harvey, Dickson, & Kormos, 2010), the materialization of these benefits is heavily dependent on an array of contextual factors including the underlying power relations that structure access and control over forest resources among diverse actors, local land tenure dynamics, and the effectiveness of REDD+ implementation and regulatory frameworks (Asiyambi, 2016; Sanders, da Silva Hyldmo, Ford, Larson, & Keenan, 2017). Indeed, Peskett, Schreckenberg and Brown (2011) argue that using carbon financing for REDD+ in developing countries introduces new actors, interest and rules in the forest sector, with the potential to alter existing forest management practices in ways that have potential adverse implications on the livelihoods of weaker groups. With the increased involvement of the private sector in carbon forest plantation development in local communities in the Ghanaian context, coupled with the fact that these activities are profit-driven and rely mainly on external donor support, it is possible that existing agricultural land access arrangements and labour relations could be reconfigured in ways that adversely affect agrarian livelihoods. In the context of competing land uses from urbanization, mining and grazing in the forest sector, these ambiguities may be further reinforced (see Armah, Luginaah, Yengoh, Taabazuing, & Yawson, 2014; Kleemann et al., 2017; Kuusaana & Bukari, 2015; Owusu-Nimo, Mantey, Nyarko, Appiah-Effah, & Aubynn, 2018; Taabazuing, Luginaah, Djietror, & Otiso, 2012). Yet, the basic requirement to ensure a coexistence of farming activities and carbon forest development as stipulated in the national REDD+ implementation framework remains unenforced by the state and is largely at the discretion of private investors. Little attention has

been paid to the property rights the state devolves to private actors in the management of community forest resources.

Given that the High Forest Zone has relatively favourable climatic and edaphic conditions, and serves as a haven for many food insecure smallholder farmers from impoverished parts of the country, these tenure complexities could exacerbate food insecurity. In a regional analysis of the impact of REDD+ on food security, Tabeau, van Meijl, Overmars, and Stehfest (2017) finds that, SSA is the most adversely affected region. Compared to Central and South America (with 16.2% and 12.4% decreases in land use and agricultural output respectively) and China (with 7.1% and 1.3% decreases in land use and agricultural output respectively), reductions in land use and food production were more pronounced in SSA (19.9% and 18.1% respectively) (Tableau et al., 2017). Despite the fact that these regional statistics offer a general picture of the negative impacts of REDD+ on food production, a rigorous context-specific analysis of the lived experiences of smallholder farmers⁵ is crucial. In the Ghanaian context for instance, Asiyambi et al. (2017) give a hint on the local level inclusion-exclusion politics that characterize REDD+, and call for in-depth context-specific analysis of the experiences of forest-based communities.

Although a number of studies have recently explored forest management in Ghana (see Acheampong, Insaideo, & Ros-Tonen, 2016; Foli, Ros-Tonen, Reed, & Sunderland, 2017; Murray, Agyare, Dearden, & Rollins, 2018; Ros-Tonen, Derkyi, & Insaideo, 2014; Teye, 2013), little research attention has been paid to REDD+ despite the uptake of carbon forestry activities in farming communities in the High Forest Zone since 2010. Furthermore, while REDD+ is currently piloted in other countries in sub-Saharan African (SSA) where livelihoods are generally dependent on land-based resources, existing studies on its implementation have mostly focused on understanding its design, institutional frameworks of governance and benefit sharing arrangements (see Andersson et al., 2018; Asiyambi et al., 2017; Leach & Scoones, 2013; Saeed, McDermott, & Boyd, 2017; Saeed et al., 2018; Sills et al., 2017). Invariably, there are no studies that examine the distributional impacts of the uptake of carbon forestry on local livelihoods activities and food security. It is to this salient gap in the literature that this study contributes.

What we explore in this paper are opportunities for knowledge sharing, inclusiveness and sustainability towards finding a common ground for the reconciliation of environmental conservation and agricultural production in forest communities across the developing world. While this paper does not suggest a blueprint for carbon forestry, it takes a preliminary stance at stimulating the discussion on the distributional impacts of REDD+ on farming communities with the goal of broadening the scope of options policymakers and local communities can draw upon to ensure sustainable coexistence of food production and carbon forestry. This analysis further demonstrates the continuous relevance of the agrarian question in the developing world and highlights the critical need to reconcile the increasingly neglected food security concerns of local farming communities with ongoing environmental conservation objectives. This connects to the clarion call by Asiyambi (2016, p. 146) for researchers to, "also engage with more-than-carbon accumulations justified by carbon".

In this paper, we argue that beyond 'green colonialism' and the widespread land grabs engendered by carbon forestry across different geographical contexts (see Asiyambi, 2016; Barbier & Tesfaw, 2013; Ickowitz, Sills, & de Sassi, 2017; Lund, Sungusia, Mabele, & Scheba, 2017; Phelps, Webb, & Agrawal, 2010; Saeed et al., 2018; Sunderlin et al., 2014), neoliberal accumulation under

⁵ Small-scale farmers who cultivate for consumption and sell surplus for income (Chamberlin, 2008). Production is largely based on simple tools and inputs (Kansanga, 2017).

the REDD+ is rapidly moving into non-carbon frontiers in the Ghanaian context whereby the labour and financial resources of displaced local farmers are further appropriated through corrupt 'backdoor' land deals and exploitative labour relations. In the context of these challenges, we make several recommendations for restructuring the current carbon forest development approach.

2. Background

2.1. Forest resource management in Ghana

Prior to state-led forest management in Ghana, community forestlands were administered through customary law. Chiefs who are the custodians of the land held forestlands in trust for the people who possessed user rights (Owubah, Le Master, Bowker, & Lee, 2001; Teye, 2005). As timber became a major source of revenue in the colonial era, concessions of stool lands⁶ were zoned as forest reserves under the Forest Ordinance of 1927 and controlled by the colonial government (Owubah et al., 2001). Post-independence governments maintained this top-down state-led community forest management approach. Over the years, a number of policies were enacted to regulate forest resource use including the Forest Commission Act of 1960; Forest Concessions Act of 1962; Land Administration Act of 1984; Control and Prevention of Bushfires Law of 1990; Forest and Wildlife Policy of 1994; and the Forest and Plantation Development Act of 2000. These policies supported a concessional forest governance approach in which forest timber rights are vested in the president in trust for local communities (Owubah et al., 2001). To harvest timber under this system, a stumpage fee determined based on the standing value of the timber concession is paid to the GFC after which a Timber Utilization Contract is reached with the logger (Ministry of Lands and Natural Resources, 2014). Concerns over the unfair benefit sharing and the lack of access to forest lands by local communities led to the evolution of integrated community forest management schemes. For instance, as part of the Voluntary Partnership Agreement (VPA) under the European Union's Forest Law Enforcement Governance and Trade (FLEGT) program, the timber rights allocation procedure was revised to make it open to all citizens. However, the processing cost of putting in a bid still excluded many actors at the local level. To enhance the sustainable flow of benefits to local communities, Community Resource Management Areas (CREMAs) were created in 2000 as integrated forest governance avenues through which local knowledge systems and community needs can be brought to bear on decision making on forest resource conservation and utilization (Murray et al., 2018).

These co-management efforts were later consolidated under the Modified Taungya Scheme (MTS) in 2002 – a collaborative reforestation initiative between the GFC and local farmer groups in forest communities aimed at ensuring coexistence of local livelihood activities and reforestation projects (Ros-Tonen et al., 2014). Under this scheme, farmers were given degraded portions of forestlands to cultivate while taking care of trees planted by the GFC until the trees close canopy (usually after three years). The benefit sharing framework of the MTS allocated 40% of timber revenue to the Forestry Commission, 40% to each gang of farmers, 15% to traditional landowners, and 5% to the forest-adjacent community (Acheampong et al., 2016). The MTS did not result in tenure security after all – a situation which made aggrieved farmers to deliberately retard tree growth in order to prolong their tenure (Acheampong et al., 2016; Ros-Tonen et al., 2014). Since the last decade, the Land Use, Land-Use Change and Forestry (LULUCF) sec-

tor in the High Forest Zone became a net emitter of greenhouse gases – a development that justified the need for intense forest conservation (Kansanga, Atuoye, & Luginaah, 2017).

Against this background, Ghana as a party to the United Nations Framework Convention on Climate Change (UNFCCC), subscribed to REDD+ in order to mitigate deforestation through plantation development in both on-reserve and off-reserve lands (Ochieng, Visseren-Hamakers, & Nketiah, 2013). Initially, Ghana's REDD+ strategy embraced a 'learning from the ground up' approach in which about seven pilots were implemented to provide lessons for scaling up. Following the failure⁷ of these pilots, Ghana's REDD+ strategy has since shifted to, "the implementation of large scale, sub-national programmes that follow ecological boundaries (jurisdictions) and are defined by major commodities and drivers of deforestation and degradation" (Government of Ghana, 2015, p. 25). Although other REDD+ activities are planned for later implementation in the savannah zones, Ghana's REDD+ strategy currently focuses on enhancing carbon stocks in the High Forest Zone.

Ghana's REDD+ activities are implemented in two major phases. The first phase involved policy reforms and institutional strengthening aimed at advancing the design and implementation of policy reforms to create the necessary institutional capacity for sustainable carbon forest development. The second phase, which is the core of Ghana's REDD+ agenda is currently implemented through three major forest investment projects (World Bank, 2015). Project 1 aims at enhancing natural forests in agroforest landscapes in forest corridors in the High Forest Zone. Project 2 focuses on securing and enhancing trees in agroforestry and cocoa cultivation areas in the High Forest Zone with emphasis on the Brong-Ahafo and Western Regions. While extending forest conservation into target off-reserve community lands, this project is supposed to provide incentives for farmers on 'admitted farms'⁸ especially for the production of climate-smart cocoa. Project 3 focuses on, "enhancing carbon stocks through facilitation of plantation investment in severely degraded landscapes" towards linking several Forest Reserves in the High Forest Zone (World Bank, 2015, p. 12). It also aims to build private sector engagement in the REDD+ process. Unlike project 2 where provision is made for 'admitted farms' in off-reserve areas, project 1 and 3 have no such provision for farmers, especially migrant smallholder farmers who were already farming on these forestlands while taking care of trees planted by the GFC under collaborative forest landscape restoration projects.

Key stakeholders in the implementation of the REDD+ in Ghana include MDBs, the Ministry of Lands and Natural Resources (MLNR), the GFC (which hosts Ghana's National REDD+ Secretariat), the Ghana Cocoa Board (COCOBOD), the Ghana Investment Promotion Centre (GIPC), Local government units (Districts and Unit Committees), private forest investors, Civil Society Organizations (CSOs), local community members and traditional leaders (see Fig. 1) (Saeed et al., 2018; World Bank, 2015). MDBs under the direction of the World Bank provide overall funding for the REDD+ in the form of low interest loans and grants. The MLNR is the lead implementing agency and is responsible for overall management and coordination of carbon forestry activities at the country level, and reporting to the UNFCCC on behalf of the government of Ghana. The GFC hosts the National REDD+ Secretariat. It is the implementation arm of MLNR and coordinates carbon forestry activities in forest communities. COCOBOD has the mandate of

⁷ According to the Ghana Forestry Commission (2017, p. 35) these pilots failed due to the lack of technical expertise and financial backing. Moreover critical concerns such as tree tenure reforms, required national level policy decisions that were beyond the scope of the pilots.

⁸ Refers to farms that were already on community lands before they were rezoned as forest conservation reserves. Per Ghana's REDD+ implementation arrangements, owners of these admitted farms are entitled to continue to farm in these areas while project activities continue.

⁶ Local community lands administered through traditional customary practices under the leadership of the chief. In southern Ghana, chiefs are enstooled and sit on stools. The stool is a symbol of traditional authority.

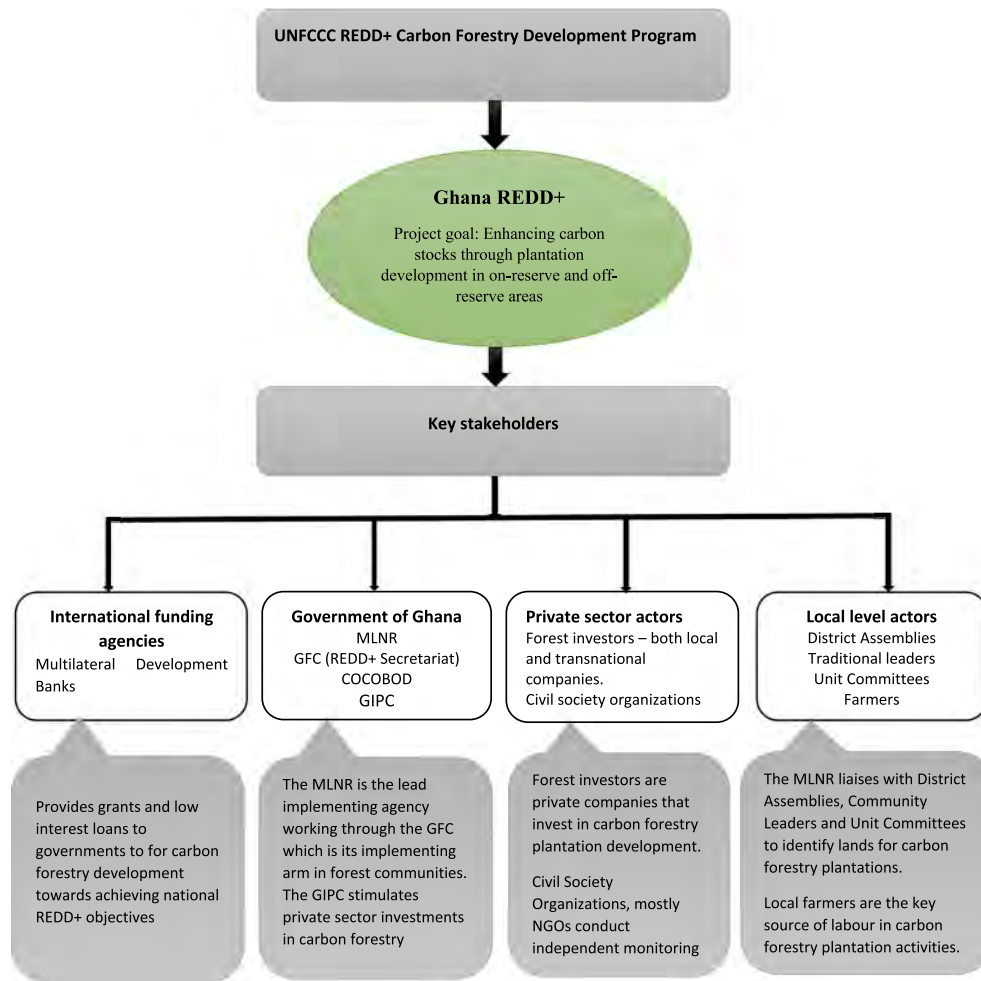


Fig. 1. Key stakeholders in the implementation of REDD+ in Ghana. Source: Adopted and modified from the Ghana REDD+ Strategy Report, 2015.

providing incentives and technical assistance to local farmers to support climate-smart crop production (particularly cocoa). The GIPC is responsible for creating incentives to stimulate private sector investment in carbon forest plantation development. It also spearheads the development of Public Private Partnerships (PPP) for the forest sector under REDD+. District Assemblies collaborate with local communities and traditional leaders to identify suitable degraded lands in forest communities for plantation development. Local farmers offer labour for day-to-day conservation activities. CSOs, mostly NGOs, are expected to engage in independent project monitoring and evaluation.

Currently, private sector involvement in forest plantation development includes the role of private investors as developers and owners of forests plantations; providers of technical services for tree development and buyers of timber (Ghana Forestry Commission, 2017; Saeed et al., 2018; World Bank, 2015). It is important to mention that private sector involvement in forest management in Ghana is not a novelty. In the past, private companies⁹ have been contracted by the state to offer secondary services to the GFC in previous state-led reforestation initiatives including the supply of seedlings and forest valuation. In recent times under the REDD+ however, their role in direct forest development has increased tremendously. For instance, between 2002 and 2010, 280 private forest investors were operating in 12 forest districts in the

country following the Expanded Plantation Programme that extended forest conservation activities from on-reserve areas to off-reserve community lands (Insaidoo, Ros-Tonen, Hoogenbosch, & Acheampong, 2012; Ros-Tonen et al., 2014). In the last ten years the GFC has released forestlands to a number of private forest investors, majority of whom are transnational corporations for plantation development in the High Forest Zone. Some of these companies include Portal Limited, FORM Ghana Limited, Mere Plantations Limited, Ecotech Services Limited, Zoil Services Limited, Kwadkoff Company Limited, Logwood Industries Limited and GroTeak Afforestation Limited.

Although benefit sharing plans under the REDD+ in the Ghanaian context are yet to be finalized as of the time of writing this paper (see also Saeed et al., 2018), the National REDD+ strategy outlines three broad benefits to be generated through carbon forestry on which any benefit sharing framework will likely be based. The first entails up-front indirect benefits including enhanced access to agricultural inputs, technical services and credits to support climate smart farming in forest areas. The second category include performance-based indirect benefits such as corporate social responsibility initiatives in forest communities. Direct performance-based benefits are the third category identified in the Government's REDD+ strategy report. These benefits include cash payments to local community CREMA funds for protection of designated off-reserve forest areas and the volume of climate-smart cocoa produced (Fox, 2017).

⁹ The category private is herein used to refer to large scale companies of both national and international origin involved in carbon forestry development in Ghana.

A number of salient issues underpin this potential benefit structure, especially when considering how local people can participate to improve their livelihoods. First, it is rather ironic that performance-based benefits to local communities are not determined based on the market value of the amount of carbon dioxide emissions local people's contributions to REDD+ initiatives are able to reduce. Rather these benefits are based on the amount of climate-smart cocoa produced by farmers. Secondly, access to the carbon markets under the REDD+ is restricted to government and so-called organized and financially capable investors. This limits the options available to local people to directly engage in carbon markets. Even among local farmers, cocoa farmers are prioritized while smallholders, particularly migrants, who produce food crops have no clearly stipulated direct benefits from carbon forest revenue. What is more pressing is that, with the current desire to extend carbon forest development into off-reserve forest community lands on which local farmers depend, coupled with the fact that restrictive plantation forestry has become the dominant carbon forest development approach (Leach & Scoones, 2013), the reproduction of local livelihoods may be grossly impacted.

2.2. Research sites

This study draws on the experiences of smallholder farmers from agrarian communities in the Bosomoa-Kintampo and Offinso forest districts (see Fig. 2). These forest districts are located in the High Forest Zone of Ghana which falls within the West African Biodiversity Hotspot. Some of the largest forest reserves in Ghana including the Bosomkese, Bosomoa, Afram Headwaters, and Afransu-Brohoma Forest Reserves are found in these study areas.



Fig. 2. Map showing the two forest districts of the study. Source: Author's construct, 2018.

The Bosomoa and Afram Headwaters Reserves for instance each span about 20,000 ha, comprising both natural and plantation forest. The High Forest Zone is the major food crop-producing zone in Ghana and attracts farmers from other regions.

The socioeconomic structure of the study context raises some salient concerns that make our analysis crucial. With increasing pressure on smallholder agriculture from climate change in recent times, the High Forest Zone in general is a key safety net for smallholder farmers from various poverty-stricken and relatively drier parts of the country, especially the three northern regions (see Kuire, Mkandawire, Luginaah, & Arku, 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017; Rademacher-Schulz, Schraven, & Mahama, 2014; Van der Geest, 2011). Also, smallholder farming is a fundamental part of the organization of social life in local communities in the High Forest Zone. As a result, local livelihoods are heavily dependent on community forest lands.

3. Theoretical framework

Theoretically, this paper illuminates the socioeconomic and political situatedness of the impacts of REDD+ on local agrarian livelihoods in Ghana. Specifically, it examines the nature and extent to which smallholder farming livelihoods are shaped and reshaped in the struggle for agricultural land following carbon forest development. Theoretical developments on land grabbing in the Ghanaian context have for some time now focused on large-scale agricultural land deals involving transnational corporations in the middle belt and savannah zones (see Aha & Ayitey, 2017; Boamah, 2014; Boamah & Overå, 2016; Choi, 2018) with little attention paid to the forest zone despite the ongoing leasing of community lands to private investors for carbon forest plantations. To adequately understand the outcomes of such local forest community land deals which often involve varied actors and interests, there is the need to situate particular land struggles within the broader agrarian political economies of land access and control (Hall, Hirsch, & Li, 2011; Montefrio, 2017; Peluso & Lund, 2011).

Despite the centrality of the concept of access to research on natural resource governance and utilization in forest communities (Faye & Ribot, 2017; Kansanga, Andersen, Atuoye, & Mason-Renton, 2018; Larson, Cronkleton, Barry, & Pacheco, 2008; Osborne, 2011), it has been defined differently in the literature. That notwithstanding, Ribot and Peluso's (2003) conceptualization of access as 'the ability to derive benefits from things' is useful to our analysis and gives a broader conceptual base for understanding how carbon forest development activities may be shaping smallholder farmers' access to forestland in Ghana. Ribot and Peluso's (2003) definition connects directly to the agrarian question and allows for a broader interrogation of the fate of smallholder farmers in a neoliberal natural resource management regime as capital rapidly moves into local agrarian spaces (Osborne, 2011; Watts, 1989).

In their concept of 'powers of exclusion', Hall et al. (2011) identified four powers (regulation, market, force and legitimation) that interact to shape land access relations. They argued that, instead of counter-posing 'exclusion' to 'inclusion' in understanding natural resource access and utilization at the theoretical level as already highlighted in the forest belt of Ghana by Asiyambi et al. (2017), emphasis should be placed on who is excluded, how, why, and with what consequences. Proceeding on this theoretical tangent, we consider the opposite of 'exclusion' not to be 'inclusion' but 'access'. This position is based on the realization that including local people in REDD+ processes does not necessarily guarantee them access and control over forest resources and carbon revenue. We therefore proceed on a broader theoretical lens grounded on the understanding that carbon forestry development not only occurs

through a governmentality which shapes livelihoods in a given context, but also influences the broader relations that make such social reproduction possible (Paprocki, 2016).

Moore (2013) draws attention to a critical dimension of the agrarian question that is directly relevant to the analysis in this paper. Moore (2013) argues that capitalism, owing to its inability to accumulate further through agriculture, has shifted its frontiers to other resources in the ecological sphere – particularly investment in forest as exemplified by the increased desire by transnational corporations to invest in carbon forestry in tropical areas of the developing world. Within the ecological sphere, ‘capitalism’ strives to redefine existing structural provisions in human-environment interaction such as customary tenure practices in order to create entry points that engender new political economies (Makki, 2012; Moore, 2017). These premeditated changes to the socioeconomic structure then provide strategic positional spaces for natural resource appropriation and the eventual crafty separation of local people from land-based resources in what Tobias and Richmond (2014) term environmental dispossession. This swift movement of capital from international into national and local agrarian frontiers is largely grounded on the desire to build neoliberal natural resource management and agricultural production regimes with value chains that facilitate accumulation (Bernstein, 2014; Myers et al., 2018; White, Borrás Jr, Hall, Scoones, & Wolford, 2012). Critics have argued that by privatizing and globalizing market economies, national sovereignty and state capacity are weakened as transnational capital moves into national spaces (Lyons & Westoby, 2014; Sassen, 2013). Lyons and Westoby (2014) observe that, ‘there is then a positive feedback cycle in which such investments lead to an increased debt regime’ thereby pushing weakened states to further disassemble national frontiers and legitimize foreign investment in local spheres including agriculture and forestry.

According to Tobias and Richmond (2014) separation of local communities from natural resources eventually sets in; directly through physical separation from land, and indirectly through processes of acculturation and assimilation. Drawing on the concept of ‘powers of exclusion’ (Hall et al., 2011) and environmental dispossession (Tobias & Richmond, 2014), our analysis interrogates how the uptake of REDD+ in the Ghanaian context produces new avenues for the displacement and exploitation of smallholder farmers. In particular, we highlight the mediating role of two powers of exclusion: ‘regulation’ and ‘market’ in shaping smallholder farmers’ access to farmland.

4. Methodology

As observed by Jacobs (2017), the complexities in the struggle over land-based resources cannot be resolved entirely on theoretical grounds since class struggle is not just an element in theory, but also a subject of empirical enquiry. This study is based on a five-month qualitative research conducted from May 2016 to September 2016 in the Bosomoa-Kintampo and Offinso forest districts in the High Forest Zone of Ghana using participant observation and in-depth interviews. We conducted in-depth interviews with 46 local farmers, 4 traditional leaders, and 4 local-level government representatives to uncover the experiences of farming communities with the uptake of REDD+. Participant farmers were sampled through a preliminary visit to the forest to obtain a first-hand experience of ongoing carbon forest activities. This approach helped us to locate farmers who were directly affected by carbon forest development.

We sampled participants to reflect the diverse socioeconomic backgrounds of farmers in the study context. Our sample included two broad categories: migrant and native farmers, majority of

whom were males. Female farmers mostly cultivated on lands within the immediate environs of the community. Male farmers were mostly those who went deeper into the forest to establish farms. Moreover, because family farming is the common farming arrangement in the study area, men who are culturally ascribed family heads mostly cultivated with their wives and were at the forefront of acquiring land. As a result, women were mostly removed from these agricultural land deals. There were however two cases where migrant women who initially settled with their husbands and farmed in the forest under the MTS continued to farm there after the demise of their spouses.

In terms of socioeconomic characteristics of sampled farmers, migrant farmers were mostly from resource-poor areas of the country especially the northern sector. Since they have no right of ownership over customary lands, they mostly farm under sharecropping arrangements with native farmers. Previous state-led integrated forest management schemes which allowed farmers to cultivate while taking care of trees planted by the GFC, further attracted most of these farmers to the forest belt. Most of these migrant farmers, in the attempt to maximize time on the farm and avoid the extra financial burden of renting homes in the community erected temporary structures close to their farms in the forest where they stayed and farmed with their nuclear families and only occasionally coming to town, mostly on market days. Native smallholder farmers on the other hand had relatively better socioeconomic status compared to migrant farmers. Unlike most migrant farmers who lived in deep hideouts in the forest, all native smallholder farmers lived in the town and were therefore able to engage in extra socioeconomic activities such as petty trading to supplement farm income. Following the extension of carbon forestry activities into off-reserve lands, some of these native farmers who previously owned lands in these areas before their re-designation for forest plantation development benefited from the ‘admitted farms’ provision and became forest caretakers¹⁰ for private companies. Most native farmers were therefore able to still engage in some form of cultivation albeit relatively minimal since production mostly has to conform to the permissible crop range of forest developers. Farmers in this category also served as ‘middlemen’ who helped migrant farmers to get temporal farming space under sharecropping arrangements. Educational attainment was low among both category of farmers for which reason interviews were conducted in the local dialect (Twi).

Data from interviews were complemented with secondary data from relevant academic literature, and government policy documents including Ghana’s REDD+ Proposal by the MLNR, and the 2016 – 2035 National REDD+ Strategy Report by the GFC. Direct quotations from the interview transcripts are used to substantiate key themes, contextualize responses, and maintain participants’ voices.

5. Findings and discussion

5.1. Growing trees in place of food? Agrarian displacements through REDD+

Contrary to the underlying requirement that REDD+ should be executed in partnership with local communities particularly to foster mutual benefits for all stakeholders, we find that local farming communities are rather being distanced from forestlands that they ‘must’ depend on for survival. Private forest investors have become the main developers of carbon forest plantations and are displacing

¹⁰ Forest caretakers are mostly community-level representatives/liasons who take care of forest concessions for private companies. These are mostly native farmers and are usually allowed to farm on portions of the forest while taking care of the trees.

local farmers on technical grounds of ownership through their largely unregulated and profit-driven plantation development activities. Central to this complexity over access to forestland are conflicts over meaning about customary and formal land tenure arrangements between farmers and forest investors. While local farmers still see themselves as legitimate co-managers of forest as was previously done under state-led integrated forest management initiatives, private investors regard themselves as 'new' owners of forestlands with the right to make new rules on forest development and resource utilization. These new rules have not only displaced local farmers, but technically frames them as 'illegal intruders' on private forest lands.

Our findings indicate that private forest developers involved in the rehabilitation of degraded forestlands evicted local farmers who were cultivating the land under previous state-led integrated forest management to allow for fresh forest plantation development. We argue that the rhetoric of 'painting' carbon forest development as a pathway to consolidating tenure security is a mere façade at the practical level. This strategic displacement of smallholder farmers by private forest developers is what [Asiyanbi et al. \(2017\)](#) term 'carbonised exclusion'. In the Ghanaian context these displacements were spontaneous and mostly without sufficient prior communication from the GFC or private forest developers. This eventually produced a landless class of smallholder farmers whose labour has been craftily integrated into a corporatized forest management system as forest caretakers and tree planters. Meanwhile, due to the limited nature of such jobs, the majority who do not get forest jobs constantly strive to reproduce themselves through unfulfilling 'backdoor' temporary land access transactions and sharecropping arrangements. A farmer expressed frustration at this displacement saying:

Since these lands [referring to forest concessions] were given to the companies and we were banned from farming there, I have since moved my farm from one hideout to another through the seasons. (Interview, 10 May 2016)

Even the few influential native smallholder farmers who were able to formally negotiate access to private company forest concessions to cultivate while taking care of trees had a different but equally challenging story. One native smallholder farmer observed:

When I finally got permission to use this land I am cultivating now, I was told the company would clear the land and supply seedlings. However, the company later complained of faulty chainsaws and instructed us to cut the trees ourselves which most of us did with our personal resources. Recently, we were asked to suspend all farming activities until after the national elections [referring to the December 2016 presidential and parliamentary elections]. (Interview, 10 May 2016)

Some displaced farmers who were unable to negotiate access to company lands through these backdoor mechanisms were left with no option but to return to portions of the forest that were already rehabilitated through the MTS. Meanwhile, cultivating in these deep hideouts in the forest comes with a key risk of having their crops destroyed during routine forest tours by the taskforce¹¹ of the GFC. A migrant farmer who lamented over his constant inability to renegotiate access to land said:

Four years ago, we were asked to stop farming on a portion of the forest the GFC allocated to us under the taungya Scheme since a new company had taken over the reforestation process. In my case, attempts at renegotiating access to land

under the management of the new company failed. As I speak, there is no other land to go to apart from parts of the forest already rehabilitated by the GFC. [...] This has been the only resort for most of us. Yet, the GFC taskforce keeps destroying our farms (Interview, 16 May 2016)

Despite the general difficulty in renegotiating access and the fact that women were mostly not involved in these land struggles in deeper areas of the forest, the predicament of a 49-year-old widow speaks to a gendered dimension in the gender-differentiated capacity of displaced farmers to renegotiate temporary access to agricultural land through backdoor means:

Since I relocated here with my husband, we lived and farmed in the forest until the company people [referring to a forest investors] came. Even so, my husband was mostly able to obtain a small parcel of land in the forest to sustain us until his demise. [...] Ever since, I have continuously struggled through the seasons to get a meaningful piece of land to cultivate. My children and I are still living in this bush here in the hope of getting some capital in order to go and settle in town (Interview, 12 May 2016).

In spite of the promise of efficiency in forest conservation with private sector involvement, local farmers adjudged private sector forest development activities as relatively more problematic. Most farmers held the opinion that previous state-led initiatives were arguably less restrictive even though they were not entirely immune to problems. The narrative of a 51-year-old displaced migrant farmer contrasts his experiences with the state-led MTS and the current carbon forest plantation development under REDD+. Highlighting how the latter is deepening the plight of smallholder farmers, he observed:

When I came into this community 15 years ago, I obtained land to farm under the taungya scheme while caring for trees planted by the GFC. We farmed under this arrangement for several years until it was rumoured four years ago that some concession of the forest was given to a private company called Mere Plantations Limited. The company asked us to stop farming on the land, cleared the land and started a forest plantation [...]. It is sad that several years since our eviction, more than half of the land still lies vacant with no trees planted. (Interview 11 August 2016)

[Phelps et al. \(2010\)](#) have argued that in the face of challenging capital requirements in forest development, developing country governments tend to revert decentralized forest regimes to meet the conditions of external forest development funding agencies. Eventually the frontiers of forest regulation shift in favour of investors who now make new rules to favour their profit-oriented activities ([Benjaminsen & Bryceson, 2012](#); [Ribot, Agrawal, & Larson, 2006](#)). It is this exclusionary potential of the shift in the mandate for resource 'regulation' [Hall et al. \(2011\)](#) call attention to in their concept of 'powers of exclusion'.

Building on the observation of [Lund et al. \(2017\)](#), we argue that a 'carbon Green Revolution' is underway in the forest belt of Ghana – an agenda whose tenets and underlying politics are geared towards producing forest and greening forest landscapes at the expense local farming livelihoods. The main vehicle for this agenda is the private sector, whose involvement in carbon forest development has not only deepened the agricultural land access challenges that arose in previous state-led reforestation initiatives but created new and more complex ones. Through the REDD+, private capital has now moved into forest landscapes in the ecological sphere and forestlands that were previously under state control have been privatized for carbon forest plantation development activities. By means of these crafty displacements described by [Benjaminsen &](#)

¹¹ These are trained forest guards of the GFC who ensure compliance to forest regulations at the local level. They conduct forest patrols to detect illegal activities and arrest perpetrators (see also [Hansen, 2011](#)).

Bryceson (2012) as 'green grabbing', non-capitalist agrarian forest spaces in the Ghanaian context are being opened-up for capitalist accumulation.

In contrast to the Mexican context where Osborne (2011) finds that smallholder farmers continue to have formal land rights following the uptake of REDD+ and can grow their own carbon-sequestering trees as a source of income, in Ghana, local farmers' rights to forestland under REDD+ are not guaranteed. Even usufruct rights to forestland previously granted by the GFC under state-led reforestation schemes have been truncated and redefined in ways that give private forest investors the 'ultimate' power to make decisions over forest resources with the government now playing a mere passive monitoring role. Beyond the theoretical imagery of perfect integration of local communities and their farming livelihoods contained in policy documents of REDD+, lies in practice, the very traits of capitalism which Marx (1978) describes as preoccupied with creating and expanding capital in ways that engender social relations of production centred on turning people (labour) and the environment into resources. In this emerging carbon green revolution, private sector investment in plantation forestry is giving rise to 'neoliberal forest enclosures' in farming communities which are used to further extend the contours of accumulation into non-carbon spheres.

5.2. Land access ambiguities as avenues for exploitation of smallholder farmers

This paper argues that beyond the widespread land grabs and green grabs engendered by carbon forestry across different geographical contexts (see Asiyambi et al., 2017; Barbier & Tesfaw, 2013; Bumpus & Liverman, 2011; Saeed et al., 2018; Teye, 2013), accumulation under REDD+ in the Ghanaian context has assumed a more complex dimension in which the labour and financial resources of displaced smallholder farmers are further appropriated under exploitative labour relations and backdoor land deals. By displacing local farmers and altering existing land access and labour relations, a conducive atmosphere is further created for accumulation. This resonates with Osborne's (2011) observation that such 'crafty' alterations of the socioeconomic and political context of resource access and control further acts as enclosure mechanisms that constrain the reproduction of rural agrarian livelihoods and determine local farmers' continuous availability and willingness to succumb to exploitative demands in the quest to survive.

Indeed, a growing body of literature highlight various tenure complexities that underscore carbon forestry development in tropical countries (de Aquino, Aasrud, & Guimarães, 2011; Holland et al., 2014; Ickowitz et al., 2017; Phelps et al., 2010; Sunderlin et al., 2014). Unique to the Ghanaian context, the unanticipated halt on smallholder farming that characterized the designation of off-reserve local community lands for carbon forestry, produced uncertainties and new exploitation mechanisms in forest communities. Left at the mercy of private investors, most displaced farmers are sometimes compelled to work through 'middlemen' to negotiate temporary access to forestland. A critical appraisal of these backdoor mechanisms that underlie smallholder farmers' struggle for forestland reveal the crucial but less highlighted mechanism we conceptualize as '*hierarchical corruption*'. This involves a chain of corrupt transactions whereby farmers are compelled to offer inducements to obtain agricultural land 'illegally' either directly from local forest caretakers or on sharecropping basis from other influential natives who also have to 'oil the lips'¹² of forest officials to obtain temporary user rights. Consistent with the obser-

¹² A local term used to describe the act of paying inducement to obtain a favour.

vation of Nel (2015) in the Ugandan context, there is eventually a "blurring of the lines between legality and illegality" where the negative impacts of the 'new carbon rules' are felt disproportionately by relatively less powerful smaller farmers who in this context, bear the burden of pushing through illegal means to gain temporary access to land at exorbitant prices. Lamenting on the exploitation and differential access possibilities that characterize the backdoor land access system, a displaced farmer observed:

These days, to get even temporary access to farmland in the forest you have to pass through an influential person using money. Land in fertile portions of the forest under these companies can be rented as high as 1500 Ghana Cedis [Equivalent to about 350 USD] per hectare for a planting season. [Sighs]. We are really suffering. It is only the rich among us with good connections [referring to networks] who get access to private company concessions. (Interview 4 June 2016)

Further highlighting the frustration and exploitation associated with the current struggles over accessing farmland, another smallholder farmer observed:

My main frustration with the involvement of these private companies is that the very land we were asked to vacate to allow for tree planting is now rented out to their 'favourites' under fraudulent arrangements for farming activities [...] I do not see any special attention being given to tree planting. (Interview 26 July 2016)

Because the lands are transacted on illegal grounds, and paid for by farmers, enhancement of carbon stocks which is the ultimate purpose for the implementation of the REDD+ is rather neglected by farmers who struggle to meet the financial conditions of these illegal leases at the end of each planting season. Even with these informal payments, local farmers are not guaranteed a secure tenure. Farmers alleged that occasionally, investors destroy their farms when they are spotted. A displaced farmer who expressed worry about the uncertainty and insecurity associated with farming on such backdoor basis said:

Even though I paid to farm here this season, I am always afraid of my farm being destroyed if spotted by the GFC taskforce. [Farmer asks rhetorically] how can we produce enough to feed to even think of expanding our farms under this situation? (Interview 12 August 2016)

While we argue that restrictive and 'market-driven' carbon forest plantation development is the foremost and major catalyst for the displacement and eventual exploitation of smallholder farmers in the Ghanaian context, we also draw on Hall et al. (2011) idea of intimate exclusion to highlight that local farmers themselves are agents of exclusion and exploitation under REDD+. In the next section, we demonstrate how relatively richer native farmers deepen the exploitation of poorer migrant smallholders in what can best be described as '*intimate exploitation*'.

5.3. From exclusion to 'intimate exploitation'

Akin to the observation of Holmes & Cavanagh (2016), we argue that neoliberal forest conservation under REDD+ has widened existing inequalities and levelled a disproportionate land access burden on migrant smallholder farmers. There is no doubt that migrant farming has become a key strategy in tackling food insecurity in Ghana (Kuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). Contextualizing the political economy of the study context for instance, it is evident that the local farming population is a microcosm of the national population with smallholder farmers congregating from different parts of the country in search of

fertile lands and better rainfall patterns (Kansanga et al., 2017; Kuuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). That notwithstanding, migrant smallholder farmers who in most cases are escaping the shackles of poverty from resource-poor source regions end up in 'new poverties' of extreme labour and financial exploitation. Relatively wealthier native farmers by virtue of their financial 'muscle' and social networks are able to negotiate access either by being forest caretakers or through backdoor land deals and in turn appropriate the labour of displaced migrant farmers under exploitative sharecropping arrangements. Thus, we argue that these 'new' land and labour relations under the REDD+, tend to favour 'some' but disadvantage 'many'. A migrant farmer recounts his experience:

For the past two years, I have been struggling to access farmland. Just to keep myself in active farming life, I took to share cropping with a native who helped me with this land. Because now it is not only the native landowners we share the farm produce with, but also the local forest caretakers, we end up making losses. (Interview, 10 May 2016)

While under conventional sharecropping practice in southern Ghana two-thirds of the annual farm produce goes to the landowner and the remaining one-third to the farmer, migrant farmers are getting even lesser of the farm produce in the already unfair produce distribution system following the uptake of REDD+. Unlike the conventional sharecropping practice where farm produce is shared between just the farmer and the landowner, current produce sharing arrangements feature 'new actors' mostly middle men and forest guards who work to shelter the farming activities of migrant smallholder farmers in strategic hideouts in the forest. Although there is no generally agreed system of sharing produce under these 'new' sharecropping arrangements that have evolved, most migrant farmers pointed to the fact that they mostly have to settle all other middle men from their one-third share of the total produce after sharing with the key individual from whom they obtained the land. As observed earlier, this exploitation is deepening largely because, the REDD+ in its design, prioritized some smallholder farmers especially cocoa farmers, most of whom either benefited from the 'admitted farms' provision under the REDD+ or are relatively well networked and able to negotiate access to forestlands at the expense of relatively poor food crop growing migrant farmers. Because migrant farmers have no customarily recognized rights to land compared to native smallholder farmers, they often do not grow cash crops like cocoa and therefore did not benefit from the 'admitted farms' provision and the incentives for small-scale cocoa farmers under the REDD+. Another displaced migrant farmer highlights the unprofitable nature of the new labour relations that underscore farming in forest communities saying:

'Since I lost my land, I have been working as a tree planter with a private plantation development company. I also cultivate on a sharecropping basis with a native of a neighbouring community [...]. Despite this current busy hustle, compared to my life prior to displacement, I can hardly make any profit to take care of family needs these days. (Interview, 2 September 2016)

From the above account, it is evident that, the REDD+ has reshaped existing power relations between migrant and native smallholder farmers, which further acts as an avenue for the exploitation of the former by the latter. Rowe (2015) calls attention to the potential adverse impacts of such unbalanced power relations at the local level arguing that all stakeholders may not have equal access to positions of influence in their struggle to leverage benefits or minimize negative impacts from REDD+.

Whereas a formidable alliance by smallholder farmers would be a potential pathway for seeking redress, the differential manoeuvring prospects available to native and migrant farmers have worked against the formation of any such meaningful community-level smallholder farmer movement. A migrant farmer expressed frustration at the futility in repeated efforts to seek redress from the government. He said:

Even in the midst of this suffering, we are not able to form any strong group to get our voices heard by the government. The influential community members who could join us to make this possible are rather benefitting from this situation. [...] The GFC is aware we are suffering like this, yet they are reluctant in intervening (Interview, 2 September 2016).

This farmer's account recalls Asiyanbi's (2016) description of 'tacit evasion of tenure ambiguities' in which efforts to recognize the tenure rights of local people to forest resources especially in migrant-dominated areas has often been evaded by stakeholders. These dynamics are further contextualized in the next subsection.

5.4. Strategic relegation of local communities and emerging unfair benefit sharing approaches

Following Nel (2015), we argue while the state plays a crucial role in the privatization of forest development under the REDD+, there is a 'tacit reluctance' in ensuring the proper integration of farmers into ongoing carbon forestry activities and the materialization of the widely touted positive gains REDD+ 'promises' local communities. The government through the MLNR and GFC is expected to exercise overall regulatory responsibility in the carbon forest development process. In reality however, like smallholder farmers, local community leaders complained about the passive role of the GFC. In the current REDD+ funding arrangement in Ghana, forest investors are given grants and low-interest loans from the FIP for plantation development (see Ministry of Lands and Natural Resources 2014). Because this funding is not comprehensive, and where investors use their own resources, they tend to maintain absolute control over forest concessions with little room for integration of local farming activities. This is consistent with the observation by Sikor, He, and Lestrelin (2017) that such shifts in natural resource governance often engender new regulatory mechanisms that entrench the control of project financiers and eventually skew benefit sharing arrangements in their favour.

As indicated earlier, although the benefit sharing framework for REDD+ has not been finalized, the government of Ghana has already laid out some broad category of benefits to local communities. These include direct benefits from payments to community CREMA funds and provision of inputs to cocoa farmers, and indirect benefits in the form of corporate social responsibility projects. It is rather ironic that carbon forestry activities under the REDD+ have been ongoing for close to a decade and yet no concrete benefit scheme has been concluded by the government. This reluctance has left local communities in uncertainty as to what they are entitled to and from who to make such claims. While the carbon benefit sharing framework is pending, Insaideo et al. (2012) allude to existing benefit sharing arrangements that have characterized the activities of large scale forest investors in off-reserve areas in the High Forest Zone in which 90 percent of total revenue from timber goes to the investor and six percent, two percent and two percent to the landowner, GFC and the adjacent community respectively. Compared to previous state-led landscape reforestation projects such as the MTS in which 40 percent and 10 percent of timber revenue went to farmers and the local communities respectively, it becomes evident that private sector entry has

shaped, and may continue to shape benefit sharing systems to the detriment of local farming communities. A member of the local Unit Committee¹³ described existing unfair timber benefit sharing arrangements saying:

Revenue allocation from forest resources is one of the biggest problems we have had with stakeholders for some years now. It is sad that even today things have even become worse for us. With this new system, our share of timber revenue has decreased. People now resort to other unsustainable backdoor strategies to derive their share from forest resources. (Interview, 12 August 2016)

Traditional leaders lamented about the complex chain of procedures involved in accessing timber revenue and the lack of clarity in terms of which institutions to direct such revenue claims in recent times. A traditional leader said:

Now, even the little timber revenue we are entitled to in recent times is often denied us. Tracing it becomes difficult as we are often tossed up and down in bureaucratic arrangements. We do not even know whether to approach the GFC or private forest companies for benefits. (Interview, 20 August 2016)

Consistent with Hall et al. (2011) typology of ‘powers of exclusion’, we argue that, the emerging relegation of local communities in forest management is largely due to two powers of exclusion: legitimation and market. By legitimizing itself over community forest resources through statutory provisions that allow the acquisition of community forest lands, the state, in turn leases some of these lands to private investors to develop forest plantations thereby opening community forest resource spaces to capitalist accumulation. Local people end up having no opportunity to plant their own carbon trees and engage meaningfully in the carbon market and more critically, reproduce themselves as smallholders. While researchers and policy makers are still fascinated about the ‘hungry farmer paradox’ in SSA including Ghana, we stress that under the prevailing carbon forestry regime, the food insecurity situation will worsen if these tenure ambiguities are not promptly addressed.

6. Conclusions and recommendations

The political economy of REDD+ in the Ghanaian context exhibits a set of complex processes, namely displacement, exploitation and corruption. These processes work interactively to distort traditional agricultural land and labour relations in local forest communities. Carbon forest plantation development facilitated corporate control over forest community lands and reinforced the marginalization and exploitation of migrant smallholder farmers in the High Forest Zone. REDD+ activities facilitated the crafty appropriation of the labour and financial resources of migrant farmers under unfair sharecropping arrangements and backdoor land deals by their native counterparts who act as middlemen. The politics of the implementation of the ‘admitted farms’ provision which provides for the integration of local farming activities into ongoing REDD+ projects, favoured native farmers who possess customarily recognized user rights to community lands to the neglect of migrant farmers who have no stake over community lands. These migrants, most of whom ‘escaped’ to the forest belt in search of better farming conditions are rather caught up in ‘new webs’ of poverty and food insecurity as they struggle to reproduce themselves.

These complex political economy dynamics especially the dispossession and exclusion of relatively poorer migrant farmers in

the Ghanaian case, points to the fact that even in the context of general resource access constraints under REDD+, the magnitude of adverse impacts may not be the same for all actors at the local level. The ongoing *hierarchical corruption* and *intimate exploitation* of non-native farmers in the Ghanaian context add a salient extension to Hall et al. (2011) typology of intimate exclusion. Beyond exclusion lies an opportunity for intimate exploitation whereby even among the same category of farmers, relatively powerful groups such as native farmers, tend to deepen the exploitation of their migrant counterparts.

This paper calls for an alternative forest management regime that reconciles local farming activities and forest conservation in a manner that guarantees local people’s rights to land and forest resources. We recommend a radical restructuring of the current carbon forest regime away from viewing forest landscapes as ‘global resources’ to viewing them as ‘territories’ (McCall, 2016) in order to properly situate and legitimize the entitlements of forest communities. Rather than centralizing community forest lands and carbon rights in the hands of the state and a few forest investors, we call for a Community Forest Management approach (see Agrawal & Angelsen, 2009) in which local communities will lead the implementation of forest conservation activities. Returning forest lands to local communities has the potential to resolve most of the adverse outcomes of REDD+. As demonstrated in our findings, the increased exploitation of food insecure migrant farmers is connected to the widespread displacement and eventual change in conventional labour relations between native and migrant farmers.

We make this recommendation on the premise that apart from the so-called direct and indirect benefits promised local communities under the REDD+, local food production is a fundamental priority that should never be neglected for conservation gains. Indeed, there is mounting evidence that local people, through indigenous knowledge systems, can lead carbon forestry activities in ways that sustainably integrate local livelihood activities and forest conservation. Community-led carbon forestry will therefore promote food security and ensure that local people benefit directly from carbon revenue. While we make this seemingly radical recommendation, we are cognizant of the fact that solutions to the current complexities from the uptake of REDD+ are not forthright. That notwithstanding, a good starting point for repossessing customary lands especially in off-reserve areas, will require rigorous community action and advocacy at the grassroots level to seek redress.

In SSA in particular where the diverse land administration systems feature a range of actors including states, transnational corporations, and unique tenure arrangements, it is very crucial for the design and implementation of REDD+ projects to go beyond the universalized expectation that local people will always benefit from carbon forest investments. Stakeholders must therefore hold context very important and understand existing land tenure dynamics in order to align carbon forestry goals with local community needs. Considering the longstanding ‘tacit evasion’ of tenure ambiguities in local communities by the government of Ghana following the uptake of REDD+, we recommend that the UNFCCC in vetting carbon forestry applications from countries should clarify in detail the prevailing land tenure dynamics, and require governments to make the necessary provisions in cases where local people’s rights to forest are not guaranteed. Indeed, environmental conservation and food security are both central to the Sustainable Development Goals, hence the need to pursue them in a coordinated manner. It is important for stakeholders to recognize that a ‘hungry’ and ‘poor’ population will not support sustainable environmental conservation and climate change mitigation. Notwithstanding these policy recommendations, political ecologists must actively engage the aggressively changing nature of accumulation engendered by REDD+.

¹³ Local Unit Committees are part of the decentralized governance system in Ghana. Members are elected from the local community to facilitate local level development.

7. Conflicts of interest

None.

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The REDD menace: Resurgent protectionism in Tanzania's mangrove forests

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ABSTRACT

Reduced Emissions from Deforestation and Degradation (REDD+) is being proclaimed as “a new direction in forest conservation” (Anglesen, 2009: 125). This financial incentives-based climate change mitigation strategy proposed by the UNEP, World Bank, GEF and environmental NGOs seeks to integrate forests into carbon sequestration schemes. Its proponents view REDD+ as part of an adaptive strategy to counter the effects of global climate change. This paper combines the theoretical approaches of market environmentalism and environmental narratives to examine the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania to make mangrove forests amenable to markets. Through a case study of a “REDD-readiness” climate change mitigation and adaptation project, we demonstrate how a shift in resource control and management from local to global actors builds upon narratives of environmental change (forest loss) that have little factual basis in environmental histories. We argue that the proponents of REDD+ (Tanzanian state, aid donors, environmental NGOs) underestimate the agency of forest-reliant communities who have played a major role in the making of the delta landscape and who will certainly resist the injustices they are facing as a result of this shift from community-based resource management to fortress conservation.

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1. Introduction

Reduced Emissions from Deforestation and Degradation (REDD+) is a financial incentives-based climate change mitigation initiative designed to compensate national governments and subnational actors in return for demonstrable reductions in carbon emissions from deforestation and degradation and enhancements of terrestrial carbon stocks (Agrawal et al., 2011). This paper examines this “new direction” (Anglesen, 2009) in carbon forestry by analyzing the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania, to be amenable to markets. We investigate the environmental narratives that inform a case study of World Wide Fund for Nature (WWF) and Tanzanian

state carbon forestry projects¹. These narratives portray local resource users, the Warufiji, in negative terms as recent migrants who are destroying the mangrove forests. This mistaken view forms the basis of a resurgent protectionism which aims to expel the

¹ The Rufiji Delta is listed as a WWF Tanzania REDD readiness site for REDD pilot projects, <http://www.reddtz.org/images/110310/a%20map%20showing%20pilot%20areas%20for%20redd%20activities.pdf> (Accessed on 30 November 2011). For a map showing approximate location of REDD related civil society actors (e.g. WWF) in the Rufiji Delta, Tanzania, see United Republic of Tanzania, October 2010, National REDD Information and Communication Strategy 2010-2012, (p. 46), [http://www.reddtz.org/images/Indepthstudy/redd information and communication strategy.pdf](http://www.reddtz.org/images/Indepthstudy/redd%20information%20and%20communication%20strategy.pdf) (Accessed on 30 November 2011). The TZ-REDD Newsletter (Issue 5, September 2011, pg. 14) states “WWF has conducted awareness-raising campaigns on the REDD project in Mbeya, Iringa, and Rufiji Districts” see <http://www.tnrf.org/files/REDDNewsletter5.pdf> (Accessed on 30 November 2011). For the contract between the Norwegian Ministry of Foreign Affairs and the WWF Tanzania Country Office that is “one of nine REDD+ pilot projects undertaken by NGOs under the Tanzania-Norway partnership” with reference to the Rufiji Delta, see http://www.norway.go.tz/PageFiles/253880/WWF_contract.pdf (Accessed 30 November 2011). Information on WWF's “Building Mangrove Resilience” project in the Rufiji Delta can be found at <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed on 30 November 2011).

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Warufiji from lands they have occupied for millennia (Havnevik, 1993; Chami and Mswema, 1997).

Carbon forestry management plans have so far assumed that “forest” is a clearly understood category (Noordwijk and Minang, 2009). We argue that current forest definitions within the context of REDD+ do not take into consideration the environmental history or the agency of forest-reliant communities in the making of forested landscapes. We seek to demonstrate how the Rufiji Delta is a socio-natural landscape shaped by past and present resource management practices, a “forest” definition that complicates the prevailing narratives that inform carbon forestry management.

At the center of our critique is the framing of the “environmental problem” in which the Warufiji are depicted by foresters, environmentalists, and donors as poor stewards of the mangrove forests. We argue that this representation builds upon a “misreading” of the human–environmental history of the Rufiji Delta (e.g. Fairhead and Leach, 1996; Forsyth and Walker, 2008). Our counter-narrative provides an alternative environmental history that presents the Warufiji in a very different light. It also highlights the politics of environmental knowledge in which carbon forestry is presented as a “sustainable” alternative to indigenous resource management practices which are demeaned as “destructive” and “illegal”. We suggest that a major consequence of this ahistorical framing is a paradigmatic shift in natural resource conservation from community-based natural resource management (CBNRM) to fortress conservation, a shift that has been aptly called “resurgent protectionism” (Adams, 2009; Forsyth and Walker, 2008; Wilshusen et al., 2002). The protectionist conservation paradigm views human use of nature as inimical to biodiversity conservation and by extension to carbon storage. This normative view contrasts with more recent approaches that assume that human–environmental interactions can produce sustainably utilized environments (Zimmerer, 2006; Bassett, 2010).

Climate change mitigation plans for the Rufiji Delta currently focus on the anticipated impacts of climate change (sea-level rise) for a particular biophysical exposure unit (mangrove forests) that needs to be offset by adaptation and mitigation strategies to enhance the resilience of that biophysical unit (mangrove reforestation) (O'Brien et al., 2007). Within the context of the Tanzanian state and WWF's climate change “adaptation strategy” (Cook, 2009), mangrove reforestation reduces the ability of Rufiji farmers to cultivate rice for subsistence needs and thus poses a direct threat to their livelihoods. Indeed, after the forests are made more “valuable” for the carbon market (“REDD ready”), the Tanzanian state plans to relocate villagers out of the delta². Although current REDD+ policy frameworks do not explicitly seek to exclude people from living in forests or utilizing forest resources, the proposed eviction plan for the Warufiji is one portentous example of how human rights may be subservient to the monitoring and verification requirements of carbon forestry. The removal of the Warufiji³ “simplifies” the mangrove forests in order to make levels of carbon sequestration “legible” for carbon markets (Scott, 1998). We illustrate how this shift from a CBNRM to an ecosystem-centered vulnerability approach for forest conservation supersedes priorities that seek to balance livelihood

and environmental concerns. In the ecosystem-centered vulnerability approach, the concern with sustainable livelihoods and social vulnerability are of secondary importance.

Our goal in writing this paper is to draw attention to the potential for “lose–lose” scenarios of climate change mitigation and adaptation projects that fail to integrate environmental justice concerns with conservation priorities. This is important as the success of carbon forestry hinges on the compliance of local populations to new power relations implicit in REDD+ policies. We argue that forest-reliant communities will resist these policies to the extent that they undermine local livelihoods and are viewed as unjust. Local resentment and resistance will increase to the extent that carbon forestry projects marginalize those communities that live in proximity to and depend on key resource areas. Resource users in developing countries throughout the world are beginning to organize and demand access to land and their right to a decent livelihood (Perfecto and Vandermeer, 2008). The Warufiji are no exception. They have a history of fiercely resisting claims on their resources and labor by outsiders. By highlighting the environmental historical role of the Warufiji in the making of the delta landscape, we provide insights into the opportunity for local resource users to contribute to the creation of an agricultural and forestry matrix that is socially just and politically stable and that has the potential to conserve biodiversity in the long run (Perfecto and Vandermeer, 2008).

This paper discusses the implications of market-oriented conservation approaches that may threaten equity-oriented projects and the environmental justice dimensions to climate change despite its “rights-based and participatory approaches” (Anglesen, 2009). REDD+ threatens to shift control and management of natural resources from local to national and global actors. REDD+ may also have an unintended consequence of undermining decentralized forest management in Tanzania and elsewhere (Phelps et al., 2010). Our counter-narrative seeks to provide insights into natural resource management alternatives that are more socially just, desirable, and feasible. These alternatives are desirable because they have the potential to address conservation goals and feasible because the environmental history of the Northern Rufiji Delta illuminates the possibilities for sustainably utilized environments.

2. Theoretical approach

The remaking of human–environmental relations for REDD+ in the Rufiji Delta is an ambitious project that involves conceptualizing forest use in ways that are amenable to carbon markets. It entails a significant turnaround in conservation thinking where ecosystem health is prioritized over multiple land-use policies in which local communities assume some resource management authority. Before showing how this “new direction in forest conservation” (Anglesen, 2009) is unfolding in the Rufiji Delta, we introduce two key concepts that inform our theoretical approach: market environmentalism and environmental narratives.

2.1. Market environmentalism

Market environmentalism is the recognition that “nature” (as transformed into raw materials or resources) can be a key constraint on or opportunity for the location and organization of economic activity (Jonas and Bridge, 2003). Production processes based on the use of natural resources pose both obstacles and opportunities for capital and reveal the contradictory political-economic dynamics that shape everyday landscapes through which nature is produced, consumed, and regulated (Henderson, 1998; Jonas and Bridge, 2003). In its production and commodification, nature is enclosed, measured, and given market value (Lovell et al., 2009). This increasing incorporation of ecological conditions into global circuits of capital accumulation via

² Eviction plans are discussed in the “Report of the Meeting of the Division of Forestry and Bee-Keeping with Councillors, Executive Officers of the Wards and Villages in the Wards of Salale, Mtunda, Maparoni, and Ruaruke in Rufiji District” held in Nyamisati on 3 November 2009 (Personal communication, January 2010). See also “Government Issues Eviction Order to Forest Invaders” *Bilham Kimati in the Tanzania Daily News*, 29 January 2011.

³ For an update see, “Villagers Evicted from Mangrove Site” Finnigan Wa Simbeye, *Tanzania Daily News* 30 October 2011, <http://dailynews.co.tz/home/?n=25016&cat=home> (Accessed on 30 November 2011) and “WWF Fears Backlash on Rufiji Delta Mangrove Forest Initiative” Finnigan Wa Simbeye, *Tanzania Daily News* 14 November 2011, <http://www.dailynews.co.tz/business/?n=25497&cat=business> (Accessed on 30 November 2011).

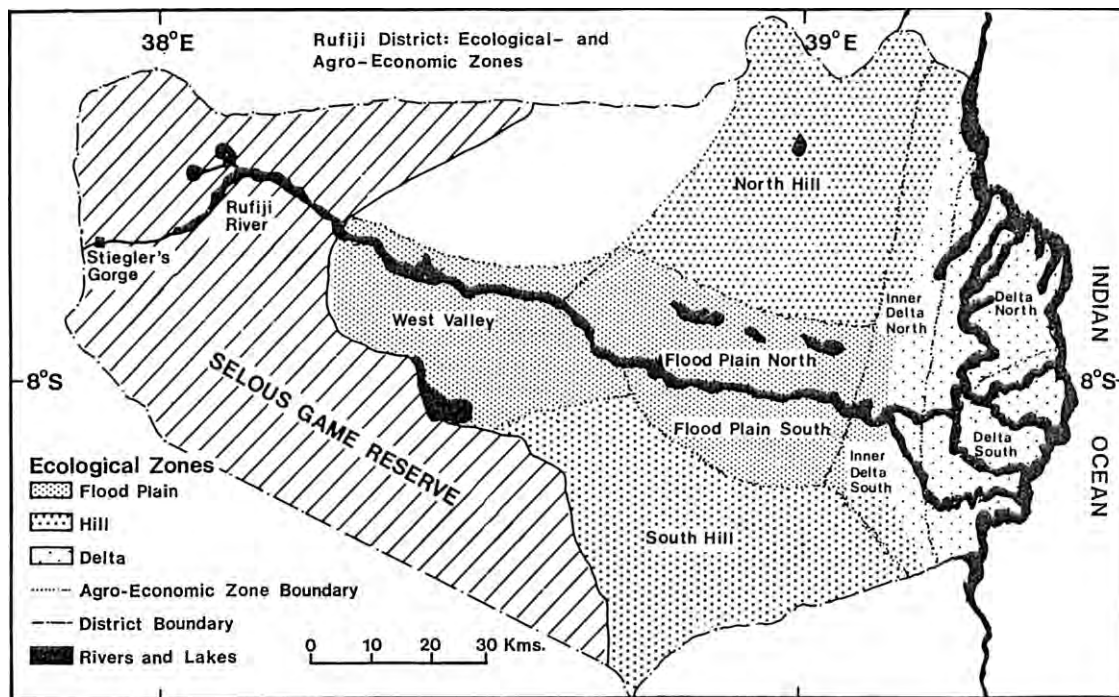


Fig. 1. Ecological and Agro-Economic Zones of the Rufiji District, Tanzania.
Source: Havnevik (1993). Used with permission of the author.

production and commodification has been referred to as “green capitalism” (Prudham, 2009: 1596). An example of green capitalism is the creation of markets for environmental services which effectively turn ecological processes and products into commodities that can be sold. Within this process the important question is not what a commodity is, but rather, what kind of characteristics do things take on when they *become* commodities (Castree, 2003: 277).

Green capitalism approaches view nature and society as conceptually distinct in the context of conservation (McAfee and Shapiro, 2010). It then reconnects them by subsuming ecology within the market economy (McAfee and Shapiro, 2010). The “splitting” of complex ecosystems simplifies them into legally definable and economically tradable property rights (Castree, 2003). This is particularly true for carbon markets. Carbon markets are one of a line of conversions of parts of nature into tradable commodities, including water, biodiversity, fish, and wetlands (Bumpus and Liverman, 2008).

For carbon to be exchanged and generate revenue, carbon reduction must be turned into a tradable commodity (Bumpus and Liverman, 2008). Offsets are generally commodified into saleable units through development of specific emission–reduction projects, the outputs of which can be quantified, owned and traded. Examples include the management of forests specifically to sequester carbon (Bumpus and Liverman, 2008). Complex forest ecosystems must be simplified into discrete processes and objects in order to define, standardize, and universally agree on their carbon content (Boyd, 2009). In the process, a fictitious commodity (Polanyi, 1944) is created in the form of “carbon credits” that are generated from emission reductions and international investments in emission reduction projects (Liverman, 2009).

In the course of “selling nature to save it” (McAfee, 1999), elite political and economic actors wield considerable power in negotiating prices and regulating market participation (Liverman, 2004). Many indigenous groups in the global south criticize carbon sequestration projects for their simplified portrayal of terrestrial systems and lack of information on the socio-economic, political, and institutional implications of carbon sequestration (Boyd,

2009). One concern is that carbon trading will allow the global North to maintain high levels of resource consumption by paying southern communities a pittance for offsetting carbon emissions generated by inefficient industries (Liverman, 2009).

2.2. Environmental narratives

The analysis of environmental narratives is a useful approach to examine the ways environmental issues are framed by showing how and why environmental problems are defined the way they are (Taylor and Buttel, 1992). An environmental narrative is a simplified explanation of cause and effect relationships that assigns roles to different actors who are implicated (or not) in an environmental problem. They are stories that simultaneously simplify and stabilize complex and uncertain processes such as “deforestation causes biodiversity loss” (Forsyth and Walker, 2008). Narratives influence the questions asked, the knowledge produced, and the policies and responses that are prioritized (Forsyth, 2003; O’Brien et al., 2007). They also reveal much about the politics of environmental knowledge (Boyd, 2009; Forsyth and Walker, 2008). The knowledge that informs environmental narratives is always conditioned by values, power relations, and institutional histories and commitments. Knowledge production is highly selective in terms of who participates in problem definition and policy making (Scoones, 2009; Forsyth and Walker, 2008). Like all narratives, environmental narratives shape popular perceptions and appeal to policy makers seeking simple solutions (Forsyth and Walker, 2008). It is important, therefore, to consider the broader contexts of legibility and simplification, as well as the political economic conditions that give form and meaning to narratives (Scott, 1998; Watts, 2002).

The case study of the Rufiji Delta contributes to a growing body of literature that illustrates how powerful political interests have embraced the neoliberal project of market environmentalism and employ environmental narratives to design an international response to climate change (Liverman, 2009). As states and international environmental NGOs act on these narratives, these stories transmute into “received ideas” (Leach and Mearns, 1996) and have real effects for local resource users. Mangrove carbon

forestry projects in the Rufiji Delta illustrate these dynamics. Environmental narratives that label human activities as “unnatural” and that portray landscapes in ahistorical terms as pristine or “Edenic” in which nature is emptied of humanity but filled with wildlife and vegetation are used to vilify local subsistence level resource users as mangrove “destroyers” and “invaders” (Neumann, 1998; West et al., 2006). In the following sections, we argue that the Tanzanian state and WWF’s portrayal of human–environmental relations represents a misreading of the environmental history of the Rufiji Delta. In contrast, we offer an historical account that portrays both the landscape and people in a very different light.

3. Rufiji Delta, Tanzania case study

The Rufiji Delta contains the largest continuous block of estuarine mangrove forest in Africa, and is of considerable economic and conservation importance (Bryceson, 2002). Our focus is on carbon forestry projects in the northern Rufiji Delta islands, referred to as the Rufiji Delta North (Fig. 1). Observations and semi-structured interviews in Rufiji Delta villages (mainly Mshinzi and Mchele⁴), with the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT), and WWF Tanzania representatives during doctoral dissertation fieldwork from 2008 to 2009, as well as continual communications with villagers through 2010, inform the case study.

3.1. Mangrove forest governance

All of Tanzania’s mangrove forests have protected status. The Forest Ordinance of 1957 allowed for the creation of forest reserves by government decree after considering any objections by interested parties to this de jure transfer of rights from local communities to the state (United Republic of Tanzania, 1994). The FBD of the MNRT is currently responsible for mangrove forest management. The Tanzanian state has repeatedly used its authority over mangrove forests to exert control over Rufiji Delta communities and resources. For example, on September 2, 1987, the Forestry Division declared a ban on the cutting of all mangroves in the northern Rufiji Delta (Semesi, 1992). To enforce this ban, the state trained and posted forest officers to the area. The 1998 National Forestry Policy was replaced by the 2002 Tanzania Forest Act which forbids any person, without a license or other lawful authority, to cut, burn, or damage mangrove trees in the forest reserve area. This includes a ban on the expansion or opening of new rice farms (Semesi, 1991). Further, the Mangrove Management Plan established in 1991 designates the majority of the north Rufiji Delta mangroves as “total protection zones” which legally restricts forest access to scientific uses and protective functions only (Semesi, 1991). These restrictions remain in force today.

In addition to employing forest guards to enforce its policies, the Tanzanian state established agreements with forest communities to jointly manage the forest reserves. In 1998, the FBD initiated a joint management agreement (JMA) with villages in the Rufiji Delta North Mangrove Forest Reserve (Akida and Blomley, 2006). Communities are divided into villages, which are managed by elected village councils (Blomley et al., 2010). The 2002 Forest Act recognizes two different types of participatory forest management (PFM) (Blomley et al., 2010). The first is community-based forest management (CBFM) that enables village-level communities to establish village, group or private forest reserves on village land in which communities are both forest owners and managers. The second type is joint forest management (JFM) which takes place on reserved forest land that is owned and managed by

the national or district-level governments (typically managed by the FBD). With the state and potentially other forest owners, village-level elected councils and environmental council representatives can sign joint management agreements (JMAs) for sharing the costs and benefits and responsibilities of forest management. Under this arrangement, village-level elected councils are “co-managers” of forests otherwise owned by the district or national governments. In theory, village governments have primary protection and management responsibility of the forest. The Forest Act of 2002, however, does not explicitly state how benefits of forest management under JMA are to be equitably shared with participating communities (Blomley and Iddi, 2009).

In Tanzania, research shows that there are few tangible benefits to villages participating in JMAs, especially in areas of high conservation value (e.g. Vihemäki, 2009 citing Kajembe et al., 2005; Blomley and Ramadhani, 2006). The paradox of the JMA project in the Rufiji Delta is that JMAs are presented as promoting “community participation” with Warufiji villagers, while at the same time the FBD prosecutes these same forest users for planting rice (Bryceson et al., 2005). For example, many Rufiji farmers were restricted from accessing JMA areas to grow rice because of mangrove reforestation policies. Rufiji villagers argue that this restriction has created conflicts and deprived them of their livelihoods (e.g. Bryceson et al., 2005; Akida and Blomley, 2006). Villagers also stated that the FBD now bears the sole responsibility of distributing licenses for logging mangrove poles. Villagers complain that their role as co-managers of forests is not taken seriously:

“We still have no say in how our forests are managed. The foresters still come here, fine us, and put us in jail if we are caught cutting mangroves for our rice fields. (JMA) agreements did not change things for us because we are still restricted from using the forests” (Personal communication, October 2010).

Despite their presence within the delta for over 2000 years, the existence of ancestral burial grounds, and villages that have been formally registered (NEMC, 1997), the Warufiji’s land rights remain highly uncertain. According to the Forest Ordinance of 1957, the Warufiji are regarded as “squatters” as they are occupying land declared as Forest Reserves (NEMC, 1997). Land tenure insecurity in Tanzania is further compounded by the National Land Policy (1995) which explicitly states that the President owns all land in Tanzania in trust for present and future generations and that the state can dispossess customary owners for “public interest” because land is “public property” (Shivji, 2006). Within forest reserves, the Director of the FBD recently stated that villages were registered “illegally and that directives have already been issued for the Commissioner of Lands and respective district councils to de-register the villages according to the Forest Act Cap 323 as revised in 2002” (Rugonzibwa, 2009).

3.2. REDD ready in Rufiji: climate change programs and proposals

The Rufiji Delta mangrove forests have attracted international attention for their conservation importance. The International Union for the Conservation of Nature (IUCN) designated the forests as part of the Rufiji-Mafia-Kilwa Ramsar wetland site in 2004 (IUCN, 2004). At the same time, WWF initiated the Rufiji-Mafia-Kilwa Seascape Program (RUMAKI) (WWF Tanzania, No Date). The RUMAKI Program aimed to address the “fundamental links between environment and poverty and between biodiversity conservation and sustainable livelihood development.”⁵ Initial

⁴ To protect our research subjects, we have changed the names of individuals and communities discussed in this paper.

⁵ See WWF Rumaki, Kilwa, Rufiji Seascape Programme Tanzania Factsheet, July 2004–June 2009, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011).

program goals included the “improved socio-economic well-being of coastal communities through sustainable, participatory, and equitable use and protection of their marine and coastal natural resources.”⁶

WWF recently shifted its emphasis in the Rufiji Delta from conservation-with-development to conserving ecosystem health, in which the human development component is significantly diminished.⁷ With funding from the Global Environmental Facility and the United Nations Environment Program, WWF has created a climate adaptation project called “Coastal Resilience to Climate Change” (Cook, 2009). For this project, WWF is working directly with the FBD (Cook, 2009).

This WWF mangrove conservation program is premised on the urgent need to improve the management and protection of mangroves, which are described as “the most critically threatened ecosystem in the world” (Cook, 2009). The program aims to “protect mangrove forests from the impacts of climate change, particularly sea level rise” (Cook, 2009). Project goals are to assess the vulnerability of mangroves to climate change impacts, and to develop and promote adaptation strategies that respond to these impacts (Cook, 2009). Adaptation strategies include reforestation with “climate smart” mangrove species (Cook, 2009). Project documents declare that one of the main “threats” to the mangroves is rice farming by local people (Cook, 2009).

To prepare for climate change, WWF is working directly with FBD officials at national and district levels to “replant and restore mangrove habitats degraded by illegal rice farming” in the Rufiji Delta North (Cook, 2009). District level WWF “adaptation coordinators” oversee and enforce mangrove reforestation in the Rufiji Delta North (Personal communication, FBD, January 2010). The FBD has been involved in mangrove reforestation in the Rufiji Delta since the establishment of the Mangrove Management Plan (Semesi, 1991). Some villagers describe the mangrove planting scheme as a long standing “tug of war” between themselves and the FBD. Renewed interest by WWF in the Rufiji Delta has intensified mangrove reforestation as a climate change adaptation strategy (Cook, 2009). The “Building Mangrove Resilience” reforestation project includes villages within the Delta North (Fig. 1). Many Rufiji Delta rice farmers stated they are resisting this mangrove reforestation project, particularly in their rice farms, by planting mangrove seedlings upside down or not planting them at all. Some villagers stated that they refused to plant mangroves because they were not given the choice. Villagers declared “tulilazimishwa” in Kiswahili, which translates to “we were forced or obliged” English (Awde, 2000) to plant mangroves. The consensus in one village, Mshinzi, is a formal “rejection” against the mangrove planting project. In another village, Mchele, the village leadership agreed to the project and a small number of villagers participate. The majority, however, are against the project. This reluctant group stated they would consider participating in mangrove planting project as long as they are able to continue rice cultivation, but most refuse to comply.

One villager stated, “How can they [WWF adaptation coordinators and the FBD] tell us to stop planting rice? We are hungry because they have taken away our daily bread.” WWF is aware of the Warufiji’s resistance to previous mangrove reforestation efforts as illustrated in a quote by a Warufiji rice farmer in a 2002 WWF publication, “We are really surprised by this government, we do not know what they are thinking about us.

We are required to plant mangroves in our paddy farms; will they send us food in the future?” (Wood et al., 2000: 320). Directly prior to the 2010 national Tanzanian elections, villagers from Mshinzi stated that mangrove reforestation strategies suddenly changed and they were given the choice to plant mangroves (Personal communication, October 2010). Meetings were held in Mshinzi village and elders warned that the handing out of small funds for planting mangroves was a “common tactic prior to elections” and “after the elections, things will change, and they [the FBD and WWF adaptation coordinators] will be against us [the villagers]” in terms of impeding villagers from farming rice. The village government and environmental council in Mshinzi stated that their decision to object to the project was superseded by higher authorities at the district level. The JMA co-management agreement exemplifies what Chhatre (2008) calls weak political “articulation” reflected in a lack of devolved power for decision making to representative and accountable local actors (Agrawal and Ribot, 1999).

In contrast to the WWF RUMAKI program’s emphasis on poverty alleviation through CBNRM, new carbon forestry management plans are threatening to deepen poverty through dispossession. The Rufiji Delta is listed as one of six WWF Tanzania REDD readiness sites for REDD Pilot Projects.⁸ REDD+ strategies for Tanzania list the “enhancement of state reserve lands” as a way to reverse the “drivers” (e.g. cultivation) of forest deforestation and degradation.⁹ This is exemplified by the FBD’s plans to begin a process of relocating rice farmers out of the delta.¹⁰ The Director of the FBD made a statement in September 2009 that villagers residing in Tabora and Rukwa regions of coastal Tanzania will be evicted for invasions of forest reserves (Rugonzibwa, 2009). The Deputy Minister of MNRT also stated that “eviction exercises will later spread to the rest of the forest reserves countrywide and all settlers in forest reserves would be moved as stipulated by the law” (Rugonzibwa, 2009). Current plans are for farmers to plant trees in areas previously used for rice cultivation until they are relocated out of the delta (Personal communication, January 2010). This will result in evictions of more than 18,000 Rufiji Delta North village residents (Fig. 1).

In order to minimize the political fallout over the controversial eviction plans, the timing of relocations was on hold until the conclusion of the national elections in October 2010¹¹ (Personal communication, December 2009). In the meantime, the FBD and WWF adaptation coordinators organized meetings with villagers in the northern Rufiji Delta to “sensitize” them to the relocation project (Personal communication, January 2010). The FBD informed villagers of “what the consequences will be and how severe they will be” (Personal communication, December 2009). In response to the “sensitizing campaigns,” village elders stated that they were trying to find documentation of their formal objections to the designation of the mangrove forests as Forest Reserves in 1957. Although village elders state that they “were not listened to at that time and there was no outcome,” such documentation is needed to mount a legal case in Tanzanian courts against planned evictions.

We argue that the objective of WWF’s carbon forestry projects¹² and the Tanzanian government’s eviction plans are to make the Rufiji Delta “REDD ready” (Tanzanian REDD Initiative, 2010). The

⁸ See footnote 1, “WWF Tanzania’s REDD Pilot Projects Sites” and related documents.

⁹ Tanzania’s National REDD Strategy Development: Supporting REDD Readiness in Tanzania, November 2009, http://www.reddtz.org/component/option,com_docman/task,doc_download/gid,22/Itemid,18/. (Accessed on 30 November 2011).

¹⁰ See footnote 2, “Report of the Meeting” and “Government Issues Eviction Order to Forest Invaders.” For an update, see footnote 3 “Finnigan Wa Simbeye Tanzania Daily News.”

¹¹ In January 2011, the FBD issued a two-week eviction order to all “invaders of reserved forests countrywide” including the Rufiji Delta (Kimati, 2011). For an update, see footnote 3 “Finnigan Wa Simbeye.”

¹² See footnote 1 carbon forestry programs.

⁶ See footnote 5, “WWF Rufiji, Mafia, Kilwa Seascape Programme.”

⁷ Compare the WWF RUMAKI Seascape project, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011), with the WWF “Building Mangrove Resilience” project, <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed 30 November 2011).

main donor for REDD+ in Tanzania is Norway which has committed Nkr 500 million towards the formulation and implementation of a national REDD+ strategy in Tanzania over the next five years. The FBD of the MNRT, with technical support from the Institute of Resource Assessment (IRA), is responsible for coordinating aspects of REDD+ and REDD-readiness activities (Tanzanian REDD Initiative, 2010). The role of WWF in Tanzanian REDD+ projects is outlined in REDD+ project documents, which state that “WWF can have a key role to play in supporting the implementation of the [REDD] strategy”¹³ and “existing NGOs, may be in charge of overseeing the fair distribution of REDD+ funds through village level bodies in Tanzania” (Chiesa et al., 2009: 7). The threat of evictions and loss of access to important resources for livelihood security is another example of how international conservation interests can either directly or indirectly legitimate the state’s use of “force” in resource management and contributes to the disenfranchisement of the Warufiji’s resource claims (Peluso, 1993).

Tanzania is often heralded as the vanguard for local democratic forest resource management, due mostly to its decentralized state institutions (Blomley et al., 2010). Accordingly, Tanzanian REDD+ policies are currently being designed on existing forest management strategies such as joint forest management agreements (JMAs) (Burgess et al., 2010). However, we show how devolved decision-making in policy discourses do not necessarily lead to justice and equity in terms of resource access and actual local-level decision-making. Critiques of decentralized resource governance in Tanzania, particularly within the wildlife sector, are numerous and well documented by a number of scholars (Neumann and Schroeder, 1999; Igoe and Croucher, 2007; Igoe and Brockington, 1999; Goldman, 2003). This case provides a cautionary note for any REDD+ project modeled after a decentralized forestry scheme that is not decentralized in practice. It is a serious shortcoming in the context of REDD+ programs in Tanzania and elsewhere (Thomas and Twyman, 2005).

It is difficult to reconcile Tanzania REDD’s participatory and benefit sharing goals (United Republic of Tanzania, 2010; Tanzanian REDD Initiative, 2010) with the rhetoric, practices, and plans of the Tanzanian state. Indicative of the contradiction between REDD+ policy and Tanzanian forest management is the statement made by the Director of Forestry and Beekeeping Department in November 2009, “I am here to make sure that forests are protected and therefore I will not wait to see these forests turning into deserts and we will do all we can, including the use of force, because for such a serious matter as this one, we do not need negotiations” (Saiboko, 2009).

If REDD+ programs genuinely seek to apply “rights-based and participatory approaches” in practice, then forest-reliant communities’ calls for land tenure security and the development of compliance procedures and accountability mechanisms for its activities in Tanzania must be addressed (Griffiths, 2009). These same communities have been unable to benefit from payment for ecosystem services, such as Clean Development Mechanisms, because their land rights are not legally recognized (Blomley et al., 2010; Yanda, 2009). Therefore, the ambiguity around land tenure in forest reserves in Tanzania such as the Rufiji Delta legitimates concerns over scaling up REDD+ before land tenure is clarified (Sunderlin et al., 2009). In order for villagers to receive compensation directly from REDD+, the “legal quagmire” (Homewood, 2006 citing Shivji, 1994) of land tenure in Tanzania, particularly within Forest Reserves, must be addressed.

3.3. Environmentalists’ narrative of the Rufiji Delta

The conceptualization of carbon forestry projects in the Rufiji Delta builds upon a narrative of environmental change that is shared by international conservation organizations, the Tanzanian state, and aid donors. In this section, we present the common elements that frame this narrative. In the following section we offer an alternative reading of environmental history. Both the narrative and counternarrative demonstrate the centrality of politics and political economy in the framing of environmental problems and solutions.

The environmental narrative used by WWF and the Tanzanian state to support their carbon forestry activities pivots around the problem of adaptation to climate change (Cook, 2009; Wagner and Sallema-Mtui, 2010). The narrative has two major parts. The first is future oriented and predicts that a main consequence of global climate change will be a rise in sea level. The second part underscores the importance of maintaining the integrity of mangrove forests as both a bulwark against rising sea levels as well as to preserve biodiversity. The main problem in preserving the forests and its biodiversity is the presence of people who are viewed as “invaders” and “destroyers” of mangrove forests. Biodiversity loss is attributed primarily to illegal rice cultivation (Cook, 2009).

WWF project documents indicate sea level rise as the main climate change threat to mangrove forests in the Rufiji Delta (Cook, 2009; Wagner and Sallema-Mtui, 2010). The 2007 Intergovernmental Panel on Climate Change (IPCC) estimates a rise in sea level of 18–59 cm by the year 2100 (IPCC, 2007). The impact of sea level rise in the Rufiji Delta could be the loss of coastal habitats as a result of flooding and erosion, and the loss of biological productivity (Ngusaru et al., 2001; Wagner and Sallema-Mtui, 2010). Since mangrove forests are widely viewed as buffering the coasts from higher seas and storms, their preservation is a top climate adaptation priority.

The narrative of causality also paints a picture of relatively recent immigration and forest degradation in the north delta area. “In the past,” the people of the Rufiji Delta cultivated rice in the Rufiji valley flood plain (Ngusaru et al., 2001). After the “devastation” that occurred from a massive flood in 1968,¹⁴ when the Rufiji river level rose by ten feet, President Nyerere ordered the relocation of flood plain communities to the northern part of the delta. This resettlement program was known as the villagization campaign “Operation Rufiji.” The displaced farmers purportedly began clearing mangrove forests to “adapt rice farming in new areas in response to this rather adverse situation” thus causing a new and major threat to the mangrove forest in the Rufiji Delta North (Ngusaru et al., 2001: 10; Wagner and Sallema-Mtui, 2010: 7). The abrupt shift in the main course of the Rufiji River towards the northern part of the delta is also believed to have changed the patterns of erosion, deposition, and salt penetration.

The less saline conditions that were enabled by the aforementioned “northward shift of the Rufiji River flow” allowed farmers to expand rice cultivation into new areas in the Rufiji Delta North (Wood et al., 2000). In addition, the IUCN (2004) reports that the technique for the “environmentally unfriendly” and “illegal practice” of large scale cutting of mangroves for rice farming is said to hinder natural regeneration of mangrove forests due to alterations of the soil microclimate and the lack of seed-bearing trees as seed sources. The FBD Director expressed concern at a Southern African Development Community (SDAC) meeting on

¹³ See footnote 1, “United Republic of Tanzania, October 2010,” p. 19.

¹⁴ Others argue 1978 marks the time period when the main flow of the Rufiji River was directed northward towards the Delta North (Wagner and Sallema-Mtui, 2010: 35). Also refer to “Report of the Meeting” (footnote 2).

REDD in Arusha, Tanzania stating, “the rapid annihilation of the country’s green cover is now going out of control” (Nkwame, 2010). In REDD+ project documents, the Rufiji Delta North is cited as having one of the highest cultivation rates, making it the “main driver” of mangrove deforestation and degradation.¹⁵

The extent of deforestation is reported in a land cover change study by Wang et al. (2003). The authors found a 1769 ha decline in mangrove forest cover in the Rufiji Delta between 1990 (49,799 ha) and 2000 (48,030 ha). Using satellite images, this study attributes “agricultural practices” as the principle cause of mangrove forest loss. The study is cited in Tanzanian REDD+ documents to chart trends in mangrove destruction (Kilahama et al., 2009). This quantitative measure justifies urgency to both protect and reclaim the mangrove forest to the natural state that purportedly characterized the Rufiji Delta prior to the expansion of rice cultivation. The politics that stem from this narrative are the strict protectionist measures, including evictions that currently define Tanzanian forestry policy for the Rufiji Delta. The take home message of the narrative is that rice farming must be stopped and mangrove trees planted if the mangroves are going to provide the critical ecosystem services needed in the context of rising sea-levels and the development of carbon markets.

3.4. An environmental historical and scientific lens of the Rufiji Delta

The environmental narrative that informs Tanzanian REDD project documents and REDD-readiness activities is flawed in three fundamental ways. First, it inaccurately describes the history of movement and settlement of people in the Rufiji Delta North. The narrative paints a picture of a relatively recent immigration of people, but archival records show the delta to be a socio-natural landscape in which farming and intensive logging were widespread since at least the nineteenth century. The area was yielding at least two rice harvests per year and mangrove poles were traded within local, regional, and international circuits. Second, the environmental science and environmental history that informs the narratives are exceedingly shallow. They do not take into account the patchy nature of the Rufiji Delta landscape that is derived in part from the fluvial geomorphology and in part from human use. This patchiness is described by 19th century explorers, colonial foresters, and contemporary environmental historians. Lastly, the threat of sea-level rise for coastal Tanzania is uncertain.

The claim that contemporary rice farmers in the Rufiji Delta North are recent immigrants that date from the villagization campaigns in 1968–1974 is historically and geographically inaccurate. The area where the villagers were planned to be relocated was not in the northern part of the delta, but further inland on higher and infertile escarpments referred to by Havnevik (1993) as North Hill (Fig. 1). Delta residents refused to comply with the government orders to move away from the fertile flood plain they had cultivated for generations (Sandberg, 1974; Sandberg, 2010). Rather than being recent immigrants, the Warufiji have populated the delta for centuries.

The Warufiji’s refusal to leave the area during villagization is consistent with a long history of resistance to outside influences. The British consul to Mozambique, James Elton, visited the Rufiji Delta North in the late-1870s. In Elton’s account of his travels, he stated that the “Rufiji sell but few slaves to the Arabs, who do not care to meddle with them” (Elton, 1879: 100). The most dramatic example of the Warufiji’s resistance to external claims on their labor and resources was their resistance to the forced cotton cultivation policies of the German Colonial Government in 1902. The brutality of forced cultivation and its effects on rural livelihoods led to the largest peasant uprising in colonial Africa

known as the Maji Maji rebellion (1905–1907) in which over 75,000 Africans were killed. Sunseri (2003, 2005, 2009) argues that the Maji Maji rebellion was sparked by the Warufiji’s refusal to recognize the colonial state’s claims to forest resources and their resistance to wage labor as wood cutters and tree planters for German colonial foresters. The Warufiji were also considered by President Nyerere to be the most supportive against the British in the struggle for Independence (Hyden, 1980). In 1996–1997, the Warufiji resisted attempts of foreign investors to build the world’s largest industrial prawn farm in the delta. This history of delta resistance is tremendously important for what we might anticipate if the proposed evictions take place.

In contrast to environmentalists’ portraits of an “Edenic” landscape prior to the 1970s, late 19th century explorers encountered a working landscape in the Rufiji Delta. The history of the region is intimately tied to the development of the coastal Swahili culture based on nearly two thousand years of trading connections between Zanzibari, Somali, Arab, Persian, and Indian traders and the coast (Havnevik, 1993; Chami and Msemwa, 1997). After 1730, the Omani engaged in extensive trading along the East African coast for mangrove poles. James Elton documented extensive settlements and trade during his travels along the Rufiji River in 1879. In the Rufiji Delta North, he described villages as “well built and populous near mangrove creeks in order for the large important trade for copal, ivory, wax, woods, and grain” (Elton, 1879: 91). In 1881, William Beardall was commissioned by the Sultan of Zanzibar to collect information of the country and people of the Rufiji Delta (Beardall, 1881). He described the Rufiji Delta North as “avenues of mangrove trees with inhabitants beginning to get in their second crop of rice” (641). In 1901, the German Captain Prussing also navigated through the same area and described loading places for wood and very suitable land for rice growing (Anonymous, 1901). In 1938, a British colonial forester stated that the area supported native villages, Indian and Arab shops, and some “good agriculture” (Grant, 1938).

Coastal traders highly valued mangrove poles from the Rufiji Delta. In the late 19th century, Rufiji was the main source of the mangrove trade for the Red Sea and Arabia (Sunseri, 2009). In 1899, the Sultan of Zanzibar had the right to exploit the Rufiji Delta for mangrove poles free of charge, despite the area being under control of the German Forest Department. At this time, fleets of Arab and Persian dhows that could load up to two hundred mangrove poles landed in the Rufiji Delta to load wood. Eighty to ninety percent of all wood exported from German East Africa originated in the Rufiji Delta (Schabel, 1990). In a five-month period from 1902 to 1903, the colonial government consumed approximately 280,000 logs of varying lengths for its steam engines (Sunseri, 2009). To maintain these forest resources, silviculture became a common practice. The German Forestry Department planted mangrove species for which demand was greatest. Merchants also prized the bark used for tanning and making resins (Barker, 1936). By the end of German rule, up to 78 percent of all mangroves in German East Africa were leased to bark exploiters (Sunseri, 2009). Mangrove forest exploitation accelerated considerably in the 1940s under British rule. In 1948, a mangrove concession was considered to be a “gold mine” (Havnevik, 1993).

A second theme in the environmental narrative of mangrove forest destruction is centered on flooding. A massive flood is believed to have caused an abrupt change in the Rufiji river course northward bringing freshwater to areas that were previously too saline to cultivate. This component of the narrative neglects the historical accounts of rice cultivation as well as the dynamic ecosystems of river deltas. All river deltas continuously change their flow patterns and courses at differing scales in time and space (Sandberg, 2010). Furthermore, fluctuations and variability in

¹⁵ See footnote 9 “Tanzania’s National REDD Strategy Development.”

flooding has occurred throughout the Rufiji river delta's history with new patterns of flooding every year, particularly during the long rains, that bring fresh water to places that were previously too saline (Marsland, 1938; Havnevik, 1993). Despite a continuous change in the patterns and courses of the Rufiji river delta, all of its river mouths tend to turn northwards as they reach the coast due to the overall net northward long-shore drift.

The Warufiji's complex shifting rice cultivation practices rely on this historical seasonal variability. They combine mangrove silviculture with rice paddy farming by abandoning rice paddy fields when they become too saline due to seasonal changes (small temporal scale) or river course changes (long temporal scale). Thus, Warufiji rice farmers plant and farm rice seasonally in relation to their predictions for salinity changes. It also makes it impossible for the Warufiji to grow rice everywhere at all seasons. Moreover, the closer to the mouth of the Rufiji River the greater the exposure is to salt water intrusion which reduces the area suitable for growing rice. The Warufiji also allow the mangroves to regenerate naturally while preparing new rice fields in less saline areas. Mangroves have a great propensity to regenerate themselves (Primavera, 2009). Natural regeneration of mangrove forests also contributes to higher biodiversity than silviculture, which often involves the planting of just a few species.

This extensive use of the Rufiji Delta North for farming, fishing, logging, and forestry demonstrates that the mangrove forests were a highly utilized environment that could hardly be described as "Edenic." Furthermore, the restrictions placed on mangrove forest land use by the FBD demonstrates how current land use in the Rufiji Delta North is not nearly as extensive as it was during the 18th and 19th centuries and even earlier. This environmental history illustrates how (1) it is problematic to suggest that a single major flood event would cause such an abrupt change in the course and direction of rivers in the Rufiji Delta to allow penetration of freshwater into an entire area it previously did not reach; and (2) Warufiji land use (e.g. rice cultivation) patterns take a mosaic form that mirrored the flooding, silting, and shifting river pattern.

In light of this mosaic land cover pattern, it is difficult to imagine the extent of environmental degradation projected by Wang et al. (2003). Mangrove vegetation is quite patchy, especially across multiple intersecting gradients of elevation, water and salinity levels, soil types, and wave exposure. These gradients affect the species composition, size, and growth patterns of mangrove trees on scales that are much finer than the satellite imagery resolution of 15 m and 30 m used by Wang et al. (2003). It is difficult to define the outer boundaries of a mangrove, and impossible to delineate the variations within a mangrove forest. One indicator of the difficulty in measuring land cover change in Tanzanian mangrove forests is the contradictory data. The World Mangrove Atlas (Spalding et al., 1997; Spalding et al., 2010), indicates that total mangrove forest cover in Tanzania has increased from 1155 km² in 1993 to 1286 km² in 2010.

The anticipated impacts of climate change, particularly sea-level rise, are considered to make conditions even more precarious for mangroves and heighten the urgent need to improve their management and protection (Cook, 2009). Using recent data from the University of Hawaii Sea Level Center, Benjaminsen et al. (2008) show that sea level in Tanzania is not rising. In fact, it appears to be falling. Mean sea level fall in the southern Indian Ocean are also corroborated by Wenzel and Schroter (2010), Woodroffe and Horton (2005), and Woodworth et al., 2007. Falling rates of sea-level are attributed to the rise of the coastline from thousands of years of tectonic plate movements associated with the East African Rift Valley (Benjaminsen et al., 2008). Therefore, at present, the Tanzanian coastline does not appear to be threatened by sea-level rise. Assumptions to the contrary do not take into consideration tectonic plate movements.

The long-standing practice of shifting rice cultivation combined with natural regeneration may have positive implications for biodiversity by creating minor perturbations and small changes and openings within environments as well as new niches for a wider variety of plant and animal species. These subsistence rice farming systems have also been recognized for at least two centuries in the Rufiji Delta and demonstrate that Delta North is an agroecological landscape. Thus, the question arises is what will happen to this complex and relatively stable socio-ecological system when carbon foresters and conservationists supplant the Warufiji in the Rufiji Delta North?

4. Revisioning REDD through an environmental justice lens

This paper has focused on the politically charged issues of environmental justice in the Rufiji Delta of Tanzania in the context of WWF and Tanzanian state carbon forestry programs to make the Rufiji Delta North "REDD ready." We have shown how in the case study of the Rufiji Delta, carbon forestry activities unfolding in anticipation of REDD+ are redolent with environmental injustices that threaten the livelihoods of the Warufiji. Our findings are four-fold. First, this case study validates the social and environmental justice concerns within the global climate change mitigation and adaptation literature associated with carbon forestry (Griffiths, 2009; Sikor et al., 2010). It shows how carbon forestry initiatives are redefining socio-natural relations in ways that threaten access to, control, and management of natural resources. In the process of making the Rufiji Delta "REDD ready" for carbon forestry markets, resource control and management appear to be shifting from local people in the Rufiji Delta to global actors.

Second, the study also demonstrates the ways this local to global shift in resource control and management are legitimated by narratives of environmental change (forest loss; rising sea levels) that have little basis in environmental history. Along with Sunseri (2009), we have demonstrated how the depiction of the Warufiji as invaders and destroyers of mangroves and forest loss as recent and abrupt, "erases the history of these forests as peopled spaces" (184). This misreading of the Rufiji landscape persists because it is central to the framing of environmental problems in ways that allow national and global actors to intervene in the landscape and livelihoods of the Warufiji. When this narrative is placed in the context of rising sea levels, it suggests an urgent need for intervention. In contrast, to this environmental crisis narrative, our case study suggests that the mangrove forests of the Rufiji can be reasonably described as sustainably utilized environments particularly when compared to historical forest use (e.g. timber extraction during pre-colonial and German colonialism). This re-reading of landscape and history reveals the injustices in current interpretations and recommends a conservation-with-development approach that supports existing practices of the Warufiji rather than their forcible removal from the forest.

Our third finding is that the Warufiji are resisting efforts to make the Rufiji Delta North "REDD ready" on the grounds that these efforts will increase their vulnerability and displacement. The Warufiji have a long history of resisting the claims on their labor and resources by outsiders. This begs the question in the formulation of REDD+ strategies, what incentives do REDD+ programs actually provide in order to change a history of resistance? The core issue at stake is the Warufiji's historical rights to land and water resources which national land laws and forest acts sometimes respect and sometimes reject. This is particularly relevant to the ability of REDD+ programs to constrain deforestation without seriously compromising food and livelihood security (Grieg-Gran, 2010).

Lastly, our case study legitimates concerns posed by Phelps et al. (2010), "does REDD+ threaten to recentralize forest

governance?" REDD+ sees decentralization of forest resource management as the key to empowering local communities. However, the Rufiji Delta case study reveals that the Warufiji have very limited representation with accountability and reduced access to significant material resources (Ribot et al., 2008). WWF, on the other hand, gains power by aligning itself with the Forestry and Beekeeping Division, while resisting downward accountability (Poteete and Ribot, 2011). Thus, resistance may be the only means for many Warufiji to defend themselves against the menace of REDD+, if it is implemented based on current carbon forestry governance in the Rufiji Delta. In order for REDD+ to result in both sustainable forestry and poverty reduction, the historical exclusion of forest-reliant communities from land ownership must be addressed. Equitable distribution in the form of securing the Warufiji's land tenure rights to resources is of primary concern. To carbon traders, however, an uninhabited forest greatly simplifies the logistical tasks of monitoring and paying for ecosystem services. The case study of the Rufiji Delta suggests that this "new direction in forest conservation" (Anglesen, 2009) may be overwhelmingly opposed by the people who stand to lose the most from such climate mitigation schemes.

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Virtual nature, violent accumulation: The ‘spectacular failure’ of carbon offsetting at a Ugandan National Park



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ABSTRACT

In East Africa, financially strained governments increasingly experiment with voluntary, market-based carbon offset schemes for enhancing the public management of protected areas. Often, conservationists and governments portray these as ‘triple-win’ solutions for climate change mitigation, biodiversity preservation, and local socioeconomic development. Examining such rhetoric, this paper analyses the rise and decline of an integrated carbon offset and conservation initiative at Mount Elgon National Park in eastern Uganda, involving a partnership between the Uganda Wildlife Authority (UWA) and a Dutch NGO, Face the Future. In doing so, the paper reveals the ways in which the uncompensated dispossession of local residents was a necessary precondition for the project’s implementation. Although external auditors expected the project to sequester 3.73 million tons of carbon dioxide equivalent (tCO₂e) between 1994 and 2034, conflicts forced the scheme to cease reforestation in 2003. Noting this rapid decline, we problematize the ways in which Face the Future and other carbon market intermediaries represented their activities via project documents and websites, obscuring the violence that was necessary for the project’s implementation. In so doing, we argue that the maintenance of a ‘triple win’ spectacle is *itself* integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capacity of carbon market brokers to accumulate exchange value by attracting ‘green’ investors. Consequently, what we term a ‘spectacular failure’ manifests in at least two ways: first, in the unravelling of the heavily mediated spectacle of harmonious, profitable conservation, and, second, in the deleterious nature of the consequences that accrue to local communities and ecosystems alike.

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Introduction

Upon visiting greenseat.nl, the homepage of a Dutch organization that markets carbon offset services to airline, train, and bus passengers, one is immediately greeted with an imperative to ‘travel greener now!’ On this website, and at the mere click of a mouse button, consumers ostensibly pay for both a clear environmental conscience and a healthier atmosphere. At present, GreenSeat markets carbon offsets derived from ‘voluntary’ clean energy projects, such as those involving solar and wind power. Between 1993 and 2003, however, the organization allegedly sold offsets sourced from tree plantations sponsored by a Dutch NGO – now known as ‘Face the Future’ – at Mount Elgon National Park in Uganda (Checker, 2009; Faris, 2007; Lang and Byakola, 2006; Sullivan, 2011).¹ Today,

by contrast, one cannot find mention of this initiative in the websites or organizational literature of either GreenSeat or Face the Future. Similarly, recent studies of conservation at Mount Elgon make little or no mention of the project and its relationship to the history of forest governance in the region (Norgrove and Hulme, 2006; Petursson et al., 2011; Petursson et al., 2013a,b; Sassen and Sheil, 2013; Sassen et al., 2013).² What happened? Examining the disappearance of this project from global ecosystem service markets, this paper analyses the rise and decline of Face the Future’s scheme at Mount Elgon; the problematic ways in which it represented its operations via the internet; and the violence that was simultaneously experienced by local people.

Such an inquiry is warranted, we claim, given that similar attempts to link Ugandan protected areas to a global ‘economy of repair’ (Fairhead et al., 2012, 242) through carbon markets have decidedly exhibited what MacDonald (2013) – following the philosophers Peter Sloterdijk and Slavoj Žižek – terms ‘cynical

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¹ ‘Face the Future’ was originally known as the Forest Absorbing Carbon Emissions (FACE) Foundation (see also Lang and Byakola (2006) and <http://www.face-thefuture.com>).

² Sassen et al. (2013, 260) note the existence of the UWA-FACE project in a summary table of the last one hundred years of conservation governance at Mount Elgon, but do not further examine or explain its disappearance.

reason”, or strategic attachment to a disingenuous set of rhetorical claims. Differently put, although brokers of the voluntary carbon market frame these initiatives as a ‘triple-win’ for biodiversity conservation, climate change mitigation, and socioeconomic development (National Forestry Authority [NFA], 2011; Uganda Wildlife Authority [UWA], 2011), a growing body of evidence documents the deleterious consequences of forest conservation for local populations in both Uganda and elsewhere in East Africa (Benjaminsen and Bryceson, 2012; Benjaminsen et al., 2013; Beymer-Farris and Bassett, 2012; Brockington, 2002; Gardner, 2012; Igoe and Croucher, 2007; Nel and Hill, 2013; Neumann, 1998; Norgrove and Hulme, 2006). Likewise, NGOs and activists have published controversial accounts of the dispossession of rural populations for Ugandan carbon offset forestry projects in particular (Friends of the Earth, 2012; Lang and Byakola, 2006; Nel and Sharife, 2012), including the notable case of more than 20,000 people allegedly evicted for a project managed by a British firm, the New Forests Company (Carrere, 2009; Oxfam International, 2011). In such instances, it would appear that these exploitative attempts to pursue carbon offset forestry in Uganda are emblematic of both ‘green grabbing’ processes (Fairhead et al., 2012) and the ‘global land grab’ more broadly (e.g. Borras et al., 2011).

The primary objective of this paper, however, is not *only* to present an empirical account of green grabbing. Additionally, we focus on what Corson et al. (2013, 5) term “grabbing green”, or on the various “inter-relations, systemics, logics, and mechanisms” that both UWA and Face the Future have utilized to pursue their respective agendas under a global environmentalist mandate, and how these mechanisms ultimately unravelled. Indeed, these organizations’ representation of carbon offset forestry as a ‘triple win’ is no simple task, as it necessarily entails the enrolment and stabilization of a vast network of actors, technologies, expertise, and institutions. In other words, these projects denote the need for “socially necessary abstractions” (Robertson, 2012, 389), or the conceptual output of processes of measurement and representation that allow certain aspects of ecosystems to be isolated, standardized, and circulated through markets. Crucially, the production of these abstractions is a profoundly *virtual* process, or an attempt “to make the world around us look like and conform to an abstract model of it” (MacDonald and Corson, 2012, 160). Such virtualism has characterized efforts to conserve biodiversity at least since the colonial era (West et al., 2006), in which fundamentally Western or ‘modern’ (Latour, 1993) conceptions of the distinction between nonhuman ‘nature’ and human ‘society’ were territorialized in the form of protected areas (Adams and Hutton, 2007). Yet, new technologies add a novel dimension to these already virtual processes, best encapsulated perhaps by the term “Nature 2.0” (Büscher, 2013). Through conservation websites and blogs, social media platforms like Facebook, Twitter, and Youtube, and the integration of conservation finance into everyday consumptive practices (Igoe, 2013), consumers increasingly experience nature itself as a spectacle, or as a series of consumable images and representations (Sullivan, 2013).³ In many ways, conservation has thus become ‘spectacularized’, generating profits through what we might term ‘spectacular accumulation’ (Igoe, 2010, 378; Tsing, 2000, 139), as it increasingly relies upon an array of mediating technologies to link capital with the often-distant places that it is now meant to conserve.

In relation to the synthesis of carbon offsetting and more conventional forms of biodiversity conservation, spectacular

³ See, for example, the new website launched by the Uganda Wildlife Authority with assistance from USAID’s Sustainable Tourism in the Albertine Rift (STAR) programme, featuring built-in connectivity for a variety of social media platforms, as well as endorsements from TripAdvisor, CNNTravel, National Geographic, and Lonely Planet (<http://ugandawildlife.org/>).

accumulation operates through representations of the presumed global commensurability of greenhouse gas emissions (Bumpus and Liverman, 2011; Fairhead et al., 2012). That is, through a series of abstractions that allow one tonne of carbon dioxide equivalent (tCO₂e) emitted by industry in the Global North to be rendered as precisely equivalent to another sequestered by forests (or via an alternative scheme) in various ‘frontier’ (Tsing, 2005, 59) regions of the Global South. This point should not be misunderstood as a methodological critique – we do not question that forests at least temporarily sequester carbon dioxide in the amounts estimated by project managers, although many analysts have raised salient technical issues related to carbon leakage and permanence (Ascuí and Lovell, 2011; Bachram, 2004; Galik and Jackson, 2009; Lovell and Liverman, 2010). Rather, we contribute to this rapidly growing literature by arguing that spectacularization constitutes a *necessary* component of the production of a carbon offset. As we will see, the maintenance of a ‘triple win’ spectacle is itself integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capability of carbon market brokers to generate exchange value by attracting ‘green’ investors. Consequently, when these projects fail to maintain a coherent triple-win representation, what we term a ‘spectacular failure’ manifests in two interrelated ways: first, in the unravelling of the heavily mediatized imagery of harmonious, profitable conservation, and, second, in the extent of the deleterious consequences that accrue to local communities and ecosystems alike.

This argument is supported in five sections. First, we examine recent approaches to the political ecology of carbon offsetting, and draw particular attention to the ways in which these processes necessarily involve spectacular forms of accumulation. Second, we highlight the ways in which the violent and uncompensated dispossession of local residents was a necessary precondition for the UWA-FACE project’s implementation, effectively constituting a process of interrelated accumulation and *naturalization* by dispossession. Third, we identify a number of antinomies between the ‘triple-win’ rhetoric that characterized the FACE Foundation’s literature with UWA’s struggles to contain local resistance and legal challenges to conservation in the area. Fourth, we specifically examine the ‘spectacular failure’ of the UWA-FACE project at Mount Elgon, and present findings regarding the impacts of these activities on both forest plantations and local communities. Finally, we conclude with a discussion of the implications of these events for other proposed schemes to trade in carbon offsets over voluntary markets in East Africa and elsewhere.

Virtual nature, or: Why carbon forests have spectacular social lives

Much recent work in political ecology has critically engaged with the production of ostensibly ‘socio-natural’ commodities (Arsel and Büscher, 2012; Büscher and Arsel, 2012; Büscher et al., 2014; Fletcher, 2012; Peluso, 2012; Roth and Dressler, 2012), and especially so within the politicized context of global environmental change (McAfee, 2012; Peet et al., 2011). Following influential conceptualizations by Castree (e.g. 2003b, 2008) and McCarthy and Prudham (2004), these inquiries increasingly share an interest with the ways in which new ‘green’ markets result in both the reproduction of old-, and the generation of new-, inequalities, dispossessions, or restrictions of access to natural resources (Büscher et al., 2012; Fairhead et al., 2012). Interestingly, then, rather than constituting a radical limit for capital accumulation (O’Connor, 1988), this literature interrogates the ways in which the environment frequently now provides a new frontier for the generation of surplus value (Sullivan, 2013), and/or a

'spatial-environmental fix' for the resolution of intertwined economic and ecological crises elsewhere in the capitalist system (Harvey, 2003; Smith, 2007). Consequently, these concerns further compound related discussions about both climate and environmental justice, which seek to prevent the mitigation of largely Northern-induced processes of global environmental change at the expense of vulnerable communities in the developing world (Agarwal and Narain, 1991; Beymer-Farris and Bassett, 2012; Marino and Ribot, 2012).

To understand the complex ways in which these concerns intersect with the production of carbon offsets, however, we must first examine the basic character of these commodities, which is simultaneously both 'social' and 'natural'. For example, Bumpus (2011, 616) notes four distinct, yet simultaneous, 'types' or dimensions of existence for each individual carbon offset:

"the carbon that continues to be emitted by the offset buyer (type 1); the carbon that would have been emitted if it had not been displaced by the project activity (type 2); the lower emissions as a result of the project activity (type 3); and the tCO₂e (type 4) that is produced by the difference in emissions as a result of the project activity and baseline."

Here, we see that a carbon offset is primarily relational or 'hybrid' (Castree, 2003a), as it necessarily problematizes the conceptual nature-society distinction that Bruno Latour (1993, 29) terms the 'modern constitution'. In the case of reforestation projects, for example, tCO₂e have a material existence in the sense that it is possible to measure the amount of carbon dioxide that is stored in a given portion of forest (Ascuí and Lovell, 2011). However, a given tCO₂e stored in forests is not, clearly, the very same tCO₂e that was released elsewhere in the world. Consequently, in contrast to the biophysical sequestration of carbon dioxide, the *production of a carbon offset* is co-dependent on the (often transnational) construction of relationships between those who emit, those who sequester, and the ecosystems and technologies enrolled by both. If one of these components functions as required, but another falters, the carbon offset unravels as an entity and ceases to exist.

Such co-dependency forces proponents of carbon offsetting to constantly engage in acts of "translation" in order to keep these relationships functioning smoothly (Mosse, 2005, 9). Project managers must constantly employ measurement, certification, and accounting technologies in order to assure the consumers of carbon offsets that they are, in fact, purchasing something that exists (Ascuí and Lovell, 2011; Lovell and MacKenzie, 2011). Yet, for offsetting arrangements that involve afforestation or reforestation, carbon is 'uncooperative' in the sense that it is significantly more difficult to measure and quantify than with other technologies (Bumpus, 2011). This is particularly true in contrast with, for example, the destruction of industrial gases like nitrous oxide and hydrofluorocarbon-23, which is an inherently more controllable and measurable process (Lovell and Liverman, 2010, 258). In particular, forestry projects are specifically afflicted by the twin problems of 'leakage' and 'permanence'; whereas 'leakage' refers to the possibility that deforestation activities will simply be displaced outside the project area, 'permanence' refers to the omnipresent risk of stored carbon being released through fire, disease, pests, human encroachment, or a variety of other contingencies (Galik and Jackson, 2009; Wunder, 2008). Thus, for Bumpus and Liverman (2011, 210), a carbon offset is best conceived as being created through a process of "hemming in" that involves the use of monitoring procedures, baseline calculations, guarantees of

additionality, and robust offset methodologies. When these components become more loosely coupled, the offset's own existence becomes less certain. Consequently, we again see how the existence of a carbon offset is inseparable from the collective functioning of biophysical systems, mediating technologies, and the 'social work' of monitoring, evaluation, auditing, and disseminating results to prospective consumers through interactive websites, applications, and blogs.

We note, moreover, that it is precisely in relation to the latter task that the business of carbon offsetting necessarily proceeds through practices of spectacular accumulation. Here, we do not draw a simple distinction between 'actual' empirical realities and falsely spectacular representations of these by conservationists and their financiers. Rather, following Igoe's (2010, 376) reading of Debord (1967) and Tsing (2000, 2005), spectacles are "not different and separate from the conditions that they portray, they are produced by them and, in turn, define and reproduce them." As such, we instead encounter a virtual relationship between the biophysical world and instrumental representations of it, wherein the spectacle of 'pristine' carbon-sequestering landscapes enables the generation of resources to both create new enclosures and more effectively govern existing ones. In other words, financial transfers for carbon offsetting must be "imagined" or "conjured" before they can be actualized, creating a situation in which, as Tsing (2000, 118) puts it, "[t]he more spectacular the conjuring, the more possible an investment frenzy."

Hence, although conservationists' attempts to produce such an 'investment frenzy' have rendered a commodified version of African 'nature' more visible to international audiences than ever before, this spectacular set of images and representations is thoroughly fetishized. Of course, for Marx (1995 [1867], 47), commodity fetishism refers to the ways in which capitalist production masks the social relations implicated in the production of a particular good or service, where "the relation of the producers to the sum total of their own labour is presented to them as a social relation, existing not between themselves, but between the products of their labour." In other words, fetishism occurs when commodities are consumed "without reference to the relationships and contexts from which they were produced" (Igoe, 2010, 378). In the case of markets for ecosystem services, therefore, fetishization obscures the ways in which both legal and extra-legal violence and dispossession are often necessary to implement the land use changes required for the production of carbon offsets and similar commodities (Peluso and Lund, 2011; Springer, 2013).

When the political-ecological relations of exploitative carbon offsetting initiatives are rendered visible, however, what we will term a 'spectacular failure' ensues. This entails, first, the unravelling of the heavily mediatized imagery of harmonious, profitable conservation often presented in websites and project documents. Yet, such failures are also 'spectacular' in an additional sense; that is, in the extent to which they reveal an enormous gap between 'representation' and 'execution' in project activities, and the ways in which this gap entails deleterious consequences for local communities and ecosystems alike. Subsequent portions of this paper provide an empirical discussion of such a 'spectacular failure' by analysing a voluntary carbon offset and conservation scheme at Mount Elgon National Park (MENP), known as the Uganda Wildlife Authority-Forest Absorbing Carbon Emissions (UWA-FACE) project. In doing so, we seek to problematize the ways in which the UWA-FACE project represented the political-ecological relations that governed the project's sequestration of carbon dioxide to prospective consumers of the resulting carbon credits.

Naturalization by dispossession? The commodification of carbon sequestration at Mount Elgon, Uganda⁴

In 1992, a Dutch NGO – the Forest Absorbing Carbon Emissions (FACE) Foundation⁵ – approached the Ugandan Ministry of Trade, Tourism, and Industry (MoTTI) with a proposition to reforest degraded sections of the Mount Elgon Forest Park.^{6,7} The FACE Foundation knew that many of Uganda's protected areas were severely degraded during the tumultuous post-independence period, and during the civil war that eventually brought current President Yoweri Museveni to power in 1986. At Mount Elgon, this damage was particularly substantial, as approximately 25,000 ha of the reserve's forest cover were lost during this time (Norgrove and Hulme, 2006; White, 2002). Since Uganda's economy also suffered greatly during this period, few internal revenues were available for the rehabilitation of national parks and forest reserves. Indeed, the World Bank notably ranked Uganda as the worst performing economy in Sub-Saharan Africa for the period between 1961 and 1989 (Norgrove, 2002, 70–71), and the implications for the government's capacity were understandably substantial.

As a result, the MoTTI favorably received the FACE Foundation's interest in Mount Elgon. According to the original contract between these two parties (FACE Foundation, 1992), FACE agreed to cover the costs of reforestation, including those incurred for labor and procurement. In return, the MoTTI and its subsidiary, Uganda National Parks (UNP),⁸ were required to relinquish the rights to market the carbon dioxide stored in the new forest compartments, and to guarantee the security of these new plantations for a period of 99 years. Further, the contract stipulated that these compartments would sequester a minimum of “5500 kg CO₂ per hectare per year” (FACE Foundation, 1992, 7). As noted earlier, carbon credits generated by this scheme were also allegedly marketed via a Dutch organization known as GreenSeat – which sells voluntary carbon offsets to airline, bus, and rail passengers – and its parent organization, the Climate Neutral Group (Checker, 2009, 46; Lang and Byakola, 2006, 9; Sullivan, 2011, 336). As such, prospective consumers were ostensibly invited to “travel greener” by purchasing carbon credits from the FACE Foundation's plantations at Mount Elgon (GreenSeat, 2012).

Presumably unbeknownst to many potential consumers, however, the Dutch Electricity Generating Board (known as ‘N.V. Sep’) originally established the FACE Foundation in 1990 (FACE Foundation, 2000, 2001a). Officially, N.V. Sep's objective was to ensure that the foundation would “provide enough CO₂ credits from afforestation and reforestation projects to offset the CO₂ emissions from a new coal fired power station” in the Netherlands

(Société Générale de Surveillance [SGS] Agrocontrol, 2001, 4).⁹ Although the FACE Foundation formally “decoupled” from N.V. Sep in 2000 (FACE Foundation, 2001a), European electricity firms apparently continued to constitute a large portion of the FACE Foundation's clientele (FACE Foundation, 2000, 2001a). Unsurprisingly, the organization generally downplays this connection with coal-fired electricity generation, and asserts that its main objective “is to establish and protect forests [...] sustainably and responsibly, in suitable areas, wherever in the world, and by so doing to contribute to reducing the amount of CO₂ in the atmosphere” (FACE Foundation, 2001a, 2). Thus, although the organization is ‘non-profit’ in a strictly technical sense, the foundation is only thinly separated from the for-profit apparatus of N.V. Sep and its other clients, who increasingly seek to reduce environmental criticisms of their operations without changing the core of their business practices, perhaps also increasing their competitiveness over firms that are not so ‘environmentally savvy’ in the process.

In the early 1990s, this type of contract was virtually unprecedented in sub-Saharan Africa. Indeed, the world's first voluntary carbon offset arrangement was implemented only a few years prior in 1989, in an agreement signed between the AES Corporation (a US electricity firm) and an agroforestry project in Guatemala managed by CARE International (Bumpus and Liverman, 2008, 133). Also a pioneer, the FACE Foundation had established a carbon offset forestry projects in Ecuador in 1990 (Bumpus, 2004), and perceived Uganda's newfound political stability as a potentially feasible entry-point for expanding their operations to East Africa. Given that the UNFCCC itself was only established after the Rio Earth Summit in 1992, and the Kyoto Protocol even later in 1997, these activities long preceded the ‘compliance’ carbon offset schemes initiated under the framework of the UNFCCC and its Clean Development Mechanism (CDM). As the ensuing discussion aims to show, however, the ‘triple-win’ spectacle of the FACE Foundation's project was undermined by the manner in which its activities were ultimately implemented. Specifically, the violent evictions that characterized this process of (re)naturalization on Mount Elgon suggest that one might accurately describe these events as a form of “primitive accumulation” (Corson and MacDonald, 2012; Kelly, 2011), or environmentally-justified “accumulation by dispossession” (Benjaminsen and Bryceson, 2012; Fairhead et al., 2012). This holds both in relation to the outright enclosure of land and resources, and the alteration of conservation institutions in ways that restricted local access to livelihood-supporting resources such as water, fuelwood, and non-timber forest products – all the while creating new sources of income for UWA and the FACE Foundation.

Accumulation by dispossession, selective history, and the (re)production of ‘nature’ at Mount Elgon

Within a year of the original MoTTI-FACE Foundation contract being signed in November 1992, the Ugandan government resolved to upgrade Mount Elgon to national park status, and to remove ‘encroachers’ from within its boundaries (Gosalamang et al., 2008; Norgrove and Hulme, 2006; White, 2002). Although it is difficult to retrospectively open up the strategic ‘black box’ surrounding this decision (Mosse, 2005, 20), one should note the correlation between financial incentives provided by both the FACE

⁹ In March 2008, the Dutch television programme ‘Zembla’ aired a documentary on Dutch coal-fired electricity and carbon offsetting at Mount Elgon, entitled ‘Het CO₂ Alibi [The CO₂ Alibi]’ (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>). The programme generated significant public controversy in the Netherlands, which in turn paralleled international debates following the publication of a widely-read report by Chris Lang and Timothy Byakola (2006) for the World Rainforest Movement.

⁴ Empirical findings in this section are the result of fieldwork conducted by the first author during September–December 2009 and July–December 2011, consisting of 53 semi-structured interviews, content analyses of project documents, and five focus group discussions with UWA-FACE plantation-adjacent communities. First, data on the establishment of UWA-FACE forest compartments at Mount Elgon, their distribution around the protected area, and local encroachment were gathered through semi-structured interviews with employees of the Uganda Wildlife Authority and other Ugandan environmental management agencies, as well as through content analyses of official documents, accounts, and project records.

⁵ The FACE Foundation has since rebranded itself as ‘Face the Future’.

⁶ According to Lang and Byakola (2006, 59), this initial series of negotiations was brokered by one Jan Bettlem, a Dutch national then working as a Technical Advisor for IUCN in Uganda.

⁷ Mount Elgon Forest Reserve was re-designated as a Forest Park in 1991, and as a National Park in 1992–3.

⁸ Uganda National Parks later merged with the Game Department to form the Uganda Wildlife Authority (UWA) in 1996, in accordance with the 1996 Uganda Wildlife Statute.

Foundation and other donors, such as USAID's (1991) US\$ 30 million National Action Plan for the Environment (NAPE),¹⁰ and the Government of Norway's support to the Mount Elgon Conservation and Development Programme (MECDP), which was first implemented in conjunction with IUCN in 1988 (White and Hinchley, 2001). Indeed, among scholars of conservation and natural resource management in East Africa, substantial debates exist regarding whether such decisions are generally 'organic', or undertaken largely at the behest of international pressures from NGOs and donors (Gibson, 1999; Gosalamang et al., 2008). The reality is complex, and, we assert, arises in response to varying combinations of the interests of political elites, NGOs, multilateral and bilateral donors, and the financial incentives provided by these actors.

In contrast to the multiplicity of these interests, however, the process of upgrading the Mount Elgon Forest Park to a National Park in 1993 was singularly violent. Beginning in 1993, the 25,000 ha of degraded parkland targeted for reforestation by the FACE Foundation were cleared of 'encroachers' by paramilitary UNP rangers and National Resistance Army¹¹ soldiers (Norgrove, 2002; Norgrove and Hulme, 2006; White, 2002). These evictions were reportedly characterized by widespread violence and human rights abuses, and may have involved little or no prior warning at many locations (Himmelfarb, 2012; Hurinet Uganda, 2011; Lang and Byakola, 2006; Norgrove, 2002; Norgrove and Hulme, 2006; Vangen, 2009). While the Ugandan Constitution and relevant land-use legislation afford the right to the state to seize land when it is deemed to be in the national interest (Government of Uganda, 1995; Hunt, 2004; Okuku, 2006), they also stipulate that both due warning and compensation must be provided to evictees. Official records of the evictions were not kept, however, and estimates now vary regarding the exact number of people displaced. For instance, Checker (2009, 45) – reviewing empirical work by Himmelfarb (2006, 16) – claims that the project resulted in the eviction of 6000 people. This figure is also cited by Sullivan (2011, 336). However, Himmelfarb's fieldwork was limited only to a specific portion of the northern edge of Mount Elgon National Park, known as the Benet Resettlement Area, which is located in two of the least populated of the eight districts that currently border the protected area (Uganda Communications Commission [UCC], 2010). Indeed, estimates of human displacement from the national park as a whole tend to be much higher: Vangen (2009, 135) roughly estimates that the overall figure could exceed 150,000 persons. Likewise, Sean White (2002, 2–3) – then IUCN's Chief Technical Advisor for the Mount Elgon region – estimates that the 25,000 ha of encroached forest could have fed as many as 84,000 households, or approximately 580,000 people at current household sizes. Regardless of the exact extent of the evictions, communities were not provided with official compensation either for the loss of land and property, nor for injuries sustained as a result of the evictions (Gosalamang et al., 2008, 44). Finally, one should note that while the bulk of these activities occurred in 1993, lower intensity paramilitary evictions continued over the next decade, and especially when the 1993 boundary was re-gazetted in 2002–3 with financial assistance from the World Bank's Protected Areas Management for Sustainable Use (PAMSU) programme (Cavanagh, 2012; Norgrove and Hulme, 2006; White, 2002). Such paramilitary activities continue to prevent access to land, cultural sites, and forest resources in territory that was formerly occupied by communities.

¹⁰ With this programme, USAID played a crucial role in both financing and conceptualizing Uganda's initiative to regain control over its protected areas. In the original grant document, USAID (1991) emphasizes the need to clearly demarcate the boundaries of reserves, remove existing encroachers, and involve nongovernmental organizations in the management of protected areas.

¹¹ The National Resistance Army was renamed the Uganda People's Defence Forces (UPDF) in 1995, and is Uganda's official military force.

Conversely, the Ugandan government and UNP¹² claim that these evictions were perfectly legal, and that allegations of abuse remain unproven. For UNP, especially, inhabitants of the Mount Elgon Forest Park were perceived as 'squatters' or 'encroachers', who simply and illegally appropriated public land for their own private use (NFA, 2011; UWA, 2009a, 2011). However, this position is complicated by our archival research on Mount Elgon's management history. First, as noted in the original working plan for the Mount Elgon Forest Reserve (Webster, 1954, 6),

“[r]ather unwillingly, the [Forest] Department agreed to a field investigation early in 1940 by an administrative officer and a forest officer. As a result of their recommendations, the [park boundary] line was adjusted in twenty places between Bulago and Bumbo [parishes]. These excisions amounting to about six square miles, were not surveyed nor was the gazetted area or the reserve altered. In addition to the excisions, licenses were issued to about 70 families who were allowed to remain and cultivate in the reserve. These licenses were issued for life and, if the original licensee died, the license could be transferred to one of the sons.”

In addition to such excisions, the 1962 *Public Land Act* and 1969 *Public Lands Act* likewise complicated the overarching tenure situation, as both were often interpreted as affording farmers the right to deforest unoccupied public land for agricultural purposes without prior consent from the government or other authorities (Mugambwa, 2007; Petracco and Pender, 2009, 6). Later, land tenure relations were further destabilized by Idi Amin's 1975 Land Reform Decree, which claimed all land in Uganda as state property (Hunt, 2004, 176; Okuku, 2006, 10–11). In some instances, farmers were encouraged to appropriate land as they pleased, the logic being that this would reduce the dependence of rural populations on the state and mitigate the effects of its increasingly dysfunctional management of the national economy. Simultaneously, Amin's government also simply distributed portions of protected areas to supporters when such actions were deemed politically expedient (Turyahabwe and Banana, 2008, 650). Further, as noted by Norgrove and Hulme (2006, 1098), settlement of the forest reserve also occurred during Milton Obote's second regime, during which allegedly corrupt Forest Department officials sold illegitimate land titles to farmers at Mount Elgon. Today, however, many conservationists systematically ignore these inconvenient pieces of Uganda's land tenure history, and instead strategically adopt a legalistic, uncritical, and ahistorical perspective on communities living within protected areas (see, for example, NFA, 2011 or UWA, 2011). Here, we perhaps see what both Peluso and Lund (2011, 674–676) and Springer (2013, 533) describe as 'law's violence', or the ways in which the law itself can be utilized as a tool of dispossession, especially when it overwrites traditional and customary forms of land possession and use.

In light of such violence, one can observe “conservation practice as primitive accumulation” (Kelly, 2011) at Mount Elgon in two distinct forms: (i) in the uncompensated expropriation of land and physical assets; and (ii) in the expropriation of rights of access to common property resources. Indeed, whereas the former component is well documented in the social scientific literature on conservation at Mount Elgon, researchers have frequently analyzed the latter only in the economic sense, as a lost asset for park-adjacent household economies. In a political-economic sense, however, the expropriation of rights to common property also entails the proletarianization of subsistence farmers, or the heightened exposure of their household's demand for basic commodities

¹² UNP and the Game Department merged to form the Uganda Wildlife Authority (UWA) in 1996. Here, we refer to actions undertaken by UNP, as they occurred prior to the passing of the 1996 Uganda Wildlife Statute.

(such as food, fuelwood, herbs, other non-timber forest products) to market forces. Differently put, whereas households would otherwise acquire these inputs by accessing commonly-owned stocks in forest locations, the expropriation of these access rights forces households to acquire such resources through market transactions, and further embeds them within the cash-based economy. In addition, while one could object to the status of conservation enclosure as primitive accumulation on the grounds that it involves the creation of public rather than private property (Kelly, 2011, 687), evictions at Mount Elgon enabled the generation of exchange value through the sale of both carbon offsets and ecotourism experiences. Differently put, while seized land and forests were not privatized, they were certainly commodified and marketized (Castree, 2008). Further, although the expropriated land was converted from customary to public property, the benefit stream resulting therefrom was appropriated by a variety of state, nongovernmental, and private actors.¹³ In essence, then, this constitutes a process of both accumulation and *naturalization* by dispossession, in which the removal of smallholding farmers enabled the production of a 'pristine' landscape for both tourists and brokers of the then-emerging carbon market, such as the FACE Foundation.

Indeed, 'degraded' areas of the forest reserve had not been merely stripped of forest cover. In many cases, communities had established permanent human settlements within the reserve's boundaries, including homesteads, schools, trading centers, and basic health facilities (Himmelfarb, 2012). In the process of evictions, UNP and NRA personnel razed these structures (Norgrove and Hulme, 2006; Vangen, 2009), and it is conceivable that their ruins were still present when reforestation activities began in 1994. Yet, the FACE Foundation continues to deny that its organization's activities have had any impact on land use conflicts at Mount Elgon. For example, when the first author contacted one of the organization's Netherlands-based executives in an attempt to record the FACE Foundation's perspective, he curtly responded as follows:

"If you are doing fieldwork I suggest you contact UWA. [...] We do not have a role in the conflict, but were only involved in a reforestation project" (FACE Foundation executive, email communication, 11.09.2011).

Unsurprisingly, evicted populations resent the violent nature of this process, and do not relish enduring attempts to obscure the relationship between the region's history of uncompensated eviction and existing carbon offset projects. In further developing this discussion, the next section examines the ways in which UWA and the FACE Foundation selectively ignored such inconvenient aspects of the region's resource management history, instead focusing rather disingenuously on the 'benefits' that were said to accrue to local populations.

Maintaining a 'triple-win' spectacle

Despite the exceedingly violent and ongoing nature of this process of naturalization by dispossession, UWA and the FACE Foundation continued to represent their activities as an unreservedly 'triple-win' case of integrated conservation and carbon offsetting. For instance, nearly a decade after large-scale evictions took place on Mount Elgon, the FACE Foundation's 2001 annual report declared that the

"involvement of the owners and local population are crucial factors to the success of projects. Because these parties have a

¹³ For a discussion of the ways in which primitive accumulation through conservation often involves the appropriation of benefit streams from land and natural resources rather than the appropriation of those resources *as such*, see also Benjaminsen and Bryceson (2012).

social and economic interest in maintaining the forest, Face pays much attention to the project region's social-economic context when selecting its locations [...] Besides the sequestration of CO₂, the forest offers other benefits to the local environment, including social and economic development such as employment" (FACE Foundation, 2001a, 2).

In addition, a project brochure describes UWA-FACE's activities at Mount Elgon National Park and related initiative at Kibale National Park thusly:

"The government has re-enforced the integrity of the national parks in the early 1990s. Since 1994 a large number of local tree species are being planted by the projects to rehabilitate the forests and their habitats for plants and animals, therewith enhancing biodiversity. The projects collaborate with IUCN, which supports conservation and sustainable development programs with the adjacent farmer communities [...] The FACE Foundation owns the CO₂ credits, while the forest and all other proceeds belong to UWA" (FACE Foundation, n.d.-a).

Moreover, concerning its rationale for choosing Mount Elgon as a project area, another FACE Foundation annual report simply notes that "one quarter of the area of the national park is damaged. The areas that will not recover naturally in the short term are being replanted by UWA-Face" (FACE Foundation, 2000, 12). Indeed, neither these brochures and annual reports – nor the contracts signed between UWA and FACE (FACE Foundation, 1992, 2001b) – make any mention of the violent and fiercely contested removal of settled agrarian communities from the areas slated for reforestation. Only passing mention of the disputed park boundary can be found in another early, undated project brochure, which somewhat cryptically notes that between "1988 and 1992 the boundary of the forest reserve was resurveyed and planted with eucalyptus trees. Agricultural encroachments were for the greater part terminated, while a sustainable development programme was initiative to improve the local livelihoods" (FACE Foundation, n.d.-b).

Yet, documents produced by the Uganda Wildlife Authority suggest that the scale and character of these evictions may have been well-known to the FACE Foundation. In a retrospective overview of project activities, for example, UWA (2011) argues that the project was necessary precisely as a consequence of agricultural encroachment and settlement of the protected area, and that conflicts arising as a result of evictions posed perhaps the greatest challenge to reforestation activities. "There are conflicts/disagreement about the ownership of land along the Park boundary", the report's authors write, resulting in a "feeling among some of the local communities that they have lost property [...] people feel they have the right to cultivate crops and as such they have sued the government for grabbing their ancestral land" (UWA, 2011, 4).

Here, UWA refers to a series of lawsuits targeting Mount Elgon National Park and the Ugandan Attorney General that were launched by communities in the Manafwa, Sironko, and Kapchorwa districts in the early 2000s. In the latter case, ActionAid and an NGO known as the Uganda Land Alliance supported local communities, which resulted in a favorable consent judgment – delivered in 2005 – that recognized the community as the "historical and indigenous" inhabitants of the Mount Elgon forest (see Cultural Survival, 2005; Okwaare and Hargreaves, 2009). Lawsuits launched by two groups of farmers in Manafwa district and one in Sironko district have also been ongoing for nearly a decade, and court injunctions were granted in the mid-2000s to prevent further evictions and destruction of community property by UWA.

Given that the plaintiffs in each of these cases formally named UWA and its personnel at Mount Elgon as respondents, relevant staff members have been required to attend relevant court proceedings, as the first author witnessed during fieldwork in 2011.

Consequently, UWA retains a detailed understanding of the nature of these conflicts, and their potential impacts on UWA-FACE reforestation activities in the corresponding sections of Sironko and Manafwa districts. And yet, these grievances have not been identified as challenges in sections of relevant annual reports and general management plans that relate to the governance of the UWA-FACE project (see [FACE Foundation, 2000, 2001a,b](#); [UWA, 2000, 2009a,b](#)). In short, the violence entailed in evictions from land slated for reforestation, the launching of lawsuits against UWA, and related conflicts are facts of material significance that appear to have been simply excluded from FACE Foundation documents, thereby preventing prospective consumers and donors from fully appreciating the controversial status of forest conservation at Mount Elgon. Further problematizing these omissions, the next section proposes several related mechanisms that eventually led to the collapse of the project's ability to conceal such conflicts, and thus also to internationally market its carbon offsets to consumers.

Uncooperative carbon, unruly people: Dissecting the 'spectacular failure' of the UWA-FACE project

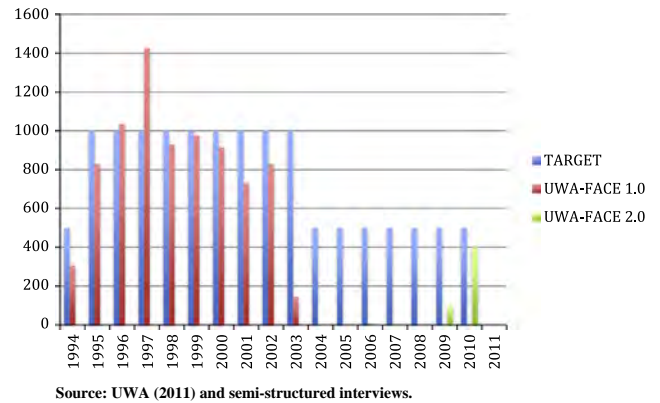
Beginning in 1995, the UWA-FACE¹⁴ project established reforestation targets of 1000 ha per year ([Fig. 1](#)). Generally, these were either achieved or exceeded until the year 2000, after which reforestation activities began to decline. By 2004, UWA-FACE restoration had almost entirely ceased, despite reformulated management targets of 500 ha per year.

Essentially, the decline of the UWA-FACE project began when its managers sought certification from the Forest Stewardship Council (FSC) for its carbon offset operations at Mount Elgon National Park in 2000. By the late 1990s, consumers had already grown sceptical of both the environmental and social benefits of carbon offsetting, and the FACE Foundation felt that such doubts could be allayed if they opened their operations to a rigorous audit. Accordingly, as part of the FSC certification process, the UWA-FACE project was subjected to a series of independent examinations by the Société Générale de Surveillance (SGS) Agrocontrol (and later by SGS Qualifor), one of the world's largest and most respected inspection firms.

In a 2001 appraisal, the assessors concluded – based on the plantations established at the time – that the project would sequester 3.73 million tonnes of carbon dioxide over the first certification period, which was deemed to last until 2034 ([SGS Agrocontrol, 2001, 36–45](#)). Of these, 1.62 million credits were set aside as a 'risk buffer', so that the remaining "2.11 million *virtually risk free* GHG credits...[could be] delivered between 1996 and 2034" – at which time plantations were due for re-inspection ([SGS Agrocontrol, 2001, 9, emphasis added](#)).

Yet, as interceding years have shown, the claim that these credits were "virtually risk free" was highly problematic. Indeed, the SGS auditors themselves originally raised a number of substantive concerns about the future security of UWA-FACE plantations, which led them to propose two "corrective actions" – one major and one minor – before the FSC could grant certification ([SGS Agrocontrol, 2001, 57–58](#)). These concerns revolved around the 'major' lack of a preexisting social impact assessment for UWA-FACE activities, and the 'minor' lack of a robust environmental impact assessment of the project's ability to guarantee the sequestration of carbon dioxide. Regarding the social impacts of the project, the assessors noted, simply, that UWA-FACE's "[s]ocial impact assessment is not adequate. Negative social impacts have not been identified and steps have not been taken to reduce those negative impacts" ([SGS Agrocontrol, 2001, 55](#)). Essentially, it was clear to

¹⁴ After UNP and the Game Department merged to become UWA in 1996, the FACE Foundation's project at Mount Elgon became known as the 'UWA-FACE project' in policy documents ([UWA, 2009b](#); [FACE Foundation, 2001b](#)).



Source: UWA (2011) and semi-structured interviews.

Fig. 1. Actual UWA-FACE reforestation vs. management targets (in hectares).

the assessors that neither UWA nor FACE had seriously considered the implications of widespread local resistance to the project for both the consumers of carbon offsets and their actual climate change mitigation effects.

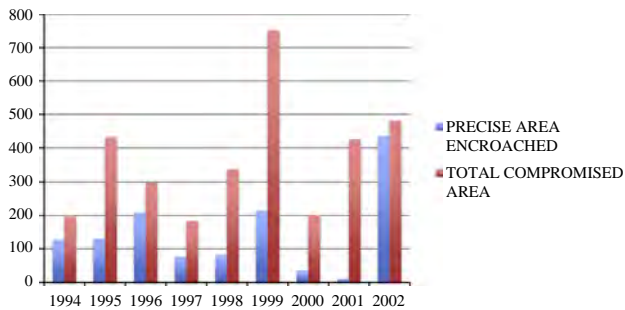
In particular, the auditors raised concerns about "political and social instability", or the ability of both UWA and FACE to protect their new plantations from local encroachment for the proposed period of 99 years. As the report's authors observed,

"[t]he political situation in the land surrounding Mt. Elgon is quite tense. There is a very high population density and land for cultivation is in very short supply. The decision to evict encroachers from the National Park has only served to increase the pressure on land outside the park. There is no doubt that local politicians can gain significant support by successfully arguing for a re-alignment of the park boundaries to afford their constituents access to more land" ([SGS Agrocontrol, 2001, 40](#)).

As noted by [Lang and Byakola \(2006, 27\)](#), it would have been virtually impossible to predict, in the early 1900s, the sort of land use regime that would prevail at Mount Elgon in the year 2000. Population dynamics have undergone massive changes, and the region has witnessed incredibly tumultuous political, economic, and social upheavals since the beginning of the 20th century. Among these were the rise and fall of British colonialism; several periods of civil war and recurring *coups d'état*; state-led programmes of political and ethnic cleansing; bio-political crises (such as the HIV/AIDS pandemic); and chronic environmental-social shocks, such as recurring drought and ensuing famines ([Bunker, 1991](#); [Mamdani, 1976](#)). From this perspective, it is arguably both naïve and potentially misleading to offer guarantees to prospective consumers regarding the future sanctity of forest plantations – in a contested region, nonetheless – until the year 2034, much less 2093.

As hindsight now demonstrates, these concerns were well-founded. From the outset of the project, agricultural encroachment and subsequent deforestation constituted omnipresent problems for UWA-FACE's plantations. Project records show that, even in the 1990s, up to 450 ha per year were compromised by community encroachment ([Fig. 2](#)). By 2004, these reforestation targets had become obviously unsustainable, and were beginning to intermingle with allegations of human rights abuse directed at UWA employees.¹⁵ Further, as noted in the previous section, portions of the land

¹⁵ Here, perhaps the most notable are reports and analysis by [Byakola and Lang \(2006\)](#), [Lang and Byakola \(2006\)](#), [Faris \(2007\)](#), [Honigsbaum \(2007\)](#), and [Cheker \(2009\)](#). A highly critical TV programme about the UWA-FACE project was aired by the Dutch programme 'Zembla' in 2008 (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>), and a documentary film on alleged human rights abuses at Mount Elgon – entitled *Cry from the Ranges* – was released by Hurinet-Uganda in 2009 (available at <http://www.youtube.com/watch?v=OLDTRS09exY>).



Source: UWA (2011) and semi-structured interviews.

Fig. 2. Encroachment into UWA-FACE plantations, 1994–2002.

slated for reforestation had become subject to lawsuits from a number of local communities, and High Court injunctions had made reforestation legally impossible in a number of areas (Hurinet-Uganda, 2011; Okwaare and Hargreaves, 2009).

From a carbon offset marketing perspective, physical encroachment is also compounded by the problem of 'de facto encroachment', or the manner in which carbon offsets become difficult to 'translate' when entire forest compartments are compromised by partial deforestation. For example, while communities physically encroached upon 1137 ha of the UWA-FACE project's approximately 7500 ha of new plantations by the end of 2002, the total area compromised by such encroachment – when measured in compartments that were compromised – amounted to 3308 ha, or approximately 44% of the total reforested area. When encroachment exceeds the allowance of a predetermined 'buffer zone' – which in this case was also 44% of total sequestration capacity (SGS Agrocontrol, 2001) – the amount of carbon sequestered in said compartments may need to be recalculated. Otherwise, the danger arises of issuing carbon credits for environmental services that were not in fact provided. Indeed, when market transactions are involved, to do otherwise would effectively risk engaging in a form of fraud (Bachram, 2004).

In addition, the technical crisis of calculating carbon sequestration is further compounded by the crisis of legitimacy that arises from persistent encroachment. Arguably, the 'spectacle' involved in the construction of a market for carbon offsets relies on the ability of individual projects to maintain 'triple-win' representations of their activities. Consequently, incentives exist for 'distancing' evidence of encroachment from consumers (Kosoy and Corbera, 2010), as such extensive deforestation rightfully poses critical questions of leakage and permanence (Galik and Jackson, 2009), as well as concerns about the human rights and socio-economic wellbeing of adjacent populations. Consequently, one might hypothesize that, rather than retaining equal status, the use value of available tCO₂e offsets quickly declines in relation to increases in experiences with both social contestation and the intentional deforestation of the project area.

Differently put, a significant portion of a carbon offset's use value is ethical or moral in nature. When consumers purchase carbon offsets, they seek not just a reduction in their carbon footprint, but also the right to advertise their membership in a socially and environmentally responsible community. When offsets derive from contested sources, therefore, use value to the consumer proportionally declines. In this sense, the 'conjuring trick' (Tsing, 2000, 118) of carbon offsetting is the production and reproduction of a triple-win representation that purports to simultaneously conserve forests, mitigate climate change, and benefit local people. Individual use value aside, the performance of this spectacle is likewise necessary for the generation of exchange value, given that it is necessary to attract both economic investors and political

supporters. Essentially, then, carbon offsetting reflects what both Tsing (2000) and Igoe (2010) term an 'economy of appearances', insofar as its functioning depends of the circulation of virtual representations rather than simply on the production and sale of tangible goods or services.

Further, when this economy of appearances begins to unravel, we encounter what we have termed a 'spectacular failure'. For example, as a result of the aforementioned contestations and allegations of human rights abuse, no additional trees were planted by the UWA-FACE project between 2004 and 2008. FACE and its financiers were presumably (and understandably) frustrated by the arguable failure of their investment, and UWA was highly cognizant of the negative press being attracted by the scheme. Truly, the manner in which the UWA-FACE project came to a halt during this period is indicative of how vulnerable such initiatives are to the judgments of both the international media and civil society. As one UWA warden explained the decline of the project:

"Their image has been tarnished, so carbon credit operations have halted. You know, it is because of the conflicts and the human rights people crying out, most of them on the internet" (UWA warden, interview 28.07.2011).

Again, since carbon credits enable organizations and individuals to claim 'carbon neutral' status, their primary benefit from the consumer's point of view is that they confer what can be described as 'normative capital', or the right to advertise one's presumably robust ethics. If one overarching lesson from the project's decline can be drawn, therefore, it is this: If the ethical basis on which these carbon credits are 'produced' is challenged – in other words, if they are de-fetishized, de-spectacularized, and have their exploitative political-ecological relations of production exposed – both their use-value for the consumer and exchange value for 'green' investors rapidly decline. To avoid this, above all else, a stable 'translation' (Mosse, 2005) of the social, political, and ecological relations involved in the offset project must be maintained among all actors involved.

Conclusion

This article has critically examined the rise and decline of an integrated carbon offset and conservation scheme at Mount Elgon National Park in eastern Uganda. While the UWA-FACE project advertised itself as a 'triple win' for climate change mitigation, biodiversity conservation, and local development (FACE Foundation, 2001a; UWA, 2009b), a political-ecological and historical analysis of the project suggests that such rhetoric is decidedly selective. The main findings of this analysis are three-fold: First, the original forest restoration agreement, signed between the FACE Foundation and the Ugandan government in 1992, was closely followed by one of the largest-scale forest eviction campaigns in Uganda's post-colonial history. Local people were evicted from the same 25,000 ha of degraded forest that were slated for UWA-FACE rehabilitation, and have not been compensated for the loss of land, property, and livelihoods that accrued as a result, despite potentially valid legal claims to their property. From this perspective, one can therefore perceive the uncompensated dispossession of local people as a simultaneous process of both accumulation and *naturalization* by dispossession, which essentially subsidized the participation of the UWA-FACE project in global carbon offset markets.

Second, in addition to its socially controversial nature, the project was likewise unable to achieve its carbon sequestration objectives. Indeed, only approximately 8000 of 25,000 planned hectares were reforested before the project was forced to cease its operations. By 2004, up to 44% of the project's newly

established forest compartments had been compromised from a carbon offset perspective, and project activities stalled as a result (UWA, 2011). Such levels of encroachment exceeded the 'risk buffer' established by the project's carbon sequestration auditors (SGS Agrocontrol, 2001), resulting in a high degree of uncertainty regarding the quantity of environmental services rendered. It does not appear that public records were made available by either UWA or FACE about carbon credits exchanged through this scheme prior to 2004, however, and it is thus nearly impossible to retroactively verify whether carbon credits were issued for actually existing environmental services.

Third, these findings present a number of second-order implications for similar forest-based carbon offset schemes in East Africa. Of particular interest is the ways in which brokers of the carbon offset market can attempt to conceal deleterious project effects by maintaining a conceptual and geographical disconnection between offset consumers and actual sites of carbon sequestration. In the Mount Elgon case, such efforts are visible in attempts to disassociate the UWA-FACE project from the violent eviction process that was necessary for its establishment. In effect, such disconnection at least temporarily enabled the FACE Foundation and its collaborators to maintain stable 'translations' of offset commodities to consumers and donors, especially in project documents and over the Internet, which obscured the above-discussed social and ecological controversies involved in the project's implementation.

More broadly, and although a now-expansive body of literature interrogates the oppressive nature of both colonial and early post-colonial conservation in Africa (for a review, see Adams and Hutton, 2007), the violence that marks emerging forms of 'green grabbing' remains largely hidden from the international public sphere. Instead, spectacular 'win-win' or 'triple-win' representations of environmental management and land acquisition dominate conventional academic, donor, and policy-based discourses on the subject (Benjaminsen and Svarstad, 2010; Igoe, 2010; Sullivan, 2013). Thus, the rhetoric of integrated conservation and carbon offsetting is always 'future positive' (Mosse, 2005, 1), in that it inexorably advocates for the technical refinement and improvement of projects, as opposed to acknowledging the often-contentious politics implicated in their actual implementation. As noted by Büscher et al. (2012, 16, emphasis original),

"conservation thus becomes an essential contribution to neoliberalism's most profound contradiction: the ability of its proponents to produce and favor discourses that are seemingly free of contradictions [...] A major part of neoliberalism's attractiveness and pervasiveness lies precisely in this ability to hybridize and stimulate consensus-oriented discourses, despite their increasingly contradictory realities."

Indeed, precisely despite evidence of the dispossession and impoverishment of rural populations, organizations such as Face the Future continue to enjoy sterling reputations among Western publics, and are generally presumed to secure environmental management outcomes that conform to their official, allegedly socially responsible rhetoric. Not least, this is evident in the IUCN's (2012) decision to offset the carbon footprint from its 2012 World Conservation Congress in Jeju, South Korea, by purchasing carbon credits from Face the Future's plantations in Indonesia. 'People benefit from the project too,' the IUCN's (2012) press release declared, 'as it creates employment based on forest restoration [...] [i]n short, the project provides a model of how carbon finance can deliver climate change mitigation, while enhancing biodiversity and supporting local livelihoods.' As we have argued, however, the use of these glossy triple-win representations of conservation constitutes a form of 'spectacular accumulation,' given that it generates substantial revenues for government agencies, firms,

and NGOs, but silences a wide range of dissenting voices that cannot be translated into an advertisement for a decidedly neoliberal version of 'nature'. Accordingly, these findings suggest the need for further critical examinations of attempts to link protected areas to a global "economy of repair" (Fairhead et al., 2012) through markets for ecosystem services, which are capable of identifying other cases of 'spectacular failure' in the production and circulation of carbon offsets and other socio-natural commodities.

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May 14, 2020

Julia Descoteaux
 City of Moreno Valley
 14177 Frederick Street
 Moreno Valley, California 92552

Via e-mail: alberta@moval.org

Re: Comments to the Draft Recirculated Revised Final Environmental Impact Report (SCH #2012021045) World Logistics Center.

Dear Ms. Descoteaux,

We would like to object to the limited time given for review of extraordinarily large set of documents and reports. Although some were previously available the comprehensive review is challenging. That said, and at this time, we have two major concerns of note related to the forgoing of certain Development Impact Fees (DIF) outlined in the Development Agreement and the extraordinary diminished changes to the mitigation measures for Noise impacts.

First: Development Agreement

Neither in Development Agreement nor anywhere else in any project documents did I find a breakdown cost analysis to justify the developer not paying DIF for arterial streets, traffic signals, interchange improvements, and fire facilities. A cost analysis and fair share factor must be provided to evaluate all impacts to the listed exempted items. Impact to the SR-60 and WLC Parkway are almost exclusively attributed to this projects development yet the developer is not required to pay fees for the cost of this improvement. Construction of all project related streets (internally) are the full responsibility of the developer and would not qualify for any form of credit. Project impacts that go beyond the project site would be relatively high nearest the project and can be calculated for a fair share cost that could give the developer credit if 100% of the improvement is made by the developer. Otherwise the DIF would be used to make the outside improvements. The following is the text from the Development Agreement defining the benefit being given the developer without analysis for just compensation verses DIF cost coverage.

Finding: Sections 4.8 and 4.9 of the Development Agreement require the developer of the Project to construct or pay for all necessary traffic improvements and a fire station, all as needed, as a result of the development of the Project. In return, section 1.5, 4.8, and 4.9 of the Development Agreement exempts the Project from the payment of development impact fees ordinarily imposed under Municipal Code sections 3.42.030, 040, and 060. These exemptions shall remain in effect only as long as the Development Agreement is in effect. If the Development Agreement is approved but does not become effective or if it is approved

and does become effective and is terminated for any reason, the requirements that the Project pay development impact fees under Municipal Code sections 3.42.030, .040, .050, and .060 shall become effective.

DA Sections:

1.5 “Development Impact Fee,” “Development Impact Fees” or “DIF” means for purposes of this Agreement only those fees imposed pursuant to Moreno Valley Municipal Code Sections 3.42.070 (police facilities), 3.42.080 (City hall facilities), 3.42.090 (corporate yard facilities) and 3.42.100 (maintenance equipment). The term “Development Impact Fees” (or “DIF”) does not include those fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals), 3.42.050 (interchange improvements) and 3.42.060 (fire facilities).

4.8 Payment of, and Reimbursement for, the Cost of Improvements Paid for by HF Which Are in Excess of HF’s Fair Share. HF shall satisfy the requirements imposed by Mitigation Measure 4.15.7.4.A, as set forth in the EIR, to ensure that all of the Development’s impacts on the City’s circulation system, including, but not limited to, improvements to arterial streets, traffic signals and interchanges, are mitigated. Because HF will be responsible for paying for or constructing all circulation-related improvements, it shall not pay the fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals) and 3.42.050 (interchange improvements). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.9 Provision of a “turnkey” Fire Station. HF shall, at its own cost, provide a fully constructed, fully equipped fire station and fire station site, including fire trucks, as specified by the City’s Fire Chief. The fire station’s furniture and fixtures shall be reasonably comparable to those of the most recently completed fire station within the City. The fire station, equipment and trucks shall be provided as and when directed by the Fire Chief. Because HF will be responsible for the provision of the fire station, fire station site, equipment, and trucks, it shall not pay the fee imposed by Moreno Valley Municipal Code Section 3.42. 060 (fire facilities). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

Second: Noise Impact Evaluations

When the original FEIR was approved it use the “**Noise Assessment for the WLCSP**” to establish mitigation measures that would be necessary to limit construction impacts to those residents in the surrounding homes. It noted that work within the project area may be done on a 24 hour 7 days per week schedule which goes beyond the Moreno Valley Municipal Code’s (MVMC Section 8.14.040 Miscellaneous standards and regulations.) listed hours of 7 a.m. to 7 p.m. The Noise Assessment defined construction limits so as to limit noise impacts on the surrounding residences outside the standard construction hours and clearly outlined the high level of noise that could be expected both during daytime and nighttime hours beyond the

allowed decibel levels defined by the MVMC. Thus the study included “**Mitigation Measure N-2. No Nighttime Grading Within 2,800 Feet of Residences South of the Freeway**” was issued. It goes on to allow closer nighttime construction at 1,580 feet after the installation of an appropriate sound barrier. These would appear to be realistic mitigations but it would appear the developer might have found this to be somewhat restrictive and excessive so a different noise analysis firm was selected to prepare a new study.

The new “**Noise and Vibration Technical Report Assessment**” proposed a substantially different evaluation and lesser mitigations to the noise impacts. It states that “No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends, and a 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity.”

The mitigation requirement for a sound barrier is similar to the original MM however the active setback is now moved forward by 2,000 feet or three and a half times closer. Additionally, the MM includes options that would eliminate the need install the on-site sound barrier if a vote by those affected fails to garner 50% favorable votes or 100% favorable votes for a sound barrier placed on private property. These two provisions were never a consideration in the original noise analysis nor do they seem to be fair to the community due to the percentages needed based on the full text of the MM. It appears that this clause in MM **4.12.6.2A** is of a greater benefit to the developer than to the surrounding residents.

Noise Study and MM

“**Noise Assessment for the WLCSP**” (Mestre Greve Associates) original dated January 2013, revised September 2014. (This document is still referenced in the 12-2019 Draft Recirculated Revised Sections of the Final Environmental Impact Report)

“**Noise and Vibration Technical Report Assessment** (ESA)”, July 2018 which was not in the original 2014 DEIR for WLC) Since both studies are cited in the Draft REIR how is it that the more stringent mitigation measures are not utilized?

In the 2018 edition of the Draft REIR it used the “**Noise and Vibration Technical Report**”, and its mitigation measures now replace those of the “**Noise Assessment for the WLCSP**” that where much more favorable to the community and surrounding homeowners.

Noise Assessment for the WLCSP

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2.2.1 On-Site Construction

Work within the project site will consist of mass grading, fine grading, building construction, utilities installation, interchange improvements, paving and curbing, and landscaping. Work within the project area may be done on a 24 hour 7 days per week schedule. Construction activities would occur at varying locations on-site, but may last for an extended period of time. For instance, grading activities for each phase are anticipated to last one year. However, the

grading may be concentrated in one area for a while and then move on to another area, and so on. In other words, grading noise will not impact one area for an entire year. Building construction will occur from time to time over a nine year period lasting from 2013 through 2021.

Residences within the Specific Plan area. Three pockets of homes are located within the Specific Plan area, and construction noise will be an issue for occupants of these residences. While these areas are to be designated for Light Logistics development under the proposed Specific Plan, they may remain in residential use indefinitely. Future Light Logistics uses would not be sensitive to noise, but as long as these sites remain in residential use, they will need to be considered as noise sensitive uses. These homes may be located adjacent to areas where intense construction activities could occur. These homes may experience worst-case unmitigated peak construction noise levels (Lmax) up to 97 dBA. The average noise levels are typically 5 to 15 dB lower than the peak noise levels. Average noise levels (Leq) at 50 feet from the residence could be in the range of 82 to 92 dBA during most phases of construction.

The City of Moreno Valley Municipal Code does not include any exemptions for construction noise. Therefore, construction would be subject to the limitations of 60 dBA during the daytime and 55 dBA at the nighttime measured at occupied residential locations. Exceeding these limits would result in a significant noise impact. Based on information in the previous paragraph these noise levels would regularly be exceeded during the daytime and nighttime hours at residences within the Specific Plan area. Based on an Leq noise level of 90 dBA at 50 feet, an observer would need to be 1580 feet from the construction to experience a noise level of 60 dBA (Leq), or 2,800 feet for a noise level of 55 dBA (Leq). A residence within 1,580 feet during active construction during the daytime would be impacted, or within 2,800 feet during the nighttime would be impacted. Mitigation is discussed in Section 3.1.1.

Residences Adjacent to the Specific Plan area. Residences are located adjacent to the project in the areas along Redlands Boulevard, Merwin Street, Bay Avenue, Cactus Avenue, and Gilman Springs Road. The potential for noise impacts will be similar to those impacts for residents within the Specific Plan area. Specifically, a receptor would need to be more than 1,580 feet from the construction to experience a noise level less than 60 dBA (Leq), or more than 2,800 feet for a noise level less than 55 dBA (Leq). A residence within 1,580 feet during active construction during the daytime would be impacted, or within 2,800 feet during the nighttime would be impacted. Mitigation is discussed in Section 3.1.1.

Mitigation Measures from “Noise Assessment for the WLCSP”
Pgs. 50 – 51

The following mitigation measures are identified for significant construction noise impacts:

N-1. No Construction Vehicles on Redlands Boulevard South of Fir Avenue. No construction vehicles of any type for on-site construction shall be permitted on Redlands Boulevard south of Fern Avenue. The prohibition for construction traffic should occur for all phases of the proposed project.

N-2. No Nighttime Grading Within 2800 Feet of Residences South of the Freeway.

Construction grading shall not be allowed within 2,800 feet of residences south of SR-60 between 8 p.m. and 7 a.m. Prior to the issuance of a grading permit, the developer shall submit a Noise Reduction Compliance Plan (NRCP) to the City as part of the grading permit submittal showing the limits of nighttime construction based on the currently occupied residential dwellings. The limits of nighttime grading shall be shown on the NRCP and grading plan submitted to the City. The limits of construction allowed at night shall be staked or posted on site, and contractors will be provided with a copy of the plan showing the limits of nighttime construction.

With the implementation of this mitigation measure the loudest noise level that would be experienced at any developed residential parcel would be less than 55 dBA (Leq) during the nighttime and these levels would be consistent with the limits established in the City's Noise Ordinance.

If grading is to occur at night within 2,800 feet of residences south of SR-60, then construction of a 12 foot temporary sound barrier will be required. A temporary barrier will reduce noise levels by approximately 10 dB. If an appropriate temporary sound barrier is constructed, then the buffer area can be reduced from 2,800 feet to 1,580 feet. The temporary sound barrier may be used. If sound blankets are used the curtains must have a Sound Transmission Class (STC) rating of 27. Examples of acceptable blankets can be found at the following websites; www.enoisecontrol.com/outdoor-sound-blankets.html and www.acousticalsurfaces.com/curtan_stop/curt_absorb.htm?d=12. Other blankets are acceptable as long as they have the required STC rating. Many unrated blankets are available, but their acoustic performance is generally unacceptable.

Noise measurements of construction activities often reveal that the construction noise levels are less than predicted. At the discretion of the builder, a Registered Professional Engineer can be hired to measure construction noise. Noise measurements over a three hour period on two consecutive nights can be used to modify the required buffer area. A Registered Professional Engineer with an expertise in acoustics shall prepare a report documenting the noise measurements and recommending a specific buffer distance. Once the report is submitted to and approved by the City, the buffer distance may be reduced to the distance recommended in the report.

N-3. Install temporary sound barrier. Construction within 1,580 feet of residential areas south of the freeway has the potential to exceed the daytime Moreno Valley Noise Ordinance criteria of 60 dBA (Leq). Any construction within 1,580 feet of a residence should be shielded from the residence with a 12 foot temporary sound barrier. A sound barrier will reduce the noise levels by about 10 dB. Residences within 500 feet may still be exposed to noise levels greater than 60 dBA (Leq), but the noise levels for residences greater than 500 feet from the construction area will experience noise levels consistent with the City's ordinance.

N-4. Require Residential Grade Mufflers. The grading contractor shall be required to certify that all equipment to be used will have residential grade mufflers or better on their equipment. All stationary construction equipment shall be placed so that emitted noise is directed away from noise sensitive receptors nearest the site. Additionally, stationary construction equipment if

standardly fitted with an acoustic cover by the manufacturer shall have the acoustic cover in place during operation.

N-5. Locate Material Stockpiles 1,200 Feet from Residences South of the Freeway.

Material stockpiles shall be located at least 1,200 feet from the residences. Remotely locating the stockpiles reduces the noise at the residences from equipment traveling to and from the stockpiles, and the noise that is sometimes associated with stacking materials. With these measures in place the impacts from on-site construction will be reduced to an extent. Nighttime impacts from on-site construction will be eliminated. However, daytime impacts to residents within 500 feet of construction will remain significant.

Noise and Vibration Technical Report Assessment (Replacement Mitigation Measures as found in the revised MMRP)

4.12.6.1A Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City's daytime and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures: • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers' standards.

- Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project. No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends.
- A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity. The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.
- Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request.

Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51).

4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City's approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development:

Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the Revised Sections of the FEIR remain valid. These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the Revised Sections of the FEIR and shall be used to impose building-specific mitigation on the individually proposed buildings.

Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the World Logistics Center site, the Applicant shall implement the mitigation identified in the Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.). Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants. If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a *no* vote. At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.

Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement.

It is hoped that the Planning Commission will actively review and amend these documents prior to forwarding them to the City Council for consideration. Should you or others have any questions regarding our comments please address them to Tom Thornsley at tomthornsley@hotmail.com .

Sincerely,

Tom Thornsley

Tom Thornsley
with Residents for a Livable Moreno Valley

Zoom Info: Works Logistic Center 7 pm Planning Commission Meeting Thursday May 14, 2020

Please keep the Zoom information found below available to use for a call on the World Logistic Center's (WLC) 7 pm Thursday Planning Commission meeting — it is the 2nd item on the agenda. Use your commuter to connect through the website or a fully charged telephone to call one of the two numbers found below. When prompted, enter the Meeting ID and later the Password. Your connection will be kept on mute as while connected to the meeting. Those on a computer can request to speak and those calling in will be asked using the telephone number. Everyone is allowed up to 3 minutes to speak your thoughts. The meeting should be available on cable channel 3. You can also email planner Julia Descoteaux (juliad@moval.org) with your thoughts for the Planning Commissioners. Do not be afraid to comment on those things that bother you most and offer suggestions on how they should be fixed.

The more active participation the better.

Join Zoom Meeting

<https://moval.zoom.us/j/94671746310>

Meeting ID: 946 7174 6310

Password: 294031

One tap mobile

+1 669) 219--2599, Password/ID: 94671746310# (San Jose)

+1 669) 900--6833, Password/ID: 94671746310# (San Jose)

Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study

Xiao Wu, Rachel C Nethery, M Benjamin Sabath, Danielle Braun, Francesca Dominici

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Abstract

Objectives: United States government scientists estimate that COVID-19 may kill tens of thousands of Americans. Many of the pre-existing conditions that increase the risk of death in those with COVID-19 are the same diseases that are affected by long-term exposure to air pollution. We investigated whether long-term average exposure to fine particulate matter (PM_{2.5}) is associated with an increased risk of COVID-19 death in the United States.

Design: A nationwide, cross-sectional study using county-level data.

Data sources: COVID-19 death counts were collected for more than 3,000 counties in the United States (representing 98% of the population) up to April 22, 2020 from Johns Hopkins University, Center for Systems Science and Engineering Coronavirus Resource Center.

Main outcome measures: We fit negative binomial mixed models using county-level COVID-19 deaths as the outcome and county-level long-term average of PM_{2.5} as the exposure. In the main analysis, we adjusted by 20 potential confounding factors including population size, age distribution, population density, time since the beginning of the outbreak, time since state's issuance of stay-at-home order, hospital beds, number of individuals tested, weather, and socioeconomic and behavioral variables such as obesity and smoking. We included a random intercept by state to account for potential correlation in counties within the same state. We conducted more than 68 additional sensitivity analyses.

Results: We found that an increase of only 1 $\mu\text{g}/\text{m}^3$ in PM_{2.5} is associated with an 8% increase in the COVID-19 death rate (95% confidence interval [CI]: 2%, 15%). The results were statistically significant and robust to secondary and sensitivity analyses.

Conclusions: A small increase in long-term exposure to PM_{2.5} leads to a large increase in the COVID-19 death rate. Despite the inherent limitations of the ecological study design, our results

underscore the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis. The data and code are publicly available so our analyses can be updated routinely.

Summary Box

What is already known on this topic

1. Long-term exposure to PM_{2.5} is linked to many of the comorbidities that have been associated with poor prognosis and death in COVID-19 patients, including cardiovascular and lung disease.
2. PM_{2.5} exposure is associated with increased risk of severe outcomes in patients with certain infectious respiratory diseases, including influenza, pneumonia, and SARS.
3. Air pollution exposure is known to cause inflammation and cellular damage, and evidence suggests that it may suppress early immune response to infection.

What this study adds

1. This is the first nationwide study of the relationship between historical exposure to air pollution exposure and COVID-19 death rate, relying on data from more than 3,000 counties in the United States. The results suggest that long-term exposure to PM_{2.5} is associated with higher COVID-19 mortality rates, after adjustment for a wide range of socioeconomic, demographic, weather, behavioral, epidemic stage, and healthcare-related confounders.
2. This study relies entirely on publicly available data and fully reproducible, public code to facilitate continued investigation of these relationships by the broader scientific community as the COVID-19 outbreak evolves and more data become available.

A small increase in long-term PM_{2.5} exposure was associated with a substantial increase in the county's COVID-19 mortality rate up to April 22, 2020.

Introduction

The scale of the COVID-19 public health emergency is unmatched in our lifetime and will have grave social and economic consequences. The suddenness and global scope of this pandemic has raised urgent questions that require coordinated investigation in order to slow the disease's devastation. A critically important public health objective is to identify key modifiable environmental factors that may contribute to the severity of the health outcomes (e.g., ICU hospitalization and death) among individuals with COVID-19. Data from China and Italy show that a majority of COVID-19 deaths occurred in adults aged ≥ 60 years¹ and in persons with serious underlying health conditions.²⁻⁴ Early age-stratified COVID-19 death rates in the United States, reported by the Centers for Disease Control and Prevention (CDC),⁵ also suggest that persons aged ≥ 65 are at highest risk. Additional factors associated with severe disease include male sex and the presence of comorbidities including hypertension, obesity, diabetes mellitus, cardiovascular disease, and chronic lung disease.^{6 7} Severe COVID-19 infection is characterized by a high inflammatory burden, and it can cause viral pneumonia with additional extrapulmonary manifestations and complications including acute respiratory distress syndrome (ARDS),⁸⁻¹³ which has a mortality rate ranging from 27% to 45%.¹⁴ Studies have also documented high rates of heart damage,^{11 15} cardiac arrhythmias,¹² and blood clots¹⁶ in COVID-19 patients. Patients with severe disease can suffer respiratory failure and failure of other vital systems, leading to death.

Although the epidemiology of COVID-19 is evolving, there is a large overlap between causes of death in COVID-19 patients and the conditions caused and/or exacerbated by long-term exposure to fine particulate matter (PM_{2.5}). PM_{2.5} contains microscopic solids or liquid droplets small enough that they can be inhaled and cause serious health problems. The Global Burden of Disease

Study identified air pollution as a risk factor for total and cardiovascular disease mortality, and it is believed to have contributed to nearly 5 million premature deaths worldwide in 2017 alone.¹⁷ On Thursday, March 26, 2020 the US EPA announced a sweeping relaxation of environmental rules in response to the coronavirus pandemic, allowing power plants, factories and other facilities to determine for themselves if they are able to meet legal requirements on reporting air and water pollution. The association between PM_{2.5} and health, including both infectious and chronic respiratory diseases, cardiovascular diseases, neurocognitive disease, and pregnancy outcomes in the United States and worldwide is well established.¹⁸⁻²⁴ A recent study by our group also documented a statistically significant association between long-term exposures to PM_{2.5} and ozone and risk of ARDS among older adults in the United States.²⁵ Numerous scientific studies reviewed by the United States Environmental Protection Agency (US EPA) have linked PM_{2.5} to a variety of health concerns including premature death in people with heart or lung disease, non-fatal heart attacks, irregular heartbeats, aggravated asthma, decreased lung function, and increased respiratory symptoms such as inflammation, airway irritations, coughing, or difficulty breathing.²⁶

We hypothesize that because long-term exposure to PM_{2.5} adversely affects the respiratory and cardiovascular systems and increases mortality risk,²⁷⁻²⁹ it also exacerbates the severity of COVID-19 infection symptoms and worsens the prognosis of COVID-19 patients. In this study, we quantified the impact of long-term PM_{2.5} exposure on COVID-19 mortality rates in United States counties. Our study includes 3,087 counties in the United States, covering 98% of the population. We leveraged our previous efforts that focused on estimating the long-term effects of PM_{2.5} on mortality among 60 million United States' Medicare enrollees.^{20 30 31} We used a well-tested research data platform that gathers, harmonizes, and links nationwide air pollution data, census

data, and other potential confounding variables with health outcome data. We augmented this platform with newly collected COVID-19 data from authoritative data sources.³² All data sources used in these analyses, along with fully reproducible code, are publicly available to facilitate continued investigation of these relationships as the COVID-19 outbreak evolves and more data become available.

Methods

Table 1 summarizes our data sources and their provenance, including links where the raw data can be extracted directly.

COVID-19 deaths

We obtained COVID-19 death counts for each county in the United States from Johns Hopkins University, Center for Systems Science and Engineering Coronavirus Resource Center.³² This source provides the most comprehensive county-level COVID-19 data to date reported by the CDC and state health departments, including the number of new and cumulative deaths and confirmed cases reported in each county across the United States, updated daily. We collected the cumulative number of deaths for each county up to and including April 22, 2020. County-level COVID-19 mortality rates were defined for our analyses as the ratio of COVID-19 deaths to county level population size. While individual-level data would have allowed a more rigorous statistical analyses, individual-level data on COVID-19 death is currently not available.

Exposure to air pollution

We calculated county-level long-term exposure to PM_{2.5} (averaged from 2000 to 2016) from an established exposure prediction model.³³ The PM_{2.5} exposure levels were estimated monthly at 0.01° × 0.01° grid resolution across the entire continental United States by combining satellite, modeled, and monitored PM_{2.5} data in a geographically weighted regression. These estimates have been extensively cross-validated.³³ We aggregated these levels spatially by averaging the values for all grid points within a zip code and then averaging across zip codes within a county. We obtained temporally averaged PM_{2.5} values (2000–2016) at the county level by averaging estimated PM_{2.5} values within a given county. We computed the average 2016 PM_{2.5} exposure analogously for each county to use in sensitivity analyses.

Potential confounders

In the main analysis, we considered the following 19 county-level variables and one state-level variable as potential confounders (see also Table 2): days since first COVID-19 case reported (a proxy for epidemic stage), population density, percent of population ≥65 years of age, percent of the population 45-64 years of age, percent of the population 15-44 years of age, percent living in poverty, median household income, percent black, percent Hispanic, percent of the adult population with less than a high school education, median house value, percent of owner-occupied housing, percent obese, percent current smokers, number of hospital beds per unit population, and average daily temperature and relative humidity for summer (June-September) and winter (December-February) for each county, and days since issuance of stay-at-home order for each state. Note that publicly available daily COVID-19 case counts at the county level were only available starting March 22, 2020, so that the measure of days since first COVID-19 case reported

was truncated by this date. Additional detail on the creation of all variables used in the analysis is available in the Supplementary Materials.

Statistical methods

We fit a negative binomial mixed model³⁴⁻³⁶ using COVID-19 deaths as the outcome and PM_{2.5} as the exposure of interest to estimate the association between COVID-19 mortality rate and long-term PM_{2.5} exposure, adjusted by covariates. The model included a population size offset and was adjusted for all the potential confounders listed above. We also included a random intercept by state to account for potential correlation in counties within the same state, due to similar socio-cultural, behavioral, and healthcare system features and similar COVID-19 response and testing policies. Additional modeling details are provided in the Supplementary Materials. We report mortality rate ratios (MRR), i.e., exponentiated parameter estimates from the negative binomial model, and 95% CI. The MRR for PM_{2.5} can be interpreted as the relative increase in the COVID-19 mortality rate associated with a 1 $\mu\text{g}/\text{m}^3$ increase in long-term average PM_{2.5} exposure. We carried out all analyses in R statistical software and performed model fitting using the lme4 package.^{37 38}

Quantifying unmeasured confounding bias

Because this study is observational and the contributing factors to COVID-19 spread and severity remain largely unknown at this early stage of the pandemic, unmeasured confounding is a concern in our analyses. The E-value is a commonly used metric to evaluate the potential impact of unmeasured confounding on results from an observational study.³⁹ For a pre-specified exposure variable of interest (long-term exposure to PM_{2.5}), the E-value quantifies the minimum strength of

association that an unmeasured confounder must have, with both the outcome (COVID-19 mortality rate) and exposure (long-term exposure to PM_{2.5}) conditional to all of the potential confounders included in the regression model, to explain away the estimated exposure-outcome relationship. We report the E-value for the MRR estimate for PM_{2.5} under the main model with 20 potential confounders.

Secondary analyses

In addition to the main analysis, we conducted six secondary analyses to assess the robustness of our results to the confounder set used, outliers, and the model form specification.

First, because the New York metropolitan area has experienced the most severe COVID-19 outbreak in the United States to date, we anticipated that it would strongly influence our analysis. As a result, we repeated the analysis excluding the counties comprising the New York metropolitan area, as defined by the Census Bureau.

Second, although in our main analysis we adjusted for days since first COVID-19 case reported to capture the size of an outbreak in a given county, this measure is imprecise. To further investigate the potential for residual confounding bias (i.e., if counties with high PM_{2.5} exposure also tend to have large outbreaks relative to the population size, then their death rates per unit population could appear differentially elevated, inducing a spurious correlation with PM_{2.5}), we also conducted analyses excluding counties with fewer than 10 confirmed COVID-19 cases.

Third, we omitted an anticipated strong confounder, days since first COVID-19 case reported, from the model. Fourth, we additionally adjusted our models for the number of tests performed at the state level (see Table 1 for data source) to evaluate how state-level differences in testing policies might impact our results. Fifth, we additionally adjusted our models for county-level estimated percentage of people with COVID-19 symptoms (see Table 1 for data source) to evaluate how the size of the outbreak in each county might impacts our results. Sixth, we introduced PM_{2.5} into our models as a categorical variable, categorized at the empirical quintiles, to assess the sensitivity of our results to the assumption of a linear effect of PM_{2.5} on COVID-19 mortality rates.

Sensitivity analyses

We conducted 68 sensitivity analyses to assess the robustness of our results to data and modeling choices. First, we repeated all the analyses using alternative methods to estimate exposure to PM_{2.5}.³¹ Second, we fit the models, modifying the adjustment for confounders, such as using a log transformation or categorized versions of some of the covariates. Third, because our study relies on observational data, our results could be sensitive to modeling choices (e.g., distributional assumptions or assumptions of linearity). We evaluated sensitivity to such choices by considering alternative model specifications and by fitting models stratified by county urban-rural status. Additional detail about the sensitivity analyses and the results are provided in the Supplementary Materials.

Results

Our study utilized data from 3,087 counties, of which 1,799 (58.3%) had reported zero COVID-19 deaths at the time of this analysis. Table 2 describes the data used in our analyses. All COVID-

19 death counts (a total of 45,817 deaths) are cumulative up to April 22, 2020. Figure 1 illustrates the spatial variation of long-term average exposure to PM_{2.5} and COVID-19 death rates (per 1 million population) by county. Visual inspection suggests higher COVID-19 death rates in the Mid-Atlantic, upper Midwest, and Gulf Coast regions. These spatial patterns in COVID-19 death rates generally mimic patterns in both high population density and high PM_{2.5} exposure areas. In the Supplementary Materials, we provide additional data diagnostics that justify the use of the negative binomial model for our analyses.

In Table 3, we report the estimated regression coefficients for each of the covariates included in our main analysis, including PM_{2.5}. We found that the estimated MRR for PM_{2.5} is 1.08 (1.02, 1.15). That is, we found that an increase of only 1 $\mu\text{g}/\text{m}^3$ in long-term average PM_{2.5} is associated with a statistically significant 8% increase in the COVID-19 death rate. Importantly, we also found that population density, days since first COVID-19 case reported, rate of hospital beds, median household income, percent with less than a high school education, and percent Black are important predictors of COVID-19 death rate. Our results are consistent with previously reported findings that Black Americans are at higher risk of COVID-19 mortality than other groups,⁴⁰ we found a 45% (32%, 60%) increase in COVID-19 mortality rate associated with a 1-standard deviation (per 14.2%) increase in percent Black residents.

For our main analysis, the E-value for the estimated MRR for PM_{2.5} was 1.37. That is, in order for an unmeasured confounder to fully account for the estimated effect of PM_{2.5} on the COVID-19 mortality rate, it would have to be associated with both long-term PM_{2.5} exposure and COVID-19 mortality by a risk ratio of at least 1.37-fold each, through pathways independent of all covariates

already included in the model. If we were to include such a confounder in our models, along with all other confounders considered, the estimated MRR for PM_{2.5} mortality would become 1 (the null value). To get a sense of the magnitude of the required confounding effect, we also computed the E-value for some of our key measured confounders for comparison. The E-values for days since first COVID-19 case reported (1.16), the weather variables (1.02), number of hospital beds (1.04) and the behavioral risk factors (1.02) were significantly smaller than the reported E-values for the required unmeasured confounder. This suggests that any unmeasured confounder would need to have a confounding effect substantially larger than any of our observed confounders in order to explain away the relationship between PM_{2.5} and COVID-19 mortality rate.

In Figure 2, we report the MRR and 95% CI for PM_{2.5} from all secondary analyses. In these analyses, we separately (a) omitted New York metropolitan area; (b) excluded counties with fewer than 10 confirmed COVID-19 cases; (c) omitted time since first reported COVID-19 case from the model; (d) additionally adjusted the model for number of tests performed; (e) additionally adjusted the model for estimated percentage of people with COVID-19 symptoms; and (f) treated PM_{2.5} as a categorical variable. The results of these analyses were consistent with the main analysis. For the analysis of the PM_{2.5} categorized into quintiles, the MRR for the k^{th} can be interpreted as the increase in COVID-19 mortality rate associated with a change from the first quintile to the k^{th} quintile in long-term PM_{2.5} exposure. The MRR estimates from this model monotonically increased as PM_{2.5} increased, supporting the assumption of a linear relationship between PM_{2.5} and COVID-19 mortality rates. The results of all sensitivity analyses are provided in the Supplementary Materials.

Discussion

This is the first nationwide study in the United States to estimate the relationship between long-term exposure to PM_{2.5} and COVID-19 death rates. The results indicate that long-term exposure to air pollution increases vulnerability to the most severe COVID-19 outcomes. We found statistically significant evidence that an increase of 1 $\mu\text{g}/\text{m}^3$ in long-term PM_{2.5} exposure is associated with an 8% increase in the COVID-19 mortality rate. Our results were adjusted for a large set of socioeconomic, demographic, weather, behavioral, epidemic stage, social isolation measures, and healthcare-related confounders and demonstrated robustness across a wide range of sensitivity analyses.

In our previous study²⁰ of 60 million Americans older than 65 years of age, we found that a 1 $\mu\text{g}/\text{m}^3$ in long-term PM_{2.5} exposure is associated with a 0.73% increase in the rate of all-cause mortality. Therefore, the same small increase in long-term exposure to PM_{2.5} led to an increase in the COVID-19 death rate of a magnitude 11 times that estimated for all-cause mortality.

Our results are consistent with previous findings that air pollution exposure increases severe outcomes during infectious disease outbreaks. Ciencewicki and Jaspers¹⁹ provide a review of the epidemiologic and experimental literature linking air pollution to infectious disease. During the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS), a type of coronavirus closely related to COVID-19, Cui et al⁴¹ reported that locations in China with a moderate or high long-term air pollution index (API) had SARS case fatality rates 126% and 71% higher, respectively, than locations with low API. Long-term particulate matter exposure has been associated with hospitalizations for pneumonia in the well-controlled quasi-experimental conditions provided by

the closing of the Utah Valley Steel Mill,⁴² and a link between long-term PM_{2.5} exposure and pneumonia and influenza deaths was reported in a well-validated cohort study.²⁸ Several studies have reported associations between short-term PM_{2.5} exposure and poor infectious disease outcomes,^{43 44} including higher hospitalization rates or increased medical encounters for influenza, pneumonia, and acute lower respiratory infections. In these studies and in the literature on the association between air pollution and chronic disease outcomes, relationships with long-term pollution exposure tend to be stronger than relationships with short-term exposure,^{20 45 46} and the large effect estimate in our study is consistent with this trend.

Relationships have also been detected between pollution exposures and severe outcomes in the context of past pandemics. Studies found particulate matter exposure to be associated with the mortality during the H1N1 influenza pandemic in 2009.^{47 48} Recent studies have even used historic data to show a relationship between air pollution from coal burning and mortality in the 1918 Spanish influenza pandemic.^{49 50}

Although our study design cannot provide insight into the mechanisms underlying the relationship between PM_{2.5} and COVID-19 mortality, prior studies have shed light on the potential biological mechanisms that may explain the relationship between air pollution and viral outcomes.¹⁹ PM_{2.5} exposure is known to be associated with many of the cardiovascular and respiratory comorbidities that dramatically increase the risk of death in COVID-19 patients. We hypothesize that the effects captured here are largely mediated by these comorbidities and pre-existing PM-related inflammation and cellular damage,^{46 51} as suggested by a recent commentary.⁵² Experimental studies^{19 53-56} also suggest that exposure to pollution can suppress early immune responses to the

infection, leading to later increases in inflammation and worse prognosis, which may also explain our findings. Some studies⁵⁷⁻⁵⁹ have suggested that air pollution can also proliferate the transmission of infectious disease. If COVID-19 spread is indeed impacted by air pollution levels, which is not yet known, some of the effects detected in our study could be mediated by this factor as well.

This analysis provides a timely characterization of the relationship between historical exposure to air pollution and COVID-19 deaths in the United States. Research on how modifiable factors may exacerbate COVID-19 symptoms and increase mortality risk is essential to guide policies and behaviors to minimize fatality related to the outbreak. Our analysis relies on up-to-date population-level COVID-19 data and well-validated air pollution exposure measures.

Strengths of this analysis include adjusting for a wide range of potential confounders and a demonstrated robustness of results to different model choices. Moreover, the analyses rely exclusively on data and code that are publicly available. This provides a platform for the scientific community to continue updating and expanding these analyses as the pandemic evolves and data accumulate.

It is important to acknowledge that this study has limitations, mainly due to the fact that this is an ecological study with data available at the county level and that this is a cross-sectional study. High quality, nationwide individual-level COVID-19 outcome data are unavailable at this time and for the foreseeable future, thus necessitating the use of an ecologic study design for these analyses. Due to the potential for ecologic bias, our results should be interpreted in the context of

this design and should not be used to make individual-level inferential statements. Also, unmeasured confounding bias is a threat to the validity of our conclusions. Unfortunately, in the midst of a pandemic it is not feasible to design a study and collect the data at the ideal level of spatial and temporal resolution to minimize all sources of bias. Yet, conditional on the data available, we have endeavored to adjust for confounding bias by all of the most important factors, including population density, time since the beginning of the outbreak, social isolation measures, behavior, weather, age structure, ethnicity, access to health care, and socio-economic factors. We also conducted 68 additional analyses to assess the robustness of the results to many modelling choices. Furthermore, we computed the E-value to demonstrate that the confounding effect of any unmeasured confounder would need to be much stronger than that of any of our observed confounders in order to explain away the relationship between PM_{2.5} exposure and COVID-19 mortality rate. The calculation of the E-value provided reassurance that the presence of a strong unmeasured confounder is unlikely; however, this possibility cannot be ruled out completely.

The inability to accurately quantify the number of COVID-19 cases due to limited testing capacity presents another potential limitation. We instead used total population size as the denominator for our mortality rates, and we additionally adjusted our models for numerous anticipated proxies of outbreak size, including time since first reported COVID-19 case, time since stay-at-home order was issued, and population density.

To conduct the most rigorous possible studies of air pollution and health using ecologic data, it is critical to utilize areal units that minimize within-area exposure variability and maximize between-area exposure variability.^{60 61} We anticipated that our use of counties satisfies this criterion,

because counties generally represent meaningful boundaries between urban, suburban, and rural areas. These population density-related delineations also often correspond to steep gradients in air pollution levels, thus maximizing across-unit exposure variability while minimizing within-unit variability. We also note that the use of long-term county-level exposure data in our study likely led to some degree of exposure misclassification. However, previous literature has found that using sub-county scale PM_{2.5} exposure in studies of mortality tends to either have no impact or to increase the strength of the associations between PM_{2.5} and mortality from various causes.⁶²

Because of the many limitations, this study also provides justification for expanded follow-up investigations as more and higher-quality COVID-19 data become available. Such studies would include validation of our findings with other data sources and study types, as well as studies of biological mechanisms, impacts of PM_{2.5} exposure timing, and relationships between PM_{2.5} and other COVID-19 outcomes such as hospitalization. The results of this study also underscore the importance of continuing to enforce existing air pollution regulations. Based on our results, we anticipate a failure to do so could potentially increase the long-term COVID-19 death toll and hospitalizations, as well as further burden our healthcare system with other PM_{2.5}-related death and disease that would draw resources away from COVID-19 patients.

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Table 1: Publicly available data sources used in the analysis

	Source	Data
Outcome: COVID-19 Deaths	Johns Hopkins University the Center for Systems Science and Engineering (JHU-CSSE) Coronavirus Resource Center (https://coronavirus.jhu.edu/)	County-level COVID-19 death count up to and including April 22, 2020
Exposure: PM _{2.5} concentrations	Atmospheric Composition Analysis Group (https://sites.wustl.edu/acag/)	0.01° × 0.01° grid resolution PM _{2.5} prediction, averaged across the period 2000–2016 and averaged across grid cells in each county
Confounders for main analysis	US Census/American Community Survey (https://www.census.gov/programs-surveys/acs/data.html)	County-level socioeconomic and demographic variables for 2012–2016
	Robert Wood Johnson Foundation County Health Rankings (https://www.countyhealthrankings.org/)	County-level behavioral risk factor variables for 2020
	JHU-CSSE Coronavirus Resource Center	Time since first reported COVID-19 case
	Raifman et al, Boston University School of Public Health, COVID-19 United States state policy database (www.tinyurl.com/statepolicies)	Time since issuance of stay-at-home order
	Homeland Infrastructure Foundation-Level Data (HIFLD) (https://hifld-geoplatform.opendata.arcgis.com/datasets/hospitals)	County-level number of hospital beds in 2019
	Gridmet via Google Earth engine (https://developers.google.com/earth-engine/datasets/catalog/IDAHO_EPSCOR_GRIDMET)	4 km × 4 km temperature and relative humidity predictions, summer and winter averaged across the period 2000–2016 and averaged across grid cells in each county

Additional confounders for secondary analyses

The COVID tracking project (<https://covidtracking.com/>)

State level number of COVID-19 tests performed up to and including April 22, 2020

Carnegie Mellon University
Delphi Research Center
(<https://covid-survey.dataforgood.fb.com/>)

Estimated percentage of people with COVID-19 symptoms, based on survey data

Table 2: Characteristics of the study cohort up to and including April 22, 2020, mean (standard deviation)

	Total 3,087 counties	PM _{2.5} <8 µg/m ³ 1,217 counties	PM _{2.5} ≥8 µg/m ³ 1,870 counties
COVID-19 death rate (per 100,000)	3.4 (10.6)	1.6 (5.7)	4.7 (12.7)
Average PM _{2.5} (µg/m ³)	8.4 (2.5)	5.7 (1.4)	10.1 (1.2)
Rate of hospital beds (per 100,000)	242 (391.9)	300 (515.2)	204.2 (278)
Days since first case	23.6 (10.7)	19 (12.6)	26.5 (7.9)
Days since stay-at-home order	18.3 (12.4)	16.7 (13.6)	19.2 (11.4)
% Smokers	17.4 (3.5)	15.8 (3.1)	18.5 (3.4)
% Obese	32.9 (5.4)	31.2 (5.1)	34 (5.3)
% In poverty	10.5 (5.7)	9.7 (5.7)	11.1 (5.6)
% Less than high school education	21.2 (10.4)	16.5 (8.7)	24.2 (10.3)
% Owner-occupied housing	74.2 (8.8)	76 (7.7)	73.1 (9.3)
% Hispanic	7.6 (12.3)	9.7 (13.7)	6.3 (11.1)
% Black	8.2 (14.2)	1 (1.8)	12.9 (16.5)
% ≥65 years of age	16 (4.1)	17.4 (4.5)	15 (3.4)
% 45-64 years of age	26.4 (3)	26.9 (3.8)	26.1 (2.4)
% 15-44 years of age	37.6 (6.5)	35.2 (8.2)	39.2 (4.5)
Population density (person/sq. mi.)	406.7 (1732.6)	132.6 (430.7)	585.1 (2180.6)
Median household income (\$1,000)	49 (13.1)	50.5 (10.9)	48 (14.3)
Median house value (\$1,000)	136 (89.4)	140.4 (87.3)	133.1 (90.6)
Average summer temperature (°F)	86 (5.7)	83.7 (6.7)	87.4 (4.4)
Average winter temperature (°F)	45.1 (11.9)	39.4 (11.5)	48.7 (10.7)
Average summer relative humidity (%)	89 (9.6)	83.2 (11.5)	92.8 (5.5)
Average winter relative humidity (%)	87.5 (4.8)	87.9 (5.6)	87.2 (4.1)

Table 3: Mortality rate ratios (MRR), 95% confidence intervals (CI), and P-values for all variables in the main analysis.

	MRR	95% CI	P-value
PM _{2.5} ($\mu\text{g}/\text{m}^3$)	1.08	(1.02, 1.15)	0.01
Population density (Q2)	0.86	(0.60, 1.23)	0.40
Population density (Q3)	0.58	(0.40, 0.82)	0.00
Population density (Q4)	0.47	(0.33, 0.68)	0.00
Population density (Q5)	0.52	(0.35, 0.77)	0.00
% Poverty	1.02	(0.93, 1.13)	0.65
log(Median house value)	1.17	(0.99, 1.39)	0.06
log(Median household income)	1.28	(1.09, 1.51)	0.00
% Owner-occupied housing	1.12	(1.02, 1.23)	0.18
% Less than high school education	1.36	(1.21, 1.52)	0.00
% Black	1.45	(1.32, 1.60)	0.00
% Hispanic	1.00	(0.89, 1.12)	0.99
% ≥ 65 years of age	1.15	(0.99, 1.33)	0.07
% 15-44 years of age	0.93	(0.74, 1.17)	0.54
% 45-64 years of age	0.96	(0.83, 1.12)	0.62
Days since stay-at-home order	1.28	(0.97, 1.70)	0.08
Days since first case	2.96	(2.50, 3.51)	0.00
Rate of hospital beds	1.12	(1.02, 1.23)	0.01
% Obese	0.94	(0.86, 1.02)	0.14
% Smokers	1.08	(0.92, 1.26)	0.36
Average summer temperature ($^{\circ}\text{F}$)	0.96	(0.79, 1.16)	0.68
Average winter temperature ($^{\circ}\text{F}$)	1.18	(0.90, 1.53)	0.22
Average summer relative humidity (%)	0.84	(0.71, 1.01)	0.07
Average winter relative humidity (%)	1.00	(0.89, 1.13)	0.99

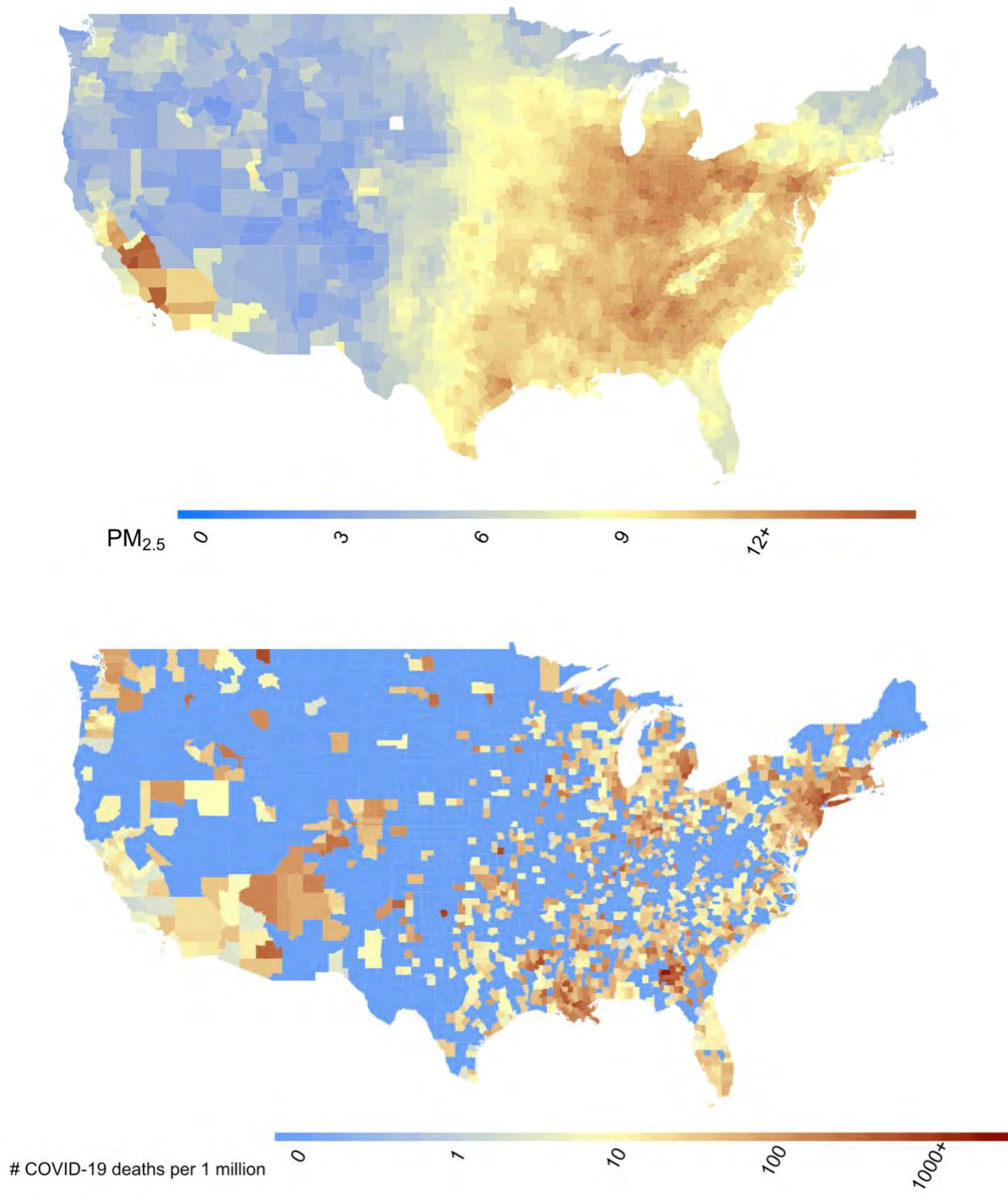


Fig 1: Maps show (a) county-level 17-year long-term average of PM_{2.5} concentrations (2000–

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2016) in the United States in $\mu\text{g}/\text{m}^3$, and (b) county-level number of COVID-19 deaths per 1 million population in the United States up to and including April 22, 2020.

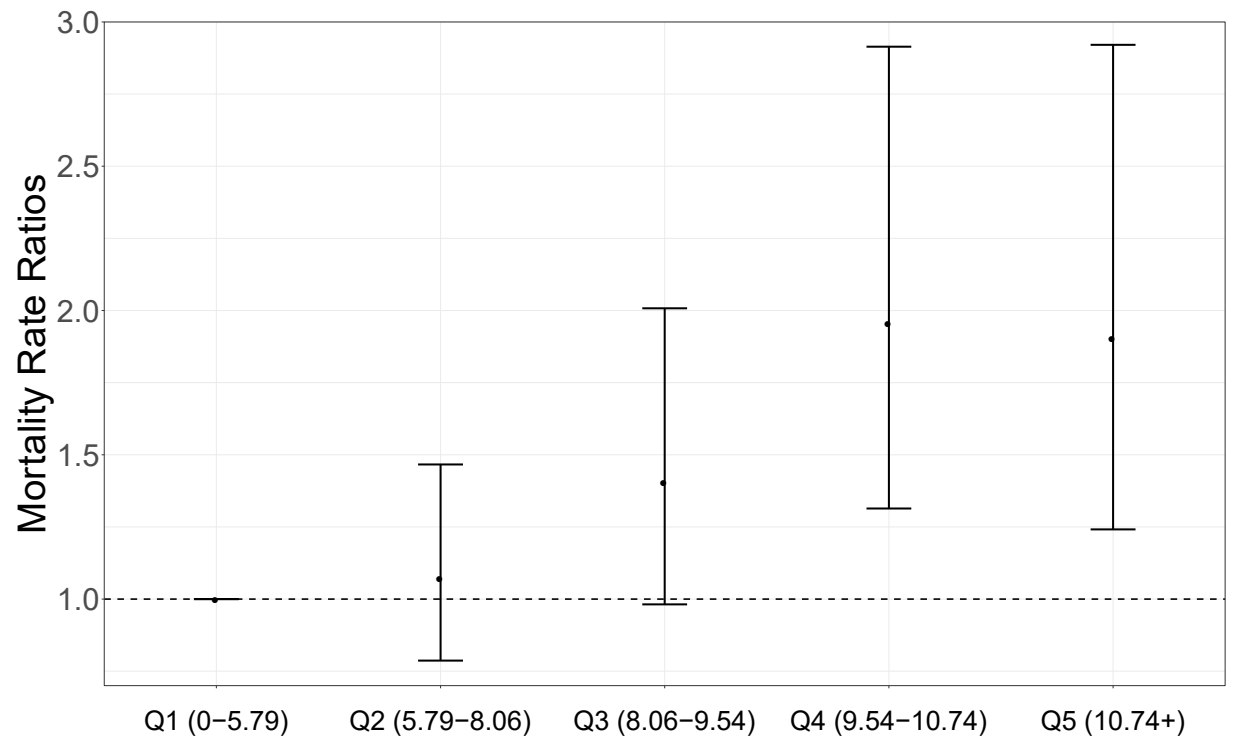
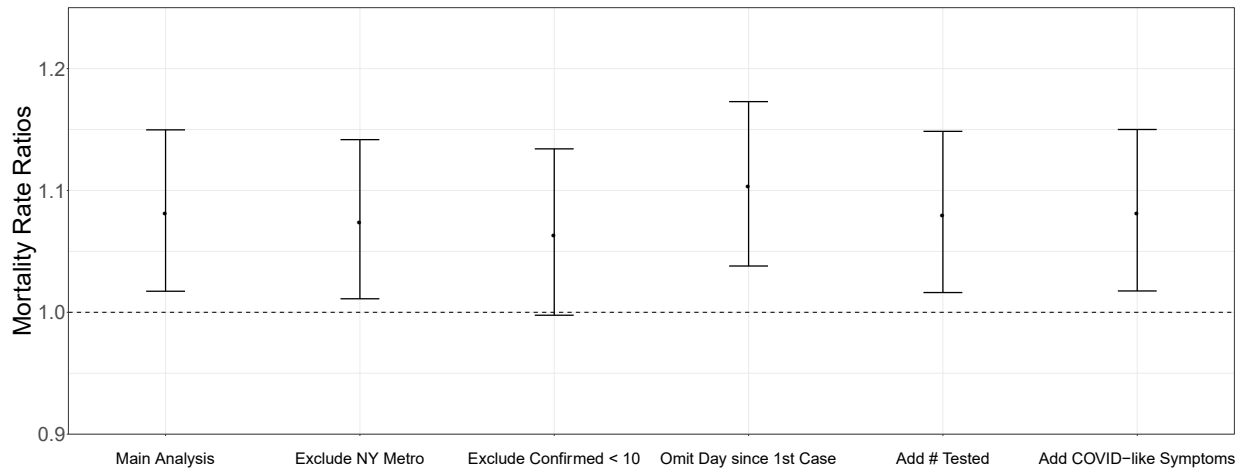


Fig 2: Mortality Risk Ratios (MRR) and 95% confidence intervals. **Upper panel,** MRR can be interpreted as percentage increase in the COVID-19 death rate associated with a 1 $\mu\text{g}/\text{m}^3$ increase in long-term average $\text{PM}_{2.5}$ exposure. The MRR from the main analysis was adjusted for 20 potential confounders. In addition to the main analysis, results are shown for secondary analyses (a) excluding the counties in New York metropolitan area, (b) excluding counties with fewer than

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10 confirmed COVID-19 cases, (c) omitting time since first reported COVID-19 case from the model, (d) adding state-level number of tests performed to the model, (e) adding county-level estimated percentage of people with COVID-19 symptoms to the model, and (f) using PM_{2.5} exposure categorized at quintiles. All COVID-19 death counts are cumulative counts up to and including April 22, 2020. **Lower panel**, MRR can be interpreted as the percentage increase in the COVID-19 death rate associated with each empirical quintile of long-term average PM_{2.5} exposure compared to the baseline quintile (Q1).

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Incidence of COVID-19 and Connections with Air Pollution Exposure

Evidence from the Netherlands

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WORLD BANK GROUP

Fragility, Conflict and Violence Global Theme

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Abstract

The fast spread of severe acute respiratory syndrome coronavirus 2 has resulted in the emergence of several hot-spots around the world. Several of these are located in areas associated with high levels of air pollution. This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands. The results show that atmospheric particulate matter with diameter less than 2.5 is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. The estimates suggest that expected COVID-19 cases increase by nearly 100 percent when pollution concentrations increase by 20 percent. The association

between air pollution and case incidence is robust in the presence of data on health-related preconditions, proxies for symptom severity, and demographic control variables. The results are obtained with ground-measurements and satellite-derived measures of atmospheric particulate matter as well as COVID-19 data from alternative dates. The findings call for further investigation into the association between air pollution and SARS-CoV-2 infection risk. If particulate matter plays a significant role in COVID-19 incidence, it has strong implications for the mitigation strategies required to prevent spreading.

This paper is a product of the Fragility, Conflict and Violence Global Theme. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The author may be contacted at bandree@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Incidence of COVID-19 and Connections with Air Pollution Exposure: Evidence from the Netherlands

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Highlights

Background: Research on viral respiratory infections has found that infection risks increase following exposure to high concentrations of particulate matter. Several hot-spots of Severe Acute Respiratory Syndrome Coronavirus 2 infections are in areas associated with high levels of air pollution.

Approach: This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands using data on confirmed cases and hospital admissions coded by residence, along with local PM_{2.5}, PM₁₀, population density, demographics and health-related pre-conditions. The analysis utilizes different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment.

Results: PM_{2.5} is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. Taking the WHO guideline of 10mcg/m³ as a baseline, the estimates suggest that expected COVID-19 cases increase by nearly 100% when pollution concentrations increase by 20%.

Conclusion: The findings call for further investigation into the association between air pollution on SARS-CoV-2 infection risk. If particulate matter plays a significant role in the incidence of COVID-19 disease, it has strong implications for the mitigation strategies required to prevent spreading, particularly in areas that have high levels of pollution.

Keywords: COVID-19, SARS-CoV-2, Coronavirus, Air Pollution, Particulate Matter.

JEL Codes: O13, F64, Q51, Q52, Q53

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1. Introduction

In 2019, confirmed infections with a new novel human coronavirus (SARS-CoV-2) emerged in Wuhan, in the Hubei Province in China. The virus rapidly spread to other parts of China and by early 2020 it had emerged in many other countries around the world. The World Health Organization (WHO) declared a global pandemic on March 11 2020, as confirmed cases topped 118,000 in more than 110 countries and territories around the world with sustained community spread.

Epidemiologists have started to investigate possible environmental factors that accelerate the spread of SARS-CoV-2 within communities (Sajadi et al., 2020; Bhattacharjee, 2020). A recent paper by van Doremalen et al. (2020) analyzed the aerosol and surface stability of SARS-CoV-2 and compared it with SARS-CoV-1, the most closely related human coronavirus (Wu et al., 2020a). The study found that SARS-CoV-2 can survive up to three days on some surfaces, like plastic and steel, and that aerosol transmission is plausible since the virus can remain viable and infectious in the air for hours. These findings echo those of Chen et al. (2004) on environmental contamination with SARS-CoV-1, and are consistent with evidence for aerosol distribution of SARS-CoV-2 found by Guo et al. (2020), but are inconsistent with the current WHO stance that SARS-CoV-2 is not transported by air. However, the possibility of airborne transmission would call for different mitigation efforts to prevent spreading and is thus an important area of study.

The risk of infection of some airborne viruses has been shown to increase in the presence of ambient fine particles that can stay in the air for long periods, travel far distances, and penetrate deeply into lungs.¹ One highly contagious airborne disease is caused by the measles virus. Previous studies on disease outbreaks have highlighted that the incidence of measles in China increased 1-3 days after short-term exposure to high concentrations of PM₁₀ and SO₂ Chen et al. (2017b); Peng et al. (2020). In another study, ambient fine particles were found to contribute to the relative risk of influenza transmission in Chinese cities (Chen et al., 2017a) with the most significant effect occurring within a period of 2-3 days.

If air pollution plays a similar role in the incidence of SARS-CoV-2, there should be a positive relationship between confirmed COVID-19 cases and particulate matter concentrations. China ranks among the worst globally in terms of PM_{2.5} concentrations and, within China, the Hubei province is among the more heavily polluted areas (van Donkelaar et al., 2016). The most heavily hit Italian region is the Lombardy area in the northern Po valley, which is among the regions with the worst air quality in Europe. Preliminary findings from Italian researchers started pointing towards a correlation between days of exceeding the limits for PM₁₀ and the number of hospital admissions from COVID-19 (Setti et al., 2020; Onufrio, 2020).

Increased air pollution could just reflect the presence of anthropogenic activity which instead explains the patterns. However, that does not explain why COVID-19 cases are not increasing rapidly in every densely populated area.

1. Over the years, numerous studies have related hospitalization numbers, case numbers, and relative risk of respiratory viral infections and influenza-like illnesses to short-term air pollution exposure, mostly at city level, using a variety of data sets and methods. See (Ciencewicky and Jaspers, 2007) for an early review, see (Xu et al., 2013; Liang et al., 2014; Su et al., 2019) on influenza-like illnesses, and (Silva et al., 2014; Huang et al., 2016; Feng et al., 2016; Li et al., 2018) on viral respiratory infections.

To investigate this further, the current paper looks at confirmed cases and COVID-19 related hospital admissions in 355 municipalities in the Netherlands and uses regression techniques to investigate correlations between COVID-19 case data and particulate matter concentrations, controlling for a variety of demographic characteristics and data on health related pre-conditions. The analysis finds that $PM_{2.5}$ is a highly significant predictor of both the number of confirmed COVID-19 cases and the number of related hospital admissions per 100,000 inhabitants.

The analysis suggests that the association between air pollution and case incidence is robust to proxies for worse respiratory health and symptom severity. The findings are also robust to other important control variables and different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment. Results are obtained with ground-measurements and satellite-derived $PM_{2.5}$. Analyzing COVID-19 data from alternative dates resulted in similar conclusions.

The remainder of this paper is organized as follows. Section 2 visually inspects several available confirmed case maps and discusses the spatial distribution. Section 3 introduces the data used for analysis. Section 4 presents regression results and discusses several of the estimates. Section 5 concludes.

2. Spatial Distribution of COVID-19: Country Examples

Suggestive evidence that the spatial distribution of COVID-19 cases is not purely random and might be related to environmental factors can be found by exploring several maps of confirmed cases. A few easily accessible fine resolution maps are presented below, in particular for the Netherlands, Germany, Spain and Italy. The data for the Netherlands is taken from the Dutch National Institute for Public Health and Environment (RIVM).² The data for Germany is from the Robert Koch Institute.³ The data for Italy can be viewed via a live dashboard,⁴ and the raw data is well organized and available on a github page.⁵ The Spanish data was taken from this link.⁶

A number of features of the spatial distributions are striking. First, there is a strong spatial correlation visible in all four countries, which is to be expected for a virus that spreads by human contact. It is intriguing, however, that the highest case density in the Netherlands is in Brabant, the southeastern part of the country, while major cities like Amsterdam and Rotterdam are in the west part of the country where the case density is lower. While Brabant is not the most populous province, it accounts for the highest contribution to nation-wide industrial GDP. Within the province, the sub-region Zuidoost-Noord-Brabant produces the highest contribution to industrial GDP.⁷ This area approximately spans the COVID-19 case cluster that can be seen on the map.

2. <https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente>.

3. <https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>.

4. <http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1>

5. <https://github.com/pcm-dpc/COVID-19/tree/master/dati-province>

6. <https://www.rtve.es/noticias/20200323/mapa-del-coronavirus-espana/2004681.shtml>

7. <https://www.cbs.nl/nl-nl/nieuws/2018/31/belang-industrie-voor-de-regio>

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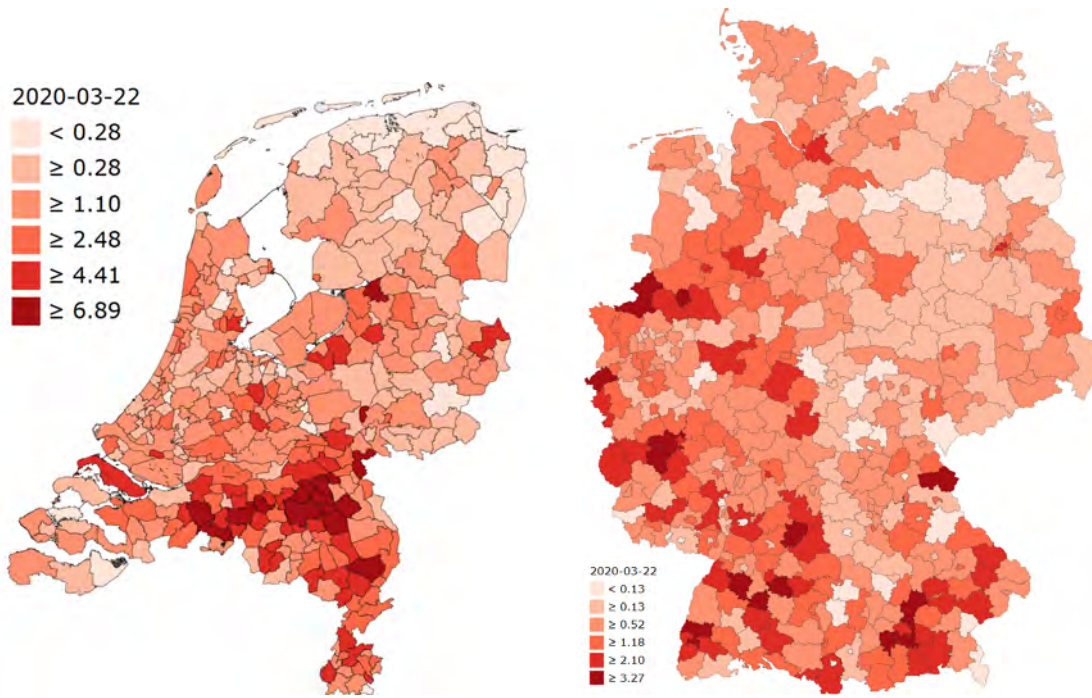


Figure 1: Distribution of COVID-19 in the Netherlands and Germany. Confirmed cases per 10,000 inhabitants.

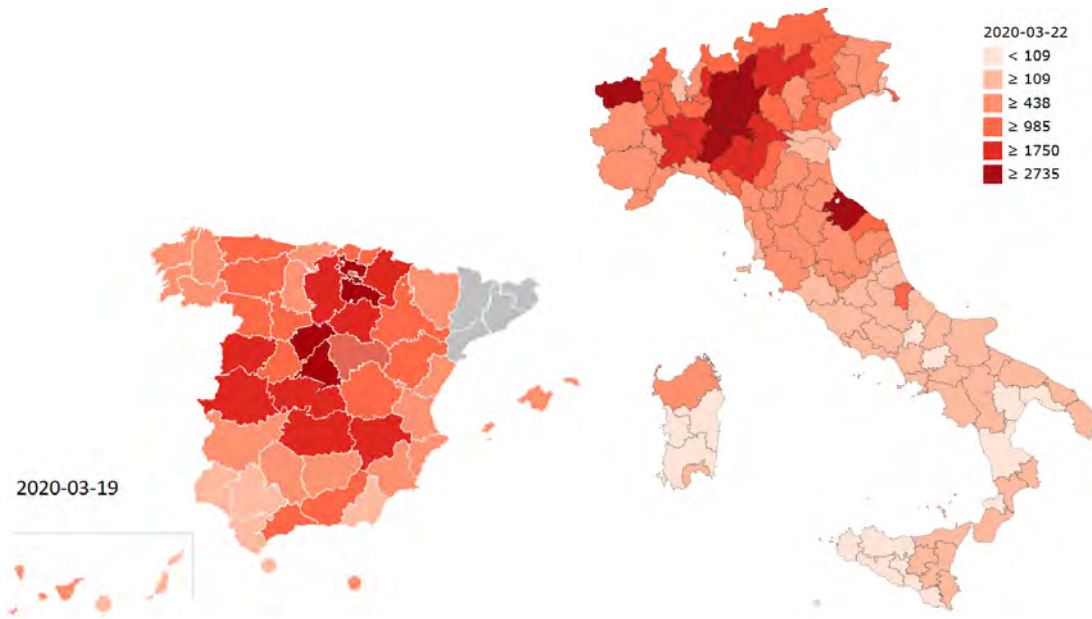


Figure 2: Distribution of COVID-19 in Spain and Italy. Confirmed cases per 1,000,000 inhabitants.

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

In Germany, two areas stand out. First, the western part of the country, near the border with the Netherlands, Belgium, and Luxembourg, has an increased case density. This area (North Rhine-Westphalia, Rheinland-Pfalz and Baden-Württemberg) contains the major industrial regions including the Ruhr area. Second, a cluster of cases can be seen in the south-eastern part of the country near Munich where major automobile industry is found. These areas are also the most populous of the country, which makes it difficult to draw any immediate conclusions about a relationship with air quality.

In Spain, confirmed cases have the highest case density in the capital, Madrid, with an extension into neighboring Sergovia. A second cluster can be also seen northeast of Madrid. Interestingly, Spain's population density is high along the eastern coast where the case density is lower. This suggests that case incidence in the country does not simply follow population densities, but that other factors play a role.

Finally, in Italy, confirmed cases have the highest case density in the northern part of the country, Lombardy in particular. Without a doubt, Lombardy and the Po valley as a whole has one of the highest concentrations of air pollutants of Europe. Moreover, the case density does not seem to trend strongly with Italy's population distribution. For example, Italy's population density is generally high along its coast, and cities like Rome and Naples do not stand out in the map.

Taken together, the maps suggest that that COVID-19 incidence clusters spatially and that environmental factors beyond population density may play a role. The analysis in the remainder of the paper confronts the relatively granular Dutch case data with possible predictors that include population density, air pollution, demographic characteristics and health related controls.

3. Data

The COVID-19 data is taken from the RIVM.⁸ The first data snapshot includes all confirmed cases as of March 22 (a total of 4,004 with known residence out of 4,157 confirmed cases). A second snapshot of confirmed cases was taken on March 30 and includes 11,258 cases with known residence out of 11,750 confirmed cases. The confirmed COVID-19 hospital admissions are taken from the same source approximately 1 week after the first data snapshot (31 March, a total of 4,562 with known residence out of 4,712 admissions from a total of 12,595 confirmed cases). While some cases are reported immediately, a share of the cases follows a typical delay of up to 1-2 days after the actual case or hospitalization confirmation. Both the confirmed cases, as well as confirmed hospital admissions, are coded by residence (not by hospital addresses).

On March 31, approximately 37% of confirmed cases were also hospital admissions, highlighting that case detection is likely biased toward more severe cases.⁹ Within one week, the number of hospital admissions exceeded the confirmed cases of the previous week, indicating that the time between confirmation and hospitalization likely spans only a few days. Cases are reported to the RIVM by the Municipal Health Service (GGD). The GGD is organized as collaboration between municipalities to provide base level public health service

8. <https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente>

9. For example, early estimates based on Chinese cases indicated that the hospitalization rate of elderly, the most vulnerable population, was only 18.4% (Verity et al., 2020).

in accordance with country-level legislation on public health. The 355 municipalities are grouped into 25 GGD areas, each covering a population of approximately 600,000 inhabitants. The GGD borders are visible in figure 5 which visualizes the hospital admissions.

The data is combined with demographic statistics (2019) obtained from the Dutch Central Bureau of Statistics.¹⁰ The data contains the official population headcount at district level, as well as a number of relevant household characteristics. A number of surveyed health statistics (2016) have been obtained as well from the RIVM (maps can be viewed in the source link).¹¹ The data is based on a survey of 457,000 people and includes the share of population in each district with a documented long-term illness (illnesses over 6 months), the prevalence of overweight and obesity, alcohol abuse, smoking and noise due to traffic. Hence the data controls for the presence of possible pre-conditions that make certain populations more vulnerable.

A variety of air pollution data sets exist. For the main analysis, annual average particulate matter concentrations from the RIVM are used to capture long-term exposure (2017, published September 2019).¹² The data is used by the government for official monitoring in accordance with EU guidelines on air quality monitoring and has a resolution of 25 meter grids. These high-resolution grids are produced by spatial interpolation of ground-measurements. For this analysis, the grids have been averaged to the municipality level. The spatial distribution of pollution has remained relatively stable in recent years. The intensity of air pollution has gradually gone down since 2013, though the difference between the 2017 and 2015 data is relatively small. This suggests that the spatial variation of the 2017 data is still relevant to analyze the role of long-term pollution exposure in the current situation. The temporal lag in the pollution data also ensures that there is no endogeneity due to feedback between case incidence and changes in pollution levels that follow lock-down policies.

To test whether the main findings of the analysis generalize to other pollution data sets, a second analysis presented in the appendix uses the coarser grids from the global PM_{2.5} data set of van Donkelaar et al. (2016). The main conclusions of the analysis do not change when this alternative pollution data set is used, and since this data is mainly satellite-derived, it may be used in other countries where detailed PM_{2.5} measurements are not easily available. Figure 6 visualizes the spatial distribution of the main PM_{2.5} and PM₁₀ statistics. Table 3 summarizes the full set of covariates used in the analysis.

4. Results

The analysis is organized into two main investigations and a set of robustness analyses. First, section 4.1 analyzes the confirmed cases per 100,000 inhabitants using linear models that account for possible spatial autocorrelation and residual dependence. Section 4.2 analyzes the data nonlinearly, allowing parameter estimates to vary across locations and levels in the data. Additional results are included in the appendix, section 6.2. In particular, the robustness of the results is diagnosed by using alternative measures of incidence, a different source of pollution data, and alternative distributional assumptions.

10. <https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/geografische-data/wijk-en-buurtkaart-2019>

11. <https://www.rivm.nl/media/smapi/langdurigeziekte.html>

12. <https://www.atlasleefomgeving.nl/kaarten>

4.1 Linear analysis of March 22 cases per 100,000 inhabitants

To analyze the relationship between spatial variation in particulate matter concentrations and COVID-19 incidence, a number of regressions are estimated that control for possible spatial autocorrelation (Anselin, 1988).¹³ Importantly, the spread of SARS-CoV-2 manifests itself in hot-spots that result from contact with infective subjects from areas that are in close proximity, and it can show strong geographical patterns that are not structurally related to air pollution levels. The fact that the infection started at different times in different areas together with the exponential and geographical nature of case spread, may lead to spurious associations between the spatial distribution of case hot-spots and pollution levels, particularly if the initial cases occurred in polluted regions by mere chance and then spread to nearby regions.¹⁴

To account for the issue, spatial models include neighboring values of the dependent variable and/or residuals as additional variables. These spatial averages control for the clustering that results from geographical spillovers.¹⁵ These models can be understood as spatial equivalents to the models that are commonly used to analyze time series in which observed values are in part explained by recent observations. While the household composition and population density terms capture more dense social links, the spatial regression components capture the likelihood of contact with infective subjects. In particular, within a hot-spot, neighboring areas have high numbers of cases per 100,000 inhabitants, and the spatial regression terms capture the increased likelihood of having contact with infective subjects within the region. The important empirical question that these models thus seek to answer is whether pollution and case incidence are associated after controlling for the geographical relationships in disease spread.

First, Model 1 estimates a linear regression using all 22 covariates and possible confounders of interest that are summarized in table 3. These include population density, gender, age groups, marital status and household composition, the share of migrants, as well as several population health indicators. Particularly the health indicators are important because PM_{2.5} is known to affect population health. This may result in important pre-conditions that lead to more severe COVID-19 disease. Pre-conditions captured by the data include the share of population with a long-term illness (including asthma), the share of people that smoke and admit to guidelines on alcohol use, the share of people diagnosed with obesity or overweight, as well as variables on populations exposed to traffic noise.

-
13. The treatment of spatial autocorrelation and spatial residual correlation took a firm position in quantitative geography after the contributions by Cliff and Ord (1969, 1972). Spatial econometrics as a subfield of econometrics was rapidly developed as a means to analyze sub-country data in regional econometric models (Anselin, 2010). Good introductory books exist, apart from the one referenced in the main text (LeSage and Pace, 2009) is one other. The (Q)MLE is worked out, for example, in (Lee, 2004). The field is still actively developed, with recent advances focusing on time series dynamics and non-linearity (Beenstock and Felsenstein, 2019; Andrée, 2020).
 14. The first case was detected on February 27 in Loon op Zand in Brabant, but that same night a case was also confirmed in Amsterdam. Within 4 days, 10 cases had been confirmed in 6 cities across 4 provinces with multiple sources of infection, it took till March 23 for lockdown policies to be announced, giving ample time for spread from multiple points, see <https://nos.nl/artikel/2325309-beatrixziekenhuis-gorinchem-gesloten-om-coronavirus-tien-patienten-in-nl.html>
 15. While the spatial autoregressive models only include the rate of infective subjects in neighboring areas as regressors, the models in fact allow for feedback and spillovers to more distant observations as each area is also a second-order neighbor of itself. See the literature on spatial models cited earlier.

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It is well known that models with a high number of variables can over-fit data sets that contain only a modest number of observations. Model 2 estimates the same linear regression but uses step-wise variable selection following the AIC, Model 3 uses the selected variables in a spatial error model that controls for spatial dependence in the residuals (λ parameter), Model 4 estimates a spatial autoregressive model that allows for dependence on neighboring observations (ρ parameter), Model 5 allows for unique spatial autocorrelation and spatial residual correlation parameters. For compactness, table 1 only lists Model 1 estimates for variables selected by the AIC, even though all regressors are included. Finally, PM_{10} correlates (.95) strongly with $PM_{2.5}$ and the AIC favored $PM_{2.5}$. Replacing it with PM_{10} in the regressions below led to a small deterioration in measures of fit, indicating that $PM_{2.5}$ is a statistically preferred predictor, although the main conclusions do not depend on this. For simplicity, the focus remains on the $PM_{2.5}$ data.

Table 1: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5b
(Intercept)	-359.58 (218.20)	-402.51*** (80.61)	-202.58*** (76.06)	-200.63*** (64.11)	-207.50*** (74.59)	-185.43*** (71.75)
Population density	-6.28** (2.58)	-6.54*** (2.38)	-0.03 (2.05)	-1.10 (1.87)	-0.48 (2.06)	-0.48 (1.94)
Share 25 to 44	3.55 (2.17)	2.62* (1.34)	-0.80 (1.05)	0.47 (1.05)	-0.37 (1.07)	-.41 (1.02)
Share above 65	5.58* (2.26)	4.22*** (1.27)	2.12** (1.03)	2.14* (1.00)	2.08** (1.05)	1.07* (1.00)
Share unmarried	4.94*** (1.33)	4.78*** (0.97)	4.01*** (0.96)	3.28*** (0.78)	3.83*** (0.94)	3.59*** (0.89)
Share single household	-4.02*** (1.47)	-2.17*** (0.57)	-1.62*** (0.49)	-1.50*** (0.45)	-1.59*** (0.49)	-1.70*** (0.46)
Share non-western immigrants	-1.32** (0.57)	-1.23** (0.48)	-0.57 (0.43)	-0.78** (0.38)	-0.77* (0.42)	-0.58 (0.40)
Share of water surface	17.58 (11.18)	16.11 (10.28)	11.30 (9.62)	13.56* (8.07)	13.53 (9.21)	11.53* (8.71)
Share with long-term illness	1.10 (1.00)	1.19 (0.76)	0.41 (0.92)	0.72 (0.60)	0.64 (0.79)	0.97 (0.74)
Case severity						-0.065*** (.01)
Mean $PM_{2.5}$	10.17** (4.66)	10.84*** (1.48)	6.21*** (2.82)	3.52*** (1.22)	4.91** (2.44)	4.47*** (2.31)
λ			0.71*** (0.26)		0.42* (0.26)	0.39 (0.25)
ρ				0.68*** (0.25)	0.43 (0.25)	0.50** (0.21)
R2	0.24	0.22	0.52	0.51	0.50	0.55
AICc	3414.85	3391.40	3274.36	3274.12	3269.31	3237.91

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In the non-spatial regressions, the correlation with population density is negative and significant, suggesting that the case density is on average lower in densely populated areas. This could reflect mis-specified scaling. However, in the models that control for spatial clustering, population density is not significant. This suggests that, after controlling for spatial clustering, the spatial variation in case density is not related to population density patterns. Instead, the share of unmarried and the share of single households, which relate to the number of households in a given population and the type of social networks that they

have, are significant regressors. The estimates suggest that instead of the total number of people a person can have contact with within an area (population density), infection risk is determined by the number of people a person is likely to interact with (determined by marital status and household type), together with the average share of infected inhabitants in the wider region (spatial components). This is a plausible result. To simplify the multi-dimensional relationship between case densities and social interaction, regressing single household shares on unmarried population shares shows that on average, a 1% increase in the first is associated with a 0.74 % increase in the latter, suggesting that on average the case densities increase when there are more households in an area.

Importantly, across all regression specifications, the coefficient for $PM_{2.5}$ is positive and highly significant in the presence of controls, and also in the specifications that control for spatial residual trends and the rate of infective subjects in nearby areas. Combined, the regressions thus provide strong evidence that $PM_{2.5}$ plays a role in COVID-19 case incidence that cannot be attributed to demographics or health pre-conditions. In particular, the estimate of 10.84 in Model (2) suggests that, on average, cases per 100,000 inhabitants grow by approximately $21.68 \sim 22$ when concentrations increase from $10\text{mcg}/\text{m}^3$ to $12\text{mcg}/\text{m}^3$. This corresponds to slightly less than a 100% increase given that the average municipal case density in the data is $24.79 \sim 25$ per 100,000 inhabitants. Note that the direct elasticity is lower in the spatial models (3-5), but the net impacts need to be multiplied by spatial spillover effects. Spatial spillovers ρ and spatial correlation in the residuals λ are both significant and have a positive sign highlighting that spatial spillovers further add to local effects. For example, evaluating the prediction difference of the spatial autoregressive model (4) at $PM_{2.5}$ levels of $10\text{mcg}/\text{m}^3$ and $12\text{mcg}/\text{m}^3$, suggests a very similar increase in case incidence of $22.08 \sim 22$ per equal number of inhabitants.

Across the regression specifications, it is found that the health indicators have no significant linear relationship with confirmed case incidence. Only the share of population with a long-term illness was kept in the model with the lowest AIC, but its effect is not significant in any of the regression specifications. Going from Model 1 to Model 2, it can be seen that the parameter estimate for $PM_{2.5}$ varies little after dropping the majority of health data controls, suggesting that the association between case incidence and pollution is not heavily impacted by adding or removing available data on possible pre-conditions. It is however important to ensure that the association between case incidence and pollution concentrations is not in fact driven by worse respiratory health in polluted areas. If worse respiratory health and aggravated symptoms in polluted areas are the main channels of action, higher COVID-19 case hospitalization rates should also be expected in these locations. For this reason, the percentage of the confirmed cases that resulted in hospital admission one week later (March 22 cases / March 31 hospital admissions times 100) was calculated as proxy for case severity. In 29 areas with no confirmed cases where hospitalizations occurred within a week, a value of 100 is assigned. In 9 areas where none of the confirmed cases resulted in hospitalization, a value of 0 is assigned.¹⁶ Model 5b adds this additional proxy

16. The proxy is not perfect due to the low data density. Using instead the percentage of March 30 cases that resulted in March 31 hospitalization leads to only 4 replacements of both types (100/0). Re-estimating Model 5b with this recalculated proxy did not result in measurable change relative to Model 5. Using instead the March 30 confirmed cases as dependent variable in the same regression specification did not find the severity proxy to be significant and found $PM_{2.5}$ to remain significant at the highest level.

variable and finds that it is highly significant. The overall model fit improves as indicated by the AICc and R2. The estimate for PM_{2.5} remains relatively unchanged and significant. While one would expect that case severity contributes to higher cases, as increased symptom severity may lead to higher case detection, the result suggests otherwise. One explanation is that high hospital admission occurred in areas with a weak case detection policy. In particular, if the disease goes unnoticed for long, the number of terminally ill patients can grow because they do not receive appropriate treatment in time. In this case, low case numbers can coincide with high hospital admission numbers. To investigate further whether the proxy captures a valuable signal related to symptom severity, appendix section 6.2.5 provides additional results that try to explain the case severity proxy using the other available predictors. These additional results find that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates. This is in line with earlier identified risk groups (Ruan, 2020), suggesting that the proxy does capture a relevant case severity signal.

Taken together, the evidence suggests a significant positive relationship between case density and PM_{2.5} concentrations. However, there are still some limitations to the basic regression results presented here. The standard linear regression model may not be perfectly suitable for modeling the number of cases per 100,000 inhabitants due to the non-negative nature of the data and a right skew in the case density distribution. Strong violations of the correct-specification assumption can result in biased estimates, for instance because the models assess linearity on an additive scale while the phenomenon is multiplicative. Instead of assessing the data on the original scale as a multiplicative error model with a changing variance function, this issue is often addressed by rewriting the model as an additive error model on the log-scale with constant variance. This is appropriate as long as the log transformation is appropriate to normalize the data. To assess whether the simple estimations presented here are prone to a strong bias, section 6.2.2 investigates the residual distribution and re-analyzes the data using a log-type power transformation from a family of functions that allows for zeros. The results highlight that when the data is appropriately scaled and multiple diagnostics confirm that the Normality assumption is in fact valid, PM_{2.5} is still a highly significant positive predictor of case densities. Earlier studies on the role of ambient fine particles in the transmission risk of airborne disease have instead relied on Poisson-type regressions using count data. While these regressions are not entirely appropriate as they do not account for the highly significant geographical relationships in the data, section 6.2.1 presents Poisson-type results that allow for over-dispersion to show that the main conclusions are also robust to this specification choice.

4.2 Nonlinear analysis of March 22 cases per 100,000 inhabitants

Instead of working on a transformed scale to address some of the highlighted issues, it is also possible to tackle the problem nonlinearly on the original scale. This might also lead to interesting results on important thresholds in the data. In particular, one might expect particulate matter to only contribute to COVID-19 incidence after concentrations surpass a certain critical threshold, or expect pollution dependencies to vary with unobserved weather variables including humidity and temperature (Chen et al., 2017b,a; Peng et al., 2020). In a recent study, Sajadi et al. (2020) have already shown that there could be a relationship

between COVID-19 incidence and climatic conditions. Some COVID-19 related climatic zones are mapped by the Copernicus Earth Observation Programme, see (Copernicus Climate Change Service, 2020), and these put all but a select few municipalities analyzed in this study in the same zone. For this reason, one should expect that if the relationship between pollution and COVID-19 incidence varies regionally, it does so with a reasonable smoothness.

Additional results below are obtained using non-parametric penalized kernel regression following (Hainmueller and Hazlett, 2014; Andrée et al., 2019). The estimates provide observation-level marginal coefficients that allow for nonlinearity conditional on levels in the data. Longitude and latitude have been added as additional controls, which allows the model to capture spatial trends in line with a spatial residual component. However, this time it also allows the model's parameters to vary across spatial gradients in unobserved components, such as related to weather. The model nests a linear model, specifically, higher levels of regularization result in linearized relationships. Evidence that the relationship with air pollution is nonlinear is strengthened by using Model (2) and re-estimating it after applying a third-order Taylor approximation to the $PM_{2.5}$ measurements. Calculating an auxiliary test statistic for the significance of the second and third terms overwhelmingly supports nonlinearity, a Likelihood Ratio obtains a p -value below 0.001 (statistic of 15.18 on 2 degrees of freedom).

The fit of the nonparametric model is tuned using standard cross-validation procedures and out-of-sample prediction performance was estimated using 10-fold, repeated twice, cross-validation. To keep the flexibility of the models at a manageable level given the small number of observations, only a few predictors are used. In particular, the significant predictors from the final model (5) are taken, the share of unmarried is dropped as the model can now estimate nonlinear dependence on the share of single households, the share of long-term illness and population density are added back in because they remain of particular interest. The share of non-Western immigrants was dropped because it was insignificant and dropping it did not negatively impact the cross-validation results. Finally, the share of population in the 25 to 44 years group was dropped because estimating nonlinearly on only the share of population above 65 resulted in better fit.

Table 2: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Avg.	Pr(Avg. > 0)	q.25	q.50	q.75
Population density	-3.75	0.24	-8.40	-1.84	1.62
Share above 65	-0.41	0.44	-1.55	0.00	1.42
Share of single households	-1.57	0.00	-2.56	-1.01	0.19
Share with long-term illness	0.39	0.59	-1.70	-0.06	1.94
Mean $PM_{2.5}$	5.98	0.02	-1.24	3.16	11.45

Insample R2: 0.50, CV R2 0.35, Longitude and Latitude used as additional controls.

Table 2 presents the estimation results. In it, Avg. takes the average across all the marginal coefficients and q.25-q.75 give the quantiles as an indication of parameter heterogeneity. To understand the shape of the nonlinearity, figure 3 plots conditional expectations across the range of values in the covariates. The values are produced by fixing all covariates,

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except the one of interest, at mean values, and plotting the model predictions and their standard errors across the .025th percentile to the .975th percentile values of inputs.

The averages of parameter estimates resemble the results from those obtained with linear regression methods. In particular, the average slope of population density is again negative but not significant, while the increased share of single households provides a stronger signal for increased case densities, particularly in the inner range of values that have denser data coverage (see figure 3). The age group control shows that elderly are more at risk. The estimated relationship with the share of population that has a long-term illness highlights an important threshold. Fewer COVID-19 cases are expected only in areas with very low values for this indicator.

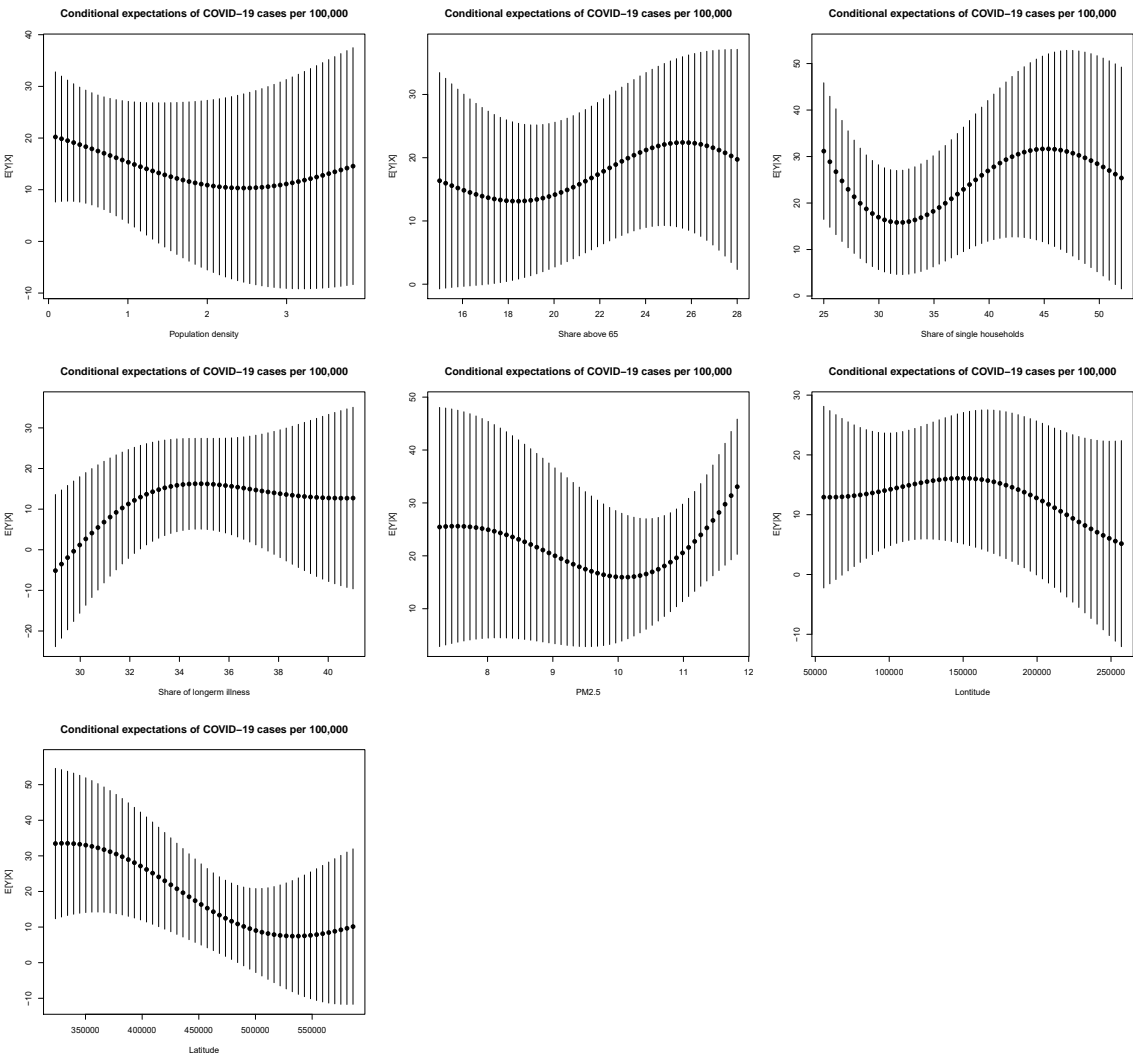


Figure 3: Conditional expectation plots for COVID-19 cases per 100,000 inhabitants.

Importantly, after addressing nonlinearity and spatial heterogeneity in parameter estimates, the average slope of $PM_{2.5}$ remains positive and highly significant. The ranges in the quantiles highlight that there is substantial parameter heterogeneity. The nonlinear estimates suggest that at low levels of $PM_{2.5}$, changes in particulate matter concentrations are not associated with significant changes in case incidence. However, after the mean annual concentrations cross the WHO guidelines of $10mcg/m^3$, the standard errors tighten and the number of expected cases increases sharply. At $12mcg/m^3$, the expected cases per 100,000 inhabitants are approximately double the numbers expected at $10mcg/m^3$.

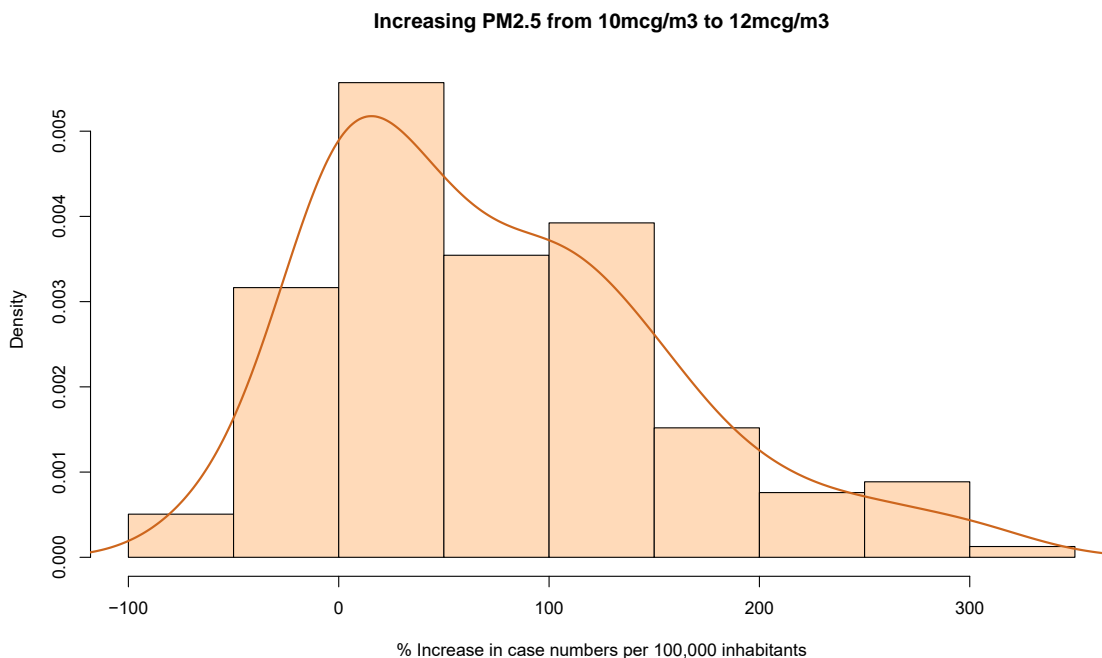


Figure 4: Prediction difference when increasing pollution concentrations (N=158).

More indication of impacts is approximated by calculating the prediction difference when $PM_{2.5}$ moves from $10mcg/m^3$ to $12mcg/m^3$, leaving all other covariates at observed values. This is performed for all areas that have at least already $9mcg/m^3$ and case numbers within the 25% to 75% quantile range (between 8.3 and 31.7 cases per 100,000). The prediction difference is standardized based on the current actual case numbers and multiplied by 100, thus expressed as a percentage increase with respect to current case numbers. The results in figure 4 highlight the effect heterogeneity, suggesting that the modeled pollution association varies strongly depending on other covariates. Numerical integration under the kernel density suggests 80% of events result in positive increases in case incidence, and of these events the estimated average increase in cases per 100,000 inhabitants is 95% when particulate matter concentrations increase from $10mcg/m^3$ to $12mcg/m^3$.

5. Conclusion

Research on viral respiratory infections, measles and influenza outbreaks has found that infection risks increase following exposure to high concentrations of particulate matter. This paper investigated the relationship between COVID-19 incidence and exposure to particulate matter in 355 municipalities in the Netherlands. Regression analysis was performed using confirmed cases per 100,000 inhabitants, confirmed COVID-19 related hospital admissions per 100,000 inhabitants, and confirmed case counts as dependent variables.

The study finds that $PM_{2.5}$ is a highly significant predictor of all three indicators of COVID-19 incidence. The findings are robust to outlier treatment and power transforms to normalize data, and are stable across alternative regression specifications that allow for spatial dependence or nonlinearity, and remain significant in the presence of demographic and health controls. Estimates suggest that when annual concentrations cross above the WHO guidelines of $10\mu\text{cg}/\text{m}^3$, the number of expected cases per 100,000 inhabitants doubles as annual concentrations reach $12\mu\text{cg}/\text{m}^3$ all else constant.

While the analysis found that these results are robust to various methodological considerations, it is important to note that testing for SARS-CoV-2 is performed using convenience sampling, which may well vary by area and in time. This may induce biases in the results if the sampling rate is indirectly correlated with pollution levels. However, it is difficult to perceive why sampling should structurally be related to pollution concentrations. Moreover, in light of the rich body of literature on the association between pollution exposure and respiratory tract infection risk, and the plausible parameter estimates with respect to many of the other variables, convenience sampling does not seem to be a more plausible explanation for the results than the findings of the study itself. Moreover, another new study by Wu et al. (2020b) has found evidence for a higher number of confirmed fatal COVID-19 cases per 100,000 inhabitants in the United States, which seems to corroborate the findings on increased hospital admissions and cases per 100,000 inhabitants.

The findings call for further investigation. In particular, the air pollution link should be investigated in multiple countries and for wider ranges of $PM_{2.5}$ concentrations. If the relationship extrapolates to higher concentrations, the implications for developing countries may be severe. In particular, developing countries are highly polluted compared to the levels observed in this study (Andrée et al., 2019) and are already identified as risk areas for COVID-19 spread (Gilbert et al., 2020; Nkengasong and Mankoula, 2020; Martinez-Alvarez et al., 2020). Even though this study was not able to find strong evidence for an impact of $PM_{2.5}$ on case severity, at the high levels of $PM_{2.5}$ in developing countries, more severe impacts on respiratory health may interact with case fatality of SARS-CoV-2. The possible association between pollution and symptom severity will thus be important to revisit, particularly because regional variation in case fatality of closely related SARS-CoV-1 has been associated with air pollution exposure (Cui et al., 2003).

Finally, as more data on COVID-19 spread becomes available, stronger results on the specific effects of short-term air pollution exposure may be estimated. If fine particulate matter plays a significant role in SARS-CoV-2 infection risk, it has strong implications for the mitigation strategies required to prevent spreading.

6. Appendix

6.1 Data descriptives

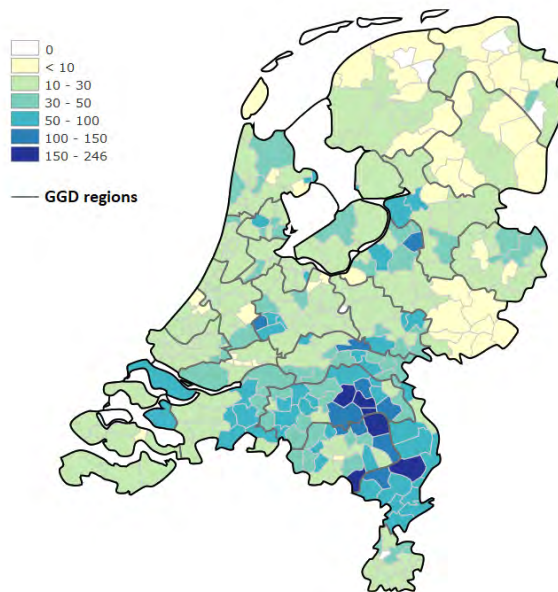


Figure 5: Hospital admissions per 100,000 inhabitants on March 31.

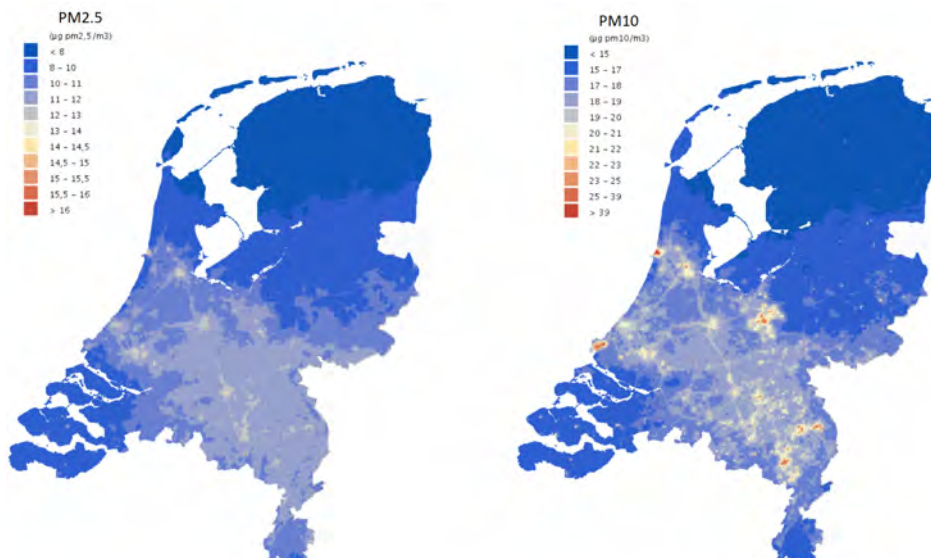


Figure 6: Particulate matter concentrations (2017).

Table 3: Data descriptives.

Variable	mean	sd	median	min	max
March 22 confirmed cases per 100,000	24.79	31.62	16.00	0.00	349.50
March 30 confirmed cases per 100,000	70.84	63.77	54.20	0.00	565.70
March 31 hospital admissions per 100,000	29.36	30.81	20.50	0.00	237.20
March 22 confirmed case counts	11.41	21.66	6.00	0.00	188.00
March 22 case hospitalization rate	141.15	102.67	107.05	0.00	804.92
March 30 case hospitalization rate	41.39	19.23	41.05	0.00	100.00
Population density (thousands per sqkm)	0.88	1.04	0.46	0.02	6.52
Share of male population	0.51	0.01	0.50	0.47	0.57
Share from 14 to 24	11.72	1.65	12.00	9.00	23.00
Share from 25 to 44	21.96	2.84	22.00	14.00	36.00
Share from 45 to 64	29.32	2.22	30.00	19.00	34.00
Share above 65	21.24	3.29	21.00	9.00	32.00
Share of unmarried	44.53	4.19	44.00	37.00	65.00
Share of single households	32.76	6.32	31.00	20.00	60.00
Share of households without children	32.02	3.56	32.00	20.00	40.00
Average household size	2.26	0.18	2.30	1.70	3.30
Share of western immigrants	8.61	4.46	8.00	2.00	47.00
Share of non-western immigrants	7.43	5.93	5.00	1.00	39.00
Share of water surface	0.11	0.17	0.04	0.00	0.94
Share with long-term illness	34.11	2.91	34.00	27.00	45.00
Share of overweight	51.01	3.68	51.00	37.00	61.00
Share exposed to noise above 50kmh	3.03	1.38	3.00	0.00	8.00
Share exposed to noise below 50kmh	4.84	2.00	5.00	1.00	13.00
Share with obesity	14.46	2.17	14.00	9.00	22.00
Share of non-heavy drinkers	39.94	4.87	40.00	30.00	58.00
Share of smokers	19.64	2.72	19.00	14.00	31.00
Mean PM _{2.5}	10.22	1.33	10.69	6.95	12.04
Mean PM ₁₀	17.28	1.61	17.74	13.60	21.09
Mean Van Donkelaar PM _{2.5}	14.60	1.77	15.01	10.15	18.05

6.2 Additional analysis results

This section presents a number of additional estimations. In particular, section 6.2.1 presents Poisson-type regressions that use case counts as dependent variables in line with earlier studies on the relationship between air pollution and viral spread, the influence of possible outlier observations or the discussed distributional issues is investigated in section 6.2.2, in section 6.2.3 the main analysis is re-estimated using confirmed cases from March 30 to show that the conclusions are not dependent on the date of the case snapshot, the main analysis is also repeated using confirmed hospital admissions from March 31 in section 6.2.4 to provide further evidence that the conclusions are not dependent on measurement error in the confirmed cases. Section 6.2.5 investigates correlations between covariates and the case hospitalization rates used to proxy for symptom severity. Finally, additional analysis in section 6.2.6 re-estimates the main analysis using alternative satellite-derived PM_{2.5}.

6.2.1 POISSON-TYPE REGRESSIONS FOR CASE INCIDENCE

In table 4, the case counts are used in regression instead of case density. Model 8 estimates a standard Poisson regression. Model 9 estimates a Poisson regression with stepwise selection following the AIC. Model 10 presents the same model, allowing for over-dispersion. Finally, Model 11 allows for a zero-inflated Negative Binomial distribution and model 12 performs step-wise AIC under the Negative Binomial.

Table 4: Dependent Variable: Confirmed COVID-19 cases.

Variable	Model 8	Model 9	Model 10	Model 11	Model 12
(Intercept)	-13.75*** (2.23)	-13.75*** (1.64)	-13.75*** (5.12)	-9.89** (4.86)	-4.14 (2.72)
Population density	-0.35*** (0.02)	-0.35*** (0.02)	-0.35*** (0.08)	-0.30*** (0.08)	-0.29*** (0.07)
Share of male population	-22.38*** (1.90)	-23.12*** (1.85)	-23.12*** (5.77)	-16.07*** (4.96)	-13.29*** (4.41)
Share 14 to 24	0.07*** (0.02)	0.07*** (0.01)	0.07 (0.04)	0.04 (0.05)	
Share 25 to 44	0.16*** (0.02)	0.16*** (0.02)	0.16*** (0.05)	0.17*** (0.05)	0.15*** (0.04)
Share above 65	0.13*** (0.02)	0.13*** (0.02)	0.13** (0.05)	0.09* (0.05)	0.05* (0.03)
Share of unmarried	0.14*** (0.01)	0.14*** (0.01)	0.14*** (0.04)	0.11*** (0.04)	0.10*** (0.02)
Share of household without children	0.06*** (0.02)	0.06*** (0.01)	0.06 (0.04)	0.04 (0.04)	
Average household size	2.75*** (0.44)	2.58*** (0.25)	2.58*** (0.77)	1.04 (0.68)	
Share of western immigrants	0.03*** (0.01)	0.03*** (0.01)	0.03 (0.02)	0.00 (0.02)	
Share of non-western immigrants	0.03*** (0.00)	0.03*** (0.00)	0.03** (0.01)	0.02 (0.02)	
Share enduring noise above 50km	0.03* (0.02)	0.04*** (0.01)	0.04 (0.04)	0.01 (0.04)	
Share of obese	0.06** (0.02)	0.05*** (0.02)	0.05 (0.05)	-0.03 (0.04)	
Share of non-drinkers	-0.05*** (0.01)	-0.05*** (0.01)	-0.05** (0.02)	0.00 (0.01)	
Share of smokers	0.11*** (0.01)	0.12*** (0.01)	0.12*** (0.04)	0.06 (0.04)	
Mean PM _{2.5}	0.52*** (0.05)	0.47*** (0.02)	0.47*** (0.06)	0.45*** (0.05)	0.44*** (0.04)
R2	0.59	0.59	0.59	0.47	0.47
AICc	3995.20	3983.77	3983.77	2242.19	2227.05

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The residuals are checked for spatial autocorrelation, and significant residual clustering was still found. Spatial autocorrelation is not easily addressed in count data with standard regression implementations, hence the results are simply from a mis-specified model. For this reason, the models that relax distributional assumptions (10-12) should provide improved indications of significance, with Model 10 being proffered. The main results of the paper presented in section 4 take spatial processes explicitly into account and are in turn preferred over Model 12.

A few results using the count data echo the main findings. In particular, the slope of population density is negative, indicating that the more populous areas in the Netherlands

are more likely to have lower case numbers on average rather than higher. Several of the health indicators are significant, but only in the standard Poisson regression. Allowing for over-dispersion or estimating under the Negative Binomial distribution finds no significant relationship suggesting that these relationships are less robust. In all specifications, the impact of PM_{2.5} remains highly stable and significant. This provides further evidence that confirmed COVID-19 cases are higher in polluted areas and that these conclusions do not depend on using count or Normal estimation techniques.

6.2.2 DISTRIBUTIONAL MIS-SPECIFICATION AND OUTLIER ANALYSIS

Since only a modest amount of observations has been used in the analysis, it is important to diagnose whether the estimation result could be heavily impacted by outlier observations. One way to diagnose this is to inspect a Q-Q plot, which compares the standardized residuals to theoretical quantities from the Normal distribution.

Figure 7 highlights that the Normality assumption is not entirely satisfied. Both Model 2 and Model 5 residuals contain outliers, particularly in the right tail of the distribution. In both models, the residuals follow a very similar pattern and the three major outliers that are prevalent on both specifications are Boekel, Uden and Bernheze which are all in the COVID-19 cluster in the province of Brabant. Outliers can be influential in a regression, though they do not necessarily have to be, while other points that lie within a normal range of the model can be influential without being an outlier per se. The impact of outlier observations depends also on the data density in the region around the data point. The Q-Q plots do not inform about whether the identified outlier observations are actually influential in the regression. Figure 8 calculates Cook’s distance, a multivariate measure of influence, and identifies influential data points by evaluating the impact of individual observations on the regression results with respect to the covariates of interest through a leave-one-out procedure.

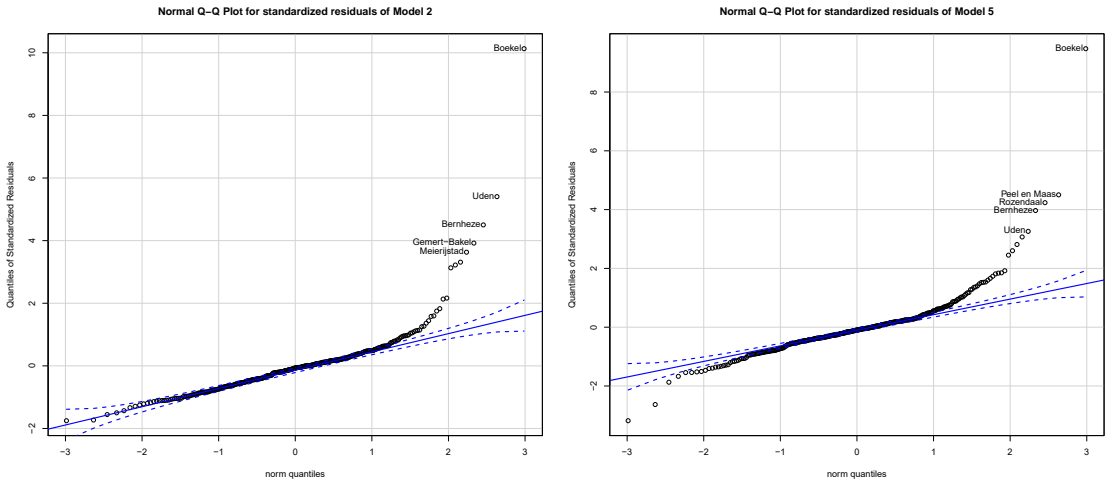


Figure 7: Comparison of residuals to theoretical quantities.

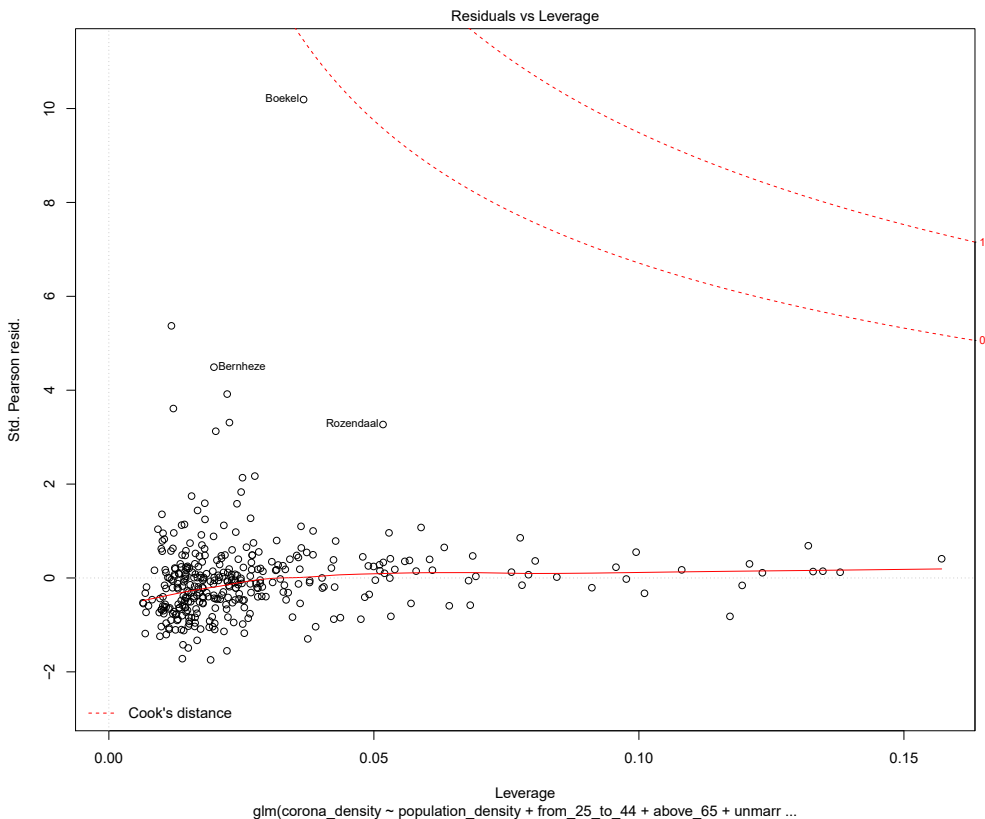


Figure 8: Residuals versus Leverage plot using Cook's distance.

Figure 8 highlights that Boekel and Bernheze are relatively influential, but not critically. This is reassuring, nevertheless it is important due to the small sample nature of the applications to evaluate whether the identified mild violations have a drastic impact on the estimation results. Two regressions are performed to analyze this. First, Model 5c replaces the dependent values of the 8 observations that have visibly the largest residuals in the Q-Q plot with predicted values from Model 5 and re-estimates the specification. This allows comparing directly how the parameter estimates change when these outlier observations are replaced with values that lie closer to the normal range of the data. It is important to note that if these observations are not outliers in an additive sense, but simply reflect the nature of the data-generating process, then these new estimates have in fact an increased bias resulting from further mis-specification. To evaluate whether outliers can be addressed through model-specification, Model 5d first normalizes the data using a power transformation (Johnson) by finding the transformation that minimizes the p -value of a Shapiro test for Normality, and then re-estimates Model 5's specification on the more Gaussian data. These parameter values cannot be directly compared to the parameter values of Model 5 because the new relationship is nonlinear (logarithmic-type). Nevertheless, Model 5d informs whether the significance of relationships remains intact when the Normality violations are neutralized.

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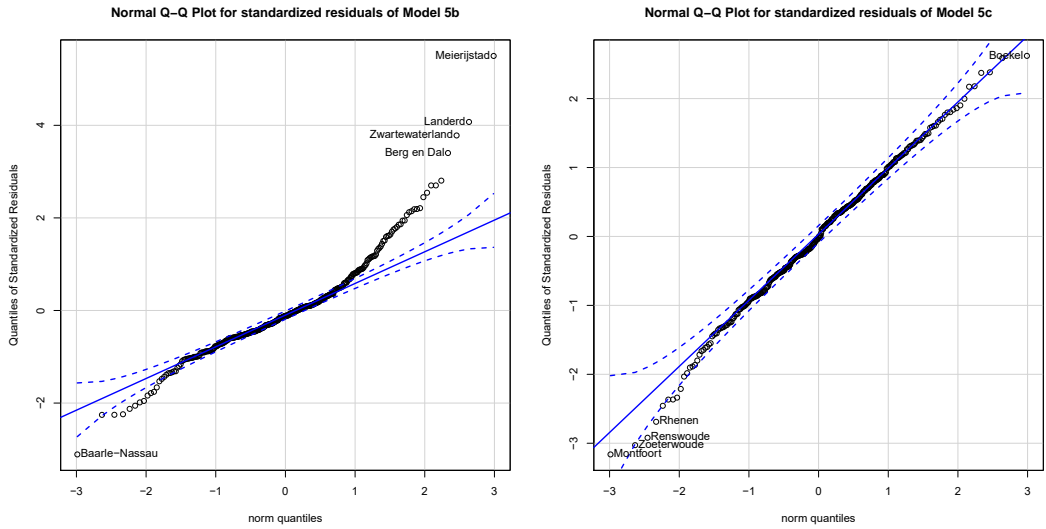


Figure 9: Comparison of residuals to theoretical quantities.

Table 5: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 5c	Model 5d
(Intercept)	-91.40** (43.93)	-10.75*** (2.41)
Population density	-0.83 (1.27)	-0.16** (0.07)
Share from 25 to 44	-0.16 (0.73)	0.05 (0.04)
Share above 65	0.67 (0.68)	0.10** (0.04)
Share of unmarried	1.61*** (0.52)	0.10*** (0.03)
Share of single households	-0.56* (0.30)	-0.05*** (0.02)
Share of non-western immigrants	-0.55** (0.25)	-0.02 (0.01)
Share of water surface	9.33* (5.31)	0.68** (0.31)
Share with long-term illness	0.29 (0.37)	0.01 (0.02)
Mean PM _{2.5}	2.67*** (0.89)	0.45*** (0.04)
λ	-0.22 (0.16)	-0.05 (0.19)
ρ	0.73 (0.07)	-0.06 (0.17)
R2	0.54	0.31

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Attachment: Appeal of PEN20-0017 Tentative Parcel Map 36457 (PAA20-0003) A. Martinez (4074 : World Logistics Center)

Inspecting the new Q-Q plots in figure 9 highlights that Model 5c is still prone to distributional mis-specification. This also suggests that the outliers whose values are now replaced with values closer to the normal range of the data are not necessarily outliers in an additive sense, but simply reflect the exponential nature of the data. From that regard, Model 5d is preferred, as it applies a suitable exponential transformation that clearly neutralizes any outlier or non-Gaussian behavior. In both models, the relationship with $PM_{2.5}$ remains significant and positive hence the conclusion is that the main findings of the analysis are not sensitive to outliers.

6.2.3 RE-ESTIMATION USING MARCH 30 CONFIRMED CASES PER 100,000 INHABITANTS

Model 5e, in table 6 below, re-estimates the step-wise AIC regression and then uses the covariates in the same specification as Model 5 using confirmed cases from March 30. This is to evaluate whether the relationship with $PM_{2.5}$ is robust to using data from a different date. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 30 is approximately .90. It is clear from the estimation results that using the newer data does not alter the main conclusions. In particular, similar covariates are preferred by the AIC and the parameter estimate for $PM_{2.5}$ increased in value and remains significant at the highest level.

Table 6: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants using March 30 cases.

Variable	Model 5e
(Intercept)	-374.01***
Population density	119.87 (3.54)
Share from 25 to 44	3.12 (1.99)
Share above 65	4.79*** (1.89)
Share of unmarried	5.03*** (1.45)
Share of single households	-2.72*** (0.83)
Share of non-western immigrants	-1.70** (0.70)
Share with long-term illness	1.14 (1.04)
Mean $PM_{2.5}$	6.39*** 2.42
λ	-0.11 0.16
ρ	0.71 0.08
R2	0.56
AICc	3736.24

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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6.2.4 RE-ESTIMATION USING MARCH 31 CONFIRMED HOSPITAL ADMISSIONS PER 100,000 INHABITANTS

Model 5f in table 7 below, re-estimates Model 2 then uses the covariates in the same specification as Model 5 using confirmed hospital admissions from March 31. This is to evaluate whether the relationship with $PM_{2.5}$ is robust to possible measurement error in the confirmed cases. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 31 hospital admissions is approximately .80, the correlation using March 30 confirmed cases is .88. It is clear from the estimation results that using confirmed admissions instead of cases does not alter the main conclusions. In particular, the parameter estimate for $PM_{2.5}$ remains highly significant.

Table 7: Dependent Variable: Confirmed COVID-19 hospital admissions per 100,000 inhabitants.

Variable	Model 5f
(Intercept)	-256.68*** (82.20)
Population density	-2.48 (1.82)
Share from 14 to 24	1.55 (1.24)
Share from 25 to 44	2.25* (1.20)
Share from 45 to 64	0.40 (0.84)
Share above 65	3.18*** (1.15)
Share of unmarried	2.63*** (0.74)
Share of single households	-1.90*** (0.48)
Share of non-western immigrants	-0.47 (0.36)
Share of water surface	14.89** (7.49)
Share with long-term illness	0.88 (0.55)
Mean $PM_{2.5}$	3.74*** (1.33)
λ	-0.10 (0.17)
ρ	0.68*** (0.09)
R2	0.54
AICc	3242.22

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.2.5 LINEAR ANALYSIS OF CASE HOSPITALIZATION RATES

The main results provided evidence for increased COVID-19 incidence in areas where populations are more exposed to air pollution. However, it is possible that the estimated association between $PM_{2.5}$ concentrations and COVID-19 incidence can be attributed to worse respiratory health in polluted areas, which then leads to more severe symptoms and higher case detection. The analysis tried to control for this using health data and the percentage of confirmed cases that resulted in hospitalization as controls. This did not impact the results. A second way to further test this theory is by analyzing the association between $PM_{2.5}$ and the case hospitalization rate because worse respiratory health would lead to more severe COVID-19 disease (Ruan, 2020). The suspect correlation is investigated below using step-wise AIC variable selection keeping $PM_{2.5}$ in the variable set, followed by the full spatial specification. Model 6 uses March 31 confirmed COVID-19 hospital admissions as a percentage of March 22 confirmed COVID-19 cases, model 7 uses March 30 confirmed cases. The analysis finds that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates which follows earlier identified risk groups (Ruan, 2020).

Table 8: Dependent Variable: Confirmed COVID-19 related hospital admissions as a percentage of COVID-19 cases.

Variable	Model 6	Model 7
(Intercept)	-587.36* (296.95)	-93.71*** (35.24)
Population density		-2.08* (1.26)
Share of male population	935.03** (487.40)	
Share 45 to 64	9.17*** (3.82)	1.05* (0.51)
Share of unmarried		0.57* (0.33)
Share of households without children	-7.74*** (2.58)	
Average household size		7.70 (5.51)
Share of western immigrants	-1.83 (1.96)	
Share of non-western immigrants		0.46* (0.25)
Share of water surface		14.25** (5.62)
Share of overweight	8.74*** (1.92)	0.57** (0.25)
Share exposed to noise above 50kmh	-10.16** (4.22)	
Mean $PM_{2.5}$	-6.70 7.79	0.40 0.63
λ	0.46* 0.13	-0.40** 0.17
ρ	-0.60*** 0.16	0.61*** 0.10
R2	0.20	0.26
AICc	3938.38	3019.20
N	355	355

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.2.6 RE-ESTIMATION USING SATELLITE-DERIVED PM_{2.5}

This section evaluates whether the relationship with PM_{2.5} generalizes to measurements from a different source. Table 9 compares the municipality-level data. Both measurements trend in the same direction but the levels according to the RIVM are roughly one-third below those of van Donkelaar.

Table 9: Comparison of PM_{2.5} statistics: RIVM 2017 vs van Donkelaar 2016.

Variable	Mean	Min	q.25	q.50	q.75	Max
RIVM 2017	10.22	6.95	9.43	10.69	11.23	12.04
van Donkelaar 2016	14.60	10.15	13.44	15.01	16.01	18.05

Correlation: 0.70

Model 5g in table 10, estimates step-wise AIC with the new pollution data and uses the selected covariates in the specification of Model 5. Model 5h uses the same controls as Model 5, and Model 5i applies the Yeo-Johnson power transform. The analysis makes use of the confirmed cases from March 22. It is clear from the estimation results that the use of satellite-derived PM_{2.5} results in similar conclusions. The parameter estimate for PM_{2.5} remains significant in the presence of controls and is significant at the highest level when the dependent variable is first normalized.

Table 10: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	Model 5g	Model 5h	Model 5i
(Intercept)	-127.26* (74.02)	-213.60*** (72.86)	-11.17*** (2.46)
Population density		0.90 (1.93)	-0.04 (0.07)
Share from 25 to 44		-0.50 (1.07)	0.026 (0.04)
Share above 65	2.38*** (0.91)	2.21** (1.06)	0.10*** (0.04)
Share of unmarried	3.50*** (1.02)	4.14*** (0.96)	0.14*** (0.03)
Share of single households	-1.76*** (0.46)	-1.78*** (0.50)	-0.07*** (0.02)
Share of non-western immigrants	-0.53 (0.34)	-0.71* (0.41)	-0.02 (0.01)
Share of water surface	2.47 (8.71)	2.22 (8.75)	-0.79*** (0.28)
Share of overweight	-1.32 (0.91)		
Share with obesity	1.60 (1.53)		
Share with long-term illness		0.68 (0.78)	0.01 (0.02)
Mean PM _{2.5}	2.75** (1.28)	3.13** (1.29)	0.28*** (0.03)
λ	0.41* (0.24)	0.40* (0.24)	0.10 (0.19)
ρ	0.45** (0.22)	0.46* (0.22)	-0.16 (0.19)
R2	0.50	0.50	0.30
AICc	3265.34	3268.53	920.81
N	355	355	355

Standard Errors in parenthesis, significance levels as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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memorandum

date June 9, 2020
to Ms. Julia Descoteaux, Associate Planner
from Michael Houlihan, AICP
Principal Associate
subject World Logistics Center – Appellant Response

Subsequent to Planning Commission approval of the Revised Final EIR on May 14, 2020, Earthjustice submitted an appeal to the approval. The following consists of responses to the arguments presented in the appeal in addition to a Master Response to the Earthjustice Appeal. The Revised Final EIR implements Mitigation Measure 4.7.7.1, which requires that greenhouse gas emissions be mitigated to net zero. As detailed in the Additional Errata Prior to the City Council Hearing (dated June 8, 2020) Mitigation Measure 4.7.7.1 has been revised to no longer rely on Cap and Trade. As a result, all Project emissions are required to be mitigated to net zero through the retirement of carbon credits.

Attachments:

- A. Revised Mitigation Measure 4.7.7.1
- B. American Carbon Registry, 2018. ACR Validation and Verification Standard, Version 1.1, May 2018. Available at: <https://americancarbonregistry.org/carbon-accounting/standards-methodologies/acr-validation-and-verification-standard-1>
- C. American Carbon Registry (ACR), ACR website, see: <https://americancarbonregistry.org/how-it-works/registry-reports>
- D. American Carbon Registry, 2019. Requirements and Specifications for the quantification, monitoring, reporting, verification, and registration of project-based GHG emissions reductions and removals, Version 6.0, July 2019. Available at: https://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v6_final_july-01-2019.pdf
- E. California Air Resources Board (CARB), 2017 Scoping Plan Update, available at: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf
- F. CARB, Notice of Public Availability of Modified Text and Availability of Additional Documents and Information, Proposed Amendments to the Proposed Advanced Clean Trucks Regulation, December 12, 2019.

Attachment: WLC ResponsestoAppeal_9JUNE2020_Part 1 (4074 : World Logistics Center)

- G. CARB, Offset Project Registries. Available at: <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm>
- H. 17 California Code of Regulations § 95986(c).
- I. California Natural Resources Agency, Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97, December 2009.
- J. Climate Action Reserve, Climate Action Reserve website, see: <https://www.climateactionreserve.org/how/projects/>
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- Z. VCS, VCS Standard v4.0, September 19, 2019.
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RESPONSES TO APPEAL

Following includes responses to the Appeal of the City of Moreno Valley's Planning Commission approval of Tentative Parcel Map and Certification of the Revised Final EIR.

Response to Argument 1: The argument summarizes the Project approvals and is introductory. No response is required.

Response to Argument 2: The argument introduces the formal appeal of the Planning Commission's approvals and lists letters filed in response to the Revised Final EIR. No response is required.

Response to Argument 3: The argument lists two studies for reference. With regard to the Los Angeles Times article, refer to Response to Comment 3-G24-2. A recent policy research working paper conducted by the World Bank Research Group that assessed the relationship between PM_{2.5} exposures and incidence and hospitalizations related to COVID-19 is also referenced.¹ The authors investigated whether estimates of PM_{2.5} exposures (from both measurement data and satellite data) in the Netherlands were associated with increased risk of COVID-19 incidence or hospitalizations, finding statistical associations between COVID-19 cases with increased PM_{2.5} concentrations. PM_{2.5} has been correlated with various disease, including respiratory and cardiovascular disease. COVID-19 deaths are also highly correlated with underlying respiratory and cardiovascular diseases, so there is a possibility that exposure to PM is also correlated with COVID-19 deaths.

This study was published as a working paper and has not undergone a peer-review process for publication, in which experts in the field scrutinize the methods and results. This peer review process is a critical step in order to ensure the quality and validity of study results. It is possible that results could change as a result of the peer-review process.

The study has a number of shortcomings. The most important limitation is that the COVID-19 pandemic is evolving rapidly and affecting areas of the world very differently, and at different times. The data are still being collected to varying degrees in different countries and many cases are likely to still be under-reported. In fact, the authors note that different regions may have had different testing policies and procedures that could have impacted study results. Because we do not have complete information on COVID-19 cases, this could significantly bias the findings in the World Bank study. Therefore, this study is, at best, incomplete.

Other important limitations could also contribute to additional bias in this study. For example, the number of COVID-19 cases in any particular region are more likely a reflection of where that region is on the COVID-19 curve than on air pollution in that region. Large cities are more likely to have higher air pollution levels, but also have higher population density and therefore more opportunity for the virus to spread. These larger cities would be expected to have higher COVID-19 cases that would be unrelated to air pollution levels. In addition, different regions may have adopted COVID-19 policies at different times (e.g., social distancing) and this greatly impacts the number of COVID-19 cases in any particular region. A study, such as the World Bank study, would need to account for differences in both air pollution and social distancing to disentangle the effect of each of these factors, but this study did not consider these policies. Lastly, ambient PM_{2.5} exposures estimated from regional monitors or satellite data are not reflective of overall PM personal

¹ <https://www.medrxiv.org/content/10.1101/2020.04.27.20081562v1>

exposures that include exposures in indoor environments (where people spend most of their time). Therefore, the study results may be biased due to exposure measurement error.

Overall, the results from the World Bank study are premature and the issues discussed here, among others, call into question the findings. More data needs to be collected on COVID-19-related cases before a scientifically sound assessment can be conducted to assess the potential impacts of air pollution exposures on COVID-19 cases and hospitalizations.

Response to Argument 4: The argument requests that the City Council reverse, reject and/or overrule the Planning Commission's approvals. No response is required.

Response to Argument 5: The argument consists of a brief background of the Project. No response is required.

Response to Argument 6: The argument consists of a summary of the Project approval process. No response is required.

Response to Argument 7: The argument consists of a summary of Highland Fairview's ballot initiatives and related litigation. No response is required.

Response to Argument 8: The argument consists of a summary of and land use and development agreement initiative litigation. No response is required.

Response to Argument 9: This argument introduces alleged deficiencies in the Revised Final EIR. Responses to each of the points outlined is included below.

Response to Arguments 10 through 19: Refer to the Master Response to the Earthjustice appeal.

Response to Argument 20: This is the same argument as Comment 3-F2-18 from Earthjustice's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to Comment 3-F2-18.

Response to Argument 21: This is the same argument as Comment 3-F2-19 from Earthjustice's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to comment 3-F2-19.

Response to Argument 22: The argument asserts that the information within the Revised Final EIR includes significant new information, and therefore, recirculation and a public comment period is required. The responses and errata provided in the Revised Final EIR does not alter the significance conclusions provided in the draft EIRs (i.e., Revised Sections of the Final EIR [RSFEIR]). The argument references Section 15088.5(a)(3) of the CEQA Guidelines, and asserts that "significant new information" includes "any feasible alternative or mitigation measure considerably different from others previously analyzed" but omits the qualifying language to that phrase. Section 15088.5(a)(3) actually states: "A feasible project alternative or mitigation measure considerably different from others previously analyzed *would clearly lessen the environmental impacts of the project, but the project proponents decline to adopt it.*" (Italicized language omitted by commenter.) The Project is adopting MM 4.7.7.1, and the addition of the mitigation does not

change the impact determination, will reduce the impact of greenhouse gas emissions and would not result in a new significant impact as discussed on pages 755 to 756 within Section 4.3.1 of the Final Response to Comments. The introduction of a new mitigation measure therefore does not meet any of the requirements for recirculation set forth in CEQA Guidelines Section 15088.5(a). As required in the CEQA Guidelines Section 15088, the City of Moreno Valley as the Lead Agency, provided written responses to public agencies that commented on either the RSFIER or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR.

Response to Argument 23: This is the largely the same argument as Comment 3-F2-21 from Earthjustice's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to comment 3-F2-21.

Response to Argument 24: This is the largely the same argument as Comment 3-F2-7 from Earthjustice's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to comment 3-F2-7.

Response to Argument 25: This is largely the same as argument as Comment 3-F1-2 from Center for Biological Diversity's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to Comment 3-F1-2. The argument incorrectly claims that the Village of Lakeview has not been included in the cumulative impact analysis. Villages of Lakeview is listed as cumulative project RC-5 on Table 6.4-1 of the 2018 RSFEIR (see page 6.4-21) and has therefore been considered in the cumulative biological resources analysis.

Response to Argument 26: This is largely the same argument as Comment 3-F1-3 from Center for Biological Diversity's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to Comment 3-F1-3.

Response to Argument 27: This is the same argument as Comment 3-F1-8 from Center for Biological Diversity's comments on the Revised Final EIR submitted prior to the Planning Commission Hearing on May 14, 2020 and no new environmental issues were raised. Refer to Response to comment 3-F1-8

Response to Argument 28: As demonstrated in Responses to Arguments 25 through 27, the biological impacts analysis is not faulty and recirculation is not required.

Response to Argument 29: Refer to Response to Comment 2-F5-8 for discussion of the noise analysis. In addition, as noted in the Note to Reader on page 4.12-1 of the 2018 RSFEIR (Revised Final EIR Part 3), the section replaces the 2015 FEIR section. The analysis was redone and based on the new analysis, mitigation measures that would reduce identified impacts are to be implemented. Mitigation measures referenced in the 2015 analysis have not been "reduced". Rather, mitigation measures required to reduce impacts to less than significant levels have been determined based on the results of the new analysis conducted for the 2018 RSFEIR. Therefore, it is not appropriate to compare mitigation measures between the 2015 FEIR and the 2018 RSFEIR.

Response to Argument 30: Mitigation Measure 4.12.6.2A (see 2018 RSFEIR page 4.12-42) includes a process to evaluate all future individual buildings within the WLC, including building-specific noise studies, building-specific noise mitigation, and a vote of the affected parties on implementation of mitigation. The provision of a vote relates specifically to the construction of permanent sound walls that may be required on land that is not controlled by the Applicant, such as private residential property. Without 100% consent from owners of private property, WLC cannot legally build an effective sound wall. The Applicant does not own any affected properties other than those located within the Project site and would not have the ability to construct a permanent sound barrier to mitigate traffic-related noise impacts.

The argument incorrectly claims that these provisions were not considered in the original noise analysis. Mitigation Measure 4.12.6.2A as required by the 2018 RSFEIR remains unchanged from Mitigation Measure 4.12.6.2A of the 2015 FEIR (see page 4.12-52).

Response to Argument 31: As stated in Response to Argument 29, the analysis was redone and based on the new analysis, mitigation measures that would reduce identified impacts are to be implemented. Mitigation measures referenced in the 2015 analysis have not been “reduced”. Rather, mitigation measures required to reduce impacts to less than significant levels have been determined based on the results of the new analysis conducted for the 2018 RSFEIR. Therefore, it is not appropriate to compare mitigation measures between the 2015 FEIR and the 2018 RSFEIR. With regard to noise mitigation being vague or speculative, all feasible measures to reduce construction and operational noise have been included. As required by Mitigation Measure 4.12.6.1A, a Noise Reduction Compliance Plan (NRCP) shall be prepared and submitted prior to the issuance of any discretionary project approvals for both on-site and off-site construction activity. The NRCP would detail the construction noise reduction measures to be implemented by a specific building. As each building is developed, more refined and detailed information about required construction equipment will be available, allowing the developer to implement appropriate noise reduction measures, including the use of mufflers, specifications of temporary construction noise barriers, and minimum distances from residential uses to maintain during nighttime construction activity. Mitigation Measure 4.12.6.2A, as discussed in Response to Argument 29, would require that each building perform a building-specific noise study to ensure that appropriate noise reduction measures related to operations would be implemented as the WLC is built out.

Response to Argument 32: There is nothing in CEQA or the Guidelines that requires that CEQA documents be in Spanish. Public Resources Code §21083.1 prohibits the imposition of “procedural or substantive requirements beyond those explicitly stated in [CEQA] or in the state guidelines.”

Response to Argument 33: Potential impacts on agricultural resources have been evaluated in Section 4.2 of the 2018 RSFEIR. Implementation of the Project would result in the conversion of approximately 2,200 acres currently used for dry farming to non-agricultural uses and would result in the permanent conversion of approximately 2,361 acres of land designated as Farmland of Local Importance. As discussed on page 4.2-11, the LESA model run for the Project yielded a significance determination of less than significant. In addition, the entire Project site and adjacent lands have been designated for urban uses for nearly 20 years by the City and the conversion of agricultural land to urban uses is supported by the City’s General Plan (page 4.2-12 of the 2018 RSFEIR). Section 4.2 of the 2018 RSFEIR does not include the implementation of mitigation measures due to determinations of less than significant for all topics addressed. Mitigation Measure 6.2.1 (see page 6.2-22 of the 2018 RSFEIR) requires that a conservation

easement be provided prior to the issuance of any grading permit that will allow grading on land identified as Farmland of Local Importance. The potential impact would occur when designated land is developed. Mitigation has been identified and will be implemented prior to the issuance of a grading permit for designated land. Therefore, the Project does not defer mitigation.

Response to Argument 34: The argument claims that the Superior Court struck down the entire EIR. As discussed in the Revised Final EIR Part 1 (Topical Response C), trial in the CEQA litigation took place in January, 2018. In a court ruling dated February, 8, 2018, (Ruling) the Honorable Sharon J. Waters, Judge of the Riverside County Superior Court, upheld the adequacy of the FEIR except for the identified five deficiencies in the FEIR. Both the 2018 RSFEIR and 2019 Draft Recirculated RSFEIR were clear on what environmental topics were being reevaluated and recirculated, thereby replacing the previous analysis. All analytical methodologies have been explained fully and all appendices attached. The decision makers and the public have been provided with sufficient information. All versions of the document have been posted on the City's website for public review.

Response to Argument 35: The argument requests that all attachments be included in the record for the appeal. No response is required.

Response to Argument 36: This argument concludes the appeal. No response is required.

Master Response to Appeal: Offset Carbon Credits

The appellants challenge the use of offset carbon credits or offsets to mitigate Project GHG emissions under CEQA. Appellant claims that MM 4.7.7.1 does not meet the required legal standards for CEQA mitigation, that mitigation will not take place until after GHG emissions have occurred, and that there is no evidence that the carbon credits and offsets provisions of MM 4.7.7.1 will result in effective mitigation to reduce the Project's GHG emissions to a less than significant level.

Mitigation Measure 4.7.7.1 has been revised to specify that "the developer shall mitigate the WLC Project's remaining GHG emissions to net zero by purchasing and retiring offset carbon credits" that have been "registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), approved by the California Air Resources Board, such as, but not limited to, Climate Action Reserve, American Carbon Registry or Verra (formerly Verified Carbon Standard). In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired."

Thus, the distinction between offsets and carbon credits has been eliminated from revised MM 4.7.7.1. Further, the revised Mitigation Measure does not rely on the Cap and Trade program for determining the amount of GHG emissions to be offset by carbon credits. Instead, the Project will mitigate 100% of its GHG emissions remaining after all feasible on-site and local mitigation measures have been complied with.

With respect to the timing of the offset carbon credits, revised Mitigation Measure 4.7.7.1 requires that no grading or building permit and no certificate of occupancy, whether temporary or permanent, be issued by the City until the developer has demonstrated that offset credits equal to the amount of GHG emissions that will result from the implementation of the permit or certificate have been purchased and retired, i.e., all offset credits will be retired before any GHG emissions occur.

A copy of revised Mitigation Measure 4.7.7.1 is attached as Attachment A.

Applicable Legal Standards for Use of Voluntary Market Carbon Credits as CEQA Mitigation

Appellants state: "Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments." (Appeal, p. 6). Appellant then outlines the process that the Legislature and CARB established for the use of compliance credits or offsets in the Cap and Trade program. Appellants then claim that MM 4.7.7.1 does not follow the CARB process and that, therefore, MM 4.7.7.1 does not meet CEQA's legal standards for mitigation.

Under CEQA, the legal standard for GHG mitigation is set forth in Section 15126.4(c) of the CEQA Guidelines, Mitigation Measures Related to Greenhouse Gas Emissions:

(c) Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

- (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
- (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;
- (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
- (4) Measures that sequester greenhouse gases;

(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

Use of carbon offset credits for reducing GHG emissions is expressly identified as appropriate CEQA mitigation. Section 15126.4, subdivision (c) of the CEQA Guidelines specifically addresses mitigation measures related to greenhouse gases and expressly provides for the use of “[o]ff-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions.” CEQA also requires the preparation of findings, based on substantial evidence, for mitigation measures that have been adopted to avoid or substantially lessen the significant environmental effects of a project. (See Cal. Publ. Res. Code §§ 21081, 21081.5 and CEQA Guidelines §15091.) CEQA also requires that the mitigation measures be “fully enforceable” and that the implementation of the mitigation measures be monitored through a monitoring and reporting program. (See Cal. Publ. Res. Code § 21081.6 and CEQA Guidelines §15097.) Factual determinations are reviewed under the “substantial evidence” standard. Public Resources Code §§ 21168 and 21168.5. The remainder of this Response to the appellants’ arguments demonstrates that substantial evidence, as that term is defined in CEQA Guidelines § 15384, supports the adequacy of revised Mitigation Measure 4.7.7.1.

The use of voluntary market carbon credits to mitigate impacts resulting from GHG emissions is valid under CEQA if it meets these legal standards. Appellants imply that the use of voluntary market carbon credits is unacceptable CEQA mitigation because such credits have not been generated using protocols approved by CARB for use in the Cap and Trade program. CEQA has never been interpreted so narrowly, and none of the cases cited in the appeal support that proposition. Further, the CARB process for compliance credits provides a path to ensure CEQA compliance for voluntary market carbon credits (as described below). The appellants have confused the existence of CARB-approved protocols, which may be used to generate offset credits for use in California’s Cap and Trade Program, with the verification programs for offset credits that are used for both regulatory (i.e., those based on CARB-approved protocols) and voluntary credits which may be based on project protocols other than the six currently approved by CARB.

Voluntary Market Carbon Credits Relied Upon by Legislature, CARB and Sacramento Metropolitan Air Quality Management District

Consistent with CEQA’s legal standards, the use of voluntary market carbon credits is supported by CARB in the Scoping Plan, relied upon by the California Legislature in project-specific CEQA legislation and permissible for GHG mitigation by the Sacramento Metropolitan Air Quality Management District (SMAQMD).

CARB: Scoping Plan and Newhall Ranch Project

CARB has endorsed the use of voluntary market carbon credits as a form of CEQA mitigation. CARB’s 2017 Scoping Plan addresses the use of carbon credits through its “guidance” to local governments for project-level measures to reduce GHG emissions. For project-specific GHG reductions, the Scoping Plan recommends the use of on-site design features and regional investment as well as the use of carbon credits: “Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits.”¹ The Scoping Plan references CAPCOA’s GHG Reduction Exchange or a “recognized and reputable voluntary

¹ Attachment E, page 101-102.

carbon registry.”² CARB recognizes the authority of local governments and states that “the decision to follow this guidance is voluntary and should not be interpreted as a directive or mandate to local governments.”³

Recently, carbon offsets were used in the settlement of litigation challenging the approval of the Newhall Ranch project. The settlement was reviewed by CARB, which found that it “provides an adequate technical basis to determine that the project would not result in any net additional GHG emissions after the mitigation measures are fully implemented.”⁴ As a part of the settlement, GHG emissions were to be reduced through combination of activities that reduce or sequester GHG emissions at a location other than the project site (“Direct Reduction Activities”)⁵ and carbon offsets (“Mitigation Credits”) issued by an Approved Registry, “which shall mean any of the following: (i) the Climate Action Reserve, the American Carbon Registry and the Verified Carbon Standard; (ii) any entity approved at any time by CARB to act as an “offset project registry” under the state’s cap-and-trade program.”⁶ These are the same three Registries identified in revised Mitigation Measure 4.7.7.1.

SMAQMD – GHG Threshold and Mitigation Best Practices

The Sacramento Metropolitan Air Quality Management District (SMAQMD) adopted on April 24, 2020 new GHG thresholds specifying that “if a project cannot incorporate the required BMPs,⁷ other on-site reductions or offsite reduction projects would be required to mitigate the emissions. If offsite mitigation is utilized, the project, credit, or registry must demonstrate with substantial evidence that the offset is real, permanent, quantifiable, verifiable, enforceable, and additional.”⁸ Accordingly, SMAQMD’s CEQA Guide⁹ was updated to include offsets as an acceptable “additional measure” that may be needed to achieve a project’s reduction target if the project cannot meet BMPs, and for additional guidance refers to Section 5 of the District’s Greenhouse Gas Thresholds for Sacramento County,¹⁰

If a project cannot incorporate the required BMPs, other on-site reductions or purchasing and retiring GHG/carbon offsets from a registry approved by the SMAQMD may be required. Carbon offsets are instruments that can be bought, sold, and traded. Like a stock or equity that represents a unit of ownership in a company, a carbon offset represents a unit of greenhouse gas emissions reductions. Each offset is essentially a certification that a certain quantity of greenhouse gas emissions has been avoided, prevented, or sequestered. Offset registries that the SMAQMD may approve have developed a broad consensus around the standards that are necessary to ensure that offsets are environmentally sound, namely, that offsets be real, permanent, quantifiable, verifiable, enforceable, and additional. Approved registries may include but are not limited to any of the following: (i) the Climate Action Reserve, the American Carbon Registry and Verra, which are all approved by CARB; (ii) any entity approved at any time by CARB to act as an “offset project registry” under the state’s cap-and-trade program; (iii) or voluntary credits with the concurrence of the SMAQMD.

Legislature: Multiple Projects

² Attachment E, page 102.

³ Attachment E, page 99.

⁴ Attachment Q

⁵ Newhall Ranch created a “direct investment” reduction program to allow for Newhall Ranch to generate GHG Mitigation Credits in geographies where they were otherwise not available.

⁶ Attachment R, page 2.

⁷ Best management practices

⁸ Attachment V

⁹ Attachment U

¹⁰ Attachment T

The California Legislature has, by adopting statutes within CEQA, required that several projects demonstrate they will not result in any net additional GHG emissions, and allowed those projects to use voluntary market offset credits to reduce GHG emissions.

Convention Center Modernization and Farmers Field Project (Los Angeles, CA)

- Public Resources Code §§ 21168.6.5(i)(1) allows the use of offset credits.

Downtown Arena/Entertainment and Sports Center Project (Sacramento, CA)

- Public Resources Code 21168.6.6(g)(3) allows the use of offset credits.

Oakland Sports and Mixed-Use Project (Oakland, CA)

- Public Resource Code 21168.6.7(a)(3)(A)(ii)(II) allows the use of offset credits where any “offset credits shall be verified by a third party accredited by the State Air Resources Board.”

City of Inglewood Basketball and Entertainment Center Project (Inglewood, CA)

- Public Resource Code 21168.6.8(j)(4) allows the use of offset credits where any “offset credits shall be verified by a third party accredited by the State Air Resources Board.”

The EIR for the Inglewood Basketball and Entertainment Center includes a GHG mitigation measure which states:

“Carbon offset credits. The project applicant may purchase carbon offset credits that meet the requirements of this paragraph. Carbon offset credits must be verified by an approved registry. An approved registry is an entity approved by CARB to act as an “offset project registry” to help administer parts of the Compliance Offset Program under CARB’s Cap and Trade Regulation. Carbon credits shall be permanent, additional, quantifiable, and enforceable.”¹¹

Revised MM 4.7.7.1 is Appropriate Mitigation

Appellant claims that MM 4.7.7.1 is improper CEQA mitigation because it lacks a performance standard, defers implementation, is unenforceable, will not address long-term project operational emissions, and will have secondary impacts. Each concern is addressed below.

Revised MM 4.7.7.1, proposed by, and acceptable to, the Project applicant, has a performance standard: achieve net zero GHG emissions. Table 4.7-16 in Section 4.7 of the Revised Final EIR on Greenhouse Gases and Global Climate Change shows the Project’s GHG emissions, without any reference to the Cap and Trade program, with the implementation of revised MM 4.7.7.1. Revised MM 4.7.7.1 satisfies the performance standard by requiring that “the developer shall mitigate the WLC Project’s remaining GHG emissions to net zero by purchasing and retiring offset carbon credits. The amounts of GHG emissions to be mitigated is disclosed in the Revised Final EIR in Table 4.7-16. As discussed above, the registries have protocols that provide methods for determining emission reductions from offset projects. When the emission reductions from the credits equal project emissions, the performance standard of “net zero” is met. Revised MM 4.7.7.1 provides the City’s Planning Official with the direction needed to ensure that the appropriate number of offset carbon credits have been purchased and retired by requiring the Project

¹¹ Attachment O, page 3.7-63.

applicant to provide information about the proposed credits, including the protocols used to generate them and verification that credits have been purchased and retired.

In response to the appellants' concern that GHG mitigation would not occur until after emissions have been generated, revised MM 4.7.7.1 requires that the appropriate number of credits be purchased and retired before any development permits can be issued. Grading-related emissions must be offset through the purchase and retirement of credits prior to the issuance of a grading permit. Construction-related emissions must be offset through the purchase and retirement of credits prior to the issuance of a building permit. Operational emissions must be offset through credits purchased and retired prior to the issuance of a certificate of occupancy, i.e., prior to when the facility becomes operational.

The appellants also state that MM 4.7.7.1 is unenforceable, but that is not the case. The City will refuse to issue Project permits if the Project applicant fails to provide evidence that the required offsets credits have been purchased and retired. The City would review the credit documents, including the verification reports, protocols, and the serial numbers of the credits, could contact the third-party verifier and registry if anything looks amiss and could refuse to accept the proposed credits.

The appellants also suggest that MM 4.7.7.1 improperly limits mitigation for 30 years. In providing guidance on GHG thresholds and the use of offsets as mitigation, SCAQMD advises "the project proponent would be required to provide offsets for the life of the project, which is defined as 30 years."¹² Further, a 30-year limitation is supported by the state's stated GHG reduction goal of 80 percent below 1990 emission levels by 2050. The state will achieve that goal in part through technology forcing requirements, such as CARB's recent proposal to require cleaner commercial harbor craft and the state legislation (SB 100) requiring electricity providers to provide carbon-free energy by 2045. (See also Attachment F [proposed advance clean truck regulation].) The Project's primary source of emissions is vehicles, which are covered under CARB's Scoping Plan, and it is reasonably foreseeable that the state will do what it can without impinging on federally-preempted areas to reduce emissions from trucks to the maximum extent feasible in 30 years.

The appellant also raises a concern that credits may cause secondary impacts. Such impacts are speculative at this time, when the source of the credits is unknown and the harm is potential rather than quantifiable. Moreover, all of the approved registries approve protocols only if they are not harmful. (E.g., Attachment L at pp. 13–14; Attachment D at p. 27; Attachment X at p. 38.) The CARB-approved registries require that the projects generating the carbon offsets/credits must fulfill all applicable local, regional and national environmental requirements that apply based on the offset location as identified in Title 17 of the California Code of Regulations, Sections 95973(b) and 95977.1(b)(3)(D)(2)(f) of the Cap-and-Trade Regulations. Therefore, the potential environmental effects associated with a carbon offset and/or credit are required to be evaluated prior to the carbon offset credits being available for the proposed Project. Some of the protocols the appellants identify as producing harms (hydropower and international Reduced Emissions from Deforestation and Degradation (REDD) projects) are not accepted by Climate Action Reserve (Attachment L at p. 10; Attachment K) or American Carbon Registry (Attachment D at p. 14; see <https://americancarbonregistry.org/carbon-accounting/standards-methodologies>). Verra has no hydropower methodologies, but does list credits from REDD projects. Also the concerns about REDD projects expressed in the article provided by the appellants are primarily social rather than environmental, and thus would not need to be analyzed under CEQA.

Credits Purchased from Approved Registries Meet the Requirements of Section 38562

The appellants claim that there is no evidence that the credits sold by the registries listed by MM 4.7.7.1 meet the requirements of Health and Safety Code section 38562, subdivisions (d)(1) and (d)(2) ("Section 38562"). This is not the case. The City has reviewed the CARB-approved registries listed in MM 4.7.7.1 (Climate Action Reserve, American Carbon Registry, and Verra) and determined that the voluntary offsets they offer meet Section 38562's requirements.

¹² Attachment S, page 3-16.

Notably, CEQA does not require mitigation for GHG emissions to meet Section 38562.¹³ When the Natural Resources Agency adopted CEQA Guidelines to address GHG emissions, it specifically rejected the request to include the requirement “that mitigation for GHG emissions must be ‘real, permanent, quantifiable, verifiable, and enforceable.’”¹⁴ The Natural Resources Agencies rejected the request because:

AB 32 is a separate statutory scheme, and . . . there is no indication that the legislature intended to alter standards for mitigation under CEQA. Similarly, standards for mitigation under CEQA already exist and are set out in section 15126.4(a). Specifically, mitigation must be fully enforceable, which implies that the measure is also real and verifiable. Additionally, substantial evidence in the record must support an agency’s conclusion that mitigation will be effective, and in the context of an EIR, courts will defer to an agency’s determination of a measure’s effectiveness. No existing law requires CEQA mitigation to be quantifiable. Rather, mitigation need only be “roughly proportional” to the impact being mitigated.¹⁵

Nonetheless, Section 38562’s requirements have been incorporated into revised MM 4.7.7.1 – namely that the offset carbon credits be real, permanent, additional, quantifiable, verifiable and enforceable – because credits that meet Section 38562 also meet CEQA’s mitigation measure requirements.

The approved registries are non-profit entities that serve in good faith and have a vested interest in building trust with their users and governmental agencies, which cannot be done unless they deliver the quality offsets promised.^{16,17,18} [“The Standard establishes the quality level that every project must meet in order for ACR to register its GHG emissions reductions and removals as tradable environmental assets.”]; Earthjustice¹⁹ [“A carbon market maintains its environmental integrity only if the offset credits it recognizes represent actual net reductions in greenhouse gas emissions.”]

For this reason, each approved registry verifies that the credits it offers on the voluntary market are:

- Real (or quantifiable); i.e., capable of being measured using scientific methods. Approved methods for quantifying such reductions or sequestration are conservative to avoid overstating a project’s GHG mitigation effect.
- Additional; i.e., beyond reductions or sequestrations required by existing or anticipated regulation and is not merely business-as-usual.
- Verifiable; i.e., reductions or sequestrations are independently verified by a third-party verifier that is accredited by the American National Standards Institute (ANSI).
- Enforceable; i.e., there must be undisputed ownership of the reductions or sequestrations to ensure there is no double counting of offsets.
- Permanent; i.e., reductions and sequestrations must be irreversible.

In short, all carbon credits, both those that are available as part of the Cap and Trade program and those offered by the approved registries on the voluntary market, must satisfy Section 38562.^{20,21,22}

¹³ Attachment I, page 50.

¹⁴ Id.

¹⁵ Id.

¹⁶ Attachment L, page 2.

¹⁷ Attachment D, page 2 and 9.

¹⁸ Attachment W, page 8.

¹⁹ Earthjustice Appeal Exhibit 4B, page 63: Haya et al, Carbon Offsets in California: Science in the Policy Development Process, 2016.

²⁰ Attachment L, page 2.

²¹ Attachment D, page 82-88.

²² Attachment W, page 10.

Each registry has safeguards substantially similar to CARB's requirements for Cap and Trade credits that ensure its credits meet Section 38562. These safeguards include:

- Rigorous protocol and methodology development process. For example, Climate Action Reserve internally reviews a proposed protocol; drafts an issue paper evaluating potential approaches and assessing the environmental and social impacts of the activity; have scoping meeting to get feedback from industry experts, environmental groups, state agencies, and academics; develop the protocol through a multi-stakeholder process; develop and release a draft protocol to the multi-stakeholder workgroup and interested members of the public for review and comment; revise the protocol based on comments and post it to its website for a 30-day public comment period.²³ At that time, the protocol is presented to the Board of Directors at a quarterly meeting, which are open to the public, discussed and put to a vote. Only after the Board adopts a protocol can it be used. American Carbon Registry²⁴ and Verra²⁵ follow substantially similar processes. This protocol development process also ensures that projects following adopted protocols result in emission reductions that would not otherwise have occurred under “business as usual” practices or existing regulatory requirements.^{26,27,28} Verra utilizes a 5-step methodology approval process that includes in-depth review “to ensure that the methodology documentation has been completed in accordance with VCS Program rules,” public stakeholder consultation, the contracting of an validation/verification body to conduct independent assessment of the methodology, and a final review process where the approved methodology is assigned a reference number and is posted with the assessment report on the Verra website.²⁹ ACR requires all project offset methodologies used under its registry to comply with the ACR Standard. ACR’s review and approval process for new methodologies includes internal review by ACR, a public review and comment period, and a blind scientific peer review process that generally requires several rounds of peer review. If approved, ACR then posts process documentation on its web site, including all public comments and documented responses, and all peer review comments and documented responses.³⁰
- Third-party verification/validation of the offset project. Before a registry will list credits on the voluntary market, an independent third-party verifier accredited by the American National Standards Institute (ANSI) must have reviewed the offset project and verified that it was developed pursuant to the registry’s protocols and has reduced the required amount of GHG emissions.^{31,32,33,34}
- Conservative methodologies for GHG emission reduction counting and listing of credits only after the emission reductions have been verified. All of the approved registries have developed conservative approaches for counting emission reductions achieved by an offset project and list the resulting credits only after the emission reductions have occurred (ex post).^{35,36,37,38} Like Cap

²³ Attachment L, page 44-46.

²⁴ Attachment D, page 48-49

²⁵ Attachment DD, page 9-14

²⁶ Attachment L, page 3-4 and 6-10.

²⁷ Attachment D, page 28-32.

²⁸ Attachment Z, page 33.

²⁹ Attachment DD, page 7-11.

³⁰ Attachment D, page 48-49.

³¹ Attachment L, page 19 and 30-36.

³² Attachment D, page 54-58.

³³ Attachment Y

³⁴ Attachment N

³⁵ Attachment L, page 18 and 37.

³⁶ Attachment D, page 17-18, 54.

³⁷ Attachment W, page 10.

³⁸ Attachment Y, page 50.

and Trade credits,³⁹ voluntary-market credits also must represent greenhouse gas reductions that are “permanent” (i.e., typically will last at least 100 years).^{40,41,42,43}

- Enforceability. Both the project owner and third-party verifier are required to sign a verification statement attesting that the offsets are authentic and conform to the registry protocol. Each registry protocol stipulates the eligibility and monitoring requirements of offset projects, functioning as a "rule book" written by the registry that must be adhered to by offset projects and third-party verifiers.^{44,45,46}

As the registry documents (attached) show, the approved registries have focused on creating protocols designed to reduce the uncertainty in GHG accounting for offset projects and create credits that result in true emission reductions.

CARB-Approved Registries Meet the Requirements of 17 Cal. Code Regs., §§ 95986 - 95987

The appellants claim that reference to a CARB-approved registry is a “misinterpretation of CARB’s regulations” and is misleading with respect to the quality of offsets traded on the voluntary market.

California’s Cap and Trade regulations direct CARB to approve Offset Project Registries to help administer its Compliance Offset Program. To be approved, Offset Project Registries must meet CARB’s rigorous requirements and professional standards as stated under 17 California Code of Regulations §§ 95986 - 94987. Potential Offset Project Registries must submit an application and meet the requirements for education and experience as defined in section 95986 of the Regulations. If the applicant satisfies all the requirements of the regulation, they must successfully complete training classes by Registry Staff and then be approved by CARB’s Executive Officer.⁴⁷ The requirements for CARB’s approval of an Offset Carbon Registry require that its “primary business must be operating an Offset Project Registry for *voluntary* and regulatory purposes”⁴⁸ (Italics added.)

The Climate Action Reserve, American Carbon Registry (ACR), and Verra (Verified Carbon Standard) are the three registries that are currently approved by CARB for use in the Compliance Offset Program. In addition to their role in administering California’s Cap and Trade, these registries serve the voluntary carbon offsets market.

Below is screen shot from CARB’s landing page for Offset Project Registries, which includes the “List of ARB Approved Offset Project Registries.”⁴⁹

List of ARB Approved Offset Project Registries

All offset projects developed under an ARB Compliance Offset Protocol must be listed with an ARB approved Offset Project Registry. Offset Project Registries will help facilitate the listing, reporting, and

³⁹ Earthjustice Appeal, Exhibit 4A: CARB, California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation, May 2013.

⁴⁰ Attachment L, page 20.

⁴¹ Attachment Z, page 11.

⁴² Attachment D, page 10 and 33.

⁴³ Attachment W, page 3.

⁴⁴ Attachment L

⁴⁵ Attachment D

⁴⁶ Attachment W

⁴⁷ Attachment G

⁴⁸ Attachment H

⁴⁹ Attachment G

verification of compliance offset projects, and issue registry offset credits. A list of approved Offset Project Registries can be found below.

- American Carbon Registry (ACR)
- Climate Action Reserve (CAR)
- Verra (formerly Verified Carbon Standard)

Further, the SMAQMD refers to CARB “approved” registries, and the California Legislature referred to the registries as “third parties accredited by” CARB. The reference to an “approved” CARB registry is not a misinterpretation of CARB’s regulations nor is it misleading.

The three registries identified in revised MM 4.7.7.1 are all members of the International Carbon Reduction and Offset Alliance (ICROA). As such they are committed to performing carbon measurement in accordance with international standards (e.g. WRI/WBCSD GHG Protocols and ISO 14064-1:2006, which specifies principles and requirements at the organization level for quantification and reporting of GHG emissions and removals), and sourcing carbon credits that are: real, measureable, permanent, additional, independently verified, and unique.⁵⁰ Accordingly the third-party validation and verification process established by each of the CARB approved registries is designed to ensure that the offset credits they approve, whether regulatory or voluntary and whether they are the result of the six CARB approved project protocols or the result of other protocols, meet these criteria. Through their formal verification programs and protocols, each of these registries applies the same standard of quality to all offset credits – regardless of their end use in the compliance or voluntary markets.

The Climate Action Reserve’s verification standard requires that all verification bodies and verifiers conducting work under the Reserve be formally trained and accredited under the requirements of International Organization for Standardization (ISO) 14065, and uphold the basic verification principles laid out in ISO 14064-3:2006, which specifies principles and requirements and provides guidance for those conducting or managing the validation and/or verification of GHG assertions. It provides specific requirements for selecting GHG validators/verifiers, establishing the level of assurance, objectives, criteria and scope, determining the validation/verification approach, assessing GHG data, information, information systems and controls, evaluating GHG assertions and preparing validation/verification statements.

As described in the Climate Action Reserve’s Verification Program Manual:

ISO 14065 is the international standard that specifies processes and requirements for accrediting verification bodies to perform GHG validation and verification services. The accreditation process provides criteria for assessing and recognizing the competence of verification bodies, thereby allowing for a consistent and comparable scheme across GHG programs. Accreditation reduces the risk to GHG programs like the Reserve by providing assurance that verification bodies are competent, and it helps establish trust within the voluntary carbon market by ensuring impartiality in the verification process.

The objectives of the ISO 14064 series and ISO 14065 standards are to:

- *Develop flexible, regime-neutral tools for use in voluntary or regulatory GHG schemes*
- *Promote and harmonize best practice*
- *Support the environmental integrity of GHG assertions*
- *Assist organizations to manage GHG-related opportunities and risks*

⁵⁰ Attachment P

- *Support the development of GHG programs and markets.*⁵¹

Similar to the Climate Action Reserve, “ACR requires that all project-based GHG emission reductions in its registry undergo validation and verification by a competent, independent, International Organization for Standardization (ISO) 14065-accredited third party that it has approved,” in accordance with the ACR Validation and Verification Standard.⁵² ACR’s validation requirements are built on the foundation of ISO 14064-3:2006.

Verra, which manages the Voluntary Carbon Standard (VCS) program, adheres to quality assurance principles that ensure all of its listed GHG emission reductions or removals are real, measurable, additional, permanent, independently verified, conservatively estimated, and uniquely numbered.⁵³ Verra is responsible for approving and overseeing the third-party validation/verification bodies operating under the VCS Program. The VCS standard’s validation and verification requirements state that “(v)alidation and verification is a risk-based process and shall be carried out in conformance with ISO 14064-3:2006 and ISO 14065:2007. Additional requirements with respect to validation and verification are spelled out in the VCS Standard.⁵⁴

The CARB-approved registries meet the rigorous requirements spelled out in 17 California Code of Regulations §§ 95986 - 94987. Each of the three currently approved registries employs a validation and verification process that is carried out in conformance with ISO 14064 and ISO 14065. Furthermore, 17 California Code of Regulations §§ 95802 and 95970(a)(1) set forth the requirement that carbon offsets be “real, permanent, additional, quantifiable, verifiable, and enforceable.” Thus, CARB’s future approval of additional registries would have to be predicated on adherence to these fundamental requirements, which are the basis for ensuring confidence in the compliance and voluntary offset markets alike.

The Approved Registries Prevent Double Counting and Provide Remedies for Credit Over-issuance and Credit Invalidation

As the appellants note, CARB approval of a registry does not mean that CARB has approved a registry’s protocols, but does mean that CARB has approved the registry’s tracking system. CARB-approved registries must meet the requirements outlined in California Code of Regulations, title 17, section 95986 for all the credits listed on the registry, not just Cap and Trade-eligible credits. Such registries must have the following capabilities for registration and tracking of their offset credits: “[a] comprehensive registration requirement for *all* registry participants;” “[t]racking ownership and transactions of *all* registry offset credits it issues at all times;” and “[p]ossesses a permanent repository of ownership information on all transactions involving *all* registry offset credits it issues under this article from the time they are issued to the time they are retired or cancelled.” (17 Cal. Code Regs., § 95986, subd. (b)(3) [emphasis added]. Registries track offset projects and issue offset credits for each unit of emission reduction that is validated and verified. Registries assure that contracts clearly identify ownership of offset credit and define who bears the risk in case of project failure. A unique identifier (i.e., serial number) is assigned to each verified offset credit. When a credit is sold, the serial number for the reduction is transferred from the account of the seller to an account for the buyer. If the buyer “uses” the credit by claiming it as an offset against its own emissions, the registry retires the serial number so that the credit cannot be resold, thereby prohibiting multiple stakeholders from taking credit for the same offset.

The appellants raise concerns regarding reliance on credits that may be subsequently invalidated. All of the registries provide mechanisms to resolve the over-issuance of carbon credits. The Program Manual for Climate Action Reserve (CAR) provides that if “the Reserve determines that GHG reductions or removals

⁵¹ Attachment N

⁵² Attachment B

⁵³ Attachment W

⁵⁴ Attachment X

for a project were incorrectly quantified or reported, such that the number of CRTs [Climate Reserve Tonne] issued to the project account holder was in excess of the correct number according to the requirements of the applicable protocol, it is primarily the project account holder's responsibility to compensate for the overissuance of CRTs."⁵⁵ This provision is reinforced in the Terms of Use for the CAR.⁵⁶ The Program Manual provides certain remedies to CAR where it may: 1) cancel other CRTs (carbon credits) held by project account holder; 2) withhold issuance of CRTs (carbon credits) otherwise issuable to the project account holder; or 3) purchase CRTs (carbon credits) from third parties at the project account holder's expense and cancel them. Through these mechanisms, the registries ensure that the issue of subsequently invalidated credits is fully resolved. Nonetheless, revised MM 4.7.7.1 still requires the mitigation of emissions to "net zero" through the use of carbon credits and this mitigation measure is fully enforceable if these mechanisms do not fully resolve any over-issuance of carbon credits.

Verra also provides that the project proponent or user is responsible for compensating for the over-issuance of credits, including replacement credits. From Verra's Terms of Use, Section 6.5. "The User acknowledges and agrees that in the event that Verra or a relevant Scheme Regulator determines that GHG reductions or removals for a project or activity were incorrectly quantified or reported, such that the number of Instruments issued to the User was in excess of the correct number according to the requirements of the applicable Verra Program Rules and Requirements, it is the User's responsibility to compensate for the overissuance of Instruments, irrespective of whether the Instruments are still held by the User."⁵⁷

Verra provisions for corrective action in cases of excess credit issuance are spelled out in its Registration and Issuance Process, Section 6.1.5:

Where Verra determines that VCUs have been issued in excess of the correct amount, the following applies: 1) The project proponent is responsible for compensating for excess VCU issuance where Verra deems, acting reasonably, that there has been a material erroneous issuance of VCUs in respect of the project, as a result of the fraudulent conduct, negligence, intentional act, recklessness, misrepresentation or mistake of the project proponent, as set out further in the issuance representation. 2) Any compensation for excess VCU issuance shall be through the following, with Verra using reasonable efforts to work with the project proponent to ensure that any adverse impacts on the project proponent are minimized to the extent possible. 3) Where the excess VCUs remain in the project proponent's Verra registry account and it can be demonstrated that they have not been used for offsetting purposes, immediate cancellation of the VCUs. 4) Replacement of VCUs through immediate cancellation from subsequent issuances of VCUs to the project. 5) Purchase by the project proponent of an equivalent number of replacement VCUs, and cancellation of same, within 60 business days of receiving formal Verra notification of such required action. 6) Where the project proponent fails to compensate for excess VCU issuance, Verra may take action against the project proponent, including applying sanctions with respect to its registry account activities until such time as the excess issuance has been compensated.⁵⁸

The American Carbon Registry (ACR) has extensive provisions to address "reversal risk" including a buffer pool, insurance, and compensation. ACR's risk mitigation approach to credit impermanence is described in its Validation and Verification Standard:⁵⁹ "For projects with a risk of reversal of GHG emission reductions/removals, Project Proponents must assess risk using an ACR-approved risk assessment tool and enter into a legally binding Reversal Risk Mitigation Agreement with ACR. Project Proponents must then mitigate reversal risk by contributing offsets to the ACR Buffer Pool (either from the project itself, or ERTs of any other type and vintage); by providing evidence of sufficient insurance coverage with an ACR-

⁵⁵ Attachment K

⁵⁶ Attachment M

⁵⁷ Attachment CC

⁵⁸ Attachment BB

⁵⁹ Attachment B

approved insurance product to recover any future reversal; or by using another ACR-approved risk management mechanism.”

ACR’s permanence provisions are spelled out in Section 5 of ACR’s Requirements and Specifications for the Quantification, Monitoring, Reporting, Verification, and Registration of Project-Based GHG Emissions Reductions and Removals:⁶⁰

5.B Reversal Mitigation, Reporting, And Compensation

Project Proponents of AFOLU projects with risk of reversal shall enter into a legally binding Reversal Risk Mitigation Agreement with ACR/Winrock that allows them to select a reversal risk mitigation mechanism and details the requirements for reporting and compensating reversals. Should reversals occur the requirements and liabilities associated with replacing lost ERTs rest with the Project Proponent, and not necessarily with the individual land owner(s) per the Risk Mitigation Agreement. 5.B.1 Primary AFOLU Risk Mitigation Mechanism: The ACR Buffer Pool Project Proponents choosing the ACR Buffer Pool as the risk mitigation mechanism agree to the ACR Buffer Pool Terms and Conditions (Exhibit 1), which detail the operation of the Buffer Pool and requirements of the Project Proponent. Generally, the project contributes to the Buffer Pool account the number of offsets as determined by the project-specific risk assessment in order to replace unforeseen losses. ACR has sole management and operational control over the offsets in the Buffer Pool.

5.B.2 Geologic Sequestration Risk Mitigation Mechanisms

For geologic sequestration projects, Project Proponents must contribute 10% of the project’s offset credits to a Reserve Account, managed by ACR, from which offsets will be retired in the event of a reversal during the Project Term. The reversed quantity shall be measured and reported, verified, and compensated by retiring an equivalent volume of offset credits from the Reserve Account. Reversals post-Project Term are compensated as outlined in the legally binding Risk Mitigation Covenant, filed in the real property records of each county, parish, and other THE AMERICAN CARBON REGISTRY STANDARD Version 6.0 July 2019 americancarbonregistry.org 35 governmental subdivision that maintains real property records, which prohibits any intentional reversal unless there is advance compensation to ACR.

5.B.3 Alternate Risk Mitigation Mechanisms

In lieu of making a Buffer Pool Contribution or Reserve Account Contribution, Project Proponents may propose an insurance product for ACR approval as a risk mitigation mechanism. Insurance may be a financial product based on an actuarial analysis of project risk that considers circumstances such as the region, threats, and mitigating factors. This is similar to the assessment done for property insurance. The Project Proponent may provide insurance, bonds, letters of credit, or other financial assurances to ACR in amounts, and in form and substance, satisfactory to ACR in its sole and absolute discretion. Such financial products must assure provision of sufficient funds to ACR, in the event a project suffers an unintentional or intentional reversal of sequestered carbon, to purchase and retire a number of ERTs sufficient to offset such reversal. There may be no hidden costs, exclusions, or unanticipated liabilities. ACR must approve the proposed alternative after it conducts due diligence, which will be at the Project Proponent’s or insurance provider’s expense.

5.C Monitoring for Reversals

All projects must adhere to ongoing monitoring requirements as detailed in relevant methodologies, including ongoing verification during the Minimum Project Term. For Geologic Sequestration, Project Proponents are required to demonstrate that the CO₂ captured and stored is permanently

⁶⁰ Attachment D

sequestered underground through detailed post-injection monitoring, required until it can be verified that no migration of injected CO₂ is detected across the boundaries of the storage volume and the modeled failure scenarios indicate that the CO₂ will remain contained within the storage volume. The Risk Mitigation Agreement details ongoing monitoring requirements.

5.D Reversal Reporting and Compensation

AFOLU reversals must be reported and compensated following requirements detailed in the ACR AFOLU Carbon Project Reversal Risk Mitigation Agreement and the Buffer Pool Terms and Conditions. Geologic sequestration reversals must be reported and compensated following requirements as detailed in applicable methodology. In the event of reversals during the project term, the quantity shall be measured and reported, verified, and compensated by retiring offset credits from the Reserve Account. Reversals post-Project Term are compensated as outlined in the Risk Mitigation Covenant, which prohibits any intentional reversal unless there is advance compensation to ACR.

Example Documentation of Voluntary Offset Project

Each of the CARB-approved registries provides public access to a list of offset projects that includes a unique project identifier, project information (including location and project developer), project verifier, and the project protocol or methodology used to quantify reductions. For credits that have been issued, registries provide a verification report, the quantity of offsets issued, the date they were issued and their retirement status. Retired credits are listed with retirement date, the account holder, quantity of credits retired, and a unique serial number for each metric ton of GHG reduced.^{61 62 63}

An example is provided here to illustrate the documentation that is readily available from an CARB-approved registry to support the provision in revised MM 4.7.7.1 that “the developer shall provide the City’s Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.”

The Climate Action Reserve (Reserve) provides public access to offset projects in its registry, and its issuance and retirement of offset credits known as Climate Reserve Tonnes⁶⁴ (CRTs), at: <https://www.climateactionreserve.org/how/projects/>. The list of retired CRTs indicates a recent listing of 16,285 CRTs for Project # CAR888 (Angelina County Landfill, in Lufkin, Texas), which has been generating carbon offset credits since 2011, using the CAR’s Landfill Gas Capture/Combustion Protocol, available on the Reserve’s web site at: <https://www.climateactionreserve.org/how/protocols/us-landfill/>. The Project Developer is Element Markets Emissions, LLC, on behalf of a third party, and the Project Verification Body is SCS Global Services:

- Vintage: 2019
- Serial numbers: CAR-1-US-888-4-666-TX-2019-5861-1 to 16285
- Quantity of Offset Credits: 16,285
- Date Issued: 10/30/2019
- ARB Eligible: No
- Status of Offset Credits: Retired
- Status Effective Date: 29 Jan 2020 15:30:52 GMT

⁶¹ Attachment C

⁶² Attachment AA

⁶³ Attachment J

⁶⁴ The unit of offset credits used by the Climate Action Reserve. One Climate Reserve Tonne is equal to one metric ton of GHG reduced/sequestered

Project Documentation for CAR888 is viewable and downloadable by the general public from:

<https://thereserve2.apx.com/mymodule/reg/TabDocuments.asp?aProj=cipub&type=PRO&r=617&ad=Prpt&act=update&tablename=doc&id1=888&iCr=>

Documentation of the recently verified and retired CRTs referred to above, for the emissions year 2018-2019 (for emissions offsets occurring from July 1, 2018 through June 30, 2019) includes the following:

- Signed Project Verification Statement for emissions offsets occurring from July 1, 2018 through June 30, 2019.
- Landfill Gas Verification Report
- Project flow chart
- Project Developer's Attestation of Title
- Project Developer's Attestation of Regulatory Compliance
- Project Developer's Attestation of Voluntary Implementation

CENTER FOR BIOLOGICAL DIVERSITY
CENTER FOR COMMUNITY ACTION & ENVIRONMENTAL JUSTICE
COALITION FOR CLEAN AIR
SAN BERNARDINO VALLEY AUDUBON SOCIETY
SIERRA CLUB

May 26, 2020

Via Email

Honorable Mayor and Members of the City Council
City of Moreno Valley
14177 Frederick St.
Moreno Valley, CA 92552
planningemail@moval.org

Re: Appeal of Planning Commission Approval of Tentative Parcel Map and Certification of Final Revised Environmental Impact Report for World Logistics Center Project (Case Nos. PEN18-0050 and PEN20-0017)

Dear Honorable Mayor and Members of the City Council:

On behalf of the Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society, and Sierra Club, we write to appeal two decisions of the City of Moreno Valley Planning Commission (“Planning Commission”) related to the World Logistics Center Project (“WLC” or “Project”): (1) Resolution No. 2020-20 and associated exhibits (certifying a Revised Final Environmental Impact Report and adopting a Mitigation Monitoring and Reporting Program and Statement of Overriding Considerations for the Project); and (2) Resolution No. 2020-21 and associated exhibits (approving Tentative Parcel Map 37457 and associated conditions of approval). These items went to the Planning Commission on the evening of Thursday, May 14, 2020, but were ultimately approved on May 15, 2020. The Planning Commission approved the two items despite significant public opposition and documented non-compliance with the requirements of the California Environmental Quality Act (“CEQA”).

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This letter serves as the formal appeal of the Planning Commission’s approvals pursuant to Chapter 9.02, Chapter 9.14, and/or other applicable provisions of the Moreno Valley Municipal Code. For the reasons set forth below, the approvals fail to meet the requirements of CEQA and other applicable law. Specifically, the Revised Final Environmental Impact Report (“Revised FEIR”) does not comply with CEQA. As a result, the City cannot make the findings required for approval of a tentative parcel map pursuant to Chapter 9.14 of the municipal code. In addition, the above-referenced organizations and others have previously described the legal failings of the Planning Commission’s determinations in written and oral comments submitted prior to or at the

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Planning Commission’s public hearing on the two approvals. In particular, Appellants specifically incorporate by reference the following letters filed in response to the 2019 Revised Final EIR:

- Letter from Ileene Anderson to Planning Commissioners (May 13, 2020) (Exhibit 1);
- Letter from Scott Wilson to Julia Descoteaux (May 13, 2020) (Exhibit 2);
- Letter from Heather Leslie and Richard Corey to Julia Descoteaux (May 14, 2020) (Exhibit 3);
- Letter from Adrian Martinez to Julia Descoteaux (May 14, 2020) (Exhibit 4);
- Letter from Tom Thornsley to Julia Descoteaux (May 14, 2020) (Exhibit 5);
- Karen Jakpor letter regarding particulates increasing COVID 19 infections with cited sources; and
- Lindsay Robinson letter raising concerns and conflicts of interest for PC members and new road improvements.

2 CONT

These comments and their attachments also set forth reasons for these appeals and are therefore incorporated by reference in their entirety. In addition, we seek to bring the following studies to the City Council’s attention:

- Wu, Xiao, et al., Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study, Department of Biostatistics, Harvard (Exhibit 6); and
- Andrée, Pieter Johannes, Incidence of COVID-19 and connections with air pollution exposure, Policy Research Working Paper 9221, April 2020, World Bank Group (Exhibit 7).

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These studies provide new evidence of the harms of COVID-19 to communities exposed to elevated levels of air pollution.

Accordingly, we respectfully request that the City Council reverse, reject and/or overrule the Planning Commission’s approvals and remand both determinations back to the Planning Commission with directions to undertake a lawful environmental review.

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I. BACKGROUND OF THE PROJECT

The immense proposed WLC would harm the region’s environment. The Project would occupy 40.6 million square feet, dramatically changing the City and committing a significant portion of its total land area to warehouses, distribution centers, and associated facilities. The Project has a host of impacts ranging from degradation of biological resources to impairing air quality to localized impacts that will harm adjacent community members.

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Moreover, the Project’s impacts would reach far beyond the City. The Project could add more than 14,000 new diesel truck trips per day to freeways linking the City to seaports more than 80 miles away in Los Angeles and Long Beach. In all, the Project will generate thousands of daily vehicle trips, according to the final EIR’s traffic analysis.

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1. The Project Approval Process.

Highland Fairview filed its Project application with the City in April 2012. On February 26, 2012, the City issued a Notice of Preparation of an EIR. Subsequently, on February 5, 2013, the City released a draft EIR, which found numerous “significant” and “unavoidable” environmental impacts, for a 60-day public comment period. Over a hundred residents, environmental groups, and government agencies submitted comments. In May 2015, the City released the final EIR, containing substantial changes from the draft EIR.

On August 19, 2015, after the City’s Planning Commission approved Highland Fairview’s proposal, the City Council adopted *Resolution No. 2015-56* certifying the final EIR, adopting a statement of overriding considerations without employing the many feasible mitigation measures put forth by agency and other commenters, and approving a mitigation monitoring program. The City also issued other approvals in reliance on the EIR, including: (1) *Resolution No. 2015-57*, approving general plan amendments; (2) *Resolution No. 2015-58*, approving a tentative parcel map for financing purposes; (3) *Resolution No. 2015-59*, requesting that Riverside County Local Agency Formation Commission (“LAFCO”) begin proceedings to allow the City to annex an 85-acre site within the Project area; and (4) *Resolution No. CSD 2015-29*, requiring the City’s Community Services District to initiate LAFCO proceedings for the expansion of the District’s boundaries to include the annexed 85-acre site. Subsequently, on August 25, 2015, the City Council passed *Ordinance No. 900*, adopting the WLC Specific Plan and other zoning modifications, and *Ordinance No. 901*, approving a development agreement between the City and Highland Fairview.

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The City filed a Notice of Determination on August 26, 2015, summarizing the approvals and environmental review. Subsequently, in September 2015, community, labor, environmental, and governmental entities filed seven lawsuits challenging the City’s failure to comply with CEQA. To date, the City and Highland Fairview have settled three of the lawsuits, and one case has been dismissed.

On June 7, 2018, the San Bernardino Superior Court entered judgement in favor of the groups challenging the original CEQA document based on an opinion entered on February 8, 2018. On June 14, 2018, the Superior Court issued a Peremptory Writ of Mandate. An appeal and a cross appeal have been filed in this case, but no final determination of the issues have been made.

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A. Highland Fairview’s Ballot Initiatives and Related Litigation.

In response to the many CEQA lawsuits, Highland Fairview subsidized an effort to secure enough petition signatures to qualify three initiative measures for the ballot. (*Center for Community Action & Environmental Justice v. City of Moreno Valley* (2018) 26 Cal.App.5th 689, 694-97 (hereafter *Center for Community Action & Environmental Justice*.) By repealing and reapproving some of the City’s August 25, 2015, approvals through the initiative process, the measures were intended to reapprove the Project without any CEQA review. (See *Tuolumne Jobs & Small Business Alliance v. Superior Court* (2014) 59 Cal.4th 1029, 1036-39 [CEQA review not required prior to legislative body’s decision to adopt initiative measure or submit it to voters].)

First, the Land Use Initiative (also known as the “Moreno Valley Jobs Initiative”) repealed the Project’s land use entitlements, Ordinance 900, and Resolutions 2015-57 and 2015-59. It then re-amended the general plan and zoning map, re-repealed the Moreno Highlands Specific Plan, and re-adopted the WLC Specific Plan, and included the mitigation-monitoring program as “conditions of development.” Second, the Development Agreement Initiative (also called the “Moreno Valley Workforce Training Initiative”) repealed the Project’s development agreement, and then adopted a “new” development agreement substantially similar to the original agreement adopted by Ordinance 901. And third, the WLC Land Benefit Initiative repealed Resolution No. CSD 2015-29, which called for the expansion of the Community Service District boundary to accommodate the Project.

On November 16, 2015, the City Clerk determined that each measure had sufficient signatures. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 696.) On November 24, 2015, the City Council voted to adopt the three initiatives outright instead of allowing a vote by the electorate. (*Ibid.*; Elec. Code, § 9215.)

2. Land Use and Development Agreement Initiative Litigation.

In response, several petitioners in the pending CEQA actions filed lawsuits challenging the validity of the Land Use and Development Agreement initiatives. (*Center for Community Action & Environmental Justice, supra*, 26 Cal.App.5th at 694-96.) In September 2016, the Superior Court entered judgment in favor of the City and Highland Fairview. Appellants Center for Community Action and Environmental Justice and other organizations appealed the Superior Court’s decision on the Development Agreement Initiative on the ground that a development agreement cannot be adopted by initiative.

On August 23, 2018, the Court of Appeals ruled in favor of Appellants in a published opinion. The City and the developer filed a petition for review with the Supreme Court, which denied review. (*Center for Community Action & Environmental Justice v. City of Moreno Valley*, review den. Nov. 28, 2018, S251674.) The Development Agreement Initiative provided that in the event of a successful legal



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challenge, the original Ordinance No. 901 approving a development agreement between the City and Highland Fairview would be reinstated.

The initiatives did not repeal Resolution No. 2015-56, which among other approvals certified the final EIR. Nor did the initiatives repeal Resolution No. 2015-58, which approved a tentative parcel map for financing purposes. These approvals, along with the revived Ordinance No. 901, remain subject to CEQA notwithstanding the initiative measures.

3. The Subsequent EIRs.

In July of 2018, the City released a revised final EIR for the Project. In December of 2019, the City released a new revised final EIR for the Project. On May 14, 2020, the Planning Commission decided several items related to this project, including certification of the Revised Final EIR. The Planning Commission made a decision on the Revised FEIR on May 15, 2020.

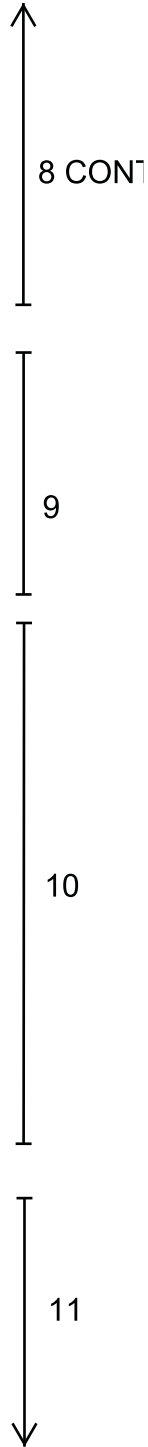
The following points outline the major deficiencies regarding the Board’s environmental determination:

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Climate Impacts.

The City’s review of this Project’s climate and greenhouse gas (“GHG”) emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a revised final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA’s requirements.

a. Legal Standards

The City’s determinations regarding the significance of greenhouse gas (“GHG”) emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency’s use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the Revised FEIR continues



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to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the Revised FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO₂e”) per year, the same quantitative evidentiary standard controls.

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CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (See Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

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Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

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regulatory requirements. (See CARB, *California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring and measurement requirements that can be ... enforced by ARB.” (*Id.*, p. 4.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 7-8.)



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b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (Revised FEIR 1a at 755-56.) As a threshold matter, the difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet, MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency” and surplus or “additional.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency or documentation whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.



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The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.



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First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (Revised FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”].) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review whatsoever of whether those credits or the protocols they were generated under satisfy the measure’s stated criteria, and without any ability even to question whether the credit is adequate.

Second, CARB “approval” of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is “approved by CARB” does not establish that voluntary market carbon credits sold by that

³ Notably, despite MM 4.7.7.1’s suggestion to the contrary, the “GHG RX” registry has *not* been approved by CARB to list Cap-and-Trade compliance offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The “GHG Rx” program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)



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registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB’s procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1’s reference to “approved” registries reflects a misinterpretation of CARB’s regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure’s reliance on CARB “approval” is legally erroneous. As a result, a registry’s “CARB-approved” status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure’s purported criteria, or the significance of the Project’s impacts after mitigation.

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Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB’s regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB’s compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism (“CDM”) methodologies.⁴ Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

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⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting “any methodology developed under the [CDM] ... for projects and programs registering with VCS).

ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project’s GHG emissions (whether those measures are denominated “offsets” or “carbon credits”), it must meet CEQA’s requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards “the mitigation *will* achieve.” (CEQA Guidelines § 15126.4(a)(1)(B).) The measure’s list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries’ processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by “presuming” otherwise. Nor is there any evidence the City’s Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

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iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, “[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place.” *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (Revised FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA’s prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on “forecasted” emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA’s requirement that mitigation be in place before impacts occur.

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iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third party who may list offset credits for sale. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

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Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between a carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased....” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (Revised FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the Revised FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the Revised FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to

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meet its long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

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vi. The Revised FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The Revised FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The Revised FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the Revised FEIR of any evidentiary support.

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c. The Revised FEIR Must Be Recirculated for Full Public Review and Comment.

The Revised FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The Revised FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the Revised FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the Revised FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

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Recirculation is required here for at least two reasons. First, the Revised FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the Revised FEIR only a few days before the Planning Commission hearing, the City has thwarted

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

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meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the Revised FEIR’s new analysis reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised Sections of the Final Environmental Impact Report measured only “Total Uncapped” Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though “Total Capped” emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The Revised FEIR, in contrast, at least conditionally considers all Project emissions—both “capped” and “uncapped”—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The Revised FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after, avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The Revised FEIR must be recirculated.



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III. The Revised FEIR’s Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques of the GHG analysis reflected in prior comments. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project.

Importantly, CARB, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the “[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground.”⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:



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Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): “Project-related greenhouse gas emissions resulting from

⁶ Letter from CARB to Moreno Valley, September 7, 2018, *available at* https://ww3.arb.ca.gov/toxics/ttdeqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

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sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

Response 44.37

The Agency declines to make any changes in response to this comment. The decision in *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (“AIR v. Kern”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated by referencing CARB’s letter on the WLC.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

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⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at* http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

⁸ *Id.*

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, both CARB (the agency responsible for implementation of AB 32 and the Cap-and-Trade Program) and the Natural Resources Agency (the agency responsible for drafting the CEQA Guidelines the Revised FEIR relies upon for authority) agree that the City cannot rely on Cap-and-Trade to dismiss the significance of all transportation and energy emissions.

Instead of recognizing that both CARB and the Natural Resources Agency disagree with its approach, the Revised FEIR continues to rely on outdated decisions in other projects by the South Coast AQMD and the San Joaquin Valley APCD--two agencies that have no jurisdiction over the GHG emissions from this Project and deserve no deference on this issue.

But, even if these agencies' positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised FEIR includes new attachments A and B, which are the specific South Coast AQMD documents the Revised FEIR claims support the use of Cap-and-Trade to discount energy emissions under CEQA. Initially, neither document allows transportation emissions – the vast majority of GHG emissions associated with the WLC – to be discarded from a significance determination.

Moreover, both of these documents are from 2014. Since that time, the South Coast AQMD has produced several other CEQA documents. In fact, in the most recent document from 2020, the agency does not appear to contend that energy-related and transportation emissions are insignificant for CEQA purposes because they are purportedly “covered” under the Cap-and-Trade program. *See* South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>.

In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. Analysis of Important Mitigation Measures has been Curtailed by the Revised FEIR’s Failure to Analyze Impacts

Mitigation of a project’s significant impacts is one of the “most important” functions of CEQA. *See Sierra Club v. Gilroy City Council*, 222 Cal.App.3d 30, 41 (1990). If the EIR is the heart of CEQA, then mitigation is its teeth. *See Env’tl. Council of*

⁹ *Id.*



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Sacramento v. City of Sacramento, 142 Cal.App.4th 108 at 1039. Under CEQA, feasible mitigation measures must be adopted that will avoid or substantially lessen significant environmental effects. Pub. Res. Code § 21002. CEQA is clear that “[m]itigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding agreements.” CEQA Guidelines § 15126.5(a)(2).

The Revised Final EIR fails to meaningfully analyze requirements that would mitigate the harmful greenhouse gas and air quality impacts from this project, including requirements for use of trucks cleaner than the current commitment of trucks meeting 2010 emission standards – a standard that would allow trucks 10 years or older to enter the project in perpetuity. Several zero-emissions models are either available and/or will be increasingly available as this project is built. Moreover, CARB will adopt a vehicle sales standard in June to require manufacturers to produce zero-emission trucks in California across a range of truck classes. The Revised FEIR fails to provide sufficient evidence refuting requirements for use of zero-emission trucks is feasible.

The Revised Final EIR similarly fails to adequately consider mitigation measures requiring zero-emissions forklifts and yard dogs (e.g. yard hostlers). There are many zero-emissions models, and the Revised Final EIR should require the use of this technology for all onsite vehicles that fall into these categories.

In addition, the project fails to commit to feasible technologies to reduce the impacts of the buildings, including increased solar to cover more than just the office energy of the buildings and all-electric buildings to prevent the need for combustion for appliances. These and other technologies identified by several commenters are feasible and should be implemented to mitigate the significant Nitrogen Oxide and other criteria pollutant emissions, in addition to the significant GHG emissions.

Because the WLC project fails to include all feasible mitigation, the document should be recirculated.

V. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Biological Impacts.

The Revised FEIR’s biological resources sections include glaring gaps and inconsistent language in contravention of the CEQA’s requirements. For example, section 15130 of the CEQA Guidelines require an EIR to analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. A cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts. CEQA Guidelines § 15355. And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, supra, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho*



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Cordova (2007) 40 Cal. 4th 412, 428.) Here the Revised FEIR failed to provide a cumulative analysis of the Project’s impact on biological resources. Nearby projects, including the Village of Lakeview housing development that will also impact the southern portion of the San Jacinto Wildlife Area are not included in the Revised FEIR’s analysis, in violation of CEQA. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721. (Absent meaningful cumulative analysis there would be no control of development and “piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment”).)

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The Revised FEIR also claims, without providing substantial evidence, “250-foot development setback is adequate for a project-SJWA buffer separation and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity.” (RFEIR at pg. 4.4-97, emphasis original.) However, as numerous commenters raised, negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems. These negative edge effects were not fully analyzed nor mitigated in the Revised FEIR.

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Additionally, while truck and vehicle traffic will increase on Gilman Springs Road and all roads adjacent to the San Jacinto Wildlife Area for both construction and operation, the Revised FEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife “roadkill”. The Revised FEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states “these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the Revised FEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, “the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project’s impact on the environment, the agency’s approval of the proposed project followed meaningful consideration of alternatives and mitigation measures.” (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA’s and the County’s responsibility to analyze, avoid, minimize and mitigate the impacts from this project; it is the developer’s responsibility as the applicant, and the City’s responsibility as the lead agency.

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Because the biological impacts section is faulty, the document should be recirculated.

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VI. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Noise Impacts.

The Revised Final EIR has significantly weakened mitigation measures designed to protect the public from noise pollution. When the original final EIR was approved it used the “**Noise Assessment for the WLCSP**” to establish mitigation measures that would be necessary to limit construction impacts to those residents in the surrounding homes. It noted that work within the project area may be done on a 24 hour, 7 days per week schedule, which goes beyond the Moreno Valley Municipal Code’s (MVMC Section 8.14.040 Miscellaneous standards and regulations) listed hours of 7 a.m. to 7 p.m. The Noise Assessment defined construction limits so as to limit noise impacts on the surrounding residences outside the standard construction hours and clearly outlined the high level of noise that could be expected both during daytime and nighttime hours beyond the allowed decibel levels defined by the MVMC. Thus the study included “**Mitigation Measure N-2. No Nighttime Grading Within 2,800 Feet of Residences South of the Freeway.**”. It goes on to allow closer nighttime construction at 1,580 feet after the installation of an appropriate sound barrier.

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The new “**Noise and Vibration Technical Report Assessment**” proposed a substantially different evaluation and lesser mitigation for the noise impacts. It states that “No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends, and a 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity.”

The mitigation requirement for a sound barrier is similar to the original MM, but the active setback is now moved forward by 2,000 feet, three and a half times closer. Additionally, the MM includes options that would eliminate the need to install the on-site sound barrier if a vote by those affected fails to garner 50% favorable votes or 100% favorable votes for a sound barrier placed on private property.¹⁰ These two provisions were never a consideration in the original noise analysis nor do they seem to be fair to the community due to the speculative nature of whether a sound barrier will be used or not. In addition, the developer’s ownership of properties in those locations subject to the noise impacts are entitled to a vote on sound barrier installations. Those property holdings collectively could prevent any opportunity for a favorable vote to occur. While the clause in MM 4.12.6.2A may be a greater benefit to the developer than to the surrounding

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¹⁰ Allowing a vote on whether or not sound barriers will be installed also raises serious constitutional questions concerning the City’s ability to delegate its basic land use authority to private property owners. (See, e.g., *Vaquero Energy, Inc. v. County of Kern* (2019) 42 Cal.App.5th 312, 328-334 [discussing federal and state case law].)

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residents, it poses a vague and unclear mitigation measures and makes it impossible to assess the efficacy at blocking noise impacts.

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The EIRs for this Project have included multiple noise studies, including the following:

“**Noise Assessment for the WLCSP**” (Mestre Greve Associates) original dated January 2013, revised September 2014. (This document is still referenced in the 12-2019 Draft Recirculated Revised Sections of the Final Environmental Impact Report); and

“**Noise and Vibration Technical Report Assessment** (ESA)”, July 2018 which was not in the original 2014 DEIR for WLC.

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Both studies have been cited for noise impacts, but the Revised FEIR has taken away significant mitigation measures designed to protect residents from noise pollution. The May 14, 2020 letter from Tom Thornsley attached as Exhibit 5 provides several examples of mitigation measures either being vague and speculative and/or less effective than prior mitigation measures. This failure to articulate and mitigate the noise impacts from the WLC project violates CEQA. This violation of CEQA means the noise analysis needs to be improved to provide effective and feasible mitigation.

VII. The Failure to Provide Spanish Translation of the Environmental Impact Report and Oral Comments at the Hearing Violates State Law.

The Final EIR should have been translated into Spanish for better review by the public. Moreover, there was at least once instance where a speaker at the Planning Commission spoke Spanish during oral testimony, and there was no translation provided to the Planning Commissioners. This failure to provide translation undermined the informational purposes of CEQA and otherwise fell short of the requirements of state law.

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VIII. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Agricultural Impacts.

The Revised Final EIR fails to adequately address and mitigate the agricultural impacts related to this Project. In particular, the Revised FEIR continues to fail to acknowledge the significant agricultural impacts. In fact, the Revised FEIR improperly defers mitigation of agricultural impacts until future plans are produced related to the development of Parcels 10 and 12. This deferral of mitigation for agricultural impacts in not permitted under CEQA.

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Attachment: WLC Response to Appeal_9JUNE2020_Part 1 (4074 : World Logistics Center)

IX. The Final EIR for this Project Makes it Impossible for the Public and Decision-Makers to Be Adequately Informed.

The current EIR for the project is a complex web with two revised versions of the EIR having been completed since the Superior Court struck down the entire EIR. Overall, the document was amended in significant ways up to two weeks before the Planning Commission meeting. The many versions of the document and reliance on information from an invalidated EIR from 2014, in addition to the two subsequent versions, have rendered the EIR’s overall analysis incomprehensible. The public and decision-makers have not been provided with sufficient information to participate meaningfully in the process or proceed with rational decision-making.

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X. Conclusion

The above referenced organizations have attached several of the relevant letters and attachments filed related to this appeal. We respectfully request that this information be incorporated into the record for this appeal.

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For the reasons stated in the incorporated prior comments and in this letter, (1) the Revised FEIR fails to comply with CEQA, and (2) the City cannot make the required findings to approve the tentative parcel map and other actions reliant upon the Revised Final EIR. Accordingly, the Planning Commission’s decisions on its approvals must be reversed, rejected and/or overruled.

Thank you for your consideration of this appeal.

Sincerely,



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Attachment A

Revised Mitigation Measure

4.7.7.1



REVISED MITIGATION MEASURE 4.7.7.1

4.7.7.1 The developer shall mitigate the WLC Project's GHG emissions to net zero by purchasing and retiring ~~providing offsets and/or~~ carbon credits, based upon where the amount of GHG emissions set forth in to be mitigated is either "Total Uncapped" GHG emissions from Table 4.7-8 or "Project Emissions" from new Table 4.7-16 of the Revised Final EIR, depending on the outcome of the appeal in *Paulek v. Moreno Valley Community Services District* ("Paulek"). If the trial court's judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed, then the GHG emissions to be mitigated to net zero will be the "Total Uncapped" GHG emissions from Table 4.7-8. If the trial court's judgment is reversed after the appellate process is completed, then the amount of GHG emissions to be mitigated to net zero will be the "Project Emissions" shown on Table 4.7-16. Upon the purchase and retirement ~~provision of offsets and/or the retirement of carbon credits~~, no further analysis of ~~eapped and uncapped~~ GHG emissions will be required, and no further reduction of those emissions will be required.

The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of ~~provide the city with any combination of qualified offsets and/or carbon credits in its sole determination~~ provided that the following conditions are satisfied:

- a) ~~Offsets: A developer shall provide proof of offsets to reduce or sequester GHG emissions (as distinguished from carbon credits) to the City's Planning Official that the offsets are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.~~
- b) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), the carbon credits represent reductions in GHG emissions that are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency. Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, or Verra (formerly Verified Carbon Standard), or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above. In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.

eb) Timing: The developer shall provide proof to the City that ~~with offsets and/or~~ carbon credits equal to the ~~proportionate~~ amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent. ~~for the facilities proposed in each plot plan (by square footage as compared to the total square footage of the project) as a condition of the issuance of a certificate of occupancy for such facilities, using either Table 4.7-8 or Table 4.7-16, as appropriate. The City shall retire the carbon credits upon their receipt. The developer shall have the right at any time to provide such offsets and/or carbon credits in advance of the issuance of any certificate of occupancy for any of the facilities in the WLC Project.~~

Attachment B

ACR Validation and Verification Standard, Version 1.1





ACR VALIDATION AND VERIFICATION STANDARD

VERSION 1.1

May 2018



ACR VALIDATION AND VERIFICATION STANDARD

VERSION 1.1

May 2018

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A leading carbon offset program founded in 1996 as the first private voluntary GHG registry in the world, ACR operates in the voluntary and regulated carbon markets. ACR has unparalleled experience in the development of environmentally rigorous, science-based offset methodologies as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting through its online registry system.

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ACRONYMS

ACR	American Carbon Registry®
AFOLU	Agriculture, Forestry, and Other Land Use
ANSI	American National Standards Institute
ARB	Air Resources Board (California)
CH ₄	Methane
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
ERT	Emission Reduction Ton
GHG	greenhouse gas
GIS	Geographic Information System
ISO	International Organization for Standardization
OPR	Offset Project Registry
IPCC	Intergovernmental Panel on Climate Change
IAF	International Accreditation Forum
N ₂ O	nitrous oxide
PDA	Programmatic Development Approach
PFC	Perfluorocarbon
QA/QC	quality assurance/quality control
SSRs	sources, sinks, and reservoirs
VVB	Validation/Verification Body

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INTRODUCTION

The American Carbon Registry® (ACR) is a leading carbon offset program with two decades of unparalleled carbon market experience in the development of rigorous, science-based offset standards and methodologies as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting through ACR's online registry system. ACR is a nonprofit enterprise of Winrock International. Winrock works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources. Key to this mission is building capacity for climate change mitigation and adaptation and leveraging the power of environmental markets. Since the 1990s, Winrock has been a leader in developing science-based greenhouse gas (GHG) measurement and monitoring methods and protocols.

ACR was founded in 1996 as the GHG Registry by the Environmental Resources Trust, and joined Winrock in 2007. As the first private GHG registry in the world, ACR has set the bar for offset quality that is the market standard today and continues to lead carbon market innovation.

In 2012, ACR was approved by the California Air Resources Board (ARB) to serve as an Offset Project Registry (OPR) and Early Action Offset Program for the California cap-and-trade market. ACR's work as a California OPR is governed by the California cap-and-trade regulation and compliance offset protocols approved by the ARB.¹ The ACR Standard and the ACR Validation and Verification Standard govern only the registration of projects under ACR-approved methodologies.

THE ACR VALIDATION AND VERIFICATION STANDARD

This document details the required validation and verification requirements that every GHG project must undergo in order for ACR to register its GHG emission reductions/removal enhancements as serialized Emission Reduction Tons (ERTs). ACR requires both validation and verification by a competent, independent, International Organization for Standardization (ISO) 14065-accredited third party that it has approved, at intervals as specified in the ACR Standard or the ACR approved methodology. This document is intended to guide validation and verification bodies (VVBs), and may also be used by Project Proponents to inform their understanding of what validation and verification will entail.

This document addresses only the validation and verification requirements for project-based GHG emission reductions and removals. It is meant to be applicable across a range of different eligible project types, rather than providing specific guidance for every type of project for which ACR has an approved methodology. Additional validation and verification guidance for specific

¹ The California cap-and-trade regulation (Subchapter 10, "Climate Change," Article 5, Sections 95801 to 96022, Title 17, California Code of Regulations) and currently approved compliance offset protocols are available at <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>.

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project types is given in the relevant methodologies and guidance documents (if applicable). Definitions of terms used in this document can be found in the ACR Standard.

Last, please note that this document does not address requirements for verification of projects developed using the ARB compliance offset protocols and submitted for OPR listing on ACR. Requirements for verification of compliance offset projects are given in the Final Regulation Order: California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms (Subchapter 10, "Climate Change," Article 5, Sections 95801 to 96022, Title 17, California Code of Regulations) and in the relevant ARB Compliance Offset Protocols.² Verifiers of California compliance offset projects must be accredited by ARB.

APPLICABILITY

ACR-approved VVBs conducting validations and/or verifications on behalf of ACR shall include this document in addition to the ACR Standard and an ACR-approved methodology as audit criteria.

The ACR Validation and Verification Standard Version 1.1 supersedes the ACR Validation and Verification Standard, Version 1.0 (February 2018), and must be used as criteria for any project validation or verification commencing after August 1, 2018.

Project Proponents and other interested parties should refer to www.americancarbonregistry.org for the latest version of the ACR Standard, methodologies, tools, document templates, and other guidance.

CHAPTER GUIDE

- Chapter 1** Objectives and scoping elements for validation
- Chapter 2** How to validate project boundaries
- Chapter 3** How to validate project baselines
- Chapter 4** How to validate additionality
- Chapter 5** How to validate quantification methods
- Chapter 6** How to validate other eligibility criteria, such as start dates and Crediting Periods
- Chapter 7** Requirements for developing and submitting a validation report
- Chapter 8** Objectives and scoping elements for verification

² See <https://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>.

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- Chapter 9** Activities to be performed while conducting a verification
- Chapter 10** Verification of aggregated or programmatic develop approach projects
- Chapter 11** Requirements for quality assurance and quality control
- Chapter 12** Requirements for developing and submitting Verification Statements and reports.
- Chapter 13** Requirements for VVBs operating on behalf of ACR
- Appendix A** A list of normative references on which the ACR Validation and Verification Standard is based

CITATION

The appropriate citation for this document is American Carbon Registry (2018). The American Carbon Registry Validation and Verification Standard, version 1.1., Winrock International, Little Rock, Arkansas.

CHAPTER 1: VALIDATION OVERVIEW

This chapter summarizes the objectives and scoping elements of validation necessary to list a GHG Project Plan. ACR's validation requirements are built on the foundation of *ISO 14064-3:2006, Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*.

1.A DEFINITION

Validation is the systematic, independent, and documented process for the evaluation of a GHG Project Plan against applicable requirements of the ACR Standard, the applicable ACR-approved methodology, and any other applicable audit criteria.

1.B OBJECTIVES OF VALIDATION

The overall goal of third-party validation is to review impartially and objectively a GHG Project Plan against the requirements laid out in the ACR Standard and relevant methodology. The VVB must independently evaluate the project design and planning information, based on supporting documentation and GHG validation best practices.

The objectives of validation are to evaluate:

- Conformance to the ACR Standard;
- GHG emissions reduction project planning information and documentation in accordance with the applicable ACR-approved methodology, including the project description, baseline, eligibility criteria, monitoring and reporting procedures, and quality assurance/quality control (QA/QC) procedures;
- Reported GHG baseline, ex ante estimated project emissions and emission reductions/removal enhancements, leakage assessment, and impermanence risk assessment and mitigation (if applicable).

The VVB shall review any relevant additional documentation provided by the Project Proponent to confirm the project's eligibility for registration on ACR.

1.C SCOPE OF VALIDATION

Validation shall include examination of all of the following elements of a GHG Project Plan:

- Project boundary and procedures for establishing the project boundary;

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- Physical infrastructure, activities, technologies, and processes of the project;
- GHGs, sources, and sinks within the project boundary;
- Temporal boundary;
- Description of and justification for the baseline scenario;
- Methodologies, algorithms, and calculations that will be used to generate estimates of emissions and emission reductions/removal enhancements;
- Process information, source identification/counts, and operational details;
- Data management systems;
- QA/QC procedures;
- Processes for uncertainty assessments; and
- Project-specific conformance to ACR eligibility criteria.

1.D INTERVAL OF VALIDATION

The ACR Standard requires validation of the GHG Project Plan once per Crediting Period, because the Project Plan remains valid for the duration of the Crediting Period. The length of the Crediting Period for different eligible project types is given in the ACR Standard or applicable methodology.

If using a programmatic development approach, new sites will need to undergo validation prior to issuance of ERTs. Validations for new sites shall occur during full verifications that include a site visit.

Agriculture, Forestry, and Other Land Use (AFOLU) projects that are a result of avoided emissions (e.g., fertilizer management) and that register less than 500 metric tons of ERTs annually are not required to conduct site visits if a VVB can reach a reasonable level of assurance through alternative methods. If the VVB cannot reach a reasonable level of assurance without visiting the project site(s), then it shall conduct a site visit as deemed necessary.

Renewal for another Crediting Period and/or updating the GHG Project Plan to apply a revised version of the applicable methodology requires re-validation.

If a Project Proponent aborts a validation after validation services have begun but before the VVB is able to reach a conclusion with a reasonable level of assurance, the VVB shall inform ACR in writing of the status of the validation and reasons why the validation has been aborted.

CHAPTER 2: VALIDATING PROJECT BOUNDARIES

The assessment of GHG project boundaries is a critical component of validation. Project boundaries must be clearly defined and transparently delineated in the GHG Project Plan. ACR defines GHG project boundaries to include the project's geographical implementation area, the types of GHG sources and sinks considered, the carbon pools considered (if applicable), and the project duration. For more information on determining and memorializing project boundaries, please refer to Chapter 2 of the ACR Standard.

2.A PHYSICAL OR GEOGRAPHIC BOUNDARY

To validate project boundaries, the VVB shall confirm through a field visit, visual and/or photographic evidence, maps, Geographic Information System (GIS) files, operating logs, and/or interviews with site operations personnel the accuracy of the project boundaries as defined in the GHG Project Plan.

2.B GHG ASSESSMENT BOUNDARY

Because the project boundary includes the types of GHG sources and sinks considered and the carbon pools considered (if applicable), the VVB must evaluate the rationale presented in the GHG Project Plan for the correct inclusion/exclusion of relevant GHG sources, sinks, and reservoirs (SSRs), including the justification given for excluding particular SSRs as de minimis or conservative, and confirm that this is consistent with the GHG assessment boundary section of the chosen methodology. The VVB shall confirm that the guidance in the ACR Standard and the chosen methodology have been applied regarding significance testing, de minimis exclusions, and a priori exclusions of particular SSRs.

2.C TEMPORAL BOUNDARY

Because the project boundary includes the project duration, the VVB must evaluate whether the Start Date, Crediting Period, and project term proposed in the GHG Project Plan are consistent with the ACR Standard, chosen methodology and evidence presented by the Project Proponent.

CHAPTER 3: VALIDATING PROJECT BASELINES

The project baseline scenario is a counterfactual scenario³ that forecasts the likely stream of emissions expected to occur if the Project Proponent does not implement the project (i.e., the “business as usual” case).

3.A TYPES OF BASELINES

Conventionally, three distinct approaches have been taken for establishing GHG project baselines.⁴ First, existing actual or historical emissions may be assumed to continue over the project lifetime or Crediting Period. This is termed the “retrofit” baseline, in which pre-retrofit measurements of actual emissions determine the project baseline. A retrofit project may involve the replacement of GHG emissions equipment/fuels with lower-emitting equipment/fuels, or the installation of GHG emissions reduction equipment. Baseline emissions are equal to historical actual GHG emissions prior to the installation of the GHG-reducing technology or change in practice.

Second, the baseline may reflect emissions and removals from a technology or practice that represents an economically attractive course of action, taking into account barriers to investment. This is termed a “project-specific” baseline approach. To determine a project-specific baseline, the Project Proponent evaluates barriers and net benefits associated with feasible alternative baseline scenarios, including the continuation of current activities, and identifies the baseline scenario with the lowest barriers and greatest benefits. The emissions/removals associated with this alternative become the baseline scenario against which emission reductions/removal enhancements in the project scenario are measured.

Third, baseline emissions may be assumed to be the average emissions of similar project activities undertaken in the recent past in similar social, economic, environmental, and technological circumstances, and whose performance is among the top specified percentage in their category. This is termed the “performance standard” approach. Project actions that, with respect to emission reductions or removal enhancements, or technologies or practices, achieve significantly better performance (e.g., lower emissions or higher removals per unit output) than the pre-established performance standard benchmark are considered additional or beyond that which

³ If applied to the project area, the option also exists of monitored baselines on proxy areas.

⁴ See, for example World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) Greenhouse Gas Protocol Initiative: The GHG Protocol for Project Accounting (November 2005). http://www.ghgprotocol.org/files/ghg_project_protocol.pdf.

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would be expected under a business-as-usual scenario.⁵ Provided the project action is also surplus to regulations, all emission reductions/removal enhancements relative to the baseline are creditable under this approach.

The VVB will confirm that the type of baseline used in the GHG Project Plan correctly applies the guidance in the chosen methodology.

3.B VALIDATING PROJECT BASELINES

Project Proponents shall use appropriate methodologies and tools to estimate and update project baselines. The baseline scenario remains valid for the duration of the approved Crediting Period for that project type, and must be re-assessed in order to renew the Crediting Period.

The objective of baseline validation is to check that technically sound baseline emissions have been established and subsequently applied. To establish baseline emissions, data representative of the operations and activities must be used, either from a single year or a multi-year average.

The VVB must ensure that the selected baseline scenario is one for which verifiable data are available. Documentation should include the baseline scenario selection rationale and justification, the guidance followed for baseline emissions estimation, and consistency across post-base year project emissions calculations (to provide accurate comparisons).

Validation of the project baseline should include:

- The explanation provided for how the baseline scenario was selected, including assessment of alternative baseline scenarios and their associated barriers and benefits; and
- Data associated with the base year chosen, and consistency in implementation of emissions estimating guidance for the baseline and project emissions.

Baseline validation may include the following activities, data, and evidence sources (as informed by the VVB's professional judgment); however not all of these are required:

- Interviews with the Project Proponent to determine how baseline emissions have been quantified;
- Review of sufficient documentation for any baseline emissions sources that contribute to total emissions by more than 3% to confirm that estimates have been addressed per stated measurement and monitoring plans, and that the estimations have been applied consistently and uniformly; and
- Check consistency with the appropriate guidance, as well as consistency in applying the guidance across baseline and project activity reporting periods.

⁵ Adapted from EPA Climate Leaders (2009): Using Offsets to Help Climate Leaders Achieve Their GHG Reduction Goals: Climate Leaders Offset Module Overview. See <http://www.epa.gov/stateply/documents/resources/OffsetProgramOverview.pdf>.

CHAPTER 4: VALIDATING ADDITIONALITY

Additionality is a test intended to ensure that project offsets are in addition to reductions and/or removals that would have occurred in the absence of the project activity and without carbon market incentives. Project Proponents must demonstrate that the GHG emission reductions and removals associated with an offset project are above and beyond the “business as usual” scenario. To qualify as additional, ACR requires every project to pass either an approved performance standard and a regulatory additionality test, or a three-pronged test of additionality in which projects demonstrate that the activity exceeds currently effective regulations, exceeds common practice in the relevant industry sector and geographic region, and faces at least one of three implementation barriers: financial, technological, or institutional. See the ACR Standard, Chapter 4, and relevant sector-specific requirements and methodologies. Some methodologies recommend, and some require, application of an additionality tool.

The VVB should evaluate each component of the additionality demonstration as required by the ACR Standard and chosen methodology.

4.A REGULATORY SURPLUS TEST

The regulatory surplus test involves existing laws, regulations, statutes, legal rulings, or any other regulatory frameworks that directly or indirectly affect GHG emissions associated with a project action or its baseline candidates, and that require technical, performance, or management actions. Project Proponents must provide clear evidence in the GHG Project Plan that the GHG reduction/removal activity is not required by any applicable federal, Tribal, state, or local laws, regulations, ordinances, consent decrees, or other legal arrangements. Only mandatory regulations, not voluntary guidelines, are considered in the regulatory surplus test.

To validate the results of the regulatory surplus test, the VVB shall review applicable regulations identified by the Project Proponent in the GHG Project Plan. If there are significant uncertainties associated with the regulatory requirements, the VVB shall conduct additional research and, if needed, contact the appropriate federal, state, Tribal, or local environmental compliance officer to collect additional documentation (e.g., notices of violation, consent decrees, and settlement agreements) and testimonial evidence.

Some project types may require that regulatory surplus be confirmed during every reporting period, which will be specified in the ACR approved methodology.

4.B COMMON PRACTICE TEST

The common practice test requires Project Proponents to evaluate the predominant technologies implemented or industry practices undertaken in a particular industry sector and/or geographic region, as determined by the degree to which those technologies/practices have penetrated the market, and demonstrate that the proposed project will reduce GHG emissions below levels produced by common technologies or practices within a comparable environment (e.g., geographic area, regulatory framework, investment climate, and access to technology/financing).

To validate the results of the common practice test, the VVB shall review the documentation provided by the Project Proponent to demonstrate that the GHG project is not common practice. In addition to this documentation, the VVB should review all original reference sources cited in the Project Proponent's documentation, such as independent consultants' reports designed to describe common practice technologies/practices, to confirm the raw data and conclusions drawn thereupon.

4.C IMPLEMENTATION BARRIERS TEST

An implementation barrier represents any factor or consideration that would prevent the adoption of the project activity. Under the implementation barriers test, Project Proponents choose at least one of three barrier assessments: financial, technological, or institutional. Project Proponents may demonstrate that their project faces more than one implementation barrier, but ACR does not require more than one barrier.

4.C.1 Financial Barriers Test

Financial barriers can include high costs, limited access to capital, or an internal rate of return in the absence of carbon revenues that is lower than the Project Proponent's established minimum acceptable rate. Financial barriers can also include high risks such as unproven technologies or business models, poor credit rating of project partners, and project failure risk. Carbon revenues can potentially address capital constraints, incentivize project implementation, or help to maintain the project's ongoing economic viability. If electing the financial implementation barrier test, Project Proponents shall provide solid quantitative evidence such as such as net present value and internal rate of return calculations. Use of an ACR-approved additionality tool is recommended.

The VVB shall review internal financial pro formas and historic/projected cash flow analyses prepared by the Project Proponent and/or an external party to confirm the validity of the financial barrier claim. The VVB should assess to what extent the assumptions used in the financial barriers analysis are defensible, how a variation on those assumptions (sensitivity analysis) could affect the outcome of the financial barriers test, and how likely such variations are during the project life.

4.C.2 Technological Barriers Test

Technological barriers can include R&D deployment risk, uncorrected market failures, lack of trained personnel and supporting infrastructure for technology implementation, and lack of knowledge on the practice/activity. Project Proponents electing the technological implementation barrier test should provide evidence that carbon market incentives are a key element in overcoming these barriers.

The VVB shall review documentation provided by the Project Proponent to demonstrate significant carbon credit creation activities occurring either before or no later than 2 years after the project start date. In addition, the VVB shall review all documentation provided by the Project Proponent regarding the development status of the technology being implemented by the project activity, supplementing those materials as needed with publicly available demographic and characteristic information on the industry sector and technology type.

4.C.3 Institutional Barriers Test

Institutional barriers can include institutional opposition to technology implementation, limited capacity for technology implementation, lack of management consensus, aversion to upfront costs, and lack of awareness of benefits. If electing the institutional implementation barrier test, Project Proponents shall provide documentation of the Project Proponent or project participant, management policies or guidelines that corroborate the claim of an organizational or institutional barrier, and should provide evidence that carbon market incentives are a key element in overcoming these barriers.

To validate these claims, the VVB shall collect testimonial evidence from the appropriate management personnel with purview over the GHG project's approval and implementation.

4.D PERFORMANCE STANDARD TEST

In lieu of the three-prong test to demonstrate project-level additionality, ACR also recognizes the "performance standard" approach, in which additionality is demonstrated by showing that a proposed project activity is surplus to all applicable regulations, and either is characterized by very low adoption rates in the relevant industry and geographic region, or results in lower emissions (or higher sequestration) than a benchmark established for the relevant region, industry/sector, and practice.

Performance standards vary by project type but generally include the above two components. The Project Proponent must first demonstrate in the GHG Project Plan that the project activity is not required by any applicable federal, Tribal, state, or local laws, regulations, ordinances, consent decrees, or other legal arrangements. Only mandatory regulations, not voluntary guidelines, are considered in the regulatory surplus test. The VVB shall review applicable regulations identified by the Project Proponent in the GHG Project Plan. If there are significant uncertainties associated with the regulatory requirements, the VVB shall conduct additional research and, if needed, contact the appropriate federal, state, Tribal, or local environmental compliance officer

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to collect additional documentation (e.g., notices of violation, consent decrees, and settlement agreements) and testimonial evidence.

Second, the Project Proponent must demonstrate in the GHG Project Plan that the project activity achieves a level of performance with respect to emission reductions and/or removals that is significantly better than business as usual. This is done by comparing the project activity to a performance threshold specific to each project type and established by examining data from similar recently undertaken practices in the same geographic region and industry/sector. In some cases, the performance standard will establish that common practice adoption rates of a particular GHG-reducing practice or technology are very low and, therefore, the practice or technology is deemed additional. In other cases, the performance standard benchmark represents a level of emissions or sequestration per unit output to which Project Proponents compare the measured performance of their project, demonstrating that the project activity achieves lower emissions or higher sequestration per unit output than the benchmark.

Validation of the performance standard will vary somewhat depending on the project type. For performance standards in which additionality is demonstrated by comparison to common practice adoption rates of a particular GHG-reducing practice or technology, the VVB need only check that an approved methodology was applied. For performance standards in which actual project performance (e.g., emissions or sequestration per unit output) is monitored and compared to a benchmark, the VVB will review measurement and monitoring methods as described elsewhere in this Guideline, but the performance benchmark itself will be as established in the ACR-approved methodology and need not be validated.

CHAPTER 5: VALIDATING QUANTIFICATION METHODS

ACR requires every project submitted for registration to use an ACR-approved methodology or secure ACR approval of a new methodology or methodology modification prior to validation.

This chapter addresses validation of GHG quantification methods for estimating emission reductions and removal enhancements. It includes brief descriptions of commonly used quantification methods and examples of their applicability and validation issues.

When validating quantification methods, the objective is to collect and test sufficient evidence to ensure that the methods are appropriately selected and applied to develop accurate and conservative estimates of emission reductions and removals.

Validating quantification methods requires review of four elements:

- The quantification method for each data parameter is clearly defined, and supporting documentation provided is adequate to support the level of assurance required.
- The methods are appropriate for accurately quantifying each data parameter based on the required level of assurance.
- The methods are applied consistently to develop estimates of emission reductions and removal enhancements.
- The ISO principle of conservativeness is applied (i.e., the choice of assumptions, calculation methods, parameters, data sources, and emission factors is more likely to lead to an underestimation than overestimation of net GHG emission reductions and removal enhancements).

5.A EMISSIONS DATA

Emissions data can be measured directly (e.g., with continuous emissions monitoring equipment) or indirectly estimated (e.g., by monitoring a surrogate parameter or using a predictive model). Emissions data may also be derived from activity data and emission factors, as described in later sections.

For direct emissions monitoring or process monitoring methodologies for quantifying GHG emissions, validation activities should consider the following:

- Operation and calibration of equipment;
- Existence and appropriateness of operation and maintenance standard operating procedures;
- Consistent and accurate data management;
- Representativeness of sampling for operating parameters;

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- Robustness of test data to substantiate use of process parameters as “surrogates” or to substantiate use of predictive algorithms;
- Accuracy of material and energy input and output estimates;
- Appropriate operation and maintenance of instrumentation; and
- Review of calibration records, equipment manufacturer documentation, and service records.

5.B ACTIVITY DATA

The accurate and conservative estimation of GHG emission reductions/removal enhancements is the key goal of quantification methodologies. Project Proponents will often estimate emissions based on activity data, which is the information that provides the magnitude of the activities that cause the emissions, emission reductions or enhancements (e.g., the amount of diesel consumed by a vehicle or pounds of nitrogen fertilizer applied to a field during a specified reporting period.)

The objective of validation is to confirm that the activity data used in the emission calculations (1) meet the requirements of the approved methodology and are appropriate for the emission sources; (2) have been correctly applied from the original documentation; and (3) is the most accurate data readily available. The VVB should confirm that the methodology accounts for all variations in activity data over the relevant Crediting Period.

5.C EMISSION FACTORS

Estimating GHG emissions using activity data requires the application of an emission factor. Emission factors are usually expressed as the ratio of the mass of GHG emitted to the unit weight, volume, distance, or duration of the activity emitting the GHG. In general, emission factors are either default or site-specific:

- **DEFAULT** emission factors taken from an external source such as the Revised 1996 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories, U.S. Energy Information Administration, or U.S. Environmental Protection Agency publications. They are specific to a given parameter, such as fuel type, electricity prime mover, production method, and geographic area. Default emission factors are readily available for many sources, and their use may reduce the time and cost of estimating emissions. However, because they are not based on the emission characteristics of specific facilities, they may produce less accurate results than site-specific factors.
- **SITE-SPECIFIC** emission factors are specific to a facility, plant, or unit, and must be developed for the facility based on historical data. They will tend to provide more facility-specific or operationally appropriate emission estimates, but their derivation and use will be more complex than default factors. The use of site-specific factors is warranted when feasible, as they are usually more accurate than default factors. They should be used in cases where specialized equipment has been developed to fit the specific needs of the facility or project, where the pattern of use of equipment varies significantly from the

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manufacturer's specifications, or where operating conditions may reduce the accuracy of default factors.

The objectives of validating emission factors are to:

- Confirm that the emission factors used meet the requirements of the approved methodology and are appropriate to activity;
- Confirm that the emission factors have been correctly applied from the original documentation to the relevant activity data, and that the most appropriate factors readily available have been selected;
- Where there is a choice among equally defensible emission factors, confirm that the principle of conservativeness has informed the choice of emission factors; and
- Where site-specific emission factors have been used, examine the sampling methods and calculations used to derive them, and compare them to known and accepted default factors (when available) from independent sources to assess accuracy. The VVB should evaluate both the source data and the methodology used to derive site-specific emission factors.

CHAPTER 6: VALIDATING OTHER PROJECT CRITERIA

The VVB shall review the elements of the GHG Project Plan discussed below.

6.A START DATE

ACR defines the Start Date for all projects other than AFOLU as the date on which the project began to reduce GHG emissions against its baseline. ACR defines the Start Date for AFOLU projects as the date on which the Project Proponent began the activity on project sites, with more specific guidance in Appendix A of the ACR Standard and the applicable methodology.

To validate the Start Date, the VVB shall review documentary evidence that confirms the project Start Date as described in the GHG Project Plan. Evidence may include documentation such as construction and operating permits, contracts, lease agreements, historical operational records, and third-party reports.

For projects developed using an aggregated or programmatic development approach, the Start Date will be the first date that a project activity or technology was implemented at the first site in the entire project. Individual project participants and/or sites will have site-specific implementation dates, which cannot occur prior to the Start Date.

6.B CREDITING PERIOD

Crediting Period is the finite length of time during which the project's GHG Project Plan is valid, and during which a project can generate offsets for registration on ACR against its baseline. The Crediting Period is defined in the ACR Standard or approved methodology. It is 10 years for non-AFOLU projects, unless otherwise specified in the relevant approved methodology. Longer Crediting Periods are allowed for some project types (e.g., some AFOLU activities), while other types have shorter Crediting Periods due to triggers that make the activity no longer surplus to regulations after a certain number of years (e.g., some types of landfill gas collection).

The VVB shall confirm that the temporal boundaries of the GHG project are entirely within the approved Crediting Period timeframe.

6.C MINIMUM PROJECT TERM

The Minimum Project Term is the length of time for which a Project Proponent commits to project continuance, monitoring, and verification. Minimum Project Term for different project types is specified in the ACR Standard or the approved methodology. Some project types do not have

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a minimum term; for those that do, the Project Proponent (not necessarily the landowner) commits to continue project implementation, monitoring, and verification for the minimum term and signs agreements with ACR to this effect.⁶

The VVB shall confirm whether a Minimum Project Term commitment is required for the project type. If one is required, it shall confirm that this minimum term is documented in the GHG Project Plan and the agreement between the Project Proponent and ACR. If no Minimum Project Term is required, the VVB shall confirm that the GHG Project Plan does not incorrectly indicate a Minimum Project Term.

6.D OFFSET TITLE

The Project Proponent shall provide documentation and attestation of undisputed title to all offsets prior to registration, including chain of custody documentation if offsets have been sold in the past. Title to offsets shall be clear, unique, and uncontested.

The VVB shall review the Project Proponent's ownership attestation and supporting documentation that specifies ownership of offsets title and, if applicable, ownership of the emissions sources within the project assessment boundary. Examples of such documentation may include incorporation/joint venture agreements; financial/Securities and Exchange Commission reports; contracts; lease agreements; purchase orders, invoices, and receipts; and agreements with the landowner specifying ownership of offsets.

For some project types (e.g. AFOLU), the Project Proponent and project participant will often be different entities. The Project Proponent need not own the project lands or the GHG sources and sinks thereon, but is required to demonstrate that title to the offsets is clear, unique, and uncontested.

6.E IMPERMANENCE AND RISK MITIGATION

GHG reductions/removals from terrestrial sequestration or carbon storage activities are impermanent in the sense that they may be subject to some risk of future reversal, including unintentional reversals (e.g., fire, flood, and insect infestation for terrestrial projects) and intentional reversals (e.g., landowners or project participants choosing to discontinue project activities).

For projects with a risk of reversal of GHG emission reductions/removals, Project Proponents must assess risk using an ACR-approved risk assessment tool and enter into a legally binding Reversal Risk Mitigation Agreement with ACR. Project Proponents must then mitigate reversal risk by contributing offsets to the ACR Buffer Pool (either from the project itself, or ERTs of any other type and vintage); by providing evidence of sufficient insurance coverage with an ACR-

⁶ For example, ACR AFOLU Carbon Project Reversal Risk Mitigation Agreement and ACR Buffer Pool Terms and Conditions – AFOLU Carbon Projects.

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approved insurance product to recover any future reversal; or by using another ACR-approved risk management mechanism.

The VVB shall review the Project Proponent's project-specific risk assessment, which must be conducted using the ACR Tool for Risk Analysis and Buffer Determination, and its chosen risk mitigation mechanism, supporting documentation, and analytics. The VVB shall also review the risk reversal mitigation measures implemented to ensure they are consistent with the terms set forth in the ACR AFOLU Carbon Project Reversal Risk Mitigation Agreement.

Note that ACR requires that the risk analysis and corresponding buffer contribution (if applicable) be evaluated in the GHG Project Plan. This will be included in ACR's eligibility screening report. The VVB shall independently evaluate whether the risk assessment has been conducted correctly.

6.F LEAKAGE

Leakage is an increase in GHG emissions or decrease in sequestration outside the project boundaries that occurs because of the project action. ACR requires Project Proponents to assess, account for, and mitigate leakage, and provide documentation to support mitigation assertions if the ACR Standard or approved methodology requires it. Project Proponents must deduct leakage that significantly reduces the GHG emissions reduction and/or removal benefit of the project. Specific leakage guidance is given in the ACR Standard, sector-specific standards, and approved methodologies.

The VVB shall confirm whether a leakage assessment is required. If one is required, it shall confirm that the leakage analysis and leakage deduction in the GHG Project Plan conforms to the requirements of the chosen methodology and the ACR Standard.

6.G ENVIRONMENTAL AND COMMUNITY IMPACTS

GHG projects have the potential to generate both positive and negative community and environmental impacts. ACR requires that all projects develop and disclose an impact assessment to ensure compliance with environmental and community safeguards best practices. Projects' environmental and community impacts should be net positive, and projects must "do no harm" in terms of being in violation of local, national, or international laws or regulations.

Project Proponents must identify a project's community and environmental impacts. Projects may disclose positive contributions as aligned with applicable sustainable development goals. Projects must describe the safeguard measures in place to avoid, mitigate, or compensate for potential negative impacts, and how such measures will be monitored, managed, and enforced. For more information on what the assessment should include, please refer to Section 8.A of the ACR Standard.

To examine a Project Proponent's claims of net positive community and environmental impacts, the VVB shall review publicly available information regarding the GHG project against the GHG Project Plan undergoing validation and the environmental community impact assessment; records of stakeholder consultations, if any; and results from methodologies and tools used for community and environmental impact analysis.

Net positive impacts, and the adequacy of community impact analysis and/or stakeholder consultations, are subjective criteria that are difficult to validate and verify. Therefore, the VVB is not required to provide a judgment on the adequacy of these processes or their qualitative results. However, it must confirm that the Project Proponent has evaluated community and environmental impacts, documented a mitigation plan for any foreseen negative community or environmental impacts, and disclosed any prior negative environmental or community impacts or claims of thereof.

6.H DOUBLE ISSUANCE, DOUBLE SELLING, AND DOUBLE USE OF OFFSETS

The VVB shall confirm that projects undergoing validation are not claiming emission reductions for the same project and reporting period on any other GHG registry or platform. This shall be confirmed during every reporting period throughout the project's Crediting Period. For more information on ACR's policies regarding double issuance, double selling, and double use, please refer to Chapter 10 of the ACR Standard.

6.I PROJECTS PARTICIPATING IN OTHER ASSET PROGRAMS

The VVB shall confirm if projects undergoing validation are enrolled in other asset programs (e.g., water quality trading). The VVB shall ensure that projects claiming other environmental assets have done so in accordance with the ACR Standard and the chosen methodology, and that the attributes quantified are for non-carbon benefits. This shall be confirmed during every reporting period throughout the project's Crediting Period. For more information on ACR's policies regarding participation in other asset programs, please refer to Chapter 2 of the ACR Standard.

CHAPTER 7: VALIDATION REPORT

The product of validation is a Validation Report, which is posted publicly by ACR. The Validation Report is a detailed description of the validation activities and conclusions. This report shall:

- Provide the name, address, and contact information of the VVB;
- Identify the GHG project by name and Crediting Period covered;
- Reference the ACR Standard, and approved methodology against which validation was conducted;
- Describe the validation objectives, scope, and activities, including but not limited to evaluation of:
 - ◆ Project boundary and procedures for establishing it;
 - ◆ Physical infrastructure, activities, technologies, and processes of the GHG project;
 - ◆ GHGs, sources, and sinks within the project boundary;
 - ◆ Temporal boundary;
 - ◆ Description of and justification for the baseline scenario;
 - ◆ Methods, algorithms, and calculations that will be used to generate estimates of emissions and emission reductions/removal enhancements;
 - ◆ Process information, source identification/counts, and operational details;
 - ◆ Data management systems;
 - ◆ QA/QC) procedures;
 - ◆ Processes for uncertainty assessments; and
 - ◆ Project-specific conformance to ACR eligibility criteria, including additionality.
- Describe any findings, including opportunities for improvement raised during the validation and their resolutions, including issues that required consultation with ACR and ACR's determinations on these issues, citing the specific communication and date;
- State the VVB's conclusion on the conformance of the GHG Project Plan to the ACR Standard and methodology chosen; and
- Be signed and dated by the lead validator and internal reviewer.

Note that validation and the first verification may be conducted simultaneously, and may be conducted by the same approved VVB. Therefore, it is acceptable to combine the Validation Report and Verification Report (see Chapter 12 for contents) into a single report which should also include the above information.

CHAPTER 8: VERIFICATION OVERVIEW

This chapter summarizes the objectives and scoping elements of verification necessary to register GHG project net emissions reductions/removals as ERTs. ACR's verification requirements are built on the foundation of the ISO 14064-3:2006, *Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*.

8.A DEFINITION

Verification is the systematic, independent, and documented process for the evaluation of a GHG assertion against specific criteria. The verification process is intended to assess the degree to which a project has correctly quantified net GHG reductions or removals per the validated GHG Project Plan and correctly utilizes ACR methodologies and tools. A successful verification provides reasonable assurance that the GHG assertion is without material misstatement.

8.B OBJECTIVES OF VERIFICATION

The overall goal of third-party verification is to review impartially and objectively a Project Proponent's claimed GHG emission reductions/removal enhancements against relevant ACR standards and the approved methodology. The VVB must independently evaluate the GHG assertion, based on supporting evidence and GHG verification best practice.

The objectives of verification are to evaluate the following:

- Reported GHG baseline, project emissions and emission reductions/removal enhancements, leakage assessment, and impermanence risk assessment and mitigation (if applicable);
- Any significant changes to the project procedures or criteria since the last verification; and
- Any significant changes in the GHG project's baseline emissions and emission reductions/removal enhancements since the last verification.

The VVB shall review the GHG Project Plan, GHG assertion, and any additional relevant documentation provided by the Project Proponent to determine:

- That the reported emissions reductions and/or removal enhancements are real;
- Degree of confidence in and completeness of the GHG assertion;
- That project implementation is consistent with the GHG Project Plan;
- Eligibility for registration on ACR; and
- Sources and magnitude of potential errors, omissions, and misrepresentations, including:

- ◆ Inherent risk of material misstatement; and
- ◆ Risk that the existing controls of the GHG project will not prevent or detect a material misstatement.

8.C SCOPE OF VERIFICATION

Verification shall include examination of some or all of the following elements of a GHG Project Plan:

- Physical infrastructure, activities, technologies, and processes of the GHG project;
- GHG SSRs within the project boundary;
- Temporal boundary;
- Baseline scenarios;
- Methods and calculations used to generate estimates of emissions and emission reductions/removal enhancements;
- Original underlying data and documentation as relevant and required to evaluate the GHG assertion;
- Process information, source identification/counts, and operational details;
- Data management systems;
- Roles and responsibilities of project participants or project proponent staff;
- QA/QC procedures and results;
- Processes for and results from uncertainty assessments; and
- Project-specific conformance to ACR eligibility criteria.

The VVB shall examine the reported data, quantification methodologies, calculation spreadsheets or databases, source data, project data management systems, data quality controls in place, measurement and monitoring systems, and records pertaining to emissions quantification. Calculation and error checks, site inspections, interviews with project participants, an iterative risk assessment, sampling plan, and audit checklist shall be performed to the extent necessary for the VVB to develop an understanding of how data are collected, handled, and stored for a specific project.

8.D INTERVAL OF VERIFICATION

The ACR Standard generally requires:

- A desk-based verification audit at each request for issuance of new ERTs. This is usually conducted annually, but may be more or less frequent at the discretion of the Project Proponent.
- A full verification including a field visit at the first verification and again at least every 5 years. Field verifications may be conducted more frequently (e.g., in the case of changes in

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monitoring and data management practices, or for particular project types with material parameters that can only be verified on site). Generally, for most project types, field verification is required at minimum every 5 years.⁷

- Following any reversal of sequestration that requires updating the project baseline.

If the Project Proponent selects a different VVB in the interval between field verifications, the new VVB shall continue desk audits until the next required field verification.

Please note that some ACR methodologies may not require additional site visits during a full verification after the initial verification if no significant changes have occurred to the project since successfully undergoing validation. If no additional site visits are necessary, it shall be specified in the methodology, along with what constitutes a significant change and how to fulfill the requirements of a remote full verification. All other projects must meet the full site visit requirement specified in the ACR Standard.

8.E LEVEL OF ASSURANCE

ACR considers verification to be a risk-based process in which the VVB conducts an iterative risk assessment that shall inform the sampling plan, allowing the VVB to provide a reasonable level of assurance that the GHG assertion is free of material misstatement and provides a true and fair representation of the project's net GHG emission reductions/removal enhancements.

ACR requires all Verification Statements to provide a reasonable (as opposed to absolute or limited) level of assurance. Chapter 11 includes the required wording of Verification Statements. Under this level of assurance, a GHG assertion is deemed materially correct, and a fair representation of the GHG data and information. This also indicates that the GHG assertion is prepared in accordance with the ACR Standard and the ACR-approved methodology.

8.F MATERIALITY

A material misstatement is an inaccurate assertion of an offset project's GHG emission reductions/removals, which may reasonably be expected to influence decisions or actions taken by the users of the GHG project information. To accept a Verification Statement, ACR requires that discrepancies between the emission reductions/removal enhancements claimed by the Project Proponent and estimated by the VVB be immaterial (i.e., less than ACR's materiality threshold of $\pm 5\%$).

⁷ Subject to the clarification that verification is required only prior to issuance of ERTs. If the Project Proponent (e.g., of an afforestation/reforestation project) does not seek ERT issuance for longer than 5 years after the Start Date, it is not required to verify until the first request for ERT issuance. Once this first verification takes place, subsequent field verifications must occur at least every 5 years. Additional rules regarding the field visits during a full verification is provided in Section 9.C and Appendix A of the ACR Standard

Individual or aggregation of errors or omissions greater than the ACR materiality threshold of $\pm 5\%$ require restating before a Verification Statements will be accepted. Individual and aggregation of errors or omissions greater than $\pm 1\%$ but less than $\pm 5\%$ must be qualified in the Verification Statement but do not require restating.

8.G MATERIALITY VS. PRECISION

The precision of GHG estimates is distinct from the concept of materiality. Materiality dictates that the individual or aggregation of errors and omissions exceeding the $\pm 5\%$ materiality threshold requires restatement (i.e., correcting of material errors) prior to ERT issuance.

For precision, ACR prescribes a target for the final calculation of GHG emission reductions/removal enhancements, and requires an uncertainty deduction if this target is not achieved. This is to provide flexibility to the Project Proponent, in the case that the costs of additional sampling to achieve the precision target outweigh the benefits of not having to take a deduction. The relevant text is:⁸

ACR sets a precision target of $\pm 10\%$ of the mean at 90% confidence, applied to the final calculation of emission reductions/sequestration. If the Project Proponent cannot achieve precision of $\pm 10\%$ of the mean at 90% confidence, then the reportable amount shall be the mean minus the lower bound of the 90% confidence interval, applied to the final calculation of emission reductions/removal enhancements.

The conservativeness principle dictates that if projects cannot achieve the precision target, then:

- For activities reducing emissions, proponents should report the lower bound of the confidence interval on baseline emissions and the upper bound of the confidence interval on project emissions.
- For activities enhancing terrestrial sequestration, proponents should report the upper bound of the confidence interval on baseline sequestration and the lower bound of confidence interval on project sequestration.

This approach will minimize the potential that measurement uncertainty causes an overestimation of net emission reductions/removals.

Thus, uncertainty may be greater than $\pm 5\%$, and may not be possible to reduce in a cost-effective manner. In such cases, provided there are no material errors or misstatements exceeding the ACR materiality threshold, the project may be registered but with the uncertainty deduction applied.

Because ACR requires all projects to use an approved methodology and meet the requirements of the ACR Standard, all projects must adhere to these uncertainty requirements (achieve precision of $\pm 10\%$ of the mean at 90% confidence, or else report the mean minus the lower bound of

⁸ See the ACR Standard.

the 90% confidence interval). Any required uncertainty calculations or deductions will be outlined in the applicable approved methodology.

8.H PROCEDURE FOR VERIFICATION DISCREPANCIES

If the verification requirements are not met, then a project will not be eligible to generate ERTs during that reporting period. However, if a Project Proponent believes that the verification requirements were adequately met and the VVB does not agree, the Project Participant may choose to initiate ACR's Complaints and Appeals Procedure. For more information on this process, please refer to Chapter 11 of the ACR Standard.

If a Project Proponent aborts a verification after verification services have begun but before the VVB is able to reach a conclusion with a reasonable level of assurance, the VVB shall inform ACR in writing of the status of the verification and reasons why the verification has been aborted.

CHAPTER 9: VERIFICATION ACTIVITIES

This chapter provides an overview of the activities the VVB shall perform, and the information and documentation it shall review.

9.A INFORMATION/RECORDS TO BE REVIEWED

The GHG information and records the VVB shall review include, but are not limited to:

- GHG Project Plan;
- GHG assertion;
- Previous Verification Statements;
- Operational and control procedures and records for ensuring GHG data quality;
- Documentation of GHG SSRs;
- Documentation of quantification methodologies; and
- Documentation of monitoring and measurement systems.

Verification of source-level data and records shall include the following activities:

- Determine whether the data used are appropriate and sufficient to allow for the accurate calculation or estimation of GHG emission reductions and/or removals;
- Confirm that appropriate calculation methodology was used for data that were estimated as indicated in the GHG Project Plan;
- Confirm that the units of measure used are correct, appropriate, internally consistent, and consistent with the ACR Standard, including raw data recorded in the data collection process and data stored in the project spreadsheet or database/management system and used in calculations;
- Confirm that any unit conversions have been made correctly; and
- Confirm that there are no missing data unaccounted for and that all data have been entered properly.

9.B DATA ASSESSMENT AND MANAGEMENT SYSTEMS

It is important for the VVB to develop an understanding of the GHG project data collection and management system and processes. The VVB should examine the process flow for collecting

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and processing activity or monitoring data. This will enable the tracing of data or references from their original root source to the final emissions data entered into the GHG assertion.

The VVB shall assess the project GHG data management system and its controls for sources of potential errors and omissions, including the following:

- Selection and management of GHG data and information;
- Processes for collecting, processing, aggregating, and reporting;
- Systems and processes to ensure accuracy; and
- Design and maintenance of the GHG data management system, including systems and processes that support it.

The VVB shall use the results of this GHG data management system assessment and its controls to modify the sampling plan, as needed.

The VVB shall review data management system documentation that describes the process of data collection, entry, calculation, and management. This will allow evaluation and cross-checking of factors, activity data, calculations, and estimates in the data system. Such data management system elements to review may include:

- Competency of data managers or employees responsible for collecting data;
- Emissions source type;
- Units of measure;
- Periodicity of data monitoring/collection;
- Data granularity and degree of aggregation;
- File type/format;
- Method of transfer;
- Assumptions; and
- Calibration records.

The VVB should assess the effectiveness of methods for data collection and processing, identify likely areas for data corruption or potential errors, and characterize GHG data collection and management system integration weaknesses.

9.C COLLECTION OF EVIDENCE

Verification of GHG projects shall involve collecting the following types of evidence:

- Physical evidence: direct observation of equipment or processes to demonstrate that the Project Proponent is collecting relevant data;
- Documentary evidence: paper or electronic records, which may include procedures, logs, invoices, and analytical results;
- Testimonial evidence: interviews with key personnel (e.g., technical, operations, managerial).

9.D DATA SAMPLING PLANS; RISK-BASED APPROACH

Because it is generally impractical to assess in detail all GHG information the Project Proponent collects, especially when the project assessment boundary may include many different sites, only a subset of the operations will be under the VVB's scrutiny. Thus, a key element of a successful verification is the sampling and examination of the sites/operations and sources that are chosen to undergo only a desktop review and not a full field audit.⁹

A risk-based approach, based on considerations of inherent, control, and detection risks, should be used to determine the intensity of sampling needed to collect adequate evidence to support the required level of assurance. Sampling plans shall take into account the following:

- Level of assurance targeted;
- Verification scope and criteria;
- Amount and type of evidence necessary to achieve the required level of assurance;
- Availability of evidence;
- Materiality threshold;
- Complexity of quantification methodologies;
- Quality and completeness of emissions factors and activity data;
- Method for determining representative data samples; and
- Risks of material errors, omissions, or other discrepancies.

The implementation of a verification plan should be treated as an iterative process, as the sampling plan or other aspects may need to be modified when weaknesses in controls, GHG information, and materiality issues are identified during the verification. Revisions to the verification plan should consider the sufficiency and appropriateness of evidence from testing whether any errors or inconsistencies are systematic or anomalous, together with any control evidence to support the project's GHG assertions.

Regardless of the type of verification to be performed, in nearly all cases the VVB will examine only a subset of the entire population of project data. The total amount of data available will often be too large to allow for a complete and comprehensive examination of all data. An exhaustive review of all supporting data may also be unnecessary for verification. For example, a Project Proponent may utilize summary data that have been aggregated, in which case the review of data management procedures and systems may be more important than the examination of all of the original unprocessed data. These concerns are particularly significant in the case of

⁹ Even at intervals when verification includes a field visit, it may be impractical to review all sites, land-holdings, operations, and data. In all cases, a risk-based approach as described in this section should be applied. Additional guidance is provided in sector-specific requirements for cases in which the VVB may visit only a subset of project sites (e.g., in the ACR AFOLU Appendix, with regard to verification of aggregated land-based projects).

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activity data, which may encompass hundreds or thousands of records for a wide range of sources over multiple years.

The design of a sampling plan typically involves three steps: (1) the selection of risk parameters that present a higher risk of misstatement and should be reviewed in further detail; (2) the selection of an appropriate subset of data or sites to be visited, and issues to be examined during the field audit; and (3) the selection of issues and data to examine from sites that are not selected for a focused field audit.

The proper selection of the sample of data to be examined is a crucial step in preparing a verification plan. The amount and types of data selected for examination is ultimately at the professional judgment of the VVB. Sufficient information must be examined for the VVB to make a credible statement about the quality of the project's data, data collection and management procedures, quantification methods, and related processes, balanced with considerations of time and cost. It is important for the VVB to prioritize and carefully select sample data and other issues with a medium to high risk of misstatement to investigate further. This can be done through data sampling, a process that allows the VVB to form an opinion on the data as a whole. To draw reasonable conclusions, the sample data must be representative of the total data.

9.E FIELD AND DESKTOP DATA AUDITS

During the verification planning process, the VVB must identify the key variables with the potential to cause a material misstatement in the GHG assertion. The VVB should seek to understand what types of emission SSRs are present, what types of data management systems are used, and what types of management structures are present in the Project Proponent's company and at the project site/facility. The purpose of this profile analysis is to identify and characterize individual sources of emissions project-wide, and to categorize emissions at the facility level according to the key verification parameters. After the emission sources have been characterized, the VVB shall assess the types of data management systems and management systems the Project Proponent uses.

The selection of data to be reviewed in a desktop audit shall be based upon the following:

- The assigned risk rating;
- The number of data points or facilities within the database;
- The degree of data variability; and
- The degree of missing/estimated data.

VVBs should not be limited to these criteria when selecting different parameters for field and desktop audits. Expert judgment should be exercised to ensure that a representative sample of data sets is selected and reviewed.

9.F ERROR CHECKING/TESTING

Methods for checking for potential errors associated with GHG information can be categorized into input, transformation, and output controls. Each is described below, with the applicable error checking tests to be used by the VVB.

INPUT CONTROLS. Procedures for checking the data from the measured or quantified values to a project database, and to original records. Tests for accuracy include:

- Record count: ensuring the number of data entries matches the number of units/sites reported in the GHG Project Plan;
- Valid character tests: ensuring the data entered are in a relevant format and checking for improperly entered data;
- Missing data tests: scanning for empty cells in the GHG database that are not accounted for; and
- Limits and reasonableness tests: comparing the data with predetermined limits as a reasonable test.

TRANSFORMATION CONTROLS. Checking for errors during the process of collating, transferring, processing, calculating, estimating, aggregating, disaggregating, or adjusting input data. Tests for accuracy include:

- Consistency tests: ensuring the methodologies and data handling process are consistent throughout project reporting;
- Re-computation tests: recalculating conversions, estimations, etc. using the same data and methodology provided in the database output; and
- Cross-checking tests: comparing reported results with other known results and alternative quantification methodologies.

OUTPUT CONTROLS. Controls surrounding the distribution of GHG information and comparisons between input and output information. Tests for accuracy include:

- Matching input with output: verifying that the data entered into the GHG database match the results in the GHG report.

Where applicable and available, the following types of cross-checking procedures will provide greater assurance that the reported GHG information is within the expected range. Significant departures should be investigated fully so the VVB can obtain a reasonable level of assurance.

- Internal checks within a process: compare current-year emission reductions with previous years, noting any changes to the size or usage capacity of the site;
- Checks within a sector/national grid (e.g., check if the sites' emission rates are comparable with the regional average emission rates published by the applicable regional grid authority); and

- Checks against international information (e.g., IPCC's typical emission intensity figures for different technologies in different countries).

9.G VERIFICATION OF QUANTIFICATION METHODS AND DATA SOURCES

The objectives for verification of quantification methods are to:

- Identify quantification errors in overall GHG project emissions, identify any outliers in facility-level and temporal boundaries results, and detect any methodological inconsistencies;
- Ensure the appropriateness of the estimation methods applied to the GHG project-specific situation, based on size of the sources, data availability, and associated levels of uncertainties;
- Review calculations and quantification methods used in the GHG Project Plan and/or GHG assertion to determine if results reported reflect emission estimation approach and supporting data;
- Examine quantification method documentation at the facility/source level, reviewing key facility-specific results, calculations, emission factors, and assumptions to determine validity of the quantification method;
- Examine the reported levels of accuracy and uncertainty of the emission estimates;
- Verify application of the quantification methodology by examining supporting evidence for key selected sites and major sources;
- Review methods, underlying data/assumptions, reference citations, and data management systems, from project roll-up to individual source root data, with field audits and use of external data and third-party records to confirm reported GHG emissions and reductions results;
- Determine accuracy of quantification data and whether metering and monitoring equipment operate within acceptable limits; and
- Conduct desk audits of data and calculations for a select number of sites or landholdings not included in field verification.

The process for verification of quantification methods may include the following activities, data, and, evidence (as informed by the VVB's professional judgment; not all are required):

- Review spreadsheets and aggregated data used to create estimates of GHG emission reductions and removal enhancements.
- Review raw or source data and emission factors to evaluate whether the data used are appropriate for the associated activities and sufficient to provide a reasonable estimate of the emissions from the source category.
- Identify any missing or incomplete data. In cases where a large number of data records exist and have been aggregated, the VVB should review data management practices used to compile final aggregated data.

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- Evaluate trends in calculated GHG emissions over multiple data collection and reporting periods, including comparison against relevant production data at the facility-, field-, forest- or parcel- level.
- Evaluate how data are collected and aggregated, including desktop data reviews of some key individual source data at select sites, comparing against aggregated totals.
- Perform field audit verification activities, potentially including:
 - ◆ Key personnel interviews (e.g., data management specialists, process engineers, and monitoring maintenance personnel);
 - ◆ Raw data recording, daily/monthly rollups, and data transfer practices;
 - ◆ Meter calibration, maintenance records, and frequency; and
 - ◆ Root data, quantification methods, and analytical results.
- Review key meter/instrument calibration and maintenance logs to determine adherence to QA/QC procedures.
- Perform re-computation checks for accuracy of calculations and algorithms.
- Check validity of detailed calculations, assumptions, and emission factors.
- Check spreadsheet and database calculations.
- Cross-check monitoring data with site-specific emission factors, fuel use data, and material/energy balance engineering calculations. Databases, reports, and other information systems should be checked, and manually recorded data logs, hand calculations, and spreadsheets checked in the field and compared against inventory data.
- Review original data records, identify errors and omissions in reported GHG data, and ensure accurate reporting (e.g., energy use verified by energy supplier data such as fuel shipment bills of lading, invoices, utility bills, and fuel analysis reports).
- In cases where data values can be expected to vary or be updated over the project Crediting Period, confirm that data have been adjusted accordingly.
- In cases where a single category of a data parameter has been estimated using several different sources, confirm that double counting or omission has been avoided.
- When data calculations incorporate several interrelated parameters, review to ensure that they have been calculated appropriately.
- Evaluate whether the most accurate and appropriate data parameters readily available were used, which may be affected by factors such as facility location, ambient operating conditions, and choice of measure (e.g., default vs. specific factors); identify and evaluate notable outlier data.
- Compare data to known and accepted external sources to assess accuracy and appropriateness.
- Evaluate whether the ISO principle of conservativeness has been applied in the choice of assumptions, calculation methods, emission factors, etc.

9.H VERIFICATION OF LEAKAGE ASSESSMENTS

Leakage is a decrease in sequestration or increase in emissions outside project boundaries as a result of project implementation. Leakage may be caused by shifting of the activities of people in the project area or by market effects whereby emission reductions are countered by emissions created by shifts in supply of and demand for the products and services affected by the project.

Some ACR-eligible project types require leakage to be assessed and, if deemed significant, deducted from the calculation of net emission reductions. Requirements to assess and deduct leakage will be included in the ACR-approved methodology.

Verification of estimates of leakage as part of a GHG project verification is integrally related to the validation of project assessment boundaries per Chapter 3. The VVB shall use the results of the project assessment boundaries validation, the Project Proponent's estimation of the GHG project leakage, leakage guidance in the approved methodology, and the VVB's sectoral knowledge to make an independent assessment of leakage. If there is a material discrepancy between the leakage assessment and deduction included in the GHG Project Plan or GHG assertion and the VVB's independent assessment, this discrepancy must be resolved with the Project Proponent and corrected prior to ERT issuance.

9.I VERIFICATION OF PERMANENCE AND RISK REVERSALS

GHG reductions/removals from terrestrial sequestration or carbon storage activities are impermanent in the sense that they are subject to some risk of future reversal, including unintentional reversals (e.g., fire, flood, and insect infestation for terrestrial projects) and intentional reversals (e.g., landowners or project participants choosing to discontinue project activities).

For sequestration or carbon storage projects, the VVB shall confirm that the project has conformed with the monitoring requirements for reversals and whether any reversals have occurred during the reporting period. If a reversal has occurred, the VVB shall confirm that the reversal was reported in accordance with the Reversal Risk Mitigation Agreement, the ACR Standard, and the ACR approved methodology.

CHAPTER 10: VERIFYING AGGREGATED PROJECTS

Aggregation — the pooling of activities at more than one project site into a single GHG project — is an important mechanism to make it feasible for smaller project participants to participate in carbon markets. Aggregation may provide transaction cost efficiencies for initial inventory, monitoring, and verification, and may also diversify risk. ACR does not require aggregation or discourage any project participants from bringing a project to ACR directly; however, recognizing the increasing prevalence of aggregated projects, ACR provides guidelines to Project Proponents aggregating multiple project participants.

Additional requirements for aggregated projects are provided in ACR program documents. This chapter reiterates the portions relevant to verifying aggregated carbon offset projects. Other aggregated projects may be treated similarly from a verification perspective.

10.A VERIFICATION OF AGGREGATED PROJECTS

ACR applies its requirements for initial baseline assessments, monitoring, and verification at the level of the overall project, whether it is a single large project participant or an aggregated group of smaller project participants.

Aggregated projects require that all project participants and sites be identified in the GHG Project Plan at the time of validation, as well as a single Start Date, Crediting Period, and verification schedule.

The field verification every 5 years should include such measurements as the VVB requires to provide a reasonable level of assurance that the GHG assertion is without material discrepancy as defined by ACR. ACR expects the VVB to conduct a risk-based assessment of the probability that verified GHG reductions/removals will be materially different from those reported by the Project Proponent. For aggregated projects, an initial random sample may be sufficient to detect whether more intensive sampling is required to verify the GHG assertion at the ACR materiality threshold. The VVB may randomly select a subset of the project for field verification; if any discrepancies are discovered in the initial selection, the VVB shall visit additional sites to investigate further. ACR does not require the VVB to visit every site or to conduct a minimum number of measurements, provided the GHG assertion for the overall project can be verified at a reasonable level of assurance and the Verification Statement worded accordingly.

10.B PROGRAMMATIC DEVELOPMENT APPROACH

Related to but distinct from aggregation is the concept of a Programmatic Development Approach (PDA) to project development. While an aggregated project may include a variety of sites all with the same overall baseline and Start Date, a programmatic approach adds the further nuance of incrementally adding sites into the project over time through the use of cohorts. This is important for flexibility but makes project design, baseline definition, Start Date, Crediting Period, monitoring, and verification more complex.

A PDA project is treated as a single project with an overall baseline and monitoring/verification plan. The methodology for such projects will need to establish applicability conditions and procedures for the addition of new cohorts to the project, so that it does not become necessary to redefine the baseline each time a new site is added. Individual sites within the programmatic project may have different dates of initial implementation but maintain a single start date. This will require the Project Proponent to design a clear plan and schedule for project accounting, monitoring, and verification. Practical and cost considerations may dictate that each cohort be limited to a single geographic region and relatively similar land types, and that new cohorts be added at the required verification interval every 5 years.

For verification purposes, programmatic projects are treated like an aggregated project with the Start Date corresponding to the 5-year full verification interval. A field verification should occur no less frequently than 5 years after the Start Date, as defined in the validated GHG Project Plan, and will need to occur for each cohort's validation.

The VVB should conduct such measurements as it requires to provide a reasonable level of assurance that the GHG assertion is without material discrepancy. The VVB may randomly select a subset of the project for field verification; if any discrepancies are discovered in the initial selection, the VVB shall visit additional sites to investigate further. Sites in new cohorts that have yet to be validated must be included in the VVB sampling plan during full verifications. ACR does not require the VVB to visit every site or to conduct any minimum number of measurements, provided the GHG assertion for the overall project can be verified at a reasonable level of assurance and the Verification Statement worded accordingly.

During verification of a PDA project, the VVB shall:

- Ensure that the project meets the requirements for a PDA project as specified in the ACR Standard.
- Select a subset of sites for in-depth review and site visits in lieu of 100% sampling of all sites, at the VVB's discretion. The VVB is not required to visit each site during a full verification, but site visits should include a mix of new sites and sites from previously validated cohorts.
- Review any revisions to previously validated cohort design documents, monitoring reports, and any other supporting documentation that memorializes project updates from all participating sites. This information can be compiled and presented in a single document at the project proponents discretion.

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- Provide to ACR its opinion on inclusion of the cohort, prior to registration or issuance of ERTs by way of a validation assessment that can be included in the relevant Verification Report.

CHAPTER 11: QUALITY ASSURANCE AND QUALITY CONTROL

The Project Proponent shall establish and apply QA/QC procedures to manage data and information, including the assessment of uncertainty, relevant to the baseline and project scenarios. QA/QC procedures and the minimization of overall uncertainty are integrally related to the level of assurance required for verification, the materiality of sources included in the GHG assessment boundary, and the risk of material misstatements.

11.A SOURCES OF UNCERTAINTY

Assessment of uncertainty is a key element of a GHG emission reduction project QA/QC program. Significant sources with the largest uncertainty in their emission estimates should be targeted for improvements. The goal of this iterative QA/QC process is to minimize overall uncertainty in the reported GHG information.

Uncertainty is defined as a statistical parameter associated with the result of a direct measurement or indirect quantitative estimate that characterizes the dispersion of the values that could be reasonably attributed to the measured/estimated quantity (e.g., the sample variance or coefficient of variation). For GHG emissions and reductions estimates, it refers to the lack of certainty in emissions-related data resulting from factors such as:

- Application of non-representative or inaccurate quantification methodologies or emission factors;
- Incomplete data on, or omission of, material sources;
- Lack of transparency;
- Measurement accuracy or error; and
- Weaknesses in data management systems in place to control data quality.

Reported uncertainty typically specifies a quantitative estimate of the likely difference between or dispersion among reported values, and a qualitative description of the likely causes of said differences. Quantitative uncertainty estimates performed according to the “Guide to the Expression of Uncertainty in Measurement (GUM)” (ISO 1995; updated 2008) or a similar methodology are recommended for those GHG emission reductions/removal enhancements whose estimation methodologies do not include multiple measurements that allow quantification of confidence intervals. These quantitative uncertainty estimates are an integral component of the ACR verification process.

The major sources of uncertainty associated with GHG emissions estimates include:

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- Estimation or model: quantification methods and mathematical equations;
- Parameter: quantifying parameters in method (emission factor, activity data);
- Systematic: estimation bias (e.g., non-representative data, faulty equipment);
- Statistical: random variability of sample data; and
- Project baseline: associated with assumptions used in development of baseline scenarios, projecting a set of circumstances possibly not likely to occur (e.g., technology, performance, timing, equivalent services uncertainties).

If adequate data are not available to quantify these uncertainties, expert judgment is often used to estimate them. GHG data uncertainties should be addressed in the QA/QC procedures and assessed by the VVB for adequacy and implementation results. Methods for estimating GHG emissions uncertainty to be assessed by the VVB may include:

- Qualitative discussion: sources listed and relative magnitude of uncertainties discussed;
- Subjective data quality rankings: rankings based on professional judgment assigned to each key emission factor and activity parameter;
- Data attribute ranking system: relative uncertainty numerical value criteria;
- Expert estimation used to estimate uncertainty;
- Propagation of errors: statistical techniques applied to expert estimates; and
- Direct simulation: Monte Carlo or other numerical modeling methods.

It is the VVB's role to assess which GHG uncertainty analysis method was utilized in the project's QA/QC program, its appropriateness for data quality objectives and end use, and its results. In all cases, the VVB should confirm that the appropriate uncertainty assessment procedures have been used.

11.B QA/QC PROCEDURES

QA/QC procedures are critical to estimating GHG reductions over time. The nature and extent of QA/QC activities, and whether the Project Proponent implements a formal QA/QC plan, will vary depending on the end uses of the reported GHG data. It is not the VVB's role to develop a GHG emissions reductions QA/QC plan as part of the verification, but rather to verify:

- The existence of QA/QC procedures for each of the major data gathering and processing steps, and general areas of conformance and non-conformance with said QA/QC procedures;
- The appropriateness of the QA/QC procedures or plan, with respect to its design and elements, and their relationship to the GHG project applications for the reported GHG emissions data;
- The existence of a QA/QC plan and/or documented QA/QC procedures, either developed specifically for the GHG project or developed for more general environmental or financial programs and applied to the GHG project; and

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- The actual application of QA/QC procedures as part of the GHG project emissions reduction activities, and availability of QA/QC results for review by the VVB.

A primary objective of QA/QC procedures is to identify the sources of error or uncertainty in both the data and data management system(s), and to reduce uncertainty and improve data quality. Verification activities should take advantage of any available results from the Project Proponent's ongoing QA/QC program, as it relates to emission reductions/removal data. QA/QC activities performed by the Project Proponent should provide reference data against which the VVB can check results of the verification and use as input to help plan for and guide execution of the verification activities.

QA/QC activities should be designed to address emissions estimation uncertainty and data quality. The uncertainty associated with the VVB's assessment of risk is reflected in the degree of confidence stated in its assertion: the greater the uncertainty, the lower degree of confidence in the reported results and, hence, a higher concern about risk.

QA/QC procedures for GHG projects will vary, ranging from institutional knowledge of the Project Proponent and documented general QA/QC procedures to a formal written QA/QC plan. Elements of a reporting party's QA/QC program that may be assessed include (as informed by the VVB's professional judgment; not all are required):

- Identify whether definitions of data quality objectives exist and are consistent with end uses of the reported GHG data;
- Determine if major sources of uncertainty have been identified, and whether an approach to reduce uncertainty and improve the quality of reported results has been developed and implemented;
- Confirm that applicable QC and independent QA activities have been performed;
- Confirm that data collection and management processes, and QA/QC procedures have been properly implemented;
- Confirm that QA/QC results and resolution of problems have been adequately documented, and results communicated to the GHG project team;
- Determine the degree to which any existing data quality objectives have been met, including assessments of accuracy (or uncertainty) of estimates, data completeness, representativeness, aggregation/disaggregation, comparability/consistency, and documentation; and
- Ensure the reasonableness of data and emissions estimates, validity of assumptions, methodology, and data used, and algorithmic correctness.

The QA/QC methods and results the VVB assesses may include (as informed by the VVB's professional judgment; not all are required):

- Reality checks: compare data or estimates to a standard reference value, estimates for similar sources, and expert judgment on reasonableness of value;
- Peer review: checklist of elements covered by peer review and written reviewer comments identifying issues;

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- Sample calculations: replication of a complete calculation set, hand replication of the most complex calculations, and recalculation using a different method;
- Computerized checks: review built-in QA/QC functions, variable type and value range checks, lookup tables, cell dependency, cell precedence, and error identification;
- Sensitivity analysis: focus on key variables and effects on results of emissions models and previous inventories/sensitivity analyses;
- Statistical checks: descriptive statistics and outlier detection for range checks;
- Independent internal reviews: evaluation to determine data quality, confidence in accuracy and completeness of results, and QC effectiveness; and
- Emission estimation comparisons: comparison of estimated emissions to real-world measurements (or their surrogates).

CHAPTER 12: VERIFICATION STATEMENT AND VERIFICATION REPORT

The end products of verification are a Verification Statement and Verification Report. ACR posts both publicly.

The Verification Statement is a brief statement of the VVB's opinion of the GHG assertion. This statement shall:

- Be addressed to ACR.
- Provide the VVB's name, address, and other contact information.
- Include an introductory paragraph that:
 - ◆ Identifies the project name and the project proponent;
 - ◆ Describes the level of assurance, objectives, and scope;
 - ◆ Identifies the reporting period covered by the verification; and
 - ◆ References the ACR Standard and approved methodology against which the verification was conducted.
- State the quantity of GHG emission reductions or removal enhancements in the GHG assertion for the reporting period.
- State the VVB's conclusion on the GHG assertion, including any qualifications or limitations. For acceptance by ACR, the Verification Statement shall confirm that the GHG assertion is without material discrepancy, as defined by ACR, and that the verification activities provide a reasonable level of assurance.
- Be signed by the lead verifier and internal reviewer.

The Verification Report is a more detailed description of the verification activities, corrective actions, and conclusions. This report shall:

- Provide the VVB's name, address, and other contact information.
- Include the date of report issue.
- Identify the GHG assertion verified and reporting period covered.
- Reference the ACR Standard and approved methodology against which the verification was conducted.
- Describe the verification objectives, scope, and activities, including:
 - ◆ GHG information or performance data verified (e.g., baseline GHG emissions, project GHG emissions, GHG emissions reductions and/or removal enhancements);
 - ◆ Project personnel interviewed;

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- ◆ Techniques and processes used to test the GHG information and associated GHG assertion;
- ◆ The results of quantitative uncertainty assessment and analysis of the quantification methodologies and applicable data sets and sources;
- ◆ Whether the data and information supporting the GHG assertion were based on assumptions and industry defaults, future projections, and/or actual historical records;
- ◆ Describe the leakage assessment, if required; and
- ◆ Describe any findings, including opportunities for improvement raised during the verification and their resolutions, including issues that required consultation with ACR and ACR's determinations on these issues, citing the specific communication and date.
- Include dates for any site visits, which sites were visited, and any onsite activities conducted.
- For projects requiring Project Proponents to assess risk of reversal and apply an ACR-approved risk reversal mechanism, include the VVB's opinion on the risk assessment.
- Describe the level of assurance.
- State the VVB's conclusion on the GHG assertion, including any qualifications or limitations. For acceptance by ACR, the Verification Statement shall confirm that the GHG assertion is without material discrepancy, as defined by ACR, and that the verification activities provide a reasonable level of assurance.
- Be signed and dated by the lead verifier and internal reviewer.

Note that validation and the first verification may be conducted simultaneously, and may be conducted by the same approved VVB. Therefore, it is acceptable to combine the Validation Report (see Chapter 7 for contents) and Verification Report into a single report.

CHAPTER 13: REQUIREMENTS FOR VVBs

This chapter reiterates information about current requirements for ACR-approved validators and verifiers provided on www.americancarbonregistry.org. The information on the ACR Web site — the current list of approved VVBs, accreditation and other requirements of VVBs, VVB application process and fees, and conflict of interest requirements — supersedes the information in this chapter in the case of any conflicts.

13.A REQUIREMENTS OF PROJECT VALIDATORS AND VERIFIERS

VVBs shall be accredited for project validation and verification in the scope of the applicable methodology, and VVB teams shall meet the competence requirements as set out in ISO 14065:2013. All ACR validators and verifiers must be accredited, by an accreditation body that is a member of the IAF and with which ACR has a Memorandum of Understanding (MoU), to ISO 14065:2013 (or the latest version of the standard) in the applicable sectoral scope to conduct validation(s) and/or verification(s)¹⁰¹¹. All entities must submit required documentation and evidence of accreditation for ACR approval prior to conducting work for any project registered or seeking registration on ACR.

ANSI accredits VVBs separately for validation and verification of assertions related to GHG emission reductions and removals at the project level.

ACR requires that all VVBs submit an application and verifier attestation, which defines the VVB role and responsibilities, ensuring technical capabilities and no conflicts of interest. Validation and verification activities may not be conducted until the VVB has received approval from ACR. Once approved, it is the VVB's responsibility to update ACR immediately about any changes in accreditation status or scope, enforcement activities, investigations, revocations or suspensions of the body itself, or any verifiers working on the VVB's behalf.

VVBs must also complete a project-specific conflict of interest form prior to initiating any validation or verification work. VVBs must complete the conflict of interest form for each reporting period, regardless of prior approval.

The VVB application process is detailed at www.americancarbonregistry.org.

¹⁰ ACR will consider, on a case-by-case basis, VVBs pursuing accreditation to perform validations or verifications on behalf of ACR.

¹¹ As of May 2018, ACR has an MoU with the ANSI. ACR may, in the future, enter into MoUs with other IAF member accreditation bodies.

13.B APPROVED VVBs

See www.americancarbonregistry.org.

13.C ROTATION REQUIREMENT FOR VVBs

Projects may elect to contract with the same VVB for both validation and the first verification. ACR requires that Project Proponents utilize a different VVB at a minimum of every 5 years or five verifications, whichever comes first. For Crediting Period renewals, a different VVB than conducted the initial project validation must be chosen.

13.D VVB OVERSIGHT

In addition to the accreditation processes to which all VVBs must adhere, ACR reserves the right to conduct oversight activities during validation and/or verification performance by the VVBs operating under the ACR program. Oversight activities are conducted to ensure an adequate level of quality control, and are intended to supplement accreditation body oversight and audit processes. Oversight activities conducted by ACR representatives include the following:

- Review of information and supplementary documentation submitted by VVBs regarding project-specific conflict of interest determinations;
- Review of VVB documentation such as verification and sampling plans;
- Review of Validation Reports, Verification Reports, and Verification Statements; and
- Participation during project-level audits.

13.D.1 Oversight of IAF Member-Accredited VVBs

Should ACR select an IAF member-accredited VVB for a project-level audit, the VVB must include ACR on communications with the Project Proponent, include ACR in substantive meetings with the Project Proponent, and make project-level data and information subject to validation and/or verification available to ACR for review. During a project-level audit, ACR may choose to send, at its own expense, a representative to the validation and/or verification site visit to observe on-site verification activities. After a project-level audit is complete, ACR will communicate its observations via written report directly to the VVB, which may also be made available to the accreditation body. The report will document, as applicable, any items of concern noted during validation and/or verification performance, including areas for improvement and nonconformities with ACR validation and verification procedures.

APPENDIX A: REFERENCES

- American Carbon Registry. 2018. The American Carbon Registry Standard, version 5.0. Winrock International, Little Rock, Arkansas.
- Environmental Resources Trust (ERT). 2005. Corporate Greenhouse Gas Verification Guideline, prepared for the U.S. Environmental Protection Agency's Climate Leaders Program, Washington, DC.
- International Standards Organization (ISO) 14064-2:2006(E) - Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
- International Standards Organization (ISO) 14064-3:2006(E) - Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.
- International Standards Organization (ISO) 14065:2013(E) - Greenhouse gases — Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.
- International Standards Organization (ISO) 14066:2011(E) - Greenhouse gases — Competence requirements for greenhouse gas validation teams and verification teams.
- International Standards Organization (ISO). Guide 98-3:2008 Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement.
- United States Environmental Protection Agency (USEPA) Climate Leaders Program, GHG Inventory Protocol (May 2005). <http://www.epa.gov/climateleaders/resources/inventory-guidance.html>.
- United States Environmental Protection Agency (USEPA). 2009. Using Offsets to Help Climate Leaders Achieve Their GHG Reduction Goals: Climate Leaders Offset Module Overview. EPA-430-F-09-046. <http://www.epa.gov/stateply/documents/resources/OffsetProgramOverview.pdf>.
- World Resources Institute and World Business Council for Sustainable Development (WRI/WBCSD). 2005. Greenhouse Gas Protocol Initiative, The GHG protocol for project accounting. <http://www.ghgprotocol.org/standards/project-standard>.

Attachment C

ACR Website

Attachment: WLC Response to Appeal_9JUNE2020_Part 1 (4074 : World Logistics Center)



Public Registry

Click on the links below to view public registry reports on projects, offset issuance, retirement, cancelation as well as buffer account balance and serial number search. Reports are sortable by column heading and can be searched, printed and/or downloaded as CSV or PDF file.

[Projects](#)

The [Projects Report](#) shows all projects submitted to the Registry for the voluntary and California markets and includes information on project type, status, geographic location as well as links to download project documentation.

[Issued Credits](#)

The [Issued Credits Report](#) details information about all the offsets (ERTs, California Registry Offset Credits and California Early Action Offset Credits) issued in the Registry. Information provided includes project name and type, location, quantity of offsets issued, issuance date, serial numbers and links to download project documentation.

[Retired Credits](#)

The [Retired Credits Report](#) details information on all offsets (ERTs, California Registry Offset Credits and California Early Action Offset Credits) that have been retired in the Registry. Information provided includes project name and type, location, quantity of offsets retired, retirement date, serial numbers, retirement reason and name of transferee/honoree.

[Canceled Credits](#)

The [Canceled Credits Report](#) details information on all offsets (ERTs, California Registry Offset Credits and California Early Action Offset Credits) that have been canceled in the Registry, including for issuance as California Air Resources Board Offset Credits (ARBOCs) on the ARB compliance registry. Information provided includes project name

and type, location, quantity of offsets canceled, cancelation date and reason, and serial numbers.

Buffer Pool Account Balance

The **Buffer Pool Account Balance report** shows the volume of offsets held in the ACR buffer account to protect against forest carbon project reversals.

Serial Number Search

The **Serial Number Search report** allows a search for information on offsets by serial number.

**Attachment D
American Carbon Registry,
Requirements and
Specifications for the
quantification, monitoring,
reporting, verification, and
registration of project-based
GHG emissions reductions and
removals, Version 6.0**





THE AMERICAN CARBON REGISTRY STANDARD

REQUIREMENTS AND SPECIFICATIONS FOR
THE QUANTIFICATION, MONITORING,
REPORTING, VERIFICATION, AND
REGISTRATION OF PROJECT-BASED GHG
EMISSIONS REDUCTIONS AND REMOVALS

VERSION 6.0

July 2019



THE AMERICAN CARBON REGISTRY STANDARD

REQUIREMENTS AND SPECIFICATIONS FOR THE QUANTIFICATION, MONITORING, REPORTING, VERIFICATION, AND REGISTRATION OF PROJECT-BASED GHG EMISSIONS REDUCTIONS AND REMOVALS

VERSION 6.0

July 2019

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ABOUT AMERICAN CARBON REGISTRY® (ACR)

A leading carbon offset program founded in 1996 as the first private voluntary GHG registry in the world, ACR operates in the voluntary and regulated carbon markets. ACR has unparalleled experience in the development of environmentally rigorous, science-based offset methodologies as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting through its online registry system.

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ACRONYMS

ACR	American Carbon Registry®
AEZ	agroecological zone
AFOLU	Agriculture, Forestry, and Other Land Use
CCBA	Climate, Community and Biodiversity Alliance
CDM	Clean Development Mechanism
CER	certified emission reduction
CO ₂ e	carbon dioxide-equivalent
CORSIA	Carbon Offset Reduction Scheme for International Aviation
DNA	Designated National Authority
ERT	Emission Reduction Ton
GIS	Geographic Information System
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
NDC	nationally determined contributions
ODS	ozone-depleting substance
OPR	Offset Project Registry
PDA	Programmatic Development Approach
QA/QC	quality assurance/quality control
REC	Renewable Energy Credit or Renewable Energy Certificate
RPS	Renewable Portfolio Standard

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- SOC** soil organic carbon
- UNFCCC** United Nations Framework Convention on Climate Change
- VVB** Validation/Verification Body



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INTRODUCTION

The American Carbon Registry® (ACR) is a leading carbon offset program with two decades of unparalleled carbon market experience in the development of rigorous, science-based offset standards and methodologies as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting through ACR's online registry system. ACR is a nonprofit enterprise of Winrock International. Winrock works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources. Key to this mission is building capacity for climate change mitigation and adaptation and leveraging the power of environmental markets. Since the 1990s, Winrock has been a leader in developing science-based greenhouse gas (GHG) measurement and monitoring methods and protocols.

ACR was founded in 1996 as the GHG Registry by the Environmental Resources Trust, and joined Winrock in 2007. As the first private GHG registry in the world, ACR has set the bar for offset quality that is the market standard today and continues to lead carbon market innovation.

In 2012, ACR was approved by the California Air Resources Board to serve as an Offset Project Registry (OPR) and Early Action Offset Program for the California cap-and-trade market. ACR's work as a California OPR is governed by the California cap-and-trade regulation and compliance offset protocols approved by the Air Resources Board.¹ The ACR Standard governs only the registration of projects under ACR-approved methodologies.

ACR GOVERNANCE

The ACR program is built on principles of accountability, transparency, responsiveness, and participatory processes. As an enterprise of Winrock, ACR benefits from the support and guidance of an established, reputable, global nonprofit organization. Winrock's management, executive team, and board of directors provide direct oversight of all ACR operations.

THE ACR STANDARD

The ACR Standard details ACR's requirements and specifications for the quantification, monitoring, and reporting of project-based GHG emissions reductions and removals, verification, project registration, and issuance of offsets. The Standard establishes the quality level that every project must meet in order for ACR to register its GHG emissions reductions and removals as tradable environmental assets.

¹ The California cap-and-trade regulation (Subchapter 10 Climate Change, Article 5, Sections 95801 to 96022, Title 17, California Code of Regulations) and currently approved compliance offset protocols are available at <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>.

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ACR aims to maximize flexibility and usability for Project Proponents while maintaining the environmental integrity and scientific rigor necessary to ensure that projects developed against its standards and methodologies are recognized as being of the highest quality, whether used for voluntary or pre-compliance early action purposes.

Adherence to the ACR Standard and associated methodologies will ensure that project-based offsets represent emissions reductions and removals that are real, measurable, permanent, in excess of regulatory requirements and common practice, additional to business-as-usual, net of leakage, verified by a competent independent third party, and used only once.

APPLICABILITY

Project Proponents wishing to develop a project for registration on ACR shall follow this Standard and must apply an ACR-approved methodology (as defined below).

The ACR Standard v6.0 supersedes the ACR Standard v5.1 (May 2018). Any project listed subsequent to August 1, 2019, must follow all requirements of and be validated against the ACR Standard v6.0. New projects listed prior to August 1, 2019, may be validated according to a previous version of the ACR Standard, as applicable at the time of listing. All Projects shall be verified to the version of the ACR Standard against which they were validated through the end of their Crediting Period.

Project Proponents and other interested parties should refer to www.americancarbonregistry.org for the latest version of the ACR Standard, methodologies, tools, document templates, and other guidance.

CHAPTER GUIDE

- Chapter 1** Basics on ACR
- Chapter 2** ACR's general accounting and data quality principles for offset projects
- Chapter 3** ACR project eligibility requirements
- Chapter 4** ACR tests to ensure that offset projects are additional to business-as-usual
- Chapter 5** ACR's approach to ensuring permanence of GHG reductions and removals
- Chapter 6** Process for Project Proponents to develop and register a project
- Chapter 7** Processes for ACR approval of new methodologies and methodology modifications
- Chapter 8** ACR requirements for Assessing Environmental and Community Impacts

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- Chapter 9** ACR requirements for validation and verification of all projects by a competent independent third-party verifier, which are addressed in greater detail in the ACR Validation and Verification Standard for GHG Projects
- Chapter 10** ACR linkages to other GHG programs and registries, emission trading systems, and national or sectoral GHG emissions reduction targets
- Chapter 11** ACR's appeals and complaints procedure
- Appendix A** ACR Requirements for Agriculture, Forestry, and Other Land Use (AFOLU)-based carbon projects
- Appendix B** ACR Buffer Pool Terms and Conditions, which details requirements for AFOLU projects that utilize the Buffer Pool for reversal risk mitigation
- Appendix C** Normative references on which the ACR Standard is based
- Appendix D** References on which the ACR Standard is based

The ACR Standard does not detail legal responsibilities of ACR and ACR members with regard to the use of the registry, which are provided for in the legally binding ACR Member Terms of Use Agreement and referenced operative documents such as the ACR Operating Procedures. A project-specific legal contract between ACR and Project Proponents governs use of ACR-approved risk mitigation mechanisms, including the ACR Buffer Pool, to mitigate the risk of reversals in certain types of projects.

CITATION

The appropriate citation for this document is American Carbon Registry (2019). The American Carbon Registry Standard, version 6.0., Winrock International, Little Rock, Arkansas.

CHAPTER 1: ACR BASICS

1.A DESCRIPTION OF THE ACR

The American Carbon Registry®, a nonprofit enterprise of Winrock International, is a leading carbon offset program that operates in both the voluntary and the regulated carbon markets. Founded in 1996 as the first private voluntary GHG registry in the world, ACR has two decades of unparalleled carbon market experience in the development of rigorous, science-based offset standards and methodologies as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting.

ACR operates a transparent online registry system for members to register projects and record the issuance, transfer, and retirement of serialized, project-based, and independently verified offsets. ACR's registry system records transactions directly negotiated between buyers and sellers; it is not an exchange. Offset transactions take place outside of ACR, over-the-counter or on exchanges, and are tracked on ACR through the unique serial numbers assigned to every offset.

1.B OBJECTIVES

ACR's objectives are to:

- Encourage action to manage GHG emissions;
- Provide guidance, transparent infrastructure, and science-based standards to foster high-quality reductions in GHG emissions;
- Support best practices in project-level GHG accounting;
- Commercialize innovative new methodologies;
- Encourage broad adoption of practices that mitigate climate change with significant community, economic, and environmental benefits;
- Enhance public confidence in market-based action for GHG reduction; and
- Support convergence of international and U.S. carbon markets.

1.C GEOGRAPHIC SCOPE

ACR accepts projects from worldwide locations, provided they conform to an ACR-approved methodology. Certain sectors and methodologies prescribe a narrower geographic scope (e.g., United States only).

1.D SCOPE: GREENHOUSE GASES AND PARTICULATE MATTER

ACR registers emission reductions and/or removal enhancements of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons, sulfur hexafluoride (SF₆), and black carbon. ACR's scope also includes destruction of Ozone-Depleting Substances (ODS) listed in Annexes A, B, C, and E of the Montreal Protocol.²

1.E SCOPE: PROJECT TYPES

ACR accepts all projects validated and verified against an ACR-approved methodology, provided they comply with the current version of the ACR Standard. ACR-approved methodologies include:

- Methodologies developed by ACR and approved through the public consultation and scientific peer review process;
- Methodologies approved by the Clean Development Mechanism (CDM) Executive Board, provided that, at the request of the Project Proponent, it has been reviewed and approved by ACR per the requirements found in Chapter 7;
- Modifications of existing ACR methodologies, provided such modifications have been approved by ACR per requirements found in Chapter 7; and
- New methodologies developed by external authors and approved by ACR through ACR's methodology development process described in Chapter 7.

1.E.1 Renewable Energy and Energy Efficiency Projects

ACR will register GHG reductions from renewable energy and energy efficiency projects if all of the following criteria are met:

- The project displaces direct emissions by reducing the consumption of fossil fuels at a facility that the Project Proponent owns or controls, or for which the facility owner has assigned the Project Proponent clear and uncontested offsets title. Examples are biomass co-firing with coal, biogas used to displace natural gas, and energy efficiency projects that reduce natural gas use;
- The project meets additionality and other requirements of the ACR Standard;
- The GHG reductions have not been used to meet a regulatory compliance obligation under a binding limit;
- Under jurisdictional (i.e. federal, Istate, provincial, etc.) regulations, the project does not take place at a regulated source; and

² See http://ozone.unep.org/Publications/MP_Handbook.

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- The project has not been counted toward a mandatory renewable energy obligation (such as a renewable portfolio standard) obligation or claimed any other voluntary renewable energy incentive (such as renewable energy credits).

1.E.2 Scope Exclusions

The following scope exclusions apply under the ACR program:

- Projects that do not meet all ACR eligibility criteria, including projects that convert and/or clear native ecosystems to generate carbon offsets;
- Renewable energy and energy efficiency projects unless meeting all criteria above;
- International project-level REDD (Reducing Emissions from Deforestation and Degradation) from REDD+ countries. The growing international implementation of land-based sectoral GHG accounting and crediting and/or results-based finance (REDD+) greatly increases the risk of double claiming project-based offset credits within a sectoral crediting scheme; and
- Projects quantifying energy or life-cycle GHG accounting-based indirect emissions reductions and removals.

1.F LANGUAGE

English is the operating language of ACR. All GHG Project Plans, methodologies, tools, verification statements, and other documents required by ACR shall be in English.

1.G UNIT OF MEASURE

Project Proponents shall calculate, quantify, and report all GHG reductions and removal enhancements in metric tons, converting each metric ton to its CO₂ equivalent (CO₂e) using calculations based on the 100-year Global Warming Potential factors listed in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4), Working Group 1, Chapter 2, Table 2.14.³

1.H UNIT OF EXCHANGE

The ACR unit of exchange is a verified emissions reduction, serialized and registered as an Emission Reduction Ton (ERT), denominated in metric tons of CO₂e. ERTs, also referred to as offsets, carbon offsets, and carbon offset credits, include emission reductions and removal enhancements (i.e., enhanced sequestration).

³ See http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

1.I NO EX-ANTE CREDITING

A project-based offset is the result of a defined and eligible project action that yields quantifiable and verifiable GHG emissions reductions/removals. ACR will not issue ERTs for GHG emissions reductions or removals when an emission mitigation activity has not occurred or is not yet verified. ACR will not credit a projected stream of offsets on an ex-ante basis.

1.J ADOPTION OF AND REVISIONS TO ACR STANDARDS

All ACR Standards will be posted for public comment for at least 60 days prior to adoption. ACR will prepare responses to all submitted comments and post the comments and responses along with the new version of the standard.

ACR will review and revise the ACR Standard, as necessary, at a minimum of every 3 years.

Such updates occur when significant changes to GHG accounting best practices or the legislative and/or regulatory context justify an update; when new provisions or requirements originating in methodologies make ACR aware of higher-level requirements or clarifications that should be made at the ACR Standard; upon an update to ACR's internal policy and/or process requirements; or for other reasons.

On a project level and in certain circumstances, ACR may require all projects, including those validated under a previous version of the ACR Standard, to immediately implement a policy or process revision (e.g., updated administrative reporting procedures) detailed in a subsequent version of the ACR Standard.

1.K CONFLICT OF INTEREST POLICY

As a nonprofit organization that values its reputation for integrity, Winrock requires that all management and staff adhere to its Code of Professional Conduct, which includes a strict and comprehensive policy against engaging in activities that present a conflict of interest. Accordingly, each Winrock director, officer, and staff member, including ACR staff, are required to regularly affirm that they are in compliance with this policy, that they avoid all conflicts of interest and take reasonable action to avoid circumstances that create the appearance of a conflict of interest. Winrock and ACR staff are required to notify management immediately if any conflict of interest situations arise or come to their attention so the conflict can be appropriately mitigated.

In addition to its internal conflict of interest policy, ACR requires that its third-party registry service provider maintain and adhere to a strict conflict of interest policy and that all ACR-approved Validation and Verification Bodies (VVBs) execute an Attestation of Validation/Verification Body, which defines the VVB role and responsibilities and ensures technical capabilities of all staff and

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no conflicts of interest. ACR-approved VVBs must also execute a project-specific conflict of interest form for each project validated and/or reporting period verified, which ACR reviews and approves.

CHAPTER 2: ACCOUNTING AND DATA QUALITY PRINCIPLES

The accounting and data quality principles summarized here are designed to ensure that the assumptions, values, and procedures used by Project Proponents and VVBs result in a fair and true accounting of GHG emission reductions and removals.

2.A GUIDING PRINCIPLES FOR GHG ACCOUNTING

ACR affirms a set of guiding principles, based on the International Organization for Standardization (ISO) 14064 Part 2 (2006) specifications from which all other ACR principles and eligibility criteria follow, as summarized in Table 1.

Table 1: Core GHG Accounting Principles

RELEVANCE	Select the GHG sources, GHG sinks, GHG reservoirs, data, and methodologies appropriate to the needs of the intended user.
COMPLETENESS	Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.
CONSISTENCY	Enable meaningful comparisons in GHG-related information. Use consistent methodologies for meaningful comparisons of emissions over time. Transparently document any changes to the data, boundary, methods, or any other relevant factors.
ACCURACY	Reduce bias and uncertainties as far as is practical.
TRANSPARENCY	Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
CONSERVATIVENESS	Use conservative assumptions, values, and procedures to ensure that GHG emission reductions or removal enhancements are not overestimated.

2.B METHODOLOGICAL SPECIFICATIONS FOR ADHERENCE TO GUIDING PRINCIPLES

2.B.1 Boundary Selection

GHG project boundaries include a project's physical boundary or implementation area, the GHG sources, sinks and reservoirs (or pools) considered, and the project duration.

Approved methodologies establish criteria for the selection of relevant GHG sources, sinks, and reservoirs for regular monitoring or estimation. The Project Proponent shall justify in the GHG Project Plan the exclusion from regular monitoring of any relevant GHG source, sink, or reservoir.

In accordance with ISO 14064-2:2006, approved methodologies establish criteria and procedures for quantifying GHG emissions and/or removals for selected GHG sources, sinks, and/or reservoirs. The Project Proponent shall quantify GHG emissions and/or removals separately for each relevant GHG for each GHG source, sink, and/or reservoir identified in the methodology as being relevant for the project and for the baseline scenario.

The Project Proponent shall provide a detailed description of the geographic boundary of Project Activities. A Project Activity may contain more than one facility or discrete area of land, but each facility or land area must have a unique geographical identification, and each land area must meet the sector-specific land eligibility requirements, if applicable. For AFOLU projects, the Project Proponent shall provide maps, Geographic Information System (GIS) shapefiles, and other relevant information to delineate the project boundary.

Sector-specific requirements found in Appendix A specify the required Minimum Project Term for particular project types.

2.B.2 Relevance and Completeness

Consistent with ISO 14064 Part 2, Project Proponents shall consider all relevant information that may affect the accounting and quantification of GHG reductions and removals, including estimating and accounting for any decreases in carbon pools and/or increases in GHG emission sources.

2.B.3 Uncertainty, Accuracy, and Precision

The Project Proponent shall reduce, as far as is practical, uncertainties related to the quantification of GHG emission reductions or removal enhancements.

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For methodologies based on statistical sampling (e.g., methodologies in the forestry or working land use sectors), ACR requires that the sampling error associated with the mean of the estimated emission reduction/removal not exceed $\pm 10\%$ of the mean at the 90% confidence interval to report the mean of the estimated emission reduction/removal. If the Project Proponent cannot meet this target, then the reportable amount shall be the mean minus the lower bound of the 90% confidence interval, applied to the final calculation of emission reductions/removal enhancements. If the sampling error is equal to or greater than 20%, the confidence deduction for the monitoring period must be 100%. Project-specific methodologies provide guidance how to calculate this uncertainty deduction. Methodologies submitted for ACR approval shall include methods for estimating uncertainty relevant to the project and baseline scenario.

Project Proponent are responsible for deciding if potential additional revenues from reporting the mean without an uncertainty deduction justify the additional costs of more intensive sampling to achieve precision of $\pm 10\%$ of the mean at 90% confidence, if sampling is required.

The use of biogeochemical or process models must also include an estimate of structural uncertainty related to the inadequacy of the model, model bias, and model discrepancy. This should be quantified using the best available science, and can include Monte Carlo analyses, uncertainty estimates from peer reviewed literature, and/or consulting model experts who have either developed or worked directly with the model in an academic setting.

2.B.4 Conservativeness

The methodology shall define assumptions and specify quantification methods and monitoring requirements to ensure that GHG emission reductions and removals are not overestimated, particularly in cases where estimation methods, not direct measurement, are used to populate parameters.

The following rules shall be applied when reporting emissions data to ACR for offset issuance:

- Claimed emissions reductions shall be rounded down to the nearest whole number; and
- Calculated Buffer Pool contributions shall be rounded up to the nearest whole number.

2.B.5 Emissions Factors

Where needed to estimate GHG emission reductions or removal enhancements in the project or baseline scenario, the methodology shall specify GHG emissions or removal factors that:

- Derive from a scientific peer-reviewed origin;
- Are appropriate for the GHG source or sink concerned; and
- Take account of the quantification uncertainty.

2.B.6 Managing Data Quality

The Project Proponent shall establish and apply quality assurance and quality control (QA/QC) procedures to manage data and information, including the assessment of uncertainty in the project and baseline scenarios. QA/QC procedures shall be outlined in the GHG Project Plan.

2.B.7 Participation in Other Asset Programs

In general, ACR allows carbon offset projects with multiple environmental and/or social attributes to participate in and benefit from programs that quantify achieved benefits beyond those of GHGs. However, participation in such programs is not always consistent with the ACR Standard and principles of carbon offsetting. Proposals for simultaneous reporting of non-carbon attributes will be subject to evaluation upon the ACR project listing review or, for carbon offset projects that have completed this step, upon submission of the proposal. The following requirements must be met for consideration:⁴

- Any project that seeks to register non-carbon environmental attributes alongside offsets must disclose to ACR the intent and details of the program prior to validation, if known;
- The attributes quantified for the non-carbon benefits must be distinct from the GHG benefits such that they have separately defined accounting units (e.g., pounds of nutrients in the case of water quality credits versus metric tons of CO₂e);
- The attributes quantified for the non-carbon benefits must represent a well-defined and distinct ecosystem service that can be “stacked” with offsets, such that they could be financially incentivized separately from the carbon benefit⁵
- The project action must not be required by regulation to achieve the quantified non-carbon benefit; and
- The project action must not compensate for an activity outside the project’s geographic boundary that results in release of GHGs or loss of a carbon sink (e.g., wetlands mitigation banking).

⁴ This section is not relevant to RECs, which are discussed in Chapter 1, Section E.

⁵ Any project using an ACR-approved GHG quantification methodology for issuance of offsets may choose to quantify alternate environmental and/or social benefits. However, these benefits may not always be creditable in a non-carbon environmental market at the same time as the GHG emissions reductions and removals benefits represented by offsets.

CHAPTER 3: PROJECT ELIGIBILITY REQUIREMENTS

Table 2 details ACR eligibility criteria for all projects, defines each criterion, and articulates ACR requirements. Eligibility requirements for specific project types are summarized in the relevant ACR sector standard and/or methodology. Project Proponents shall address, in their GHG Project Plan, each of the criteria below.

Table 2: Eligibility Requirements for Offset Projects

CRITERION	DEFINITION	ACR REQUIREMENT
Start Date ^{6,7}	<p>ACR defines the Start Date for all projects other than AFOLU as the date on which the project began to reduce GHG emissions against its baseline.</p> <p>ACR defines the eligible Start Date(s) for AFOLU project types in Annex A, “ACR Requirements for AFOLU-Based Carbon Projects.”</p>	<p>Non-AFOLU Projects must be validated within 2 years of the project Start Date. AFOLU Projects must be validated within 3 years of the project Start Date.</p> <p>One exception applies to these timeframes: Projects using a newly approved methodology⁸ or a newly approved modification that expands the eligibility of a previously published methodology⁹ may submit it for listing with ACR within 10 years of the project Start Date. However, the date of listing submittal must be within 6 months of the methodology publication date, and the project must then be validated within 2 years of the listing.</p> <p>The Start Date and the start of the Minimum Project Term shall be the same. The Start Date and the start of the first Crediting Period</p>

⁶ The Start Date requirements do not apply to existing ACR projects that renew a Crediting Period. In these instances, the initial project Start Date, as previously validated, shall apply and shall be accepted in the Crediting Period renewal validation process on a de facto basis.

⁷ Projects transferring to ACR from another GHG program and that have reached the end of a Crediting Period may apply for an initial Crediting Period at ACR per ACR Standard requirements. The project must have been successfully validated and/or verified at the previous GHG program, and must have a validated/verified Start Date of January 1, 2000, or after.

⁸ A methodology is considered “newly approved” if ACR has published it no more than 6 months prior to the project’s listing or registration with ACR. See Chapter 6 for guidance on ACR listing and registration requirements.

⁹ The project must demonstrate that it was not eligible under the previously published version of the relevant methodology, without the newly approved modification.

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CRITERION	DEFINITION	ACR REQUIREMENT
		are generally the same, unless otherwise allowable in the relevant methodology.
Minimum Project Term	The minimum length of time for which a Project Proponent commits to project continuance, monitoring, and verification.	<p>The Minimum Project Term for specific project types is defined in the relevant ACR sector requirements and/or methodology. Project types with no risk of reversal after crediting have no required Minimum Project Term. Project Proponents of AFOLU projects with a risk of reversal shall commit to a Minimum Project Term of 40 years. The minimum term begins on the Start Date, not the first or last year of crediting.</p> <p>The Minimum Project Term is a requirement of the Project Proponent, not necessarily of the landowner (unless the landowner is the Project Proponent). ACR enters into legal agreements only with the Project Proponent. Agreements between Project Proponent and landowner may have a shorter term and/or a “buy-out” option, provided the Project Proponent commits to replace issued ERTs in the event a landowner opts to discontinue Project Activities. See Chapter 4 and Chapter 6.</p> <p>Project Proponents and landowners may continue AFOLU carbon activities beyond the Minimum Project Term, but ACR does not require monitoring or verification unless the Crediting Period is renewed. At the end of the Minimum Project Term, if the Project Proponent does not renew for another Crediting Period and continue monitoring and verification, ACR conservatively assumes that its activities have ceased and retains and may require any remaining buffer contributions (if applicable).</p>
Crediting Period	Crediting Period is the finite length of time for which a GHG Project Plan is valid, and during	The Crediting Period for non-AFOLU projects shall be 10 years. AFOLU projects may have different Crediting Periods, as specified in the relevant ACR sector requirements or methodology.

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CRITERION	DEFINITION	ACR REQUIREMENT
	<p>which a project can generate offsets against its baseline scenario.</p> <p>Crediting Periods are limited in order to require Project Proponents to reconfirm, at intervals appropriate to the project type, that the baseline scenario remains realistic and credible, the Project Activity remains additional, and GHG accounting best practice is being used. This is important because once a project has demonstrated its additionality, it is not required to do so again until applying to renew the Crediting Period.</p>	<p>A Project Proponent may apply to renew the Crediting Period by complying with all then-current ACR requirements, re-evaluating the baseline scenario, reconfirming additionality, and using emission factors, tools, and methodologies in effect at the time of renewal. Except where specified in a methodology, ACR does not limit the number of renewals.</p> <p>Projects that are deemed to meet all ACR additionality criteria are considered additional for the duration of their Crediting Period. If regulations or common practice change during the Crediting Period, this may make the project non-additional and thus ineligible for renewal but does not affect its additionality during the current Crediting Period, unless otherwise specified in the project-specific methodology.</p>
Real	<p>A real offset is the result of a project action that yields quantifiable and verifiable GHG emissions reductions and/or removals.</p>	<p>GHG reductions and/or removals shall result from an emission mitigation activity that has been conducted in accordance with an approved ACR Methodology and is verifiable. ACR will not credit a projected stream of offsets on an ex-ante basis.</p>
Emission or Removal Origin	<p>An emission or removal is direct if it originates from sources or sinks over which the Project Proponent has control.</p> <p>An emission or removal is indirect if it originates at sources or sinks over which the Project Proponent does not have control.</p>	<p>For projects reducing or removing direct emissions, the following requirement applies:</p> <p>The Project Proponent shall own, have control over, or document effective control over the GHG sources/sinks from which the emissions reductions or removals originate. If the Project Proponent does not own or control the GHG sources or sinks, it shall document that effective control exists over the GHG sources and/or sinks from which the reductions/removals originate.</p>

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CRITERION	DEFINITION	ACR REQUIREMENT
		<p>For projects reducing or removing non-energy indirect emissions,¹⁰ the following requirement applies:</p> <p>The Project Proponent shall document that no other entity may claim GHG emission reductions or removals from the Project Activity (i.e., that no other entity may make an ownership claim to the emission reductions or removals for which credits are sought).</p>
Offset Title	Offset title is a legal term representing rights and interests in an offset, a future stream of offsets, or a project delivering offsets.	<p>The Project Proponent shall provide documentation and attestation of undisputed title to all offsets prior to registration. Title to offsets shall be clear, unique, and uncontested.</p> <p>ACR will issue offsets into the account of a Project Proponent only if there is clear, unencumbered, and uncontested offset title.</p>
Additional	GHG emission reductions and removal enhancements are additional if they exceed those that would have occurred in the absence of the Project Activity and under a business-as-usual scenario.	<p>Every project shall use either an ACR-approved performance standard and pass a regulatory surplus test, or pass a three-pronged test of additionality in which the project must:</p> <ol style="list-style-type: none"> 1. Exceed regulatory/legal requirements; 2. Go beyond common practice; and 3. Overcome at least one of three implementation barriers: institutional, financial, or technical.
Regulatory Compliance	Adherence to all laws, regulations, and other legally binding mandates directly related to Project Activities.	Projects must maintain material regulatory compliance. To do this, a regulatory body/bodies must deem that a project is not out of compliance at any point during a reporting period. Projects deemed to be out of compliance with regulatory requirements are not eligible to earn ERTs during the period of non-compliance. Regulatory compliance violations related to administrative processes

¹⁰ ACR will not consider projects or methodologies for indirect emissions reductions/removals based on life-cycle GHG accounting methods.

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CRITERION	DEFINITION	ACR REQUIREMENT
		<p>(e.g., missed application or reporting deadlines) or for issues unrelated to integrity of the GHG emissions reductions shall be treated on a case-by-case basis and may not disqualify a project from ERT issuance. Project Proponents are required to provide a regulatory compliance attestation to a verification body at each verification. This attestation must disclose all violations or other instances of non-compliance with laws, regulations, or other legally binding mandates directly related to Project Activities.</p>
<p>Permanent</p>	<p>Permanence refers to the longevity of removal enhancements and the risk of reversal (i.e., the risk that atmospheric benefit will not be permanent). Reversals may be unintentional or intentional.</p>	<p>For projects with a risk of reversal of GHG removal enhancements or avoided conversion projects, Project Proponents shall assess and mitigate risk, and monitor, report, and compensate for reversals.</p> <p>AFOLU Project Proponents shall assess reversal risk using ACR’s Tool for Risk Analysis and Buffer Determination, and shall enter into a legally binding Reversal Risk Mitigation Agreement with ACR/Winrock that details the risk mitigation option selected and the requirements for reporting and compensating reversals.</p> <p>Proponents of terrestrial sequestration or avoided conversion projects shall mitigate reversal risk by contributing ERTs to the ACR Buffer Pool or using another ACR-approved insurance or risk mitigation mechanism. Proponents of geologic sequestration projects shall mitigate reversal risk during the project term by contributing ERTs to the ACR Reserve Account and post-project term by filing a Risk Mitigation Covenant, which prohibits any intentional reversal unless there is advance compensation to ACR, or by using another ACR-approved insurance or risk mitigation mechanism.</p>

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CRITERION	DEFINITION	ACR REQUIREMENT
		All projects must adhere to ongoing monitoring, reversal reporting, and compensation requirements as detailed in relevant methodologies and legally binding agreements (e.g., the ACR Reversal Risk Mitigation Agreement).
Net of Leakage	Leakage is an increase in GHG emissions or decrease in sequestration outside the project boundaries that occurs because of the project action.	ACR requires Project Proponents to address, account for, and mitigate certain types of leakage, according to the relevant sector requirements and methodology conditions. Project Proponents must deduct leakage that reduces the GHG emissions reduction and/or removal benefit of a project in excess of any applicable threshold specified in the methodology.
Independently Validated	Validation is the systematic, independent, and documented process for the evaluation of a GHG Project Plan against applicable requirements of the ACR Standard and approved methodology.	<p>ACR requires third-party validation of the GHG Project Plan by an accredited, ACR-approved VVB once during each Crediting Period and prior to issuance of ERTs.</p> <p>Validation can be conducted at the same time and by the same VVB as a full verification; however, the deadline for validation is determined by the methodology being implemented and the project Start Date (see above). Governing documents for validation are the ACR Standard, including sector-specific requirements, the relevant methodology, and the ACR Validation and Verification Standard.</p>
Independently Verified	Verification is the systematic, independent, and documented assessment by a qualified and impartial third party of the GHG assertion for a specific reporting period.	<p>Verification must be conducted by an accredited, ACR-approved VVB prior to any issuance of ERTs and at minimum specified intervals.</p> <p>ACR requires verifiers to provide a reasonable, not limited, level of assurance that the GHG assertion is without material discrepancy. ACR's materiality threshold is $\pm 5\%$.</p>

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CRITERION	DEFINITION	ACR REQUIREMENT
Environmental and Community Assessments	<p>Projects have the potential to generate positive and negative community and environmental impacts. Appropriate safeguard procedures can identify, evaluate, and manage potential negative impacts. Positive impacts can contribute to sustainable development objectives.</p>	<p>ACR requires that all projects develop and disclose an impact assessment to ensure compliance with environmental and community safeguards best practices. Environmental and community impacts should be net positive, and projects must “do no harm” in terms of violating local, national, or international laws or regulations.</p> <p>Project Proponents must identify in the GHG Project Plan community and environmental impacts of their project(s). Projects shall also disclose and describe positive contributions as aligned with applicable sustainable development goals. Projects must describe the safeguard measures in place to avoid, mitigate, or compensate for potential negative impacts, and how such measures will be monitored, managed, and enforced.</p> <p>ACR does not require that a particular process or tool be used for the impact assessment as long as basic requirements defined by ACR are addressed. (See Chapter 8) ACR projects can follow internationally recognized approaches such as The World Bank Safeguard Policies, or can be combined with the Climate Community and Biodiversity Alliance (CCBA) Standard or the Social Carbon Standard for the assessment, monitoring, and reporting of environmental and community impacts.</p> <p>Project Proponents shall disclose in their Annual Attestations any negative environmental or community impacts or claims thereof and the appropriate mitigation measure.</p> <p>ACR reserves the right to refuse to list or issue credits to a project based on community or environmental impacts that have not or cannot be mitigated, or that present a significant risk of future negative environmental or community impacts.</p>

CHAPTER 4: ADDITIONALITY

ACR's additionality requirements are intended to ensure that credited offsets exceed the GHG reductions and removals that would have occurred under current laws and regulations, current industry practices, and without carbon market incentives. Project Proponents must demonstrate that the GHG emission reductions and removals from an offset project are above and beyond the "business as usual" scenario. To qualify as additional, ACR requires every project:

- Either to exceed an approved performance standard, as defined in the applicable methodology, and a regulatory additionality test; or
- To pass a three-prong test of additionality.

4.A THREE-PRONG ADDITIONALITY TEST

This approach combines three tests that help determine whether GHG emission reductions and removals from an offset project are above and beyond the "business as usual" scenario. This does not mean the Project Activity delivers no financial or other benefits other than GHG reduction; it simply attempts to ascertain whether GHG reduction was a significant factor.

The three-prong test requires projects to demonstrate that they exceed currently effective and enforced laws and regulations; exceed common practice in the relevant industry sector and geographic region; and face at least one of three implementation barriers (financial, technological, or institutional). The three-prong test is described in Table 3 on the next page. The GHG Project Plan must present a credible demonstration, acceptable to ACR and the VVB, that the project passes these tests.

Some ACR-approved methodologies require application of an additionality tool to assist Project Proponents in demonstrating additionality. ACR does not require all methodologies to mandate application of an additionality tool; however, if the relevant methodology requires one, its use is mandatory, unless otherwise indicated by the ACR-approved conditions for use of the methodology.¹¹

¹¹ An example is some CDM methodologies approved by ACR.

Table 3: Three-Prong Additionality Test

TEST	KEY QUESTIONS
REGULATORY SURPLUS	<p>Is there an existing law, regulation, statute, legal ruling, or other regulatory framework in effect as of the project Start Date that mandates the Project Activity or effectively requires the GHG emissions reductions?</p> <p>YES = FAIL NO = PASS</p>
COMMON PRACTICE	<p>In the field or industry/sector, is there widespread deployment of this project, technology, or practice within the relevant geographic area?</p> <p>YES = FAIL NO = PASS</p>
IMPLEMENTATION BARRIERS	<p>CHOOSE ONE OF THE FOLLOWING THREE</p> <p>Financial Does the project face capital constraints that carbon revenues could address; or is carbon funding reasonably expected to incentivize the project's implementation; or are carbon revenues a key element to maintaining the project action's ongoing economic viability after its implementation? YES = PASS NO = FAIL</p> <p>Technological Does the project face significant technological barriers such as R&D deployment risk, uncorrected market failures, lack of trained personnel and supporting infrastructure for technology implementation, or lack of knowledge on practice/activity, and are carbon market incentives a key element in overcoming these barriers? YES = PASS NO = FAIL</p> <p>Institutional Does the project face significant organizational, cultural, or social barriers to implementation, and are carbon market incentives a key element in overcoming these barriers? YES = PASS NO = FAIL</p>
<p>If the project passes the Regulatory Surplus and Common Practice tests and at least one Implementation Barrier test, ACR considers the project additional.</p>	

4.A.1 Regulatory Surplus Test

The regulatory surplus test requires the Project Proponent to evaluate existing laws, regulations, statutes, legal rulings, or other regulatory frameworks that directly or indirectly affect GHG emissions associated with a project action or its baseline candidates, and which require technical,

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performance, or management actions. These legal requirements may require the use of a specific technology, meeting a certain standard of performance (e.g., new source performance standards), or managing operations according to a certain set of criteria or practices (e.g., forest practice rules). In determining whether an action is surplus to regulations, the Project Proponent does not need to consider voluntary agreements without an enforcement mechanism, proposed laws or regulations, optional guidelines, or general government policies.

Projects that are deemed regulatory surplus are considered surplus for the duration of their Crediting Period. If regulations change during the Crediting Period, this may make the project non-additional and thus ineligible for renewal, but does not affect its additionality during the current Crediting Period, unless otherwise specified in the project-specific methodology. AFOLU projects with easements need to consider the legally binding requirements of the easement if the recordation date is within 1 year of the project Start Date. (The constraints outlined in the easement would also need to be included in the baseline scenario within this time frame.)

4.A.2 Common Practice Test

The common practice test requires the Project Proponent to evaluate the predominant technologies or practices in use in a particular industry, sector, and/or geographic region, as determined by the degree to which those technologies or practices have penetrated the market, and demonstrate that the proposed Project Activity is not common practice and will reduce GHG emissions below levels produced by common technologies or practices within a comparable environment (e.g., geographic area, regulatory framework, investment climate, access to technology/financing).

The level of penetration that represents common practice may differ between sectors and geographic areas, depending on the diversity of baseline candidates. The common practice penetration rate or market share for a technology or practice may be quite low if there are many alternative technologies and practices. Conversely, the common practice penetration rate or market share may be quite high if there are few alternative technologies or practices. Projects that are “first of its kind” are not common practice.

Projects that are deemed to go beyond common practice are considered as such for the duration of their Crediting Period. If common practice adoption rates of a particular technology or practice change during the Crediting Period, this may make the project non-additional and thus ineligible for renewal; however, this does not affect its additionality during the current Crediting Period.

Note that the common practice test, a component of the three-prong test, is distinct from a performance standard. For some activities, the data used to define common practice in a particular industry, sector, or region may be functionally equivalent to the data required to establish an acceptable practice-based performance standard. In such cases, Project Proponents may elect the option to demonstrate additionality by defining a practice-based performance standard and demonstrating that the Project Activity both exceeds this standard and is surplus to regulations.

4.A.3 Implementation Barriers Test

An implementation barrier represents any factor that would prevent the adoption of the Project Activity the Project Proponent proposes. Generally, there are no barriers to the continuation of current activities, exceptions being regulatory or market changes that force a shift in a Project Activity or the end of equipment's useful lifetime.

Under the implementation barriers test, Project Proponents shall choose at least one of three barrier assessments (financial, technological, or institutional). Project Proponents may demonstrate that the Project Activity faces more than one implementation barrier, but are not required to address more than one barrier.

- **FINANCIAL BARRIERS** include high costs, limited access to capital, or an internal rate of return in the absence of carbon revenues that is lower than the Project Proponent's established and documentable minimum acceptable rate. Financial barriers can also include high risks such as unproven technologies or business models, poor credit rating of project partners, and project failure risk. If electing the financial implementation barrier test, Project Proponents shall include solid quantitative evidence such as net present value and internal rate of return calculations.
- **TECHNOLOGICAL BARRIERS** include R&D deployment risk, uncorrected market failures, lack of trained personnel and supporting infrastructure for technology implementation, and lack of knowledge on practice/activity.
- **INSTITUTIONAL BARRIERS** include institutional opposition to technology implementation, limited capacity for technology implementation, lack of management consensus, aversion to upfront costs, and lack of awareness of benefits.

4.B PERFORMANCE STANDARD APPROACHES

In lieu of the three-prong test, ACR also recognizes the "performance standard" approach, in which additionality is demonstrated by showing that a proposed Project Activity is (1) surplus to regulations, and (2) exceeds a performance standard as defined in an approved methodology.

Project Proponents must first establish regulatory additionality per the requirements in section A.1 of this chapter.

Second, under the performance standard approach, projects are required to achieve a level of performance that, with respect to emission reductions or removals, or technologies or practices, is significantly better than average compared with similar recently undertaken practices or activities in a relevant geographic area.¹² The performance threshold may be:

- **PRACTICE-BASED**, developed by evaluating the adoption rates or penetration levels of a particular practice in a relevant industry, sector, or sub-sector. If these levels are sufficiently low that it is determined the Project Activity is not common practice, then the activity is

¹² Adapted from the U.S. Environmental Protection Agency Climate Leaders offset methodologies at <http://www.epa.gov/stateply/resources/optional-module.html>.

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considered additional. Specific thresholds may vary by industry, sector, geography, and practice, and are specified in the relevant methodology.

- **TECHNOLOGY STANDARD:** Installation of a particular GHG-reducing technology may be determined to be sufficiently uncommon that simply installing the technology is considered additional.
- **EMISSIONS RATE OR BENCHMARK** (e.g., tons of CO₂e emission per unit of output) with examination of sufficient data to assign an emission rate that characterizes the industry, sector, subsector, or typical land management regime, the net GHG emissions/removals associated with the Project Activity, in excess of this benchmark, may be considered additional and credited.

Performance standard baselines specific to particular project types, activities, and regions will be detailed in the relevant ACR-approved methodologies.

CHAPTER 5: PERMANENCE

In GHG accounting, permanence refers to the perpetual nature of GHG removal enhancements (or avoided emissions from conversion) and the risk that a project's atmospheric benefit will not be permanent. GHG emissions reductions from terrestrial sources and sinks may not be permanent if a project has exposure to risk factors such as intentional or unintentional events that result in emissions into the atmosphere of stored or sequestered CO₂e for which offset credits were issued (termed a Reversal). Impermanence is not an issue for some project types for which the GHG reductions or avoidance are not reversible once they occur. However, terrestrial and geologic sequestration and avoided conversion projects have the potential for GHG reductions and removals to be reversed upon exposure to risk factors, including unintentional reversals (e.g., fire, flood, and insect infestation for terrestrial projects, and unanticipated releases of CO₂ for geologic projects) and intentional reversals (e.g., landowners or Project Proponents choosing to discontinue AFOLU Project Activities and/or participate in an activity that reverses the sequestration previously achieved by a carbon sink, and for geologic sequestration, the release of stored CO₂ that is intentional or that is a collateral effect of any planned activities affecting the storage volume).

ACR AFOLU projects must commit to maintain, monitor, and verify Project Activity for a Minimum Project Term of 40 years. The Minimum Project Term is not equated with the assurance of permanence, because no length of time, short of perpetual, is truly permanent, nor is there a sound scientific basis or accepted international standard around any number of years that equates to an emission reduction/removal being permanent. Only well-designed reversal risk mitigation mechanisms can make sequestration-based offsets effectively permanent and fungible with permanent offsets. Assessment and mitigation of reversal risk ensures that any losses of sequestration (i.e., increases in atmospheric GHG concentrations), whether occurring from an unforeseen natural disturbance or from an intentional discontinuation of sequestration activities, are effectively compensated and the atmosphere "made whole."

ACR requires that projects with a risk of reversals shall assess and mitigate risk, and monitor, report, and compensate for reversals.

5.A ASSESSMENT OF RISK

Project Proponents of terrestrial sequestration and avoided conversion projects with a risk of reversal must conduct a reversal risk assessment using an ACR-approved tool that addresses both general and project-specific risk factors. General risk factors include financial failure, technical failure, management failure, rising land opportunity costs, regulatory and social instability, and natural disturbances. Project-specific risk factors vary by project type.

AFOLU Project Proponents shall conduct their risk assessment using the ACR Tool for Risk Analysis and Buffer Determination. The output of the tool is an overall risk-rating percentage for the project, translating into a number of offsets that must be deposited in the ACR Buffer Pool Account to mitigate the risk of reversal, the Minimum Buffer Percentage.

The risk assessment, overall risk category, Minimum Buffer Percentage, and calculated Buffer Contribution amount shall be included in the GHG Project Plan and Monitoring Report. ACR evaluates the proposed overall risk category and corresponding buffer contribution, and the VVB evaluates whether the risk assessment has been conducted correctly. Concurrent with each issuance of offsets to the project, the Project Proponent shall contribute offsets to the Buffer Account equal to the sum of the Minimum Buffer Percentage multiplied by each of the annual volumes of offsets being issued.

If no reversals occur, the project's risk category and Minimum Buffer Percentage may remain unchanged for 5 years. The risk analysis must be re-evaluated at least every 5 years, or coincident with site visit verification. An exception is in the event of a reversal, in which case the project baseline, risk category, and Minimum Buffer Contribution shall be immediately re-assessed and re-verified.

5.B REVERSAL MITIGATION, REPORTING, AND COMPENSATION

Project Proponents of AFOLU projects with risk of reversal shall enter into a legally binding Reversal Risk Mitigation Agreement with ACR/Winrock that allows them to select a reversal risk mitigation mechanism and details the requirements for reporting and compensating reversals. Should reversals occur the requirements and liabilities associated with replacing lost ERTs rest with the Project Proponent, and not necessarily with the individual land owner(s) per the Risk Mitigation Agreement.

5.B.1 Primary AFOLU Risk Mitigation Mechanism: The ACR Buffer Pool

Project Proponents choosing the ACR Buffer Pool as the risk mitigation mechanism agree to the ACR Buffer Pool Terms and Conditions (Exhibit 1), which detail the operation of the Buffer Pool and requirements of the Project Proponent. Generally, the project contributes to the Buffer Pool account the number of offsets as determined by the project-specific risk assessment in order to replace unforeseen losses. ACR has sole management and operational control over the offsets in the Buffer Pool.

5.B.2 Geologic Sequestration Risk Mitigation Mechanisms

For geologic sequestration projects, Project Proponents must contribute 10% of the project's offset credits to a Reserve Account, managed by ACR, from which offsets will be retired in the event of a reversal during the Project Term. The reversed quantity shall be measured and reported, verified, and compensated by retiring an equivalent volume of offset credits from the Reserve Account. Reversals post-Project Term are compensated as outlined in the legally binding Risk Mitigation Covenant, filed in the real property records of each county, parish, and other

governmental subdivision that maintains real property records, which prohibits any intentional reversal unless there is advance compensation to ACR.

5.B.3 Alternate Risk Mitigation Mechanisms

In lieu of making a Buffer Pool Contribution or Reserve Account Contribution, Project Proponents may propose an insurance product for ACR approval as a risk mitigation mechanism. Insurance may be a financial product based on an actuarial analysis of project risk that considers circumstances such as the region, threats, and mitigating factors. This is similar to the assessment done for property insurance.

The Project Proponent may provide insurance, bonds, letters of credit, or other financial assurances to ACR in amounts, and in form and substance, satisfactory to ACR in its sole and absolute discretion. Such financial products must assure provision of sufficient funds to ACR, in the event a project suffers an unintentional or intentional reversal of sequestered carbon, to purchase and retire a number of ERTs sufficient to offset such reversal. There may be no hidden costs, exclusions, or unanticipated liabilities. ACR must approve the proposed alternative after it conducts due diligence, which will be at the Project Proponent's or insurance provider's expense.

5.C MONITORING FOR REVERSALS

All projects must adhere to ongoing monitoring requirements as detailed in relevant methodologies, including ongoing verification during the Minimum Project Term.

For Geologic Sequestration, Project Proponents are required to demonstrate that the CO₂ captured and stored is permanently sequestered underground through detailed post-injection monitoring, required until it can be verified that no migration of injected CO₂ is detected across the boundaries of the storage volume and the modeled failure scenarios indicate that the CO₂ will remain contained within the storage volume. The Risk Mitigation Agreement details ongoing monitoring requirements.

5.D REVERSAL REPORTING AND COMPENSATION

AFOLU reversals must be reported and compensated following requirements detailed in the ACR AFOLU Carbon Project Reversal Risk Mitigation Agreement and the Buffer Pool Terms and Conditions. Geologic sequestration reversals must be reported and compensated following requirements as detailed in applicable methodology. In the event of reversals during the project term, the quantity shall be measured and reported, verified, and compensated by retiring offset credits from the Reserve Account. Reversals post-Project Term are compensated as outlined in the Risk Mitigation Covenant, which prohibits any intentional reversal unless there is advance compensation to ACR.

CHAPTER 6: PROJECT DEVELOPMENT TRAJECTORY

Every project submitted for registration must use an ACR-approved methodology. This chapter focuses on the project development steps that occur after the methodology has been approved: Project listing, validation and verification, and issuance of ERTs.

6.A PROJECT DEVELOPMENT PROCESS

A Project Proponent using an ACR-approved methodology shall proceed per the following sequence of steps:

1. Project Proponent submits a GHG Project Listing Form using the template found at www.americancarbonregistry.org.
2. ACR reviews the GHG Project Listing Form for completeness, and a compatibility check with the ACR Standard, at fees per the currently published ACR fee schedule.¹³ This screening results in (a) Project Listing with approval to proceed to Validation/Verification Body (VVB) selection, (b) requests for clarifications or corrections, or (c) rejection because the project is ineligible or does not meet requirements of the ACR Standard. If the ACR screening includes requests for clarifications or corrections, the Project Proponent may re-submit the GHG Project Listing Form for further review. ACR reserves the right to accept or reject a GHG Project Listing at any time and for any reason during the review. A project is considered to be listed once the GHG Project Listing Form is approved. The project listing information and form will then be made public on ACR.
3. Having received listing approval to proceed to VVB selection, the Project Proponent selects an ACR-approved independent third-party VVB to validate the GHG Project Plan and verify the Project's GHG assertions for the first reporting period as presented in the monitoring report. The VVB shall submit to ACR a Conflict of Interest self-evaluation form for review. ACR must approve the VVB selection prior to the start of validation and verification services based on proper accreditation, conflict of interest review, and VVB rotation requirements.
4. Validation and the first verification may occur simultaneously and must occur prior to issuance of ERTs. Fees for validation and verification are as agreed between the Project Proponent and verifier. This results in submission to ACR of a validated GHG Project Plan, verified monitoring report, validation report, verification report, and verification statement.

¹³ The ACR fee schedule is posted at www.americancarbonregistry.org.

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5. ACR reviews the project, validation and verification documents. This results in (a) acceptance, (b) acceptance contingent on requested corrections or clarifications, or (c) rejection. See ACR Validation and Verification Standard for further details.
6. Upon acceptance of the submitted documents, ACR registers the project and makes the final validated GHG Project Plan, verified monitoring report, validation report, and verification report and statement public on its registry.
7. ACR issues to the Project Proponent's account serialized ERTs for the relevant reporting period, in the amount listed in the verification statement. The vintage year of the ERTs correspond to the year the emissions reductions or removals occurred. In the case of a terrestrial or geologic sequestration project, ACR simultaneously deposits the appropriate number of ERTs into the ACR Buffer Pool, if this is the risk management option the Project Proponent has chosen.
8. Next steps are at the Project Proponent's discretion—offset transfer, retirement, etc.—with activation, transaction, cancellation, and retirement fees per the currently published ACR fee schedule.
9. Subsequent reporting periods qualifying within the originally validated crediting period can be verified per ACR's Validation and Verification Standard, and be tied to the same GHG Project Plan.

6.B INFORMATION IN A GHG PROJECT PLAN

A GHG Project Plan is a document that describes the Project Activity; addresses ACR eligibility requirements; identifies sources and sinks of GHG emissions; establishes project boundaries; describes the baseline scenario; defines how GHG quantification will be done and what methodologies, assumptions, and data will be used; and provides details on the project's monitoring, reporting, and verification procedures. The GHG Project Plan shall use the ACR template and include the following information:

- Project title, purpose(s), and objective(s);
- Type of GHG project;
- Project location, including geographic and physical information allowing for the unique identification and delineation of the specific extent of the project. Projects implementing a Programmatic Design Approach shall include location information for all sites known at the time of the GHG Project Plan validation;
- Physical conditions prior to project initiation;
- Description of how the project will achieve GHG emission reductions and/or removal enhancements;
- Project technologies, products, services, and expected level of activity;
- Ex ante projection of estimated GHG emission reductions and removal enhancements, stated in metric tons of CO₂e;
- Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements;

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- Roles and responsibilities, including contact information of the Project Proponent, other project participants, relevant regulator(s) and/or administrators of any GHG program(s) in which the GHG project is already enrolled, and the entities holding offset title and land title;
- Information relevant to the eligibility of a GHG project and quantification of GHG emission reductions or removal enhancements, including legislative, technical, economic, sectoral, socio-cultural, environmental, geographic, site-specific, and temporal information;
- Relevant outcomes from any stakeholder consultations and mechanisms for ongoing communication, as applicable;
- Chronological plan for initiating Project Activities, project term, frequency of monitoring, reporting, and verification, including relevant Project Activities in each step of the GHG project cycle;
- Notification of relevant local laws and regulations related to the project and a demonstration of compliance with them;
- Statement whether the project has applied for and been listed, registered, and/or been issued GHG emission reduction or removal credits through any other GHG emissions program, including detailed information on any credit issuance (volume, vintage, status), and information on any rejections of the project application, as applicable (see 6.C below);
- An environmental and community impact assessment, following ACR requirements, to ensure compliance with best practices and that safeguard measures are in place to avoid, mitigate, or compensate potential negative impacts, and how such measures will be monitored, managed, and enforced; and
- Identification and description of the Sustainable Development Goals to which the project impacts are aligned and positively contribute.

Project Proponents shall use the GHG Project Plan template available at www.americancarbon-registry.org.

6.C PREVIOUS REJECTION BY A GHG SYSTEM

ACR may consider a project rejected by other voluntary or compliance GHG programs, due to procedural or eligibility requirements, if the project complies with all aspects of the ACR Standard and any relevant sector standard. The Project Proponent for such a project shall:

1. Include a statement in the GHG Project Plan that lists all other programs to which the Project Proponent has applied for registration, was rejected, and the reason(s) for the rejection. Such information shall not be considered Commercially Sensitive Information.
2. Provide the actual rejection document(s), including any additional explanation, to ACR and its verifier.

6.D PROJECT DEVIATIONS

ACR will permit project-specific deviations to an existing approved methodology where they do not negatively affect the conservativeness of an approved methodology's approach to the quantification of GHG emissions reductions and removal enhancements. For instance, where alternate monitoring or measurement regimes are proposed, ACR may permit these changes provided they are conservative. ACR will not permit, on a project-specific basis, changes to requirements related to additionality assessment or baseline establishment.

Project Proponents shall submit any proposed project-specific methodology deviation to ACR for review and approval. Deviations apply for that specific project but are not published as modifications to the methodology. Project Proponents must provide evidence that the proposed deviation, such as a substitute calculation method for missing data, is conservative (i.e., likely to underestimate net GHG reductions or removal enhancements).

Project Proponents shall request a project-specific deviation by using the Methodology Deviation template available at www.americancarbonregistry.org.

6.E PROJECT MONITORING REPORTS

Project monitoring reports shall be completed for each verified reporting period using the template for Project Monitoring Report available at www.americancarbonregistry.org. The monitoring report shall be submitted to the approved VVB during verification and submitted to ACR upon completion of the verification, including any corrections/revisions identified by the VVB. The report shall describe the current status of project operation, and include the data monitored and monitoring plan, and the calculated emission reductions for the reporting period. Additionally, project monitoring reports shall describe any project-specific deviations that may have occurred during the reporting period, as described below.

Changes to validated GHG Project Plans are not permitted. Instead, project-specific deviations from methodology requirements or other changes from the validated GHG Project Plan (e.g., new GHG sources, sinks, or reservoirs) must be described in a Project Monitoring Report—as well as all subsequent Project Monitoring Reports—and submitted during the project's subsequent verification. As described in Section 6.D above, ACR must pre-approve any project-specific deviation from methodology requirements. Where changes to GHG Project Plans require revisions to baseline or additionality assessments, these changes must be validated at the time of the subsequent verification.

6.F AGGREGATION AND PROGRAMMATIC DEVELOPMENT APPROACH

ACR has established procedures for projects to include multiple facilities, fields, or parcels (hereafter referred to collectively as “sites”) as an Aggregated Project or as a Programmatic Development Approach (PDA) so that they may achieve efficiencies of-scale and other potential project administrative benefits while preserving the accounting principles of the ACR Standard and its approved methodologies, and the integrity of the monitoring, reporting and verification processes. Streamlined processes associated with documentation, registration and verification of multiple project sites may be available to projects applying these approaches.

6.F.1 Aggregation

A Project Proponent proposing an Aggregated Project shall submit a GHG Project Plan encompassing all project sites, and applying project boundaries, baseline definition, additionality demonstration, and all other requirements at the level of the Aggregate. No new sites can be added after the initial validation. An Aggregated Project shall:

- Be under the management of a single Project Proponent and registered under a single ACR account.
- Implement a single ACR-approved methodology (or pair of ACR-approved methodologies when relevant¹⁴).
- Adhere to a single overarching project Start Date, which corresponds to the earliest Implementation Date among the sites.
- If an environmental impact analysis is required by the methodology, provide confirmation of compliance with any applicable analysis requirements, unless the analysis was undertaken for the whole Aggregated Project and applies equally to each site.
- If public consultation from stakeholders is required by the methodology, provide information on how comments by local stakeholders were invited, a summary of any comments received and how due account was taken of any comments received, unless the comments were sought for the whole Aggregated Project and apply equally to each site.
- Where relevant, the Project Proponent should pursue the ACR Standard requirements for precision ($\pm 10\%$ of the mean at a 90% confidence level) at the Aggregated Project level for the purposes of monitoring and verification.
- Assess general and project-specific risk factors for an Aggregated Project as for any other project. The risk rating is applied at the overall Aggregate;
- Adhere to the Crediting Period requirements of the chosen methodology with each site able to report and verify GHG emissions reductions for the duration of its individual Crediting

¹⁴ Some ACR-approved methodologies may be paired to be used simultaneously on the same project area. This allowance will be specified in the methodologies themselves.

Period. However; upon any request for a renewed Crediting Period all sites must be included in an updated GHG Project Plan and be re-validated at the same time.

If the Project Proponent anticipates adding more project sites after the initial validation, they should instead register using the Programmatic Development Approach (PDA), described on the next page.

6.F.2 Programmatic Development Approach

The PDA provides for organization of project participants around basic similarity criteria and a common project Start Date but with flexibility for sites to enter the project at different times. The PDA is intended for projects where the participation of all project participants or sites is impractical at the time of initial validation. Although this approach allows for new project participants and sites to enter over time, it does require more complex project management and verification considerations than an Aggregated Project approach, in which all project participants and sites are included in the project's initial validation.

6.F.2.1 GENERAL PDA REQUIREMENTS:

- A PDA project will be under the management of a single Project Proponent and listed under a single ACR account.
- A PDA project will implement a single ACR-approved methodology (or pair of ACR-approved methodologies, when relevant¹⁵).
- The Project Proponent shall assess general and project-specific risk factors for a PDA project as for any other project. The risk rating is applied at the overall PDA level.
- A PDA project will adhere to a single overarching project Start Date, which corresponds to the earliest Implementation Date among the sites included in the first validation. All sites participating in the PDA project must have a site-specific Implementation Date that is the same or after the established project Start Date.
- A site or group of sites will be considered “participating” in the PDA project upon its successful validation by an ACR-approved VVB;
- A group of sites undergoing validation and entering the project at the same time is considered a “cohort.” Multiple cohorts may enter the project during the same validation, and may be organized along various site characteristics (e.g., location, quantification approach) to try to facilitate verification efficiencies.
- Sites within a cohort must be on the same validation and verification schedule.
- The Crediting Period requirements of the chosen methodology can be applied at the site level where the project may report and verify GHG emissions reductions for the duration of each site's individual Crediting Period; however, upon request for a renewed Crediting Period

¹⁵ Some ACR-approved methodologies may be paired to be used simultaneously on the same project area. This allowance will be specified in the methodologies themselves.

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at any site, an updated GHG Project Plan must be submitted and the project re-validated for all participating sites at the same time.

- If the chosen methodology is no longer approved for use by ACR, new sites cannot be added to the PDA project. Existing sites can continue report and verify for the duration of their own Crediting Periods.
- If a new version of the chosen methodology has been published, new sites may continue to be added to the same PDA project only after an updated GHG Project Plan is submitted and the project is re-validated using the most recent version of the methodology.
- The GHG Project Plan shall specify the programmatic boundaries (geographic, temporal, and GHG assessment boundary), a baseline scenario, and a monitoring/verification plan for the entire PDA (i.e., for the initial and future participating sites), to include a proposed recruitment schedule for future sites to be enrolled in the project. It must also include the site-specific details for at least one enrolled project site upon listing.
- The Project Proponent must describe in the GHG Project Plan a management system that includes the following:
 - ◆ The reason why all expected project participants and sites cannot be included upon initial validation;
 - ◆ A clear definition of the roles and responsibilities of personnel involved in the process of inclusion of new sites;
 - ◆ A description of the principles that will be applied to recruit new sites to the program;
 - ◆ Procedures to avoid double counting that no site or group of sites has been or will be registered on ACR as part of another project; and
 - ◆ A records and documentation control process for each site, made available to the VVB at the time of validation.
- Each site must undergo validation by an ACR-approved VVB before ERTs can be issued against its associated Project Activities. This may be conducted at the same time as a full verification for the whole project, and in addition to desk-based review for each new site, must include site visits to a selection of the new sites, to the extent required by the chosen methodology and as determined by the VVB's sampling procedures.

6.F.2.2 EACH SITE PARTICIPATING IN A PDA PROJECT MUST:

- Meet all project eligibility criteria as determined by the ACR Standard and chosen methodology.
- Be enrolled by the Project Proponent no later than 5 years after the site's Implementation Date. The enrollment date is the date upon which the project participant and Project Proponent agree to enter the site into the PDA project. Dated documentation of the agreement must be provided to the VVB for validation.
- Be available for a site visit during the validation and any subsequent verification where site visits are required. VVBs may use equal probabilities among sites to select which will receive validation and verification site visits, or a risk- or sensitivity-based analysis to identify those sites with the strongest influence over a project's overall carbon reduction estimates. (Not all sites must undergo a site visit at each required interval.) VVBs must use their own discretion

to determine if a cohort lends itself to sub-sampling. All project sites are subject to desk-based review at minimum.

- Be described in a single, consolidated PDA Project Design Document, which shall be considered an addendum to the GHG Project Plan. The PDA Project Design Document shall outline the unique attributes of the site(s) enrolled at project listing, and be updated as new sites are added, to include the following:
 - ◆ A clearly defined geographic boundary to uniquely identify the site, including maps and spatial files as required by the chosen methodology;
 - ◆ A description of the Project Activities carried out on the site;
 - ◆ Name/contact details of the entity/individual responsible for the operation of each site;
 - ◆ The site-specific Implementation Date and confirmation that the Implementation Date of any site is not, or will not be, prior to the project's Start Date;
 - ◆ Information on how the site fulfills the eligibility criteria of the ACR Standard and chosen methodology, is within the project boundaries, and demonstration of additionality as specified in the GHG Project Plan;
 - ◆ Calculations of baseline emissions and estimated net emission reductions or removal enhancements; and
 - ◆ Confirmation of the date of enrollment as demonstrated by agreement between the project participant and the Project Proponent.
- Provide the information required in the monitoring report during each verification. This information can be consolidated into a single summary report to facilitate easier review across all participating sites.
- If the methodology requires an environmental impact analysis, provide confirmation of compliance with any applicable analysis requirements, unless the analysis was undertaken for the whole PDA project and applies equally to each site.
- If the methodology requires public consultation from stakeholders, provide information on how local stakeholders' comments were invited, a summary of any comments received, and how due account was taken of any comments received, unless the comments were sought for the whole PDA project and apply equally to each site; and
- If defined by the chosen methodology, meet the required inventory statistical precision ($\pm 10\%$ at 90% confidence interval) for the CO_{2e} estimate reported in the monitoring report.

6.F.3 Design Considerations for Aggregates and PDA Cohorts

Project Proponents may be able to increase the efficiencies around reporting and verification by strategically designing the groups of sites participating in an Aggregated Project or PDA. To maximize such potential efficiencies, sites should be grouped so their defining characteristics are as homogeneous as possible. VVBs may use equal probabilities among sites to select which will receive verification site visits, or a risk- or sensitivity-based analysis to identify sites with the strongest influence over a project's overall carbon reduction estimates. VVBs must use their own discretion to determine if a cohort or Aggregate lends itself to sub-sampling. All project

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sites are subject to desk-based review at minimum. Below are some examples of how variation in site characteristics may be minimized in an aggregate or cohort.

- Homogenous project practices or technologies are implemented, to the extent there are multiple options within the chosen methodology.
- Use of a single quantification approach for the baseline and project conditions (models, equations, measurements, default factors) as outlined in the methodology. These methods shall be documented in the GHG Project Plan. Any subsequent changes to these methods following the initial validation of the GHG Project Plan must be applied across all sites in the cohort to maintain any achieved efficiencies, tracked, and made available for review at succeeding third-party verification events to ensure the quality and conservativeness of carbon accounting principles originally validated for the project are maintained.
- For AFOLU projects only: Sites are located within a pre-defined geographic region, such that all fall within a maximum of three ecoregions, defined by the World Wildlife Foundation (2014) as “A large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions. The boundaries of an ecoregion are not fixed and sharp, but rather encompass an area within which important ecological and evolutionary processes most strongly interact.”¹⁶
 - ◆ To determine the ecoregion of each participating site located in the United States, please refer to U.S. Forest Service maps at <http://www.fs.fed.us/land/ecosysmgmt/index.html>.
 - ◆ To determine the ecoregion of each international participating site outside the United States, please refer to the World Wildlife Federation delineation of ecoregions at <http://www.worldwildlife.org/biomes>.
- For AFOLU projects only: Sites encompass relatively similar forest land or soil types.
- Sites share a similar baseline scenario in which there are the same legal constraints (i.e., the without-project scenario is comparable).
- For methodologies that require direct measurements, stratification and organizing projects along some of the characteristics above will help make the precision target ($\pm 10\%$ of the mean at a 90% confidence level), which shall be applied at the Aggregate or cohort level for the purposes of monitoring and verification, achievable at reasonable sampling costs.

6.G COMMERCIALY SENSITIVE INFORMATION

Project Proponents may designate certain parts of the GHG Project Plan or other project documentation as Commercially Sensitive Information. This information must be available for review by ACR and the VVB (with non-disclosure agreements, as necessary), but will be excised from the project documentation posted publicly on the ACR registry.

For the sake of transparency, ACR shall presume project information to be available for public scrutiny, and demonstration to the contrary shall be incumbent on the Project Proponent. At a

¹⁶ WWF, 2014. http://wwf.panda.org/about_our_earth/ecoregions/about/what_is_an_ecoregion/.

¹⁷ Note: The geographic boundaries may be further constrained for projects where the chosen methodology requires regional-specific factors in the establishment of the baseline.

minimum, ACR shall disclose publicly the project baseline scenario, calculations, monitoring report, and additionality assertion. The VVB shall check that any information requested as “commercially sensitive” meets the ACR definition of Commercially Sensitive Information.

6.H ADDITIONAL PROJECT DOCUMENTATION FOR REGISTRATION

ACR may require the following documentation as part of the project review prior to registration:

- Title documents or sample landowner agreements;
- Chain of custody documentation, if applicable; and
- ACR-Proponent agreement governing Buffer Pool obligations, if applicable.

To support the GHG Project Plan’s declaration of title, ACR may require one or more of the following: a legislative right; a right under local common law; ownership of the plant, land, equipment and/or process generating the reductions/removals; or a contractual arrangement with the owner of the plant, land, equipment, or process that grants offset title to the Project Proponent.

6.I CREDITING PERIOD RENEWAL

All projects have a limited Crediting Period (i.e., the finite length of time for which a GHG Project Plan is valid, and during which a project can generate offsets against its baseline scenario).

In general, the Crediting Period for non-AFOLU projects is 10 years, unless otherwise specified in the relevant ACR sector requirements or approved methodology. Crediting periods for AFOLU projects vary and are specified in the relevant sector requirements and/or methodology.

A Project Proponent may apply to renew the Crediting Period by:

- Re-submitting the GHG Project Plan in compliance with then-current ACR standards and criteria;
- Re-evaluating the project baseline, as required by the methodology;
- Demonstrating additionality against then-current regulations, common practice, and implementation barriers (or against an approved performance standard and then-current regulations), as required by the methodology;
- Using ACR-approved baseline methods, emission factors, tools, and methodologies in effect at the time of Crediting Period renewal; and,

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- Completing validation of the new GHG Project Plan within one year from the end of the previous crediting period.¹⁸

ACR does not limit the allowed number of renewals, since at each Crediting Period renewal the Project Proponent must demonstrate that the project is additional and meets all ACR requirements. An acceptable validation report is necessary for ACR to renew the Crediting Period and continue issuing offsets generated by the project. Upon acceptance by ACR of the validation and verification documents, ACR will issue new ERTs each year (or more or less frequently, at the Project Proponent's request) for the duration of the new Crediting Period, provided the Project Proponent continues to meet the current ACR reporting and verification requirements.

On a project level, when a project seeks renewal of a Crediting Period (i.e., the previous was validated under a prior version of the ACR Standard or under a different GHG program and the project's Crediting Period has expired), the project is required to meet the requirements of the most recent version of the ACR Standard.

¹⁸ ACR suggests that the Project Proponent conduct the validation of the re-submitted GHG Project Plan for the new Crediting Period concurrently with the last verification of the previous, expiring Crediting Period. ACR may on a case-by-case basis consider applications for crediting period renewal submitted beyond the one-year deadline for validation of the new GHG Project plan.

CHAPTER 7: METHODOLOGIES AND TOOLS

If ACR has not yet published a methodology for a particular project type, the Project Proponent has two options: request approval of a methodology developed under another GHG program or submit a new or modified methodology to ACR for approval. Any project proposing to use an ACR-approved methodology from another GHG program must comply with the ACR Standard.

7.A GHG MEASUREMENT TOOLS AND METHODOLOGIES

7.A.1 ACR-Published and CDM-Approved Methodologies

Current versions of methodologies published by ACR via the public consultation and peer review process are approved without qualification. Current versions of methodologies approved by the CDM Executive Board are generally approved for use; however, Project Proponents implementing projects under CDM methodologies must first have ACR's review, clarifications, and approval as described in 7.B.1 below to ensure compliance with ACR requirements at fees per the currently published ACR fee schedule.

7.A.2 Modifications to Existing Approved Methodologies

ACR may permit modifications to an existing ACR-approved methodology where they do not negatively affect the conservativeness of the methodology's approach to determining additionality and quantification of GHG emissions reductions and removal enhancements. Methodology modifications may be submitted for review by ACR, at fees per the currently published ACR fee schedule. ACR will review the extent of the modification and determine whether the internal review, public consultation, and peer review process, as described in Section B of this chapter, must be implemented. In general, if the extent of the proposed modification(s) necessitates the process described in Section B, a new version number for the methodology will be issued (e.g., Version 3.0 to Version 4.0). Modifications to eligibility, applicability, Project Activities, and/or baseline assumptions are likely to trigger the full process stipulated in Section B; minor modifications to correct quantification errors or provide clarification on monitoring requirements may not require the full process.

7.A.3 New Methodologies

New methodologies proposed to ACR for approval always require internal screening, public consultation, and blind scientific peer review as described in section B.

7.B ACR'S INTERNAL REVIEW, PUBLIC CONSULTATION, AND SCIENTIFIC PEER REVIEW PROCESS

The following process is applied to new methodologies developed internally by Winrock/ACR, methodologies drafted by external authors, and certain methodology modifications, per Section A.2 of this chapter. In such cases, ACR coordinates a process of internal review, public stakeholder consultation, and a blind scientific peer review. ACR administers this process, with fees charged to the methodology author.

1. The methodology developer(s) submits to ACR for review the following information: 1) Market analysis demonstrating technical potential for emissions reductions of the proposed activity and ability and timing to scale impact given geographic, regulatory or other market considerations; 2) Sample project using the proposed methodology including an economic analysis demonstrating that the proposed activity is viable under current market conditions; and 3) Indication of intent for near-term project development. Based on review of this information, ACR will determine whether to move forward with the methodology review.
2. The Project Proponent submits the proposed new or modified methodology to ACR. ACR has templates posted at www.americancarbonregistry.org for some proposed methodologies. Project Proponents must submit their proposed methodology using the available templates to reduce the time and cost of the approval process for both Project Proponent and ACR.
3. ACR screens the methodology against its requirements, communicates any corrections or clarifications that are immediately needed, and informs the methodology author of its judgment as to whether the methodology is ready for public consultation and peer review. ACR conducts this internal review at currently published fees.¹⁹ If the methodology author elects to proceed, they address any corrections and clarifications identified in the ACR review and resubmit the methodology. ACR's agreement to proceed with the methodology approval process does not guarantee that the methodology will be approved.
4. ACR coordinates a public consultation process. The methodology is posted publicly on the ACR website for a minimum of 30 days, and ACR sends out a public notice inviting comments. During this period, the methodology authors may also elect to conduct a webinar with ACR to present the draft methodology and solicit additional comments.

¹⁹ The ACR Methodology screening fee includes two rounds of ACR review. The fee will be charged again for any necessary additional reviews prior to the initiation of the public consultation process.

At the conclusion of the public comment period, ACR compiles all comments by methodology section and forwards a compiled report to the methodology author, who then incorporates revisions and/or documents responses to each comment, which are posted on ACR's website.

5. The revised methodology is provided to a team of independent subject matter experts for a blind scientific peer review process. ACR may consult the relevant ACR Technical Committee in the selection of reviewers. The lead reviewer compiles comments and recommendations from the peer review team, and prepares a summary report. ACR delivers to the methodology author a peer review report, organized by section of the methodology, to which the author must respond by incorporating revisions and/or documenting justifications for the proposed approach. Generally, several rounds of peer review are necessary. Timing and cost of peer review depends on the complexity, scope, and quality of the methodology and the availability of peer reviewers. The cost of peer review is borne by the methodology author.
6. Once all required corrections have been made, ACR approves the new methodology and publishes it on its website. An approved methodology may be used by any Project Proponent, including the methodology author, in preparing GHG Project Plans and registering projects on ACR.
7. ACR posts process documentation—including all public comments and documented responses, and all peer review comments and documented responses—along with the public comment version of the methodology, and the final approved methodology.

Scientific peer review teams are selected from a pool of potential reviewers with applicable subject matter expertise. ACR actively identifies and qualifies candidates for inclusion in this pool, and publicly solicits applications from interested parties. Applications are reviewed for sector expertise, GHG quantification experience, and impartiality. Throughout and after the peer review process, the experts selected for each review team remain unknown to the methodology author and the public.

7.C UPDATES TO ACR-APPROVED METHODOLOGIES AND TOOLS

ACR may periodically update (or decide to retire) its approved methodologies and tools. Such updates occur when significant changes to GHG accounting best practice or the legislative and/or regulatory context justify an update; when sufficient new data is available to revise eligibility and/or additionality requirements; when ACR becomes aware of clarifications that should be made; or for other reasons.

For methodologies that employ a performance standard for additionality assessment, ACR shall review the validity and underlying assumptions of the performance standard for all non-forestry projects every 5 years, at minimum. The period for forestry projects is every 10 years, at minimum.

7.D ROLES OF THE ACR TECHNICAL COMMITTEE(S)

ACR may periodically establish Technical Committees for particular sectors (e.g., AFOLU), to provide independent advice on methodology acceptance, methodology modifications and project deviations, selection of peer reviewers, and related issues. The responsibilities of the Technical Committees include the following:

- Review proposed new methodologies and tools submitted to ACR for approval;
- Advise ACR on the selection of appropriate peer reviewers for a proposed new methodology or methodology revision;
- Make final determinations in the event consensus on a particular methodological issue is not reached by the peer review team or between the peer reviewers and the methodology author;
- Advise ACR on continuous improvements to its AFOLU standards, including issuance of new versions at appropriate intervals; and
- Advise ACR on decisions to commission new methodologies and tools using internal resources.

ACR Technical Committees are constituted via calls for applications to select the most relevant experts.

CHAPTER 8: ENVIRONMENTAL AND COMMUNITY IMPACTS

ACR supports a diverse set of offset Project Activities, each with its own potential to generate both positive and negative environmental and social impacts. Positive impacts can contribute to sustainable development objectives; negative risks and impacts can be identified, evaluated, and managed through appropriate safeguard procedures.

ACR requires that projects adhere to environmental and community safeguards best practices to:

- Ensure that projects “do no harm” by maintaining compliance with local, national, and international laws and regulations;
- Identify environmental and community risks and impacts and contributions to sustainable development;
- Detail how negative environmental and community impacts will be avoided, reduced, mitigated, or compensated, and how mechanisms will be monitored, managed, and enforced;
- Ensure that the rights of affected communities and other stakeholders are recognized, and that they have been fully and effectively engaged and consulted; and
- Ensure that ongoing communications and grievance redress mechanisms are in place, and that affected communities will share in the project benefits.

8.A ENVIRONMENTAL AND COMMUNITY IMPACT ASSESSMENT REQUIREMENTS

As part of the GHG Plan, ACR requires all projects to prepare and disclose an environmental and community impact assessment. ACR does not require that a particular process or tool be used for the impact assessments as long as basic requirements are addressed, as detailed below. ACR projects can follow internationally recognized approaches, such as The World Bank Safeguard Policies, or can be combined with the Climate Community and Biodiversity Alliance (CCBA) Standard or the Social Carbon Standard for the assessment, monitoring and reporting of environmental and community impacts. Projects’ environmental and community impacts should be net positive. Project Proponents shall include in their GHG Project Plan a description of project impacts on communities and the environment in the immediate project area. This shall include changes in community well-being due to the Project Activity and an evaluation of any negative impacts on community groups. Project Proponents shall base these estimates on defined and defensible assumptions about how the Project Activity will alter social and economic well-being, including potential impacts of changes in natural resources and ecosystem services identified as important by the communities, for the project duration. In the GHG Project Plan Project Proponents shall also identify and describe the Sustainable Development Goals to which those impacts are aligned and positively contribute.

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The assessment should include the following:

1. An overview of the Project Activity and geographic location.
2. Applicable laws, regulations, rules, and procedures and the associated oversight institutions.
3. A description of the process to identify community(ies)²⁰ and other stakeholders²¹ affected by the project and, as applicable, the community consultation and communications plan.
4. An assessment of the project's environmental risks and impacts, including factors such as climate change mitigation and adaptation, biodiversity, air quality, water quality, soil quality, and ozone quality, as well as the protection, conservation, or restoration of natural habitats such as forests, grasslands, and wetlands. The assessment shall: 1) identify each risk/impact; 2) categorize the risk/impact as positive, negative, or neutral and substantiate the risk category; 3) describe how any negative impacts will be avoided, reduced, mitigated, or compensated; 4) detail how risks and impacts will be monitored, and how often and by whom; and 5) describe how positive impacts contribute to sustainable development goals.
5. For community-based projects, an assessment of the project's community risks and impacts, including factors such as land and natural resource tenure, land use and access arrangements, natural resource access (e.g., water, fuelwood), food security, land conflicts, economic development and jobs, cultural heritage, and relocation. The assessment shall: 1) briefly describe the process to identify community risks/impacts; 2) identify each risk/impact; 3) categorize the risk/impact as positive, negative, or neutral, and substantiate the risk category; 4) provide detailed information regarding the community stakeholder consultation process (e.g., meeting minutes, attendees), including documentation of stakeholder comments and concerns and how those are addressed; 5) provide evidence of Free, Prior and Informed Consent for the Project Activity, as applicable; 6) provide evidence of no relocation or resettlement (voluntary or involuntary), as applicable; 7) describe how any negative project impacts will be avoided, reduced, mitigated, or compensated; 8) detail how risks/impacts will be monitored, and how often and by whom; 9) describe the mechanism for ongoing communications with the community and grievance mechanisms, as applicable; and 10) describe how positive impacts contribute to sustainable development goals.

²⁰ As defined by CCBA, a community includes all groups of people, including indigenous peoples, mobile peoples, and other local communities, who live within or adjacent to the project area, as well as any groups that regularly visit the area and derive income, livelihood, or cultural values from the area. This may include one or more groups that possess characteristics of a community, such as shared history, shared culture, shared livelihood systems, shared relationships with one or more natural resources (e.g., forests, water, rangeland, wildlife), and shared customary institutions and rules governing the use of resources.

²¹ Other stakeholders are defined as groups other than communities that can potentially affect or be affected by the Project Activities and who may live within or outside the Project Zone.

8.B ONGOING DISCLOSURE AND ENFORCEMENT

In their Annual Attestations to ACR, Project Proponents shall disclose any negative environmental or community impacts or claims of negative environmental and community impacts and the appropriate mitigation measure.

ACR reserves the right to refuse to list or issue credits to a project based on community or environmental impacts that have not or cannot be mitigated, or that present a significant risk of future negative environmental or community impacts.

CHAPTER 9: VALIDATION AND VERIFICATION

This chapter provides a general overview of ACR requirements for validation of GHG Project Plans, and ex post verification of GHG assertions, by a competent and independent third-party VVB approved by ACR. Further detail on ACR verification requirements is included in the ACR Validation and Verification Standard, available at www.americancarbonregistry.org.

9.A DEFINITIONS

ACR conducts a preliminary listing review of every project. ACR may request clarifications and corrections regarding a proposed project's listing documentation before allowing a project to commence validation.

Validation is the systematic, independent, and documented process for the evaluation of a GHG Project Plan against applicable requirements of the ACR Standard and approved methodology.

Verification is the systematic, independent, and documented assessment by a qualified and impartial third party of the GHG assertion for a specific reporting period.

Validation and verification must be conducted by an ACR-approved independent third-party VVB. Validation and verification may be conducted by the same entity, and may occur simultaneously.

9.B MATERIALITY THRESHOLD

A material misstatement is an inaccurate assertion of an offset project's GHG emission reductions/removals, which may reasonably be expected to influence decisions or actions taken by the users of the GHG project information. To accept a verification statement, ACR requires that discrepancies between the emission reductions/removal enhancements claimed by the Project Proponent and estimated by the VVB be immaterial (i.e. less than ACR's materiality threshold of $\pm 5\%$). Individual or aggregation of errors or omissions greater than the ACR materiality threshold require re-stating before a verification statement will be accepted.

ACR's materiality threshold also applies in the event that an overstated GHG emission reduction/removal assertion is discovered during a subsequent verification after it has been credited. If the misstatement exceeds the materiality threshold, the amount of over issuance shall be deducted from the net verified emissions reductions upon the next completed verification, cancelled from the project's ACR account, or be deducted from the project's contribution to the ACR Buffer Pool, to be replenished by the project account holder, as applicable.

The following equation is to be used to calculate the percent error in an emission reduction assertion:

Equation 1

$$\% \text{ Error} = \frac{\text{Project Emission Reduction Assertion} - \text{Verifier Emission Reduction Recalculation}}{\text{Verifier Emission Reduction Recalculation}} \times 100$$

9.C VALIDATION AND VERIFICATION INTERVAL

Validation of the GHG Project Plan occurs once per Crediting Period. Renewal of the Crediting Period requires a new validation within one year from the end of the previous, expiring crediting period. Per Section 6.E, if project-specific changes that require revision to baseline or additionality assessments occur after the initial validation, these changes must be disclosed in the Project Monitoring Report and validated at the project's subsequent verification.

ACR requires verification of GHG assertions at specified intervals in order to issue new ERTs.²² ERTs may be created and issued annually, or at the Project Proponent's request, more or less frequently. At each request for issuance of new ERTs, the Project Proponent must submit a verification statement from an approved verifier. No less than once every 5 years of reporting, and upon the first verification conducted by a new VVB (per ACR's VVB rotation requirements in Section 9.G), Project Proponents must submit a verification statement based on a full verification including a field visit to the project site.²³ This 5-year verification requirement begins on the date that the project is listed in the ACR. In the case of sequestration projects, the scope of this verification should include an updated assessment of risk of reversal and an updated buffer determination, as applicable.

9.D VALIDATION AND VERIFICATION BODY REQUIREMENTS

Verification is a risk-based process carried out in conformance with ISO 14064-3:2006 and ISO 14065:2013.²⁴ VVBs shall be accredited for project validation and verification in the sector of the applicable methodology, and shall meet the competence requirements as set out in ISO 14065:2013.

All VVBs must be approved by ACR and be accredited under ISO 14065 by an accreditation body that is a member of the International Accreditation Forum (IAF) and with which ACR has a

²² Verification activities may begin only after the completion of the project's reporting period being verified.

²³ A field visit is required for validation and the first verification for the project. PDA projects are subject to risk-based sampling by the VVB to determine the number of site visits to be visited during a full verification. More information can be found in Chapter 10 of the ACR Validation and Verification Standard.

²⁴ ISO 14065:2013 references to "GHG programme" shall mean the ACR.

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Memorandum of Understanding (MoU) in place, as detailed in the ACR Validation and Verification Standard.

A list of currently approved VVBs and the sectors for which they are approved to conduct validation and/or verification is provided at <http://americancarbonregistry.org/carbon-accounting/verification>.

Prior to commencing validation or verification work on ACR, all VVBs must be in good standing; have completed the application process described at <http://americancarbonregistry.org/carbon-accounting/verification>, including submitting an application form and Attestation of Validation/Verification Body, which details requirements for conflicts of interest and makeup of the verification teams; document technical capabilities for each of the sectoral scopes in which the verifier seeks to conduct validation or verification; established their VVB account on ACR; and have submitted a project-specific Conflict of Interest Form for ACR's approval.

9.E VERIFICATION REPORT AND STATEMENT

On completion of verification, the Project Proponent shall submit a verification report and verification statement to ACR. Verification documents shall be in English, and describe the verification process, any issues raised during the verification and their resolutions, and the conclusions reached by the VVB. The verification report shall:

- Describe the level of assurance of the verification statement;
- Describe the objectives, scope, and criteria of the verification against the ACR Standard and relevant sector standards;
- Describe whether the data and information supporting the GHG assertion were hypothetical, projected, and/or historical in nature;
- State the actual number of ERTs associated with the project-specific monitoring report that the verifier has verified;
- Include the GHG assertion, signed by the lead verifier;
- Include the verifier's conclusion on the GHG assertion, with any qualifications or limitations; and
- For projects requiring Project Proponents to assess risk of reversal and apply an ACR-approved risk reversal mitigation option, include the verifier's opinion on the risk assessment and adequate risk reversal mitigation.

More detail on contents of the verification report and statement is provided in the ACR Validation and Verification Standard.

The VVB shall keep all documents and records in a secure and retrievable manner for at least 2 years after the end of the relevant project Crediting Period, even if it does not carry out verification throughout the project Crediting Period.

9.F VERIFICATION ACCEPTANCE

ACR will review the verification report and statement and accept them, request corrections and/or clarifications, or reject them. If ACR requests corrections or clarifications, the Project Proponent and verifier shall make all necessary corrections and clarifications and resubmit the verification statement for subsequent review.

If ACR accepts a verification statement, and the project has already completed all other required steps, then ACR will post the validation and verification reports, verification statement, and other public documentation to the ACR website (if applicable), and issue ERTs to the Project Proponent's account.

Projects must be verified without reservation, with Project Proponents having addressed all clarifications and corrections required by the verifier. ACR reserves the right to accept or reject verification from an approved VVB.

9.G ROTATION OF VERIFICATION BODIES

ACR requires that Project Proponents utilize a different VVB at a minimum of every 5 years²⁵ of reporting or five verifications (including both full and desk reviews), whichever comes first. The first verification conducted by a new VVB must be a full verification.

9.H VALIDATION AND VERIFICATION BODY OVERSIGHT

In addition to the accreditation processes to which all ACR VVB's must adhere, ACR reserves the right to conduct oversight activities during validation and/or verification performance by the VVB's operating under the ACR program. Oversight activities are conducted to ensure an adequate level of quality control and are intended to supplement accreditation body oversight and audit processes. Oversight activities conducted by ACR representatives include the following:

- Review of information and supplementary documentation submitted by VVBs regarding project-specific conflict of interest determinations;
- Review of VVB documentation, such as verification and sampling plans and calculation spreadsheets;
- Review of Project Proponent documentation, such as data sources, quantification methodologies, and calculation spreadsheets or databases; Review of validation and verification reports and verification statements; and
- Project-level audits.

²⁵ In this context, a year is defined as a 12-month period.

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Should ACR select a project for a project-level audit, the VVB must include ACR on communications with the Project Proponent and in substantive meetings with the Project Proponent, and make project-level data and information subject to validation and/or verification available to ACR for review. During a project-level audit, ACR may choose to send, at its own expense, a representative to the validation and/or verification site visit to observe on-site verification activities. At the conclusion of a project-level audit, ACR will communicate its observations in a written report directly to the VVB. The report will document, as applicable, any items of concern noted during validation and/or verification performance, including areas for improvement and non-conformities with ACR validation and verification procedures.

CHAPTER 10: AVOIDING DOUBLE COUNTING WITH OTHER GHG PROGRAMS & REGISTRIES, EMISSION TRADING SYSTEMS, AND NATIONAL OR SECTORAL GHG EMISSIONS REDUCTION TARGETS

In the context of climate change mitigation, double counting refers to situations where a single GHG emission reduction, removal, avoidance, or other mitigation outcome is used more than once to demonstrate achievement of mitigation targets or pledges. Double counting can occur in different ways, including double issuance, double use, and double claiming. ACR has program rules and operational processes, tracking systems, and oversight to mitigate these double counting risks and incorporates by reference the procedures to avoid double counting as detailed in “*Guidelines on Avoiding Double Counting for the Carbon Offsetting and Reduction Scheme for International Aviation*” version 1.0 of June 2019²⁶ and any future updates to this document in which ACR participates as a workgroup member. ACR will adhere to any future requirements established by the UNFCCC and International Civil Aviation Organization to prevent double counting and to ensure the environmental integrity of emissions reductions.

10.A POLICIES TO PREVENT DOUBLE ISSUANCE AND DOUBLE USE OF OFFSETS

Double issuance occurs when more than one unique unit is issued for the same emissions reduction or removal, within the same program/registry or involving concurrent issuance under more than one program(s)/registry(ies). ACR has rules and procedures in place to mitigate the risk of double issuance, including checks of duplicate registration under other programs and requirements for disclosure of other registrations, as well as for cancellation of the units on one registry prior to re-issuance on another.

²⁶ <https://americancarbonregistry.org/carbon-accounting/guidance-tools-templates/guidelines-for-adc-with-corsia-june-2019.pdf>

Double use refers to either 1) an instance in which a single GHG reduction or removal is sold to more than one entity at a given time (also referred to as double selling) due to double issuance or fraudulent sales practices, which may or may not be detectable, or 2) an instance in which an issued unit is used by the same buyer toward more than one target (e.g., under systems that are not linked, do not coordinate, or may have inconsistent rules for reporting and/or retirement). To prevent double use, ACR requires execution of ACR's legal Terms of Use (ToU) Agreement by authorized account representatives, clear proof of ownership upon registration, tracking of ownership of credits within the registry by serial number and account, and an annual attestation of unique, uncontested ownership and legal rights to the emissions reductions as well as that no emissions reductions issued by and registered on ACR have been serialized, registered, retired or otherwise transacted on another registry and/or by another standard nor have they been transferred, retired or otherwise used or disposed of other than as duly recorded on the ACR registry.

10.A.1 Projects Registered on ACR and Other Voluntary or Compliance GHG Programs

ACR allows for offset project registration simultaneously on ACR and other voluntary or compliance GHG programs or registries in only two circumstances: 1) the simultaneous registration is disclosed and approved by both programs/registries, including explicitly through regulation, and 2) offsets issued for the same unique emissions reductions (project boundary and vintage) do not reside concurrently on more than one registry.

To prevent double issuance and double use of offsets for projects registered simultaneously on ACR and another GHG program, 1) offsets representing the same emissions reduction must be publicly canceled from one registry before they can be converted and re-issued on another registry or 2) offsets can be issued to a project by both programs as long as the registration of the project under more than one program is disclosed in writing to the GHG program and the verifier, and the offset represents unique emissions reductions in terms of location (project boundary) and vintage.

10.A.2 Transferred Projects Previously Registered on ACR and Other Voluntary or Compliance GHG Programs or Registries

For projects transferring from another GHG program to ACR, the project must be validated and verified by an ACR-approved VVB to comply with the ACR Standard and relevant methodology. To avoid double issuance and double use of the same GHG reduction or removal, any offsets that had been issued that were not transferred, sold, or retired must be canceled from the other program's registry before conversion and re-issuance by ACR.

For projects transferring from ACR to another GHG program, Project Proponents must cancel from ACR all offsets that have not been transferred, sold, or retired to allow for conversion and re-issuance of offsets by the other GHG program on its registry.

10.B POLICIES TO PREVENT DOUBLE CLAIMING OF EMISSIONS REDUCTIONS

Double claiming occurs when two or more parties claim the same GHG reduction, removal, or other mitigation outcome toward their regional, national, or sector-wide emissions reduction cap, target(s) / pledge(s) / contributions / commitments (collectively “target”).

In the pre-2020 carbon market context, double claiming occurs if emissions reductions that reduce or remove emissions from activities that are part of a binding GHG emissions trading program, or that take place in a jurisdiction or sector in which there is a binding limit/cap established on GHG emissions, are being issued as offsets for use outside of those programs. This would include, for example, emissions reductions in Annex I countries that ratified the Kyoto Protocol, in the EU Emissions Trading System, in the California cap-and-trade program, and in the Regional Greenhouse Gas Initiative. In these instances, offset Project Proponents shall provide evidence that the reductions and removals the project generated have not and will not be used in the emissions trading program or for the purpose of demonstrating compliance with binding limits that are in place in that program or jurisdiction.

If Project Activities take place in such a program or jurisdiction, the Project Proponent shall include in its GHG Project Plan a written statement from the GHG emissions program operator, as well as other documentation in a form acceptable to ACR, that it has canceled from the program or national or regional cap (as applicable) a number of emissions allowances, offsets or other (acceptable) GHG credits equivalent to the reductions and removals generated by the project so that they can no longer be used within the operator’s GHG program. Alternately, the Project Proponent may provide evidence of purchase and cancelation of GHG allowances equivalent to the GHG emissions reductions or removals the project generated related to the program or national cap.

In order to prevent double-counting of GHG emission reductions or removal enhancements for offset projects in non-Annex I countries under the UNFCCC, Project Proponents shall provide documentation that they have notified the relevant project host country Designated National Authority (DNA) of their project registration in the voluntary market, including the project’s expected GHG reductions/removals.

10.B.1 The Paris Agreement and the International Civil Aviation Organization Carbon Offset Reduction Scheme for International Aviation

In the post-2020 carbon market context, in which all signatories to the Paris Agreement have emissions reduction target(s) / pledge(s) / contributions / commitments (collectively “targets”) as formulated in the nationally determined contributions (NDCs) and air carriers have an offsetting obligation under the International Civil Aviation Organization Carbon Offset Reduction Scheme for International Aviation (CORSIA), double claiming occurs when two or more Parties claim the same emission reduction to comply with their mitigation targets/pledges/commitments/obligations. Transparent reporting and accounting procedures at both the national and international level will be developed to track emissions reductions transferred to / from other Parties to meet targets. In these instances, as required by the UNFCCC, a corresponding adjustment may be made by the host country of the emissions reduction activity to account for the transfer of the emissions reduction for use by another Party towards its NDC or by airlines towards their CORSIA obligation. The adjustment will be applied, as determined by the UNFCCC, to the host country national GHG inventory or NDC, and will also be reported by the receiving Party.

To mitigate the risk of double claiming in these instances, ACR will require notification by the owner of the emissions reductions of the export of any emissions reductions for these purposes as well as a formal host country letter of assurance and authorization of the use of the emissions reductions by another Party, including for the CORSIA. ACR will report to the project host country’s national UNFCCC focal point and the transferee country’s UNFCCC focal point the details of any ACR units transferred / retired for use by another Party toward fulfillment of its Paris Agreement targets / pledges / contributions / commitments and/or canceled by/for an airline for use toward its CORSIA obligation.

ACR will post publicly on the registry the national UNFCCC focal point letter of assurance and authorization of transfers / cancelations of emissions reductions towards a mitigation target / obligation. ACR will make public on the registry all retirements / cancelation of units toward a CORSIA offsetting obligation. In addition, ACR will report such information to ICAO and to host countries as required to confirm that the units are included in national emissions reporting to facilitate GHG accounting reconciliation via corresponding adjustments, as determined by the UNFCCC and the CORSIA.

CHAPTER 11: COMPLAINTS AND APPEALS PROCEDURE

11.A COMPLAINTS PROCEDURE

When a Project Proponent or ACR stakeholder objects to a decision made by ACR representatives or the application of the ACR program requirements, the following confidential complaint procedure shall be followed:

1. Project Proponent or ACR stakeholder sends a written complaint via email to ACR@winrock.org. The complaint must detail the following:
 - Description of the complaint with specific reference to ACR Standard and/or ACR Methodology requirements, as applicable;
 - Supporting documentation provided for consideration by ACR in the complaint resolution process; and
 - Complainant name, contact details, and organization.
2. ACR Senior Management shall assign an ACR representative to research and further investigate the complaint. The representative assigned to handle the complaint shall not have been involved with the issue that is the subject of the formal complaint.
3. ACR Senior Management will provide a written response, via email, to the complainant detailing ACR's decision on the matter.

11.B APPEALS PROCEDURE

In the event that a complaint remains unresolved after the conclusion of the complaints procedure, an ACR Project Proponent or stakeholder may appeal any such decision or outcome reached. The following confidential appeals procedure shall be followed:

1. Project Proponent or ACR stakeholder sends a written appeal via email to ACR@winrock.org. The appeal must detail the following:
 - Description of the appeal, with specific reference to ACR Standard and/or ACR Methodology requirements, as applicable;
 - Supporting documentation provided for consideration in the appeal process, including previous communication on the complaint and all relevant details of the previously implemented complaint procedure; and
 - Appellant name, contact details, and organization.
2. ACR Senior Management shall forward the appeal to the appropriate Winrock Senior Director, who will convene a committee of representatives to review and discuss the matter. The committee will include a member of the Winrock Board of Directors, a

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member of the Winrock Senior Management team, and an ACR staff member unrelated to the complaint, all of whom will have equal votes. The committee may also include a technical and/or subject matter expert or experts as necessary, who will not be able to vote. The committee members selected will depend on the subject matter and nature of the appeal.

3. The decision reached by the committee shall be communicated, via written response, to the ACR Project Proponent or stakeholder. Any decision reached by the committee shall be final.

DEFINITIONS

Additionality	ACR's additionality requirements are intended to ensure that project offsets are in addition to reductions and/or removals that would have occurred in the absence of the Project Activity and without carbon market incentives. A Project Proponent must demonstrate that the GHG emission reductions and removals associated with an offset project are above and beyond the "business as usual" scenario. ACR requires that every project either pass an approved performance standard and a regulatory additionality test, or pass a three-pronged test to demonstrate that the Project Activity is beyond regulatory requirements, beyond common practice, and faces at least one of three implementation barriers (institutional, financial, or technical).
Afforestation/ Reforestation	Activities to increase carbon stocks by establishing, increasing, and restoring vegetative cover through the planting, sowing, or human-assisted natural regeneration of woody vegetation. These activities must target the eventual establishment of "forest" per the applicable definition. In general, the term "afforestation" is applied to activities to establish forest on lands that have been in another land use for some relatively long period, and "reforestation" is applied to activities to reestablish forest on lands that were relatively recently in forest cover. ACR does not make a specific distinction between afforestation and reforestation, because both are eligible. Project Proponents shall document that afforestation/reforestation project lands were not cleared of trees during the 10 years preceding the project Start Date in order to implement an afforestation/reforestation project. This exclusion does not apply to natural disturbances or to removal of non-tree vegetation (e.g., heavy brush) to prepare the site for planting. Project lands that already meet the applicable "forest" definition due to the percentage tree cover or other factors, and on which a Project Proponent wishes to implement activities to increase carbon stocks by increasing and restoring vegetative cover through the planting, sowing, or human-assisted natural regeneration of woody vegetation, qualify under the Improved Forest Management (IFM) category.
Aggregate	The grouping of multiple project instances, fields, producers, or facilities into a single project registered on ACR. An Aggregate must be coordinated by a Project Proponent (public or private entity) serving as the aggregator. The GHG Project Plan will define the overall project boundary and baseline conditions encompassing all project instances, fields, producers, or facilities. An Aggregate will have a single Start Date and Crediting Period.
Agriculture, Forestry, and Other Land Use (AFOLU)	A broad category of ACR-eligible project activities that reduce GHG emissions and/or enhance GHG removals through changes in agriculture, forestry, and land-use practices.

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Agricultural Land	Any ecosystem modified or created specifically to grow or raise biological products for human consumption or use. This includes cropland, pasture, rangeland, orchards, groves, vineyards, nurseries, ornamental horticultural areas, and confined feeding areas. It is generally synonymous with farmland.
American Carbon Registry® (ACR)	A leading carbon offset program founded in 1996 as the first private voluntary GHG registry in the world, ACR operates in the voluntary and regulated carbon markets. ACR has two decades of experience in the development of environmentally rigorous, science-based offset methodologies, as well as operational experience in the oversight of offset project verification, registration, offset issuance, and retirement reporting through its online registry system.
ACR-Approved Methodology	GHG quantification, monitoring, reporting, and verification published by ACR after public consultation and scientific peer review, and methodologies approved for use by the CDM Executive Board, provided they are approved for use by ACR.
Annual Attestation Statement	The statement that a Project Proponent provides annually to ACR relating to the continuance, ownership, and community and environmental impacts of a project. The Attestation is required to continue crediting.
Avoided Conversion of Forest	Activities that prevent the conversion of forests to development, agriculture or other land uses.
Avoided Conversion of Non-Forest	Activities that prevent the conversion of non-forest native lands to anthropogenically productive uses (e.g., cropland, settlement, or development). Eligible project activities include avoided conversion of grasslands and shrublands to crop production.
Baseline Scenario	A counterfactual scenario that forecasts the likely stream of emissions or removals to occur if the Project Proponent does not implement the project (i.e., the “business as usual” case). It also reflects the sum of the changes in carbon stocks (and, where significant, nitrous oxide and methane emissions) in the carbon pools within the project boundary that would occur in the absence of the Project Activity.
Buffer Contribution	The number of offsets contributed to the Buffer Pool for AFOLU projects with a risk of reversal.
Buffer Pool	An account managed by ACR as a reversal risk mitigation mechanism for AFOLU projects into which Project Proponents contribute a determined quantify of ERTs to replace unforeseen losses in carbon stocks. The Buffer Contribution is a percentage of the project’s reported offsets, the Minimum Buffer Percentage, determined through a project-specific assessment of the

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	<p>risk of reversal. The buffer contribution may be made in ERTs of any type and vintage.</p>
<p>Cancel or Cancellation</p>	<p>The permanent removal of an offset credit from the Registry so that it cannot be transferred, transacted, retired or applied towards any emissions reduction targets as an ACR offset credit unit. The exception to this is for airplane operators who cancel units to surrender them towards their CORSIA compliance obligations. If the offset credit has been canceled so that the equivalent can be reissued on another offset program, ACR no longer tracks the credit ownership and permanence (if applicable).</p>
<p>Carbon Dioxide-Equivalent (CO₂e)</p>	<p>A metric to compare GHGs based on their global warming potential (GWP) relative to CO₂ over the same timeframe. The Intergovernmental Panel on Climate Change publishes GWP values for converting all GHGs to a CO₂e basis.</p>
<p>Carbon Offset</p>	<p>A reduction, removal, or avoidance of GHG emissions that is used to compensate for GHG emissions that occur elsewhere. In a regulated market, offsets are GHG reductions from projects undertaken outside the coverage of a mandatory emissions reduction system for which the ownership of verifiable GHG emission reductions can be transferred and used by a regulated source to meet its emission reduction obligations.”²⁷ The ACR registers both voluntary market and compliance-eligible offsets. Also referred to as a verified emission reduction (VER), a carbon credit, or offset credit.</p>
<p>Carbon Pool</p>	<p>A reservoir of carbon that has the potential to accumulate or lose carbon over time. Common forest carbon pools are aboveground biomass, belowground biomass, litter, dead wood, soil organic carbon (SOC), and wood products.</p>
<p>Carbon Stocks</p>	<p>The measured, estimated or modeled quantity of carbon held in a particular carbon pool. Quantifying GHG emissions and removals for terrestrial carbon offset projects involves estimating, for the baseline vs. project scenario, changes over time in carbon stocks in relevant pools.</p>
<p>Cohort</p>	<p>A new group of Project Participants, meeting all eligibility, project boundary, baseline, and additionality criteria of an already established Programmatic Development Approach (PDA).</p>
<p>Clean Development Mechanism (CDM)</p>	<p>A mechanism that allows GHG emission reduction and removal projects in non-Annex 1 parties to the UNFCCC to earn certified emission reduction (CER) credits, each equivalent to one metric ton of CO₂, which can be sold and used by Annex 1 countries to meet a part of their emission reduction targets under the Kyoto Protocol. The CDM is intended to stimulate</p>

²⁷ Adapted from Pew Center on Global Climate Change. Climate Change 101: Cap and Trade. <http://www.pewclimate.org/docUploads/Cap&Trade.pdf>.

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	sustainable development and emission reductions while giving industrialized countries flexibility in how they meet their emission reduction targets. ²⁸
Commercially Sensitive Information	Trade secrets, financial, commercial, scientific, technical, or other information whose disclosure could result in a material financial loss or gain, prejudice the outcome of contractual or other negotiations, or otherwise damage or enrich the person or entity to which the information relates.
Community	All groups of people who live within or adjacent to a project area, including indigenous peoples, mobile peoples, and other local communities, as well as any groups that regularly visit the area and derive income, livelihood, or cultural values from it. This may include one or more groups that possess characteristics of a community, such as shared history, shared culture, shared livelihood systems, shared relationships with one or more natural resources (e.g., forests, water, rangeland, wildlife), and shared customary institutions and rules governing the use of resources. ²⁹
Community and Environmental Impacts	The effects, positive and negative, that a Project Activity may have on the socioeconomic well-being of affected communities or environmental quality in the project area. ACR requires that the Project Activity provide net benefits to affected communities and the environment, and that negative impacts be mitigated or compensated and monitored throughout the project.
Crediting Period	The finite length of time for which a GHG Project Plan is valid, and during which a project can generate offsets against its baseline scenario. The baseline must be re-evaluated to renew the Crediting Period. ACR sector standards and methodologies specify the Crediting Period for particular project types.
Cropping Cycle	The period between the first day after harvest of the last crop in a field and the last day of harvest of the current crop. A single cropping cycle does not have to be 12 months, and multiple cropping cycles may occur within a cultivation year.
Cultivation Year	The annual cycle of activities related to the growth and harvest of crops within an approximate 12-month period. A single cultivation year may contain a single cropping cycle or several cropping cycles.
De Minimis	So minor as to merit disregard. ACR sets a de minimis threshold of 3% of the final calculation of emission reductions or removals. For the purpose of completeness, any decreases in carbon pools and/or increases in GHG emission sources that exceed the de minimis threshold must be included. Any exclusions using the de minimis principle shall be justified using fully

²⁸ <http://cdm.unfccc.int/about/index.html>.

²⁹ Climate, Community, and Biodiversity Standards – Project Design Standards. Second Edition (2008). Climate, Community & Biodiversity Alliance.

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	documented ex ante calculations, and within the specifications of the chosen methodology.
Do no harm	Offset projects must be in compliance with applicable local, national, and international laws and regulations.
Double Counting	In the context of climate change mitigation, situations where a single GHG emission reduction, removal, avoidance, or other mitigation outcome is used more than once to demonstrate achievement of mitigation targets or pledges. Double counting can occur in different ways, including double issuance, double use, and double claiming.
Double Claiming	Whereby two or more parties claim the same GHG reduction, removal, or other mitigation outcome toward their national or sector-wide emissions reduction cap or target (e.g., mitigation targets/pledges under the Paris Agreement as formulated in the NDCs and/or air carriers offsetting obligation under the CORSIA). Transparent accounting and reporting procedures at both the national and international level must be in place to track emissions reductions transferred to other Parties toward meeting their targets. In these instances, a corresponding adjustment should be made by the host country, adding the emissions back to its national GHG inventory (or NDC), as well as by the receiving party.
Double Issuance	Whereby more than one unique unit is issued for the same emissions reduction or removal, within the same program/registry or involving concurrent issuance under more than one program(s)/registry(ies). This can lead to double use/selling and double claiming, in that more tons are being created and supplied than were actually mitigated. The risk of double issuance can be avoided by having preventative program rules and oversight processes in place, such as cancellation of units by one program prior to re-issuance by another.
Double Use	When a single GHG reduction or removal is sold to more than one entity at a given time, or when an issued unit is used by the same buyer toward more than one target (e.g., under systems that do not “talk” to each other or may have inconsistent rules for reporting and/or retirement). Double use can be avoided by having operational processes, program rules, tracking systems, and oversight processes in place. Also referred to as double selling due to, for example, double issuance (registry/program/verification issue) or fraudulent sales practices, which may or may not be detectable by registry/program/verifier.
Emission Reduction Ton (ERT)	The ACR unit of exchange for tradable, project-based carbon offsets. ERTs refer to both emission reductions and enhancements in sequestration. ACR issues one ERT for each metric ton of CO ₂ e emission reductions or removals verified against an ACR Standard and methodology.

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Emission Factor	A coefficient that relates an activity datum to the quantity of GHG emissions released to the atmosphere. Emission factors are often based on a sample of measured emissions data that are averaged to develop a representative rate of GHG emissions for a given activity level under a given set of operating conditions.
Farm	The entire operations, which may include multiple fields or parcels of land, and is under the management of a single owner or entity.
Field	A contiguous tract of land with a homogenous management strategy and a common owner separated by permanent boundaries such as fences, waterways, woodlands, or other similar features.
Forest	Forest projects shall use a nationally approved “forest” definition for the country where the activity occurs. For projects in the United States, Project Proponents shall use the U.S. definition in Appendix A, which is based on the U.S. Forest Service Forest Inventory & Analysis Program definition. For projects outside of the United States, Project Proponents may use the Kyoto Protocol definition in Appendix A, with the relevant Designated National Authority (DNA) selections for minimum land area, crown cover, and tree height. If the project is in a country that no longer has a designated DNA or whose DNA has not made these selections, the Project Proponent may propose another nationally approved forest definition. The definition of forest shall apply in each eligible forest project category. For example, afforestation/ reforestation activities must target the eventual establishment of a forest; IFM activities must be implemented in a forest remaining as forest; and Avoided Conversion activities must be implemented in a forest and prevent its conversion to non-forest or its degradation remaining forest.
Geologic Sequestration	The process of capturing carbon dioxide from a stationary source and injecting it deep underground through a well, with or without enhanced oil recovery. Also called carbon capture and storage.
Greenhouse Gas (GHG)	Any gaseous compound that absorbs infrared radiation in the atmosphere and contributes to the warming of the atmosphere. The primary GHGs regulated under the Kyoto Protocol are carbon dioxide (CO ₂), nitrous oxide (N ₂ O), methane (CH ₄), HFCs, perfluorocarbons (PFCs), and sulfur hexafluoride (SF ₆). The IPCC lists and periodically updates GHGs in its assessment reports. ACR’s scope includes all GHGs (including ODS) listed in the IPCC Fourth Assessment Report, Working Group 1, Chapter 2, Table 2.14. ³⁰
GHG Emission Reductions and Removals	A GHG emission reduction is the measured decrease of GHG emissions over a specified period relative to an approved baseline. A GHG removal is the mass of GHGs removed from the atmosphere over a specified period relative to an approved baseline.

³⁰ See http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

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GHG Emission System/Trading Program	A voluntary or regulated program that allows for trading in project-based GHG emission reductions or removals, government-issued credits, and/or allowances.
GHG Project Plan	A document that describes the Project Activity, satisfies eligibility requirements, identifies sources and sinks of GHG emissions, establishes project boundaries, describes the baseline scenario, defines how GHG quantification will be done and what methodologies, assumptions, and data will be used, and provides details on the project's monitoring, reporting, and verification procedures. ACR requires every project to submit GHG Project Plan using an ACR-approved methodology.
Global Warming Potential (GWP)	A relative scale translating the global warming impact of any GHG into its CO ₂ e over the same timeframe. The IPCC periodically updates the list of GHGs and their GWP factors, based on the most recent science. ACR requires Project Proponents to calculate GHG reductions and removals based on the 100-year GWPs in the IPCC Fourth Assessment Report, Working Group 1, Chapter 2, Table 2.14.
Grassland and Shrubland	A land-use category on which the plant cover is composed principally of grasses, grass-like plants (e.g., sedges and rushes), forbs, or shrubs. Savannas, some wetlands, deserts, and tundra are considered grassland; they are often suitable for grazing and browsing, and include pastures and native rangelands. Practices such as clearing, burning, chaining, and/or chemicals may be applied to maintain the grass vegetation. Woody plant communities of low forbs and shrubs (e.g., mesquite, chaparral, mountain shrub, and pinyon-juniper) are also classified as grassland and shrubland if they do not meet the criteria for forest land. Grassland includes land managed with agroforestry practices such as silvopasture and windbreaks, assuming the stand or woodlot does not meet the criteria for forest land.
Implementation Date	The site-specific date corresponding to the start of project activities (as they are defined by the relevant methodology) on a single site within a project implementing an Aggregate or Programmatic Design Approach.
Improved Forest Management (IFM)	Activities to reduce GHG emissions and/or enhance GHG removals, implemented on lands designated, sanctioned, or approved for forest management (e.g., production of sawtimber, pulpwood, and fuelwood). Eligible IFM project activities include conversion from conventional logging to reduced-impact logging; conversion of managed forests to protected forests ("stop logging"); extending rotation lengths in managed forest; conversion of low-productive forests to high-productive forests; increasing forest productivity by thinning diseased or suppressed trees; managing competing brush and short-lived forest species; increasing the stocking of trees on understocked areas (including lands not historically managed as forest but meeting the applicable "forest" definition due to percent tree cover or other factors);

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	<p>increasing carbon stocks in harvested wood products; improving harvest or production efficiency; and shifting from shorter- to longer-term wood products.</p>
<p>Indirect GHG Emissions</p>	<p>GHG emissions caused by a Project Proponent's activities but that are not directly released into the atmosphere from sources owned or controlled by the Project Proponent. Indirect emissions can occur upstream or downstream from activities directly controlled by the Project Proponent.</p>
<p>Intentional Reversal</p>	<p>The decrease of average carbon stocks within a project area below levels associated with previously issued ERTs as a result of intentional, willful activity (e.g., harvesting, forest conversion) on the part of the Project Proponent or project owner(s). When carbon stocks decline in this way (i.e., negative stocks, relative to previous reporting), it is assumed that the carbon is released back into the atmosphere. Willful withdrawal of a parcel or parcels from a PDA or aggregated project such that monitoring and verification will no longer be conducted for the minimum project term is automatically considered an intentional reversal and must be compensated per the provisions in the Project Proponent's Risk Mitigation Agreement with ACR.</p>
<p>Intergovernmental Panel on Climate Change (IPCC)</p>	<p>The IPCC is "the leading body for the assessment of climate change, established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socioeconomic consequences."³¹</p>
<p>Leakage</p>	<p>A decrease in sequestration or increase in emissions outside project boundaries resulting from project implementation. Leakage may be caused by shifting of the activities of people present in the project area or by market effects whereby emission reductions are countered by emissions created by shifts in supply of and demand for the products and services affected by the project.</p>
<p>Listing</p>	<p>The process by which a Project Proponent submits a draft GHG Project Plan to ACR for review, the successful outcome of which results in the project being approved for listing as a project on the ACR platform. ACR's review and subsequent approval of a project listing is not a project certification, nor does it take the place of a successful validation and verification.</p>
<p>Methodology</p>	<p>A systematic approach that establishes requirements for a Project Proponent to develop the project baseline scenario(s) and to quantify, monitor, report, and verify emissions reductions or removals by following scientific good practice. Good practice entails that a methodology be conservative, transparent, and thorough.</p>

³¹ <http://www.ipcc.ch/organization/organization.htm>.

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Methodology Deviations and Revisions	A project-specific change to an existing approved methodology due to a change in the conditions, circumstances, or nature of a project. A deviation may be accepted for a specific project but does not result in an approved modification to the methodology. A methodology revision is a fundamental change in an existing approved methodology due to a change in conditions, circumstances, or general developments in knowledge. ACR approval of methodology deviations and modifications is determined by the relevant ACR Technical Committee. Approval of revisions requires public consultation and peer review.
Methodological Tools	An approved component of a methodology (e.g., a stand-alone methodological module to perform a specific task) or a calculation tool (e.g., spreadsheets or software that perform calculation tasks) that a Project Proponent uses to quantify net GHG reductions/removals or meet other ACR requirements.
Minimum Buffer Percentage	An overall reversal risk rating for an AFOLU project based on the ACR Tool for Risk Analysis and Buffer Determination, which translates into the number of offsets that will be deposited in the ACR Buffer Pool at each issuance to mitigate the risk of reversals.
Minimum Project Term	The minimum period for which a Project Proponent commits to project continuance, monitoring, and verification.
Monitoring	Continuous or periodic direct measurements and/or indirect assessment of GHG emissions, reductions, or other GHG data that is typically specified in the ACR-approved methodology.
Native vs. Non-native Vegetation	Native vegetation is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Non-native vegetation does not need human help to reproduce and maintain itself over time in an area where it is not native.
Naturalized Plants	Refers to non-native vegetation that does not need human help to reproduce and maintain itself over time in an area where it is not native. Even though their offspring reproduce and spread naturally (i.e., without human help), naturalized plants do not become native members of the local plant community.
Net Emissions Reductions	GHG emission reductions or removals created by a Project Activity, minus the baseline scenario and any deductions for uncertainty and leakage.
Ozone-Depleting Substances (ODS)	Controlled substances under Annexes A, B, C, and E of the Montreal Protocol, ³² many of which are also potent GHGs. The Montreal Protocol controls the consumption, production, and international trade of ODS, but not

³² See http://ozone.unep.org/Publications/MP_Handbook.

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	emissions; therefore, the destruction of ODS in existing facilities and equipment worldwide has the potential to prevent significant GHG emissions.
Pasture	Grassland that has been seeded, usually to introduced species, and intensively managed for livestock using agronomy practices and control of livestock.
Permanence	In GHG accounting, a reference to the perpetual nature of GHG removal enhancements and the risk that a project's atmospheric benefit will not be permanent. GHG removals may not be permanent if a project has exposure to risk factors such as intentional or unintentional events (e.g., fire, flood, insect infestation) that results in the emissions into the atmosphere of stored or sequestered CO ₂ e for which offset credits were issued (i.e., a reversal).
Permanence Risk Analysis	To account for and mitigate against the risk of reversal in some AFOLU projects, ACR requires Project Proponents to conduct a risk analysis to determine the number of offsets that must be deposited in the ACR Buffer Pool. The risk analysis evaluates several types of risk—project, economic, regulatory, and social and environmental/natural disturbance—and must be conducted using the ACR-approved tool.
Programmatic Development Approach (PDA)	A project in which successive cohorts of sites are added incrementally to a project over time. A PDA must be coordinated by a Project Proponent (public or private entity) that must use an approved baseline and monitoring methodology that defines the appropriate boundary, avoids double counting, accounts for leakage, and ensures that the emission reductions are real, measurable, verifiable, and additional to any that would occur in the absence of the project. ³³
Project Boundaries	A GHG project's physical boundary or implementation area, the GHG sources, sinks and reservoirs (or pools) considered, and the project duration.
Project Proponent	An individual or entity that undertakes, develops, and/or owns a project. This may include the project investor, designer, and/or owner of the lands/facilities on which project activities are conducted. The Project Proponent and landowner/facility owner may be different entities. The Project Proponent is the ACR account holder.
Rangeland	A land use category generally synonymous with grazed grassland. Rangelands support native vegetation and include areas that have been seeded to introduced species but are managed as native range.

³³ Adapted from Clean Development Mechanism Rulebook at <http://cdmrulebook.org/452>.

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Registration	Projects are considered registered and eligible for ERT issuance into a Project Proponent's account upon acceptance of the validation report and a positive verification opinion.
Reporting Period	The period of time covering a GHG assertion that is submitted for a single verification and subsequent request for ERT issuance.
Sustainable Biomass	<p>Biomass which meets one of the following conditions:</p> <p>a) The biomass is a biomass residue and the use of that biomass residue in an ACR project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas from which the biomass residues originate;</p> <p>(b) The biomass is the non-fossil fraction of industrial or municipal waste. Such sources can include: Agricultural residues, animal wastes, forestry residues, wood wastes, industrial wastes such as black liquor and food processing.</p>
Retire or Retirement	The permanent removal of an offset credit from circulation as a transactable unit so that it represents a permanent reduction or removal of CO ₂ e from the atmosphere. A retired credit may be applied toward the emissions reduction target of the ACR account holder that retired the credit, or on behalf of a third party.
Reversal	An intentional or unintentional event that results in the emissions into the atmosphere of stored or sequestered CO ₂ e for which carbon offsets (ERTs) were issued.
Site	A physical location at which GHG emissions are generated and/or GHG emissions reductions are achieved. Project sites may consist of forest, fields, parcels of land, or industrial facilities located within the project boundary.
Standard	A standard is an established norm or requirement in a formal document that establishes uniform engineering or technical criteria, methods, processes, and practices. Standards may provide general guidance across all project types, such as this document, or be sector-specific. ACR registers only projects that meet the ACR Standard.
Start Date	For non-AFOLU projects, the date on which the project began to reduce GHG emissions against its baseline. For AFOLU projects, the date on which the Project Proponent began the activity on project lands, with more specific guidance in the relevant ACR sector-specific requirements.
Terrestrial Sequestration	The process of increasing the carbon stock of terrestrial carbon pools by changing the management of forests, rangelands, agricultural lands, and wetlands, resulting in increased removals of CO ₂ from the atmosphere and sequestration of carbon through biological processes.

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Unintentional Reversal	The decrease of average carbon stocks within a project area below levels associated with previously issued ERTs as a result of natural disturbances. Examples include fire, disease, and insect infestations.
Validation	The systematic, independent, and documented process for the evaluation of a GHG Project Plan against applicable requirements of the ACR Standard, sector standard, and approved methodology.
Validation/ Verification Body (VVB)	A competent and independent person, persons, or firm responsible for performing the validation and/or verification process. A VVB must be ACR-approved to conduct verification.
Verification	The systematic, independent, and documented assessment by a qualified and impartial third party of the GHG assertion for a specific reporting period. The verification process is intended to assess the degree to which a project complies with ACR-approved methodologies, tools, eligibility criteria, requirements, and specifications, and has correctly quantified net GHG reductions or removals. Verification must be conducted by an independent third-party verifier.
Verification Statement	A statement issued by a verification body that provides assurance, through examination of objective evidence by a competent and independent third party, that a GHG assertion is in conformity with applicable requirements.
Wetlands	Areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and that under normal circumstances do support) a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

APPENDIX A: ACR REQUIREMENTS FOR AGRICULTURE, FOREST, AND OTHER LAND USE-BASED CARBON PROJECTS

PURPOSE

This annex details ACR's overarching requirements for the quantification, monitoring, and reporting, verification, registration, and issuance of carbon emissions reductions and removals from AFOLU project activities. All AFOLU projects must also meet all relevant requirements of the main body of this ACR Standard.

The ACR Requirements for AFOLU-Based Carbon Projects supersedes the ACR Forest Carbon Project Standard version 2.1 and includes updates, clarifications for consistency, and removal of redundancies with the ACR Standard and approved methodologies. Details around non-forest project types have also been added to include agriculture and other land use-specific requirements. All essential requirements remain unchanged.

APPLICABILITY

The ACR Requirements for AFOLU-Based Carbon Projects cover the project types specified in Section A.1 below. Other eligible AFOLU carbon project types may be added in the future.

A.1 ELIGIBLE PROJECT TYPES

A.1.1 Eligible Project Types

The following broad categories of AFOLU project types are eligible for registration on ACR. Within each category, the GHG Project Plan will outline specific activities undertaken to reduce GHG emissions and/or enhance removals.

- **IMPROVED FOREST MANAGEMENT (IFM)** Activities to reduce GHG emissions and/or enhance GHG removals, implemented on lands designated, sanctioned, or approved for

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forest management (e.g., production of sawtimber, pulpwood, and fuelwood). Eligible IFM project activities include conversion from conventional logging to reduced impact logging; conversion of managed forests to protected forests (“stop logging”); extending rotation lengths in managed forest; conversion of low-productive forests to high-productive forests; increasing forest productivity by thinning diseased or suppressed trees; managing competing brush and short-lived forest species; increasing the stocking of trees on understocked areas (including lands not historically managed as forest but meeting the applicable “forest” definition due to percent tree cover or other factors); increasing carbon stocks in harvested wood products; improving harvest or production efficiency; and shifting from shorter- to longer-term wood products and activities to avoid emissions from wildfire by improving fuels and fire management.

- **AFFORESTATION/REFORESTATION (AR)** Activities to increase carbon stocks by establishing, increasing, and restoring vegetative cover through the planting, sowing, or human-assisted natural regeneration of woody vegetation. AR activities must target the eventual establishment of “forest” per the applicable definition. In general, the term “afforestation” is applied to activities to establish forest on lands that have been in another land use for some relatively long period, and “reforestation” is applied to activities to reestablish forest on lands that were in forest cover relatively recently. ACR does not make a specific distinction between afforestation and reforestation, because both are eligible.

Project Proponents shall document that afforestation/reforestation project lands were not cleared of trees during the 10 years preceding the project Start Date in order to implement an afforestation/reforestation project. This exclusion does not apply to natural disturbances or to removal of non-tree vegetation (e.g., heavy brush) to prepare the site for planting. Project lands that already meet the applicable “forest” definition due to the percentage tree cover or other factors, and on which a Project Proponent wishes to implement activities to increase carbon stocks by increasing and restoring vegetative cover through the planting, sowing, or human-assisted natural regeneration of woody vegetation, qualify under the Improved Forest Management (IFM) category.

- **AVOIDED CONVERSION OF FOREST (AC-F)** The reduction in GHG emissions from the avoided conversion of forest to non-forest use (e.g., to cropland, grassland, settlement, or development) or avoided degradation of forests remaining as forests.
- **AGRICULTURE-SOIL CARBON ENHANCEMENT** Activities that increase soil carbon sequestration on agricultural land through the application of soil amendments, the improvement of primary productivity, and/or less disruptive management practices. Eligible project activities include compost addition to grasslands and changes in tillage practices.
- **AGRICULTURE-AVOIDED EMISSIONS** Activities that reduce emissions of GHGs by improving efficiency of inputs or the application of a lower GHG practice/technology. Eligible project activities include changes to fertilizer rate and application, and changes in rice management systems.
- **WETLAND RESTORATION OR REVEGETATION** Activities that increase carbon sequestration and/or prevent soil oxidation on degraded wetlands. Eligible project activities include tidal wetland creation, deltaic wetland creation, and rewetting previously drained wetlands, including pocosins. Quantification frameworks and baseline definitions need to be developed for each location where this project type is applied due to unique, location-specific wetland dynamics, pressures, and restoration techniques.

- **AVOIDED CONVERSION OF NON-FOREST** The reduction in GHG emissions from the avoided conversion of lands with non-forest, native vegetation to anthropogenically productive uses (e.g., to cropland, settlement, or development). Eligible project activities include avoided conversion of grasslands and shrublands to crop production.

Project Proponents uncertain about eligibility of a planned activity may consult with ACR.

A.1.2 AFOLU Projects with a Biomass Energy Component

AFOLU carbon activities may include a biomass energy component if they provide biomass fuel for Scope One, direct electricity generation, heating, or transportation fuels. Such projects occupy a unique GHG accounting niche with potential impacts on GHG emissions and removals in terrestrial ecosystems, as well as the ability to displace GHG emissions from fossil fuels. Projects that combine an eligible forest carbon Project Activity with biomass production shall account for changes in GHG reductions and removals in forest carbon pools using the requirements outlined in this document and appropriate AFOLU methodologies. Displacement of fossil fuel GHG emissions, if eligible, shall be accounted for by using appropriate energy sector methodologies and tools. Please refer to Chapter 1, Section E, of the ACR Standard for requirements related to renewable energy.

A.2 ACCOUNTING PRINCIPLES

A.2.1 Exclusion of Pools in Accounting

Project Proponents should refer to Chapter 2 of the ACR Standard for general accounting and data quality principles. Additional guidance is provided here for forest AFOLU projects. In general, the basis for ACR's accounting principles is ISO 14064 Part 2:2006, Specification, with guidance at the project level for quantification, monitoring, and reporting of GHG emission reductions or removal enhancements.

Project Proponents shall apply the guidance in ISO 14064-2:2006 and consider all relevant information that may affect the accounting and quantification of GHG reductions/removals, including estimating and accounting for any decreases in carbon pools, avoided emissions, and/or increases in GHG emission sources.

ACR methodologies dictate which GHG sources, sinks and pools must be accounted for in the GHG boundary for each project. However, the Project Proponent may elect to exclude from accounting a GHG source, sink, or pool if any of the following is demonstrated:

- The source, sink, or pool is a priori optional per the guidance below or has been explicitly excluded from the project boundary in the applied methodology.
- The source, sink, or pool is demonstrated to be de minimis per the ACR definition. A pool or source not initially considered de minimis in ex ante calculations, but found to be de minimis

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in monitoring, may be omitted from subsequent monitoring and verification if the Project Proponent presents evidence that the pool or source is likely to remain indefinitely below the de minimis threshold (i.e., that the monitoring activities in which an individual pool or source was de minimis was not merely a temporary condition).

- All combined sources, sinks, and pools thus excluded must represent less than 3% of the ex-ante calculation of emission reductions/removal enhancements.

Sources, sinks, and pools that could be excluded may still be accounted; but any source, sink, or pool selected for accounting in the baseline scenario must also be accounted in the project scenario.

The following pools and sources are considered insignificant a priori for AFOLU carbon projects.

Emissions sources:

- Fertilizer application in forest projects.
- Removal of herbaceous vegetation in forest projects.
- Transportation emissions from vehicles used in project visits, monitoring, verification, etc. This does not include emissions of harvest, processing, or transport equipment, which may be insignificant but are not insignificant a priori; the Project Proponent shall justify exclusion of such emissions.
- Collection of wood from non-renewable sources to be used for fencing of the project area.
- Nitrous oxide (N₂O) emissions from decomposition of litter and fine roots from nitrogen-fixing trees.

Carbon pools:

- Litter

A.3 ELIGIBILITY REQUIREMENTS

A.3.1 AFOLU Land Classification

1. Forest projects shall use a nationally approved “forest” definition for the country where the activity occurs. For projects in the United States, Project Proponents shall use the U.S. definition below, which is based on the U.S. Forest Service Forest Inventory & Analysis Program definition. For projects outside of the United States, Project Proponents may use the Kyoto Protocol definition below, with the relevant Designated National Authority (DNA) selections for minimum land area, crown cover, and tree height. If the project is in a country that no longer has a designated DNA or whose DNA has not made these selections, the Project Proponent may propose another nationally approved forest definition.

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Forest (for projects in U.S.; based on U.S. Forest Service Forest Inventory & Analysis Program definition)³⁴

Land with at least 10% cover (or equivalent stocking) by live trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. To qualify, the area must be at least 1 acre in size. Forest land includes transition zones, such as areas between forest and non-forest lands that have at least 10% cover (or equivalent stocking) with live trees and forest areas adjacent to urban and built-up lands.

Forest (for projects in Kyoto Protocol signatory countries)

The Kyoto Protocol defines forest as follows but allows each country's DNA to define minimum land area, crown cover, and tree height within the bracketed ranges: A minimum area of land of (0.05–1.0 hectares) with a minimum tree crown cover (or equivalent stocking level) of (10–30%) with trees, and with the potential to reach a minimum height of (2–5 meters) at maturity in situ. A forest may consist either of closed forest formations, where trees of various heights and undergrowth cover a large portion of the ground, or open forest. The definition includes young natural stands and all plantations that have yet to reach a crown density of (10–30%) or tree height of (2–5 meters), as well as areas that usually form part of the forest area but that are temporarily unstocked because of human intervention (e.g., harvesting) or natural causes, but likely will revert to forest.³⁵

The definition of forest shall apply in each eligible forest project category. For example, afforestation/ reforestation activities must target the eventual establishment of a forest; IFM activities must be implemented in a forest remaining as forest; and Avoided Conversion activities must be implemented in a forest and prevent its conversion to non-forest or its degradation remaining forest.

2. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and that under normal circumstances do support) a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Methodologies specific to different types of wetlands must define the specific regional geographic applicability.
3. Agricultural Land is defined as any ecosystem modified or created specifically to grow or raise biological products for human consumption or use. This includes cropland, pasture, rangeland, orchards, groves, vineyards, nurseries, ornamental horticultural areas, and confined feeding areas. It is generally synonymous with farmland.

³⁴ See http://fia.fs.fed.us/library/database-documentation/current/ver4/draft%20FIADB_user%20manual_v4-0_p2_12_22_2009.pdf at page 51. ACR does not exclude urban forestry activities, or forested areas less than 120 feet wide, from potentially meeting the definition of forest.

³⁵ DNA selections for minimum land area, crown cover, and tree height are at <http://cdm.unfccc.int/DNA/allCountriesARInfos.html>. If the project is in a country that has not yet designated a DNA or whose DNA has not yet made selections, the Proponent may propose another nationally approved forest definition.

4. Grassland and shrubland is a land-use category on which the plant cover is composed principally of grasses, grass-like plants (e.g., sedges and rushes), forbs, or shrubs. Savannas, some wetlands, deserts, and tundra are considered grassland. They are often suitable for grazing and browsing, and include both pastures and native rangelands. Practices such as clearing, burning, chaining, and/or chemicals may be applied to maintain the grass vegetation. Woody plant communities of low forbs and shrubs (e.g., mesquite, chaparral, mountain shrub, and pinyon-juniper) are also classified as grassland and shrubland if they do not meet the criteria for forest land. Grassland includes land managed with agroforestry practices such as silvopasture and wind-breaks, assuming the stand or woodlot does not meet the criteria for forest land.³⁶

A.3.2 Eligible Land Ownership Types

ACR accepts projects on all land ownership types—private, public (municipal, county, state, federal, or other), and tribal—provided the Project Proponent demonstrates that the land is eligible, documents clear land title and offsets title, the offsets contract is enforceable, and the Project Activity is additional and meets all other requirements of the ACR Standard. Projects on public lands, like any other project, shall demonstrate that the activity is not required by regulations and meets other additionality criteria. Agriculture and land use projects that generate ERTs with no risk of reversal need not demonstrate land title.

A.3.3 Eligibility Criteria

Table 4 details unique eligibility criteria for AFOLU carbon projects, provides a definition of each criterion, and articulates ACR requirements specific to AFOLU project types. Project Proponents must also refer to Chapter 3 of the ACR Standard for additional requirements that apply to all project types. GHG Project Plans shall address each of these criteria.³⁷

Table 4: Eligibility Criteria for AFOLU-Based Carbon Offset Projects

CRITERION	DEFINITION	REQUIREMENT
Start Date	<p>For AR or Wetland restoration/re-vegetation projects, the Start Date is when the Project Proponent began planting or site preparation.</p> <p>For IFM, the Start Date may be denoted by one of the following:</p>	<p>AFOLU Projects must be validated within 3 years of the project Start Date.</p> <p>One exception applies to these timeframes: Projects using a newly approved methodology⁷ or a newly approved modification that expands the eligibility of a previously pub-</p>

³⁶ <http://www.epa.gov/climatechange/Downloads/ghgemissions/US---GHG---Inventory---2011---Chapter---7---LULUCF.pdf>.

³⁷ A template for GHG Project Plans is available at <http://www.americancarbonregistry.org/carbon-accounting/tools-templates>.

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CRITERION	DEFINITION	REQUIREMENT
	<ol style="list-style-type: none"> 1. The date that the Project Proponent began to apply the land management regime to increase carbon stocks and/or reduce emissions relative to the baseline. 2. The date that the Project Proponent initiated a forest carbon inventory. 3. The date that the Project Proponent entered into a contractual relationship to implement a carbon project. 4. The date the project was submitted to ACR for listing review. Other dates may be approved by ACR on a case by case basis. <p>For Avoided Conversion of non-forest, the Start Date is when the Project Proponent implemented the project action physically and/or legally, such as securing a concession or placing a land conservation agreement on the project land.</p> <p>For other Agricultural Land-based projects, the Start Date is the date by which the Project Proponent began the Project Activity on project lands, or the start of the cultivation year during which the Project Activity began.</p>	<p>lished methodology, may submit it for listing with ACR within 10 years of the project Start Date. However, the date of listing submittal must be within 6 months of the methodology publication date, and the project must then be validated within 2 years of the listing.</p> <p>The Start Date and the start of the Minimum Project Term shall be the same. The Start Date and the start of the first Crediting Period</p>
<p>Minimum Project Term</p>	<p>The minimum period for which a Project Proponent commits to project monitoring and verification. This requirement applies only to AFOLU projects that have had ERTs issued that are associated with GHG removals (sequestration). AFOLU projects that have</p>	<p>Project Proponents of AFOLU projects with a risk of reversal shall commit to a Minimum Project Term of 40 years. The minimum term begins on the Start Date, not the first or last year of crediting.</p> <p>The Minimum Project Term is a requirement of the Project Proponent, not necessarily of the landowner</p>

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CRITERION	DEFINITION	REQUIREMENT
	<p>claimed only avoided emissions are not subject to this requirement.</p>	<p>(unless the landowner is the Project Proponent). ACR enters into legal agreements only with the Project Proponent. Agreements between Project Proponent and landowner may have a shorter term and/or a “buy-out” option, provided the Project Proponent commits to replace issued ERTs in the event a landowner opts to discontinue Project Activities. See Chapter 4 and Chapter 6.</p> <p>Project Proponents and landowners may continue AFOLU carbon activities beyond the Minimum Project Term, but ACR does not require monitoring or verification unless the Crediting Period is renewed. At the end of the Minimum Project Term, if the Project Proponent does not renew for another Crediting Period and continue monitoring and verification, ACR conservatively assumes that its activities have ceased and retains and may re-tire any remaining buffer contributions (if applicable)</p>
<p>Crediting Period</p>	<p>Crediting Period is the finite length of time for which a GHG Project Plan is valid, and during which a project can generate offsets against its baseline scenario.</p> <p>Crediting Periods are limited in order to require Project Proponents to reconfirm, at intervals appropriate to the project type, that the baseline scenario remains realistic and credible, the Project Activity re-</p>	<p>All AR projects shall have a Crediting Period of 40 years.</p> <p>All IFM projects shall have a Crediting Period of 20 years.</p> <p>Avoided Conversion projects on both forest and non-forest land with land conservation agreements in place³⁸ shall have a Crediting Period of 40 years, unless otherwise specified in chosen methodologies.</p>

³⁸ All land conservation agreements must be employed with a specified duration longer than a project’s minimum project term.

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CRITERION	DEFINITION	REQUIREMENT
	<p>mains additional, and GHG accounting best practice is being used. This is important because once a project has demonstrated its additionality, it is not required to do so again until applying to renew the Crediting Period.</p>	<p>Wetland Restoration/Revegetation projects shall have a Crediting Period of 40 years.</p> <p>The Crediting Periods for agriculture projects that avoid emissions by changing to lower GHG practices and those that include a soil sequestration component will be specified in the applicable methodology.</p> <p>Unless otherwise specified in the methodology, a Project Proponent may apply to renew the Crediting Period by complying with all then-current ACR requirements, re-evaluating the baseline scenario, re-confirming additionality, and using emission factors, tools, and methodologies in effect at the time of Crediting Period renewal. ACR does not limit the allowed number of renewals.</p> <p>Projects that are deemed to meet ACR additionality criteria are considered additional for the duration of their Crediting Period. If regulations or common practice change during the Crediting Period, this may make the project non-additional and thus ineligible for renewal, but does not affect its additionality during the current Crediting Period.</p> <p>If a project chooses not to renew its Crediting Period, it must continue monitoring and verification activities for the duration of the Minimum Project Term.</p>

Attachment: WLC Responses to Appeal_9JUNE2020_Part 1 (4074 : World Logistics Center)

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CRITERION	DEFINITION	REQUIREMENT
<p>Land Eligibility</p>	<p>Land eligibility restrictions may apply to certain types of offset projects.</p>	<p>For AR projects, Project Proponents shall provide documented evidence in the GHG Project Plan that no project areas have been cleared of trees within the 10 years prior to the project Start Date in order to establish an AR project; or if project lands have experienced loss of forest cover within the last 10 years, this loss was caused by fire or natural disturbance. Loss of forest cover due to fire or natural disturbance does not disqualify an AR project.</p> <p>Some reforestation projects require removal of non-tree vegetation to prepare the site and establish trees. An example is the removal of brush from areas where it has invaded after fire and prevented or significantly slowed the return of trees due to factors such as competition, water limitations, and lack of a nearby seed source. Brush removal for site preparation does not disqualify a reforestation project. Emissions from brush removal must be accounted for in the GHG Project Plan if they exceed the de minimis threshold.</p>
<p>Land Title</p>	<p>Land title is a legal term representing rights and interests in project lands.</p>	<p>For U.S. projects with GHG emissions reductions resulting from terrestrial sequestration, Project Proponents shall provide documentation of clear, unique, and uncontested land title. For international projects, Project Proponents shall provide documentation and/or attestation of land title; ACR may require a legal review by an expert in local law.</p>

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CRITERION	DEFINITION	REQUIREMENT
		<p>Land title may be held by a person or entity other than the Project Proponent, provided the Project Proponent can show clear, unique, and uncontested offsets title.</p> <p>AFOLU projects that result only in the crediting of avoided emissions with no risk of reversal may not require demonstration of land title.</p>
Natural Management Requirements	<p>New plantations of forests and revegetation of wetlands will be carbon sinks regardless of the species planted. However, ACR requires that project plantations are designed within a minimum threshold for facilitating regrowth of species that contribute to an ecosystem with broad environmental benefits and avoid potential negative impacts.</p>	<p>For AR and Wetland Restoration/Revegetation projects, Project Proponents shall ensure that planting/regeneration of vegetation comprises at least 95% native species. Agricultural tree plantations shall be limited to small-scale agroforestry (under 1,000 ha, with demonstrable livelihood benefits).</p> <p>Exceptions to the native species requirement may be granted if the following can be demonstrated:</p> <ul style="list-style-type: none"> ● The non-native species can be considered naturalized or; ● The non-native species does not negatively affect the local ecosystem (in terms of input use (including water, fertilizer, pesticides), invasiveness, competition, etc.
Permanent	<p>Permanence refers to the longevity of removal enhancements and the risk of reversal (i.e., the risk that atmospheric benefit will not be permanent).</p> <p>Reversals may be unintentional or intentional. All AFOLU projects with emissions reductions derived from sequestration have a risk of reversal.</p>	<p>AFOLU Project Proponents shall assess reversal risk using ACR's Tool for Risk Analysis and Buffer Determination, and shall enter into a legally binding Reversal Risk Mitigation Agreement with ACR/Winrock that details the risk mitigation option selected and the requirements for reporting and compensating reversals.</p>

CRITERION	DEFINITION	REQUIREMENT
		<p>Proponents of terrestrial sequestration projects shall mitigate reversal risk by contributing ERTs to the ACR Buffer Pool or using another ACR-approved insurance or risk mitigation mechanism.</p> <p>All projects must adhere to ongoing monitoring, reversal reporting, and compensation requirements as detailed in relevant methodologies and legally binding agreements (e.g., the ACR Reversal Risk Mitigation Agreement).</p>

A.4 BASELINES AND LEAKAGE

This chapter provides requirements on baselines and leakage for the broad categories of eligible AFOLU carbon project activities. Exceptions to these requirements may occur in specific methodologies.

A.4.1 Baselines: AR

The AR baseline scenario is the carbon stock present immediately prior to site preparation, or the most likely carbon stock in the absence of project implementation. If trees are present within the project boundary at the project start, Project Proponents may only count sequestration in pre-existing trees as offsets if growth of the trees is also projected in the baseline. If the Project Proponent does not intend to project growth of pre-existing trees in the baseline scenario, they should be excluded from the project boundary.

If natural forest regeneration is occurring or is likely to occur absent the project action, but the project action (planting, seeding, and/or the human-induced promotion of natural regeneration) accelerates the return to forest, then Project Proponents shall include the estimated natural regeneration in the without-project scenario in the baseline scenario.

Removals of any standing biomass as part of site preparation should be included in project accounting if these exceed the de minimis threshold.

A.4.2 Baselines: IFM

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The IFM baseline scenario shall quantify and justify harvest and forest growth in the absence of a carbon project. Wood products must be accounted for in an IFM baseline scenario. Each methodology shall specify the approach to calculating carbon in long-lived and landfilled wood products.

For project-specific baselines, Project Proponents shall determine the baseline scenario by identifying credible alternative forest management scenarios to the proposed Project Activity, including historical and common practice forest management in the region, using the approach in an approved methodology. All forest management practices that are modeled in the baseline must be demonstrably legally and financially feasible. IFM baseline modeling must include all relevant legal constraints, including Safe Harbor Agreements, legally binding Best Management Practices, restrictions related to endangered or threatened species, and any conservation easements (in place more than 1 year prior to the Start Date).

Performance standard baseline approaches are allowed for IFM projects, and shall be approved on a case-by-case basis.

A.4.3 Baselines: AC-F

The baseline for AC-F projects is the conversion of forest to non-forest over time. Baseline scenarios for planned deforestation and U.S. AC-F to non-forest can be directly calculated. Unplanned deforestation must be modeled.

Avoiding deforestation displaces some use of the forest, often clearing of land for agriculture, or for developed uses such as buildings and roads. Therefore, activity-shifting leakage must always be considered for AC-F projects. Calculation of leakage must be specified in each methodology.

For unplanned deforestation, to determine the appropriate scale for setting a baseline, Project Proponents shall consider the cause of deforestation that the project will address, then consider the geographic range over which that activity is occurring. The goal is to determine potential leakage emissions from deforestation that have occurred across the entire area in which the project might have an effect.

For planned deforestation and AC-F to non-forest, Project Proponents shall consider the probability of conversion as well as the carbon stock of the post-deforestation/conversion land use. The baseline agent of deforestation/conversion (or at a minimum a class of agent) must be identified, and the methodology must address activity-shifting leakage emissions.

A.4.4 Baselines: Agriculture-Soil Carbon Enhancement

The baseline scenario for agriculture-soil carbon enhancement projects is quantified by estimating soil carbon stocks within the project area in the absence of project activities. The specific requirements for determining the baseline scenario will be specified in the chosen methodology. Selecting baseline stock changes can be based on common practice, historical trends, and scientific literature. Models may be used provided they are approved for use by the chosen methodology and/or ACR.

A.4.5 Baselines: Agriculture-Avoided Emissions

The baseline for Agriculture-Avoided Emissions projects is quantified by estimating the avoided emissions that result in a change from a high GHG practice to a low GHG practice. The baseline scenario shall represent the quantified emissions associated with higher GHG emitting practices. Baseline estimates shall be based on common practice, and emissions can be quantified using models, regional datasets, scientific literature, or other ACR-approved approaches. Each methodology will specify requirements for establishing baselines.

A.4.6 Baselines: Wetland Restoration and Revegetation

The baseline for Wetland Restoration and Revegetation projects is quantified by estimating the emissions from a degrading or subsiding wetland or salinization. Baseline could also be agricultural practices, open water, or seasonal wetlands. In each methodology, baseline and project activities shall be summarized per currently eligible geographies.

A.4.7 Baselines: Avoided Conversion of Non-Forest

The full project area must currently be under a single land use classification and have qualified as that classification for at least 10 years prior to the Start Date (or Implementation Date in the case of aggregated/PDA projects). It will remain as that classification throughout the Project Term, and is legally able to be converted and would be converted to alternate use in the absence of the Project Activity.

A.4.8 Leakage

If an AFOLU project displaces activities, the Project Proponent shall account for the activity shifting, either by quantifying actual emissions that result for leakage or by applying a verifiable default. The geographic scope of activity-shifting leakage assessments should be constrained to the area in which the Project Activity can reasonably be expected to have resulted in activity shifting.

Similarly, if an AFOLU project causes market effects leakage, it must be accounted. If AFOLU Project Activities cause a quantifiable, statistically significant decrease in supply of goods, then the methodology must provide an approach for addressing this (via peer-reviewed studies on market leakage rates or similar).

If AR Project Activities cause an increase in supply of emitting goods, ACR does not require Project Proponents to assess market leakage.

Projects that involve changes in hydrologic management practices (e.g., wetland restoration) must address the potential for ecological leakage (impacts outside the project boundary) caused by changes to the hydrologic regime as a result of project development.

More detailed leakage specifications in approved AR methodologies must be followed.

A.5 AGGREGATED AND PROGRAMMATIC DEVELOPMENT APPROACH PROJECTS

A.5.1 Risk Assessment

The Project Proponent shall assess general and project-specific risk factors for an aggregated or PDA project as for any other project. The risk rating is applied at the overall aggregate or PDA level. The risk of unintentional reversals may be lower for aggregated or PDA projects, because risk is diversified across a group of geographically dispersed project participants. The risk of intentional reversals could also be lower; in a large Aggregated Project, the probability is great that at least one project participant will choose to discontinue participation, but this probability is spread across multiple project participants and many acres so that the probability of intentional reversals significantly affecting the project as a whole is lower.

A.5.2 Carbon Stock Inventory and Monitoring of Sequestration-Based AFOLU projects

AFOLU projects with direct measurement of emissions removals resulting from sequestration in an aggregated or PDA project must meet the same accuracy and precision targets as non-grouped projects in order not to avoid a confidence deduction.

As noted in Chapter 2, ACR requires a 90% statistical confidence interval of sampling of no more than $\pm 10\%$ of the mean. If the Project Proponent cannot meet this target, then the reportable amount shall be the mean minus the lower bound of the 90% confidence interval, applied to the final calculation of emission reductions/removal enhancements.

For aggregated or PDA projects, the $\pm 10\%$ at 90% confidence precision target is applied at the level of the project overall. Project Proponents may use stratification to reduce inventory sampling intensity and cost to achieve this target. ACR advises Project Proponents to design projects within a single geographic region and relatively similar forest, land types, or crops, which combined with careful stratification as an initial inventory design step will help make the target achievable at reasonable costs spread across the overall project.

ACR does not require any minimum number of inventory plots per participating landholding (unless otherwise specified in the methodology) as long as the target is achieved for the project overall. ACR does not require individual landowner baseline inventories, as long as the Project Proponent has a stratified inventory meeting ACR requirements for the (aggregated) project overall. Arrangements with individual project participants regarding inventories, entry and exit, crediting, buffer contributions, and other factors are left to the discretion of the Project Proponent.

As with initial carbon stock inventories and soil sampling, standards for monitoring and verification are applied at the level of the overall project, whether it is a single large landholding or an aggregated or PDA project.

A.6 USE OF MODELS

Process-based biogeochemical models and empirical models may be approved for use under ACR-approved AFOLU methodologies to quantify emissions. The correct application of any such models shall be specified in the approved methodology. To be applicable, any model shall:

- Have the potential to model emissions from the relevant practice change(s) with consideration of relevant factors;
- Have been accepted in a peer reviewed scientific publication and/or been published by a government agency³⁹; and
- Allow for the calculation of uncertainty in predicted emissions (as the root mean squared error (RMSE) for empirical models), meeting the relevant requirements for uncertainty assessments as stated in Section 2.B.3.

A.6.1 Requirements for Process-Based Biogeochemical Models

Process-based biogeochemical models must consider the following factors, where relevant:

- Atmospheric factors (e.g., atmospheric background concentrations of ammonia and CO₂, and nitrogen concentration in rainfall);
- Daily meteorology;
- Edaphic factors (e.g., clay content; bulk density; soil pH; SOC at surface soil⁴⁰; soil texture; slope; depth of water retention layer; field capacity; wilting point);
- Cropping factors (e.g. crop type; planting date; harvest date; carbon-to-nitrogen ratio of the grain, leaf + stem tissue and root tissue; fraction of leaves and stem left in field after harvest; maximum yield);
- Tillage factors (e.g., number of tillage events, date and depth of tillage events);
- Fertilizer application factors (e.g., number of fertilizer applications; date of each fertilizer application; application method; type of fertilizer; fertilizer application rate; number of organic applications per year; date, type, carbon-to-nitrogen ratio and rate of organic amendment application); and
- Irrigation factors (e.g., number of irrigation events; date, type, and rate of irrigation event).

³⁹ ACR may also approve other models on a case-by-case basis via an ACR-lead peer review process.

⁴⁰ Depth as required by the process model.

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For application of the selected model to the project area, the following criteria must be met: There must be a study or studies (e.g., scientific journals, university theses, local research studies, or work carried out by the Project Proponent) that demonstrate that the use of the selected model is appropriate for the IPCC climatic regions of 2006 IPCC AFOLU Guidelines⁴¹ or the agroecological zone (AEZ) in which the project is situated using one of the following options:⁴²

Option 1 The studies used in support of the project should meet the guidance on model applicability as outlined in IPCC AFOLU 2006 guidelines in order to show that the model is applicable for the relevant IPCC climatic region. The guidance notes that an appropriate model should be capable of representing the relevant management practices and that the model inputs (i.e., driving variables) are validated from country- or region-specific locations that are representative of the variability of climate, soil, and management systems in the country.

Option 2 Where available, the use of national-, regional-, or global-level AEZ classification is appropriate to show that the model has been validated for similar AEZs. It is recognized that national-level AEZ classifications are not readily available; therefore, this methodology allows the use of the global and regional classification.

Where a project area consists of multiple sites, it is recognized that studies demonstrating model validity using either Option 1 or Option 2 may not be available for each of the sites in the project area. In such cases, the study used should be capable of demonstrating that the following two conditions are met:

1. The model is validated for at least 50% of the total project area relevant to the practice change where the project area covers up to 50,000 ha; or at least 75% of the total project area where the project area relevant to the practice change covers more than 50,000 ha; and
2. The area for which the model is validated generates at least two-thirds of the total project emission reductions.

A.7 VALIDATION AND VERIFICATION

A.7.1 Validation and Verification Requirements

ACR definitions and requirements for independent validation and verification are provided in Chapter 9 and in the separate ACR Validation and Verification Standard.

⁴¹ http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_03_Ch3_Representation.pdf.

⁴² IPCC. 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry, and Other Land Use. Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan. <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

A.7.2 Desk-based Verification on Request for New Issuance

At each interval that the Project Proponent requests issuance of ERTs (usually annually, but may be more or less frequent), the Project Proponent shall submit a verification statement that is the product of a desk-based audit by an ACR-approved verifier. If applicable, this audit may use satellite or other aerial imagery, or other means acceptable to the verifier, to verify project continuance and boundaries.

A.7.3 Full Verification Every 5 Years

ACR requires a full verification for all projects, including a field visit to the project site, no less frequently than every 5 years. In AR and wetlands restoration projects, several years may elapse between the project Start Date and significant carbon accrual in vegetation. These project types may defer their first verification up to 10 years after project validation. The scope of this verification should include such carbon stock measurements as the verifier requires to provide a reasonable level of assurance that the GHG assertion is without material discrepancy (per ACR's materiality threshold of $\pm 5\%$). It should also include an updated assessment of the risk of reversal and an updated buffer contribution (if applicable).

Contingent upon Annual Attestations and desk-based audits, projects continue to be credited until the end of the fifth calendar year following the year in which the field verification was performed. For example, if there is a measurement event in June 2010, a calculation of carbon stocks in August 2010, and an initial verification in September 2010, ACR will continue crediting through the end of December 2015, provided the Project Proponent supplies its Annual Attestations and desk-based verification statements at the required intervals. The full verification with updated risk assessment also offers Project Proponents the opportunity to demonstrate that the risk of reversal has decreased, and thus decrease its contribution to the ACR Buffer Pool, as described in Chapter 5.

APPENDIX B: BUFFER POOL TERMS AND CONDITIONS

THESE BUFFER POOL TERMS AND CONDITIONS (the “Buffer Pool Terms”) govern the use of the American Carbon Registry® Buffer Pool (the “ACR Buffer Pool”) by a Project Proponent and apply to the ACR AFOLU Carbon Project Reversal Risk Mitigation Agreement.

B.1 CONDITIONS TO PARTICIPATION IN ACR BUFFER POOL

To use the ACR Buffer Pool in connection with a project, a Project Proponent must first satisfy the following conditions:

- I. The Project Proponent must have entered into the American Carbon Registry® AFOLU Carbon Project Reversal Risk Mitigation Agreement for the project (as amended from time to time, the “Reversal Risk Mitigation Agreement”).
- II. There must be a GHG Project Plan for the project which, among other things, includes a risk assessment conducted in accordance with the ACR Tool for Risk Analysis and Buffer Determination, a risk category and an approved buffer contribution amount equal to a minimum percentage of the offsets issued by ACR in connection with the project (as amended from time to time due to updated ACR-approved risk assessments, the “Minimum Buffer Percentage”).

B.2 DEFINITIONS

Terms capitalized in these Buffer Pool Terms but not defined herein shall have the meanings given such terms in the Reversal Risk Mitigation Agreement or, if not defined therein, shall have the meanings given such terms in the Definitions section of this ACR Standard (as in effect as of the execution date of the Reversal Risk Mitigation Agreement, the “ACR Standard”).

B.3 BUFFER POOL ACCOUNT

ACR will establish an American Carbon Registry® Buffer Pool Account (the “Buffer Pool”), over which it has sole operational and management control, to hold the Buffer Contribution from the Project (as defined below). ACR shall have the right to hold buffer contributions from all agriculture, forest and other land use (AFOLU) carbon projects registered with ACR in one or more co-mingled accounts. As long as offsets deposited by a Project Proponent are retained in the Buffer Pool Account, the Project Proponent may not transfer, sell, pledge, retire, or otherwise dispose of such offsets.

In the event that ACR is no longer operational or able to manage the Buffer Pool Account, the account will be managed by ACR's parent organization, Winrock International ("Winrock") or a comparable, qualified organization of Winrock's election.

B.4 BUFFER POOL CONTRIBUTION

- I. **ASSESSMENT OF RISK.** For AFOLU projects that have risk of Reversal, Project Proponent shall conduct a risk assessment addressing both general and project-specific risk factors using the ACR Tool for Risk Analysis and Buffer Determination. The output of the tool is an overall risk rating percentage for the project, translating into a number of offsets that will be deposited in the ACR Buffer Pool Account to mitigate the risk of reversals at the time of each issuance, the Minimum Buffer Percentage. The risk assessment, overall risk category and Minimum Buffer Percentage, and calculated buffer contribution amount shall be included in the GHG Project Plan and Monitoring Report. ACR evaluates the overall risk category and corresponding buffer contribution, and the VVB evaluates whether the risk assessment has been conducted correctly. If no Reversals occur, the project's risk category and Minimum Buffer Percentage can remain unchanged for five years. The risk analysis must be re-evaluated at least every five years, or coincident with the interval of required site visit verification except in the event of a Reversal, in which case the risk category and Minimum Buffer Contribution shall be re-assessed and re-verified immediately.
- II. **BUFFER CONTRIBUTION REQUIREMENT AND TIMING.** As set forth herein and in the ACR Standard, concurrent with each issuance of offsets to the project, Project Proponent shall contribute offsets to the Buffer Pool Account equal to the respective annual volumes of offsets being issued within the relevant reporting period multiplied by the Minimum Buffer Percentage. Project Proponent may, at its option, contribute a number of offsets greater than the number required by application of the Minimum Buffer Percentage. The number of offsets contributed to the Buffer Pool Account shall be referred to as the "Buffer Contribution." In the event of an increase in the Minimum Buffer Percentage due to an updated risk assessment, Project Proponent shall make the required additional Buffer Contribution within ten (10) days following ACR's approval of the updated risk assessment.
- III. **COMPOSITION OF BUFFER CONTRIBUTION.** The Buffer Contribution shall consist of offsets generated by the Project, offsets of any other type or vintage held in an ACR registry account by the Project Proponent, or any combination thereof.

B.5 REVERSAL

- I. **NOTICE OF REVERSAL.** Project Proponent shall provide written notice to ACR immediately upon becoming aware of any Unintentional or Intentional Reversal or Early Project Termination decision. Such notice shall include the number of offsets affected by the Reversal (the "Estimated Lost Offset Amount"), a description of how the Estimated Lost Offset Amount was determined, a description of the nature and cause of the Reversal and all other relevant facts. Project Proponent shall, at its expense, promptly and fully comply with all ACR requests for additional information or analyses relating to the Reversal. ACR

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requires the quantification of carbon stocks after the Reversal as verified by a VVB, at the Project Proponent's expense, to be reported to and confirmed by ACR (the "Verified Lost Offset Amount") within six months of the Reversal.

- II. LOSS MITIGATION FOR AN UNINTENTIONAL REVERSAL.** ACR mitigates the loss from an Unintentional Reversal by retiring from the Buffer Pool the Estimated Loss Amount at Project Proponent's expense (including payment of then-applicable offset retirement fees). If the Lost Offset Amount is less than the Project Proponent's net Buffer Contributions up to that time, then the Buffer Contributions cover the Reversal. If the Lost Offset Amount from the Reversal exceeds the Proponent's Buffer Contributions to date, the Project Proponent shall pay a "deductible" of 10% of the Lost Offset Amount, depositing this additional offset amount in the ACR Buffer Pool within thirty (30) days of the retirement, and the Buffer Pool covers the remainder. The deductible contribution may be of ACR offsets of any type and vintage. Following unintentional reversals, the Proponent is not required to replenish the buffer unless the Minimum Buffer Percentage increases based on the risk assessment update. If the Verified Lost Amount is greater than the Estimated Lost Amount, ACR will retire from the Buffer Pool the difference.
- III. LOSS MITIGATION FOR AN INTENTIONAL REVERSAL.** ACR mitigates the loss from an Intentional Reversal, which is assumed as all affected carbon stocks, by canceling the associated volume of credits from the Project Proponent's account and/or canceling or retiring from the Buffer Pool the Estimated Loss Amount (as applicable) at Project Proponent's expense (including payment of then-applicable offset activation, retirement and cancellation fees) upon notification by the Project Proponent. Cancellation of all non-transacted offsets will occur for a project that has terminated early and retirement will occur equivalent to any volume that has been transferred. The Project Proponent shall, at the Project Proponent's expense, contribute the Estimated Lost Offset Amount to the Buffer Pool Account within thirty (30) days of the Reversal. This Buffer Contribution may be made using ACR offsets of any type or vintage. If the Project Proponent does not make this Buffer Contribution within thirty (30) days, ACR retains the right to freeze the account and use any existing offsets to compensate for the Reversal.
- The Verified Offset Amount must be submitted to ACR within six months of Reversal unless additional time is granted by ACR in writing. If the Verified Lost Amount is greater than the Estimated Lost Amount, Project Proponent shall contribute an additional amount for the difference, which will be retired by ACR.
- IV. EARLY PROJECT TERMINATION DUE TO REVERSAL.** Sequestration projects will terminate automatically if a Reversal, Intentional or Unintentional, causes project stocks to decrease below baseline levels prior to the end of the Minimum Project Term. In cases where this decrease is caused by intentional reductions to stocks (e.g., forest conversion or over-harvesting), which is considered an Intentional Reversal, the Project Proponent shall compensate for all issued offsets to that project following the process in III above.
- V. EARLY PROJECT TERMINATION.** If a Project Proponent opts to terminate the project at any time prior to the end of the Minimum Project Term by discontinuing project monitoring, verification and reporting activities for the Project (or subset of the project in an aggregated or PDA project) or leaves the carbon program, ACR conservatively considers the cumulative sequestration and/or emissions reductions from avoided conversion of the project to be lost (i.e., all offsets issued to the project). Project Proponents must compensate

for the full amount of all offsets issued cumulatively to the project upon termination. If only a portion of the project land owners (i.e., in the case of an aggregated or POA project) chooses to terminate, the remaining land owners may continue project activities if the area which was terminated is compensated. The Project Proponent shall have the responsibility to compensate for project termination following the process in III above.

In the case of Early Project Termination in order to re-enroll the project in another voluntary, state or federal program, the Project Proponent must compensate for all offsets issued to the Project following the process in III above. This is because ACR does not have the ability to enforce the actions of a Project Proponent on a project that is no longer registered on ACR.

- VI. RISK ASSESSMENT UPDATE.** Project Proponent shall comply with the risk assessment update requirements pursuant to the Reversal Risk Mitigation Agreement upon occurrence of a Reversal. Frequent recurring reversals will lead to a higher assessed risk and accordingly increased Minimum Buffer Percentage.

B.6 END-OF-TERM BUFFER POOL ACCOUNT BALANCE TRANSFER TO ACR

To the extent required under the ACR Standard, ACR shall, following the termination of the Project Term, decide to continue to hold or to retire any remaining offsets contributed to the Buffer Pool Account with respect to the Project. For purposes hereof, "Project Term" shall mean the period ending at the termination of the later of (i) the Minimum Project Term (including any renewals or extensions) and (ii) any additional period in which, pursuant to the ACR Standard, Project Proponent has agreed to document project continuance.

B.7 EVENTS OF DEFAULT; REMEDIES

The following events and circumstances shall constitute an Event of Default under these Buffer Pool Terms: (i) Project Proponent's failure to notify ACR within ten (10) days after becoming aware of a reversal or Early Project Termination decision; (ii) Project Proponent's failure to cure a breach of these Buffer Pool Terms within ten (10) days following notice of such breach by ACR to Project Proponent; (iii) the occurrence of an Event of Default under the Reversal Risk Mitigation Agreement; and (iv) a bankruptcy, receivership or other insolvency proceeding by or against Project Proponent and not dismissed within sixty (60) days of the making of a general assignment for the benefit of creditors, insolvency, or the institution of bankruptcy, reorganization, liquidation or receivership proceedings, by or against Project Proponent.

Upon the occurrence of an Event of Default, ACR may, in its sole discretion and without limitation of ACR's right to pursue other available legal or equitable remedies, pursue any of the remedies set forth in the Reversal Risk Mitigation Agreement.

B.8 LIMITATION OF LIABILITY; INDEMNIFICATION

- I. LIMITATION OF LIABILITY.** In no event shall ACR, its owners, affiliates or subsidiaries, and their respective officers, directors, independent contractors, employees, agents, or donors (the “ACR Parties”) be liable for damages arising out of or in connection with these Buffer Pool Terms, except to the extent caused by the ACR’s negligence or willful misconduct.

UNDER NO CIRCUMSTANCES SHALL ANY ACR PARTY BE LIABLE FOR LOST PROFITS OR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THESE BUFFER POOL TERMS. NOTWITHSTANDING ANYTHING TO THE CONTRARY IN THIS AGREEMENT, IN NO EVENT SHALL THE AGGREGATE LIABILITY OF THE ACR PARTIES TO PROJECT PROPONENT OR ANY THIRD PARTIES UNDER OR IN CONNECTION WITH THESE BUFFER POOL TERMS EXCEED THE AMOUNT OF FEES PAID BY PROJECT PROPONENT TO THE REGISTRY UNDER THE ACR MEMBER AGREEMENT.

Project Proponent acknowledges and agrees that the foregoing limitations are independent of any remedy and will remain in full force and effect notwithstanding the failure of the essential purposes of any such remedy. The provisions of this section shall apply regardless of the form of action, damage, claim, liability, cost, expense, or loss, whether in contract, statute, tort (including, without limitation, negligence), or otherwise.

- II. INDEMNIFICATION.** Project Proponent agrees to indemnify and hold the ACR Parties harmless from any losses, damages, liabilities, judgments, settlements, fines, taxes, liens, impositions, encumbrances, penalties, claims, suits, costs and expenses, including reasonable attorneys’ fees, arising out of or related to: (i) Project Proponent’s breach of these Buffer Pool Terms; or (ii) violation by Project Proponent of any law or regulation, or the rights of a third party.

B. 9 MODIFICATIONS

ACR reserves the right, in its sole discretion, to augment, segment, reformat, reconfigure, delete elements of, or otherwise modify at any time these Buffer Pool Terms or create new types or versions thereof. ACR shall provide Project Proponent with at least thirty (30) days’ prior notice of material modifications to the Buffer Pool Terms. Such modifications shall be effective upon the date set forth in the notice. Continued use of the American Carbon Registry® by Project Proponent after the effective date set forth in the notice shall constitute acceptance of such modifications.

B.10 NOTICE

All notices and other communications required, made or permitted hereunder shall be made in the manner set forth in the Reversal Risk Mitigation Agreement. ACR also may provide notices of changes to the ACR Standard, the Buffer Pool Terms or other matters by displaying notices or links to notices to Project Proponents generally on the American Carbon Registry® website.

APPENDIX C: NORMATIVE REFERENCES

The ACR Standard is based on the foundation laid by the normative reference standards and documents listed in Table 5 below. These documents assisted ACR to articulate its own requirements and specifications for the quantification, monitoring, and reporting of GHG project-based emissions reductions and removals, verification, project registration, and issuance of project-based offsets.

In particular, the ACR Standard builds on the ISO technical specifications for GHG accounting, GHG assertions and verification, and verifier accreditation as set forth in the ISO 14064 Parts 1-3:2006 and ISO 14065:2013, Specifications. To the ISO specifications, ACR adds its own mandatory requirements as detailed in the ACR eligibility criteria, additionality determination process, sector standards, and approved methodologies and tools. In the event of conflicts between the ACR Standard and the ISO technical specifications or other normative references, the ACR Standard shall take precedence.

Table 5: Normative References for the ACR Standard

AUTHORING BODY	DOCUMENT OR STANDARD	RELATIONSHIP TO ACR
International Standardization Organization (ISO)	<ul style="list-style-type: none"> ISO 14064:2006 Parts 1-3: A set of international standards that address the quantification, reporting, and verification of GHG emissions and project reductions ISO 14065:2013: Verifier accreditation requirements 	ISO 14064:2006 provides a foundation for the ACR Standard with technical specifications for GHG accounting and reporting for projects and verification assertions. ISO 14065: 2007 specifies requirements for verifier accreditation.
Intergovernmental Panel on Climate Change (IPCC)	<ul style="list-style-type: none"> Guidelines for National GHG Inventories Good Practice Guidance Fourth Assessment Report 	Identification of best practices and options for GHG emission inventory development; methodological guidance and primary seed document for more specific guidance materials and standards

THE AMERICAN CARBON REGISTRY STANDARD

Version 6.0



AUTHORING BODY	DOCUMENT OR STANDARD	RELATIONSHIP TO ACR
<p>Clean Development Mechanism (CDM)</p>	<ul style="list-style-type: none"> ● Project-level baseline and monitoring tools and methodologies ● Tool for the Demonstration and Assessment of Additionality ● GHG sources and sinks significance test 	<p>ACR generally accepts approved CDM methodologies for baselines and monitoring. The CDM additionality tool informs ACR additionality tests and may assist Project Proponents in formulating additionality arguments.</p>

APPENDIX D. REFERENCES

- Clean Development Mechanism (CDM). List of Accepted Baseline and Monitoring Tools and Methodologies. <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>.
- Clean Development Mechanism (CDM). Tool for the demonstration and assessment of additionality. <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v5.2.pdf>.
- Climate, Community & Biodiversity Alliance (CCBA). Climate, Community and Biodiversity Standards, Project Design Standards, Second Edition (2008). http://www.climate-standards.org/standards/pdf/ccb_standards_second_edition_december_2008.pdf.
- Good Practice Guidance for Land Use, Land-Use Change, and Forestry (especially Chapter 4.3 on LULUCF projects). IPCC. http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_contents.htm.
- International Organization for Standardization (ISO) 14064-1:2006(E) - Greenhouse gases. Part 1: Specification with guidance at the organization level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal.
- International Organization for Standardization (ISO) 14064-2:2006(E) - Greenhouse gases. Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
- International Organization for Standardization (ISO) 14064-3:2006(E) - Greenhouse gases. Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.
- International Organization for Standardization (ISO) 14065:2013(E) - Greenhouse gases. Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.
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Attachment E

CARB 2017 Scoping Plan Update

Attachment: WLC ResponsestoAppeal_9JUNE2020_Part 1 (4074 : World Logistics Center)





California's 2017 Climate Change Scoping Plan

The strategy for achieving California's
2030 greenhouse gas target

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Decades of Leadership

From the first law to protect rivers from the impact of gold mining in 1884, to decades of work to fight smog, the Golden State has set the national – and international – standard for environmental protection. California pushes old boundaries, encounters new ones, and figures out ways to break through those as well. This is part of the reason why California has grown to become both the 6th largest economy in the world, and home to some of the world’s strongest environmental protections. And, we have seen our programs and policies adopted by others as they seek to protect public health and the environment.

California’s approach to climate change channels and continues this spirit of innovation, inclusion, and success. The 2030 target of 40 percent emissions reductions below 1990 levels guides this Scoping Plan, as the economy evolves to reduce greenhouse gas (GHG) emissions in every sector. It also demonstrates that we are doing our part in the global effort under the Paris Agreement to reduce GHGs and limit global temperature rise below 2 degrees Celsius in this century.

California’s 2017 Climate Change Scoping Plan: The Strategy for Achieving California’s 2030 Greenhouse Gas Target (Plan) builds on the state’s successes to date, proposing to strengthen major programs that have been a hallmark of success, while further integrating efforts to reduce both GHGs and air pollution. California’s climate efforts will:

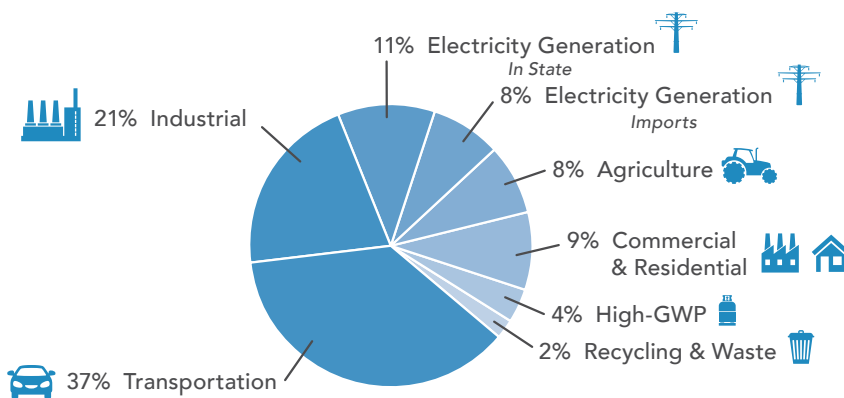
- Lower GHG emissions on a trajectory to avoid the worst impacts of climate change;
- Support a clean energy economy which provides more opportunities for all Californians;
- Provide a more equitable future with good jobs and less pollution for all communities;
- Improve the health of all Californians by reducing air and water pollution and making it easier to bike and walk; and
- Make California an even better place to live, work, and play by improving our natural and working lands.



Governor Brown signs SB 32 recommitting California’s efforts to curb climate change.

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CALIFORNIA CARBON EMISSIONS BY SCOPING PLAN SECTOR



2015 Total Emissions
440.4 MMTCO₂e

The Climate Imperative – We Must Act

The evidence that the climate is changing is undeniable. As evidence mounts, the scientific record only becomes more definitive – and makes clear the need to take additional action now.

In California, as in the rest of the world, climate change is contributing to an escalation of serious problems, including raging wildfires, coastal erosion, disruption of water supply,

threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.

The drought that plagued California for years devastated the state’s agricultural and rural communities, leaving some of them with no drinking water at all. In 2015 alone, the drought cost agriculture in the Central Valley an estimated \$2.7 billion, and more than 20,000 jobs. Last winter, the drought was broken by record-breaking rains, which led to flooding that tore through freeways, threatened rural communities, and isolated coastal areas. This year, California experienced the deadliest

wildfires in its history. Climate change is making events like these more frequent, more catastrophic and more costly. Climate change impacts all Californians, and the impacts are often disproportionately borne by the state’s most vulnerable and disadvantaged populations.



CALIFORNIA

is already experiencing
the impacts of
CLIMATE CHANGE

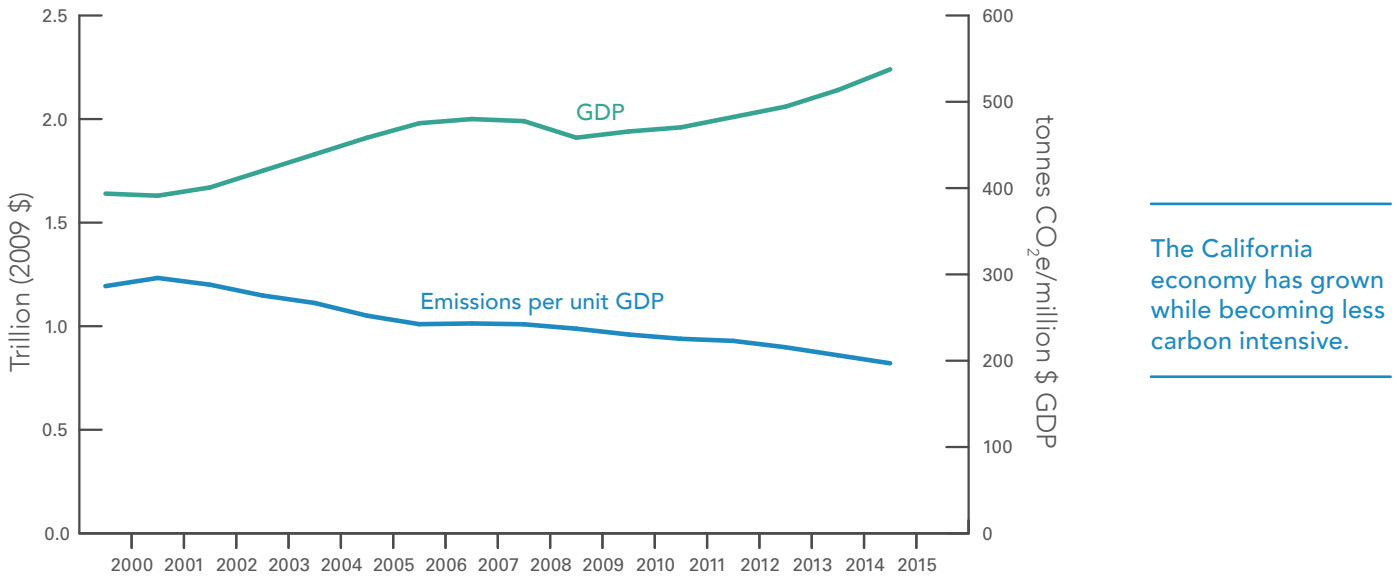
IN 2015 THE DROUGHT COST THE AGRICULTURE INDUSTRY IN THE CENTRAL VALLEY AN ESTIMATED \$2.7 BILLION & 20,000 JOBS



California is on Track – But There is More to Do

Although the California Global Warming Solutions Act of 2006 – also known as AB 32 – marked the beginning of an integrated climate change program, California has had programs to reduce GHG emissions for decades. The state’s energy efficiency requirements, Renewable Portfolio Standard, and clean car standards have reduced air pollution and saved consumers money, while also lowering GHG emissions.

ENVIRONMENTAL PROGRESS AND A RESILIENT ECONOMY

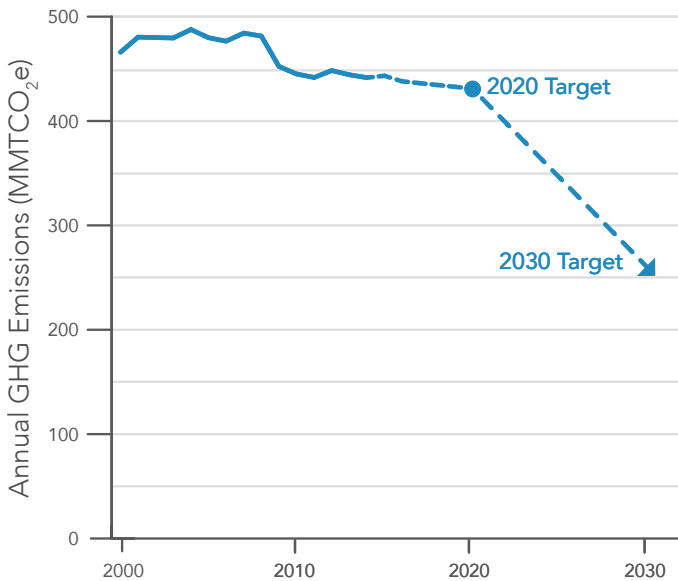


The California economy has grown while becoming less carbon intensive.

AB 32 set California’s first GHG target called on the state to reduce emissions to 1990 levels by 2020. California is on track to exceed its 2020 climate target, while the economy continues to grow. Since the launch of many of the state’s major climate programs, including Cap-and-Trade, economic growth in California has consistently outpaced economic growth in the rest of the country. The state’s average annual growth rate has been double the national average – and ranks second in the country since Cap-and-Trade took effect in 2012. In short, California has succeeded in reducing GHG emissions while also developing a cleaner, resilient economy that uses less energy and generates less pollution.

Importantly, the State’s 2020 and 2030 targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in line with California’s role in stabilizing global warming below dangerous thresholds. As we consider efforts to reduce emissions to meet the State’s near-term requirements, we must do so with an eye toward reductions needed beyond 2030. The Paris Agreement – which calls for limiting global warming to well below 2 degrees Celsius and pursuing efforts to limit it to 1.5 degrees Celsius – frames our path forward.

CALIFORNIA’S PATH FORWARD

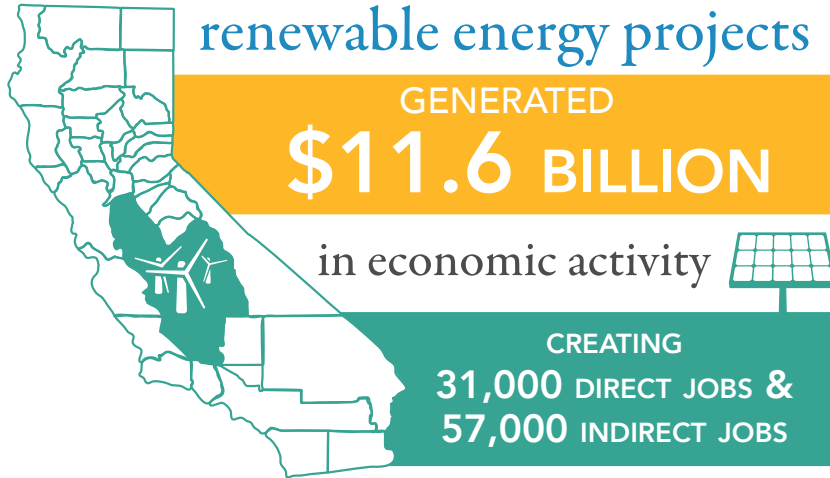


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California's Path to 2030

Executive Order B-30-15 and SB 32 extended the goals of AB 32 and set a 2030 goal of reducing emissions 40 percent from 2020 levels. This action keeps California on target to

FROM 2002-2015 SAN JOAQUIN VALLEY renewable energy projects



achieve the level of reductions scientists say is necessary to meet the Paris Agreement goals. This is an ambitious goal – calling on the State to double the rate of emissions reductions. Nevertheless, it is an achievable goal.

This Plan establishes a path that will get California to its 2030 target. Given our ambitious goals, this Plan is built on unprecedented outreach and coordination. Over 20 state agencies collaborated to produce the Plan, informed by 15 state agency-sponsored workshops and more than 500 public comments. The broad range of state agencies involved reflects the complex nature of addressing climate change, and the need to work across institutional










boundaries and traditional economic sectors to effectively reduce GHG emissions. As part of the Plan development, alternative strategies were considered and evaluated, ranging from carbon taxes to individual facility caps to relying solely on sector-specific regulations. In addition, efforts were made to ensure that the Plan would benefit all Californians. To this end, the Environmental Justice Advisory Committee (EJAC), a Legislatively created advisory body, convened almost 20 community meetings throughout California to discuss the climate strategy, and held 19 meetings of its own to provide recommendations on the Plan.

This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California's 2030 GHG reduction target. The Plan is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state.

Every sector, every local government, every region, every resident is part of the solution. The Plan underscores that there is no single solution but rather a balanced mix of strategies to achieve the GHG target. This Plan highlights the fact that a balanced mix of strategies provides California with the greatest level of certainty in meeting the target at a low cost while also improving public health, investing

in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs and energy diversity. Successful implementation of this Plan relies, in part, on long-term funding plans to inform future appropriations necessary to achieve California's long-term targets.

CALIFORNIA'S CLIMATE POLICY PORTFOLIO

-  Double building efficiency
-  Cleaner freight and goods movement
-  50% renewable power
-  Slash potent "super-pollutants" from dairies, landfills and refrigerants
-  More clean, renewable fuels
-  Cap emissions from transportation, industry, natural gas, and electricity
-  Cleaner zero or near-zero emission cars, trucks, and buses
-  Invest in communities to reduce emissions
-  Walkable/Bikeable communities with transit

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California's Climate Vision

Create Inclusive Policies and Broad Support for Clean Technologies


Remarkable progress over the past 10 years has put the global energy and transportation sector on a transformative path to cleaner energy. Far outpacing previous predictions, today solar and wind power are often less expensive than coal or natural gas, and they now comprise the majority of global investment in the power sector. Electric vehicle battery costs have tumbled even more quickly than solar costs, while performance has improved dramatically, and the auto industry is committed to an electric future.

California's policies have created markets for energy efficiency, energy storage, low carbon fuels, renewable power – including utility-scale and residential-scale solar – and zero-emission vehicles. Our companies are thriving, making those markets grow. California is home to nearly half of the zero-emission vehicles in the U.S., 40 percent of North American clean fuels investments, the world's best known electric car manufacturer, and the world's leading ride-sharing services. California is further advancing efficient land use policies that reduce auto dependency. Altogether, we're unleashing nonlinear transitions to clean energy and clean transportation technologies that will put California on the path to meeting our 2030 target and the goals of the Paris Agreement.


California policymaking has succeeded through thoughtful planning, bolstered by an open public process that solicits the best ideas from a wide array of sources, and by integrating effective regulation with targeted investments to provide broad market support for clean technologies. A key element of California's approach continues to be careful monitoring and reporting on the results of our programs and a willingness to make mid-course adjustments. As the State looks to 2030 and beyond, all sectors of the economy must benefit from these ideas to create a new and better future.

California is home to

NEARLY **50%**
OF THE ZEVs
IN THE U.S.

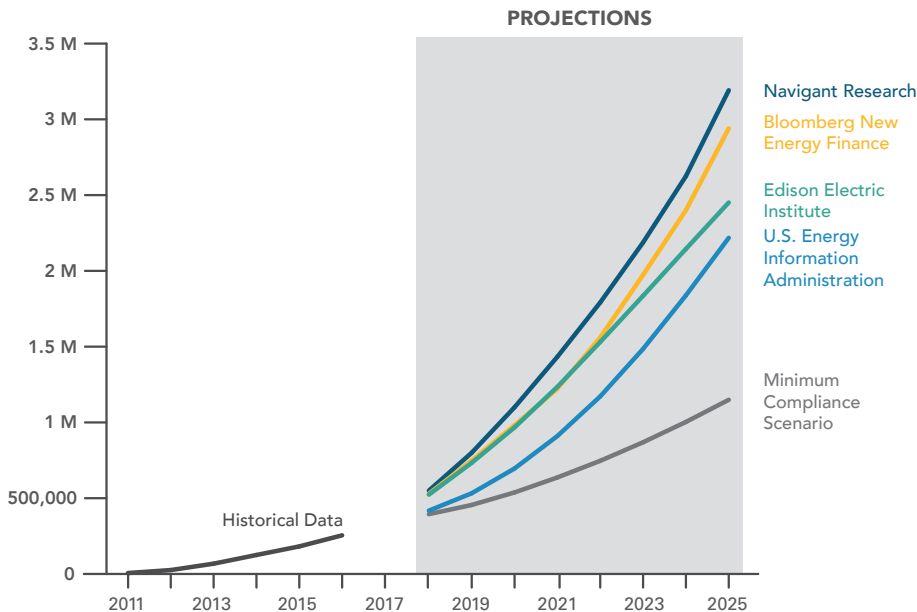


40%
OF NORTH AMERICAN
CLEAN FUEL
INVESTMENTS




90% OF TOTAL U.S. INVESTMENT IN
CLEAN TRANSPORTATION

CUMULATIVE CALIFORNIA ZEV SALES PROJECTIONS



Experience has shown clean technology and markets continue to outpace expectations.

LEGISLATIVE LEADERSHIP ON CLIMATE

The California Legislature has shaped the State's climate change program, setting out clear policy objectives over the next decade:

- 40% reduction in GHG emissions by 2030;
- 50% renewable electricity;
- Double energy efficiency savings;
- Support for clean cars;
- Integrate land use, transit, and affordable housing to curb auto trips;
- Prioritize direct reductions;
- Identify air pollution, health, and social benefits of climate policies;
- Slash "super pollutants";
- Protect and manage natural and working lands;
- Invest in disadvantaged communities; and
- Strong support for Cap-and-Trade.

The benefits of innovative technologies need to reach all residents and businesses. Air pollution reductions and the associated health benefits should be targeted to communities where they are needed most. All Californians need access to clean transportation options that enable healthy communities to develop and thrive, including walking, cycling, transit, rail, and clean vehicle options.

Although GHG reductions can help to reduce harmful air pollution, California must concurrently employ other strategies to accelerate reductions of pollutants from large industrial sources that adversely impact communities. Newly passed AB 617 strengthens existing criteria and toxic air pollutant programs and our partnerships with local air districts to further reduce harmful air pollutants and protect communities. More fundamentally, AB 617 establishes a comprehensive statewide program – the first of its kind – to address air pollution where it matters most: in neighborhoods with the most heavily polluted air.

CALIFORNIA'S GOALS



California's environmental justice and equity movement is establishing a blueprint for the nation and world. The State is pioneering targeted environmental and economic development programs to help those most in need. So far, half of all California Climate Investments, stemming from the State's Cap-and-Trade-Program, have been used to provide benefits in the 25 percent of California communities that are most disadvantaged by environmental and socio-economic burdens. By increasingly engaging with, and investing in, these communities – investing in technical assistance resources, holding listening sessions, improving our programs, and accelerating our efforts to bring the cleanest technologies to mass market – all California residents can have clean air to breathe, clean water to drink, and opportunities to participate in the cleaner economy.

ACHIEVING SUCCESS IN EQUITY AND ACCESS

- Continue to engage local organizations and invest in disadvantaged communities to ensure broad access to clean technologies;
- Ensure air pollution reductions happen where they are needed the most;
- Integrate across programs and agencies to ensure complementary policies provide maximum benefits to disadvantaged communities;
- Implement California Energy Commission and CARB recommendations to overcome barriers to clean energy and clean transportation options for low-income residents;
- Provide energy-efficient affordable housing near job centers and transit; and
- Implement AB 617 to dramatically improve air quality in local communities through targeted action plans.



Enhance Industrial Efficiency & Competitiveness

California leads the country in manufacturing and industrial efficiency. For every dollar spent on electricity, our manufacturers produce 55 percent more value than the national average. And the efficiency of California industry continues to grow at rates faster than the national average. High efficiency rates, coupled with the Cap-and-Trade Program's firm emission cap, allow economic activity to increase without corresponding increases in GHG emissions. In other words, the more California produces, the better it is for the planet. Maintaining and extending our successful programs – from the Cap-and-Trade Program and Low Carbon Fuel Standard to zero-emission, renewable energy and energy efficiency programs – will reduce GHGs, increase energy cost savings, offer businesses flexibility to reduce emissions at low cost and provide clear policy and market direction, and certainty, for business planning and investment. This will encourage continued research, evaluation, and deployment of innovative strategies and technology to further reduce emissions in the industrial sector through advances in energy efficiency and productivity, increased access to cleaner fuels, and carbon capture, utilization and storage.

ACTION ON HFCs

Hydrofluorocarbons (HFCs) represent one of the biggest opportunities to reduce GHGs in the State through 2030 due to their high climate impacts, and in many cases, offer energy efficiency and financial savings, as well. The world recently agreed to phase down their use, but California has committed to move more quickly, in line with the scope of the opportunity for cost-effective emissions reductions in the State.

ACHIEVING SUCCESS IN INDUSTRIAL EFFICIENCY AND COMPETITIVENESS

- Evaluate and implement policies and measures to continue reducing GHG, criteria, and toxic air contaminant emissions from sources such as refineries;
- Improve productivity and strengthen economic competitiveness by further improving energy efficiency and diversifying fuel supplies with low carbon alternatives;
- Prioritize procurement of goods that have lower carbon footprints
- Support and attract industry that produces goods needed to reduce GHGs; and
- Cut energy costs and GHG emissions by quickly transitioning to efficient HFC alternatives.

Prioritize Transportation Sustainability

California's transportation system underpins our economy. The extensive freight system moves trillions of dollars of goods each year and supports nearly one-third of the state economy and more than 5 million jobs. The way we plan our communities impacts everything from household budgets to infrastructure needs, productivity lost to congestion, protection of natural and working landscapes, and our overall health and well-being. And transportation is the largest source of GHG, criteria, and toxic diesel particulate matter emissions in the state.

RENEWABLE DIESEL USE

has increased 7000% since 2011

California's ability to remain an economic powerhouse and environmental leader requires additional efforts to improve transportation sustainability with a comprehensive approach that includes regulation, incentives, and investment.

This approach addresses a full range of

transportation system improvements relating to efficient land use, affordable housing, infrastructure for cyclists and pedestrians, public transit, new vehicle technologies, fuels and freight. One example is the deployment of the nation's first high-speed rail system, which will include seamless connections to local transit.

The approach is working: California is home to nearly half of the country's zero-emission vehicles. Innovative alternative fuel producers and oil companies are bringing more low carbon fuels to market than required by the Low Carbon Fuel Standard. And, the State has committed to investing billions in zero-emission vehicles and infrastructure, land use planning, and active transportation options such as walking and biking. In fact, renewable fuels in the heavy-duty vehicle sector are displacing diesel fossil fuel as quickly as renewable power is replacing fossil fuels on the electricity grid. California's climate policies will also reduce fossil fuel use and decouple the state from volatile global oil prices. CARB's analyses show fossil fuel demand will decrease by more than 45 percent by 2030, which means Californians will be using less gasoline and diesel resulting in healthier air and cost-savings on transportation fuels. These benefits will be further amplified as we move away from light-duty combustion vehicles.

By re-doubling our efforts, California can make sure that markets tip quickly and definitively in the favor of electric cars, trucks, buses, and equipment, while increasing the use of clean, low carbon fuels where zero-emissions options are not yet available. Local transportation planning can make communities become healthier and more vibrant and connected – encouraging housing, walking, biking and transit policies that reduce GHGs and promote good quality of life. And, we can work to ensure that an efficient sustainable freight system continues to power our ever-growing economy.



ACHIEVING SUCCESS IN TRANSPORTATION SUSTAINABILITY

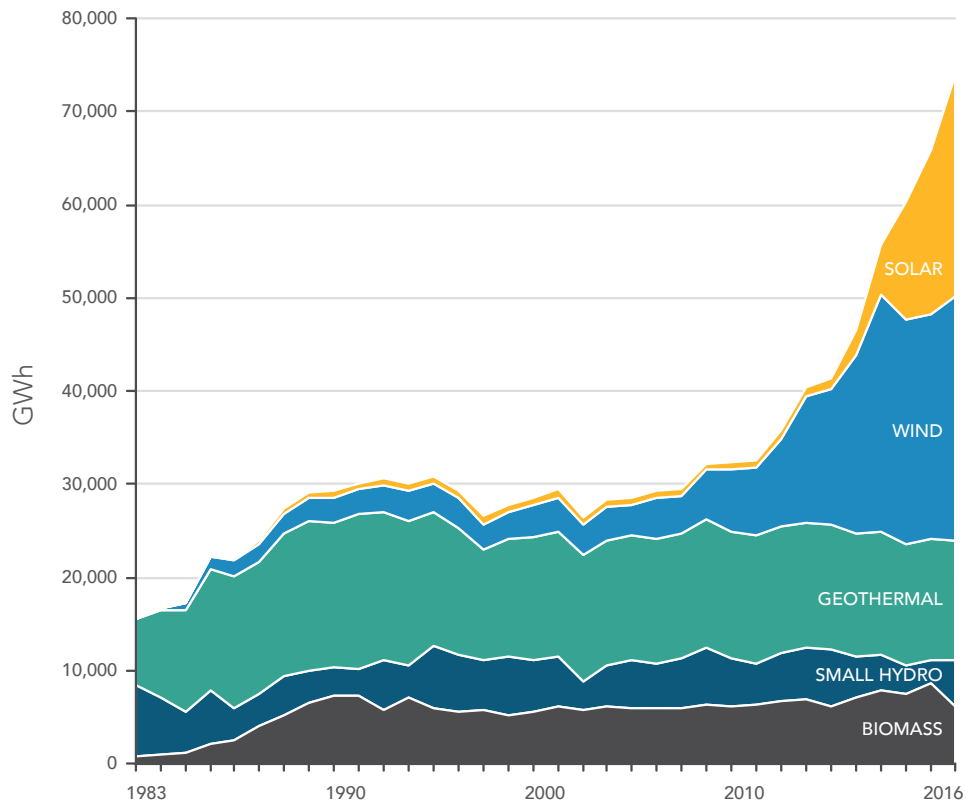
- Connect California's communities with a state-of-the-art high-speed rail system;
- Promote vibrant communities and landscapes through better planning efforts to curb vehicle-miles-traveled and increase walking, biking and transit;
- Build on the State's successful regulatory and incentive-based policies to quickly make clean cars, trucks, buses, and fuels definitive market winners;
- Coordinate agency activities to ensure that emerging automated and connected vehicle technologies reduce emissions; and
- Improve freight and goods movement efficiency and sustainability to enable California's continued economic growth.



Continue Leading on Clean Energy

California is well ahead of schedule in meeting its renewable energy targets. Wind and solar generation have grown exponentially in recent years, while hydroelectric, geothermal, and biomass have consistently contributed renewable power to our energy supply. Californians are the ones who will take action to meet energy efficiency targets, integrate renewable power through demand response, and drive demand for net zero energy buildings. This includes self-generation which also grew exponentially in recent years with installed solar totaling 2,000 megawatts (MW) in 2014 and 5,100 MW of the total statewide self-generation installed solar in 2015. By June 2017, solar installed in California was about 5,800 MW, far exceeding the State's goals.

INCREASING RENEWABLE ELECTRICITY GENERATION (IN & OUT OF STATE)

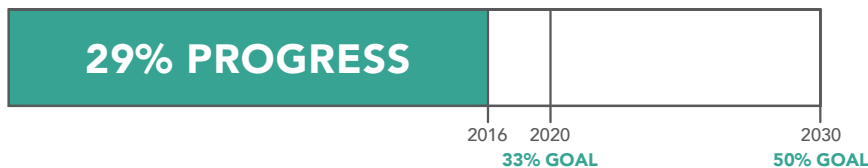


The Renewable Portfolio Standard, Carbon Pricing, and lower costs for renewable technology are delivering real environmental benefits.



While at this time natural gas is an important energy source, we must move toward cleaner heating fuels and replicate the progress underway for electricity. As with electricity, this starts with efficiency and demand reduction, including building and appliance electrification where these advancements make sense. It calls for minimizing fugitive methane leaks throughout the system, including beyond California’s borders where 90 percent of the natural gas used here originates. And, it includes using more renewable gas – a valuable in-state resource made from waste products – especially in the transportation sector. Replacing fossil fuels with renewable gas can reduce potent short-

Reaching California’s Clean Electricity Goals



The State’s 3 largest investor-owned utilities are on track to achieve a 50% RPS by 2020.

lived climate pollutants, and state policies should support this effort. Reducing demand for natural gas, and moving toward renewable natural gas, will help California achieve its 2030 climate target. However, switching from natural gas to electricity – where feasible and demonstrated to reduce GHGs – is needed to stay on track to achieve our long-term goals.

ACHIEVING SUCCESS IN CLEAN ENERGY

- Effectively integrate at least 50 percent renewables as the primary source of power in the State through coordinated planning, additional deployments of energy storage, and grid regionalization;
- Utilize distributed resources and engage customers by making net zero energy buildings standard, implement Existing Buildings Energy Efficiency Action Plan to double existing building efficiency, and increase access to energy efficiency, renewable energy, and energy use data; and
- Reduce the use of heating fuels while concurrently making what is used cleaner by minimizing fugitive methane leaks, prioritizing natural gas efficiency and demand reduction, and enabling cost-effective access to renewable gas.



Put Waste Resources to Beneficial Use

Effectively managing waste streams is perhaps the most basic of environmental tenets. “Reduce, re-use, and recycle” is a mantra known even to elementary school students. For decades California law has reduced waste reaching landfills and recaptured value from waste streams through recycling and composting. California law requires reducing, recycling, or composting 75 percent of solid waste generated by 2020. The State also has specific goals for diverting organic waste, which decomposes in landfills to produce the super pollutant methane. State law also directs edible food to hungry families rather than having it discarded.

Capturing value from waste makes sense. As described in the Healthy Soils Initiative, compost from organic matter provides soil amendments to revitalize farmland, reduces irrigation and landscaping water demand, and potentially increases long-term carbon storage in rangelands. Organic matter can also provide a clean, renewable energy source in the form of bioenergy, biofuels, or renewable natural gas.

California should take ownership of its waste and adhere to a waste “loading order” that prioritizes waste reduction, re-use, and material recovery over landfilling. The State can take steps to reduce waste from packaging, which constitutes about one-quarter of California’s waste stream. It can invest in and streamline in-state infrastructure development to support recycling, remanufacturing, composting, anaerobic digestion, and other beneficial uses of organic waste. And, it can help communities in their efforts to recover food for those in need.

ACHIEVING SUCCESS IN PUTTING WASTE RESOURCES TO BENEFICIAL USE

- Develop and implement programs, including edible food waste recovery, to divert organics from landfills and reduce methane emissions;
- Develop and implement a packaging reduction program; and
- Identify a sustainable funding mechanism to support waste management programs, including infrastructure development to support organics diversion.

Support Resilient Agricultural and Rural Economies and Natural and Working Lands

California's natural and working landscapes, like forests and farms, are home to the most diverse sources of food, fiber, and renewable energy in the country. They underpin the state's water supply and support clean air, wildlife habitat, and local and regional economies. They are also the frontiers of climate change. They are often the first to experience the impacts of climate change, and they hold the ultimate solution to addressing climate change and its impacts. In order to stabilize the climate, natural and working lands must play a key role.

Work to better quantify the carbon stored in natural and working lands is continuing, but given the long timelines to change landscapes, action must begin now to restore and conserve these lands. We should aim to manage our natural and working lands in California to reduce GHG emissions from business-as-usual by at least 15-20 million metric tons in 2030, to complement the measures described in this Plan.

Natural and working lands can be better incorporated into California's climate change mitigation efforts by encouraging collaboration with local and regional organizations and increasing investment to protect, enhance, and innovate in our rural landscapes and communities. The State is partnering with tribes to preserve carbon, protect tribal forest lands and increase their land base. Transportation and land use planning should minimize the footprint of the built environment, while supporting and investing in efforts to restore, conserve and strengthen natural and working lands. California's forests should be healthy carbon sinks that minimize black carbon emissions where appropriate, supply new markets for woody waste and non-merchantable timber, and provide multiple ecosystem benefits. Rehabilitating and strengthening wetlands and tidal environments, and incorporating natural landscapes into urban environments will also help make natural and working lands part of the state's climate solution. Finally, California farmers can be a powerful force in the fight against climate change, in how they manage their lands, tend their crops, and husband their livestock.



Improved forest management on tribal lands has preserved almost 3 million metric tons of carbon in California and the revenues from the carbon offsets have been used to secure ownership of ancestral lands.

ACHIEVING SUCCESS IN SUPPORTING RESILIENT AGRICULTURAL AND RURAL ECONOMIES AND NATURAL AND WORKING LANDS

- Protect, enhance and innovate on California's natural and working lands to ensure natural and working lands become a net carbon sink over the long-term;
- Develop and implement the Natural and Working Lands Implementation Plan to maintain these lands as a net carbon sink and avoid at least 15-20 metric tons of GHG emissions by 2030;
- Measure and monitor progress by completing CARB's Natural and Working Lands Inventory and implementing tracking and performance monitoring systems; and
- Unleash opportunity in the agricultural sector by improving manure management, boosting soil health, generating renewable power, electrifying operations, utilizing waste biomass, and increasing water, fertilizer, and energy use efficiency to reduce super pollutants.



Secure California's Water Supplies

Water is California's lifeblood. It sustains communities and drives the economy. An elaborate network of storage and delivery systems has enabled the state to prosper and grow. But this aging system was built for a previous time and is increasingly challenged by the realities of climate change and population growth.

THE WATER-ENERGY NEXUS

- About 12% of the total energy used in the state is related to water, with 2% for conveyance, treatment and distribution, and 10% for end-customer uses like heating and cooling.
- The water-energy nexus provides opportunities for conservation of these natural resources as well as reduction of GHGs.

Producing, moving, heating and treating water demands significant energy and produces commensurately significant emissions. As California looks to the future, meeting new demands and sustaining prosperity requires increased water conservation and efficiency, improved coordination and management of various water supplies, greater understanding of the water-energy nexus, and deployment of new technologies in drinking water treatment, groundwater remediation and recharge, and potentially brackish and seawater desalination. State efforts must support systemic shifts toward conservation, efficiency, and renewable energy in the water sector.

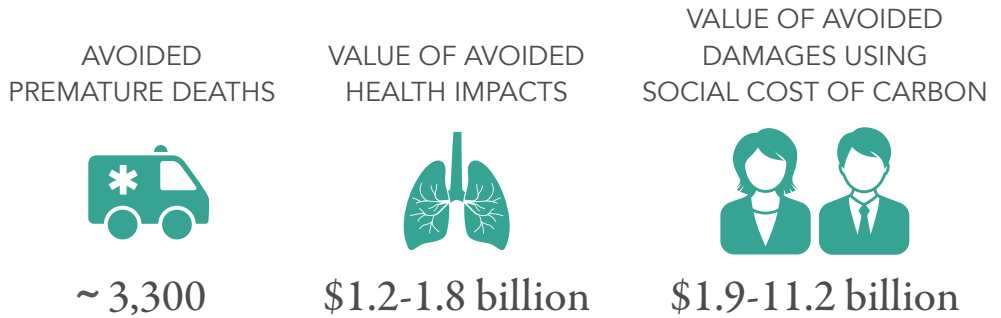
ACHIEVING SUCCESS IN SECURING CALIFORNIA'S WATER SUPPLIES

- Increase water savings by certifying innovative technologies for water conservation and developing and implementing new conservation targets, updated agricultural water management plans, and long term conservation regulations;
- Develop a voluntary registry for GHG emissions from energy use associated with water; and
- Continue to increase the use of renewable energy to operate the State Water Project.

Cleaning the Air and Public Health

The benefits of this Plan are broader than just climate change – implementation of the Plan will also help improve public health. The Plan incorporates freight and mobile source strategies which will deliver reductions in criteria and toxic air pollutants to improve air quality.

Climate Plan Provides Health Benefits in 2030



California continues to seek ways to improve implementation of its climate program and its ability to address the unique set of impacts facing the state’s most pollution burdened communities. In addition, CARB’s environmental justice efforts are intended to reach far beyond climate change. While this Plan provides a path for reducing GHG emissions in disadvantaged communities, it also includes new tools that will complement the Plan and lead to further air quality improvements.

In particular, implementation of AB 617 will improve air quality in local communities, in partnership with local air districts, using targeted investments in neighborhood-level air monitoring and the development of air pollution reduction action plans with strong enforcement programs. These plans will require pollution reductions from both mobile and stationary sources. Through these efforts, CARB anticipates, and will work for, increased data transparency and the adoption of new statewide air pollutant emission controls that will not only confer short-term benefits to those most in need of improvement, but which will ultimately benefit all Californians.

Under the leadership of CARB’s first executive-level environmental justice liaison, the agency is also laying a roadmap to better serve California’s environmental justice communities in the design and implementation across its broader programs.



Successful Example of Carbon Pricing and Investment

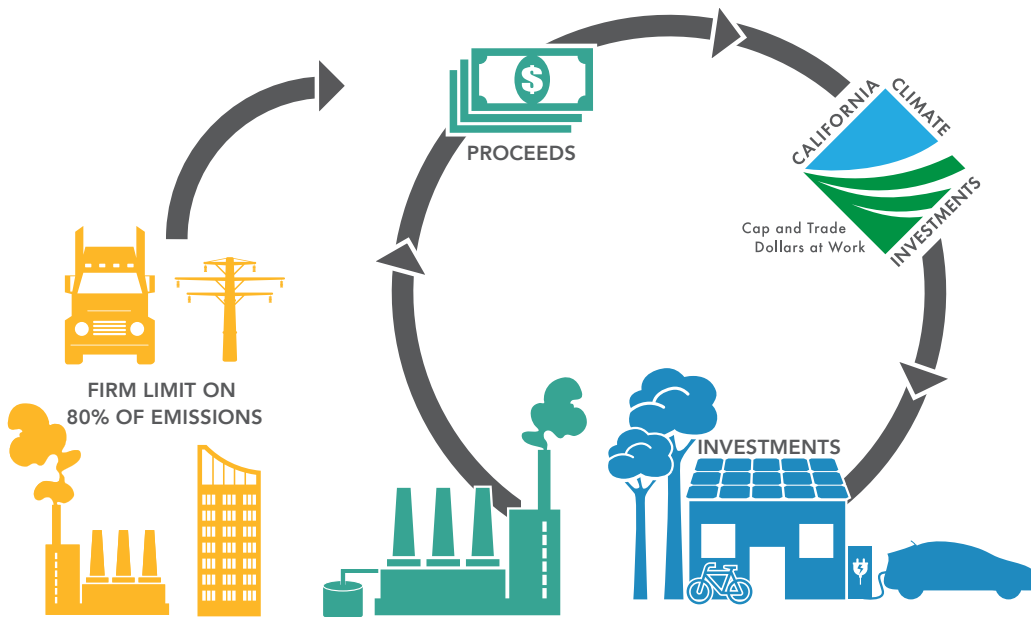
The Cap-and-Trade Program is fundamental to meeting California’s long-range climate targets at low cost. The Cap-and-Trade Program includes GHG emissions from transportation, electricity, industrial, agricultural, waste, residential and commercial sources, and caps them while complementing the other measures needed to meet the 2030 GHG target. Altogether, the emissions covered by the Cap-and-Trade program total 80 percent of all GHG emissions in California. California’s response to climate change has led to many innovative programs designed to reduce GHG emissions, including the Renewable Portfolio and Low Carbon Transportation Standards, but the Cap-and-Trade Program guarantees GHG emissions reductions through a strict overall emissions limit that decreases each year, while trading provides businesses with flexibility in their approach to reducing emissions. The Cap-and-Trade Program also generates revenue when the allowances to emit pollution are auctioned. Some of the revenue is returned directly to electricity ratepayers, and the rest is dedicated to reducing GHG emissions by making Legislatively directed investments in California with an emphasis on programs or projects that benefit disadvantaged and low-income communities.

CAP-AND-TRADE PROGRAM

- Firm, declining cap provides highest certainty to achieve 2030 target.
- Low cost GHG emission reductions minimize impact on consumers and economy.
- Flexibility for businesses
- Can be linked with similar programs worldwide.

Including the latest budget, approximately \$5 billion has been appropriated to reduce GHG emissions, reduce air pollutant emissions where reductions are needed most, grow markets for clean technologies, and spur emissions reductions in sectors not covered by Cap-and-Trade. These investments are strengthening the economy and improving public health – especially in the areas of the state most burdened by pollution. So far, half of the \$1.2 billion spent provides benefits to disadvantaged communities, and one-third of those investments were made directly in those communities.

CALIFORNIA’S CARBON PRICING & INVESTMENTS OVERVIEW



CAP-AND-TRADE DOLLARS AT WORK (2017)

California's Cap-and-Trade Program is the most comprehensive, effective, and well-designed carbon market on the planet. Today, the Program is linked with a similar program in Quebec and will link with a similar program in Ontario beginning in 2018. Nearly 40 countries and over 20 subnational entities – altogether representing nearly a quarter of global emissions – have developed, or are developing, emissions trading programs. Each of them looks to California and our linked Western Climate Initiative Partners as they design, implement, and refine their own programs.



Nearly 30,000 projects installing efficiency measures in homes



105,000+ rebates issued for zero-emission and plug-in hybrid vehicles



16,000+ acres of land preserved or restored



200+ transit agency projects funded, adding or expanding transit options



6,200+ trees planted in urban areas



1,100+ new affordable housing units under contract



50% of projects benefiting Disadvantaged Communities (\$614M)



140,000+ total projects implemented

Fostering Global Action

Through the State's leadership in the Cap-and-Trade Program, innovative sector-specific policies that are reducing technology costs and GHG emissions, and community-scale engagement and investments to reduce GHGs and promote equity, California is playing a significant role in addressing global climate change.

Governor Brown has stated that climate change is the most important issue of our lifetime, and has promoted scientifically sound approaches to address climate change in California and beyond. He has participated in international climate discussions at the United Nations headquarters in New York, the United Nations Climate Change Conference in Paris, the Vatican, and the Climate Summit of the Americas in Canada – calling on other subnational and national leaders to join California in the fight against climate change. He has signed climate change agreements with leaders from Chile, China, the Czech Republic, Israel, Japan, Mexico, the Netherlands, other North American states and provinces, and Peru. He has joined an unprecedented alliance of heads of state, city and state leaders – convened by the World Bank Group and International Monetary Fund – to urge countries and companies around the globe to put a price on carbon. And California is a founding member of the International Zero Emission Vehicle (ZEV) Alliance, a coalition of national and subnational governments working to accelerate the adoption of ZEVs and make all new

UNDER 2^{*} REGIONS REPRESENT

1.20 BILLION PEOPLE

AND

\$28.8 TRILLION IN GDP

That's 39 % of the global economy

To find out more visit: Under2MOU.org

cars zero emissions. Delegations from around the world travel to Sacramento to meet with the architects and implementers of California’s climate policies to learn how to successfully combine strong greenhouse gas policies with a strong economy.

Perhaps most significant is the Under2Coalition. It is a global climate pact – spearheaded by Governor Brown – among states, provinces, countries, and cities all committing to do their part to limit the increase in global average temperatures below the dangerous levels. Signatories commit to either reducing greenhouse gas emissions 80 to 95 percent below 1990 levels by 2050 or achieving a per capita annual emission target of less than 2 metric tons by 2050. More than 200 jurisdictions from 38 countries and six continents have now signed or endorsed the agreement. Together, members of the Under2Coalition represent more than 1.2 billion people and \$28.8 trillion in GDP, equivalent to 39 percent of the global economy.

Unleashing the California Spirit

This Plan is a declaration of California’s path forward. It builds on the State’s successful approach to addressing climate change and harnesses the California spirit to propel a cleaner economy, while serving as an example for others.

But this Plan will not be successful on its own. Our collective, and individual, efforts must reach every sector of California’s economy, and every community in the state. As California faces the challenge of climate change, it will succeed as it always has – through open, inclusive processes, through support of clean technology markets, and through a relentless pursuit of a healthy California for all.

There should be no doubt that California is united in understanding the need to act, and in the will to act. Investments in clean, low-carbon options will pay off – for the environment and the economy. Investments and training in education and workforce development for a lower carbon economy are a critical part of this transition.

This Plan is only the beginning. All of the measures in the Plan will be developed in their own public process, shaped not just by the vision of this Plan, but also by the best understanding of the technology, costs and impacts on communities – and by input from a broad range of stakeholders and perspectives with the recognition that achieving the 2030 target is a milestone on our way to the deeper GHG reductions needed to protect the environment and our way of life. The Plan also proposes developing a long-term funding plan to inform future appropriations necessary to achieve our long-term targets, which will send clear market and workforce development signals.

Climate change presents unprecedented challenges, but just as we have always done, Californians will tackle them with innovation, inclusion and ultimately, success.

Chapter 1

INTRODUCTION

Background

In November 2016, California Governor Edmund G. Brown affirmed California's role in the fight against climate change in the United States, noting, "We will protect the precious rights of our people and continue to confront the existential threat of our time—devastating climate change." By working to reduce the threat facing the State and setting an example, California continues to lead in the climate arena. This Scoping Plan for Achieving California's 2030 Greenhouse Gas Target (Scoping Plan or 2017 Scoping Plan) identifies how the State can reach our 2030 climate target to reduce greenhouse gas (GHG) emissions by 40 percent from 1990 levels, and substantially advance toward our 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels. By selecting and pursuing a sustainable and clean economy path for 2030, the State will continue to successfully execute existing programs, demonstrate the coupling of economic growth and environmental progress, and enhance new opportunities for engagement within the State to address and prepare for climate change.

This Scoping Plan builds on and integrates efforts already underway to reduce the State's GHG, criteria pollutant, and toxic air contaminant emissions. Successful implementation of existing programs has put California on track to achieve the 2020 target. Programs such as the Low Carbon Fuel Standard and Renewables Portfolio Standard are delivering cleaner fuels and energy, the Advanced Clean Cars Program has put more than a quarter million clean vehicles on the road, and the Sustainable Freight Action Plan will result in efficient and cleaner systems to move goods throughout the State. Enhancing and implementing these ongoing efforts puts California on the path to achieving the 2030 target. This Scoping Plan relies on these, and other, foundational programs paired with an extended, more stringent Cap-and-Trade Program, to deliver climate, air quality, and other benefits.

In developing this Scoping Plan, it is paramount that we continue to build on California's success by taking effective actions. We must rapidly produce real results to avoid the most catastrophic impacts of climate change. The Scoping Plan identifies policies based on solid science and identifies additional research needs, while also recognizing the need for flexibility in the face of a changing climate. Ongoing research to better understand systems where our knowledge is weaker will allow for additional opportunities to set targets and identify actionable policies. Further, a long-term funding plan to inform future appropriations is critical to achieve our long-term targets, which will send clear market and workforce development signals.

Climate Legislation and Directives

California has made progress on addressing climate change during periods of both Republican and Democratic national and State administrations. California's governors and legislature prioritize public health and the environment. A series of executive orders and laws have generated policies and actions across State government, among local and regional governments, and within industry. These policies also have encouraged collaboration with federal agencies and spurred partnerships with many jurisdictions beyond California's borders. Moving forward, California will continue its pursuit of collaborations and advocacy for action to address climate change. The following list provides a summary of major climate legislation and executive orders that have shaped California's climate programs.

Assembly Bill 32 (AB 32) (Nuñez, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006.

- Cut the State's GHG emissions to 1990 levels by 2020 with maintained and continued reductions post 2020.
- First comprehensive climate bill in California, a defining moment in the State's long history of environmental stewardship.

- Secured the State's role as a national and global leader in reducing GHGs.

Pursuant to AB 32, the California Air Resources Board (CARB or Board) prepared and adopted the initial Scoping Plan to *"identify and make recommendations on direct emissions reductions measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and non-monetary incentives"* in order to achieve the 2020 goal, and to achieve *"the maximum technologically feasible and cost-effective GHG emissions reductions"* by 2020 and maintain and continue reductions beyond 2020. AB 32 requires CARB to update the Scoping Plan at least every five years.

Executive Order B-30-15

In his January 2015 inaugural address, Governor Brown identified actions in five key climate change strategy "pillars" necessary to meet California's ambitious climate change goals. These five pillars are:

- Reducing today's petroleum use in cars and trucks by up to 50 percent.
- Increasing from one-third to 50 percent our electricity derived from renewable sources.
- Doubling the efficiency savings achieved at existing buildings and making heating fuels cleaner.
- Reducing the release of methane, black carbon, and other short-lived climate pollutants.
- Managing farm and rangelands, forests, and wetlands so they can store carbon.

Consistent with these goals, Governor Brown signed Executive Order B-30-15 in April 2015:

- Establishing a California GHG reduction target of 40 percent below 1990 levels by 2030.
- Calling on CARB, in coordination with sister agencies, to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target.
- Building out the "sixth pillar" of the Governor's strategy—to safeguard California in the face of a changing climate—highlighting the need to prioritize actions to reduce GHG emissions and build resilience in the face of a changing climate.

Senate Bill 350 (SB 350) (De Leon, Chapter 547, Statutes of 2015), Golden State Standards

- Required the State to set GHG reduction planning targets through Integrated Resource Planning in the electricity sector as a whole and among individual utilities and other electricity providers (collectively known as load serving entities).
- Codified an increase in the Renewables Portfolio Standard (RPS) to 50 percent by 2030¹ and doubled the energy savings required in electricity and natural gas end uses as discussed in the Governor's inaugural address.

Senate Bill 32 (SB 32) (Pavley, Chapter 249, Statutes of 2016), California Global Warming Solutions Act of 2016: emissions limit and Assembly Bill 197 (AB 197) (E. Garcia, Chapter 250, Statutes of 2016), State Air Resources Board: greenhouse gases: regulations.

SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's Executive Order B-30-15. The 2030 target reflects the same science that informs the agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at keeping the global temperature increase below 2 degrees Celsius (°C). The California 2030 target represents the most ambitious GHG reduction goal for North America. Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 million metric tons of carbon dioxide equivalent (MMTCO₂e).

The companion bill to SB 32, AB 197, provides additional direction to CARB on the following areas related to the adoption of strategies to reduce GHG emissions.

- Requires annual posting of GHG, criteria, and toxic air contaminant data throughout the State, organized by local and sub-county level for stationary sources and by at least a county level for mobile sources.
- Requires CARB, when adopting rules and regulations to achieve emissions reductions

¹ <http://www.cpuc.ca.gov/renewables/>

and to protect the State's most affected and disadvantaged communities, to consider the social costs of GHG emissions and prioritize both of the following:

- Emissions reductions rules and regulations that result in direct GHG emissions reductions at large stationary sources of GHG emissions and direct emissions reductions from mobile sources.
- Emissions reductions rules and regulations that result in direct GHG emissions reductions from sources other than those listed above.
- Directs CARB, in the development of each scoping plan, to identify for each emissions reduction measure:
 - The range of projected GHG emissions reductions that result from the measure.
 - The range of projected air pollution reductions that result from the measure.
 - The cost-effectiveness, including avoided social costs, of the measure.

CARB has begun the process to implement the provisions of AB 197. For instance, CARB is already posting GHG, criteria pollutant and toxic air contaminant data. CARB also incorporated air emissions data into a visualization tool in December 2016 in response to direction in AB 197 to provide easier access to this data.²

Senate Bill 1383 (SB 1383) (Lara, Chapter 395, Statutes of 2016), Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills

- Requires the development, adoption, and implementation of a Short-Lived Climate Pollutant Strategy.^{3, 4}
- Includes the following specific goals for 2030 from 2013 levels:
 - 40 percent reduction in methane.
 - 40 percent reduction in hydrofluorocarbon gases.
 - 50 percent reduction in anthropogenic black carbon.⁵

Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane, are powerful climate forcers that have a dramatic and detrimental effect on air quality, public health, and climate change. These pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide. In March 2017, the Board adopted the Short-Lived Climate Pollutant Reduction Strategy (SLCP Strategy) establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The SLCP Strategy also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the SLCP Strategy also identifies measures that can reduce hydrofluorocarbon (HFC) emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-Global Warming Potential (GWP) refrigerants, and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment.

Assembly Bill 1504 (AB 1504) (Skinner, Chapter 534, Statutes of 2010): Forest resources: carbon sequestration

- Requires the Board of Forestry and Fire Protection to adopt district forest practice rules and regulations in accordance with specified policies to, among other things, assure the continuous growing and harvesting of commercial forest tree species.
- Requires the Board of Forestry and Fire Protection to ensure that its rules and regulations that govern the harvesting of commercial forest tree species consider the capacity of forest resources to sequester carbon dioxide emissions sufficient to meet or exceed the sequestration target of 5 million metric tons of carbon dioxide annually, as established in the first AB 32 Climate Change Scoping Plan.

² CARB. 2016. CARB's Emission Inventory Activities. www.arb.ca.gov/ei/ei.htm

³ CARB. Reducing Short-Lived Climate Pollutants in California. www.arb.ca.gov/cc/shortlived/shortlived.htm

⁴ Senate Bill No. 605. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB605

⁵ Senate Bill No.1383. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383

Senate Bill 1386 (SB 1386) (Wolk, Chapter 545, Statutes of 2016): Resource conservation, natural and working lands

- Declares it the policy of the State that protection and management of natural and working lands, as defined, is an important strategy in meeting the State's GHG reduction goals.
- Requires State agencies to consider protection and management of natural and working lands in establishing policies and grant criteria, and in making expenditures, and "implement this requirement in conjunction with the State's other strategies to meet its greenhouse gas emissions reduction goals."

Assembly Bill 398 (AB 398) (E. Garcia, Chapter 135, Statutes of 2017): California Global Warming Solutions Act of 2006: market-based compliance mechanisms: fire prevention fees: sales and use tax manufacturing exemption

- Clarifies the role of the State's Cap-and-Trade Program from January 1, 2021, through December 31, 2030, continuing elements of the current program, but requiring CARB to make some post-2020 refinements.
- Establishes a Compliance Offsets Protocol Task Force to provide guidance to CARB in approving new offset protocols that increase projects with direct, in-state environmental benefits.
- Establishes the Independent Emissions Market Advisory Committee to report annually on the environmental and economic performance of the Cap-and-Trade Program and other climate policies.
- Identifies legislative priorities for allocating auction revenue proceeds, to include but not be limited to: air toxic and criteria air pollutants from stationary and mobile sources; low- and zero-carbon transportation alternatives; sustainable agricultural practices that promote transition to clean technology, water efficiency, and improved air quality; healthy forests and urban greening; short-lived climate pollutants; climate adaptation and resiliency; and climate and clean energy research.

In addition, AB 398 requires CARB to designate the Cap-and-Trade Program as the mechanism for reducing GHG emissions from petroleum refineries and oil and gas production facilities in this update to the Scoping Plan. With respect to local air districts, AB 398 states that it does not limit or expand the district's existing authority, including the authority to regulate criteria pollutants and toxic air contaminants, except that it prohibits an air district from adopting or implementing a rule for the specific purpose of reducing emissions of carbon dioxide from stationary sources that are subject to the Cap-and-Trade Program.

Assembly Bill 617 (AB 617) (C. Garcia, Chapter 136, Statutes of 2017): Nonvehicular air pollution: criteria air pollutants and toxic air contaminants.

This bill was passed as a companion to AB 398 (E. Garcia, 2017) to strengthen air quality monitoring and reduce air pollution at a community level, in communities affected by a high cumulative burden of exposure to pollution. CARB is required to prepare a monitoring plan by October 1, 2018, that assesses the State's current air monitoring network with recommendations for a set of high-priority locations around the State to deploy community focused air monitoring systems. Local air districts must deploy air monitoring systems in the selected high priority locations by July 1, 2019. Thereafter, CARB will evaluate and select additional locations for community air monitoring on an annual basis. The air districts must also deploy air monitoring systems within one year of CARB's selection of the high-priority locations. In addition to the monitoring plan, the bill requires CARB to develop a statewide strategy to reduce criteria pollutants and toxic air contaminants (TACs) in communities affected by high cumulative exposure burdens through approved community emissions reduction programs developed by local air districts, in partnership with residents in the affected communities; requires CARB to establish a uniform system of annual reporting of criteria pollutants and TACs for the existing statewide air monitoring network; and expedites implementation of best available retrofit control technology in non-attainment areas.

Tables summarizing the legislation described in this section, along with other climate related legislation and programs are included in Appendix H and organized by sector.

Initial Scoping Plan and First Update to the Scoping Plan

The Initial Scoping Plan⁶ in 2008 presented the first economy-wide approach to reducing emissions and highlighted the value of combining both carbon pricing with other complementary programs to meet California's 2020 GHG emissions target while ensuring progress in all sectors. The coordinated set of policies in the Initial Scoping Plan employed strategies tailored to specific needs, including market-based compliance mechanisms, performance standards, technology requirements, and voluntary reductions. The Initial Scoping Plan also described a conceptual design for a cap-and-trade program that included eventual linkage to other cap-and-trade programs to form a larger regional trading program.

AB 32 requires CARB to update the scoping plan at least every five years. The First Update to the Scoping Plan⁷ (First Update), approved in 2014, presented an update on the program and its progress toward meeting the 2020 limit. It also developed the first vision for long-term progress beyond 2020. In doing so, the First Update laid the groundwork for the goals set forth in Executive Orders S-3-05⁸ and B-16-2012⁹. It also identified the need for a 2030 mid-term target to establish a continuum of actions to maintain and continue reductions, rather than only focusing on targets for 2020 or 2050.

Building on California's Environmental Legacy

California's successful climate policies and programs have already delivered emissions reductions resulting from cleaner, more fuel-efficient cars and zero emission vehicles (ZEVs), low carbon fuels, increased renewable energy, and greater waste diversion from landfills; water conservation; improved forest management; and improved energy efficiency of homes and businesses. Beyond GHG reductions, these policies and programs also provide an array of benefits including improved public health, green jobs, and more clean energy choices. The 2030 GHG emissions reduction target in SB 32 will ensure that the State maintains this momentum beyond 2020, mindful of the State's population growth and needs. This Scoping Plan identifies a path to simultaneously make progress on the State's climate goals as well as complement other efforts such as the State Implementation Plans (SIPs) and community emissions reduction programs to help improve air quality in all parts of the State.

California's future climate strategy will require continued contributions from all sectors of the economy, including enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables, such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for GHG reductions at stationary sources complement efforts of local air pollution control and air quality management districts (air districts) to tighten criteria and toxics air pollution emission limits on a broad spectrum of industrial sources, including in disadvantaged communities historically located adjacent to large stationary sources. Finally, meeting the State's climate, public health, and environmental goals will entail understanding, quantifying, and addressing emissions impacts from land use decisions at all governmental levels.

Purpose of the 2017 Scoping Plan

This Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts and identifies new policies and actions to accomplish the State's climate goals. Chapter 2 of this document includes a description of a suite of specific actions to meet the State's 2030 GHG limit. In addition, Chapter 4 provides a broader description of the many actions and proposals being explored across the sectors, including the natural resources sector, to achieve the State's mid and long-term climate goals.

Guided by legislative direction, the actions identified in this Scoping Plan reduce overall GHG emissions in California and deliver policy signals that will continue to drive investment and certainty in a low carbon

6 CARB. Initial AB 32 Climate Change Scoping Plan. Available at: www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

7 CARB. First Update to the AB 32 Scoping Plan. Available at: www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm

8 www.gov.ca.gov/news.php?id=1861

9 www.gov.ca.gov/news.php?id=17472

economy. This Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Plan includes policies to require direct GHG reductions at some of the State's largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade Program, which constrains and reduces emissions at covered sources.

Process for Developing the 2017 Scoping Plan

This Scoping Plan was developed in coordination with State agencies, through engagement with the Legislature, and with open and transparent opportunities for stakeholders and the public to engage in workshops and other meetings. Development also included careful consideration of, and coordination with, other State agency plans and regulations, including the Cap-and-Trade Program, Low Carbon Fuel Standard (LCFS), State Implementation Plan, California Sustainable Freight Action Plan, California Transportation Plan 2040, Forest Carbon Plan, and the Short-Lived Climate Pollutant Strategy, among others.

To inform this Scoping Plan, CARB, in collaboration with the Governor's Office and other State agencies, solicited comments and feedback from affected stakeholders, including the public, and the Environmental Justice Advisory Committee (EJAC or Committee). The process to update the 2017 Scoping Plan began with the Governor's Office Pillar Symposia, which included over a dozen public workshops, and featured a series of Committee and environmental justice community meetings.¹⁰

One key message conveyed to CARB during engagement with the legislature, EJAC, and environmental justice communities was the need to emphasize reductions at large stationary sources, with a particular focus on multi-pollutant strategies for these sources to reduce GHGs and harmful criteria and toxic air pollutants that result in localized health impacts, especially in disadvantaged communities. Other consistent feedback for CARB included the need for built and natural infrastructure improvements that enhance quality of life, increase access to safe and viable transportation options, and improve physical activity and related health outcomes.

Updated Climate Science Supports the Need for More Action

Climate scientists agree that global warming and other shifts in the climate system observed over the past century are caused by human activities. These recorded changes are occurring at an unprecedented rate.¹¹ According to new research, unabated GHG emissions could allow sea levels to rise up to ten feet by the end of this century—an outcome that could devastate coastal communities in California and around the world.¹²

California is already feeling the effects of climate change, and projections show that these effects will continue and worsen over the coming centuries. The impacts of climate change have been documented by the Office of Environmental Health Hazard Assessment (OEHHA) in the Indicators of Climate Change Report, which details the following changes that are occurring already:¹³

- A recorded increase in annual average temperatures, as well as increases in daily minimum and maximum temperatures.
- An increase in the occurrence of extreme events, including wildfire and heat waves.
- A reduction in spring runoff volumes, as a result of declining snowpack.
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops.
- Changes in the timing and location of species sightings, including migration upslope of flora and fauna, and earlier appearance of Central Valley butterflies.

¹⁰ www.arb.ca.gov/cc/scopingplan/scopingplan.htm

¹¹ Cook, J., et al. 2016. Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters* 11:048002 doi:10.1088/1748-9326/11/4/048002. iopscience.iop.org/article/10.1088/1748-9326/11/4/048002.

¹² California Ocean Protection Council. 2017. Rising Seas in California: An Update On Sea-Level Rise Science. www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf

¹³ Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): oehha.ca.gov/climate-change/document/indicators-climate-change-california

In addition to these trends, the State's current conditions point to a changing climate. California's recent historic drought incited land subsidence, pest invasions that killed over 100 million trees, and water shortages throughout the State. Recent scientific studies show that such extreme drought conditions are more likely to occur under a changing climate.^{14,15} The total statewide economic cost of the 2013–2014 drought was estimated at \$2.2 billion, with a total loss of 17,100 jobs.¹⁶ In the Central Valley, the drought cost California agriculture about \$2.7 billion and more than 20,000 jobs in 2015, which highlights the critical need for developing drought resilience.¹⁷ Drought affects other sectors as well. An analysis of the amount of water consumed in meeting California's energy needs between 1990 and 2012 shows that while California's energy policies have supported climate mitigation efforts, the performance of these policies have increased vulnerability to climate impacts, especially greater hydrologic uncertainty.¹⁸

Several publications carefully examined the potential role of climate change in the recent California drought. One study examined both precipitation and runoff in the Sacramento and San Joaquin River basins, and found that 10 of the past 14 years between 2000 and 2014 have been below normal, and recent years have been the driest and hottest in the full instrumental record from 1895 through November 2014.¹⁹ In another study, the authors show that the increasing co-occurrence of dry years with warm years raises the risk of drought, highlighting the critical role of elevated temperatures in altering water availability and increasing overall drought intensity and impact.²⁰ Generally, there is growing risk of unprecedented drought in the western United States driven primarily by rising temperatures, regardless of whether or not there is a clear precipitation trend.²¹

According to the U.S. Forest Service report, National Insect and Disease Forest Risk Assessment, 2013–2027,²² California is at risk of losing 12 percent of the total area of forests and woodlands in the State due to insects and disease, or over 5.7 million acres. Some species are expected to lose significant amounts of their total basal area (e.g., whitebark pine is projected to lose 60 percent of its basal area; and lodgepole pine is projected to lose 40 percent). While future climate change is not modeled within the risk assessment, and current drought conditions are not accounted for in these estimates, the projected climate changes over a 15 year period (2013–2027) are expected to significantly increase the number of acres at risk, and will increase the risk from already highly destructive pests such as the mountain pine beetle. Extensive tree mortality is already prevalent in California. The western pine beetle and other bark beetles have killed a majority of the ponderosa pine in the foothills of the central and southern Sierra Nevada Mountains. A recent aerial survey by the U.S. Forest Service identified more than 100 million dead trees in California.²³ As there is usually a lag time between drought years and tree mortality, we are now beginning to see a sharp rise in mortality from the past four years of drought. In response to the very high levels of tree mortality, Governor Brown issued an Emergency Proclamation on October 30, 2015, that directed state agencies to identify and take action to reduce wildfire risk through the removal and use of the dead trees.

14 Diffenbaugh, N., D. L. Swain, and D. Touma. 2015. Anthropogenic Warming has Increased Drought Risk in California. *Proceedings of the National Academy of Sciences* 112(13): 3931–3936.

15 Cayan, D., T. Das, D. W. Pierce, T. P. Barnett, M. Tyree, and A. Gershunov. 2010. Future Dryness in the Southwest US and Hydrology of the Early 21st Century Drought. *Proceedings of the National Academy of Sciences* 107(50): 21272–21276.

16 Howitt, R., J. Medellin-Azuara, D. MacEwan, J. Lund, and D. Summer. 2014. Economic Impacts of 2014 Drought on California Agriculture. watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf.

17 Williams, A. P., et al. 2015. Contribution of anthropogenic warming to California drought during 2012–2014. *Geophysical Research Letters* <http://onlinelibrary.wiley.com/doi/10.1002/2015GL064924/abstract>.

18 Fulton, J., and H. Cooley. 2015. The water footprint of California's energy system, 1990–2012. *Environmental Science & Technology* 49(6):3314–3321. pubs.acs.org/doi/abs/10.1021/es505034x.

19 Mann, M. E., and P. H. Gleick. 2015. Climate change and California drought in the 21st century. *Proceedings of the National Academy of Sciences of the United States of America*, 112(13):3858–3859. doi.org/10.1073/pnas.1503667112.

20 Diffenbaugh, N. S., D. L. Swain, and D. Touma. 2015. Anthropogenic warming has increased drought risk in California. *Proceedings of the National Academy of Sciences of the United States of America*. 10.1073/pnas.1422385112. www.pnas.org/content/112/13/3931.full.pdf

21 Cook, B. I., T. R. Ault, and J. E. Smerdon. 2015. Unprecedented 21st century drought risk in the American Southwest and Central Plains. *Science Advances* 1(1), e1400082, doi:10.1126/sciadv.1400082.

22 Krist, F.J. Jr., J.R. Ellenwood, M.E. Woods, A.J. McMahan, J.P. Cowardin, D.E. Ryerson, F.J. Sapio, M.O. Zweifler, S.A. Romero. 2014. FHTET 2013 – 2027 National Insect & and Disease Forest Risk Assessment. FHTET-14-01 January 2014. Available at: http://www.fs.fed.us/foresthealth/technology/pdfs/2012_RiskMap_Report_web.pdf

23 USDA. 2016. New Aerial Survey Identifies More Than 100 Million Dead Trees in California. www.usda.gov/wps/portal/usda/usdahome?contentid=2016/11/0246.xml&contentidonly=true



CLIMATE IMPACTS AT THE COMMUNITY LEVEL

The California Energy Commission Cal-Adapt tool provides information about future climate conditions to help better understand how climate will impact local communities.

cal-adapt.org

A warming climate also causes sea level to rise; first, by warming the oceans which causes the water to expand, and second, by melting land ice which transfers water to the ocean. Even if storms do not become more intense or frequent, sea level rise itself will magnify the adverse impact of any storm surge and high waves on the California coast. Some observational studies report that the largest waves are already getting higher and winds are getting stronger.²⁴ Further, as temperatures warm and GHG concentrations increase more carbon dioxide dissolves in the ocean, making it more acidic. More acidic ocean water affects a wide variety of marine species, including species that people rely on for food. Recent projections indicate that if no significant GHG mitigation efforts are taken, the San Francisco Bay Area may experience sea level rise between 1.6 to 3.4 feet, and in an extreme scenario involving the rapid loss of the Antarctic ice sheet, sea levels along California's coastline could rise up to 10 feet by 2100.²⁵ This change is likely to have substantial ecological and economic consequences in California and worldwide.²⁶

While more intense dry periods are anticipated under warmer conditions, extremes on the wet end of the spectrum are also expected to increase due to more frequent warm, wet atmospheric river events and a higher proportion of precipitation falling as rain instead of snow. In recent years, atmospheric rivers have also been recognized as the cause of the large majority of major floods in rivers

all along the U.S. West Coast and as the source of 30-50 percent of all precipitation in the same region.²⁷ These extreme precipitation events, together with the rising snowline, often cause devastating floods in major river basins (e.g., California's Russian River). It was estimated that the top 50 observed floods in the U.S. Pacific Northwest were due to atmospheric rivers.²⁸ Looking ahead, the frequency and severity of atmospheric rivers on the U.S. West Coast will increase due to higher atmospheric water vapor that occurs with rising temperature, leading to more frequent flooding.^{29, 30}

Climate change can drive extreme weather events such as coastal storm surges, drought, wildfires, floods, and heat waves, and disrupt environmental systems including our forests and oceans. As GHG emissions continue to accumulate and climate disruption grows, such destructive events will become more frequent. Several recent studies project increased precipitation within hurricanes over ocean regions.^{31, 32} The primary physical mechanism for this increase is higher water vapor in the warmer atmosphere, which enhances moisture convergence in a storm for a given circulation strength. Since hurricanes are responsible for many of the most extreme precipitation events, such events are likely to become more extreme. Anthropogenic warming by

24 National Research Council of the National Academy of Sciences. 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. National Academies Press.

25 California Ocean Protection Council. 2017. Rising Seas in California: An Update On Sea-Level Rise Science. www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf

26 Chan, F., et al. 2016. The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions. California Ocean Science Trust, Oakland, California, USA.

27 Dettinger, M. D. 2013. Atmospheric rivers as drought busters on the U.S. West Coast. *Journal of Hydrometeorology* 14:1721-1732, doi:10.1175/JHM-D-13-02.1. journals.ametsoc.org/doi/abs/10.1175/JHM-D-13-02.1.

28 Warner, M. D., C. F. Mass, and E. P. Salathé. 2012. Wintertime extreme precipitation events along the Pacific Northwest coast: Climatology and synoptic evolution. *Monthly Weather Review* 140:2021-43. <http://journals.ametsoc.org/doi/abs/10.1175/MWR-D-11-00197.1>.

29 Hagos, S. M., L. R. Leung, J.-H. Yoon, J. Lu, and Y. Gao, 2016: A projection of changes in landfalling atmospheric river frequency and extreme precipitation over western North America from the Large Ensemble CESM simulations. *Geophysical Research Letters*, 43 (3), 357-1363, <http://onlinelibrary.wiley.com/doi/10.1002/2015GL067392/epdf>.

30 Payne, A. E., and G. Magnusdottir, 2015: An evaluation of atmospheric rivers over the North Pacific in CMIP5 and their response to warming under RCP 8.5. *Journal of Geophysical Research: Atmospheres*, 120 (21), 11,173-111,190, <http://onlinelibrary.wiley.com/doi/10.1002/2015JD023586/epdf>.

31 Easterling, D.R., K.E. Kunkel, M.F. Wehner, and L. Sun, 2016: Detection and attribution of climate extremes in the observed record. *Weather and Climate Extremes*, 11, 17-27. <http://dx.doi.org/10.1016/j.wace.2016.01.001>.

32 NAS, 2016: Attribution of Extreme Weather Events in the Context of Climate Change. The National Academies Press, Washington, DC, 186 pp. <http://dx.doi.org/10.17226/21852>.

the end of the 21st century will likely cause tropical cyclones globally to become more intense on average. This change implies an even larger percentage increase in the destructive potential per storm, assuming no changes in storm size.^{33,34} Thus, the historical record, which once set our expectations for the traditional range of weather and other natural events, is becoming an increasingly unreliable predictor of the conditions we will face in the future. Consequently, the best available science must drive effective climate policy.

California is committed to further supporting new research on ways to mitigate climate change and how to understand its ongoing and projected impacts. California's Fourth Climate Change Assessment and Indicators of Change Report will further update our understanding of the many impacts from climate change in a way that directly informs State agencies' efforts to safeguard the State's people, economy, and environment.^{35, 36}

Together, historical data, current conditions, and future projections provide a picture of California's changing climate, with two important messages:

- Change is already being experienced and documented across California, and some of these changes have been directly linked to changing climatic conditions.
- Even with the uncertainty in future climate conditions, every scenario estimates further change in future conditions.

It is critical that California continue to take steps to reduce GHG emissions in order to avoid the worst of the projected impacts of climate change. At the same time, the State is taking steps to make the State more resilient to ongoing and projected climate impacts as laid out by the Safeguarding California Plan.³⁷ The Safeguarding California Plan is being updated in 2017 to present new policy recommendations and provide a roadmap of all the actions and next steps that state government is taking to adapt to the ongoing and inevitable effects of climate change. The Draft Safeguarding California Plan³⁸ is available and will be finalized after workshops and public comments. California's continuing efforts are vital steps toward minimizing the impact of GHG emissions and a three-pronged approach of reducing emissions, preparing for impacts, and conducting cutting-edge research can serve as a model for action.

California's Greenhouse Gas Emissions and the 2030 Target

Progress Toward Achieving the 2020 Limit

AB 32 directs CARB to develop and track GHG emissions and progress toward the 2020 statewide GHG target. California is on track to achieve the target while also reducing criteria pollutants and toxic air contaminants and supporting economic growth. As shown in Figure 1, in 2015, total GHG emissions decreased by 1.5 MMTCO₂e compared to 2014, representing an overall decrease of 10 percent since peak levels in 2004. The 2015 GHG Emission Inventory and a description of the methodology updates can be accessed at: www.arb.ca.gov/cc/inventory/inventory.htm.

Per California Health and Safety Code section 38505, CARB monitors and regulates seven GHGs to reduce emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). The fluorinated gases are also referred to as "high global warming potential gases" (high-GWP gases). California's annual statewide GHG emission inventory has historically been the primary tool for tracking GHG emissions trends. Figure 1 provides the GHG inventory trend. Additional information on the methodology for the GHG inventory can also be found at: www.arb.ca.gov/cc/inventory/data/data.htm.

33 Sobel, A.H., S.J. Camargo, T.M. Hall, C.-Y. Lee, M.K. Tippett, and A.A. Wing, 2016: Human influence on tropical cyclone intensity. *Science*, 353, 242-246.

34 Kossin, J. P., K. A. Emanuel, and S. J. Camargo, 2016: Past and projected changes in western North Pacific tropical cyclone exposure. *Journal of Climate*, 29 (16), 5725-5739, <https://doi.org/10.1175/JCLI-D-16-0076.1>.

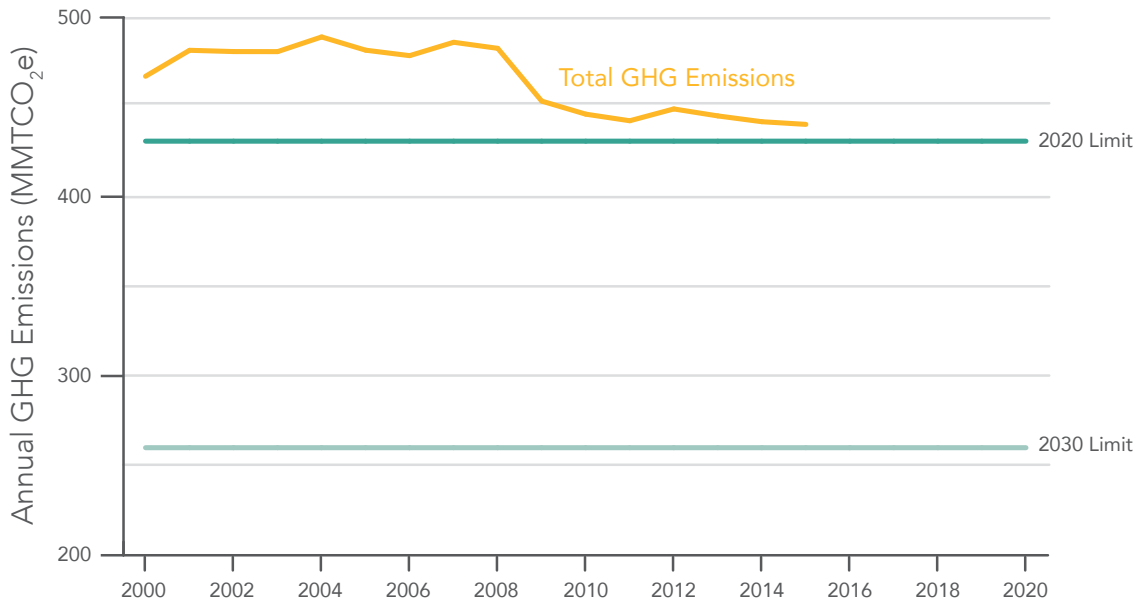
35 California's Fourth Climate Change Assessment. <http://resources.ca.gov/climate/safeguarding/research/>

36 Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): <https://oehha.ca.gov/climate-change/document/indicators-climate-change-california>

37 California Natural Resources Agency. 2017. Safeguarding California. <http://resources.ca.gov/climate/safeguarding/>

38 <http://resources.ca.gov/climate/safeguarding/>

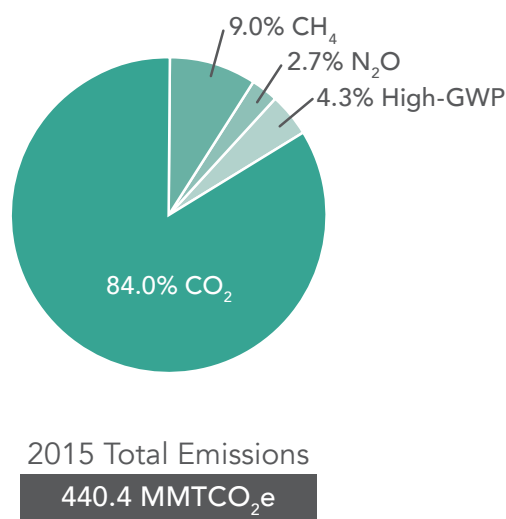
FIGURE 1: CALIFORNIA GHG INVENTORY TREND



Carbon dioxide is the primary GHG emitted in California, accounting for 84 percent of total GHG emissions in 2015, as shown in Figure 2 below. Figure 3 illustrates that transportation, primarily on-road travel, is the single largest source of CO₂ emissions in the State. Upstream transportation emissions from the refinery and oil and gas sectors are categorized as CO₂ emissions from industrial sources and constitute about 50 percent of the industrial source emissions. When these emissions sources are attributed to the transportation sector, the emissions from that sector amount to approximately half of statewide GHG emissions. In addition to transportation, electricity production, and industrial and residential sources also are important contributors to CO₂ emissions.

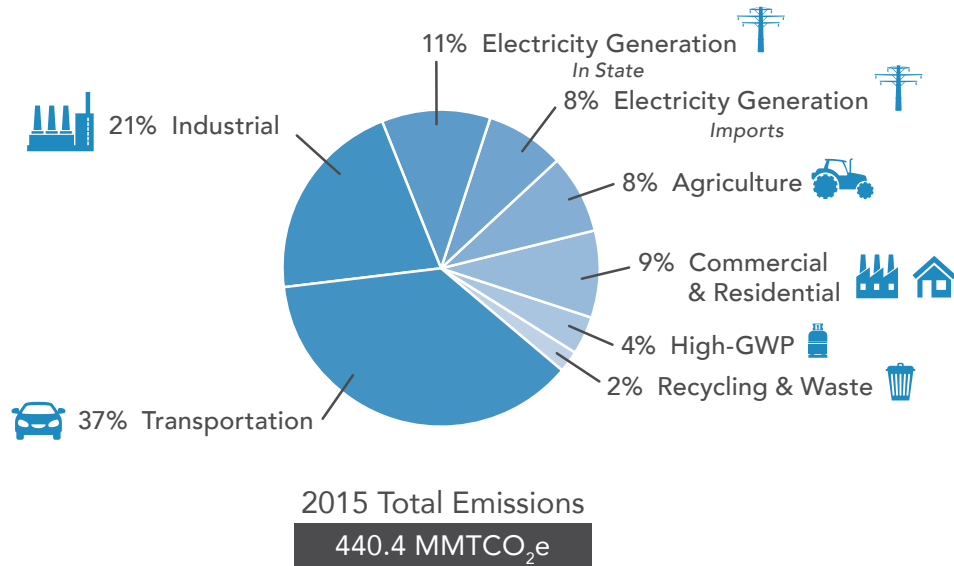
Figures 2 and 3 show State GHG emission contributions by GHG and sector based on the 2015 GHG Emission Inventory. Emissions in Figure 3 are depicted by Scoping Plan sector, which includes separate categories for high-GWP and recycling/waste emissions that are otherwise typically included within other economic sectors.

FIGURE 2: EMISSIONS BY GHG



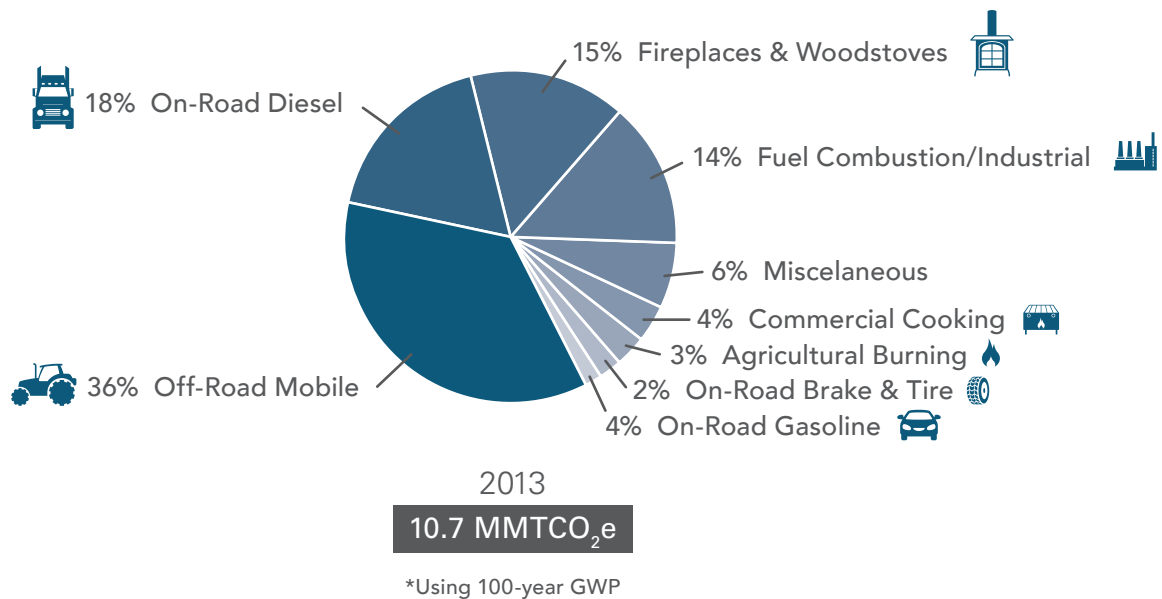
Attachment: WLC ResponsestoAppeal_9JUNE2020_Part 1 (4074 : World Logistics Center)

FIGURE 3: EMISSIONS BY SCOPING PLAN SECTOR



In addition, CARB has developed a statewide emission inventory for black carbon in support of the SLCP Strategy, which is reported in two categories: non-forestry (anthropogenic) sources and forestry sources.³⁹ The black carbon inventory will help support implementation of the SLCP Strategy, but is not part of the State’s GHG Inventory that tracks progress towards the State’s climate targets. The State’s major anthropogenic sources of black carbon include off-road transportation, on-road transportation, residential wood burning, fuel combustion, and industrial processes (Figure 4). The forestry category includes non-agricultural prescribed burning and wildfire emissions.

FIGURE 4: CALIFORNIA 2013 ANTHROPOGENIC BLACK CARBON EMISSION SOURCES*



The exchange of CO₂ between the atmosphere and California’s natural and working lands sector is currently unquantified and therefore, excluded from the State’s GHG Inventory. A natural and working lands carbon inventory is essential for monitoring land-based activities that may increase or decrease carbon sequestration over time. CARB staff is working to develop a comprehensive inventory of GHG fluxes from all of California’s

³⁹ Per SB 1383, the SLCP Strategy only addresses anthropogenic black carbon.

natural and working lands using the Intergovernmental Panel on Climate Change (IPCC) design principles. CARB released the Natural and Working Lands Inventory with the 2030 Target Scoping Plan Update Discussion Draft.⁴⁰ This inventory provides an estimate of GHG emissions reductions and changes in carbon stock from some carbon pools in agricultural and natural and working lands. The CARB Natural and Working Lands Inventory includes an inventory of carbon stocks, stock-change (and by extension GHG flux associated with stock-change) with some attribution by disturbance process for the analysis period 2001-2010. Disturbance processes include activities such as conversion from one land category to a different category, fire, and harvest. The CARB Natural and Working Lands Inventory covers varieties of forests and woodlands, grasslands, and wetlands (biomass-stock-change only). The Inventory includes default carbon densities for croplands and urban/developed lands to facilitate stock-change estimation for natural lands that convert to cropland, natural lands that convert to developed lands, and for croplands that convert to developed lands.

Greenhouse Gas Emissions Tracking

As described above, California maintains an economy-wide GHG inventory for the State that is consistent with IPCC practices to allow for comparison of statewide GHG emissions with those at the national level and with other international GHG inventories. Statewide GHG emissions calculations use many data sources, including data from other State and federal agencies. However, the primary source of data comes from reports submitted to CARB through the Regulation for the Mandatory Reporting of GHG Emissions (MRR). MRR requires facilities and entities with more than 10,000 metric tons of carbon dioxide equivalent (MTCO₂e) of combustion and process emissions, all facilities belonging to certain industries, and all electric power entities to submit an annual GHG emissions data report directly to CARB. Reports from facilities and entities that emit more than 25,000 MTCO₂e are verified by a CARB-accredited third-party verification body. More information on MRR emissions reports can be found at: www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

All data sources used to develop the GHG Emission Inventory are listed in inventory supporting documentation at: www.arb.ca.gov/cc/inventory/data/data.htm.

Other State agencies, nonprofit organizations, and research institutions are developing and testing methodologies and models to quantify GHG fluxes from California's natural and working lands. CARB's ongoing work on the Natural and Working Lands Inventory will serve as one source of data to gauge the scope of GHG reduction potential from California's natural and working lands and monitor progress over time. CARB will evaluate other data sources and methodologies to validate or support the CARB inventory or project-scale tracking. Interagency work is also underway to integrate and account for the land use and management impacts of development, transportation, housing, and energy policies.

Greenhouse gas mitigation action may cross geographic borders as part of international and subnational collaboration, or as a natural result of implementation of regional policies. In addition to the State's existing GHG inventory, CARB has begun exploring how to build an accounting framework that also utilizes existing program data to better reflect the broader benefits of our policies that may be happening outside of the State. For GHG reductions outside of the State to be attributed to our programs, those reductions must be real and quantifiable, without any double counting, including claims to those reductions by other jurisdictions. CARB is collaborating with other jurisdictions to ensure GHG accounting rules are consistent with international best practices. Robust accounting rules will instill confidence in the reductions claimed and maintain support for joint action across jurisdictions. Consistency and transparency are critical as we work together with other jurisdictions on our parallel paths to achieve our GHG targets.

California's Approach to Addressing Climate Change

Integrated Systems

The State's climate goals require a comprehensive approach that integrates and builds upon multiple ongoing State efforts. As we address future mobility, we identify how existing efforts – such as the California Sustainable Freight Action Plan, Mobile Source Strategy, California Transportation Plan 2040, High-Speed

⁴⁰ CARB. 2016. California Greenhouse Gas Inventory - Forests and Other Lands. www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

Rail,⁴¹ urban planning, housing, and goals for enhancement of the natural environment – can complement each other while providing multiple environmental benefits, including air quality and climate benefits. The collective consideration of these efforts illuminates the synergies and conflicts between policies. For example, land disturbance due to increased renewables through utility scale wind and solar and transmission can release GHGs from soil and disturb grasslands and rangelands that have the potential to sequester carbon. Further, policies that support sustainable land use not only reduce vehicle miles traveled (VMT) and its related emissions, but may also avoid land disturbance that could result in GHG emissions or loss of sequestration potential in the natural environment. Identifying these types of trade-offs, and designing policies and implementation strategies to support goals across all sectors, will require ongoing efforts at the local, regional, and State level to ensure that sustainable action across both the built and natural environments help to achieve the State’s long-term climate goals.

Promoting Resilient Economic Growth

California’s strategic vision for achieving at least a 40 percent reduction in GHG emissions by 2030 is based on the principle that economic prosperity and environmental sustainability can be achieved together. Policies, strategies, plans and regulations to reduce GHG emissions help California businesses compete in a global economy and spur new investments, business creation, and jobs to support a clean energy economy. California’s portfolio-based climate strategy can achieve great success when accompanied by consistent and rigorous GHG monitoring and reporting, a robust public process, and an effective enforcement program for the few that attempt to evade rules. The transition to a low-carbon future can strengthen California’s economy and infrastructure and produce other important environmental benefits such as reductions in criteria pollutants and toxic air contaminants, especially in California’s most vulnerable communities.

Actions that are presented in this Scoping Plan provide economic opportunities for the future, but progress toward our goals is already evident today. For example, in 2015, California added more than 20,000 new jobs in the solar sector. This was more than half of the new jobs in this industry across the nation. Employment in the clean economy grew by 20 percent between 2002 and 2012, which included the period of economic recession around 2008.⁴² Shifting to clean, local, and efficient uses of energy reinvests our energy expenditures in our local economies and reduces risks to our statewide economy associated with exposure to volatile global and national oil and gas commodity prices. Indeed, a clean economy is a resilient economy.

Successfully driving economic transition will require cleaner and more efficient technologies, policies and incentives that recognize and reward innovation, and prioritizing low carbon investments. Enacting policies and incentives at multiple jurisdictional levels further ensures the advancement of land use and natural resource management objectives for GHG mitigation, climate adaptation, and other co-benefits. Intentional synergistic linkages between technological advances and resource stewardship can result in sustainable development. The development and implementation of Sustainable Communities Strategies (SCSs) pursuant to Senate Bill (SB) 375, which link transportation, housing, and climate policy, are designed to reduce per capita GHG emissions while improving air quality and expanding transportation and housing options. This Scoping Plan identifies additional ways, beyond SB 375, to promote the technologies and infrastructure required to meet our collective climate goals, while also presenting the vision for California’s continuing efforts to foster a sustainable, clean energy economy.

Increasing Carbon Sequestration in Natural and Working Lands

California’s natural and working lands make the State a global leader in agriculture, a U.S. leader in forest products, and a global biodiversity hotspot. These lands support clean air, wildlife and pollinator habitat, rural economies, and are critical components of California’s water infrastructure. Keeping these lands and waters intact and at high levels of ecological function (including resilient carbon sequestration) is necessary for the well-being and security of Californians in 2030, 2050, and beyond. Forests, rangelands, farms,

41 California’s High-Speed Rail is part of the International Union of Railways (UIC) and California signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UN Framework Convention on Climate Change as part of achieving global 2050 targets.

42 California Business Alliance for a Clean Economy. 2015. Clean Energy and Climate Change Summary of Recent Analyses for California. clean-economy.org/wp-content/uploads/2015/01/Clean-Energy-Climate-Change-Analyses_January2015.pdf

wetlands, riparian areas, deserts, coastal areas, and the ocean store substantial carbon in biomass and soils. Natural and working lands are a key sector in the State's climate change strategy. Storing carbon in trees, other vegetation, soils, and aquatic sediment is an effective way to remove carbon dioxide from the atmosphere. This Scoping Plan describes policies and programs that prioritize protection and enhancement of California's landscapes, including urban landscapes, and identifies next steps to ensure management actions are taken to increase the sequestration potential of those resources. We cannot ignore the relationships between energy, transportation, and natural working lands sectors or the adverse impacts that climate change is having on the environment itself. We must consider important trade-offs in developing the State's climate strategy by understanding the near and long-term impacts of various policy scenarios and actions on our State and local communities.

Improving Public Health

The State's drive to improve air quality and promote community health and well-being as we address climate change remains a priority, as it has for almost 50 years. The State is committed to addressing public health issues, including addressing chronic and infectious diseases, promoting mental health, and protecting communities from exposure to harmful air pollutants and toxins. Several of the strategies included in this Plan were primarily developed to help California achieve federal and State ambient air quality standards for air pollutants with direct health impacts, but they will also deliver GHG reductions. Likewise, some climate strategies, such as GHG reduction measures that decrease diesel combustion from mobile sources, produce air quality co-benefits in the form of concurrent reductions in criteria pollutants and toxic air contaminants.

Climate change itself is already affecting the health of our communities and is exacerbating existing health inequities. Those facing the greatest health burdens include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.⁴³ Economic factors, such as income, poverty, and wealth, are among the strongest determinants of health. Addressing climate change presents an important opportunity to improve public health for all of California's residents and to further our work toward making our State the healthiest in the nation.

The major provisions of AB 617 (C. Garcia, 2017), to be completed by 2020, will ensure that as the State seeks to advance climate policy to meet the 2030 target, we will also act locally to improve neighborhood air quality. AB 617 requires strengthening and expanding community level air monitoring; expediting equipment retrofits at large industrial sources that are located in areas that are in nonattainment for the federal and State ambient air quality standards; requiring development of a statewide strategy to further reduce criteria pollutants and toxic air contaminants in communities faced with high cumulative exposure levels; and local air district-developed community emissions reductions plans that identify emissions reductions targets, measures, implementation schedules, and enforcement plans for these affected communities. By identifying and addressing the disproportionate impacts felt today and by planning, designing, and implementing actions for a sustainable future that considers both climate and air quality objectives, we can be part of the solution to make public health inequities an issue of the past.

Environmental Justice

Fair and equitable climate action requires addressing the inequities that create and intensify community vulnerabilities. The capacity for resilience in the face of climate change is driven by living conditions and the forces that shape them. These include, but are not limited to, access to services such as health care, healthy foods, air and water, and safe spaces for physical activity; income; education; housing; transportation; environmental quality; and good health status. Strategies to alleviate poverty, increase access to economic opportunities, improve living conditions, and reduce health and social inequities will result in more climate-resilient communities. The transition to a low carbon California economy provides an opportunity to not only reduce GHG emissions, but also to reduce emissions of criteria pollutants and air toxins, and to create a healthier environment for all of California's residents, especially those living in the State's most disadvantaged communities. Policies designed to facilitate this transition and state-wide, regional, and local reductions,

⁴³ California Department of Public Health (CDPH). 2015. The Portrait of Promise: The California Statewide Draft Plan to Promote Health and Mental Health Equity. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

must also be appropriately tailored to address the unique characteristics of economically distressed communities throughout the State's diverse geographic regions, including both rural and highly-urbanized areas. Equity considerations must likewise be part of the deliberate and thoughtful process in the design and implementation of all policies and measures included in the Scoping Plan. And CARB must ensure that its ongoing engagement with environmental justice communities will continue beyond the development of the Scoping Plan and be included in all aspects of its various air pollution programs. Additional detail on CARB's efforts to achieve these goals is provided in Chapter 5.

It is critical that communities of color, low-income communities, or both, receive the benefits of the cleaner economy growing in California, including its environmental and economic benefits. Currently, low-income customers enrolled in the California Alternate Rates for Energy (CARE) Program or the Family Electric Rate Assistance (FERA) Program are also eligible to receive a rebate under the California Climate Credit, or a credit on residential and small business electricity bills resulting from the sale of allowances received by investor-owned utilities as part of the Cap-and-Trade Program. SB 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012) and other implementing legislation requires that Cap-and-Trade Program auction monies deposited into the Greenhouse Gas Reduction Fund (GGRF) be used to further the purposes of AB 32 and facilitate reduction of GHG emissions. Investments made with these funds not only reduce GHG emissions, but also provide other environmental, health, and economic benefits including, fostering job creation by promoting in-state GHG emissions reduction projects carried out by California workers and businesses.

Further, SB 535 (De Leon, Chapter 830, Statutes of 2012) and AB 1550 (Gomez, Chapter 369, Statutes of 2016) direct State and local agencies to make significant investments using GGRF monies to assist California's most vulnerable communities. Under SB 535 (de León, Chapter 830, Statutes of 2012), a minimum of 25 percent of the total investments were required to benefit disadvantaged communities; of that, a minimum of 10 percent were required to be located within and provide benefits to those communities. Based on cumulative data reported by agencies as of March 2016, the State is exceeding these targets. Indeed, 50 percent of the \$1.2 billion dollars spent on California Climate Investments projects provided benefits to disadvantaged communities; and 34 percent of this funding was used on projects located directly in disadvantaged communities.⁴⁴

Environmental Justice Advisory Committee

AB 32 calls for CARB to convene an Environmental Justice Advisory Committee (EJAC), to advise the Board in developing the Scoping Plan, and any other pertinent matter in implementing AB 32. It requires that the Committee be comprised of representatives from communities in the State with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income

ENVIRONMENTAL JUSTICE ADVISORY COMMITTEE

Martha Dina Argüello	Physicians for Social Responsibility	Los Angeles
Colin Bailey	The Environmental Justice Coalition for Water	Sacramento
Gisele Fong	End Oil	Los Angeles
Tom Frantz	Association of Irrigated Residents	Central Valley
Katie Valenzuela Garcia (Served until May 2017)	Oak Park Neighborhood Association	Sacramento
Sekita Grant (Served until June 2017)	The Greenlining Institute	Statewide
Kevin Hamilton	Central California Asthma Collaborative	Central Valley
Rey León	Valley LEAP	Central Valley
Luis Olmedo	Comité Civico Del Valle	Salton Sea Region
Kemba Shakur	Urban Releaf	Bay Area
Mari Rose Taruc	Asian Pacific Environmental Network	Bay Area
Eleanor Torres	The Incredible Edible Community Garden	Inland Empire
Monica Wilson	Global Alliance for Incinerator Alternatives	Bay Area

44 www.arb.ca.gov/cc/capandtrade/auctionproceeds/ci_annual_report_2017.pdf

populations, or both. CARB consulted 13 environmental justice and disadvantaged community representatives for the 2017 Scoping Plan process, starting with the first Committee meeting in December 2015. In February and April 2017, members of the California Air Resources Board held joint public meetings with the EJAC to discuss options for addressing environmental justice and disadvantaged community concerns in the Scoping Plan. The full schedule of Committee meetings and meeting materials is available on CARB's website.⁴⁵

Starting in July 2016, the Committee hosted a robust community engagement process, conducting 19 community meetings throughout the State. To enhance this community engagement, CARB staff coordinated with staff from local government agencies and sister State agencies. At the community meetings, staff from State and local agencies participated in extensive, topic-specific "world café" discussions with local groups and individuals. The extensive dialogue between the EJAC, State agencies, and local agencies provided community residents the opportunity to share concerns and provide input on ways California can meet its 2030 GHG target while addressing a number of environmental and equity issues.

Environmental Justice Advisory Committee Recommendations

The Committee's recommendations for the Scoping Plan were informed by comments received at community meetings described above and Committee member expertise. Recommendations were provided for the sector focus areas, overarching environmental justice policy, and California Climate Investments. The Committee also sorted their recommendations into five themes: partnership with environmental justice communities, equity, economic opportunity, coordination, and long-term vision. Finally, the Committee provided direction that their recommendations are intended "to be read and implemented holistically and not independently of each other." The EJAC's recommendations, in their entirety, are included in Appendix A and available at www.arb.ca.gov/cc/ejac/meetings/04262017/ejac-sp-recommendations033017.pdf.

The Committee's overarching recommendations for partnership with environmental justice communities, equity, coordination, economic opportunity, and long-term vision include the following recommendations:

- Encourage long-term community engagement, a culture shift in California, and neighborhood-level solutions to promote the implementation of the State's climate plans, using strategies identified by the Committee.
- Improve the balance of reducing GHGs and compliance costs with other AB 32 goals of improving air quality in environmental justice communities while maximizing benefits for all Californians.
- Consider public health impacts and equity when examining issues in any sector and have CARB conduct an equity analysis on the Scoping Plan and each sector, with guidance from the Committee.
- Develop metrics to ensure actions are meeting targets and develop contingency plans for mitigation and adjustment if emissions increases occur as programs are implemented.
- Develop a statewide community-based air monitoring network to support regulatory efforts and monitor neighborhood scale pollution in disadvantaged communities.
- Coordinate strategies between State, federal, and local agencies for strong, enforceable, evidence-based policies to prevent and address sprawl with equity at the center.
- Maximize the accessibility of safe jobs, incentives, and economic benefits for Californians and the development of a just transition for workers and communities in and around polluting industries.
- Prioritize improving air quality in environmental justice communities and analyze scenarios at a neighborhood scale for all California communities.
- Ensure that AB 32 economic reviewers come from various areas around the State to represent insights on economic challenges and opportunities from those regions.
- Do not limit the Scoping Plan to examining interventions and impacts until 2030, or even 2050. Plan and analyze on a longer-term scale to prevent short-sighted mistakes and reach the long-term vision, as actions today and for the next 30 years will have impacts for seven generations.
- The Scoping Plan must prioritize GHG reductions and investments in California environmental justice communities first, before other California communities; and the innovation of new technologies or strategies to reach even deeper emissions cuts, whenever possible.
- Convene the Committee beyond the Scoping Plan development process.

The Committee's key Energy sector recommendations include:

- Developing aggressive energy goals toward 100 percent renewable energy by 2030, including a vision for a clean energy economy, and prioritizing actions in disadvantaged communities.

⁴⁵ www.arb.ca.gov/cc/ejac/ejac.htm

- Setting goals for green buildings.
- Enforcing GHG reduction targets for existing buildings, and providing upgrades that enable buildings to use renewable energy technologies and water capture.
- Prioritizing and supporting community-owned technologies, such as community-owned solar, for environmental justice communities.

Key Water sector recommendations include:

- Encouraging water conservation and recycling.
- Prioritizing safe drinking water for all.

The Committee's key Industry sector recommendations include:

- Prioritizing direct emissions reductions in environmental justice communities.
- Replacing the Cap-and-Trade Program with a carbon tax or fee and dividend program.
- Eliminating offsets and the allocation of free allowances if the Cap-and-Trade Program continues.
- Analyze where GHG emissions are increasing and identify strategies to prevent and reduce such emissions in environmental justice communities.
- Committing to reductions in petroleum use.

The Committee's key Transportation sector recommendations include:

- Increasing access to affordable, reliable, clean, and safe mobility options in disadvantaged communities.
- Community-engaged land use planning.
- Maximizing electrification.
- Restricting sprawl and examining transportation regionally.
- Considering the development of green transportation hubs that integrate urban greening with transportation options and implement the recommendations of the SB 350 studies.

The Committee's key Natural and Working Lands, Agriculture, and Waste sector recommendations include:

- Reducing waste and mandating that local jurisdictions manage the waste they create.
- Returning carbon to the soil.
- Not burning biomass or considering it a renewable resource.
- Supporting healthy soils as a critical element to land and waste management.
- Integrating urban forestry within local communities.
- Exploring ways to allow and streamline the process for cultural and prescribed burning for land management and to prevent large-scale wildfires.
- Including an annual reduction of 5 million metric tons of CO₂e from natural and working lands.

The Committee's recommendations for California Climate Investments include:

- Ensuring near-term technologies do not adversely impact communities and long-term investments move toward zero emissions.
- Requiring GGRF projects to be transformative for disadvantaged communities as defined by each community.
- Eliminating funding for AB 32 regulated entities.
- Providing technical assistance to environmental justice communities so they can better access funding and resources.
- Prioritizing projects identified by communities and ensuring all applicants have policies to protect against displacement or gentrification.

In April 2017, EJAC members provided a refined list of priority changes for the Scoping Plan from the full list of EJAC recommendations. CARB staff responded to each priority recommendation, describing additions to the Scoping Plan or suggested next steps for recommendations beyond the level of detail in the Plan. Appendix A includes the Priority EJAC Recommendations with CARB Responses and full list of EJAC Recommendations.

More information about the Committee and its recommendations on the previous Scoping Plans and this Scoping Plan is located at: www.arb.ca.gov/ejac.

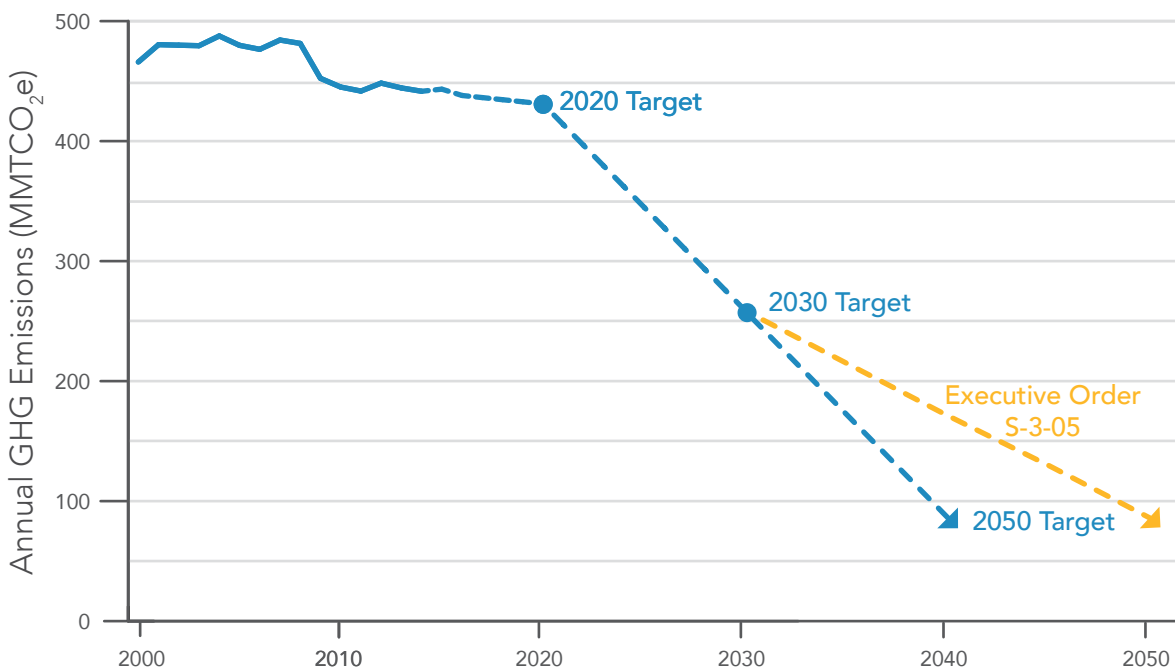
Setting the Path to 2050

The State’s 2020 and 2030 targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in-line with California’s role in stabilizing global warming below dangerous thresholds. As we consider efforts to reduce emissions to meet the State’s near-term requirements, we must do so with an eye toward reductions needed beyond 2030, as well. The Paris Agreement – which calls for limiting global warming to well below 2 degrees Celsius and aiming to limit it below a 1.5 degrees Celsius – frames our path forward.

While the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals. For example, though Zero Net Carbon Buildings are not feasible at this time and more work needs to be done in this area, they will be necessary to achieve the 2050 target. To that end, work must begin now to review and evaluate research in this area, establish a planning horizon for targets, and identify implementation mechanisms. Concurrently, we must consider and implement policies that not only deliver critical reductions in 2030 and continue to help support the State’s long-term climate objectives, but that also deliver other health, environmental and economic benefits. We should not just be planning to put 1.5 million ZEVs on the road by 2025 or 4.2 million on the road by 2030 – but rather, we should be comprehensively facilitating the market-wide transition to electric drive that we need to see materialize as soon as possible. This means that we need to be working towards making all fuels low carbon as quickly as possible, even as we incrementally ramp up volume requirements through the Low Carbon Fuel Standard. And it means that we need to support the broad array of actions and strategies identified in Chapter 4, and new ones that may emerge – to keep us on track to achieve deeper GHG reductions to protect the environment and our way of life. As with all investments, the approach taken must balance risk, reward, longevity, and timing.

Figure 5 illustrates the potential GHG reductions that are possible by making consistent progress between 2020 and 2050, versus an approach that begins with the 2030 target and then makes progress toward the 2050 level included in Executive Order S-3-05. Depending on our success in achieving the 2030 target, taking a consistent approach may be possible. It would achieve the 2050 target earlier, and together with similar actions globally, would have a greater chance of preventing global warming of 2°C. The strategy for achieving the 2050 target should leave open the possibility for both paths. Note that Figure 5 does not include emissions or sequestration potential from the natural and working lands sector or black carbon.

FIGURE 5: PLOTTING CALIFORNIA’S PATH FORWARD



Intergovernmental Collaboration

Federal, state, Tribal, and local action can be complementary. We have seen federal action through the Clean Air Act, regulations for GHG emissions from passenger cars and trucks, development of the Clean Power Plan to limit GHGs from power plants, and the advancement of methane rules for oil and gas production. We have also seen recent federal efforts to delay or reverse some of these actions. As we have done in the past, California, working with other climate leaders, can take steps to advance more ambitious federal action and protect the ability of states to move forward to address climate change. Both collaboration and advocacy will mark the road ahead. However, to the extent that California cannot implement policies or measures included in the Scoping Plan because of the lack of federal action, we will develop alternative measures to achieve the reductions from the same sectors to ensure we meet our GHG reduction targets.

Regional, Tribal, and local governments and agencies are critical leaders in reducing emissions through actions that reduce demand for electricity, transportation fuels, and natural gas, and improved natural and working lands management. Many local governments already employ efforts to reduce GHG emissions beyond those required by the State. For example, many cities and counties improve their municipal operations by upgrading vehicle fleets, retrofitting government buildings and streetlights, purchasing greener products, and implementing waste-reduction policies. In addition, they may adopt more sustainable codes, standards, and general plan improvements to reduce their community's footprints and emissions. Many Tribes within and outside of California have engaged in consultations with CARB to develop robust carbon offset projects under California's Cap-and-Trade Program, in particular forest projects. In fact, Tribal forest projects represent a significant percentage of offset credits issued under the Program. These consultations and carbon sequestration projects are in addition to other Tribal climate-related efforts. The State will provide a supportive framework to advance these and other local efforts, while also recognizing the need to build on, and export, this success to other regional, Tribal, and local governments throughout California and beyond.

Local actions are critical for implementation of California's ambitious climate agenda. State policies, programs, and actions—such as many of those identified throughout this Scoping Plan—can help to support, incentivize, and accelerate local actions to achieve mutual goals for more sustainable and resilient communities. Local municipal code changes, zoning changes, or policy directions that apply broadly to the community within the general plan or climate action plan area can promote the deployment of renewable, zero emission, and low carbon technologies such as zero net energy buildings, renewable fuel production facilities, and zero emission charging stations. Local decision-making has an especially important role in achieving reductions of GHG emissions generated from transportation. Over the last 60 years, development patterns have led to sprawling suburban neighborhoods, a vast highway system, growth in automobile ownership, and under-prioritization of infrastructure for public transit and active transportation. Local decisions about these policies today can establish a more sustainable built environment for the future.

International Efforts

California is not alone in its efforts to address climate change at the international level to reduce global GHG emissions. The agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at keeping the global temperature rise below 2°C, is spurring worldwide action to reduce GHGs and support decarbonization across the global economy. In recent years, subnational governments have emerged to take on a prominent role. With the establishment of the Under 2 Memorandum of Understanding (MOU),^{46,47} the Governors' Climate and Forests Task Force,⁴⁸ and the Western Climate Initiative,⁴⁹ among other partnership initiatives, subnational jurisdictions from the around the world are collaborating and leading on how best to address climate change.

⁴⁶ Under 2 MOU website: under2mou.org/

⁴⁷ One of the Brown Administration's priorities is to highlight California's climate leadership on the subnational level, and to ensure that subnational activity is recognized at the international level. In the year preceding the Paris negotiations, the Governor's Office recruited subnational jurisdictions to sign onto the Memorandum of Understanding on Subnational Global Climate Leadership (Under 2 MOU), which brings together states and regions willing to commit to reducing their GHG emissions by 80 to 95 percent, or to limit emissions to 2 metric tons CO₂-equivalent per capita, by 2050. The governor led a California delegation to the Paris negotiations to highlight our successful climate programs and to champion subnational action and international cooperation on meeting the challenge of reducing GHG emissions. As of October 2017, 188 jurisdictions representing more than 1.2 billion people and more than one-third of the global economy had joined California in the Under 2 MOU.

⁴⁸ Governors' Climate and Forests Task Force website: www.gcftaskforce.org/

⁴⁹ Western Climate Initiative website: www.wci-inc.org/

From its inception, AB 32 recognized the importance of California's climate leadership and engagement with other jurisdictions, and directed CARB to consult with the federal government and other nations to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. California undertook a two-pronged approach: first, we assessed our State-specific circumstances to develop measures that would apply specifically in California; and second, we assessed which measures might lend themselves, through careful design and collaboration with other interested jurisdictions, toward linked or collaborative GHG reduction programs. Under the Clean Air Act, California has a special role as an innovator and leader in the area of motor vehicle emission regulations, which allows our State to adopt motor vehicle emission standards that are stricter than federal requirements. Partners around the country and the world emulate these motor vehicle standards, leading to widespread health benefits. Similarly, by enacting a comprehensive climate strategy that appeals to national and international partners, California can help lead the world in tackling climate change.

Today, the State's Cap-and-Trade Program is linked with Québec's program and scheduled to link with Ontario's emissions trading system on January 1, 2018. Low carbon fuel mandates similar to California's LCFS have been adopted by the United States Environmental Protection Agency (U.S. EPA) and by other jurisdictions including Oregon, British Columbia, the European Union, and the United Kingdom. Over two-dozen states have a renewables portfolio standard. California is a member of the Pacific Coast Collaborative with British Columbia, Oregon, and Washington, who collaborate on issues such as energy and sustainable resource management, among others.⁵⁰ California continues to discuss carbon pricing through a cap-and-trade program with international delegations. We have seen design features of the State's Cap-and-Trade Program incorporated into other emerging and existing programs, such as the European Union Emissions Trading System, the Regional Greenhouse Gas Initiative, China's emerging national trading program, and Mexico's emerging pilot emission trading program.

Recognizing the need to address the substantial GHG emissions caused by the deforestation and degradation of tropical and other forests, California worked with a group of subnational governments to form the Governors' Climate and Forests Task Force (GCF) in 2008.⁵¹ The GCF is currently comprised of 38 different subnational jurisdictions— including states and provinces in Brazil, Colombia, Ecuador, Indonesia, Ivory Coast, Mexico, Nigeria, Peru, Spain, and the United States—that are contemplating or enacting programs for low-emissions rural development and reduced emissions from deforestation and land use. GCF members continue to engage in discussions to share information and experiences about the design of such programs and how the programs could potentially interact with carbon markets. Ongoing engagement between California and its GCF partners, as well as ongoing discussions with other stakeholders, continues to provide lessons on how such programs could complement California's climate programs.⁵²

Further, California's High-Speed Rail is part of the International Union of Railways (UIC), and California has signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UNFCCC as part of achieving the global 2050 targets. This initiative is to demonstrate that rail transport is part of the solution for sustainable and carbon free mobility.

California will continue to engage in multi-lateral forums that develop the policy foundation and technical infrastructure for GHG regulations in multiple jurisdictions through entities such as the International Carbon Action Partnership (ICAP), established by California and other partners in 2007. Members of the ICAP that have already implemented or are actively pursuing market-based GHG programs⁵³ share experiences and knowledge. California also participates in the Partnership for Market Readiness (PMR), a multilateral World Bank initiative that brings together more than 30 developed and developing countries to share experiences and build capacity for climate change mitigation efforts, particularly those implemented using market instruments.⁵⁴ In November 2014, CARB became a Technical Partner of the PMR, and CARB staff members have provided technical information on the design and implementation of the Cap-and-Trade Program at several PMR meetings.

50 Pacific Coast Collaborative website: pacificcoastcollaborative.org/

51 Governors' Climate and Forests Task Force Website: www.gcftaskforce.org/

52 Continued collaboration on efforts to reduce emissions from tropical deforestation and to evaluate sector-based offset programs, such as the jurisdictional program in Acre, Brazil, further demonstrates California's ongoing climate leadership and fosters partnerships on mutually beneficial low emissions development initiatives, including measures to encourage sustainable supply chain efforts by public and private entities.

53 International Carbon Action Partnership website: icapcarbonaction.com/

54 Partnership for Market Readiness website: www.thepmr.org/

Many foreign jurisdictions seek out California's expertise because of our history of success in addressing air pollution and climate change. California also benefits from these interactions. Expanding global action to fight air pollution and climate change expands markets for clean technology. This can bolster business for companies in California developing clean energy products and services and help to bring down the cost of those products globally and in California. Additionally, innovative policies and lessons learned from our partners' jurisdictions can help to inform future climate policies in California.

Governor Brown's focus on subnational collaborations on climate change and air quality has strengthened and deepened California's existing international relationships and forged new ones. These relationships are a critical component of reducing emissions of GHGs and other pollutants worldwide. As we move forward, CARB and other State agencies will continue to communicate and collaborate with international partners to find the most cost-effective ways to improve air quality, fight climate change, and share California's experience and expertise in reducing air pollution and GHGs while growing a strong economy. To highlight the State's resolve and support of other governments committed to action and tackling the threat of the global warming, on July 6, 2017, Governor Brown announced a major initiative to host world leaders at a Global Climate Action Summit planned for September 2018 in San Francisco.

Chapter 2

THE SCOPING PLAN SCENARIO

This chapter describes the State strategy for meeting the 2030 GHG target (also called the Scoping Plan Scenario), along with a short description of the four alternative scenarios, which were evaluated but ultimately rejected when compared against statutory and policy criteria and priorities that the State's comprehensive climate action must deliver. All scenarios are set against the business-as-usual (BAU or Reference Scenario) scenario—what would GHG emissions look like if we did nothing beyond the existing policies that are required and already in place to achieve the 2020 limit. BAU includes the existing renewables requirements, advanced clean cars, the 10 percent reduction in carbon intensity Low Carbon Fuel Standard, and the SB 375 program for sustainable communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years.

The Reference Scenario (BAU) shows continuing, but modest, reductions followed by a later rise of GHG emissions as the economy and population grow. The comprehensive analysis of all five alternatives indicates that the Scoping Plan Scenario—continuing the Cap-and-Trade Program—is the best choice to achieve the State's climate and clean air goals. It also protects public health, provides a solid foundation for continued economic growth, and supports California's quality of life.

All of the alternative scenarios briefly described in this chapter are the product of the Scoping Plan development process and were informed by public input, including that from EJAC, as well as Board and legislative direction over the course of two years. The scenarios all include a range of additional measures developed or required by legislation over the past two years with 2030 as their target date and include: extending the LCFS to an 18 percent reduction in carbon intensity beyond 2020, and the requirements of SB 350 to increase renewables to 50 percent and to double energy efficiency savings. They also all include the Mobile Source Strategy targets for more zero emission vehicles and much cleaner trucks and transit, the Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission freight handling technologies, and the requirements under SB 1383 to reduce anthropogenic black carbon 50 percent and hydrofluorocarbon and methane emissions by 40 percent below 2013 levels by 2030. The recent adoption of AB 398 into State law on July 25, 2017, clarifies the role of the Cap-and-Trade Program through December 31, 2030.

Work is still underway on how to quantify the GHG emissions within the natural and working lands sector. As such, the analyses in this chapter do not include any estimates from this sector. Additional information on the current efforts to better understand GHG emissions fluxes and model the actions needed to support the goal of net carbon sequestration in natural and working lands can be found in Chapter 4. Even absent quantification data, the importance of this sector in achieving the State's climate goals should be considered in conjunction with any efforts to reduce GHG emissions in the energy and industrial sectors.

During the development of the Scoping Plan, stakeholders suggested alternative scenarios to achieve the 2030 target. While countless scenarios could potentially be developed and evaluated, the four below were considered, as they were most often included in comments by stakeholders and they bracket the range of potential scenarios. Several of these alternative scenarios were also evaluated in the Initial AB 32 Scoping Plan in 2008 (All Regulations, Carbon Tax).⁵⁵ Since the adoption of the Initial AB 32 Scoping Plan, some of the alternative scenarios have been implemented or contemplated by other jurisdictions, which has helped in the analysis and the development of this Scoping Plan. This section provides a brief description of the alternatives. A full description of the alternatives and staff's AB 197 and policy analyses are included in Appendix G.

⁵⁵ CARB. 2009. Initial AB 32 Climate Change Scoping Plan Document. www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

Scoping Plan Scenario: Ongoing and statutorily required programs and continuing the Cap-and-Trade Program. This scenario was modified from the January 2017 Proposed Scoping Plan to reflect AB 398, including removal of the 20 percent refinery measure.

Alternative 1: No Cap-and-Trade. Includes additional activities in a wide variety of sectors, such as specific required reductions for all large GHG sources, and more extensive requirements for renewable energy. Industrial sources would be regulated through command and control strategies.

Alternative 2: Carbon Tax. A carbon tax to put a price, but not limit, on carbon, instead of the Cap-and-Trade Program.

Alternative 3: All Cap-and-Trade. This alternative is the same as the Scoping Plan Scenario, while maintaining the LCFS at a 10 percent reduction in carbon intensity past 2020.

Alternative 4: Cap-and-Tax. This would place a declining cap on individual industrial facilities, and individual natural gas and fuel suppliers, while also requiring them to pay a tax on each metric ton of GHGs emitted.

Since the statutory direction on meeting a 2030 GHG target is clear, the issue of certainty of reductions is paramount. These alternatives vary greatly as to the certainty of meeting the target. The declining mass emissions cap under a cap-and-trade program provides certain and measurable reductions over time; a carbon tax, meanwhile, establishes some carbon price certainty, but does not provide an assurance on reductions and instead assumes that some degree of reductions will occur if costs are high enough to alter behavior.

There are also other considerations: to what extent does an alternative meet the target, but also deliver clean air benefits, prioritize reductions at large stationary sources, and allow for continued investment in disadvantaged communities? What is the cost of an alternative and what will be the impact on California consumers? Does an alternative allow for California to link with other jurisdictions, and support the Clean Power Plan⁵⁶ and other federal and international climate programs? Does an alternative provide for flexibility for regulated entities, and a cost-effective approach to reduce greenhouse gases?

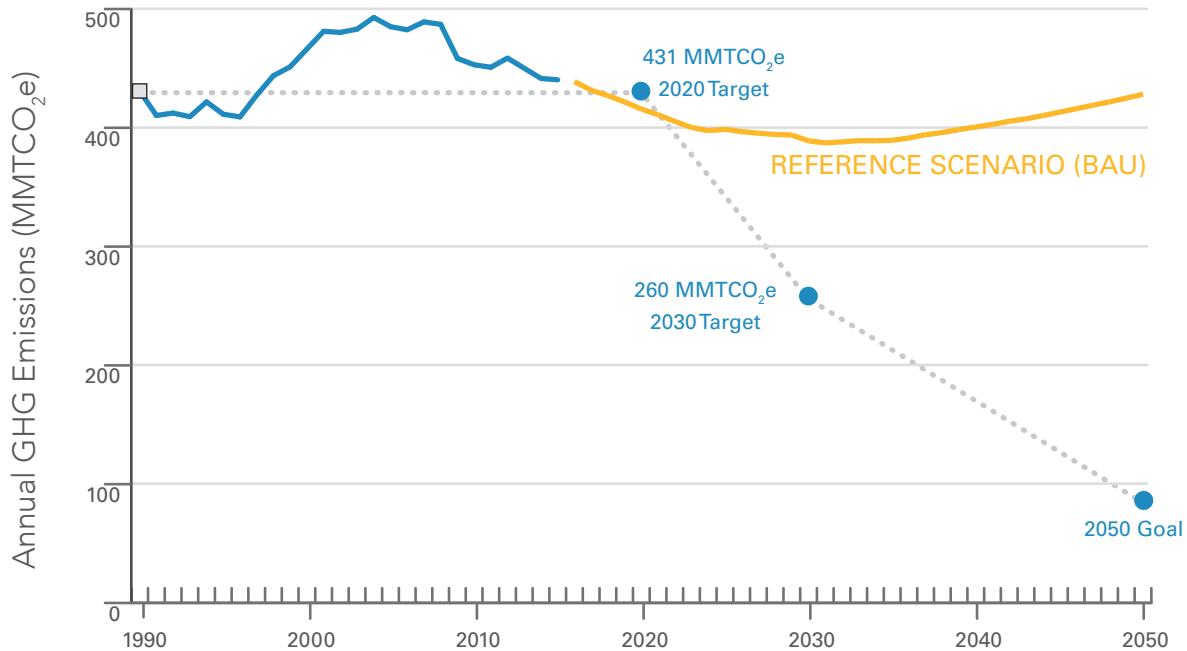
The Scoping Plan Scenario provides a portfolio of policies and measures that balances this combination of objectives, including the highest certainty to achieve the 2030 target, while protecting the California economy and consumers. A more detailed analyses of the alternatives is provided in Appendix G.

Scoping Plan Scenario

The development of the Scoping Plan began by first modeling a Reference Scenario (BAU). The Reference Scenario is the forecasted statewide GHG emissions through 2030 with existing policies and programs, but without any further action to reduce GHGs. Figure 6 provides the modeling results for a Reference Scenario for this Scoping Plan. The graph shows the State is expected to reduce emissions below the 2020 statewide GHG target, but additional effort will be needed to maintain and continue GHG reductions to meet the mid- (2030) and long-term (2050) targets. Figure 6 depicts a linear, straight-line path to the 2030 target. It should be noted that in any year, GHG emissions may be higher or lower than the straight line. That is to be expected as periods of economic recession or increased economic activity, annual variations in hydropower, and many other factors may influence a single or several years of GHG emissions in the State. CARB's annual GHG reporting and inventory will provide data on progress towards achieving the 2030 target. More details about the modeling for the Reference Scenario can be found in Appendix D.

⁵⁶ Although the Clean Power Plan is being challenged in legal and administrative processes, its requirements reflect U.S. EPA's statutory obligation to regulate greenhouse gases from the power sector. Thus it, and other federal programs, are a key consideration for Scoping Plan development.

FIGURE 6: 2017 SCOPING PLAN REFERENCE SCENARIO



The Scoping Plan Scenario is summarized in Table 1. As shown in the table, most of the measures are identified as “known commitments” (marked with “*”), meaning that they are existing programs or required by statute. These commitments are not part of the Reference Scenario (BAU) in Figure 6 since their passage and implementation is related to meeting the Governor’s climate pillars, the 2030 climate target, or other long-term climate and air quality objectives. In addition to the known commitments, the Scoping Plan Scenario includes a post-2020 Cap-and-Trade Program.

TABLE 1: SCOPING PLAN SCENARIO

Policy	Primary Objective	Highlights	Implementation Time Frame
SB 350 ^{57*}	Reduce GHG emissions in the electricity sector through the implementation of the 50 percent RPS, doubling of energy savings, and other actions as appropriate to achieve GHG emissions reductions planning targets in the Integrated Resource Plan (IRP) process.	<ul style="list-style-type: none"> • Load-serving entities file plans to achieve GHG emissions reductions planning targets while ensuring reliability and meeting the State's other policy goals cost-effectively. • 50 percent RPS. • Doubling of energy efficiency savings in natural gas and electricity end uses statewide. 	2030
Low Carbon Fuel Standard (LCFS)*	Transition to cleaner/less-polluting fuels that have a lower carbon footprint.	<ul style="list-style-type: none"> • At least 18 percent reduction in carbon intensity, as included in the Mobile Source Strategy. 	2030
Mobile Source Strategy (Cleaner Technology and Fuels [CTF] Scenario) ^{58*}	Reduce GHGs and other pollutants from the transportation sector through transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled.	<ul style="list-style-type: none"> • 1.5 million zero emission vehicles (ZEV), including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles by 2025 and 4.2 million ZEVs by 2030. • Continue ramp up of GHG stringency for all light-duty vehicles beyond 2025. • Reductions in GHGs from medium-duty and heavy-duty vehicles via the Phase 2 Medium and Heavy-Duty GHG Standards. • Innovative Clean Transit: Transition to a suite of innovative clean transit options. Assumed 20 percent of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100 percent of new bus sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO_x standard. • Last Mile Delivery: New regulation that would result in the use of low NO_x or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5 percent of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10 percent in 2025. • Reduction in vehicle miles traveled (VMT), to be achieved in part by continued implementation of SB 375 and regional Sustainable Community Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy, but included in the document "Potential VMT Reduction Strategies for Discussion" in Appendix C.⁵⁹ 	Various
SB 1383*	Approve and Implement Short-Lived Climate Pollutant strategy ⁶⁰ to reduce highly potent GHGs	<ul style="list-style-type: none"> • 40 percent reduction in methane and hydrofluorocarbon (HFC) emissions below 2013 levels by 2030. • 50 percent reduction in anthropogenic black carbon emissions below 2013 levels by 2030. 	2030
California Sustainable Freight Action Plan ^{61*}	Improve freight efficiency, transition to zero emission technologies, and increase competitiveness of California's freight system.	<ul style="list-style-type: none"> • Improve freight system efficiency by 25 percent by 2030. • Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030. 	2030
Post-2020 Cap-and-Trade Program	Reduce GHGs across largest GHG emissions sources	<ul style="list-style-type: none"> • Continue the existing Cap-and-Trade Program with declining caps to ensure the State's 2030 target is achieved. 	

* These measures and policies are referred to as "known commitments."

57 SB 350 Clean Energy and Pollution Reduction Act of 2015 (De León, Chapter 547, Statutes of 2015). leginfo.legislature.ca.gov/faces/billNavClient.xhtml?billid=201520160SB350 This policy also includes increased demand response and PV.

58 CARB. 2016. 2016 Mobile Source Strategy. www.arb.ca.gov/planning/sip/2016sip/2016mobsrsrc.pdf

59 CARB. Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT)--for Discussion. www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

60 CARB. 2016. Reducing Short-Lived Climate Pollutants in California. www.arb.ca.gov/cc/shortlived/shortlived.htm

61 State of California. California Sustainable Freight Action Plan website. www.casustainablefreight.org/

Table 2 summarizes the results of the modeling for the Reference Scenario and known commitments. Per SB 32, the 2030 limit is 260 MMTCO₂e. That is a limit on total GHG emissions in a single year. At approximately 389 MMTCO₂e, the Reference Scenario is expected to exceed the 2030 limit by about 129 MMTCO₂e.

Table 2 also compares the Reference Scenario 2030 emissions estimate of 389 MMTCO₂e to the 2030 target of 260 MMTCO₂e and the level of 2030 emissions with the known commitments, estimated to be 320 MMTCO₂e. And, in the context of a linear path to achieve the 2030 target, there is also a need to achieve cumulative emissions reductions of 621 MMTCO₂e from 2021 to 2030 to reach the 2030 limit. While there is no statutory limit on cumulative emissions, the analysis considers and presents some results in cumulative form for several reasons. It should be recognized that policies and measures may perform differently over time. For example, in early years, a policy or measure may be slow to be deployed, but over time it has greater impact. If you were to look at its performance in 2021 versus 2030, you would see that it may not seem important and may not deliver significant reductions in the early years, but is critical for later years as it results in greater reductions over time. Further, once GHGs are emitted into the atmosphere, they can have long lifetimes that contribute to global warming for decades. Policies that reduce both cumulative GHG emissions and achieve the single-year 2030 target provide the most effective path to reducing climate change impacts. A cumulative construct provides a more complete way to evaluate the effectiveness of any measure over time, instead of just considering a snapshot for a single year.

TABLE 2: 2030 MODELING GHG RESULTS FOR THE REFERENCE SCENARIO AND KNOWN COMMITMENTS

Modeling Scenario	2030 GHG Emissions (MMTCO ₂ e)	Cumulative GHG Reductions 2021–2030 (MMTCO ₂ e)	Cumulative Gap to 2030 Target (MMTCO ₂ e)
Reference Scenario (Business-as-Usual)	389	n/a	621
Known Commitments	320	385	236

As noted above, the known commitments are expected to result in emissions that are 60 MMTCO₂e above the target in 2030, and have a cumulative emissions reduction gap of about 236 MMTCO₂e. This means the known commitments do not decline fast enough to achieve the 2030 target. The remaining 236 MMTCO₂e of estimated GHG emissions reductions would not be achieved unless further action is taken to reduce GHGs. Consequently, for the Scoping Plan Scenario, the Post-2020 Cap-and-Trade Program would need to deliver 236 MMTCO₂e cumulative GHG emissions reductions from 2021 through 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved. Figure 7 illustrates the cumulative emissions reductions contributions of the known commitments and the Cap-and-Trade Program from 2021 to 2030.

Post-2020 Cap-and-Trade Program with Declining Caps

This measure would continue the Cap-and-Trade Program post-2020 pursuant to legislative direction in AB 398. The program is up and running and has a five-year-long record of auctions and successful compliance. In the face of a growing economy, dry winters, and the closing of a nuclear plant, it is delivering GHG reductions. This is not to say that California should continue on this road simply because the Cap-and-Trade Program is already in place. The analyses in this chapter, and the economic analysis in Chapter 3, clearly demonstrate that continuing the Cap-and-Trade Program through 2030 will provide the most secure, reliable, and feasible clean energy future for California—one that will continue to deliver crucial investments to improve the quality of life and the environment in disadvantaged communities.

Under this measure, funds would also continue to be deposited into the Greenhouse Gas Reduction Fund (GGRF) to support projects that fulfill the goals of AB 32, with AB 398 identifying a list of priorities for the Legislature to consider for future appropriations from GGRF. Investment of the Cap-and-Trade Program proceeds furthers the goals of AB 32 by reducing GHG emissions, providing net GHG sequestration, providing co-benefits, investing in disadvantaged communities and low-income communities, and supporting the long-term, transformative efforts needed to improve public and environmental health and

develop a clean energy economy. These investments support programs and projects that deliver major economic, environmental, and public health benefits for Californians. Importantly, prioritized investments in disadvantaged communities are providing a multitude of meaningful benefits to these communities some of which include increased affordable housing opportunities, reduced transit and transportation costs, access to cleaner vehicles, improved mobility options and air quality, job creation, energy cost savings, and greener and more vibrant communities.

Further, the Cap-and-Trade Program is designed to protect electricity and natural gas residential ratepayers from higher energy prices. The program includes a mechanism for electricity and natural gas utilities to auction their freely allocated allowances, with the auction proceeds benefiting ratepayers. The Climate Credit is a twice-annual bill credit given to investor-owned utility electricity residential customers. The total value of the Climate Credit for vintage 2013 auction allowances alone was over \$400 million. The first of these credits appeared on customer bills in April 2014.⁶² Currently, natural gas utilities are permitted to use a portion of their freely allocated allowances to meet their own compliance obligations; however, over time, they must consign a larger percentage of allowances and continue to provide the value back to customers.

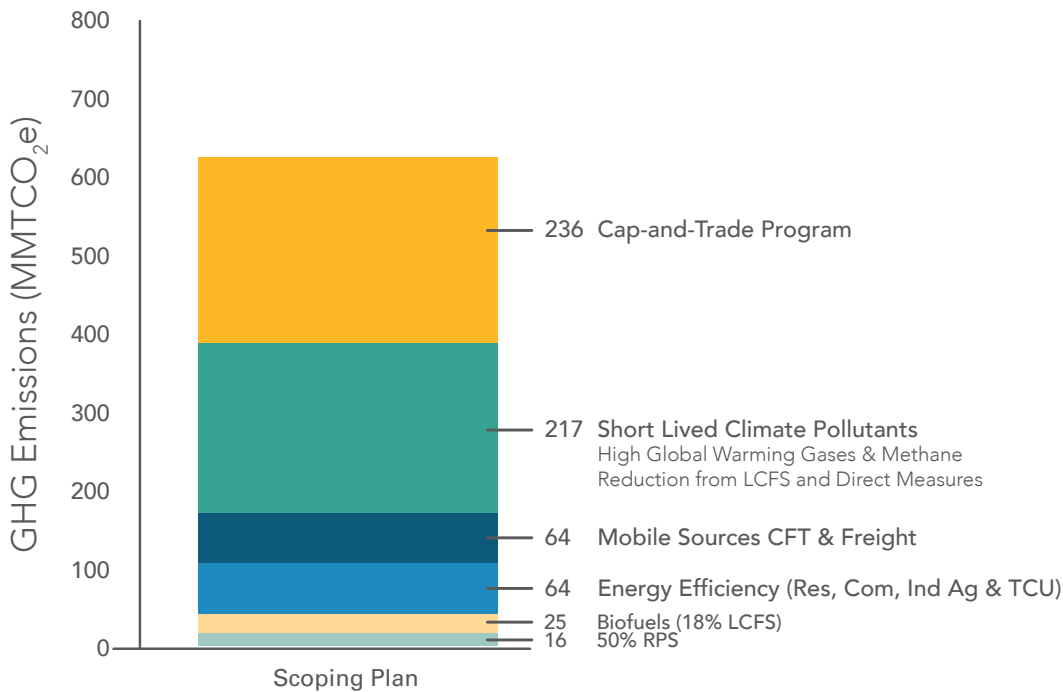
Additionally, under this measure, the State would preserve its current linkages with its Canadian partners and support future linkages with other jurisdictions, thus facilitating international action to address climate change. The high compliance rates with the Cap-and-Trade Program also demonstrate that the infrastructure and implementation features of the program are effective and understood by the regulated community. This measure also lends itself to integration with the Clean Power Plan requirements and is flexible to allow expansion to other sectors or regions.

In late 2017, CARB began evaluating changes to program design features for post-2020 in accordance with AB 398.⁶³ This includes changes to the offset usage limit, direction on allocation, two price containment points, and a price ceiling – which, if in the unlikely event were to be accessed, must result in GHG reductions by compensating for any GHG emissions above the cap, ensuring the environmental integrity of the program. Changes to conform to the requirements of AB 398 will be subject to a public process, coordinated with linked partners, and be part of a future rulemaking that would take effect by January 1, 2021.

⁶² www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-v2013-allowance-value-report.pdf

⁶³ www.arb.ca.gov/cc/capandtrade/meetings/20171012/ct_presentation_11oct2017.pdf

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴



The Scoping Plan Scenario in Figure 7 represents an expected case where current and proposed GHG reduction policies and measures begin as expected and perform as expected, and technology is readily available and deployed on schedule. An Uncertainty Analysis was performed to examine the range of outcomes that could occur under the Scoping Plan policies and measures. The uncertainty in the following factors was characterized and evaluated:

- Economic growth through 2030;
- Emission intensity of the California economy;
- Cumulative emissions reductions (2021 to 2030) achieved by the prescriptive measures, including the known commitments; and
- Cumulative emissions reductions (2021 to 2030) that can be motivated by emission prices under the Cap-and-Trade Program.

The combined effects of these uncertainties are summarized in Figure 8. As shown in Figure 7, the Scoping Plan analysis estimates that the prescriptive measures will achieve cumulative emissions reductions of 385 MMT_{CO2e}, the Cap-and-Trade Program will achieve 236 MMT_{CO2e}, resulting in total cumulative emissions reductions of 621 MMT_{CO2e}. These values are again reflected in the bar on the left of Figure 8. The results of the Uncertainty Analysis are summarized in the three bars on the right of the figure as follows:

- The cumulative emissions reductions required to achieve the 2030 emission limit has the potential to be higher or lower than the Scoping Plan estimate. The uncertainty analysis simulates an average required emissions reductions of about 660 MMT_{CO2e} with a range of +130 MMT_{CO2e}.⁶⁵ This estimate and the range are shown in Figure 8 as the bar on the right. Notably, the estimate of the average required emissions reductions is 40 MMT_{CO2e} greater than the estimate in the Scoping Plan analysis.
- The prescriptive measures have the potential to underperform relative to expectations. Based on CARB staff assessments of the potential risk of underperformance of each measure, the average emissions reductions simulated to be achieved was 335 MMT_{CO2e}, or about 13 percent below the Scoping Plan estimate. The range for the performance of the measures was about +50 MMT_{CO2e}.

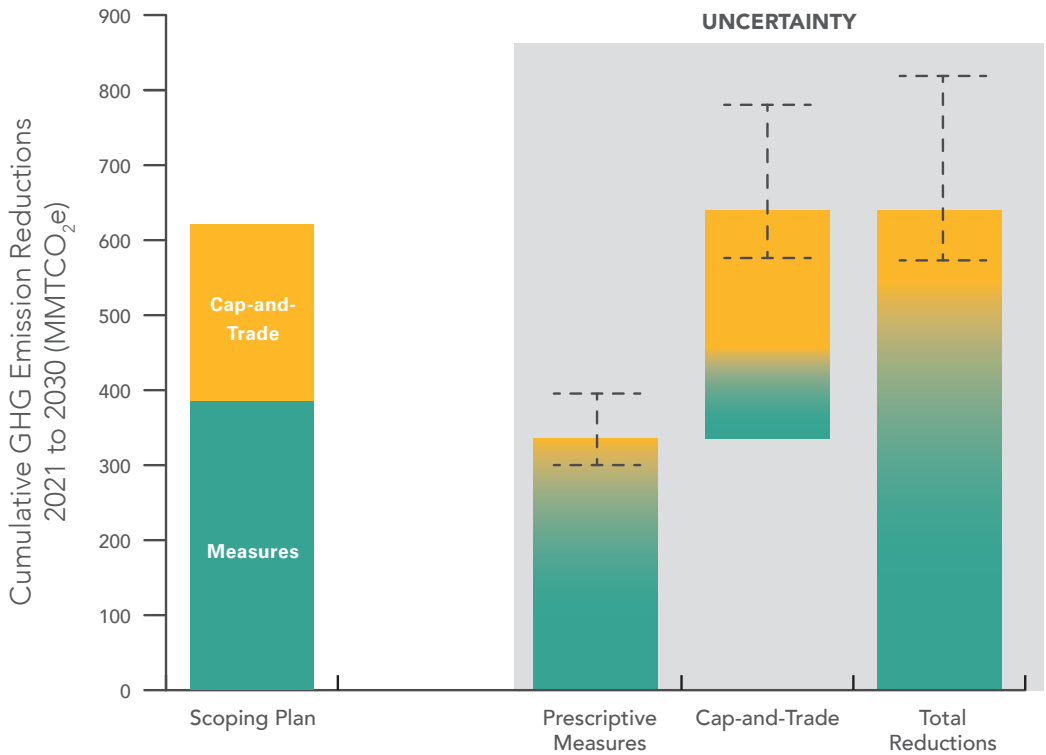
⁶⁴ The whole number values displayed in Figure 7 do not mathematically sum to 621 MMT_{CO2e}, consistent with the modeling results summary in Table 2. This is a result of embedded significant figures and rounding for graphic display purposes. Please refer to the corresponding PATHWAYS modeling data spreadsheets for details.

⁶⁵ The ranges presented are the 5th and 95th percentile observations in the Uncertainty Analysis. See Appendix E for details.

- These values for the potential reductions achieved by the measures are shown in the figure.
- The Cap-and-Trade program is designed to fill the gap in the required emissions reductions over and above what is achieved by the prescriptive measures. Because the total required emissions reductions are uncertain, and the emissions reductions achieved by the prescriptive measures are uncertain, the required emissions reductions from the Cap-and-Trade Program are also uncertain. The Uncertainty Analysis simulated the average emissions reductions achieved by the Cap-and-Trade Program at about 305 MMTCO₂e, or about 30 percent higher than the Scoping Plan estimate. The range was simulated to be about +120 MMTCO₂e. These values for the potential reductions achieved by the Cap-and-Trade Program are shown in the figure.

The Uncertainty Analysis provides insight into the range of potential emissions outcomes that may occur, and demonstrates that the Scoping Plan, with the Cap-and-Trade Program, is extremely effective in the face of uncertainty, assuring that the required emissions reductions are achieved (see Appendix E for more detail). The Uncertainty Analysis also indicates that the Cap-and-Trade Program could contribute a larger or smaller share of the total required cumulative emissions reductions than expected in the Scoping Plan analysis.

FIGURE 8: UNCERTAINTY ANALYSIS



While the modeling results provide estimates of the GHG reductions that could be achieved by the measures, the results also provide other insights and highlight the need to ensure successful implementation of each measure. The SLCP Strategy will provide significant reductions with a focus on methane and hydrofluorocarbon gases. To ensure the SLCP Strategy implementation is successful, it will be critical to ensure programs such as LCFS maintain incentives to finance the capture and use of methane as a transportation fuel—further reducing the State’s dependence on fossil fuels. The modeling also shows that actions on energy efficiency could provide the same magnitude of GHG emissions reductions as the mobile source measures, but each effort will provide different magnitudes of air quality improvements and cost-effectiveness as discussed in Chapter 3.

Another way to look at this scenario is to understand the trajectory of GHG reductions over time, relative to the 2030 target. Figure 9 provides the trajectory of GHG emissions modeled for the Scoping Plan Scenario. Again, this depicts a straight-line path to the 2030 target for discussion purposes, but in reality GHG emissions may be above or below the line in any given year(s).

FIGURE 9: SCOPING PLAN SCENARIO GHG REDUCTIONS

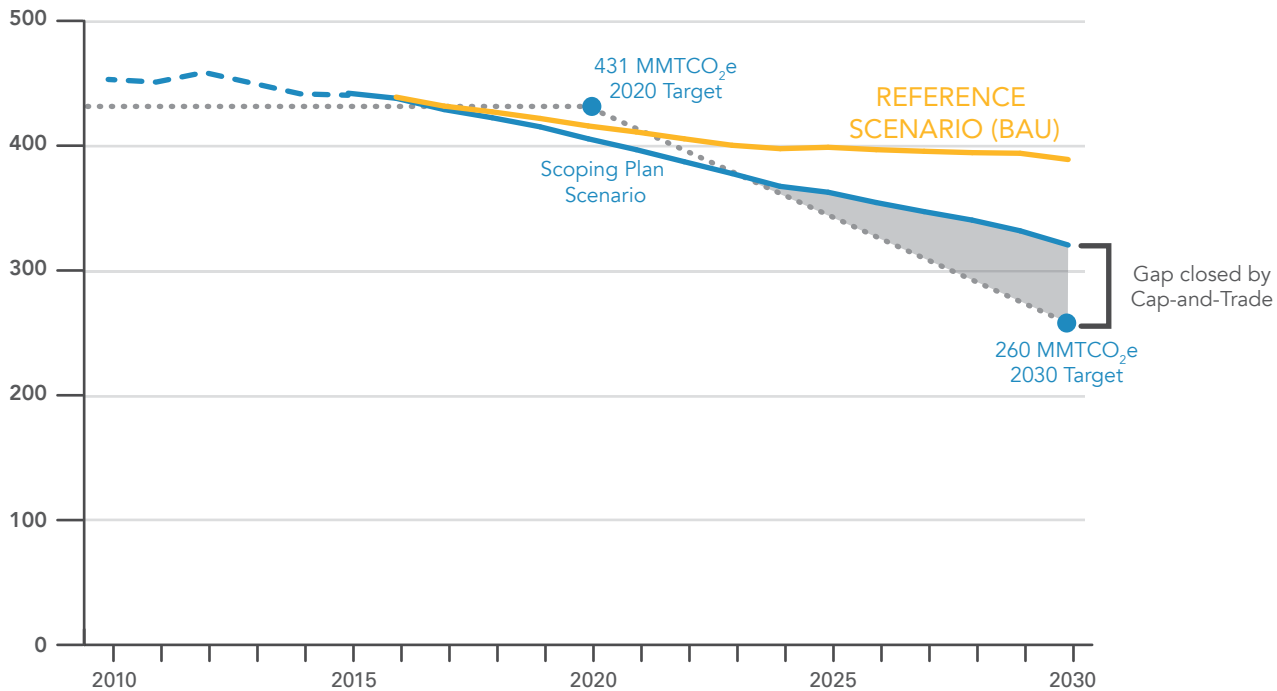


Figure 9 shows the Reference Scenario (yellow) and the version of the Scoping Plan Scenario that excludes the Cap-and-Trade Program (blue). Until 2023, the measures in the Scoping Plan Scenario constrain GHG emissions below the dotted straight line. After 2023, GHG emissions continue to fall, but at a slower rate than needed to meet the 2030 target. It is the Cap-and-Trade Program that will reduce emissions to the necessary levels to achieve the 2030 target. In this scenario, it is estimated that the known commitments will result in an emissions level of about 320 MMTCO₂e in 2030. Thus, for the Scoping Plan Scenario, the Cap-and-Trade Program would deliver about 60 MMTCO₂e in 2030 and ensure the 2030 target is achieved.

To understand how the Scoping Plan affects the main economic sectors, Table 3 provides estimated GHG emissions by sector, compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030. This comparison helps to illustrate which sectors are reducing emissions more than others and where to focus additional actions to reduce GHGs across the entire economy.

TABLE 3: ESTIMATED CHANGE IN GHG EMISSIONS BY SECTOR (MMT_{CO₂E})

	1990	2030 Scoping Plan Ranges ⁶⁶	% change from 1990
Agriculture	26	24–25	-8 to -4
Residential and Commercial	44	38–40	-14 to -9
Electric Power	108	30–53 ⁶⁷	-72 to -51
High GWP	3	8–11 ⁶⁸	267 to 367
Industrial	98	83–90 ⁶⁹	-15 to -8
Recycling and Waste	7	8–9 ⁷⁰	14 to 29**
Transportation (Including TCU)	152	103–111	-32 to -27
Natural Working Lands Net Sink*	-7***	TBD	TBD
Sub Total	431	294–339	-32 to -21
Cap-and-Trade Program	n/a	34–79	n/a
Total	431	260	-40

* Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

** The SLCP will reduce emissions in this sector by 40 percent from 2013 levels. However, the 2030 levels are still higher than the 1990 levels as emissions in this sector have grown between 1990 and 2013.

*** This number reflects net results and is different than the intervention targets discussed in Chapter 4.

The sector ranges may change in response to how the sectors respond to the Cap-and-Trade Program. While the known commitments will deliver some reductions in each sector, the Cap-and-Trade Program will deliver additional reductions in the sectors it covers. Annual GHG reporting and the GHG inventory will track annual changes in emissions, and those will provide ongoing assessments of how each sector is reducing emissions due to the full complement of known commitments and the Cap-and-Trade Program, as applicable.

Scenario Modeling

There are a variety of models that can be used to model GHG emissions. For this Plan, the State is using the PATHWAYS model.⁷⁰ PATHWAYS is structured to model GHG emissions while recognizing the integrated nature of the industrial economic and energy sectors. For example, if the transportation sector adds more electric vehicles, PATHWAYS responds to reflect an energy demand increase in the electricity sector. However, PATHWAYS does not reflect any change in transportation infrastructure and land use demand associated with additional ZEVs on the road. The ability to capture a subset of interactive effects of policies and measures helps to provide a representation of the interconnected nature of the system and impacts to GHGs.

66 Unless otherwise noted, the low end of the sector range is the estimated emissions from the Scoping Plan Scenario and the high end adjusts the expected emissions by a risk factor that represents sector underperformance.

67 The high end of the electric power sector range is represented by the Scoping Plan Scenario, and the low end by enhancements and additional electricity sector measures such as deployment of additional renewable power, greater behind-the-meter solar PV, and additional energy efficiency. The electric power sector range provided in Table 3 will be used to help inform CARB's setting of the SB 350 Integrated Resource Plan greenhouse gas emissions reduction planning targets for the sector. CARB, CPUC, and CEC will continue to coordinate on this effort before final IRP targets are established for the sector, load-serving entities, and publicly-owned utilities. State agencies will investigate the potential for and appropriateness of deeper electric sector reductions in light of the overall needs of the Scoping Plan to cost-effectively achieve the statewide GHG goals. Concurrently, CEC and CPUC are proceeding with their respective IRP processes using this range.

68 The sector emissions are anticipated to increase by 2030. As such, the high end of the sector range is the estimated emissions from the Scoping Plan Scenario and the low end adjusts the expected emissions by a risk factor that represents sector over performance.

69 This estimate does not account for the reductions expected in this sector from the Cap-and-Trade Program. The Cap-and-Trade line item includes reductions that will occur in the industrial sector.

70 CARB. 2016. AB 32 Scoping Plan Public Workshops. www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

At this time, PATHWAYS does not include a module for natural and working lands. As such, PATHWAYS cannot be used to model the natural and working lands sector, the interactive effects of policies aimed at the economic and energy sectors and their effect on land use or conditions, or the interactive effects of policies aimed at the natural environment and their impact on the economic and energy sectors. For this Plan, external inputs had to be developed for PATHWAYS to supply biofuel volumes. The natural and working lands sector is also being modeled separately as described in Chapter 4. Moving forward, CARB and other State agencies will work to integrate all the sectors into one model to fully capture interactive effects across both the natural and built environments.

Lastly, the PATHWAYS assumptions and results in this Plan show the significant action that the State must take to reach its GHG reduction goals. It is important to note that the modeling assumptions may differ from other models used by other State agencies. Modeling exercises undertaken in future regulatory proceedings may result in different measures, programs, and program results than those used in the modeling for this Scoping Plan. State agencies will engage on their specific policies and measure development processes separately from CARB Scoping Plan activities, in public forums to engage all stakeholders.

Uncertainty

Several types of uncertainty are important to understand in both forecasting future emissions and estimating the benefits of emissions reductions scenarios. In developing the Scoping Plan, we have forecast a Reference Scenario and estimated the GHG emissions outcome of the Scoping Plan using PATHWAYS. Inherent in the Reference Scenario modeling is the expectation that many of the existing programs will continue in their current form, and the expected drivers for GHG emissions such as energy demand, population growth, and economic growth will match our current projections. However, it is unlikely that the future will precisely match our projections, leading to uncertainty in the forecast. Thus, the single "reference" line should be understood to represent one possible future in a range of possible predictions. For the Scoping Plan Scenario, PATHWAYS utilized inputs that are assumptions external to the model. PATHWAYS was provided plausible inputs such as energy demand over time, the start years for specific policies, and the penetration rates of associated technologies. Each of the assumptions provided to PATHWAYS has some uncertainty, which is also reflected in the results. Thus, while the results presented in the Scoping Plan may seem precise due to the need for precision in model inputs, these results are estimates, and the use of ranges in some of the results is meant to capture that uncertainty.

Further, as noted in the November 7, 2016, 2030 Target Scoping Plan Workshop, "All policies have a degree of uncertainty associated with them."⁷¹ As this Scoping Plan is meant to chart a path to achieving the 2030 target, additional work will be required to fully design and implement any policies identified in this Scoping Plan. During the subsequent development of policies, CARB and other State agencies will learn more about technologies, cost, and how each industry works as a more comprehensive evaluation is conducted in coordination with stakeholders. Given the uncertainty around assumptions used in modeling, and in performance once specific policies are fully designed and implemented, estimates associated with the Scoping Plan Scenario are likely to differ from what actually occurs when the Scoping Plan is implemented. One way to mitigate for this risk is to develop policies that can adapt and increase certainty in GHG emissions reductions. Periodic reviews of progress toward achieving the 2030 target and the performance of specific policies will also provide opportunities for the State to consider any changes to ensure we remain on course to achieve the 2030 target. The need for this periodic review process was anticipated in AB 32, as it calls for updates to the Scoping Plan at least once every five years. Additional information on the uncertainty analyses conducted in the development of this Scoping Plan is located in Appendix E.

⁷¹ Bushnell, James. Economic Modeling and Environmental Policy Choice. PowerPoint. Department of Economics, University of California, Davis. www.arb.ca.gov/cc/scopingplan/meetings/110716/bushnellpresentation.pdf

Policy Analysis of Scoping Plan Scenario

The following key criteria were considered while evaluating potential policies beyond the known commitments. The results of the economic analysis (presented in Chapter 3) were also important in the design of this Scoping Plan.

- **Ensure the State achieves the 2030 target.** The strategy must ensure that GHG emissions reductions occur and are sufficient to achieve the 2030 target.
- **Provide air quality co-benefits.** An important concern for environmental justice communities is for any Scoping Plan to provide air quality co-benefits.
- **Prioritize rules and regulations for direct GHG reductions.** AB 197 requires CARB in developing this Scoping Plan to prioritize emissions reductions rules and regulations that result in direct emissions reductions at large stationary sources of GHG emissions sources and direct emissions reductions from mobile sources.
- **Provide protection against emissions leakage.** Require any policies to achieve the statewide limits to minimize emissions leakage to the extent possible. Emissions leakage can occur when production moves out-of-state, so there appears to be a reduction in California's emissions, but the production and emissions have just moved elsewhere. This loss in production may be associated with loss in jobs and decreases in the State's gross domestic product (GDP) and could potentially increase global GHG emissions if the production moves to a less efficient facility outside of California.
- **Develop greenhouse gas reduction programs that can be readily exported to other jurisdictions.** Currently, California's Cap-and-Trade Program is linked with Québec's program and is scheduled to link with Ontario's cap-and-trade program beginning in 2018. At the same time, California's ambitious policies such as the RPS, LCFS, and Advanced Clean Cars have resulted in other regions adopting similar programs.
- **Minimize costs and increase investment in disadvantaged and low-income communities, and low-income households.** Currently, Cap-and-Trade auction proceeds from the sale of State-owned allowances are appropriated for a variety of programs to reduce GHGs, and provide other environmental, health and economic benefits including job creation and economic development. Under AB 1550, a minimum of 25 percent of the proceeds are to be invested in projects located in and benefiting disadvantaged communities, with an additional minimum 10 percent to projects in low-income communities, and low-income households. It is important to understand if the strategy will require or result in funding to support these GHG reductions and associated benefits.
- **Avoid or minimize the impacts of climate change on public health by continuing reductions in GHGs.** Climate change has the potential to significantly impact public health, including increases in heat illness and death, air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.
- **Provide compliance flexibility.** Flexibility is important as it allows each regulated entity the ability to pursue its own path toward compliance in a way that works best for its business model. Flexibility also acknowledges that regulatory agencies may not have a complete picture of all available low-cost compliance mechanisms or opportunities even across the same sector. In addition, under AB 32 and AB 197, the strategy to reduce GHGs requires consideration of cost-effectiveness, which compliance flexibility provides.
- **Support the Clean Power Plan and other federal climate programs.** California will continue to support aggressive federal action, as well as to defend existing programs like the Clean Power Plan, which is the most prominent federal climate regulation applicable to stationary sources. The U.S. Supreme Court has repeatedly confirmed that federal greenhouse gas regulation must move forward under the federal Clean Air Act, so it is important to ensure that California's programs can support federal compliance as well. Although continuing litigation has stayed certain Clean Power Plan deadlines in the near term, and U.S. EPA has proposed to reconsider aspects of the rule as issued, the Clean Power Plan remains the law of the land. California is vigorously defending this important program, and is continuing to support federal climate regulation as is required by law. U.S. EPA also has a legal obligation to implement GHG controls for power plants, even if it proposes to alter the form of those controls in the future. Therefore, the Clean Power Plan and other federal efforts are important considerations for this Scoping Plan. With regard to the

Clean Power Plan, California power plants are expected to be within their limits as set forth by the State's compliance plan, which was approved by CARB on July 27, 2017. However, the State still needs a mechanism to ensure the emissions for the covered electricity generating plants do not exceed the federal limits. This mechanism must be federally enforceable with regard to the affected power plants, and limit their emissions in accordance with the federal limit.

Table 4 uses the criteria listed above to assess the Scoping Plan Scenario. This assessment is based on CARB staff evaluation as well as the analyses described in Chapter 3.

TABLE 4: POLICY ASSESSMENT OF THE SCOPING PLAN

Criteria	Details
Ensure the State Achieves the 2030 Target	<ul style="list-style-type: none"> • Incorporates existing and new commitments to reduce emissions from all sectors • The Cap-and-Trade Program scales to ensure reductions are achieved, even if other policies do not achieve them. This is particularly critical given the uncertainty inherent in both CARB's emission forecast and its estimate of future regulations.
Provide Air Quality Co-Benefits	<ul style="list-style-type: none"> • Reduced fossil fuel use and increased electrification (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) from policies such as the Mobile Source Strategy, enhanced LCFS and RPS, energy efficiency, and land conservation will likely reduce criteria pollutants and toxic air contaminants. • The Cap-and-Trade Program will ensure GHG emissions reductions within California that may reduce criteria pollutants and toxic air contaminants.
Prioritize Rules and Regulations for Direct GHG Reductions	<ul style="list-style-type: none"> • Advanced Clean Cars regulations require reduction in the light-duty vehicle sector. • Enhanced LCFS requires reductions in light-duty and heavy-duty transportation. • SB 350, RPS, and energy efficiency will reduce the need for fossil power generation. • The Cap-and-Trade Program constrains and reduces emissions across approximately 80 percent of California GHG emissions. • SB 1383 and the Short-lived Climate Pollutant Reduction Strategy require reductions in the agricultural, commercial, residential, industrial, and energy sectors.
Protect Against Emissions Leakage	<ul style="list-style-type: none"> • Free allowance allocation to minimize leakage, where supported by research.
Develop GHG Reduction Programs that can be Readily Exported to Other Jurisdictions	<ul style="list-style-type: none"> • Supports existing and future linkages, allows for larger GHG emissions reductions worldwide through collaborative regional efforts. • Provides leadership on how to integrate short-lived climate pollutants into the broader climate mitigation program.
Minimize Costs and Invest in Disadvantaged and Low-Income Communities, and Low-Income Households	<ul style="list-style-type: none"> • Continue to fund programs and projects that reduce GHGs and meaningfully benefit disadvantaged and low-income communities and low-income households through the Greenhouse Gas Reduction Fund.
Avoid or Minimize the Impacts of Climate Change on Public Health	<ul style="list-style-type: none"> • Reduces GHGs and provides leadership nationally and internationally for climate action. • Provides funding for programs such as home weatherization focused on disadvantaged communities, to mitigate potential cost impacts.
Compliance Flexibility	<ul style="list-style-type: none"> • Regulated sources self-identify and implement some GHG emissions reductions actions, beyond those already required to comply with additional prescriptive measures.
Support the Clean Power Plan and other Federal Climate Programs	<ul style="list-style-type: none"> • Post-2020 Cap-and-Trade Program can be used to comply with the Clean Power Plan.

Chapter 3

EVALUATIONS

Programs for Air Quality Improvement in California

For half a century, CARB has been a leader in measuring, evaluating, and reducing sources of air pollution that impact public health. Its air pollution programs have been adapted for national programs and emulated in other countries. Significant progress has been made in reducing diesel particulate matter (PM), which is a designated toxic air contaminant, and many other hazardous air pollutants. CARB partners with local air districts to address stationary source emissions and adopts and implements State-level regulations to address sources of criteria and toxic air pollution, including mobile sources. The key air quality strategies being implemented by CARB include the following:

- **State Implementation Plans (SIPs).**⁷² These comprehensive plans describe how an area will attain national ambient air quality standards by deadlines established by the federal Clean Air Act. SIPs are a compilation of new and previously submitted plans, programs, air district rules, State regulations, and federal controls designed to achieve the emissions reductions needed from mobile sources, fuels, stationary sources, and consumer products. On March 23, 2017, CARB adopted the Revised Proposed 2016 State Strategy for the SIP, describing the commitments necessary to meet federal ozone and PM_{2.5} standards over the next 15 years.
- **Diesel Risk Reduction Plan.**⁷³ The plan, adopted by CARB in September 2000, outlined 14 recommended control measures to reduce the risks associated with diesel PM and achieve a goal of 75 percent PM reduction by 2010 and 85 percent by 2020. Since 2000, CARB has adopted regulations to reduce smog-forming pollutants and diesel PM from mobile vehicles and equipment (e.g., trucks, buses, locomotives, tractors, cargo handling equipment, construction equipment, marine vessels, transport refrigeration units); stationary engines and portable equipment (e.g., emergency standby generators, prime generators, agricultural irrigation pumps, portable generators); and diesel fuels. Diesel PM accounts for approximately 60 percent of the current estimated inhalation cancer risk for background ambient air.⁷⁴ CARB staff continues to work to improve implementation and enforcement efforts and examine needed amendments to increase the community health benefits of these control measures.
- **Sustainable Freight Action Plan.**⁷⁵ This joint agency strategy was developed in response to Governor's Executive Order B-32-15 to improve freight efficiency, transition to zero emission technologies, and increase the competitiveness of California's freight system. The transition of the freight transport system is essential to support the State's economic development in the coming decades and reduce air pollution affecting many California communities.
- **AB 32 Scoping Plan.**⁷⁶ This comprehensive strategy is updated at least every five years and is designed to achieve the State's climate goals, which includes measures that achieve air pollutant reduction co-benefits.
- **AB 1807.**⁷⁷ AB 1807 (Tanner, 1983) created California's program to reduce exposure to air toxics. CARB uses a comprehensive process to prioritize the identification of substances that pose the greatest health threat and to develop airborne toxic control measures to reduce those exposures. CARB has reduced public exposure to toxic air contaminants (TACs) through control of motor vehicles, fuels, consumer products, and stationary sources, including adopting control measures for

72 CARB. 2016. California State Implementation Plans. www.arb.ca.gov/planning/sip/sip.htm

73 CARB. 2000. Final Diesel Risk Reduction Plan with Appendices. www.arb.ca.gov/diesel/documents/rrpapp.htm

74 CARB and California Air Pollution Control Officers Association. 2015. Risk Management Guidance for Stationary Sources of Air Toxics. July 23. www.arb.ca.gov/toxics/rma/rmgssat.pdf

75 CARB. 2016. Sustainable Freight Transport. www.arb.ca.gov/gmp/sfti/sfti.htm

76 CARB. 2016. AB 32 Scoping Plan. www.arb.ca.gov/cc/scopingplan/scopingplan.htm

77 CARB. 2014. California Air Toxics Program – Background. www.arb.ca.gov/toxics/background.htm

industrial sources (e.g., perchloroethylene in automotive products; hexavalent chromium from cooling towers, automotive coatings and plating; ethylene oxide from sterilizers and aerators; dioxins from medical waste incinerators; perchloroethylene from dry cleaners; cadmium from metal melting).

- **AB 2588 Air Toxics “Hot Spots” Program.**⁷⁸ The Hot Spots Program supplements the AB 1807 program by requiring a statewide air toxics inventory, identification of facilities having localized impacts, notification of nearby residents exposed to a significant health risk, and facility risk management plans to reduce those significant risks to acceptable levels.
- **AB 617 Community Air Protection Program.** Together with the extension of the Cap-and-Trade Program and in recognition of ongoing air quality challenges, California has committed to expand its criteria and toxic emissions reductions efforts through the pursuit of a multipronged approach to reduce localized air pollution and address community exposure, framed by recently-signed new legislation, AB 617 (C. Garcia, 2017). AB 617 outlines actions in five core areas, to be completed in the 2018 to 2020 timeframe, to reduce criteria and toxic emissions in the most heavily impacted areas of the State:
 - **Community-scale air monitoring.** Ambient air monitoring is needed to evaluate the status of the atmosphere compared to clean air standards and historical data. Monitoring helps identify and profile air pollution sources, assess emerging measurement methods, characterize the degree and extent of air pollution, and track progress of emissions reductions activities. AB 617 requires a statewide assessment of the current air monitoring network and identification of priority locations where community-level air monitoring will be deployed.
 - **Statewide Strategy to reduce air pollutants impacting communities.** CARB will identify locations with high cumulative exposure to criteria and toxic pollutants, the sources contributing to those exposures, and select locations that will be required to develop a community action plan to reduce pollutants to acceptable levels.
 - **Community Action Plans to reduce emissions in identified communities.** High priority locations identified in the Statewide Strategy will need to prepare a community action plan that includes emissions reductions targets, measures, and an implementation timeline. The plan will be submitted to CARB for review and approval.
 - **Accelerated retrofits and technology clearinghouse.** This effort will focus on stationary source equipment at Cap-and-Trade facilities that, as of 2007, have not been retrofitted with BARCT-level emission controls for nonattainment pollutants. In addition, creation of a statewide clearinghouse that identifies BACT and BARCT technologies and emission levels for criteria pollutants and TACs will be developed to assist the air districts with the BARCT evaluation and identify available emission controls for the Statewide Strategy.
 - **Direct reporting of facility emissions data to CARB.** An improved, standardized emission inventory promotes a better understanding of actual emissions and helps identify major emission sources, priorities for emissions reduction, and data gaps requiring further work. AB 617 requires CARB to establish a uniform emission inventory system for stationary sources of criteria pollutants and TACs. Data integration and transparency-related efforts are already required by AB 197 (E. Garcia, 2016) and underway at CARB, so this new task will build on these efforts. Moreover, it is clear that better data reporting is necessary to identify localized exposure risk to harmful criteria and toxic pollutants and actions to address any localized impacts must be taken as quickly as possible.

To support efforts to advance the State’s toxics program, the Office of Environmental Health Hazard Assessment (OEHHA) finalized a new health risk assessment methodology, *Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, on March 6, 2015, which updates the previous version of the guidance manual and reflects advances in the field of risk assessment along with explicit consideration of infants and children.⁷⁹ Subsequently, CARB, in collaboration with the California Air Pollution Control Officers Association (CAPCOA), finalized a *Risk Management Guidance for Stationary Sources of Air Toxics* for the air districts to use to incorporate OEHHA’s new health risk assessment methodology into their stationary source permitting and AB 2588 Air Toxics Hot Spots programs.⁸⁰

Together, all of these efforts will reduce criteria and toxics emissions in the State, with a focus on the most burdened communities. In particular, AB 617 responds to environmental justice concerns that the Cap-and-

⁷⁸ CARB. 2016. AB 2588 Air Toxics “Hot Spots” Program. www.arb.ca.gov/ab2588/ab2588.htm

⁷⁹ OEHHA. 2015. Notice of Adoption of Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments 2015. <http://oehha.ca.gov/air/cnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0>

⁸⁰ www.arb.ca.gov/toxics/rma/rmgssat.pdf

Trade Program does not force large GHG emitters to reduce air pollution which results in localized health impacts. Prior to the passage of AB 617, in February 2017, OEHHA published the first in a series of reports tasked with evaluating the impacts of California's climate change programs on disadvantaged communities. The initial report focused on the Cap-and-Trade Program.⁸¹ Future reports will focus on the impacts of other climate programs on disadvantaged communities. The report confirms disadvantaged communities are frequently located close to large stationary and mobile sources of emissions. It also notes there are complexities in trying to correlate GHGs with criteria and toxics emissions across industry and within sectors, although preliminary data review shows there may be some poor to moderate correlations in specific instances. Lastly, the report noted, "...the emissions data available at this time do not allow for a conclusive analysis."

Two additional reports were released during this same period of time: a California Environmental Justice Alliance (CEJA) report focused on identifying equity issues for disadvantaged communities resulting from the implementation of the Cap-and-Trade Program⁸² and a research paper examining the question of whether the Cap-and-Trade Program is causing more GHG emissions in disadvantaged communities when compared to other regions.⁸³ Both of these reports also confirmed that disadvantaged communities are disproportionately located close to large stationary and mobile sources of emissions. While the CEJA report noted, "Further research is needed before firm policy conclusions can be drawn from this preliminary analysis," the research paper, in reference to GHGs, states, "By and large, the annual change in emissions across disadvantaged and non-disadvantaged communities look similar."

While the reports do not provide evidence that implementation of the Cap-and-Trade Program is contributing to increased local air pollution, they do underscore the need to use all of the tools (e.g., enhanced enforcement, new regulations, tighter permit limits) available to the State and local agencies to achieve further emissions reductions of toxic and criteria pollutants that are impacting community health. Importantly, AB 617 provides a new framework and tools for CARB, in collaboration with local air districts, to deploy focused monitoring and ensure criteria and toxics emissions reductions at the State's largest GHG emitters.

AB 197 Measure Analyses

This section provides the required AB 197 estimates for the measures evaluated in this Scoping Plan. These estimates provide information on the relative impacts of the evaluated measures when compared to each other. To support the design of a suite of policies that result in GHG reductions, air quality co-benefits, and cost-effective measures, it is important to understand if a measure will increase or reduce criteria pollutants or toxic air contaminant emissions, or if increasing stringency at additional costs yields few additional GHG reductions. To this end, AB 197 (E. Garcia, Chapter 250, Statutes of 2016) requires the following for each potential reduction measure evaluated in any Scoping Plan update:

- The range of projected GHG emissions reductions that result from the measure.
- The range of projected air pollution reductions that result from the measure.
- The cost-effectiveness, including avoided social costs, of the measure.

As the Scoping Plan was developed, it was important to understand if any of the proposed policies or measures would increase criteria pollutant or toxic air contaminant emissions. Note the important caveats around some of the estimates; they must be considered when using the information in the tables below for purposes other than as intended.

Estimated Emissions Reductions for Evaluated Measures

For many of the existing programs with known commitments, such as the Mobile Source Strategy, previous analyses provide emission factors or other methods for estimating the impacts required by AB 197. Where available, these values were used. In some cases, estimates are based on data from other sources, such as the California Public Utilities Commission (CPUC) Renewables Portfolio Standard Calculator. For newly proposed measures, assumptions were required to estimate the values. Consequently, the estimates for the newly proposed measures have substantial uncertainty. The uncertainty in the impacts of these measures would be reduced as the measures are defined in greater detail during the regulatory processes that are undertaken to

81 <https://oehha.ca.gov/media/downloads/environmental-justice/report/oehhaab32report020217.pdf>

82 <http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade>

83 https://www.dropbox.com/s/se3ibxkv8t4at8g/Meng_CA_EJ.pdf?dl=1

define and adopt the programs. For example, as a measure is developed in detail, ways to obtain additional co-pollutant reductions or avoid co-pollutant increases may be identified and evaluated.

Table 5 provides the estimates for the measures evaluated during the development of the Scoping Plan. Based on the estimates below, these measures are expected to provide air quality benefits. The table also provides important context, limitations, and caveats about the values. As shown, the table includes criteria pollutant and diesel PM estimates. As mentioned in the Diesel Risk Reduction Plan, diesel PM accounts for 60 percent of the current estimated inhalation cancer risk for background ambient air. As we do not have direct modeling results for criteria and toxic pollutant estimates from PATHWAYS, we are estimating air quality benefits by using reductions in GHGs to assign similar reductions for criteria and toxic pollutants. By assigning an arbitrary 1:1 relationship in changes between GHGs and criteria and toxic pollutants, the air quality reductions likely overestimate the actual reductions from implementation of the measures. As noted in the OEHHA report, the exact relationship between GHGs and air pollutants is not clearly understood at this time. Moving forward, CARB will continue to assess the nature of the exact relationship between GHGs and criteria and toxics emissions. All estimates in Table 5 have some inherent uncertainty. The table allows for assessing measures against each other and should not be used for other purposes without understanding the limitations on the how the air quality values are derived.

Table 6 provides a summary of the total estimated emissions reductions for the Scoping Plan Scenario as outlined in Table 1. Table 6 was developed by adding the estimated emissions reductions for all of the measures included within the Scoping Plan Scenario in Table 1. More detail on the estimates for the Scoping Plan Scenario, as well as the specific measures included in each of the other four alternative scenarios can be found in Appendix G. In 2030, the Scoping Plan scenario and alternatives will provide comparable GHG and air quality reductions. When there is a range, the measure or policy should be designed to maximize the benefit to the extent possible.

TABLE 5: RANGES OF ESTIMATED AIR POLLUTION REDUCTIONS BY POLICY OR MEASURE IN 2030

Measure	Range of NO _x Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM _{2.5} Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
50 percent RPS	~0.5	<0.1	~0.4	< 0.01
Mobile Sources CTF and Freight	51–60	4.6–5.5	~1.1	~0.2
18 percent Carbon Intensity Reduction Target for LCFS - Liquid Biofuels*	3.5–4.4	0.5–0.6	0.4–0.6	~0.5
Short-Lived Climate Pollutant Strategy	–	–	–	–
2x additional achievable energy efficiency in the 2015 Integrated Energy Policy Report (IEPR)	0.4–0.5	0.5–0.7	< 0.1	< 0.01
Cap-and-Trade Program	A	A	A	4–9

- * LCFS estimates include estimates of the NO_x and PM_{2.5} tailpipe benefits limited to renewable diesel consumed in the off-road sector.
- CARB is evaluating how to best estimate these values. Criteria and toxic values are shown in tons per day, as they are episodic emissions events with residence times of a few hours to days, unlike GHGs, which have atmospheric residence times of decades.
- A Due to the inherent flexibility of the Cap-and-Trade Program, as well as the overlay of other complementary GHG reduction measures, the mix of compliance strategies that individual facilities may use is not known. However, based on current law and policies that control industrial and electricity generating sources of air pollution, and expected compliance responses, CARB believes that emissions increases at the statewide, regional, or local level due to the regulation are not likely. A more stringent post-2020 Cap-and-Trade Program will provide an incentive for covered facilities to decrease GHG emissions and any related emissions of criteria and toxic pollutants. Please see CARB's Co-Pollutant Emissions Assessment for a more detailed evaluation of a cap-and-trade program and associated air emissions impacts: www.arb.ca.gov/regact/2010/capandtrade10/capv6app.pdf
- NO_x = nitrogen oxides; VOC = volatile organic compound

Important: These estimates assume a 1:1 relationship between changes in GHGs, criteria pollutants, and toxic air contaminant emissions, and it is unclear whether that is ever the case. The values should not be considered estimates of absolute changes for other analytical purposes and only allow for comparison across measures in the table. The values are estimates that represent current assumptions of how programs may be implemented; actual impacts may vary depending on the design, implementation, and performance of the policies and measures. The table does not show interactions between measures, such as the relationship with increased transportation

electrification and associated increase in energy demand for the electricity sector. The measures in the Scoping Plan Scenario are shown in bold font in the table below. Additional details, including GHG reductions, are available in Appendix G.

TABLE 6: SUMMARY OF RANGES OF ESTIMATED AIR POLLUTION REDUCTIONS FOR THE SCOPING PLAN SCENARIO IN 2030

Scenario	Range of NO _x Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM _{2.5} Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
Scoping Plan Scenario	48–73	5.1–7.3	1.4–2.4	5–10

The total estimates for air pollution reductions provided in this table for the Scoping Plan Scenario are estimated by adding the air pollution benefits for the subset of individual measures examined in Table 5 and included in the Scoping Plan Scenario described in Table 1, and scaled by a risk adjustment factor to capture interactive effects and risks of under/over achieving on air pollution reductions. Appendix G includes details of the specific measures in the Scoping Plan Scenario and Alternatives. **All caveats in Table 5 apply to air quality estimates in this table.**

Estimated Social Costs of Evaluated Measures

Consideration of the social costs of GHG emissions is a requirement in AB 197, including evaluation of the avoided social costs for measures within this Scoping Plan.⁸⁴ Social costs are generally defined as the cost of an action on people, the environment, or society and are widely used to evaluate the impact of regulatory actions. Social costs do not represent the cost of abatement or the cost of GHG reductions, rather social costs estimate the harm that is avoided by reducing GHGs.

Since 2008, federal agencies have been incorporating the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide into the analysis of their regulatory actions. Agencies including the U.S. Environmental Protection Agency (U.S. EPA), Department of Transportation (DOT), and Department of Energy (DOE) are subject to Executive Order 12866, which directs agencies “to assess both the costs and benefits of the intended regulation...”.⁸⁵ In 2007, the National Highway Transportation Safety Administration (NHTSA) was directed by the U.S. 9th Circuit Court of Appeals to include the social cost of carbon in a regulatory impact analysis for a vehicle fuel economy rule. The Court stated that “[w]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.”⁸⁶

In 2009, the Council of Economic Advisors and the Office of Management and Budget convened the Interagency Working Group on the Social Cost of Greenhouse Gases⁸⁷ (IWG) to develop a methodology for estimating the social cost of carbon (SC-CO₂). This methodology relied on a standardized range of assumptions and could be used consistently when estimating the benefits of regulations across agencies and around the world. The IWG, comprised of scientific and economic experts, recommended the use of SC-CO₂ values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.⁸⁸

In this Scoping Plan, CARB utilizes the current IWG supported SC-CO₂ values to consider the social costs of actions to reduce GHG emissions. This approach is in line with Executive Orders including 12866 and the OMB Circular A-4 of September 17, 2003, and reflects the best available science in the estimation of the socio-economic impacts of carbon.⁸⁹ CARB is aware that the current federal administration has recently withdrawn certain social cost of carbon reports as no longer representative of federal governmental policy.⁹⁰ However, this determination does not call into question the validity and scientific integrity of federal social

84 AB 197 text available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB197.

85 https://www.reginfo.gov/public/jsp/Utilities/EO_12866.pdf

86 Center for Biological Diversity v National Highway Traffic Safety Administration 06-71891 (9th Cir, November 15 2007)

87 Originally titled the Interagency Working Group on the Social Cost of Carbon, the IWG was renamed in 2016.

88 Additional technical detail on the IWG process is available in the Technical Updates of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866. Iterations of the Updates are available at: <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>, <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-tds-final-july-2015.pdf>, and https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf.

89 OMB circular A-4 is available at: <https://www.transportation.gov/sites/dot.gov/files/docs/OMB%20Circular%20No.%20A-4.pdf>.

90 See Presidential Executive Order, March 28, 2017, sec. 5(b).

cost of carbon work, or the merit of independent scientific work. Indeed, the IWG’s work remains relevant, reliable, and appropriate for use for these purposes.

The IWG describes the social costs of carbon as follows:

The social cost of carbon (SC-CO₂) for a given year is an estimate, in dollars, of the present discounted value of the future damage caused by a 1-metric ton increase in carbon dioxide (CO₂) emissions into the atmosphere in that year, or equivalently, the benefits of reducing CO₂ emissions by the same amount in that year. The SC-CO₂ is intended to provide a comprehensive measure of the net damages – that is, the monetized value of the net impacts – from global climate change that result from an additional ton of CO₂.

These damages include, but are not limited to, changes in net agricultural productivity, energy use, human health, property damage from increased flood risk, as well as nonmarket damages, such as the services that natural ecosystems provide to society. Many of these damages from CO₂ emissions today will affect economic outcomes throughout the next several centuries.⁹¹

Table 7. presents the range of IWG SC-CO₂ values used in regulatory assessments including this Scoping Plan.⁹²

TABLE 7: SC-CO₂, 2015-2030 (IN 2007 \$ PER METRIC TON)

Year	5 Percent Discount Rate	3 Percent Discount Rate	2.5 Percent Discount Rate
2015	\$11	\$36	\$56
2020	\$12	\$42	\$62
2025	\$14	\$46	\$68
2030	\$16	\$50	\$73

The SC-CO₂ is year specific, that is, the IAMs estimate the environmental damages from a given year in the future and discount the value of the damages back to the present. For example, the SC-CO₂ for the year 2030 represents the value of climate change damages from a release of CO₂ in 2030 discounted back to today. The SC-CO₂ increases over time as systems become stressed from the aggregate impacts of climate change and future emissions cause incrementally larger damages. Table 7 presents the SC-CO₂ across a range of discount rates – or the value today of preventing environmental damages in the future. A higher discount rate decreases the value placed on future environmental damages. This Scoping Plan utilizes the IWG standardized range of discount rates, from 2.5 to 5 percent to represent varying valuation of future damages.

The SC-CO₂ is highly sensitive to the discount rate. Higher discount rates decrease the value today of future environmental damages. This Scoping Plan utilizes the IWG standardized range of discount rates, from 2.5 to 5 percent to represent varying valuation of future damages. The value today of environmental damages in 2030 is higher under the 2.5 percent discount rate compared to the 3 or 5 percent discount rate, reflecting the trade-off of consumption today and future damages. The IWG estimates the SC-CO₂ across a range of discount rates that encompass a variety of assumptions regarding the correlation between climate damages and consumption of goods and is consistent with OMB’s Circular A-4 guidance.⁹³

There is an active discussion within government and academia about the role of SC-CO₂ in assessing regulations, quantifying avoided climate damages, and the values themselves. In January 2017, the National Academies of Sciences, Engineering, and Medicine (NAS) released a report examining potential approaches for a comprehensive update to the SC-CO₂ methodology to ensure resulting cost estimates reflect the best available science. The NAS review did not modify the estimated values of the SC-CO₂, but evaluated the models, assumptions, handling of uncertainty, and discounting used in the estimating of the SC-CO₂. The report titled, “Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide,” recommends near-term improvements to the existing IWG SC-CO₂ as well as a long-term strategy to more comprehensive updates.⁹⁴ The State will continue to follow updates to the IWG SC-CO₂, including changes

91 From The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at: <http://www.nap.edu/24651>

92 The SC-CO₂ values as of July 2015 are available at: <https://obamawhitehouse.archives.gov/sites/default/files/omb/infocreg/scc-tsd-final-july-2015.pdf>

93 The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at: <http://www.nap.edu/24651>.

94 The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at:

outlined in the NAS report, and incorporate appropriate peer-reviewed modifications to estimates based on the latest available data and science.

It is important to note that the SC-CO₂, while intended to be a comprehensive estimate of the damages caused by carbon globally, does not represent the cumulative cost of climate change and air pollution to society. There are additional costs to society outside of the SC-CO₂, including costs associated with changes in co-pollutants, the social cost of other GHGs including methane and nitrous oxide, and costs that cannot be included due to modeling and data limitations. The IPCC has stated that the IWG SC-CO₂ estimates are likely underestimated due to the omission of significant impacts that cannot be accurately monetized, including important physical, ecological, and economic impacts.⁹⁵ CARB will continue engaging with experts to evaluate the comprehensive California-specific impacts of climate change and air pollution.

The Social Cost of GHG Emissions

Social costs for methane (SC-CH₄) and nitrous oxide (SC-N₂O) have also been developed using methodology consistent with that used in estimating the IWG SC-CO₂. These social costs have also been endorsed by the IWG and have been used in federal regulatory analyses.⁹⁶ Along with the SC-CO₂, the State also supports the use of the SC-CH₄ and SC-N₂O in monetizing the impacts of GHG emissions.

While the SC-CO₂, SC-CH₄, and SC-N₂O provide metrics to account for the social costs of climate change, California will continue to analyze ways to more comprehensively identify the costs of climate change and air pollution to all Californians. This will include following updates to the IWG methodology and social costs of GHGs and incorporating the SC-CO₂, SC-CH₄, and SC-N₂O into regulatory analyses.

Table 9 presents the estimated social cost for each policy or measure considered in the development of the Scoping Plan in 2030. For each measure or policy, Table 9 includes the range of the IWG SC-CO₂ values that result from the anticipated range of GHG reductions in 2030 presented in Appendix G. The SC-CO₂ range is obtained using the IWG SC-CO₂ values in 2030 at the 2.5, 3, and 5 percent discount rates. These values (of \$16 using the 5 percent discount rate, \$50 using the 3 percent discount rate, and \$73 using the 2.5 percent discount rate) are translated into 2015 dollars and multiplied across the range of estimated reductions by measure in 2030 to estimate the value of avoided social costs from each measure in that year.⁹⁷

Implementation of the SLCP Strategy will result in reduction of a variety of GHGs, including methane and HFCs, which reported in carbon dioxide equivalent (CO₂e). While there is no social cost of CO₂e, the avoided damages associated with the methane reductions outlined in the SLCP Strategy are estimated in Table 9 using the IWG SC-CH₄ as presented in Table 8.⁹⁸

TABLE 8: SC-CH₄, 2015-2030 (IN 2007\$ PER METRIC TON)

Year	5 Percent Discount Rate	3 Percent Discount Rate	2.5 Percent Discount Rate
2015	\$450	\$1000	\$1400
2020	\$540	\$1200	\$1600
2025	\$650	\$1400	\$1800
2030	\$760	\$1600	\$2000

The range of SC-CH₄ is obtained using the IWG SC-CH₄ values in 2030 at the 2.5, 3, and 5 percent discount rates. The SC-CH₄ values (e.g., \$760 using the 5 percent discount rate, \$1,600 using the 3 percent discount rate, and \$2,000 using the 2.5 percent discount rate) are translated into 2015 dollars and multiplied across the range of estimated methane reductions in 2030 to estimate the value of climate benefits from the SLCP

<http://www.nap.edu/24651>

95 https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch3s3-5-3-3.html

96 More information is available at: https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf

97 The IWG SC-CO₂ values are in 2007 dollars. In 2015 dollars, \$16, \$50, and \$73 in 2007 translates to about \$18, \$57, and \$83, respectively, based on the Bureau of Labor Statistics GDP Series Table 1.1.4.

98 https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf

Strategy.⁹⁹ As the social cost associated with the SLCP Strategy does not include the impact associated with non-methane reductions, Table 9 underestimates the avoided social costs of this Scoping Plan as calculated using the IWG valuations.

As this Scoping Plan is a suite of policies developed to reduce GHGs to a specific level in 2030, any alternative scenario that also achieves the 2030 target (with the same proportion of carbon dioxide and methane reductions) will have the same avoided social cost, as estimated using the IWG social cost of GHGs, for the single year 2030. The social costs of alternatives could vary if the 2030 target is achieved with vastly different ratios of carbon dioxide to methane reductions. However, all alternatives in this Scoping Plan are anticipated to achieve the same proportion of carbon dioxide and methane reductions and will therefore all have the same estimated avoided social damage or social cost. This social cost, as estimated in 2030 using the IWG SC-CO₂ and SC-CH₄, ranges from \$1.9 to \$11.2 billion using the 2.5 to 5 percent discount rates, and is estimated at \$5.0 to \$7.8 billion using the 3 percent discount rate. For example, in Table 9 the CH₄ reductions for the SCLP strategy are about 1 MMTCH₄. That value is multiplied by the 2030 SC-CH₄ values in Table 8 for the 2030 values at the 2.5 and 5 percent discount rates to get a range of \$860 to \$2,260 in 2015 dollars.

⁹⁹ The IWG.SC-CH₄ values are in 2007 dollars. In 2015 dollars, the range of SC-CH₄ translates to about \$858, \$1,807, and \$2,259, for the 5 percent, 3 percent, and 2.5 percent discount rates, respectively. These values are based on the Bureau of Labor Statistics GDP Series Table 1.1.4.

TABLE 9: ESTIMATED SOCIAL COST (AVOIDED ECONOMIC DAMAGES) OF POLICIES OR MEASURES CONSIDERED IN THE 2017 SCOPING PLAN DEVELOPMENT[#]

Measure (Measures in bold are included in the Scoping Plan)	Range of Social Cost of Carbon \$ million USD (2015 dollars)**
50 percent Renewables Portfolio Standard (RPS)	\$55–\$250
Mobile Sources CTF and Freight	\$200–\$1,080
18 percent Carbon Intensity Reduction Target for LCFS -Liquid Biofuels	\$70–\$330
Short-Lived Climate Pollutant Strategy	\$860–\$2,260 (SC-CH ₄)
2x additional achievable energy efficiency in the 2015 IEPR	\$125–\$750
Cap-and-Trade Program	\$610–\$6,560
10 percent incremental RPS and additional 10 GW behind-the-meter solar PV*	\$250–\$1,160
25 percent Carbon Intensity Reduction Target for LCFS and a Low-Emission Diesel Standard - Liquid Biofuels*	\$90–\$415
20 percent Refinery	\$55–\$500
30 percent Refinery	\$20–\$250
25 percent Industry	\$20–\$415
25 percent Oil and Gas	\$35–\$330
5 percent Increased Utilization of RNG (core and non-core)	\$35–\$165
Mobile Source Strategy (CTF) with Increased ZEVs in South Coast and early retirement of LDVs with more efficient LDVs*	\$55–\$500
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps and res. electric stoves) and early retirement of HVAC*	\$70–\$580
Carbon Tax	\$775–\$8,300
All Cap-and-Trade	\$700–\$6,890
Cap-and-Tax	\$775–\$8,300
Scoping Plan Scenario SC-CO ₂	\$1,060–\$8,970
Scoping Plan Scenario SC-CH ₄	\$860–\$2,260
Scoping Plan Scenario (Total)	\$1,920–\$11,230

Note: All values are rounded. The values for SC-CO₂ and SC-CH₄ in 2030 are presented in Tables 7 and 8.

* Where enhancements have been made to a measure or policy, the ranges in emissions reductions are incremental to the original measure. For example, the ranges for the 25 percent LCFS are incremental to the emissions ranges for the 18 percent LCFS.

Measures included in the Scoping Plan and the All Cap-and-Trade measure reflect emissions reductions from modeling changes after passage of AB 398. Emissions reductions from all other measures reflect modeling completed prior to passage of AB 398. See Appendix G for additional details.

** All values have been rounded to the nearest 0 or 5.

~ Some measures do not show a significant change in 2030 when there is an incremental increase in measure stringency or when modeling uncertainty was factored.

Social Costs of GHGs in Relation to Cost-Effectiveness

AB 32 includes a requirement that “rules and regulations achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions.”¹⁰⁰ Under AB 32, cost-effectiveness means the relative cost per metric ton of various GHG reduction strategies, which is the traditional cost metric associated with emission control. In contrast, the SC-CO₂, SC-CH₄, and SC-N₂O are estimates of the economic benefits, and not the cost of reducing GHG emissions.

There may be technologies or policies that do not appear to be cost-effective when compared to the SC-CO₂, SC-CH₄, and SC-N₂O associated with GHG reductions. However, these technologies or policies may result in other benefits that are not reflected in the IWG social costs. For instance, the evaluation of social costs might include health impacts due to changes in local air pollution that result from reductions in GHGs, diversification of the portfolio of transportation fuels (a goal outlined in the LCFS) and reductions in criteria pollutant emissions from power plants (as in the RPS).

Estimated Cost Per Metric Ton by Measure

AB 197 also requires an estimation of the cost-effectiveness of the potential measures evaluated for the Scoping Plan. The values provided in Table 10 are estimates of the cost per metric ton of estimated reductions for each measure in 2030. To capture the fuel and GHG impacts of investments made from 2021 through 2030 to meet the 2030 GHG goal, the table also includes an evaluation of the cost per metric ton based on the cumulative GHG emissions reductions and cumulative costs or savings for each potential measure from 2021 through 2030. While it is important to understand the relative cost effectiveness of measures, the economic analysis presented in Appendix E provides a more comprehensive analysis of how the Scoping Plan and alternative scenarios affect the State’s economy and jobs.

The cost (or savings) per metric ton of CO₂e reduced for each of the measures is one metric for comparing the performance of the measures. Additional factors beyond the cost per metric ton that could be considered include continuity with existing laws and policies, implementation feasibility, contribution to fuel diversity and technology transformation goals, as well as health and other benefits to California. These considerations are not reflected in the cost per ton metric below.

Because many of the measures interact with each other, isolating the cost and GHG savings of an individual measures is analytically challenging. For example, the performance of the renewable electricity measure impacts the GHG savings and cost per ton associated with increasing the use of electric vehicles. Likewise, the increased use of electric vehicles may increase flexible loads on the electric system, enabling increased levels of renewable electricity to be achieved more cost effectively. Both the renewable electricity measure and the increased use of electric vehicles affect the cost of meeting the Low-Carbon Fuel Standard.

For most of the measures shown in Table 10, the 2030 cost per metric ton is isolated from the other measures by performing a series of sensitivity model runs in the California PATHWAYS model. This cost per metric ton is calculated as the difference in the 2030 annualized cost (or savings) with and without the measure. For the measures in the Scoping Plan Scenario, the analysis starts with the Scoping Plan Scenario PATHWAYS estimates, and then costs and emissions are recalculated with each measure removed individually. For measures included in the No Cap-and-Trade Scenario, the approach starts with the No Cap-and-Trade Scenario PATHWAYS estimates and then each measure is removed. Using this approach, the incremental impact on GHG emissions and costs for each measure is calculated. The incremental cost in 2030 is divided by the incremental GHG emission impact to calculate the cost per ton in 2030.

The same approach of removing each measure individually is used to estimate the incremental cost and emission impacts of each measure for the period 2021 to 2030. For each measure, its annual incremental costs from 2021 to 2030 are calculated and then discounted to 2021 using the discount rate used in PATHWAYS to levelize capital costs over the life of equipment. As a result, the discounted incremental cost of each measure is the total investment required from 2021 to 2030 to achieve each measure’s emissions reductions from 2021 to 2030 (including both incremental capital costs and incremental fuel savings/expenditures). This discounted cost for each measure was divided by its cumulative emissions reductions from 2021 to 2030 to calculate a cost per ton for the measure for the period. A second calculation was also made that divides each measure’s discounted cost by its discounted emissions reductions from 2021 to 2030. The

100 www.arb.ca.gov/cc/docs/ab32text.pdf

same discount rate is used to discount both incremental costs and emissions in this approach. The estimates are presented in the table below.

Costs that represent transfers within the state, such as incentive payments for early retirement of equipment, are not included in this California total cost metric. The cost ranges shown below represent some of the uncertainty inherent in estimating this metric. The details of how the ranges for each measure were estimated are described in the footnotes below. All cost estimates have been rounded representing further uncertainty in individual values.

It is important to note that this cost per metric ton does not represent an expected market price value for carbon mitigation associated with these measures. In addition, the single year (2030) values and the estimates that encompass 2021 to 2030 do not capture the fuel savings or GHG reductions associated with the full economic lifetime of measures that have been implemented by 2030, but whose impacts extend beyond 2030. The estimates also do not capture the climate or health benefits of the GHG mitigation measures. Table 10 also notes the measures for which sources other than the PATHWAYS model were used to develop estimates of the cost per metric ton. The estimates in the table indicate that the relative cost of the measures is reasonably consistent across the different measures of cost per metric ton. Measures that are relatively less costly using the 2030 cost per metric ton are also less costly using the cost per metric ton based on the period 2021 to 2030. However, for several measures the sign of the estimate differs, such that in 2030 the measure has a positive cost while there is a negative cost for the period 2021 to 2030. This difference in sign occurs because the measure includes increasingly costly investments toward the end of the period examined. By examining only 2030, the lower cost components of the measure that occur in earlier years are omitted, resulting in a higher cost estimate for 2030 alone.

TABLE 10: ESTIMATED COST PER METRIC TON OF MEASURES CONSIDERED IN THE 2017 SCOPING PLAN DEVELOPMENT AND AVERAGED FROM 2021 THROUGH 2030

Important: As individual measures are designed and implemented they will be subject to further evaluation and refinement and public review, which may result in different findings than presented below. The ranges are estimates that represent current assumptions of how programs may be implemented and may vary greatly depending on the design, implementation, and performance of the policies and measures. Measures in bold text are included in the Scoping Plan.

Measure	Cost/metric ton in 2030*	Cost/metric ton 2021-2030**
50 percent Renewables Portfolio Standard (RPS) ^a	\$175	\$100 to \$200
Mobile Sources CFT and Freight ^b	<\$50	<\$50
Liquid Biofuels (18 percent Carbon Intensity Reduction Target for LCFS) ^c	\$150	\$100 to \$200
Short-Lived Climate Pollutant Strategy ^d	\$25	\$25
2x additional achievable energy efficiency in the 2015 IEPR ^f	-\$350	-\$300 to -\$200
10 percent incremental RPS and additional 10 GW behind-the-meter solar PV ^a	\$350	\$250 to \$450
Liquid Biofuels (25 percent Carbon Intensity Reduction Target for LCFS and a Low-Emission Diesel Standard) ^b	\$900	\$550 to \$975
20 percent Refinery ^d	\$100	\$50 to \$100
30 percent Refinery ^d	\$300	\$175 to \$325
25 percent Industry ^d	\$200	\$150 to \$275
25 percent Oil and Gas ^d	\$125	\$100 to \$175
5 percent Increased Utilization of renewable natural gas - core and non-core ^e	\$1500	\$1350 to \$3000
Mobile Source Strategy (CFT) with Increased ZEVs in South Coast & additional reductions in VMT and energy demand & early retirement of LDVs with more efficient LDVs ^b	\$100	<\$50
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps & res. electric stoves) and early retirement of HVAC ^f	\$75	-\$120 to -\$70
<p>* Where enhancements have been made to a measure or policy, the cost per metric ton are incremental to the original measure. For example, the cost per metric ton for the 25 percent LCFS are incremental to the cost per metric ton for the 18 percent LCFS.</p> <p>** The lower values use a cost discount rate of 10 percent and cumulative emissions for the period 2021 to 2030. The higher values discount both costs and emissions using a discount rate of 10 percent.</p> <p>a Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.</p> <p>b Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.</p> <p>c Liquid biofuel values are calculated as the average unsubsidized cost of biofuels supplied above that of an equivalent volume of fossil fuels. These values do not reflect impacts from other biofuel policies, such as the Renewable Fuel Standard or production tax credits, that are partially supported by fuel purchasers/taxpayers outside of California. Therefore, these values do not represent LCFS program costs or potential LCFS credit prices.</p> <p>d See Appendix D</p> <p>e Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.</p> <p>f Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The cost per metric ton does not represent the results of the CPUC's or CEC's standard cost-effectiveness evaluation tests</p>		

Health Analyses

Climate mitigation will result in both environmental and health benefits. This section presents information about the potential health benefits of the Scoping Plan. The impacts are primarily from reduced particulate matter pollution, reduced toxics pollution (both diesel combustion particles and other toxic pollutants), and the health benefits of increased physical activity that will result from more active modes of transportation such as walking and biking in lieu of driving. CARB is using the AB 197 air quality estimates in Table 5 as a proxy to understand the potential health impacts from the Scoping Plan. There is uncertainty in the air quality estimates and that is carried through to the health impacts evaluation presented here. In the future, CARB will be working to explore how to better integrate health analysis and health considerations in the design and implementation of climate programs.

Because the health endpoints of each of these benefits is different (e.g., fewer incidences of premature mortality, lower cancer risk, and fewer incidences of heart disease), the methodologies for estimating the benefits differ. Further, the methodologies are statistical estimates of adverse health outcomes aggregated to the statewide level. Therefore, this information should only be used to understand the relative health benefits of the various strategies and should not be taken as an absolute estimate of the health outcomes of the Scoping Plan statewide, or within a specific community. The latter is a function of the unique exposure to air pollutants within each community and each individual's choice of more active transport modes that increase physical activity.

The estimates of health benefits in this section do not include any potential avoided adverse health impacts associated with a reduction in global climate change. While we recognize that mitigating climate change will, for example, prevent atmospheric temperature rise, thereby preventing increases in ozone in California, which will result in fewer breathing problems, the connection is difficult to estimate or model. Since it takes collective global action to mitigate climate change, the following analyses do not attempt to quantify the improved health outcomes from reducing or stopping the rise in global temperatures.

The estimated statewide health benefits of the Scoping Plan are dominated by reductions in particulate matter from mobile sources and wood burning and a switch to more active transport modes. In particular, the focus on the impacts of exposure to particulate matter from mobile sources is expected because this is a major cause of air pollution statewide. For this reason, the actions concerning mobile sources in the Scoping Plan were specifically developed with the goal of achieving health-based air quality standards by reducing criteria and toxics emissions as well as GHG emissions simultaneously. In addition, actions that support walkable communities not only result in reduced VMT and related GHG emissions, but promote active transport and increased physical activity that is strongly related to improved health.

Table 11 provides a summary of the total estimated health benefits from the relevant metrics for the Scoping Plan. The sections below summarize the methodologies used to estimate these benefits. More detail on how these estimates were calculated can be found in Appendix G. The air pollutant values used in estimating the health impacts are from Table 5 and all caveats in the estimation of the air quality impacts must be considered when reviewing the health impacts discussed below as the air pollutant values are likely overestimates based on assigned relationships to GHGs that may not be real.

Potential Health Impacts of Reductions in Particulate Matter Air Pollution

CARB relied on an U.S. EPA-approved methodology to estimate the health impacts of reducing air pollution by actions in the Scoping Plan. This methodology relies on an incidents-per-ton factor to quantify the health benefits of directly emitted (diesel particles and wood smoke) and secondary PM_{2.5} formed from oxides of nitrogen from reductions due to regulatory controls. It is similar in concept to the methodology developed by the U.S. EPA for comparable estimations¹⁰¹, but uses California air basin specific relationships between emissions and air quality. The basis of the methodology is an approximately linear relationship between changes in PM_{2.5} emissions and estimated changes in health outcomes. In this methodology, the number of premature deaths is estimated by multiplying emissions by the incidents-per-ton scaling factor. The factors are derived from studies that correlate the number of incidents (premature deaths, hospitalizations, emergency room visits) associated with exposure to PM_{2.5}.

¹⁰¹ Fann, N., Fulcher, C.M., & Hubbell, B.J. (2009) The influence of location, source, and emission type in estimates of the human health benefits of reducing a ton of air pollution. (2009) Air Quality, Atmosphere & Health 2(3), 169–176

Potential Health Impacts of Reductions in Toxic Air Pollution

A number of factors complicate any attempt to evaluate the health benefits of reducing exposure to toxic air pollution. First, there are hundreds of individual chemicals of concern with widely varying health effects and potencies. Therefore, a single metric is of limited value in capturing the range of potential toxics benefits. Furthermore, unlike the criteria pollutants whose impacts are generally measured on regional scales, toxics pose concern for both near-source impacts and larger-scale photochemical transformations and transport. Finally, the accepted scientific understanding for cancer risk is that there is usually no safe threshold for exposures to carcinogens. Therefore, cancer risks are usually expressed as “chances per million” of contracting cancer over a (70-year) lifetime exposure (in Table 11 lifetime exposure is provided in the far right column).

In light of these complexities, CARB relied on the most recent National Air Toxics Assessment (NATA) conducted by the U.S. EPA.¹⁰² The NATA 2011 models the potential risks from breathing emissions of approximately 180 toxic air pollutants across the country. Modeled cancer risk results are available by census tract. The NATA data cover industrial facilities, mobile sources (on-road and off-road), small area-wide sources, and more. CARB multiplied the NATA “cancer risk-per-million” values by census tract by the census tract’s population, in order to estimate a population-weighted metric that could be aggregated to the statewide level. This statistic should not be construed as actual real-world cancers (due to the many uncertainties in estimating the real-world levels of risk). Next, CARB applied the percent reductions in emissions due to Scoping Plan actions, in order to obtain an estimate of the “avoided incidence” of statistical lifetime cancers attributable to implementation of the Scoping Plan. Again, the “avoided incidence” is a construct designed to provide a useful statistical metric for comparative purposes among scenarios. It should not be construed to be a real-world parameter.

Potential Health Impacts of Active Transportation

High levels of active transportation have been linked to improved health and reduced premature mortality by increasing daily physical activity, representing a major direct co-benefit of using active transportation as a strategy to reduce GHG emissions. The benefits of physical activity can be very large. Individuals who are active for approximately 12 minutes a day have a 20 percent lower risk of dying early than those who are active for just 5 minutes a day and those who are active an hour a day, have close to a 40 percent lower risk of premature death.¹⁰³

The Scoping Plan includes reductions in VMT, which can be achieved in a number of ways, including increased active transportation. To estimate the potential health benefits of active transport, CARB staff reviewed work done by the California Department of Public Health (CDPH) concerning the potential health benefits associated with the Caltrans Strategic Management Plan. In this Management Plan, Caltrans set a target for increasing the adoption of active transportation, aiming for a doubling of walking and a tripling of bicycle trips by 2020 compared to 2010. While this plan itself is not part of the Scoping Plan, it helps provide a sense of the magnitude of health benefits associated with increased active transportation.

CDPH performed a risk assessment to compare the number of premature deaths due to physical inactivity and traffic injuries in the baseline year of 2010 to the year 2020, assuming that Caltrans’ walking and bicycling mode share targets were met.¹⁰⁴ CDPH’s methodology has been documented in a publicly available technical manual¹⁰⁵ and the model has appeared in many peer-reviewed research articles.¹⁰⁶ It has been in development

102 U.S. Environmental Protection Agency (2011), National Air Toxics Assessment (NATA) 2011, <https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results>

103 U.S. Department of Health and Human Services (2008) Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, Washington, DC

104 Maizlish, N. (2016a) Increasing Walking, Cycling, and Transit: Improving Californians’ Health, Saving costs, and Reducing Greenhouse Gases. Office of Health Equity, California Department of Public Health. <https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/Maizlish-2016-Increasing-Walking-Cycling-Transit-Technical-Report-rev8-17-ADA.pdf>

105 Maizlish, N. (2016b) Integrated Transport and Health Impact Model (ITHIM): A Guide to Operation, Calibration and Integration with Travel Demand Models. California Spreadsheet Version December 12, 2016.

106 Gotschi, T., Tainio, M., Maizlish, N., Schwanen, T., Goodman, A., & Woodcock, J. (2015). Contrasts in active transport behaviour across four countries: how do they translate into public health benefits? *Preventative Medicine*, 74, 42-48. doi:10.1016/j.ypmed.2015.02.009

Maizlish, N., Woodcock, J., Co, S., Ostro, B., Fanai, A., & Fairley, D. (2013). Health cobenefits and transportation-related reductions in greenhouse gas emissions in the San Francisco Bay area. *American journal of public health*, 103(4), 703-709. doi:10.2105/ajph.2012.300939

Whitfield, G. P., Meehan, L. A., Maizlish, N., & Wendel, A. M. (2016). The Integrated Transport and Health Impact Modeling

since 2009, and a California-specific version was released with a recent update in November 2016.¹⁰⁷

CDPH estimated that 2,100 premature deaths annually would be avoided if Californians met the Management Plan's 2020 targets were met by Californians compared to 2010 travel patterns. A recent paper by Dr. Maizlish et al¹⁰⁸ quantified the health co-benefits of the preferred Sustainable Communities Strategies scenarios (compared to the 2010 baseline travel pattern) for the major Metropolitan Planning Organizations using the same methodology and found that 940 deaths annually would be avoided. For both analyses, there were significant reductions in cause-specific premature mortality due to increased physical activity, which was slightly counteracted by a much smaller increase in fatal traffic injuries due to the increased walking and bicycling. When taken together, the health benefit of increasing active transportation greatly outweighed the increased mortality from road traffic collisions. The Scoping Plan goals related to active transportation are more aggressive than those in both the Maizlish et al. 2017 publication and the analysis by CDPH for the Management Plan. Therefore, CARB staff used the CDPH estimate of approximately 2,100 fewer premature deaths from the Management Plan as a lower bound of what could be realized through implementation of the VMT reductions and active transport goals called for in the Scoping Plan Scenario.

TABLE 11: SUMMARY OF RANGES OF ESTIMATED HEALTH IMPACTS FOR THE SCOPING PLAN SCENARIO IN 2030

	Fewer Premature Deaths	Fewer Hospitalizations (all)	Fewer ER visits	Fewer cancers *
Diesel PM	~60-91	~9-14	~25-38	
Secondary PM	~76-120	~11-17	~33-50	
Toxics				~21-61
Wood smoke	~1000	~ 148	~ 418	
Active Transport**	>2100			
Total	~3300	~180	~500	~21-61

* This metric should not be construed as actual real-world cancer cases. It is intended to be a comparative metric, based on the NATA estimates of lifetime cancer risk (chances-per-million over a 70 year life-time exposure) by census tract multiplied by the tract population.

** Reduction in premature death assumes meeting the CSMP 2020 mode shift target.

Note: The numbers in the table represent individual avoided incidences.

- Tool in Nashville, Tennessee, USA: Implementation Steps and Lessons Learned. *Journal of transport & health*, 3. doi:10.1016/j.jth.2016.06.009
- Woodcock, J. (2015). Integrated Transport and Health Impact Modelling Tool (ITHIM). Retrieved from <http://www.cedar.iph.cam.ac.uk/research/modelling/ithim/>
- Woodcock, J., Edwards, P., Tonne, C., Armstrong, B. G., Ashiru, O., Banister, D., & Roberts, I. (2009). Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport. *Lancet*, 374(9705), 1930-1943. doi:10.1016/s0140-6736(09)61714-1
- Woodcock, J., Givoni, M., & Morgan, A. S. (2013). Health impact modelling of active travel visions for England and Wales using an Integrated Transport and Health Impact Modelling Tool (ITHIM). *PLoS One*, 8(1), e51462. doi:10.1371/journal.pone.0051462
- Woodcock, J., Tainio, M., Cheshire, J., O'Brien, O., & Goodman, A. (2014). Health effects of the London bicycle sharing system: health impact modelling study. *BMJ (Clinical research ed.)*, 348, g425. doi:10.1136/bmj.g425
- 107 Woodcock, J. Maizlish, N. (2016). ITHIM: Integrated Transport & Health Impact Modelling, California Version, November 11, 2016. Original citation: Woodcock J, Givoni M, Morgan AS. Health Impact Modelling of Active Travel Visions for England and Wales Using an Integrated Transport and Health Impact Modelling Tool (ITHIM). *PLoS One*. 2013;8(1):e51462.
- 108 Maizlish N, Linesch N, & Woodcock J. (2017) Health and greenhouse gas mitigation benefits of ambitious expansion of cycling, walking, and transit in California. *Journal of Transport and Health*. ; doi: 10.1016/j.jth.2017.04.011

Future Health Activities

As Table 11 shows, the Scoping Plan measures would have significant potential positive health outcomes. The integrated nature of the strategies to reduce emissions of GHGs and criteria and toxics emissions could provide multiple benefits. Actions to reduce black carbon from wood smoke are reducing the same particles that lead to premature mortality. Reductions in fossil combustion will not only reduce GHG emissions, but also toxics emissions. Finally, reducing VMT with strategies that provide opportunities for people to switch to active transport modes can have very large health benefits resulting from increased physical activity.

In recognition of the potential for significant positive health benefits of the Scoping Plan, CARB is initiating a process to better understand how to integrate health analysis broadly into the design and implementation of our climate change programs with the goal of maximizing the health benefits. Although health impact assessments have been used to inform CARB's policymaking, these analyses have not been consistently integrated into the general up-front design of CARB programs. To begin the effort to increase health benefits from climate change mitigation policies, CARB will convene a public meeting in Spring 2018 to solicit input on how best to incorporate health analyses into our policy development. CARB staff will seek appropriate tools for these analyses and will assemble a team of academic advisors to provide input on the latest developments in methods and data sources.

Economic Analyses

The following section outlines the economic impact of the Scoping Plan relative to the business-as-usual Reference Scenario. Additional detail on the economic analysis, including modeling details and the estimated economic impact of alternative scenarios is presented in Appendix E.

The Scoping Plan outlines a path to achieve the SB 32 target that requires less reliance on fossil fuels and increased investment in low carbon fuels and clean energy technologies. Through this shift, California can lead the world in developing the technologies needed to reduce the global risks of climate change. This builds on California's current successes of reducing GHG emissions while also developing a cleaner, resilient economy that uses less energy and generates less pollution. Innovation in low-carbon technologies will continue to open growth opportunities for investors and businesses in California. As modeled, the analysis in this Scoping Plan suggests that the costs of transitioning to this lower carbon economy are small, even without counting the potential opportunities for new industries and innovation in California. Under the Scoping Plan, the California economy, employment, and personal income will continue to grow as California businesses and consumers make clean energy investments and improve efficiency and productivity to reduce energy costs.

In 2030, the California economy is projected to grow to \$3.4 trillion, an average growth rate of 2.2 percent per year from 2021 to 2030. It is not anticipated that implementation of the Scoping Plan will change the growth of annual State Gross Domestic Product (GDP). Further, this growth in GDP will occur under the entire projected range of Cap-and-Trade Program allowance prices. Based on this analysis, in 2030 the California economy will take only three months longer to grow to the GDP estimated in the absence of the Scoping Plan—referred to as the Reference Scenario. The impact of the Scoping Plan on job growth is also negligible, with employment less than one half of one percent smaller in 2030 compared to the Reference Scenario.

Additionally, reducing GHG emissions 40 percent below 1990 levels under the Scoping Plan will lead to avoided social damages from climate change on the order of \$1.9 to \$11.2 billion, as estimated using the SC-CO₂ and SC-CH₄, as well as additional potential savings from reductions in air pollution and petroleum dependence. These impacts are not accounted for in this economic analysis. The estimated impact to California households is also modest in 2030. In 2030, the average annual household impact of the Scoping Plan ranges from \$115 to \$280, depending on the price of reductions under the Cap-and-Trade Program.¹⁰⁹ Estimated personal income in California is also relatively unchanged by the implementation of the Scoping Plan.

¹⁰⁹ Household projections are obtained from the California Department of Finance and were access on March 16, 2017 at: <http://www.dof.ca.gov/Forecasting/Demographics/projections/>.

Overview of Economic Modeling

Two models are used to estimate the economic impact of the Scoping Plan and California's continued clean energy transition: (1) the California PATHWAYS model, and (2) the Regional Economic Models, Inc. (REMI) Policy Insight Plus model. The California PATHWAYS model estimates the direct costs and GHG emissions reductions of implementing the prescriptive (or non-Cap-and-Trade) measures in the Scoping Plan relative to the BAU scenario.¹¹⁰ Direct costs are the sum of the incremental changes in capital expenditures and fuel expenditures, including fuel savings for reduced energy use from efficiency measures. In most cases, reducing GHG emissions requires the use of more expensive equipment that can be operated using less fuel. In the Scoping Plan, the prescriptive measures modeled in PATHWAYS account for a portion of the GHG reductions required to meet the 2030 target. The remaining reductions are delivered through the Cap-and-Trade Program. The direct costs associated with the Cap-and-Trade Program are calculated outside of PATHWAYS based on an assumed range of Cap-and-Trade allowance prices from 2021 through 2030.

To estimate the future costs of the Scoping Plan, this economic analysis necessarily creates a hypothetical future California that is essentially identical to today, adjusted for currently existing climate policy as well as projected economic and population growth through 2030. The analysis cannot predict the types of innovation that will create efficiencies nor can it fully account for the significant economic benefits associated with reducing emissions. Rather, the economic modeling is conducted by estimating incremental capital and clean fuel costs of measures and assigning those costs to certain sectors within this hypothetical future.

The macroeconomic impacts of the Scoping Plan on the California economy are modeled using the REMI model with output from California PATHWAYS and estimated Cap-and-Trade Program costs as inputs. Additional methodological detail is presented in Appendix E.¹¹¹

Estimated Cost of Prescriptive Measures

As described above, the Scoping Plan combines new measures addressing legislative mandates and the extension of existing measures, including a comprehensive cap on overall GHG emissions from the State's largest sources of pollution. The PATHWAYS model calculates costs and GHG emissions reductions associated with the prescriptive measures in the Scoping Plan. Changes in energy use and capital investment are calculated in PATHWAYS and represent the estimated cost of achieving an estimated 50 to 70 percent of the cumulative GHG reductions required to reach the SB 32 target between 2021 and 2030. The Cap-and-Trade Program delivers any remaining reductions, as shown in Figure 8.

Table 12 outlines the cost of prescriptive measures by sector in 2030, compared to the Reference Scenario, as calculated in PATHWAYS. Estimated capital costs of equipment are leveled over the life of the equipment using a 10 percent discount rate and fuel costs are calculated on an annual basis.¹¹² The costs in Table 12 are disaggregated into capital costs and fuel costs, which includes the varying costs of gasoline, diesel, biofuels, natural gas, electricity and other fuels.¹¹³ Table 12 assumes that all prescriptive measures deliver anticipated GHG reductions, and does not include any uncertainty in GHG reductions or cost.¹¹⁴ The impact of uncertainty in GHG reductions is explored in more detail in Appendices E, which include additional detail on measure, cost, and Reference Scenario uncertainty.

The prescriptive measures result in incremental capital investments of \$6.7 billion per year in 2030, but these annual capital costs are nearly offset by annual fuel savings of \$6.6 billion in 2030. The incremental net cost of prescriptive measures in the Scoping Plan is estimated at \$100 million in 2030, which represents 0.03 percent of the projected California economy in 2030. The residential and transportation sectors are anticipated to see net savings in 2030 as fuel savings for these areas vastly outweigh annual capital investment. Several sectors will see a net cost increase from implementation of the prescriptive measures. The industrial sector sees higher fuel costs relative to the Reference Scenario. In the agriculture sector, capital expenditures are due to investments in more efficient lighting and the mitigation of agricultural methane and nitrogen oxides. Agricultural fuel costs increase due to higher electricity and liquid biofuel costs.

¹¹⁰ The PATHWAYS modeling is described in Chapter 2, and additional detail is presented in Appendix D.

¹¹¹ Additional modeling details are available at the REMI PI+ webpage: <http://www.remi.com/products/pi>.

¹¹² PATHWAYS costs are calculated in real \$2012. For this analysis, all costs are reported in \$2015. The PATHWAYS costs are inflated using Bureau of Economic Analysis (BEA) data available at: <https://www.bea.gov/iTable/iTable.cfm?ReqID=9#reqid=9&step=1&isuri=1&903=4>.

¹¹³ Additional information on the fuels included in PATHWAYS is available at: www.arb.ca.gov/cc/scopingplan/meetings/1142016/e3pathways.pdf.

¹¹⁴ More information on the inputs to the California PATHWAYS model is available at: www.arb.ca.gov/cc/scopingplan/scoping_plan_scenario_description2016-12-01.pdf.

TABLE 12: CHANGE IN PATHWAYS SECTOR COSTS IN 2030 RELATIVE TO THE REFERENCE SCENARIO (BILLION \$2015)¹¹⁵

End Use Sector ¹¹⁶	Levelized Capital Cost	Fuel Cost	Total Annual Cost
Residential	\$0.1	-\$1.2	-\$1.1
Commercial	\$1.8	-\$1.8	\$0.1
Transportation	\$3.5	-\$3.8	-\$0.3
Industrial	\$0.8	\$0.3	\$0.5
Oil and Gas Extraction	\$0.0	\$0.0	\$0.1
Petroleum Refining	\$0.0	\$0.0	\$0.0
Agriculture	\$0.3	\$0.2	\$0.5
TCU (Transportation Communications and Utilities)	\$0.1	\$0.1	\$0.2
Total	\$6.7	-\$6.6	\$0.1

Note: Table values may not add due to rounding.

Estimated Cost of the Cap-and-Trade Program

The direct cost of achieving GHG reductions through the Cap-and-Trade Program is estimated outside of PATHWAYS. The Cap-and-Trade Program sets an economy-wide GHG emissions cap and gives firms the flexibility to choose the lowest-cost approach to reduce emissions. As with the prescriptive measures, the direct costs of any single specific GHG reduction activity under the Cap-and-Trade Program is subject to a large degree of uncertainty. However, as Cap-and-Trade allows covered entities to pursue the reduction options that emerge as the most efficient, overall abatement costs can be bounded by the allowance price. Covered entities should pursue reduction actions with costs less than or equal to the allowance price. An upper bound on the compliance costs under the Cap-and-Trade Program can therefore be estimated by multiplying the range of anticipated allowance prices by the anticipated GHG reductions needed (in conjunction with the reductions achieved through the prescriptive measures) to achieve the SB 32 target.

A large number of factors influence the allowance price, including the ease of substituting lower carbon production methods, consumer price response, the pace of technological progress, and impacts to the price of fuel. Other policy factors that also affect the allowance price include the use of auction proceeds from the sale of State-owned allowances and linkage with other jurisdictions.

Flexibility allows the Cap-and-Trade allowance price to adjust to changes in supply and demand while a firm cap ensures GHG reductions are achieved. This analysis includes a range of allowance prices bounded at the low end by the Cap-and-Trade auction floor price (C+T Floor Price) which represents the minimum sales price for allowances sold at auction and the Allowance Price Containment Reserve Price (C+T Reserve Price), which represents the price at which an additional pool of allowances will be made available to ensure entities can comply with the Cap-and-Trade Program and is the highest anticipated price under the Program. Table 13 outlines the projected allowance prices used in this analysis.¹¹⁷

¹¹⁵ PATHWAYS costs reported in \$2012 are inflated to \$2015 using the Bureau of Economic Analysis (BEA) data available at: <https://www.bea.gov/iTable/iTable.cfm?ReqID=9#reqid=9&step=1&isuri=1&903=4>.

¹¹⁶ Information on the end use sectors are available in the California PATHWAYS documentation available at: www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

¹¹⁷ The Cap-and-Trade allowance price range is based on the Cap-and-Trade Regulation approved by the Office of Administrative

TABLE 13: ESTIMATED RANGE OF CAP-AND-TRADE ALLOWANCE PRICE 2021–2030*

(\$2015)	2021	2025	2030
C+T Floor Price	\$16.2	\$19.7	\$25.2
C+T Reserve Price	\$72.9	\$76.4	\$81.9

* Based on current regulation in effect October 1, 2017

Uncertainty in the GHG reduction potential of prescriptive measures in the Scoping Plan can affect the cost of achieving the 2030 target. The aggregate emissions cap of the Cap-and-Trade Program ensures that the 2030 target will be met—irrespective of the GHG emissions realized through prescriptive measures. If GHG reductions anticipated under prescriptive measures do not materialize, the Cap-and-Trade Program will be responsible for a larger share of emissions reductions. Under that scenario, the demand for Cap-and-Trade allowances may rise, resulting in an increase in allowance price. While the Cap-and-Trade allowance price may rise, it is highly unlikely that it will rise above the C+T Reserve price, given the program design. If prescriptive measures deliver anticipated GHG reductions, demand for allowances will be low, depressing the price of allowances. However, the C+T Floor Price represents the lowest price at which allowances can be sold at auction.

Table 14 presents the estimated direct cost estimates for GHG reductions achieved through the Cap-and-Trade Program in 2030. These costs represent the lower and upper bounds of the cost of reducing GHG emissions to achieve the SB 32 target under the Scoping Plan. The estimated direct costs range from \$1.6 to \$5.1 billion dollars (in \$2015), depending on the allowance price in 2030. This range highlights the allowance price uncertainty that is a trade-off to the GHG reduction certainty provided by the Cap-and-Trade Program. The estimated cost of GHG reductions is calculated by multiplying the allowance price by the GHG emissions reductions required to achieve the SB 32 target.

Sensitivity Analysis

In addition to uncertainty in the Cap-and-Trade allowance price and uncertainty in the GHG reductions achieved through the prescriptive measures, there is uncertainty in the GHG emissions that will occur under the Reference Scenario, as presented in Figure 6. There is also uncertainty in costs embedded within the Reference Scenario including the price of oil, other energy costs, and technology costs.

The PATHWAYS incremental cost results are also sensitive to the fossil fuel price assumptions. Altering the fuel price trajectory in the Reference Scenario directly impacts the incremental cost of achieving GHG reductions in the Scoping Plan, as the costs of the Scoping Plan are relative to the Reference Scenario.¹¹⁸

The PATHWAYS scenarios use fossil fuel price projections from the Annual Energy Outlook (AEO) 2015 reference case.¹¹⁹ To estimate the impact of changes in future fuel prices on the estimated incremental cost of the Scoping Plan two sensitivities were conducted. In the low fuel price sensitivity, the AEO low oil and natural gas price case is used to project the future cost of fuels in the Reference Scenario. The cost of the Scoping Plan, relative to the Reference Scenario, increases under these conditions, since fuel savings are less valuable when fuel prices are low. A second sensitivity shows that high future oil and natural gas prices (as projected in the AEO high oil price case) reduce the net cost of the Scoping Plan, relative to the Reference Scenario. This is because avoided fuel savings are more valuable when fuel prices are high. Table 14 outlines the costs and savings from the Scoping Plan (both prescriptive measures and cap-and-trade) under the high and low fuel price sensitivities.

The price of oil and natural gas affects the value of fuel savings (as presented in Table 12), which are estimated to be significant using AEO reference oil and natural gas prices. Under the low fuel price sensitivity,

Law on September 18, 2017. Documentation is available at: www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm

118 In addition to the fuel cost sensitivities presented in this section, Appendix E includes an uncertainty analysis of the Scoping Plan Scenario and alternatives. This analysis addresses uncertainty in the Reference Scenario emissions, GHG reductions from each measure, as well as capital and fuel costs.

119 The high and low fuel price sensitivity ranges are derived from differences between the AEO 2016 High Oil Price or Low Oil Price forecast and the AEO 2016 reference case, and are applied as ratios to the base case fuel price assumptions (which are based on the AEO 2015 report). The AEO 2015 report is available at: [http://www.eia.gov/outlooks/aeo/pdf/0383\(2015\).pdf](http://www.eia.gov/outlooks/aeo/pdf/0383(2015).pdf) and the AEO 2016 report is available for download at: [http://www.eia.gov/outlooks/aeo/pdf/0383\(2016\).pdf](http://www.eia.gov/outlooks/aeo/pdf/0383(2016).pdf).

the net incremental cost of prescriptive measures is \$2.9 billion in 2030. Under the high fuel price sensitivity, the prescriptive measures result in net savings of \$4.9 billion in 2030. Table 14 also shows that these price uncertainties are captured within the analyzed range of allowance prices. As described above, changes in fuel prices may affect the price of Cap-and-Trade allowances, but the price is highly unlikely to go outside the range of prices bounded by the C+T Floor Price and C+T Reserve Price. The final column in Table 14 presents the estimated direct cost of the Scoping Plan, including both the prescriptive measures and a range of estimated costs to achieve GHG reductions under the Cap-and-Trade Program for varying projections of future fuel prices. The total cost, reflecting fuel and allowance price uncertainty, ranges from an annual savings to California of \$3.3 billion to an annual cost of \$8.0 billion in 2030. The net climate benefits, as estimated by the SC-CO₂ and SC-CH₄, outweigh these direct costs.¹²⁰

TABLE 14: ESTIMATES OF DIRECT COST AND CLIMATE BENEFITS IN 2030 RELATIVE TO THE REFERENCE SCENARIO AND INCLUDING FUEL PRICE SENSITIVITY (BILLION \$2015)

Scenario	Prescriptive Measures	C+T Floor Price	C+T Reserve Price	2030 Total Cost
Scoping Plan	\$0.1	\$1.6	\$5.1	\$1.7 to \$5.2
Low Fuel Price Sensitivity	\$2.9	\$1.6	\$5.1	\$4.5 to \$8.0
High Fuel Price Sensitivity	-\$4.9	\$1.6	\$5.1	-\$3.3 to -\$0.2

Fuel price sensitivity is directly modeled in PATHWAYS, resulting in a range of impacts from prescriptive measures. The range of costs labeled "2030 Total Cost" includes the cost of prescriptive measures estimated in PATHWAYS and the impact of the Cap and-Trade Program calculated at the C+T Floor Price (the lower bounds) and the C+T Reserve Price (the upper bounds). The social cost of GHGs estimated range in 2030 is \$1.9 to \$11.2 billion.

Macroeconomic Impacts

The macroeconomic impacts of the Scoping Plan are estimated using the REMI model. Annual capital and fuel costs (for example, the costs in Table 12) are estimated using PATHWAYS and input into the REMI model to estimate the impact of the Scoping Plan on the California economy each year relative to GDP, which is often used as a proxy for economic growth, as well as employment, personal income, and changes in output by sector and consumer spending. Table 15 presents key macroeconomic impacts of implementing the Scoping Plan, based on the range of anticipated allowance prices. In 2030, under the Scoping Plan, growth across the indicators is about one-half of one percent less than the Reference Scenario. The results in Table 15 include not only the estimated direct cost of the Cap-and-Trade Program, but also distribution of allowance value from the auction of Cap-and-Trade allowances to California and consumers. See Appendix E for more detail on the modeling of the return of allowance value under the Cap-and-Trade Program in REMI.

The Cap-and-Trade Program is modeled in REMI as an increase in production cost to sectors based on estimated future GHG emissions and anticipated free allowance allocation. If a sector is expected to receive free allocation of allowances, the value of those free allowances is not modeled as a cost in REMI. The analysis does include the estimated benefit to sectors due to the proceeds from the auction of cap-and-trade allowances and assumes that each year \$2 billion of proceeds from the auction of State-owned cap-and-trade allowances are distributed to the economic sectors currently receiving GGRF appropriations. These funds work to achieve further GHG reductions in California, lower the cost to businesses of reducing GHG emissions and protect disadvantaged communities. Any auction proceeds remaining after the distribution of \$2 billion through GGRF sectors are distributed evenly to consumers in California as a dividend. The estimated costs in Table 15 include the cost of the GHG reductions to sectors, as well as the benefit to those sectors when allowance proceeds are returned through the GGRF and as a dividend to consumers, as detailed in Appendix E.

¹²⁰ Climate benefits are estimated using the Social Cost of Carbon in 2030 across the range of discount rates from 2.5 to 5 percent. All values are reported in \$2015. Additional information on the Social Cost of Carbon is available from the National Academies of Sciences, Engineering, and Medicine at: <https://www.nap.edu/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of>.

TABLE 15: MACROECONOMIC INDICATORS IN 2030 UNDER BASE FUEL PRICE ASSUMPTIONS

	Reference Scenario (2030)	Scoping Plan (2030)	Percentage Change Relative to Reference Scenario
California GDP (Billion \$2015)	\$3,439	\$3,430 to \$3,420	-0.3 percent to -0.6 percent
Employment (Thousand Jobs)	23,522	23,478 to 23,441	-0.2 percent to -0.3 percent
Personal Income (Billion \$2015)	\$3,010	\$3,006 to \$3,008	-0.1 percent to -0.1 percent

Table 15 was estimated using the REMI model. The range of costs for the Scoping Plan represents the impact of achieving the SB 32 target through prescriptive measures and the Cap-and-Trade Program at the C+T Floor Price (the lower bounds) and the C+T Reserve Price (the upper bounds).

It is important to put the results of Table 15 into context of the growing \$3.4 trillion California economy in 2030. As noted earlier, the economic analysis does not include avoided social damages and other potential savings from reductions in air pollution and petroleum dependency.

Determining employment changes as a result of policies is challenging to model, due to a range of uncertainties and global trends that will influence the California economy, regardless of implementation of the Scoping Plan. The global economy is seeing a shift toward automation and mechanization, which may lead to slowing of employment across some industries globally, irrespective of California's energy and low carbon investments. In California, employment is projected to reach 23.5 million jobs in 2030. In this analysis, implementing the Scoping Plan would slow the growth of employment by less than one-half of one percent in 2030.

Estimated personal income in California is relatively unchanged under the Scoping Plan relative to the Reference Scenario. Considering the uncertainty in the modeling, modest changes in the growth of personal income are not different from zero, which suggests that meeting the SB 32 target will not change the growth of personal income relative to the Reference Scenario.

When analyzing the estimated macroeconomic impacts, it is important to remember that a major substitution of electricity and capital away from fossil fuels is anticipated to have a very small effect on California GDP, employment, and personal income—less than one percent relative to the Reference Scenario in 2030. The economic impacts indicate that shifting money and investment away from fossil fuels and to clean energy is likely to have a negligible effect on the California economy. Additionally, it is certain that innovation will continue as new technologies are developed and implemented. While this analysis projects the costs and GHG reductions of current technologies over time, it does not capture the impact of new technologies that may shift the economy and California in unanticipated ways or benefits related to changes in air pollution and improvements to human health, avoided environmental damages, and positive impacts to natural and working lands. Thus, the results of this analysis very likely underestimate the benefits of shifting to a clean energy economy.

Consumer spending also shifts in response to implementation of the Scoping Plan relative to the Reference Scenario. As presented in Table 15, there is a negligible impact to consumer income, but small changes in income can alter the distribution of consumer spending among categories. In 2030, consumer spending is lower under the Scoping Plan than in the Reference Scenario across all analyzed allowance prices. Consumers spend less on fuels, electricity, natural gas, and capital as a result of measures in the Scoping Plan that reduce demand, increase efficiency, and drive technological innovations. The estimated impact to California households is also modest in 2030. The estimated cost to California households in 2030 ranges from \$115 to \$280, depending on the price of reductions under the Cap-and-Trade Program.¹²¹

The household impact is estimated using the per-household change in personal income as modeled in REMI and utilizing household estimates from the California Department of Finance. The household impact does not account for benefits from reduced climate impacts, health savings from reduced air pollution impacts, or lower petroleum dependence costs that might impact households. Additional details are presented in Appendix E.

As modeled, the household impact of the Scoping Plan comprises approximately one percent of average household expenditures in 2030. To ensure that vulnerable populations and low-income households are not

¹²¹ Household projections are obtained from the California Department of Finance and are available at: <http://www.dof.ca.gov/Forecasting/Demographics/projections/>.

disproportionately affected by California's climate policy, CARB is taking steps to better quantify localized economic impacts and ensure that low-income households see tangible benefits from the Scoping Plan. Researchers at the University of California, Los Angeles (UCLA) are currently working on a retrospective analysis that will estimate the impacts across California communities of the implementation of AB 32, which will help identify areas of focus as 2030 measures are developed. The Cap-and-Trade Program will also continue to provide benefit to disadvantaged communities through the disbursement of GGRF funds.

The investments made in implementing the Scoping Plan will have long-term benefits and present significant opportunities for California investors and businesses, as upfront capital investments will result in long-term fuel and energy efficiency savings, the benefits of which will continue into the future. The California economy will continue to grow under the Scoping Plan, but it will grow more resilient, more sustainable, and will be well positioned to reap the long-term benefits of lower carbon investments.

Economic Modeling of Health Impacts

Health benefits associated with reductions in diesel particulate matter (DPM) and nitrogen oxides (NO_x) are monetized for inclusion in the macroeconomic modeling. The health benefits are estimated by quantifying the harmful future health effects that will be avoided by reducing human exposure to DPM and NO_x, as detailed in Appendix G, and monetized by estimating a health effect's economic value to society. As previously noted the health impacts are based on air quality benefits estimated in Table 6, which have important limitations and likely overestimate the impacts of the Scoping Plan. Additional detail on the economic modeling of health impacts, including the monetization methodology and modeling results for all Scoping Plan scenarios, is presented in Appendix E. Including the monetized health impacts in the REMI modeling has no discernible impact on the overall results. The impact of including the monetized health impacts is indiscernible relative to the impact of the Scoping Plan.

Estimating the Economic Impact on Disadvantaged Communities (DACs)

Implementing the Scoping Plan is estimated to have a small impact on the Statewide California economy through 2030. However, shifting from fossil fuels can disproportionately affect specific geographic regions whose local economies rely on fossil fuel intensive industries. These regions can also include vulnerable populations and disadvantaged communities who may be disproportionately impacted by poor air quality and climate.

The regional impacts of the Scoping Plan, including the impact to disadvantaged communities, are estimated using the REMI California County model, which represents the 58 counties and 160 sectors of the California economy. Utilizing the same inputs used for modeling the statewide impact of the Scoping Plan relative to the Reference Scenario, the California County model estimates how measures will affect employment, value added, and other economic indicators at the county level across the state.

The county-level REMI output is also used to estimate impacts on disadvantaged communities affected by the Scoping Plan by allocating county impacts proportional to their share of economic indicators unique to each census tract.¹²² These indicators include industry output, industry consumption by fuel category, personal consumption, and population. The overall impact on employment across regions is not significant and there is no discernible difference in the impact to employment in disadvantaged communities. There is also no discernible impact to wages in disadvantaged communities across regions in California. Additional details on the regional modeling, including the results for the Scoping Plan and alternatives, is presented in Appendix E.

In addition to the regional modeling conducted in this analysis, there are currently three research contracts underway at CARB to quantify the impact of California's climate policy on regions and disadvantaged communities throughout California. As mentioned above, researchers from UCLA are estimating the improvements in health outcomes associated with AB 32, with a focus on disadvantaged communities. This research will be informed by input from technical advisory committees including a group focused on environmental justice.

¹²² Census tracts are small geographic areas within greater metropolitan areas that usually have a population between 2,500 and 8,000 persons. More information on the composition of census tracts available here: https://www.census.gov/geo/reference/gtc/gtc_ct.html. Disadvantaged census tracts are identified using CalEnviroScreen 2.0. Additional information is available at: <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20>.

There are also two studies currently underway to quantify the impact of GGRF funds. A UCLA contract focuses on quantifying jobs supported by GGRF funds in California, while a University of California, Berkeley contract is constructing methodologies to assess the co-benefits of GGRF projects across California. These research efforts will provide a regional analysis of the impact of and benefits to specific communities and sectors to ensure that all Californians see economic benefits, in addition to clean air benefits, from the implementing the Scoping Plan.

Public Health

Many measures to reduce GHG emissions also have significant health co-benefits that can address climate change and improve the health and well-being of all populations across the State. Climate change is already affecting the health of communities.¹²³ Climate-related health impacts can include increased heat illness and death, increases in air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.¹²⁴ The urgency of action to address the impacts already being felt from a changing climate and the threats in coming decades provides a unique opportunity for California's leadership in climate action to reduce GHG emissions and create healthy, equitable, and resilient communities where all people thrive. This section discusses the link between climate change and public health. It does not analyze the specific measures included in the strategy but provides context for assessing the potential measures and scenarios.

Achieving Health Equity through Climate Action

Many populations in California face *health inequities*, or unfair and unjust health differences between population groups that are systemic and avoidable.¹²⁵ Differences in environmental and socioeconomic determinants of health result in these health inequities. Those facing the greatest health inequities include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.¹²⁶ It is these very same populations, along with those suffering existing health conditions and certain populations of workers (e.g., outdoor workers), that climate change will most disproportionately impact.¹²⁷ The inequitable distribution of social, political, and economic power results in health inequities, while perpetuating systems (e.g., economic, transportation, land use, etc.) that drive GHG emissions. As a result, communities face inequitable living conditions. For example, low-income communities of color tend to live in more polluted areas and face climate change impacts that can compound and exacerbate existing sensitivities and vulnerabilities.^{128,129} Fair and healthy climate action requires that the inequities creating and intensifying community vulnerabilities be addressed. Living conditions and the forces that shape them, such as income, education, housing, transportation, environmental quality, and access to services, significantly drive the capacity for climate resilience. Thus, strategies such as alleviating poverty, increasing access to opportunity, improving living conditions, and reducing health and social inequities will result in more climate-resilient communities. In fact, there are already many "no-regret" climate mitigation and adaptation measures available (discussed below) that can reduce health burdens, increase community resilience, and address social inequities.¹³⁰ Focusing efforts to achieve health equity can thus lead to significant progress in addressing human-caused climate change.

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124 Ibid.

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Potential Health Impacts of Climate Change Mitigation Measures

Socioeconomic Factors: Income, Poverty, and Wealth

Economic factors, such as income, poverty, and wealth, are collectively one of the largest determinants of health. As such, climate mitigation measures that yield economic benefits can improve population health significantly, especially if the economic benefits are directed to those most vulnerable and disadvantaged (including those living in poverty) who often face the most health challenges. From the poorest to richest ends of the income spectrum, higher income is associated with greater longevity in the United States.^{131,132,133} The gap in life expectancy between the richest 1 percent and poorest 1 percent of Americans was almost 15 years for men in 2014, and about 10 years for women.¹³⁴ Early death among those living in poverty is not a result of those with higher incomes having better access to quality health care.¹³⁵ Only about 10-20 percent of a person's health status is accounted for by health care (and 20-30 percent attributed to genetics), while the remainder is attributed to the social determinants of health. These include environmental quality, social and economic circumstances, and the social, media, policy, economic, retail, and built environments— all of which in turn shape stress levels and behaviors, including smoking, diet, and exercise.^{136,137,138,139,140,141,142,143,144,145,146} In fact, where people live, work, learn, and play is often a stronger predictor of life expectancy than their genetic and biological makeup.¹⁴⁷ The World Health Organization's Commission on the Social Determinants of Health concluded that the poor health of poor people, and the social gradient in health, are caused by the unequal distribution of power, income, goods, and services resulting from poor social policies and programs, unfair economic arrangements, and bad politics.¹⁴⁸ Thus, improving the conditions of daily life and tackling the inequitable distribution of power, money, and resources can remedy inequitable health outcomes.¹⁴⁹ Simply put, the more evenly distributed the wealth, the healthier a society is.¹⁵⁰

The wealth-health gradient has significant implications for this Scoping Plan. State climate legislation and policies require prioritizing GHG reduction strategies that serve vulnerable populations and improve well-being for disadvantaged communities. As such, strategies that improve the financial security of communities facing disadvantages while reducing GHG emissions are win-win strategies. These include providing funds or services for GHG reduction programs (e.g., weatherization, energy efficiency, renewable energy, ZEVs, transit, housing, and others) to low-income individuals and households to help them reduce costs. Among the poorest 25 percent of people, per capita government expenditures are strongly associated with longer

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149 Ibid.

150 Smith, R. 1996. "The big idea." British Medical Journal 312:April 20th, Editor's choice.

life spans.¹⁵¹ Successful strategies California has already implemented to assure the poor do not pay higher costs for societal GHG reductions include low-income energy discount programs, in combination with direct climate credits, and policies and programs that help Californians reduce electricity, natural gas, and gasoline consumption.¹⁵² More such strategies could be pursued. To tackle the inequitable distribution of power that leads to disparate health outcomes, agencies can first assure their hearing and decision-making processes provide opportunities for civic engagement so people facing health inequities can themselves participate in decision-making about solutions. Whether it is absolute poverty or relative deprivation that leads to poor health, investments and policies that both lift up the poor and reduce wealth disparities will address the multiple problems of climate change mitigation, adaptation, and health inequities.

Employment

Employment status impacts human health in many ways. Poor health outcomes of unemployment include premature death, self-rated ill-health (a strong predictor of poor health outcomes), and mental illness.^{153,154,155,156} Economic strain related to unemployment can impact mental health and trigger stress that is linked to other health conditions.^{157,158} Populations of color are overrepresented in the unemployment and under-employment ranks, which likely contributes to racial health inequities. In 2014, 14.7 percent of African-Americans, 12.1 percent of American Indians and Alaska Natives, and 9.8 percent of Latinos were unemployed, compared to 7.9 percent of Whites.¹⁵⁹ In addition to providing income, the work experience has health consequences. There is a *work status–health gradient* similar to the wealth–health gradient. Workers with lower occupational status have a higher risk of death,¹⁶⁰ increased blood pressure,¹⁶¹ and more heart attacks.^{162,163} Higher status workers often have a greater sense of autonomy, control over their work, and predictability, compared to lower status workers, whose lack of control and predictability translates to stress that shortens their lives.¹⁶⁴ Nonstandard working arrangements such as part-time, seasonal, shift, contract, or informal sector work have been linked to greater psychological distress and poorer physical health.^{165,166} Women are heavily overrepresented in nonstandard work, as are people of color and people with low levels of education.^{167,168}

The implementation of California’s climate change goals provides great opportunity to not only improve the habitability of the planet, but also to increase economic vitality, employ historically disadvantaged people

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in secure jobs, and improve the health of the population. Measures in the Scoping Plan that aim to reduce GHGs can simultaneously improve health and social equity by prioritizing or requiring that: (1) infrastructure projects using public funds pay living wages, provide quality benefits to all employees, and minimize nonstandard work; (2) locals are hired as much as is feasible; (3) preference is given for women-owned and minority-owned businesses; (4) employers receiving public funds assess and reduce work stress and lack of workplace control; (5) projects benefiting from State climate investments prioritize hiring from historically hard-to-employ groups, such as youth (especially youth of color), formerly incarcerated people, and people with physical or mental illness; and (6) training is provided to these same groups to work in jobs in sectors that will support a sustainable economy.

Communications Supporting Climate Change Behaviors and Policies

California's leadership on GHG reductions is exceptional. However, climate mitigation goals are often treated independently by sector, and the public does not see a unified message that changes must take place on every level in every sector to preserve human health and well-being. Climate strategy could be supported by public communications campaigns that link sectors and present a message of the need for bold action, along with the benefits that action can yield. Mass media communications and social marketing campaigns can help shift social and cultural norms toward sustainable and healthy practices. Messaging about the co-benefits of climate change policies in improving health and well-being can lead to increased community and decision-maker support among vulnerable groups for policies and measures outlined in the Scoping Plan.

Community Engagement Leads to Robust, Lasting, and Effective Climate Policies

For California's climate change policies to be supported by the public and be implemented with enthusiasm, they must be developed through ample, genuine opportunities for community members to discuss and provide input. Californians' contributions to the policy arena strengthen the end products and assist in their implementation and enforcement.

Efforts to mitigate climate change through policy, environmental, and systems change present considerable opportunities to promote sustainable, healthy, resilient, and equitable communities. The measures in the Scoping Plan, and the way they are implemented, can help create living conditions that facilitate physical activity; encourage public transit use; provide access to affordable, fresh, and nutritious foods; protect the natural systems on which human health depends; spur economic development; provide safe, affordable, and energy-efficient housing; enable access to jobs; and increase social cohesion and civic engagement. These climate change mitigation measures can improve overall population health, as well as material conditions, access to opportunity, and health and well-being in communities facing health inequities. Approaching the policy solutions outlined in the Scoping Plan with a health and equity lens can ultimately help lead to a California in which all current and future generations of Californians can benefit and thrive.

Environmental Analysis

CARB, as the lead agency, prepared a Draft Environmental Analysis (Draft EA) in accordance with the requirements of the California Environmental Quality Act (CEQA) and CARB's regulatory program (CARB's program has been certified as complying with CEQA by the Secretary of Natural Resources; see California Code of Regulation, title 17, sections 60006-60008; California Code of Regulation, title 14, section 15251, subdivision (d)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for a programmatic environmental analysis of the reasonably foreseeable compliance responses resulting from implementation of the measures proposed in the Scoping Plan to achieve the 2030 target. Following circulation of the Draft EA for an 80-day public review and comment period (January 20, 2017 through April 10, 2017), CARB prepared the Final Environmental Analysis Prepared for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Final EA), which includes minor revisions to the Draft EA, and the Response to Comments on the Draft Environmental Analysis prepared for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (RTC). The Final EA is included as Appendix F to the 2017 Scoping Plan. The Final EA and RTC were posted on CARB's Scoping Plan webpage before the Board hearing in December 2017.

The Final EA provides a programmatic level of analysis of the adverse environmental impacts that are reasonably foreseeable as resulting from implementation of the proposed Scoping Plan measures; feasible mitigation measures; a cumulative impacts analysis and an alternatives analysis.

Collectively, the Final EA concluded that implementation of these actions could result in the following short-term and long-term beneficial and adverse environmental impacts:

- Beneficial long-term impacts to air quality, energy demand and greenhouse gas emissions.
- Less than significant impacts to energy demand, resources related to land use planning, mineral resources, population and housing, public services, and recreational services.
- Potentially significant and unavoidable adverse impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, resources related to land use planning, noise, recreational services, transportation/traffic, and utilities and service systems.

The potentially significant and unavoidable adverse impacts are disclosed for both short-term construction-related activities and long-term operational activities, which explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. For a summary of impacts, please refer to the table in Attachment B to the Final EA.

Chapter 4

KEY SECTORS

Climate change mitigation policies must be considered in the context of the sector's contribution to the State's total GHGs, while also considering any co-benefits for criteria pollutant and toxic air contaminant reductions. The transportation, electricity (in-state and imported), and industrial sectors are the largest contributors to the GHG inventory and present the largest opportunities for GHG reductions. However, to ensure decarbonization across the entire economy and to meet our 2030 GHG target, policies must be considered for all sectors. Policies that support energy efficiency, alternative fuels, and renewable power also can provide co-benefits for both criteria and toxic air pollutants.

The specific policies identified in this Scoping Plan are subject to additional analytical and public processes to refine the requirements and methods of implementation. For example, a change in the LCFS Carbon Intensity (CI) target would only take effect after a subsequent rulemaking for that regulation, which would include its own public process and environmental, economic, and public health analyses. As described in Chapter 2, many policies for reducing emissions toward the 2030 target are already known. This Scoping Plan identifies these and additional policies or program enhancements needed to achieve the remaining GHG reductions in a complementary, flexible, and cost-effective manner to meet the 2030 target. These policies should continue to encourage reductions beyond 2030 to keep us on track to stabilize the climate. Policies that ensure economy-wide investment decisions that incorporate consideration of GHG emissions are particularly important.

As we pursue GHG reduction targets, we must acknowledge the integrated nature of our built and natural environments, and cross-sector impacts of policy choices. The State's Green Buildings Strategy is one such example of this type of integrated approach. Buildings have tremendous cross-sector interactions that influence our health and well-being and affect land use and transportation patterns, energy use, water use, communities, and the indoor and outdoor environment. Green building regulations and programs offer complementary opportunities to address the direct and indirect effects of buildings on the environment by incorporating strategies to minimize overall energy use, water use, waste generation, and transportation impacts. The Governor's Green Buildings Executive Order B-18-12 for State buildings and the California Green Building Standards (CALGreen) Code¹⁶⁹ are key state initiatives supporting emissions reductions associated with buildings. Local governments are taking action by adopting "beyond code" green building standards. Additional efforts to maintain and operate existing buildings as third-party certified green buildings provides a significant opportunity to reduce GHG emissions associated with buildings. These foundational regulations and programs for reducing building-related emissions are described in more detail in Appendix H. Looking forward, there is a need to establish a path toward transitioning to zero net carbon buildings¹⁷⁰, which will be the next generation of buildings that can contribute significantly to achieving long-term climate goals. A discussion of how the green buildings strategy can support GHG reductions to help meet the 2030 target is provided in Appendix I. Recent research activities have provided results to better quantify GHG emissions reductions of green buildings, and additional research activities need to continue to expand their focus to support technical feasibility evaluations and implementation. Research needs related to green buildings are included in Appendix I.

Further, each of the policies directed at the built environment must be considered in the broader context of the high-level goals for other sectors, including the natural and working lands sector. For example, policies that support natural and working lands can reduce emissions and sequester carbon, while also providing ecosystem benefits such as better water quality, increased water yield, soil health, reduced erosion, and

¹⁶⁹ The authority to update and implement the CALGreen Code is the responsibility of several State agencies identified in California Building Standards Law.

¹⁷⁰ A zero carbon building generates zero or near zero GHG emissions over the course of a year from all GHG emission sources associated, directly and indirectly, with the use and occupancy of the building (initial definition included in the May 2014 *First Update to the Climate Change Scoping Plan*).

habitat connectivity. These policies and co-benefits will be considered as part of the integrated strategy outlined above. Table 16 provides examples of the cross-sector interactions between and among the main sectors analyzed for the Scoping Plan that are discussed in this chapter (Energy, Transportation, Industry, Water, Waste Management, and Natural and Working Lands, including agricultural lands).

This chapter recognizes these interactions and relates these broad strategic options to the specific additional programs recommended in Chapter 2 of this document. Accordingly, Chapter 4 provides an overview of each sector's contributions to the State's GHG emissions, a description of both ongoing and proposed programs and policies to meet the 2030 target, and additional climate policy or actions that could be considered in the future. The wide array of complementary and supporting measures being contemplated or undertaken across State government are detailed here. The broad view of State action described in this chapter thus provides context for the narrower set of measures discussed in detail in Chapter 2 of this Scoping Plan. It is these measures in Chapter 2 that CARB staff has identified as specific actions to meet the 2030 target in SB 32.

The following phrases have specific meanings in this discussion of the policy landscape: "Ongoing and Proposed Measures" refers to programs and policies that are either ongoing existing efforts, or efforts required by statute, or which are otherwise underway or about to begin. These measures include, but are not limited to, those identified as necessary specific actions to meet the 2030 GHG target, and which are set apart and described in greater detail in Chapter 2. "Sector Measures" listed also include cross-cutting measures that affect many entities in the sector; some of these are also identified in Chapter 2. "Potential Additional Actions" are not being proposed as part of the specific strategy to achieve the 2030 target in this Scoping Plan. This Scoping Plan includes this broader, comprehensive, review of these measures because it aims to spur thinking and exploration of innovative new technologies and policies that may help the State achieve its long-term climate goals. Some of these items may not ever be formally proposed, but they are included here because CARB, other agencies, and stakeholders believe their potential should be explored with stakeholders in coming years.

TABLE 16: CROSS-SECTOR RELATIONSHIPS

Sector	Example Interactions with Other Sectors
 <p>Energy</p>	<ul style="list-style-type: none"> • Hydroelectric power, cooling, cleaning, waste water treatment plant (WWTP) bioenergy • Vehicle-to-grid power; electricity supply to vehicle charging infrastructure • Biomass feedstock for bioenergy, land for utility-scale renewable energy (solar, wind) • Agricultural waste and manure feedstocks for bioenergy/biofuels • Organic waste for bioenergy
 <p>Transportation</p>	<ul style="list-style-type: none"> • Electric vehicles, natural gas vehicles, transit/rail; more compact development patterns that reduce vehicle miles traveled (VMT) also demand less energy per capita • More compact development patterns that reduce VMT also demand less water per capita and reduce conversion of natural and working lands • Reducing VMT also reduces energy demands necessary for producing and distributing fuels and vehicles and construction and maintenance of roads • Biomass feedstock for biofuels • Agricultural waste and manure feedstocks for biofuels • Organic waste for biofuels • Greenfield suburban development on natural and working lands leads to increased VMT
 <p>Industry</p>	<ul style="list-style-type: none"> • Potential to electrify fossil natural gas equipment, substitution of fossil-based energy with renewable energy • Greenfield urban development impacts
 <p>Water</p>	<ul style="list-style-type: none"> • Energy consumption for water pumping, treatment, heating; resource for cooling, cleaning; WWTP bioenergy • Use of compost to help with water retention / conservation / drought mitigation • Land conservation results in healthier watersheds by reducing polluted runoff, allowing groundwater recharge, and maintaining properly functioning ecosystems
 <p>Waste Management</p>	<ul style="list-style-type: none"> • Composting, anaerobic digestion, and wastewater treatment plant capacity to help process organic waste diverted from landfills • Compost for carbon sequestration, erosion control in fire-ravaged lands, water conservation, and healthy soils • Replacing virgin materials with recycled materials associated with goods production; enhanced producer responsibility reduces energy impacts of consumption • Efficient packaging materials reduces energy consumption and transportation fuel use
 <p>Agriculture</p>	<ul style="list-style-type: none"> • Crop production, manure management; WWTP biosolids for soil amendments • Agricultural waste and manure feedstocks for bioenergy • Compost production in support of Healthy Soils Initiative
 <p>Natural and Working Lands</p>	<ul style="list-style-type: none"> • Healthy forestlands provide wood and other forest products • Restoring coastal and sub-tidal areas improves habitat for commercial and other fisheries • Sustainable management can provide biomass for electricity • Sustainable management can provide biomass for biofuels • Resilient natural and working lands provide habitat for species and functions to store water, recharge groundwater, naturally purify water, and moderate flooding. Forests are also a source of compost and other soil amendments. • Conservation and land protections help reduce VMT and increase stable carbon pools in soils and above-ground biomass

Low Carbon Energy

The energy sector in California is composed of electricity and natural gas infrastructure, which brings electricity and natural gas to homes, businesses, and industry. This vast system is critical to California's economy and public well-being, and pivotal to reducing its GHG emissions.

Historically, power plants generated electricity largely by combusting fossil fuels. In the 1970s and early 1980s, a significant portion of California's power supply came from coal and petroleum resources. To reduce air pollution and promote fuel diversity, the State has shifted away from these resources to natural gas, renewable energy, and energy efficiency programs, resulting in significant GHG emissions reductions. Emissions from the electricity sector are currently approximately 20 percent below 1990 levels and are well on their way to achieving deeper emissions cuts by 2030. Since 2008, renewable generation has almost doubled, coal generation has been reduced by more than half, and GHG emissions have been reduced by a quarter.

Carbon dioxide is the primary GHG associated with electricity and natural gas systems. The electricity sector, which is composed of in-State generation and imported power to serve California load, has made great strides to help California achieve its climate change objectives. Renewable energy has shown tremendous growth, with capacity from solar, wind, geothermal, small hydropower, and biomass power plants growing from 6,600 megawatts (MW) in 2010 to 27,500 MW as of June 2017.¹⁷¹

Renewable energy adoption in California has been promoted through the RPS and several funding mechanisms, such as the California Solar Initiative (CSI) programs, Self-Generation Incentive Program (SGIP), Net-Energy Metering (NEM), and federal tax credits. These mandates and incentives have spurred both utility-scale and small-scale customer-developed renewable energy projects. SB 350 increased the RPS requirement from 33 percent by 2020 to 50 percent by 2030.

SB 350 requires publicly-owned utilities under the jurisdiction of the California Energy Commission (CEC) and all load-serving entities under the jurisdiction of the California Public Utilities Commission (CPUC) to file integrated resource plans (IRPs) with the CEC and CPUC, respectively. Through their IRPs, filing entities will demonstrate how they will plan to meet the electricity sector's share of the State's 2030 GHG reduction target while ensuring reliability in a cost-effective manner. The CEC and CPUC have developed the guidelines that publicly-owned utilities and load-serving entities will follow to prepare and submit IRPs, and CARB is working collaboratively with CEC and CPUC to set the sector and utility and load-serving entity planning targets. The Scoping Plan provides information to help establish the range of GHG reductions required for the electricity sector, and those numbers will be translated into planning target ranges in the IRP process. The IRP processes as currently proposed by CEC and CPUC staff will grant publicly-owned utilities flexibility to determine the optimal way to reduce GHG emissions, and load serving entities some flexibility to achieve the electricity sector's share of the 2030 goal. The CPUC has developed a Reference System Plan to help guide investment, resource acquisition, and programmatic decisions to reach the State's policy goals, in addition to informing the development of individual load serving entities' IRPs.

Energy efficiency is another key component to reducing energy sector GHG emissions, and is another consideration in each agency's IRP process. Utilities have been offering energy efficiency programs, such as incentives, to California customers for decades, and CEC has continually updated building and appliance standards. In the context of IRPs, utility-ratepayer-funded energy efficiency programs will likely continue to play an important role in reducing GHG emissions in the electricity sector.

SB 350 requires CEC and CPUC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. These targets can be achieved through appliance and building energy efficiency standards; utility incentive, rebate, and technical assistance programs; third-party delivered energy efficiency programs; and other programs. Achieving greater efficiency savings in existing buildings, as directed by Governor Brown in his 2015 inaugural speech, will be essential to meet the goal of doubling energy efficiency savings. In September 2015, CEC adopted the Existing Buildings Energy Efficiency Action Draft Plan, which is designed to provide foundational support and strategies to enable scaling of energy efficiency in the built environment. Pursuant to SB 350, CEC published an updated Existing Buildings Energy Efficiency Action Plan prior to January 2017. More than \$10 billion in private capital investment will be needed

¹⁷¹ California Energy Commission. August, 2017. Tracking Progress. Renewable Energy – Overview. http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf

to double statewide efficiency savings in California.¹⁷² Energy efficiency programs are one part of the broader green buildings strategy, which incorporates additional measures to minimize water use, waste generation, and transportation impacts. The green buildings strategy is described in further detail in Appendix I.

Heating fuels used for activities such as space and water heating in the residential, commercial, and industrial sectors represent a significant source of GHG emissions. Transitioning to cleaner heating fuels is part of the solution of achieving greater efficiency savings in existing buildings and has significant GHG emissions reductions potential. Examples of this transition can include use of renewable gas and solar thermal, as well as electrification of end uses in residential, commercial, and industrial sectors. However, achieving significant GHG emissions reductions can only be achieved by decarbonizing the electricity sector – switching from natural gas end uses to electricity generated by burning natural gas would not be effective. Electrification can complement renewables and energy storage if implemented in an integrated, optimized manner. Other hurdles that will have to be overcome include electric equipment performance across all California climate regions, seasonal variations of renewable generation, cost-effectiveness, and consumer acceptance of different heating fuel options.

Fossil-fuel-based natural gas is a significant fuel source for both in-State electricity generation and electricity imported into California. It is also used in transportation applications and in residential, commercial, industrial, and agricultural sector end uses. Greenhouse gas emissions from combustion of fossil natural gas decreased from 134.71 MMTCO₂e in 2000 to 126.98 MMTCO₂e in 2015, while natural gas pipeline fugitive emissions were estimated to be 4.0 MMTCO₂e in 2015 and have been nearly unchanged since 2000.¹⁷³ Greenhouse gas-reduction strategies should focus on efficiency, reducing leakage from wells and pipelines, implementing the SLCP strategy, and studying the potential for renewable gas fuel switching (e.g., renewable hydrogen blended with methane or biomethane).

Moving forward, reducing use of fossil natural gas wherever possible will be critical to achieving the State's long-term climate goals. For end uses that must continue to rely on natural gas, renewable natural gas could play an important role. Renewable natural gas volume has been increasing from approximately 1.5 million diesel gallon equivalent (dge) in 2011 to more than 68.5 million dge in 2015, and continued substitution of renewable gas for fossil natural gas would help California reduce its dependence on fossil fuels. In addition, renewable gas can be sourced by in-vessel waste digestion (e.g., anaerobic digestion of food and other organics) and recovering methane from landfills, livestock operations, and wastewater treatment facilities through the use of existing technologies, thereby also reducing methane emissions. The capture and productive use of renewable methane from these and other sources is consistent with requirements of SB 1383.

Collectively, renewable energy and energy efficiency measures can result in significant public health and climate benefits by displacing air pollution and GHG emissions from fossil-fuel based energy sources, as well as by reducing the health and environmental risks associated with the drilling, extraction, transportation, and storage of fossil fuels, especially for communities living near fossil-fuel based energy operations.

As the energy sector continues to evolve and decarbonize, both the behavior of individual facilities and the design of the grid itself will change, with important distributional effects. Some power plants may operate more flexibly to balance renewables, emerging technologies (examples include storage, smart inverters, renewably-fueled fuel cells, and others) will become more prevalent, and aging facilities may retire and be replaced. In turn, this may shift patterns of criteria pollutant emissions at these facilities. Because many existing power plants are in, or near, disadvantaged communities, it is of particular importance to ensure that this transition to a cleaner grid does not result in unintended negative impacts to these communities.

Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

172 California Energy Commission. 2016. Existing Building Energy Efficiency Action Plan. page 61. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficiency_Plan_Update_Deceber_2016_Thi.pdf

173 CARB. 2017. CARB's Emission Inventory Activities. www.arb.ca.gov/ei/ei.htm

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Electricity Goals

- Achieve sector-wide, publicly-owned utility, and load-serving entity specific GHG reduction planning targets set by the State through Integrated Resource Planning.
- Reduce fossil fuel use.
- Reduce energy demand.

Natural Gas Goals

- Ensure safety of the natural gas system.
- Decrease fugitive methane emissions.
- Reduce dependence on fossil natural gas.

Cross-Sector Interactions

The energy sector interacts with nearly all sectors of the economy. Siting of power plants (including solar and wind facilities) and transmission and distribution lines have impacts on land use in California—be it conversion of agricultural or natural and working lands, impacts to sensitive species and habitats, or implications to disadvantaged, vulnerable, and environmental justice communities. Additionally, more compact development patterns reduce per capita energy demands, while less-compact sprawl increases them. Further, efforts to reduce GHG emissions in the transportation sector include electrification, such as PHEVs, BEVs, and FCEVs. Some industrial sources also use electricity as a primary or auxiliary source of power for manufacturing. In the future, industrial facilities may electrify their systems instead of relying on natural gas. These activities will increase demand in this sector. In addition, water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. Given California's recent historic drought, water use for the electricity sector is an important consideration for operation, maintenance, and construction activities.

Continued planning and coordination with federal, State, and local agencies, governments, Tribes, and stakeholders will be crucial to minimizing environmental and health impacts from the energy sector, deploying new technologies, and identifying feedstocks.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Electricity

- Per SB 350, with respect to Integrated Resource Plans, establish GHG planning targets for the electricity sector, publicly-owned utilities, and load-serving entities.
- Per SB 350, ensure meaningful GHG emissions reductions by publicly-owned utilities and load-serving entities through Integrated Resource Planning.
- Per AB 197, prioritize direct reductions at large stationary sources, including power-generating facilities.
- Per SB 350, increase the RPS to 50 percent of retail sales by 2030 and ensure grid reliability.
- Per Governor Brown's Clean Energy Jobs Plan, AB 327 (Perea, Chapter 611, Statutes of 2013), and AB 693 (Eggman, Chapter 582, Statutes of 2015), increase development of distributed renewable generation, including for low income households.
- Continue to increase use of distributed renewable generation at State facilities where space allows.
- Increase retail customers' use of renewable energy through optional utility 100 percent renewable energy tariffs.
- Continue GHG reductions through participation in the California Independent System Operator (CAISO) Energy Imbalance Market.

- Per SB 350, efforts to evaluate, develop, and deploy regionalization of the grid and integration of renewables via regionalization of the CAISO should continue while maintaining the accounting accuracy and rigor of California's GHG policies.
- Per SB 350, establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.
- Per SB 350, implement the recommendations of the Barriers Study for increasing access to renewable energy generation for low-income customers, energy efficiency and weatherization investments for low-income customers, and contracting opportunities for local small business in disadvantaged communities.¹⁷⁴ And, track progress towards these actions over time to ensure disadvantaged communities are getting equal access and benefits relative to other parts of the State.
- Continue implementation of the Regulations Establishing and Implementing a Greenhouse Gases Emission Performance Standard for Local Publicly Owned Electric Utilities as required by SB 1368 (Perata, Chapter 598, Statutes of 2006), which effectively prohibits electric utilities from making new long-term investments in high-GHG emitting resources such as coal power.
- Per AB 802 (Williams, Chapter 590, Statutes of 2015), adopt the forthcoming CEC regulations governing building energy use data access, benchmarking, and public disclosure.
- Per AB 2868 (Gatto, Chapter 681, Statutes of 2016), encourage development of additional energy storage capacity on the transmission and distribution system.
- Per AB 758 (Skinner, Chapter 470, Statutes of 2009),¹⁷⁵ implement recommendations under State jurisdiction included in the AB 758 Action Plan developed by CEC.

Ongoing and Proposed Measures – Natural Gas

- Implement the CARB Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities to reduce fugitive methane emissions from storage and distribution infrastructure.
- Per SB 1371 (Leno, Chapter 525, Statutes of 2014), adopt improvements in investor-owned utility (IOU) natural gas systems to address methane leaks.
- Implement the SLCP Strategy to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use.
- Per SB 1383, CEC will develop recommendations for the development and use of renewable gas as part of its 2017 Integrated Energy Policy Report (IEPR).
- Per SB 1383, adopt regulations to reduce methane emissions from livestock manure and dairy manure management operations by up to 40 percent below the dairy sector's and livestock sector's 2013 levels by 2030, including establishing energy infrastructure development and procurement policies needed to encourage dairy biomethane projects. The regulations will take effect on or after January 1, 2024.
- Per SB 1383, reduce methane emissions at landfills by reducing landfill disposal of organic waste 75 percent below 2014 levels by 2025, including establishing energy infrastructure development and procurement policies needed to encourage in-vessel digestion projects and increase the production and use of renewable gas.
- Per SB 887 (Pavley, Chapter 673, Statutes of 2016), initiate continuous monitoring at natural gas storage facilities and (by January 1, 2018) mechanical integrity testing regimes at gas storage wells, develop regulations for leak reporting, and require risk assessments of potential leaks for proposed new underground gas storage facilities.
- Per Public Utilities (PU) Code 454.56, CPUC, in consultation with CEC, (1) identifies all potentially achievable cost-effective natural gas efficiency savings and establishes gas efficiency targets for the gas corporation to achieve, and (2) requires gas corporations to first meet unmet resource needs through available natural gas efficiency and demand reduction resources that are cost-effective, reliable, and feasible (PU Codes 890–

¹⁷⁴ CEC. 2016. Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities. http://docketpublic.energy.ca.gov/PublicDocuments/16-OIR-02/TN214830_20161215T184655_SB_350_LowIncome_Barriers_Study_Part_A__Commission_Final_Report.pdf

¹⁷⁵ AB 758 requires CEC, in collaboration with CPUC, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.

- 900 provide public goods charge funding authorization for these programs).
- Per SB 185 (De Leon, Chapter 605, Statutes of 2015), implement the requirement for the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) to sell their holdings in coal-producing companies by June 1, 2017, and explore extending divestiture requirements for additional fossil-fuel assets.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Further deploy fuel cells that use renewable fuels or those that generate electricity that is less carbon intensive than the grid.
- Increase use of renewable energy through long-term agreements between customers and utilities (such as Sacramento Municipal Utility District Solar Shares).
- Develop rules needed for the development of electricity storage technologies.
- Adopt a zero net energy (ZNE) standard for residential buildings by 2018/2019, and for commercial buildings by 2030.
- Through a public process, evaluate and set targets for the electrification of space and water heating in residential and commercial buildings and cleaner heating fuels that will result in GHG reductions, and identify actions that can be taken to spur market transformation in the 2021-2030 period.
- Expand the State Low-Income Weatherization Program (LIWP) to continue to improve energy efficiency and weatherize existing residential buildings, particularly for low-income individuals and households.
- Decrease usage of fossil natural gas through a combination of energy efficiency programs, fuel switching, and the development and use of renewable gas in the residential, commercial, and industrial sectors.
- Accelerate the deployment of heat pumps and the replacement of diesel generators.
- Consider enhanced energy efficiency (high efficiency air conditioners, light-emitting diode (LED) lamps, efficiency improvements in industrial process cooling and refrigeration, efficient street lighting).
- Promote programs to support third-party delivered energy efficiency projects.
- Per AB 33 (Quirk, Chapter 680, Statutes of 2016), consider large-scale electricity storage.
- Support more compact development patterns to promote reduced per capita energy demand (see the Transportation sector for specific policy recommendations).

Industry

California's robust economy, with the largest manufacturing sector in the United States, is supported by a variety of sub-industrial sectors, some of which include cement plants, refineries, food processors, paper products, wineries, steel plants, and industrial gas, entertainment, technology and software, aerospace, and defense companies. Together, industrial sources account for approximately 21 percent of the State's GHG emissions—almost equal to the amount of GHG emissions from the energy sector. Emissions in this sector are mainly due to fuel combustion and, in some industries, process-related emissions. Changes in this sector strongly correlate with changes in the overall economy. For example, housing and construction growth usually increases demand for cement. Moving toward a cleaner economy and ensuring we meet the statewide targets requires us to address GHG emissions in this sector, which has the potential to provide local co-benefits in criteria pollutant and toxic air contaminant reductions in immediate surrounding locations, especially in vulnerable communities. At the same time, we must ensure there is a smooth path to a cleaner future to support a resilient and robust economy with a strong job force, including training opportunities for workers in disadvantaged communities, while continuing to support economic growth in existing and new industries.

Greenhouse gas emissions in the Industrial sector have remained relatively flat for the last few years while the State's economy has continued to grow, meaning the GHG emissions to produce each dollar of gross standard product is decreasing. Manufacturing accounts for approximately 10 percent of the gross state product.¹⁷⁶ In 2016, California industry exported \$163.6 billion in merchandise.¹⁷⁷

Policies to address GHG emissions reductions must continue to balance the State's economic well-being with making progress toward achievement of the statewide limits.

As this sector is dominated by combustion-related emissions, policies and measures to supply cleaner fuels and more efficient technology are the key to reducing GHG emissions. Some sectors, such as cement and glass, also have significant process emissions, and it may be more challenging to address those process emissions, as they are related to chemical reactions and processes to meet safety, product-specific, or regulatory standards for the final products. Another important aspect for this sector is its role as the State transitions to a cleaner future. Infrastructure, including existing facilities and new facilities, can support the production of new technology to bolster the State's efforts to address GHGs. For example, existing refineries have an opportunity to move away from fossil fuel production and switch to the production of biofuels and clean technology. As the State works to double energy efficiency in existing buildings, there will be an increased demand for efficient lighting fixtures, building insulation, low-e¹⁷⁸ coatings for existing windows, or new windows—goods which could be produced in California. The predominant paths to reducing GHG emissions for the Industrial sector are: fuel switching, energy efficiency improvements, and process modifications. Carbon capture and sequestration also offers a potential new, long-term path for reducing GHGs for large stationary sources.

Relocation of production to outside the State would also reduce emissions, but this is disadvantageous for a couple of reasons and efforts are needed to avoid this outcome. First, AB 32 requires the State's climate policies to minimize emissions leakage, and relocation would shift GHG emissions outside of the State without the benefit of reducing pollutants that contribute to overall global warming impacts. Second, it could also reduce the availability of associated jobs and could impact a local tax base that supports local services such as public transportation, emergency response, and social services, as well as funding sources critical to protecting the natural environment and keeping it available for current and future generations.

Even while we continue to seek further GHG reductions in the sector, it is important to recognize the State has a long history of addressing health-based air pollutants in this sector. Many of the actions for addressing criteria pollutants and toxic air contaminants in the industrial sector are driven by California's local air district stationary source requirements to ensure progress toward achieving State and national ambient air quality standards. Some of those actions, such as use of Best Available Control Technology, have resulted in co-benefits in the form of GHG reductions. The State must continue to strengthen its existing criteria and toxic air pollutant programs and relationships with local air districts to ensure all Californians have healthy, clean air. This is especially true in disadvantaged communities.

AB 32 directed CARB to take several actions to address GHG emissions, such as early action measures, GHG reporting requirements for the largest GHG sources, and other measures. In response, the State adopted multiple measures and regulations, including regulations for high global warming potential (high-GWP) gases used in refrigeration systems and the semiconductor industry.¹⁷⁹ These regulations apply to specific GHGs and types of equipment that can be found across the economy. For example, high-GWP gases are found in refrigeration systems in large food processing plants and chemical and petrochemical facilities, among others.¹⁸⁰

The State has also adopted the first in the world economy-wide cap-and-trade program that applies to all large industrial GHG emitters, imported electricity, and fuel and natural gas suppliers. As discussed in Chapters 2 and 3, the Cap-and-Trade Program is a key element of California's GHG reduction strategy. The

176 <http://www.investopedia.com/articles/investing/011416/californias-economy-9-industries-driving-gdp-growth.asp>

177 U.S. Department of Commerce. International Trade Administration. 2017. California Exports, Jobs, & Foreign Investment. www.trade.gov/mas/ian/statereports/states/ca.pdf

178 Low-e coatings reduce the emissivity, or heat transfer, from a window to improve its insulating properties.

179 CARB. Refrigerant Management Program. www.arb.ca.gov/cc/rmp/rmp.htm

180 The U.S. Environmental Protection Agency (U.S. EPA) has also enacted regulations to reduce hydrofluorocarbon (HFC) emissions by prohibiting high-GWP refrigerants in new retail food refrigeration equipment and in chillers used for large air-conditioning applications. On the international level, the European Union F-gas regulations went into effect January 1, 2015. Those regulations prohibit high-GWP HFCs in new equipment and require a gradual phasedown in the production and import of HFCs. A similar HFC phasedown that would take place globally was the subject of international negotiations during the Montreal Protocol meeting in Rwanda in October, 2016. Those negotiations resulted in an agreement that will phase down the use of HFCs and put the world on track to avoid nearly 0.5°C of warming by 2100.

Cap-and-Trade Program establishes a declining limit on major sources of GHG emissions, and it creates a powerful economic incentive for major investment in cleaner, more efficient technologies. The Cap-and-Trade Program applies to emissions that cover about 85 percent of the State's GHG emissions. CARB creates allowances equal to the total amount of permissible emissions (i.e., the "cap") over a given compliance period. One allowance equals one metric ton of GHG emissions. Fewer allowances are created each year, thus the annual cap declines and statewide emissions are reduced over time. An increasing annual auction reserve (or floor) price for allowances and the reduction in annual allowance budgets creates a steady and sustained pressure for covered entities to reduce their GHGs. All covered entities in the Cap-and-Trade Program are still subject to the air quality permit limits for criteria and toxic air pollutants.

The Cap-and-Trade Program is designed to achieve the most cost-effective statewide GHG emissions reductions; there are no individual or facility-specific GHG emissions reductions requirements. Each entity covered by the Cap-and-Trade Program has a compliance obligation that is set by its GHG emissions over a compliance period, and entities are required to meet that compliance obligation by acquiring and surrendering allowances in an amount equal to their compliance obligation. Companies can also meet a limited portion of their compliance obligation by acquiring and surrendering offset credits, which are compliance instruments that are based on rigorously verified emissions reductions that occur from projects outside the scope of the Cap-and-Trade Program. Like allowances, each offset credit is equal to one metric ton of GHG emissions. The program began in January 2013 and achieved a near 100 percent compliance rate for the first compliance period (2013–2014). Reported and verified emissions covered by the Cap-and-Trade Program have been below the cap throughout the first years of the Program.¹⁸¹

Allowances are issued by CARB and distributed by free allocation and by sale at auctions. CARB also provides for free allocation to some entities covered by the Program to address potential trade exposure due to the cost of compliance with the Program and address concerns of relocation of production out-of-state and resulting emissions leakage. Offset credits are issued by CARB to qualifying offset projects. Secondary markets exist where allowances and offset credits may be sold and traded among Cap-and-Trade Program participants. Facilities must submit allowances and offsets to match their annual GHG emissions. Facilities that emit more GHG emissions must surrender more allowances or offset credits, and facilities that can cut their emissions need to surrender fewer compliance instruments. Entities have flexibility to choose the lowest-cost approach to achieving program compliance; they may purchase allowances at auction, trade allowances and offset credits with others, take steps to reduce emissions at their own facilities, or utilize a combination of these approaches. Proceeds from the sale of State-owned allowances at auction are placed into the Greenhouse Gas Reduction Fund.

It is important to note that while the Cap-and-Trade Program is designed to reduce GHGs for the industrial sector, there are recommendations from the EJAC (or Committee) for the State to pursue more facility-specific GHG reduction measures to achieve potential local air quality co-benefits, and AB 197 directs CARB to prioritize direct reductions at large stationary sources. The Committee has expressed a strong preference to forgo the existing Cap-and-Trade Program and rely on prescriptive facility level regulations.

We agree with the EJAC that more can and should be done to reduce emissions of criteria pollutants and toxic air contaminants. These pollutants pose air quality and related health issues to the communities adjacent to the sources of industrial emissions. Further, many of these communities are already disadvantaged and burdened by a variety of other environmental stresses. As described in Chapter 3, however, there is not always a direct correlation between emissions of GHGs, criteria pollutants, and toxic air contaminants. Also, relationships between these pollutants are complex within and across industrial sectors. The solution, therefore, is not to do away with or change the regulation of GHGs through the Cap-and-Trade Program to address these legitimate concerns; instead, consistent with the direction in AB 197 and AB 617, State and local agencies must evaluate and implement additional measures that directly regulate and reduce emissions of criteria and toxic air pollutants through other programs.

181 CARB. 2016. Mandatory Greenhouse Gas Emissions Reporting. www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Increase energy efficiency.
- Reduce fossil fuel use.
- Promote and support industry that provides products and clean technology needed to achieve the State's climate goals.
- Create market signals for low carbon intensity products.
- Maximize air quality co-benefits.
- Support a resilient low carbon economy and strong job force.
- Make California the epicenter for research, development, and deployment of technology needed to achieve a near-zero carbon future.
- Increase in-State recycling manufacturing.

Cross-Sector Interactions

There are clear, direct relationships between the industrial sector and other sectors that go beyond the economic support that a strong economy provides. For instance, this sector could increase its use of renewable fuels such as biomethane, which would be sourced from landfills or dairies. Additionally, some industries could shift from raw materials to recycled materials to reduce waste and reduce GHG emissions associated with processing of raw materials. Further, addressing energy efficiency could reduce onsite heating, water, and fuel demand. Moreover, supporting mass-transit or ride share programs for employees would reduce VMT. Finally, upgrading existing facilities or repurposing existing infrastructure instead of constructing new facilities or infrastructure would support land conservation and smart growth goals.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures

- At the October 2016 annual Montreal Protocol Meeting of Parties in Kigali, Rwanda, an international amendment to globally phase down HFC production was agreed upon by more than 150 countries. Depending on the level of future HFC emissions reductions expected for California from the Kigali Agreement, California may also: (1) consider placing restrictions on the sale or distribution of refrigerants with a GWP > 2,500, and (2) consider prohibiting refrigerants with a GWP >= 150 in new stationary refrigeration equipment and refrigerants with a GWP >= 750 for new stationary air-conditioning equipment. At the time the SLCP Strategy was finalized, U.S. EPA was expected to continue implementing certain HFC reductions under its Significant New Alternatives Policy (SNAP). Recent litigation may result in CARB implementing similar measures as state law instead.
- Develop a regulatory monitoring, reporting, verification, and implementation methodology for the implementation of carbon capture and sequestration projects.
- Implement the CARB Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities to reduce fugitive methane emissions from storage and distribution infrastructure.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program.
- Continue and strategically expand research and development efforts to identify, evaluate, and help deploy innovative strategies that reduce GHG emissions in the industrial sector.
- Promote procurement policies that prioritize low carbon production to delivery options, including at the State and local government levels.
- Identify and remove barriers to existing grant funding for onsite clean technology or efficiency upgrades.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Further deploy fuel cells that use renewable fuels or those that generate electricity that is less carbon intensive than the grid.
- Decrease usage of fossil natural gas through a combination of efficiency, fuel switching, and the development and use of renewable gas.
- Partner with California's local air districts to effectively use BARCT to achieve air quality and GHG reduction co-benefits at large industrial sources.
- Evaluate the potential for and promote electrification for industrial stationary sources whose main emissions are onsite natural gas combustion.
- Identify new funding for grants and tariff opportunities for onsite clean technology, efficiency upgrades, diesel generator replacement, or recycling manufacturing technology.
- Develop an incentive program to install low-GWP refrigeration systems in retail food stores.
- Evaluate and design additional mechanisms to further minimize emissions leakage in the Cap-and-Trade Program (e.g., border carbon adjustment).

Transportation Sustainability

California's population is projected to grow to 50 million people by 2050. How and where the State grows will have important implications for all sectors of the economy, especially the transportation sector. Supporting this growth while continuing to protect the environment, developing livable and vibrant communities, and growing the economy is dependent on transitioning the State's transportation system to one powered by ZEVs (including PHEVs, BEVs, and FCEVs) and low carbon fuels. It must also offer other attractive and convenient low carbon transportation choices, including safe walking and bicycling, as well as quality public transportation. Investments should consider California's diverse communities and provide accessible and clean travel options to all while drastically reducing reliance on light-duty combustion vehicles.

The transportation system in California moves people between home, work, school, shopping, recreation, and other destinations, and connects ports, industry, residential communities, commercial centers, educational facilities, and natural wonders.¹⁸² California's vast transportation system includes roads and highways totaling more than 175,000 miles and valued at approximately \$1.2 trillion, 500 transit agencies, 245 public-use airports, 12 major ports, and the nation's first high-speed rail system, now under construction.¹⁸³ Transportation infrastructure also includes sidewalks, bicycle paths, parking, transit stations and shelters, street trees and landscaping, signage, lighting, and other elements that affect the convenience, safety, and accessibility of transportation choices. Increasingly, technologies such as real-time, web- and mobile-enabled trip planning and ride-sourcing services are changing how people travel. In the near future, automated and connected vehicles, and unmanned aerial systems (e.g., drones) are expected to be part of our transportation landscape and to transform the way that people and freight are transported. Responsibility for the transportation system is spread across State, regional, and local levels.

Through effective policy design, the State has an opportunity to guide technology transformation and influence investment decisions with a view to mitigate climate and environmental impacts while promoting economic opportunities and community health and safety. The network of transportation technology and infrastructure, in turn, shapes and is shaped by development and land use patterns that can either support or detract from a more sustainable, low carbon, multi-modal transportation future. Strategies to reduce GHG emissions from the transportation sector, therefore, must actively address not only infrastructure and technology, but also coordinated strategies to achieve development, conservation, and land use patterns that align with the State's GHG and other policy goals.

Transportation also enables the movement of freight such as food, building materials, and other consumable products, as well as waste and recyclables. The California freight system includes myriad equipment and

¹⁸² Caltrans. California Transportation Plan 2040, February 2016.

¹⁸³ Ibid.

facilities,¹⁸⁴ and is the most extensive, complex, and interconnected system in the country, with approximately 1.5 billion tons of freight valued at \$2.8 trillion shipped in 2015 to, through, and within California.¹⁸⁵ Freight-dependent industries accounted for over \$740 billion of California's GDP and over 5 million California jobs in 2014.^{186, 187}

Transportation has a profound and varied impact on individuals and communities, including benefits such as economic growth, greater accessibility, and transport-related physical activity, and adverse consequences such as GHG emissions, smog-forming and toxic air pollutants, traffic congestion, and sedentary behaviors. The sector is the largest emitter of GHG emissions in California. Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions (e.g., chronic obstructive pulmonary disease, or COPD), low-income communities, and communities of color.^{188, 189, 190, 191, 192} Importantly, transportation costs are also a major portion of most Californian's household budgets.¹⁹³ Additionally, dependence on cars has a direct impact on levels of physical activity, which is closely linked to multiple adverse health outcomes.

Fortunately, many measures that reduce transportation sector GHG emissions simultaneously present opportunities to bolster the economy, enhance public health, revitalize disadvantaged communities, strengthen resilience to disasters and changing climate, and improve Californians' ability to conveniently access daily destinations and nature. These opportunities are particularly important for those who are not able to, or cannot afford to, drive. In addition, a growing market demand for walkable, bikeable, and transit-accessible communities presents a significant opportunity to shift California's transportation systems toward a lower-carbon future while realizing significant public health benefits through increased levels of physical activity (e.g., walking and bicycling). In fact, transport-related physical activity could result in reducing risks from chronic diseases such as cardiovascular disease, diabetes, certain cancers, and more, to such an extent that it would rank among the top public health accomplishments in modern history, and help to reduce the billions of dollars California spends each year to treat chronic diseases. Just as California was the first to mitigate the contribution of cars and trucks to urban smog, it is leading the way toward a clean, low carbon, healthy, interconnected, and equitable transportation system.

Continuing to advance the significant progress already underway in the areas of vehicle and fuel technology is critical to the transportation sector strategy and to reducing GHG emissions in the transportation sector. The rapid technological and behavioral changes underway with automated and connected vehicles, unmanned aerial systems, and ride-sourcing services are redefining the transportation sector, and should be part of the solution for a lower carbon transportation sector. It is critical to support and accelerate progress on transitioning to a zero carbon transportation system, while ensuring VMT reductions are still achieved. The growing severity of climate impacts, persistent public health impacts and costs from air pollution,¹⁹⁴ and rapid technology progress that supports the expectation that cost parity between some ZEVs and comparable internal combustion vehicles will be attained in a few years, underscores the need for further

184 The freight system includes trucks, ocean-going vessels, locomotives, aircraft, transport refrigeration units, commercial harborcraft and cargo handling, industrial and ground service equipment used to move freight at seaports, airports, border crossings, railyards, warehouses, and distribution centers.

185 U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration. Freight Analysis Framework, V 4.1, 2016.

186 U.S. Department of Commerce, Bureau of Economic Analysis. Regional Economic Accounts. Available at: www.bea.gov/regional/index.htm, accessed March 11, 2016.

187 State of California Employment Development Department. Labor Market Information by California Geographic Areas. Available at: www.labormarketinfo.edd.ca.gov/geography/lmi-by-geography.html, accessed March 21, 2016.

188 CARB. May 2016. Mobile Source Strategy. Available at: www.arb.ca.gov/planning/sip/2016sip/2016mobsrsc.pdf

189 Hoek, G., Krishnan, R. M., Beelen, R., Peters, A., Ostro, B., Brunekreef, B., and Kaufman, J. D. 2013. Long-term air pollution exposure and cardio-respiratory mortality: a review. *Environmental Health*, 12(1), 1.

190 Friedman, M. S., K. E. Powell, L. Hutwagner, L. M. Graham, and W. G. Teague. 2001. "Impact of changes in transportation and commuting behaviors during the 1996 Summer Olympic Games in Atlanta on air quality and childhood asthma." *JAMA* 285(7), 897-905.

191 Bell, M. L., and K. Ebisu. 2012. "Environmental inequality in exposures to airborne particulate matter components in the United States." *Environmental Health Perspectives* 120(12), 1699.

192 Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. "Understanding the cumulative impacts of inequalities in environmental health: implications for policy." *Health Affairs* 30(5), 879-887.

193 H + T® Index website. htaindex.cnt.org/

194 For example, a recent report by the American Lung Association estimates the costs of climate and air pollution from passenger vehicles in California to be \$15 billion annually. Holmes-Gen, B. and W. Barrett. 2016. Clean Air Future – Health and Climate Benefits of Zero Emission Vehicles. American Lung Association in California, October.

action on ZEVs. Therefore, CARB is signaling the need for additional policy and technical support on strategies to move toward a goal of achieving 100 percent ZEV sales in the light-duty vehicle sector. Austria, Germany, India, Netherlands, and Norway are all taking steps to, or have indicated a desire to, move to 100 percent ZEV sales in the 2020–2030 time frame.

In addition, policies that maximize the integration of electrified rail and transit to improve reliability and travel times, increase active transportation such as walking and bicycling, encourage use of streets for multiple modes of transportation, improve freight efficiency and infrastructure development, and shift demand to low carbon modes will need to play a greater role as California strives to achieve its 2030 and 2050 climate targets.¹⁹⁵

The State’s rail modernization program has identified critical elements of the rail network where improvements, either in timing of service or infrastructure, provide benefits across the entire statewide network, furthering the attractiveness of rail for a range of trip distances.¹⁹⁶ The State also uses the Transit and Intercity Rail Capital Program (TIRCP) and Low Carbon Transit Operations Program (LCTOP) to provide grants from GGRF to fund transformative improvements modernizing California’s intercity, commuter, and urban rail systems, as well as bus and ferry transit systems, to reduce emissions of GHGs by reducing congestion and VMT throughout California. As the backbone of an electrified mass-transportation network for the State, the high-speed rail system catalyzes and relies on focused, compact, and walkable development well-served by local transit to funnel riders onto the system and provide alternative options to airplanes and automobiles for interregional travel. Concentrated development, such as that incentivized by the Affordable Housing and Sustainable Communities (AHSC) grant program, can improve ridership and revenue for the system while providing vibrant communities for all.

At the same time, more needs to be done to fully exploit synergies with emerging mobility solutions like ride-sourcing and more effective infrastructure planning to anticipate and guide the necessary changes in travel behavior, especially among millennials. Uniquely, high-speed rail affects air-miles traveled, diverting, at minimum, 30 percent of the intrastate air travel market in 2040.¹⁹⁷

While most of the GHG reductions from the transportation sector in this Scoping Plan will come from technologies and low carbon fuels, a reduction in the growth of VMT is also needed. VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State’s 2030 and 2050 goals.

At the time of this writing, adoption of the first round of SCSs by MPOs is complete, and the second round of SCS planning is underway. Three MPO regions are in the very early stages of developing their third SCSs. To date, CARB staff reviewed the final determinations of 16 MPOs, and concluded that all 16 of those SCSs would achieve their targets, if implemented, with many of the MPOs indicating that they expect to exceed their targets. CARB staff recognizes the very strong performance in this first round of SCSs as a major success. Currently adopted sustainable communities strategies achieve, in aggregate, a 17 percent reduction in statewide per capita GHG emissions relative to 2005 by 2035.

Since 2014, CARB has been working with MPOs and other stakeholders to update regional SB 375 targets. At the same time, CARB has also conducted analysis for development of the Mobile Source Strategy and Scoping Plan that identifies the need for statewide per capita greenhouse gas emissions reductions on the order of 25 percent by 2035, to meet our climate goals. Many MPOs have identified challenges to incorporating additional strategies and reducing emissions further in their plans, principally tied to the need for additional and more flexible revenue sources. MPOs have submitted target update recommendations to CARB that in aggregate maintains a 17 percent reduction statewide, which includes commitments of 18 percent reduction by 2035 from each of the four largest MPOs in the State.

CARB is currently reviewing each MPOs target update recommendations alongside new State policies. State agencies have been working on new State-level VMT-related Policies and Measures (see Table 17) as part of this Scoping Plan intended to provide the State, MPOs, and local agencies with additional funding resources and tools to successfully meet the State’s climate goals. CARB’s preliminary review indicates that new State-level policies and measures will help support updated SB 375 targets that achieve up to 20 percent of the

195 Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. “Understanding the cumulative impacts of inequalities in environmental health: Implications for policy.” *Health Affairs* 30(5), 879–887.

196 California State Transportation Agency. 2016. 2018 California State Rail Plan factsheet and TIRCP fact sheet.

197 California High-Speed Rail Authority. 2016. 2016 Business Plan. Ridership and Revenue Forecast.

needed statewide reduction, as well as help bridge the remaining VMT growth reduction gap.

Discussions among a broad suite of stakeholders from transportation, the building community, financial institutions, housing advocates, environmental organizations, and community groups are needed to begin the process to pursue and develop the needed set of strategies to ensure that we can achieve necessary VMT reductions, and that the associated benefits are shared by all Californians. Appendix C further details potential actions for discussion that can be taken by State government, regional planning agencies, and local governments, to achieve a broad, statewide vision for more sustainable land use and close the VMT gap.¹⁹⁸

At the State level, a number of important policies are being developed. Governor Brown signed Senate Bill 743 (Steinberg, Chapter 386, Statutes of 2013), which called for an update to the metric of transportation impact in CEQA. That update to the CEQA Guidelines is currently underway. Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375. The State can provide guidance and tools to assist local governments in achieving those objectives.

Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Vibrant Communities and Landscapes / VMT Reduction Goals

- Implement and support the use of VMT as the metric for determining transportation impacts under CEQA, in place of level of service (LOS).
- Promote all feasible policies to reduce VMT, including:
 - Land use and community design that reduce VMT,
 - Transit oriented development,
 - Complete street design policies that prioritize transit, biking, and walking, and
 - Increasing low carbon mobility choices, including improved access to viable and affordable public transportation and active transportation opportunities.
- Complete the construction of high-speed rail integrated with enhanced rail and transit systems throughout the State.
- Promote transportation fuel system infrastructure for electric, fuel-cell, and other emerging clean technologies that is accessible to the public where possible, and especially in underserved communities, including environmental justice communities.
- Increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use.
- Promote potential efficiency gains from automated transportation systems and identify policy priorities to maximize sustainable outcomes from automated and connected vehicles (preferably ZEVs), including VMT reduction, coordination with transit, and shared mobility, and minimize any increase in VMT, fossil fuel use, and emissions from using automated transportation systems.
- Promote shared-use mobility, such as bike sharing, car sharing and ride-sourcing services to bridge the “first mile, last mile” gap between commuters’ transit stops and their destinations.
- Continue research and development on transportation system infrastructure, including:
 - Integrate frameworks for lifecycle analysis of GHG emissions with life-cycle costs for pavement and large infrastructure projects, and
 - Health benefits and costs savings from shifting from driving to walking, bicycling, and transit use.
- Quadruple the proportion of trips taken by foot by 2030 (from a baseline

¹⁹⁸ CARB. Potential State - Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) -- for Discussion. www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

- of the 2010–2012 California Household Travel Survey).
- Strive for a nine-fold increase in the proportion of trips taken by bicycle by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).
- Strive, in passenger rail hubs, for a transit mode share of between 10 percent and 50 percent, and for a walk and bike mode share of between 10 percent and 15 percent.

Vehicle Technology Goals

- Through a strong set of complementary policies—including reliable incentives, significant infrastructure investment, broad education and outreach, and potential regulation—aim to reach 100 percent ZEV sales in the light-duty sector (PHEVs, BEVs, and FCEVs) by 2050.
- Make significant progress in ZEV penetrations in non-light-duty sectors.
- Deploy low-emission and electrified rail vehicles.

Clean Fuels Goals

- Electrify the transportation sector using both electricity and hydrogen.
- Promote research development and deployment of low carbon fuels such as renewable gas, including renewable hydrogen.
- Rapidly reduce carbon intensity of existing liquid and gaseous transportation fuels.

Sustainable Freight Goals

- Increase freight system efficiency of freight operations at specific facilities and along freight corridors such that more cargo can be moved with fewer emissions.
- Accelerate use of clean vehicle and equipment technologies and fuels of freight through targeted introduction of zero emission or near-zero emission (ZE/NZE) technologies, and continued development of renewable fuels.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects in the freight sector.
- Accelerate use of clean vehicle, equipment, and fuels in freight sector through targeted introduction of ZE/NZE technologies, and continued development of renewable fuels. This includes developing policy options that encourage ZE/NZE vehicles on primary freight corridors (e.g., Interstate-710); examples of such policy options include a separated ZE/NZE freight lane, employing market mechanisms such as favorable road pricing for ZE/NZE vehicles, and developing fuel storage and distribution infrastructure along those corridors.

Cross-Sector Interactions

The transportation sector has considerable influence on other sectors and industries in the State. California's transportation sector is still primarily powered by petroleum, and to reduce statewide emissions, California must reduce demand for driving; continue to reduce its gasoline and diesel fuel consumption; diversify its transportation fuel sources by increasing the adoption of low- and zero-carbon fuels; increase the ease and integration of the rail and transit networks to shift travel mode; and deploy ZE/NZE vehicles.

As California's population continues to increase, land use patterns will directly impact GHG emissions from the transportation sector, as well as those associated with the conversion and development of previously undeveloped land. Specifically, where and how the State population grows will have implications on distances traveled and tailpipe emissions; as well as on secondary emissions from the transportation sector, including emissions from vehicle manufacturing and distribution, fuel refining and distribution, demand for new infrastructure (including roads, transit, and active transportation infrastructure), demand for maintenance and upkeep of existing infrastructure. Conversion of natural and working lands further affects emissions, with the attendant impacts to food security, watershed health, and ecosystems. Less dense development also demands higher energy and water use. With the exception of VMT reductions, none of these secondary emissions are currently accounted for in the GHG models used in this Scoping Plan, but are nonetheless important considerations. Additionally, compact, lower-VMT future development patterns are essential to achieving public health, equity, economic, and conservation goals, which are also not modeled but are important co-benefits of the overall transportation sector strategy. For example, high-speed rail station locations were identified in downtown areas to reinforce existing city centers.

Achieving LCFS targets and shifting from petroleum dependence toward greater reliance on low carbon fuels also has the potential to affect land use in multiple ways. For example, increased demand for conventional biofuels could require greater use of land and water for purpose-grown crops, which includes interactions with the agricultural and natural and working lands sectors. On the other hand, continuing growth in fuels from urban organic waste, as well as waste biomass such as composting residues, by-processing residues and agricultural waste and excess forest biomass acts to alleviate the pressure on croplands to meet the need for food, feed, and fuel. Likewise, captured methane from in-vessel digestion, landfills or dairy farms for use in vehicles requires close interaction with the waste and farming sectors.

Also, as more electric vehicles and charging stations are deployed, drivers' charging behavior will affect the extent to which additional electric generation capacity and ancillary services are needed to maintain a reliable grid and accommodate a portfolio of 50 percent renewable electricity by 2030. Charging control and optimization technologies will determine how well integrated the electric and transportation sectors can become, including, for instance, the widespread use of electric vehicles as storage for excess renewable generation, vehicle to grid, smart charging, and/or smart grid. The GHG emissions intensity of electricity affects the GHG savings of fuel switching from petroleum-based fuels to electricity; the cleaner the electric grid, the greater the benefits of switching to electricity as a fuel. Similar to electric vehicles, hydrogen fuel cell electric vehicles have zero-tailpipe emissions and can mitigate GHGs and criteria pollutants. Greenhouse gas emissions could be further reduced with the use of renewable hydrogen, which can be produced using renewable electricity or renewable natural gas.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for the transportation sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Vibrant Communities and Landscapes / VMT Reduction Goals

- Mobile Source Strategy – 15 percent reduction in total light-duty VMT from the BAU in 2050 (with measures to achieve this goal not specified; potential measures identified in Appendix C).
- Work with regions to update SB 375 Sustainable Communities Strategies targets for 2035 to better align with the 2030 GHG target and take advantage of State rail investments.
- Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward the goal of reducing total light-duty VMT by 15 percent from expected levels in 2050, but alone will not provide all of the VMT reductions that will be needed. The gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals needs to be addressed through additional VMT reduction measures such as those mentioned in Appendix C.
- Implement and support the adoption and use of VMT as the CEQA metric of transportation impact, such that it promotes GHG reduction, the development of multimodal transportation networks, and a diversity of land uses.
- Continue to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in the document "Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) – for Discussion"¹⁹⁹ – included in Appendix C – through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities, with a focus on:
 - Accelerating equitable and affordable transit-oriented and infill development through new and enhanced financing and policy incentives and mechanisms,
 - Promoting stronger boundaries to suburban growth through enhanced support for sprawl containment mechanisms such as urban growth boundaries and transfer of development rights programs,
 - Identifying performance criteria for transportation and other infrastructure investments

¹⁹⁹ Refers to the document discussed at the September 2016 Public Workshop on the Transportation Sector to Inform Development of the 2030 Target Scoping Plan Update, also available at: www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

- to ensure alignment with GHG reduction goals and other State policy priorities and expand access to transit, shared mobility, and active transportation choices,
- Promoting efficient development patterns that maximize protection of natural and working lands,
 - Developing pricing mechanisms such as road user/VMT-based pricing, congestion pricing, and parking pricing strategies,
 - Reducing congestion and related GHG emissions through commute trip reduction strategies, and
 - Programs to maximize the use of alternatives to single-occupant vehicles, including bicycling, walking, transit use, and shared mobility options.
- Finalize analysis of the results of the pilot road usage charge program, implemented pursuant to SB 1077 (DeSaulnier, Chapter 835, Statutes of 2014), and evaluate deployment of a statewide program.
 - Continue promoting active transportation pursuant to SB 99 (Committee on Budget and Fiscal Review, Chapter 359, Statutes of 2013) – The Active Transportation Program and beyond.
 - Continue to build high-speed rail and broader statewide rail modernization pursuant to the funding program in SB 862 (Committee on Budget and Fiscal Review, Chapter 36, Statutes of 2014) and other sources.
 - Encourage use of streets for multiple modes of transportation (including public transit and active transportation, such as walking and bicycling), and for all users, including the elderly, young, and less able bodied, pursuant to AB 1358 (Leno, Chapter 657, Statutes of 2008) – Complete Streets policies.
 - Support and assist local and regional governments, through technical assistance, and grant and other local assistance programs, to develop and implement plans that are consistent with the goals and concepts in The Second Investment Plan for Fiscal Years 2016-2017 through 2018-2019²⁰⁰ and its subsequent updates, and Appendix C: Vibrant Communities and Landscapes, including the following:
 - California Climate Investment programs such as Transformative Climate Communities Program, ensuring promotion of GHG reductions from neighborhood-level community plans in disadvantaged communities.
 - AB 2087 (Levine, Chapter 455, Statutes of 2016) – Help local and State agencies apply core investment principles when planning conservation or mitigation projects.
 - High speed rail station area plans.
 - Implementation of updated General Plan Guidelines.
 - Per SB 350, implement the recommendations identified in the Barriers Study to accessing ZE/NZE transportation options for low-income customers and recommendations on how to increase access.²⁰¹ And, track progress towards these actions over time to ensure disadvantaged communities are getting equal access and benefits relative to other parts of the State.
 - Take into account the current and future impacts of climate change when planning, designing, building, operating, maintaining, and investing in State infrastructure, as required under Executive Order B-30-15.

Ongoing and Proposed Measures – Vehicle Technology

- Implement the Cleaner Technology and Fuels Scenario of CARB’s Mobile Source Strategy, which includes:
 - An expansion of the Advanced Clean Cars program, which further increases the stringency of GHG emissions for all light-duty vehicles, and 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030,
 - Phase 1 and 2 GHG regulations for medium- and heavy-duty trucks, and
 - Innovative Clean Transit.
- Periodically assess and promote cleaner fleet standards.
- Deploy ZEVs across all vehicle classes, including rail vehicles, along with the necessary charging infrastructure.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects.
- Collaborate with the U.S. Environmental Protection Agency to promulgate more

200 CARB. January 2016. Cap-and-Trade Auction Proceeds Second Investment Plan: Fiscal Years 2016-17 through 2018-19. Available at: www.arb.ca.gov/cc/capandtrade/auctionproceeds/16-17-updated-final-second-investment-planii.pdf

201 CARB. 2017. Low-Income Barriers Study, Part B: Overcoming Barriers to Clean Transportation Access for Low Income Residents. www.arb.ca.gov/msprog/transoptions/draft_sb350_clean_transportation_access_guidance_document.pdf

stringent locomotives requirements,²⁰² work with California seaports, ocean carriers, and other stakeholders to develop the criteria to incentivize introduction of Super-Low Emission Efficient Ships, and investigate potential energy efficiency improvements for transport refrigeration units and insulated truck and trailer cargo vans.

- Promote research, development, and deployment of new technology to reduce GHGs, criteria pollutants, and toxics.
- Implement a process for intra-state agency and regional and local transportation coordination on automated vehicles to ensure shared policy goals in achieving safe, energy efficient, and low carbon autonomous vehicle deployment that also contribute to VMT reductions.

Ongoing and Proposed Measures – Clean Fuels

- Continue LCFS activities, with increasing stringency of at least 18 percent reduction in carbon intensity (CI).
- Continue to develop and commercialize clean transportation fuels through renewable energy integration goals, tax incentives, research investments, support for project demonstration, public outreach, setting procurement standards, including updating State and local procurement contracts.
- Per SB 1383 and the SLCP Strategy, adopt regulations to reduce and recover methane from landfills, wastewater treatment facilities, and manure at dairies; use the methane as a source of renewable gas to fuel vehicles and generate electricity; and establish infrastructure development and procurement policies to deliver renewable gas to the market.
- Accelerate deployment of alternative fueling infrastructure pursuant to the following:
 - SB 350 – CPUC to accelerate widespread transportation electrification.
 - Executive Order B-16-2012 and 2016 ZEV Action Plan – call for infrastructure to support 1 million ZEVs by 2020.
 - CEC’s Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP).
 - CPUC’s NRG settlement.
 - CALGreen Code provisions mandate installation of PEV charging infrastructure in new residential and commercial buildings.²⁰³
 - IOU electric vehicle charging infrastructure pilot programs.

Ongoing and Proposed Measures – Sustainable Freight

- Implement the California Sustainable Freight Action Plan:
 - 25 percent improvement of freight system efficiency by 2030.
 - Deployment of over 100,000 freight vehicles and equipment capable of zero emission operation, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.

Ongoing and Proposed Measures – California and Transportation Plan

- Update every five years and implement California Transportation Plan.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Develop a set of complementary policies to make light-duty ZEVs clear market winners, with a goal of reaching 100 percent light-duty ZEV sales. This could include the following:
 - Reliable purchase/trade-in incentives for at least 10 years.
 - Dealer incentives for ZEV sales.
 - Policies to ensure operating cost savings for ZEVs relative to internal

²⁰² www.arb.ca.gov/railyard/docs/final_locomotive_petition_and_cover_letter_4_13_17.pdf

²⁰³ Such as raceway and panel capacity to support future installation of electrical vehicle charging stations.

- combustion engines, including low cost electricity.
- Additional investments in charging and ZEV refueling infrastructure.
- A broad and effective marketing and outreach campaign.
- Collaborations with cities to develop complementary incentive and use policies for ZEVs.
- Targeted policies to support ZEV sales and use in low income and disadvantaged communities.
- Develop a Low-Emission Diesel Standard to diversify the fuel pool by incentivizing increased production of low-emission diesel fuels. This standard is anticipated to both displace consumption of conventional diesel with increased use of low-emission diesel fuels, and to reduce emissions from conventional fuels.
- Continue to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in Appendix C through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities, with a focus on the following:
 - Accelerating equitable and affordable transit-oriented and infill development through new and enhanced financing and policy incentives and mechanisms.
 - Promote infrastructure necessary for residential development in existing communities, and ensure any urban growth boundaries are paired with significant infill promotion strategies and removal of infill development barriers.
 - Identifying performance criteria for transportation and other infrastructure investments, to ensure alignment with GHG reduction goals and other State policy priorities, and improve proximity, expanded access to transit, shared mobility, and active transportation choices.
 - Promoting efficient development patterns that maximize protection of natural and working lands.
 - Developing pricing mechanisms such as road user/VMT-based pricing, congestion pricing, and parking pricing strategies.
 - Reducing congestion and related GHG emissions through programs to maximize the use of alternatives to single-occupant vehicles, including bicycling, walking, transit use, and shared mobility options for commute trips.
- Continue to promote research and standards for new and existing technologies to reduce GHGs, including but not limited to:
 - Low rolling resistance tires in the replacement tire market, subject to certification standards that identify tires as low rolling resistance tires or verify emissions reductions and potential fuel savings.
 - Impacts on VMT of car sharing, ride-sourcing, and other emerging mobility options.
 - Driving behaviors that reduce GHG emissions, such as ecodriving training and real-time feedback mechanisms.

Natural and Working Lands Including Agricultural Lands

In his 2015 State of the State address, Governor Brown established 2030 targets for GHG emissions reductions and called for policies and actions to reduce GHG emissions from natural and working lands, including forests, rangelands, farms, wetlands, and soils. The passage of SB 1386 (Wolk, Chapter 535, Statutes of 2015-16) codified this policy and emphasized the important role natural and working lands play in the State's climate strategy. This Scoping Plan focuses renewed attention on California's natural and working lands and the contribution they make to meet the State's goals for carbon sequestration, GHG reduction, and climate change adaptation.

California's natural and working lands encompass a range of land types and uses, including farms, ranches, forests, grasslands, deserts, wetlands, riparian areas, coastal areas and the ocean-- as well as the green spaces in urban and built environments. These resources can be both a source and sink for GHG emissions. Policy in this sector must balance GHG emissions reductions and carbon sequestration with other co-benefits, such as clean air, wildlife and pollinator habitat, strong economies, food, fiber and renewable energy production, and water supply.²⁰⁴

Recent trends indicate that significant pools of carbon from these landscapes risk reversal: over the period 2001–2010 disturbance caused an estimated 150 MMT C loss, with the majority— approximately 120 MMT C—

²⁰⁴ www.sierranevada.ca.gov/our-region/ca-primary-watershed

lost through wildland fire.²⁰⁵ At the same time, energy use, methane, and N₂O emissions from the agricultural sector accounts for eight percent of the emissions in the statewide GHG inventory.

California's climate objective for natural and working lands is to maintain them as a carbon sink (i.e., net zero or negative GHG emissions) and, where appropriate, minimize the net GHG and black carbon emissions associated with management, biomass utilization, and wildfire events. In order to achieve this objective, this Plan directs the continued development of the broad and growing understanding of carbon dynamics on California's landscapes, statewide emission trends, and their responses to different land management scenarios. Further, in order to build a programmatic framework for achieving this long-term objective to maintain California's natural and working lands as a carbon sink, this Plan directs the State to quantify the carbon impacts of both publicly funded (e.g., bonds, special taxes, general fund) climate intervention activities on California's natural and working lands made through existing programs as well as potential regulatory actions on land management. This Plan proposes an intervention based reduction goal of at least 15-20 million metric tons by 2030 as a reasonable beginning point for further discussion and development based on the State's current preliminary understanding of what might be feasible. This Plan recognizes that achieving an initial statewide goal of sequestering and avoiding emissions in this sector by at least 15-20 million metric tons by 2030 through existing pathways and new incentives would provide a crucial complement to the measures described in this Scoping Plan and will inform the development of longer-term natural and working lands goals. Achieving this ambitious climate goal will require collaboration and support from State and local agencies, which must improve their capacity to participate and benefit from State climate programs, and set the path for natural and working lands to help the State meet its long-range climate goals.

Looking to the Future

This section outlines how the State will achieve California's climate objectives to: (1) maintain them as a resilient carbon sink (i.e., net zero or negative GHG emissions), and (2) minimize the net GHG and black carbon emissions associated with management, biomass disposal, and wildfire events to 2030 and beyond.

Implementation will include policy and program pathways, with activities related to land protection; enhanced carbon sequestration; and innovative biomass utilization. The framework for this section is to:

- **Protect** land from conversion to more intensified uses by increasing conservation opportunities and pursuing local planning processes in urban and infrastructure development patterns that avoid greenfield development.
- **Enhance** the resilience of and potential for carbon sequestration on lands through management and restoration, and reduce GHG and black carbon emissions from wildfire and management activities. This enhancement includes expansion and management of green space in urban areas.
- **Innovate** biomass utilization such that harvested wood and excess agricultural and forest biomass can be used to advance statewide objectives for renewable energy and fuels, wood product manufacturing, agricultural markets, and soil health, resulting in avoided GHG emissions relative to traditional utilization pathways. Associated activities should increase the resilience of rural communities and economies.

To accomplish these objectives, the State, led by California Natural Resources Agency (CNRA), California Department of Food and Agriculture (CDFA), California Environmental Protection Agency (CalEPA) and CARB will complete a Natural and Working Lands (NWL) Climate Change Implementation Plan (Implementation Plan) in 2018 to evaluate a range of implementation scenarios for natural and working lands and identify long-term (2050 or 2100) sequestration goals that can be incorporated into future climate policy. The Implementation Plan will:

- Include a projection of statewide emissions under business-as-usual land use and management conditions and alternative scenarios, as well as a listing and quantitative assessment of conservation and management activities the state may pursue to achieve the NWL climate objectives and the statewide goals of at least 15-20 MMTCO₂e emissions sequestering and avoidance from the NWL sector by 2030;
- Identify state departments, boards, conservancies, and CNRA and CDFA programs responsible for meeting the 15-20 MMTCO₂e goal by 2030; and
- Identify methodologies to be used by State programs to account for the

²⁰⁵ www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

GHG impacts of prior state funded land use and management interventions, and to be used to estimate the GHG impacts of future interventions.

While growing trees and other vegetation, as well as soil carbon sequestration, reduce some of the carbon losses measured, climate change itself further stresses many of these systems and affects the ability of California's landscapes to maintain its carbon sink. The State will continue to rely on best available science to support actions and incentives to slow and reverse these trends, in concert with other production and ecological objectives of land use. The Forest Climate Action Team, Healthy Soils Initiative, State Coastal Conservancy's Climate Ready Program, various California Climate Investment programs, and CARB's compliance offset program already undertake portions of this work. As we move towards and maximize the ability of our land base to serve as a carbon sink, it will also be important to strengthen these individual activities through the coordination and aggregation of ecoregional plans that inform these interventions. These and future additional efforts can not only protect California's natural carbon stocks, they can also improve quality of life in urban and rural communities alike and increase the climate resilience of agricultural, forestry, and recreational industries and the rural communities they support; the State's water supply; biodiversity; and the safety and environmental health of all who call California home.

Research and Policy Needs

Research is ongoing across agencies to advance the state of the science on NWL carbon dynamics, including a number of projects within the Fourth Climate Change Assessment, and a compendium of climate research being managed by the CNRA that will be completed in 2018. Additionally, California needs a well-defined reference case, or "business as usual" scenario to set a comprehensive and strategic path forward for California's lands and ocean environments to contribute to the State's climate goals. Finally, efforts must increase to gather, interpret, and unify best available science on the GHG and carbon sequestration impacts of land use and management practices applied across forests, cultivated agricultural lands, rangelands and grasslands, wetlands, coastal and ocean systems, desert ecosystems, and urban and other settled lands.

The Implementation Plan, as summarized above, will utilize the Protect-Enhance-Innovate framework and employ projections for carbon sequestration and GHG emissions from California's land base under reference case and increased management scenarios. The quantitative outputs of these projections, expressed as carbon dioxide equivalents will drive acreage needs for implementation using CO₂e/acre results from multiple modeling efforts. The Implementation Plan will also identify GHG emissions quantification within and across programs and agencies and describe implementation monitoring and emissions inventories.

Natural and Working Lands Inventory

In order to understand how carbon is released and sequestered by natural and working landscapes, CARB has worked extensively with other State agencies, academic researchers and the public to develop a Natural and Working Lands inventory that will guide this process. As with other sectors, the CARB Natural and Working Lands inventory represents a snapshot of emissions in recent years, using a combination of reported and measured data. A time lag exists between the last year of available data and the completion of the inventory to allow time for reporting and processing the data. For emission sources that are hard to individually measure, the CARB inventory estimates emissions based on "surrogates," such as the typical amount of travel on unpaved roads to estimate particulate matter emissions at the county level. The most recent inventory can also be "forecast" to project prevailing conditions in a future year based on rules and programs currently in place – known as a "business as usual projection" - along with scenarios to explore the benefits of further strategies to reduce emissions. Forecasts of business-as-usual and policy scenarios guide planning efforts.

As discussed below, ongoing research into forecasting emissions from Natural and Working Lands includes a project at Lawrence Berkeley National Laboratory funded by CNRA. CARB is monitoring this and other research activities and will incorporate results into a proposed inventory and forecasting methodology for Natural and Working Lands. CARB will solicit public feedback and review on the resulting product prior to completing the first full Natural and Working Lands Inventory by the end of 2018, as called for in SB 859. The Natural and Working Lands Inventory is spatially-resolved, so it can be segmented by county, watershed, or other regional planning areas. This spatial resolution allows local governments and regional organizations to use the inventory, along with more granular location-specific information, to track progress from projects in their jurisdictions.

CARB plans to update the forest component of the Natural and Working Lands inventory to include 2012 GHG emissions estimates, followed by emissions estimates for soil carbon, urban forestry, and croplands by mid-2018. Work currently in progress applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon. California and federal agencies are working with researchers and funding studies to enhance our understanding of the roles of forests and other lands in climate change using rapidly advancing remote sensing technology.^{206, 207}

CALAND Carbon Emissions Model

CNRA is managing the development of a CALAND model through Lawrence Berkeley National Laboratory, which will include a projection of business-as-usual emissions as well as a listing and quantitative assessment of conservation and management activities the State may pursue to achieve at least 15-20 MMT sequestration and GHG avoided emissions from the NWL sector by 2030.

CNRA, along with CARB and CDFA, will establish a formal public engagement process to gather external scientific expertise to inform development and finalization of the CALAND model for use in the Implementation Plan. Development of the Implementation Plan itself will also include a formal public process.

Cross-Sector Interactions

Strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors, most notably at intersections with land use, biomass and waste utilization, energy and water. It will be important for the sector to make critical linkages to other sectors, including energy, transportation fuels, and waste, and develop plans to integrate the natural and working lands sector into existing models, such as PATHWAYS and REMI.

Landowner, local, and regional decisions affect land use development patterns and natural and working land conversion rates; conversely, conservation activities can support infill-oriented regional development and related transportation needs. As discussed earlier in the Transportation Sustainability section, under SB 375, Sustainable Communities Strategies (SCSs) aim to link transportation, housing, and climate policy to reduce per capita GHG emissions while providing a range of other important benefits for Californians. Some SCSs include policies, objectives or implementation measures relating to conservation and land protections, and to urban greening.²⁰⁸ Protecting natural and working lands that are under threat of conversion can promote infill development, reduce VMT, limit infrastructure expansion, and curb associated GHG emissions. An integrated vision for community development, land conservation and management, and transportation is a key component of meeting our transportation and natural and working lands goals.²⁰⁹

Agricultural and commercial forestry operations produce biomass as both an objective (i.e., food and fiber production) and a waste by-product. How this material is utilized can either increase or decrease emissions associated with management and restoration activities, turn waste into usable products, displace fossil fuels used in energy and transportation, and increase carbon stored in durable wood products in the built environment. Finding productive ways to use this material offers new opportunities to reduce GHG emissions, promote carbon sequestration, and generate economic resources for forest, agricultural, and waste sectors and communities. California is investigating ways to transform how organic waste from the agricultural and municipal sectors is managed to meet SLCP emissions reductions targets required by SB 1383,²¹⁰ and to protect public health. Cross-sector synergies and complete waste inter-cycles, discussed further in the Waste Management section, result from conscientious treatment of these resources, including opportunities to improve soil health, increase renewable energy generation, and enhance market support for non-commercial products and waste. Productive utilization of dead and dying trees is a significant focus of the Governor's Tree Mortality Task Force, and efforts to resolve the current shortfall in utilization capacity is addressed in that State of Emergency Declaration as well as in SB 859.

Natural and working lands stewardship is essential to securing the State's water supply along the entire

206 Asner, G. et al. (2015) Progressive forest canopy water loss during the 2012–2015 California drought. PNAS 113.2: E249-E255

207 Battles, J. et al. (in progress) Innovations in measuring and managing forest carbon stocks in California. Project 2C: 4th California Climate Change Assessment. Natural Resources Agency. resources.ca.gov/climate/fourth/

208 Livingston, Adam. Sustainable Communities Strategies and Conservation. January 2016. Available at: www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/sustainable-communities-strategies-and-conservation.pdf

209 www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

210 SB1383 (Lara, Chapter 396, Statutes of 2016) requires a 50 percent reduction in anthropogenic black carbon emissions by 2030.

supply chain, from protection and management of the forested headwaters to preserving the ability of mountain meadows to retain and filter water ensuring flows and habitat in the Delta and its tributaries, end use efficiencies in agricultural and urban uses, and groundwater infiltration and utilization statewide. For example, more efficient water and energy use in farming operations could support GHG emissions reductions goals in the energy sectors. And improving forest health in the Sierra Nevada, Cascades, and other headwaters protects water quality and availability, in alignment with the California Water Action Plan.

Potential Actions to Enhance Carbon Sequestration and Reduce Greenhouse Gases in NWL

While agricultural and forest lands comprise the greatest acreage of NWL statewide, representing significant opportunity for achieving the State's NWL climate goals, actions on all NWL remain critical. The land management strategies and targets included in these sections are illustrative of the types of actions that will be necessary to maintain all of California's NWL and urban green space as a net sink of carbon, and are being used to aid in development of scenario modeling. The Implementation Plan will use this scenario modeling to scope the scale of action needed to ensure resilient future landscapes and identify key areas for advancement.

Agriculture's Role in Emissions Reductions and Carbon Sequestration

In 2030 and 2050, the agricultural sector must remain vibrant and strong. California's agricultural production is critical to global food security. It is also vulnerable to climate change. A study²¹¹ by the University of California concluded that the drought in 2015 cost the state economy \$2.7 billion and 21,000 full time jobs. These losses are expected to ripple through rural communities for another several years. This illustrates the importance of strengthening agriculture while protecting resources and mitigating climate change.

As the State works to meet emissions reductions goals, the agricultural sector can reduce emissions from production, sequester carbon and build soil carbon stocks, and play a role in cross-sectoral efforts to maximize the benefits of natural and working lands.

Climate-smart agriculture is an integrated approach to achieving GHG reductions while also ensuring food security and promoting agricultural adaptation in the face of climate change. Conserving agricultural land, sequestering carbon in agricultural soils, employing a variety of techniques to manage manure on dairies, and increasing the efficiency of on-farm water and energy use are examples of practices that can achieve climate and food production goals across diverse agricultural systems. Climate-smart agriculture can support the Protect, Enhance, and Innovate goals.

Approximately 60 percent of agricultural emissions are methane emissions from the dairy and livestock sectors. Emissions come from the animals themselves, through enteric fermentation, as well as from manure management—especially at dairies. SB 1383 and the resultant SLCP Strategy identify a mix of voluntary, incentive-based, and potential regulatory actions to achieve significant emissions reductions from these sources. A variety of techniques can attain the best results for each specific farming operation; effectively implementing a broad mix of strategies will reduce the GHG emissions from the agricultural sector significantly. CARB and CDFA and other agencies are working together to solicit input from industry, environmental, and community groups to encourage early and meaningful action to reduce emissions from the livestock sector.

Over the last several years, farms have begun to optimize fertilizer applications to protect water quality, maintain high yields, and reduce emissions of N₂O, a greenhouse gas. Farmers are required through the Irrigated Lands Regulatory Program to manage nitrogen fertilizers to protect water quality through the use of nitrogen management plans. Nitrogen management plans are a tool designed to prevent over-applications of nitrogen through an approach that accounts for the nitrogen inputs from water, soil amendments and other sources, and also accounts for nitrogen removed from the field. CDFA's Fertilizer Research and Education Program, in coordination with university researchers and others, has developed fertilization guidelines to optimize the rate, timing and placement of fertilizers for crops that represent more than half of the irrigated agriculture in California. Similarly, innovations in water management and the expansion of high efficiency irrigation methods also are contributing to N₂O reductions.

211 Howitt, Richard E., Duncan MacEwan, Josué Medellín-Azuara, Jay R. Lund, Daniel A. Sumner. 2015. Economic Analysis of the 2015 Drought for California. Davis, CA: Center for Watershed Sciences, University of California – Davis.

California's farms and ranches have the ability to remove carbon from the atmosphere through management practices that build and retain soil organic matter. Adequate soil organic matter ensures the continued soil capacity to function as a vital living ecosystem with multiple benefits, producing food for plants, animals, and humans. The Healthy Soils Initiative, announced by Governor Brown in 2015, offers an opportunity to incentivize the management of farmland for increased carbon sequestration in soil, also augmenting co-benefits including improved plant health and yields, increased water infiltration and retention, reduced sediment erosion and dust, improved water and air quality, and improved biological diversity and wildlife habitat.

SB 859, signed into law in 2016, establishes the Healthy Soils Program at CDFA to provide incentives to farmers. It enables financial support for on-farm demonstration projects that "result in greenhouse gas benefits across all farming types with the intent to establish or promote healthy soils". It defines healthy soils as "soils that enhance their continuing capacity to function as a biological system, increase soil organic matter, improve soil structure and water-and nutrient-holding capacity, and result in net long-term greenhouse gas benefits."

As noted in the Cross-Sector Interactions section, State and local efforts to manage land for carbon sequestration must work in conjunction with existing plans, incentives, and programs protecting California's water supply, agricultural lands, and wildlife habitat. This Scoping Plan fits within a wide range of ongoing planning efforts throughout the State to advance economic and environmental priorities associated with natural and working lands.

The Role of Forests in Emissions Reductions and Carbon Sequestration

Decades of fire exclusion, coupled with an extended drought and the impacts of climate change, have increased the size and intensity of wildfires and bark beetle infestations; exposed millions of urban and rural residents to unhealthy smoke-laden air from wildfires; and threatened progress toward meeting the state's long-term climate goals. Managing forests in California to be healthy, resilient net sinks of carbon is a vital part of California's climate change policy.

More than 100 million trees are dead, and recent wildfires have been among the most destructive and expensive in state history. As many as 15 million acres of California forests are estimated to be unhealthy and in need of some form of restoration, including more than 9 million acres managed by federal land management agencies and 6 million acres of State and privately managed forests.

California's urban forests also face multiple challenges, including drought and invasive exotic insects. Urban forests require maintenance to preserve the multiple values they provide and merit expansion to sequester carbon and secure other benefits to urban dwellers and the State.

The California Forest Carbon Plan (FCP), being developed by the Forest Climate Action Team (FCAT), seeks to establish California's forests as a more resilient and reliable long-term carbon sink, rather than a GHG and black carbon emission source, and confer additional ecosystem benefits through a range of management strategies.²¹² The FCP emphasizes working collaboratively at the watershed or landscape scale to restore resilience to all forestlands in the state.

The current draft of the FCP places carbon sequestration and reducing black carbon and GHG emissions as one set of management objectives in the broader context of forest health and a range of other important forest co-benefits. California will manage for carbon alongside wildlife habitat, watershed protection, recreational access, traditional tribal uses, public health and safety, forest products, and local and regional economic development.

212 <http://www.fire.ca.gov/fcat/>

Federally managed lands play an important role in the achievement of the California climate goals established in AB 32 and subsequent related legislation and plans. Over half of the forestland in California is managed by the federal government, primarily by the USDA Forest Service Pacific Southwest Region, and these lands comprise the largest potential forest carbon sink under one ownership in the state. Several regulatory, policy, and financial challenges have hindered the ability of the Forest Service and Department of Interior agencies (Bureau of Land Management and National Park Service) to increase the pace and scale of restoration needed, such as the current budget structure to fund wildland fire suppression and the procedural requirements of a number of federal environmental and planning statutes. The State of California must continue to work closely and in parallel to the federal government's efforts to resolve these obstacles and achieve forest health and resilience on the lands that federal agencies manage.

Protection of Land and Land Use

California will continue to pursue development and new infrastructure construction patterns that avoid greenfield development, limit conflicts with neighboring land uses, and increase conservation opportunities for NWL to reduce conversion to intensified uses. Success will depend on working through local and regional land use planning and permitting, as well as developing incentives for participation by local governments and individual landowners.

Enhance Carbon Sequestration and Resilience through Management and Restoration

California will increase efforts to manage and restore land to secure and increase carbon storage and minimize GHG and black carbon emissions in a sustainable manner so that the carbon bank is resilient and provides other benefits such as water quality, habitat and recreation.

One tool to demonstrate the potential for greater management and restoration on NWL is the CALAND model. As detailed in the Discussion Draft²¹³ and discussed above, it considers a variety of management and restoration activities employed across the State. Version 1 of the CALAND model considered two potential scenarios, a "low" and a "high" rate of implementation to 2030, with resulting carbon sequestration outcomes to 2050. The acreages given in the "low" scenario all represent feasible implementation on public and private lands beyond current rates for the listed activity, given availability of additional funding and other supporting resources. The "high" scenario represents a more ambitious approach, requiring new programs and policies, including collaboration with federal partners, to support implementation.

The activities presented in the Discussion Draft and Version 2 of CALAND are not inclusive of all activities under this strategy. Modeling will continue beyond finalization of the Scoping Plan. Agencies and modelers will continue to identify and analyze land management and restoration activities to advance the State's climate goals and improvements in modeling projections or other quantification protocols.

Management and restoration activities under consideration to help reduce GHG emissions beyond those identified in initial modeling include, but are not limited to the following:

- Forest fuel reduction treatments, reforestation, other restoration activities, prescribed fire and managed ignition.
- Restoration of mountain meadows, managed wetlands in the Sacramento San Joaquin Delta, coastal wetlands and desert habitat.
- Increasing the extent of eelgrass beds.
- Creation and management of parks and other greenspace in urban areas, including expansion of the existing urban tree canopy.
- Implementation of U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) management practices suitable for California agriculture including those practices identified in the Healthy Soils Incentive Program.
- Compost application to irrigated cropland.

Additional potential tools to encourage these activities include working with the federal government to fund more management on federal lands, mitigating for land conversion (as modeled by the High Speed Rail Authority), and revisiting the Forest Practices Act to enhance carbon sequestration benefits associated with timber production activities.

213 www.arb.ca.gov/cc/scopingplan/2030target_sp_dd120216.pdf

Innovate NWL Waste Utilization Pathways

Excess materials generated by commercial agricultural and forestry operations, biomass and wood harvested through forest health and restoration treatments, and material that is generated in response to Tree Mortality Emergency activities, should be used in a manner that minimizes GHG and black carbon emissions and promotes public and environmental health. The Legislature and Governor Brown set an ambitious goal of 75 percent recycling, composting or source reduction of solid waste in landfills by 2020. The State and stakeholders must develop targeted policies or incentives to support durable markets for all of this diverted material. Market opportunities include production of renewable electricity and biofuels, durable wood products, compost and other soil amendments, animal feed and bedding, and other uses. Research, development, and implementation activities in energy, wood products, waste, and soil amendment fields should be spatially-scaled to better link waste generation with infrastructure development.

The goals of this sector, with the potential to reduce GHGs and complement the measures and policies identified in Chapter 2, are described in Looking to the Future. The development of the Implementation Plan will spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

Waste Management

The Waste Management sector covers all aspects of solid waste²¹⁴ and materials management including reduction/reuse; recycling, and remanufacturing of recovered material; composting and in-vessel (anaerobic and aerobic) digestion; biomass management (chip and grind, composting, biomass conversion); municipal solid waste transformation; and landfilling. This sector also includes market development programs, such as the State's recycled-content product procurement program and a range of grant and loan programs. Data from CalRecycle's report, *2014 Disposal Facility-Based Characterization of Solid Waste in California*, shows that materials, such as organics, that decompose in landfills and generate methane comprise a significant portion of the waste stream. Methane is a potent SLCP with a global warming potential 25 times greater than that of carbon dioxide on a 100-year time horizon and more than 70 times greater than that of carbon dioxide on a 20-year time horizon.²¹⁵

Within CARB's greenhouse gas inventory, emissions from the waste management sector consist of methane and nitrous oxide emissions from landfills and from commercial-scale composting, with methane being the primary contributor to the sector's emissions. The sector emitted 8.85 MMTCO₂e in 2014, comprising approximately 2 percent of the State's GHG emissions.

Emissions from recycling and waste have grown by 19 percent since 2000. The majority of those emissions are attributed to landfills, despite the majority of landfills having gas collection systems in place.²¹⁶ Landfill emissions account for 94 percent of the emissions in this sector, while compost production facilities make up a small fraction of emissions.²¹⁷ The annual amount of solid waste deposited in California landfills grew from 37 million tons in 2000 to its peak of 46 million tons in 2005, followed by a declining trend until 2009 when landfilled solid waste stabilized to relatively constant levels. Landfill emissions are driven by the total waste-in-place, rather than year-to-year fluctuation in annual deposition of solid waste, as the rate and volume of gas produced during decomposition depends on the characteristics of the waste and a number of environmental factors. As a result, waste disposed in a given year contributes to emissions that year and in subsequent years.

In addition to direct emissions, the reduction, reuse, and recycling of waste materials decreases upstream GHG emissions associated with the extraction and processing of virgin materials and their use in production and transport of products. Although many of these upstream GHG emissions happen outside of California, California's waste policies can reduce both local and global GHG emissions and create jobs within the State.

214 In general, the term solid waste refers to garbage, refuse, sludges, and other discarded solid materials resulting from residential activities, and industrial and commercial operations. This term generally does not include solids or dissolved material in domestic sewage or other significant pollutants in water such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

215 Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 2.10.2 Direct Global Warming Potentials. Fourth Assessment Report. www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

216 CARB. 2013. California Greenhouse Gas Inventory for 2000–2013 – by Category as Defined in the 2008 Scoping Draft Plan (based upon IPCC Fourth Assessment Report's Global Warming Potentials).

217 CARB. 2016. 2016 Edition California GHG Emission Inventory. California Greenhouse Gas Emission Inventory: 2000–2014. Version June 17, 2016.

While landfills are an effective and relatively safe way to manage some waste, disposal-centric activities result in squandering valuable resources and generate landfill gases as well as other risks. A large fraction of the organics in the waste stream can be diverted from landfills to composting or digestion facilities to produce beneficial products. Moreover, food waste is the largest component of organics disposed in landfills; a portion of this is edible and should be captured at its source and, for example, provided to food banks to feed people in need. A State waste management sector “loading order” should focus more attention on reducing how much waste we generate and recovering and recycling whatever resources we can, using landfills as a last resort.

Landmark initiatives like the Integrated Waste Management Act of 1989 (AB 939) demonstrate California’s efforts to build communities that consume less, recycle more, and take resource conservation to higher and higher levels. Statewide, Californians achieved a 49 percent recycling rate in 2014, and recycling programs support an estimated 75,000 to 115,000 green jobs in California. If California were to achieve a 75 percent statewide solid waste recycling rate by 2020—a goal set out by the Legislature in AB 341 (Chesboro, Chapter 476, Statutes of 2011)—by recycling and remanufacturing at in-state facilities, the State could potentially generate an additional 100,000 green jobs.²¹⁸ In addition to employment contributions, diversion of organic waste from landfills can generate positive environmental impacts. Compost from organic matter provides soil amendments to revitalize farmland, reduces irrigation and landscaping water demands, contributes to erosion control in fire-ravaged landscapes, and potentially increase long-term carbon storage in rangelands. Production and use of bioenergy in the form of biofuels and renewable natural gas has the potential to reduce dependency on fossil fuels for the transportation sector. For the energy sector, however, renewable natural gas faces safety, feasibility, and cost issues.

The State has a robust waste management system in place, with established programs that reduce air emissions through activities such as gas collection systems from landfills²¹⁹ and stringent recycling mandates. AB 939 required cities and counties to reduce the amount of waste going to landfills by 50 percent in 2000, and municipalities have nearly universally met this mandate. Californians dispose about 30 million tons of solid waste in landfills each year. To further reduce landfilled solid waste, the Legislature adopted AB 341 to achieve more significant waste reductions by setting a goal that 75 percent of solid waste generated be reduced, recycled, or composted by 2020, and by mandating commercial recycling. AB 1826 (Chesboro, Chapter 727, Statutes of 2014) added requirements regarding mandatory commercial organics recycling.

Although solid waste management has evolved over the last 27 years and diversion rates (which include more than recycling) have increased more than six-fold since 1989, if no further changes in policy are made, the State’s growing population and economy will lead to higher amounts of overall disposal along with associated increases in GHG emissions. The pathway to reducing disposal and associated GHG emissions will require significant expansion of the composting, anaerobic digestion, and recycling manufacturing infrastructure in the State.

To help reduce GHG emissions by 40 percent below 1990 levels by 2030 and meet California’s waste reduction goals, California’s waste management sector strives to achieve in-state processing and management of waste generated in California. To carry out this vision, we must work with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction. Packaging comprises approximately 8 million tons of waste landfilled in California annually, or about one quarter of the State’s total disposal stream. To reduce the climate change footprint of packaging, the State is promoting the inclusion of source reduction principles in packaging and product design; fostering recycling and recyclability as a front end design parameter for packaging and products that cannot be reduced; and encouraging recycling markets and market development for recycled-content products and packaging. CalRecycle is developing a packaging policy model containing components necessary for a mandatory comprehensive, statewide packaging program in California; this would need to be legislatively enacted to achieve a packaging reduction goal, such as 50 percent by 2030. CalRecycle is also continuing to work with stakeholder organizations and industry to explore complementary voluntary activities that have the potential to significantly decrease packaging disposal in California. In addition, large-scale shifts in materials management will be necessary, including steps to maximize recycling and diversion from landfills

218 CalRecycle. 2013. AB 341’s 75 Percent Goal and Potential New Recycling Jobs in California by 2020. July. www.calrecycle.ca.gov/Publications/Documents/1463/20131463.pdf

219 CARB approved a regulation to reduce methane from municipal solid waste landfills as a discrete early action measure under AB 32. The regulation became effective June 17, 2010. Additional information is available at: www.arb.ca.gov/regact/2009/landfills09/landfillfinalfro.pdf

and build the necessary infrastructure to support a sustainable, low carbon waste management system within California. Working together, State and local agencies will identify ways to increase the use of waste diversion alternatives and expand potential markets, obtain funds and incentives for building the infrastructure and strengthening markets, and evaluate the need for additional research to achieve California's GHG reduction and waste management goals.

Additional legislation codified since the First Scoping Plan Update outlines new opportunities and requirements to reduce GHG emissions from the waste sector, with a focus on reducing organic waste sent to landfills. SB 605 (Lara, Chapter 523, Statutes of 2014) requires that CARB develop a strategy to reduce SLCPs and SB 1383 requires the strategy to be implemented by January 1, 2018. CARB's recently adopted SLCP Reduction Strategy includes organic waste diversion targets for 2020 and 2025 consistent with SB 1383 to reduce methane emissions from landfills. It requires CalRecycle, in consultation with CARB, to adopt regulations to achieve statewide disposal targets to reduce landfilling of organic waste by: (1) 50 percent from the 2014 level by 2020, and (2) 75 percent from the 2014 level by 2025. Under SB 1383, of the edible food destined for the organic waste stream, not less than 20 percent is to be recovered to feed people in need by 2025. The regulations are to take effect on or after January 1, 2022, and CalRecycle, in consultation with CARB, must analyze the progress that the waste management sector, State government, and local government have made in achieving the 2020 and 2025 goals by July 1, 2020. It is estimated that the combined effect of the food waste prevention and rescue programs and organics diversion from landfills will reduce 4 MMTCO₂e of methane in 2030 (using a 20-year GWP), but one year of waste diversion in 2030 is expected to result in a reduction of 14 MMTCO₂e of emissions over the lifetime of waste decomposition.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Take full ownership of the waste generated in California.
- View waste as a resource and convert waste from all sectors to beneficial uses.
- Develop a sustainable, low carbon waste management system that processes collected waste within California and generates jobs, especially in disadvantaged communities.
- Maximize recycling and diversion from landfills.
- Reduce direct emissions from composting and digestion operations through improved technologies.
- Build the infrastructure needed to support a sustainable, low carbon waste management system within California.
- Increase organics markets which complement and support other sectors.²²⁰
- Capture edible food before it enters the waste stream and provide to people in need.
- Increase production of renewable transportation fuels from anaerobic digestion of waste.
- Recognize the co-benefits of compost application.

Cross-Sector Interactions

The waste management sector interacts with all of the other sectors of the State's economy. Reducing waste, including food waste, is key to reducing the State's overall carbon footprint. Additionally, replacing virgin materials with recycled materials reduces the energy and GHGs associated with the goods we produce and consume.

California leads the United States in agricultural production in terms of value and crop diversity. Soil carbon is the main source of energy for important soil microbes and is key for making nutrients available to plants. Waste-derived compost and other organic soil amendments support the State's Healthy Soils Initiative being implemented by CDFA. In addition, the use of compost to increase soil organic matter in the agricultural sector provides other benefits, including reduced GHG emissions, conserved water, reduced synthetic (petroleum-based) fertilizer and herbicide use, and sequestered carbon.

²²⁰ Examples may include renewable energy (biogas to renewable transportation fuels or electricity); soils (application of organics to agricultural soils for building soil organic matter and conserving water; application of organics to mulch for erosion control; application of organics to rangelands for increased carbon sequestration); and forests (support use of forest residues for erosion control; stabilization of fire-ravaged lands).

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, to move forward with the goals of the waste management sector and achieve the 2030 target, certain actions are recommended to help set the groundwork. These actions affect several broad areas and are necessary for reducing the challenges facing this sector, and they are listed below as supporting actions.

Ongoing and Proposed Measures

- Continue implementation of the Landfill Methane Control Measure.
- Continue implementation of the Mandatory Commercial Recycling Regulation and the Mandatory Commercial Organics Recycling requirements.
- As required by SB 1383:
 - By 2018, CARB will implement the SLCP Strategy.
 - CalRecycle will develop regulations to require 50 percent organic waste diversion from landfills from 2014 levels by 2020 and 75 percent by 2025, including programs to achieve an edible food waste recovery goal of 20 percent below 2016 levels by 2025. The regulations shall take effect on or after January 1, 2022. By July 1, 2020, analyze the progress that the waste sector, State government, and local governments have made in achieving these goals.
 - CEC will develop recommendations for the development and use of renewable gas as part of the 2017 Integrated Energy Policy Report. Based on these recommendations, adopt policies and incentives to significantly increase sustainable production and use of renewable gas.

Potential Additional or Supporting Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Establishing a sustainable State funding source (such as an increased landfill tip fee and new generator charge) for development of waste management infrastructure, programs, and incentives.
- Working with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction.
- Increasing organics diversion from landfills, building on established mandates (AB 341's 75 percent by 2020 solid waste diversion goal, AB 1594,²²¹ AB 1826,²²² AB 876²²³) and new short-lived climate pollutant targets for 2025 (SB 605, SB 1383) to be accomplished via prevention (including food rescue), recycling, composting/digestion, and biomass options.
- Addressing challenges and issues associated with significant expansion and construction of organics and recycling infrastructure in California that is needed to achieve recycling and diversion goals. Challenges and issues include permitting, grid/pipeline connection, funding, local siting, markets, and research.
- Developing programmatic Environmental Impact Reports (EIRs) and model permit and guidance documents to assist in environmental review and CEQA for new facilities.
- Providing incentives for expanded and new facilities to handle organics and recyclables to meet 2020 and 2030 goals.
- Providing incentives to develop and expand food rescue programs to reduce the amount of edible food being sent to landfills.
- Further quantifying co-benefits of compost products and addressing regulatory barriers that do not provide for consideration of co-benefits.
- Supporting existing and new clean technologies and markets for excess woody biomass from urban areas, forests, and agriculture.
- Supporting the development of transportation fuel production at digestion facilities to generate renewable transportation fuels.

²²¹ Assembly Bill 1594, Waste Management (Williams, Chapter 719, Statutes of 2014).

²²² Assembly Bill 1826, Solid Waste: Organic Waste (Chesbro, Chapter 727, Statutes of 2014).

²²³ Assembly Bill 876, Compostable Organics (McCarty, Chapter 593, Statutes of 2015).

- Resolving issues of pipeline injection and grid connection to make renewable energy projects competitive.
- Supporting the use of available capacity at wastewater treatment plants that have digesters to process food waste.
- Working with local entities to provide a supportive framework to advance community-wide efforts that are consistent with, or exceed, statewide goals.
- Supporting research and development and pathways to market for dairy and codigestion digesters, including pipeline injection and interconnection.
- Supporting research on digestate characterization and end products.

Water

Water is essential to all life, and is vital to our overall health and well-being. A reliable, clean, and abundant supply of water is also a critical component of California's economy and has particularly important connections to energy, food, and the environment. California's water system includes a complex infrastructure that has been developed to support the capture, use, conveyance, storage, conservation, and treatment of water and wastewater. This elaborate network of storage and delivery systems enables the State to prosper and support populations, amidst wide variability in annual precipitation rates and concentration of rain north of Sacramento, through storing and moving water when and where it is needed.

Local water agencies play an important role in delivering water to communities, farms, and businesses. Some purchase water from the major State and federal projects, treat the water as needed, and deliver it to their customers; others act as wholesale agencies that buy or import water and sell it to retail water suppliers. Some agencies operate their own local water supply systems, including reservoirs and canals that store and move water as needed. Many agencies rely on groundwater exclusively, and operate local wells and distribution systems. In recent decades, local agencies have developed more diversified sources of water supplies. Many agencies use a combination of imported surface water and local groundwater, and also produce or purchase recycled water for end uses such as landscape irrigation.²²⁴

The State's developed surface and groundwater resources support a variety of residential, commercial, industrial, and agricultural activities. California's rapidly growing population—estimated to reach 44 million by 2030²²⁵—is putting mounting pressure on the water supply system. In the future, the ability to meet most new demand for water will come from a combination of increased conservation and water use efficiency, improved coordination of management of surface and groundwater, recycled water, new technologies in drinking water treatment, groundwater remediation, and brackish and seawater desalination.²²⁶

One of the State's largest uses of energy is attributed to several aspects of the water life cycle, including end uses such as heating and cooling, and water treatment and conveyance. Ten percent of the State's energy use is associated with water-related end uses, while water and wastewater systems account for 2 percent of the State's energy use.²²⁷ Therefore, as water demand grows, energy demand may increase concurrently. Population growth drives demand for both water and energy resources, so both grow at about the same rates and in many of the same geographic areas.²²⁸ This dynamic is further exacerbated by the precipitation-population mismatch between Northern and Southern California. Since the greatest energy consumption related to water is from delivery to end uses, the potential for energy savings also resides with water end users, where water conservation and efficiency play an important role.

The principal source of GHG emissions from the water sector comes from the fossil fuel-based energy consumed for water end uses (e.g., heating, cooling, pressurizing, and industrial processes), and the fossil fuel-based energy used to "produce" water (e.g., pump, convey, treat). Therefore, emissions reductions strategies are primarily associated with reducing the energy intensity of the water sector. Energy intensity is a measure of the amount of energy required to take a unit of water from its origin (such as a river or aquifer)

224 California Department of Water Resources. Regional Energy Intensity of Water Supplies.

www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

225 <http://www.dof.ca.gov/Forecasting/Demographics/projections/>

226 California Natural Resources Agency, California Department of Food and Agriculture, and California Environmental Protection Agency. California Water Action Plan.

227 California Department of Water Resources. Water-Energy Nexus: Statewide. Web page accessed November 2016 at: www.water.ca.gov/climatechange/WaterEnergyStatewide.cfm.

228 Ibid

and extract and convey it to its end use.²²⁹ Within California, the energy intensity of water varies greatly depending on the geography, water source, and end use. The California Department of Water Resources (DWR) subdivides the State into 10 regions corresponding to the State's major drainage basins. An interactive map on the DWR website allows users to see a summary of the energy intensity of regional water supplies, ignoring end-use factors.²³⁰ As the energy sector is decarbonized through measures such as increased renewable energy and improved efficiency, energy intensities will also be reduced. It is also important to note that end user actions to reduce water consumption or replace fresh water with recycled water do not automatically translate into GHG reductions. The integrated nature of the water supply system means that a reduction by one end user can be offset by an increase in consumption by another user. Likewise, use of recycled water has the potential to reduce GHGs if it replaces, and not merely serves as an alternative to, an existing, higher-carbon water supply.

The State is currently implementing several targeted, agricultural, urban, and industrial-based water conservation, recycling, and water use efficiency programs as part of an integrated water management effort that will help achieve GHG reductions through reduced energy demand within the water sector. Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

While it is important for every sector to contribute to the State's climate goals, ensuring universal access to clean water as outlined in AB 685 (Eng, Chapter 524, Statutes of 2012), also known as the "human right to water" bill, should take precedence over achieving GHG emissions reductions from water sector activities where a potential conflict exists. AB 685 states that it is the policy of the State that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." As described in this section, water supplies vary in energy intensity and resulting GHGs, depending on the source of the water, treatment requirements, and location of the end user.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Develop and support more reliable water supplies for people, agriculture, and the environment, provided by a more resilient, diversified, sustainably managed water resources system with a focus on actions that provide direct GHG reductions.
- Make conservation a California way of life by using and reusing water more efficiently through greater water conservation, drought tolerant landscaping, stormwater capture, water recycling, and reuse to help meet future water demands and adapt to climate change.
- Develop and support programs and projects that increase water sector energy efficiency and reduce GHG emissions through reduced water and energy use.
- Increase the use of renewable energy to pump, convey, treat, and utilize water.
- Reduce the carbon footprint of water systems and water uses for both surface and groundwater supplies through integrated strategies that reduce GHG emissions while meeting the needs of a growing population, improving public safety, fostering environmental stewardship, aiding in adaptation to climate change, and supporting a stable economy.

Cross-Sector Interactions

Water, energy, food, and ecosystems are inextricably linked, and meeting future climate challenges will require an integrated approach to managing the resources in these sectors.

Water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. In 2003, CEC adopted a water conservation policy for power plants to limit the use of freshwater for power plant cooling, and has since encouraged project

²²⁹ A broader definition of energy intensity could consider the "downstream" energy (i.e., wastewater treatment) as well as the upstream components. More robust data are needed, and the State is working to better quantify these upstream and downstream emissions.

²³⁰ California Department of Water Resources. Regional Energy Intensity of Water Supplies. www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

owners proposing to build new power plants in California to reduce water consumption with water-efficiency technologies such as dry cooling and to conserve fresh water by using recycled water. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems, including energy for heating and chilling water; treating and delivering drinking water; conveying water; extracting groundwater; desalination; pressurizing water for irrigation; and wastewater collection, treatment, and disposal.

Although GHG reduction strategies for the water sector have the closest ties to energy, the water sector also interacts with the natural and working lands, agricultural, waste management, and transportation sectors. Water flows from mountains to downstream regions through natural and working lands, which provide habitat for many species and function to store water, recharge groundwater, naturally purify water, and moderate flooding. Protection of key lands from conversion results in healthier watersheds by reducing polluted runoff and maintaining a properly functioning ecosystem. California is the United States' leading agricultural production state in terms of value and crop diversity. Approximately nine million acres of farmland in California are irrigated.²³¹ In addition, water use is associated with livestock watering, feedlots, dairy operations, and other on-farm needs. Altogether, agriculture uses about 40 percent of the State's managed water supply.²³² In the end, agricultural products produced in California are consumed by humans throughout the world as food, fiber, and fuel. Wastewater treatment plants provide a complementary opportunity for the waste management sector to help process organic waste diversion from landfills. Treatment plants with spare capacity can potentially accommodate organic waste for anaerobic co-digestion of materials such as food waste and fats, oil, and grease from residential, commercial, or industrial facilities to create useful by-products such as electricity, hydrogen, biofuels, and soil amendments.²³³ The water sector is also essential to our community health and long-term well-being, and measures must ensure that we continue to have access to clean and reliable sources of drinking water. Climate change threatens to impact our water supplies, for example, with long-term droughts leading to wells and other sources of water running dry. This can have devastating consequences, especially on communities already vulnerable and sensitive to changes in their water supply and natural hydrological systems, including rural communities who have limited options for water supplies. Water conservation and management strategies that are energy efficient can also ensure a continued supply of water for our health and well-being.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, several recommended actions are identified to help the water sector move forward with the identified goals and measures to achieve the 2030 target; these are listed as supporting actions.

Ongoing and Proposed Measures

- As directed by Governor Brown's Executive Order B-37-16, DWR and State Water Resources Control Board (SWRCB) will develop and implement new water use targets to generate more statewide water conservation than existing targets (the existing State law requires a 20 percent reduction in urban per capita water use by 2020 [SBx7-7, Steinberg, Chapter 4, Statutes of 2009]). The new water use targets will be based on strengthened standards for indoor use, outdoor irrigation, commercial, industrial, and institutional water use.
- SWRCB will develop long-term water conservation regulation, and permanently prohibit practices that waste potable water.
- DWR and SWRCB will develop and implement actions to minimize water system leaks, and to set performance standards for water loss, as required by SB 555 (Wolk, Chapter 679, Statutes of 2015).
- DWR and CDFA will update existing requirements for agricultural water management plans to increase water system efficiency.

²³¹ Hanson, Blaine. No date. Irrigation of Agricultural Crops in California. PowerPoint. Department of Land, Air and Water Resources University of California, Davis. www.arb.ca.gov/fuels/lcfs/workgroups/lcfssustain/hanson.pdf

²³² Applied water use is the official terminology used by DWR. "Applied water refers to the total amount of water that is diverted from any source to meet the demands of water users without adjusting for water that is used up, returned to the developed supply, or considered irrecoverable."

²³³ An example of a resource recovering project that can help achieve methane reductions includes fuel cells that are integrated into wastewater treatment plants for both onsite heat and power generation and the production of renewable hydrogen.

- CEC will certify innovative technologies for water conservation and water loss detection and control.
- CEC will continue to update the State's Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601–1608) for appliances offered for sale in California to establish standards that reduce energy consumption for devices that use electricity, gas, and/or water.
- California Environmental Protection Agency (CalEPA) will oversee development of a voluntary registry for GHG emissions resulting from the water-energy nexus, as required by SB 1425 (Pavley, Chapter 596, Statutes of 2016).
- The State Water Project has entered long-term contracts to procure renewable electricity from 140 MW solar installations in California.
- As described in its Climate Action Plan, DWR will continue to increase the use of renewable energy to operate the State Water Project.

Overall, these actions will contribute to the broader energy efficiency goals discussed in the Low Carbon Energy section of this chapter.

Potential Additional or Supporting Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Where technically feasible and cost-effective, local water and wastewater utilities should adopt a long-term goal to reduce GHGs by 80 percent below 1990 levels by 2050 (consistent with DWR's Climate Action Plan), and thereafter move toward low carbon or net-zero carbon water management systems.
- Local water and wastewater utilities should develop distributed renewable energy where feasible, using the expanded Local Government Renewable Energy Bill Credit (RES-BCT) tariff and new Net Energy Metering (which allow for installation without system size limit).
- In support of the Short-Lived Climate Pollutant Strategy, encourage resource recovering wastewater treatment projects to help achieve the goal of reducing fugitive methane by 40 percent by 2030, to include:
 - Determining opportunities to support co-digestion of food-related waste streams at wastewater treatment plants.
 - Incentivizing methane capture systems at wastewater treatment plants to produce renewable electricity, transportation fuel, or pipeline biomethane.
- Support compact development and land use patterns, and associated conservation and management strategies for natural and working lands that reduce per capita water consumption through more water-efficient built environments.

Chapter 5

ACHIEVING SUCCESS

Meeting, and exceeding, our mandated GHG reduction goals in 2020 and through 2030 requires building on California's decade of success in implementing effective climate policies. State agencies are increasingly coordinating planning activities to align with overarching climate, clean air, social equity, and broader economic objectives.

However, to definitely tip the scales in favor of rapidly declining emissions, we also need to reach beyond State policy-making and engage all Californians. Further progress can be made by supporting innovative actions at the local level—among governments, small businesses, schools, and individual households. Ultimately, success depends on a mix of regulatory program development, incentives, institutional support, and education and outreach to ensure that clean energy and other climate strategies are clear, winning alternatives in the marketplace—to drive business development and consumer adoption.

Ongoing Engagement with Environmental Justice Communities

CARB continues seek ways to improve implementation of AB 32 and the unique set of impacts facing environmental justice communities. However, CARB's environmental justice efforts reach far beyond climate change. In 2001, the Board approved CARB's "Policies and Actions for Environmental Action,"²³⁴ which expresses a broad commitment to environmental justice and makes it integral to all of CARB's programs, consistent with State directives at the time. Though over the years CARB has taken on a wide array of activities aimed at reducing environmental burdens on environmental justice communities, it has not knitted its various efforts together in a coherent narrative or maximized the impact of these activities by leveraging them off of each other.

This year, CARB appointed its first executive-level environmental justice liaison. Under her leadership, CARB will lay a roadmap for better serving California's environmental justice communities in the design and implementation of its programs, and identifying new actions CARB can take to advance environmental justice and social equity in all of its functions.

The extensive legislative framework addressing climate change, air quality, and environmental justice that has emerged since the passage of AB 32 has prompted CARB to step up its environmental justice efforts and articulate a vision that reflects the current context. CARB will initiate a public process, seeking advice and input from environmental justice advocates and other key stakeholders to inform the development of a new strategic plan for further institutionalizing environmental justice and social equity.

CARB understands that in addition to our programs to address climate change and reduce emissions of GHGs, more needs to be done to reduce exposure to toxic air and criteria pollutants and improve the quality of life in communities surrounding our largest emissions sources. To this end, and consistent with AB 617, AB 197, AB 1071, SB 535 and AB 1550, we will actively engage EJ advocates, communities, and relevant air districts in the development of programs that improve air quality and quantify the burdens placed on air quality in local communities. Measuring and monitoring air quality conditions over time and ongoing community engagement are integral to the success of CARB's efforts. This engagement will include substantive discussions with EJ stakeholders, gathering their input and providing adequate time for review before matters are taken to the Board for decision.

²³⁴ www.arb.ca.gov/ch/programs/ej/ejpolicies.pdf

CARB's approach to environmental justice will be grounded in five primary pillars: transparency, integration, monitoring, research, and enforcement.

- **Transparency:** CARB must improve communication and engagement with environmental justice stakeholders and deepen partnerships with local communities impacted by air pollution. CARB will continue to prioritize transparency in its decision-making processes and provide better access to the air quality, toxics, and GHG data CARB collects and stewards.
- **Integration:** Besides integrating environmental justice throughout all of CARB's programs, those programs must complement each other. To that end, CARB will endeavor to break down programmatic silos so that it is able to leverage its work and achieve more effective and timely results. Focused resources in individual communities can accelerate reduction in emissions, proliferation of clean vehicles and creation of jobs in the clean energy economy, while concurrently improving public health.
- **Monitoring:** Communities should be engaged in CARB's monitoring work. They can play a critical role in collecting their own data and adding to the coverage of other air monitoring efforts (e.g., CARB, local air districts). CARB has already invested in research on low-cost monitors that are accessible by communities, and it will continue to evaluate how community monitoring can make CARB more nimble in identifying and addressing "hotspots." Mobile monitoring projects similarly will allow CARB to better serve and protect residents of disadvantaged communities. CARB will continue to build partnerships with local communities and help build local capacity through funding and technical assistance.
- **Research:** CARB's research agenda is core to achieving its mission. To ensure that the research done by CARB responds to environmental justice concerns and has the greatest potential to improve air quality and public health in disadvantaged communities, CARB will engage communities groups early in the development of its research agenda and the projects that flow out from that agenda.
- **Enforcement:** Disadvantaged communities are often impacted by many sources of pollution. In order to improve air quality and protect public health, CARB will prioritize compliance with legal requirements, including enforcement actions if necessary, in environmental justice communities to ensure emissions of toxic and criteria pollutants in these communities are as low as possible.

Our inclusive approaches to further environmental justice in California's local communities may include an array of direct regulation, funding, and community capacity-building. CARB will continue to actively implement the provisions of AB 617, AB 197, AB 1071, SB 535, AB 1550, and other laws to better ensure that environmental justice communities see additional benefits from our clean air and climate policies. Our inclusive approaches to further environmental justice in California's local communities may include an array of direct regulation, funding, and community capacity-building.

Enabling Local Action

Local governments are essential partners in achieving California's goals to reduce GHG emissions. Local governments can implement GHG emissions reduction strategies to address local conditions and issues and can effectively engage citizens at the local level. Local governments also have broad jurisdiction, and sometimes unique authorities, through their community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and municipal operations. Further, local jurisdictions can develop new and innovative approaches to reduce GHG emissions that can then be adopted elsewhere. For example, local governments can develop land use plans with more efficient development patterns that bring people and destinations closer together in more mixed-use, compact communities that facilitate walking, biking, and use of transit. Local governments can also incentivize locally generated renewable energy and infrastructure for alternative fuels and electric vehicles, implement water efficiency measures, and develop waste-to-energy and waste-to-fuel projects. These local actions complement statewide measures and are critical to supporting the State's efforts to reduce emissions. Local efforts can deliver substantial additional GHG and criteria emissions reductions beyond what State policy can alone, and these efforts will sometimes be more cost-effective and provide more cobenefits than relying exclusively on top-down statewide regulations to achieve the State's climate stabilization goals. To ensure local and regional engagement, it is also recommended local jurisdictions make readily available information regarding ongoing and proposed actions to reduce GHGs within their region.

Many cities and counties are already setting GHG reduction targets, developing local plans, and making progress toward reducing emissions. The Statewide Energy Efficiency Collaborative recently released a report, *The State of Local Climate Action: California 2016*,²³⁵ which highlights local government efforts, including:

- In California, 60 percent of cities and over 70 percent of counties have completed a GHG inventory, and 42 percent of local governments have completed a climate, energy, or sustainability plan that directly addresses GHG emissions. Many other community-scale local plans, such as general plans, have emissions reduction measures incorporated as well (see Governor's Office of Planning and Research [OPR] Survey questions 23 and 24).²³⁶
- Over one hundred California local governments have developed emissions reduction targets that, if achieved, would result in annual reductions that total 45 MMTCO₂e by 2020 and 83 MMTCO₂e by 2050.²³⁷

Local air quality management and air pollution control districts also play a key role in reducing regional and local sources of GHG emissions by actively integrating climate protection into air quality programs. Air districts also support local climate protection programs by providing technical assistance and data, quantification tools, and even funding.²³⁸ Local metropolitan planning organizations (MPOs) also support the State's climate action goals via sustainable communities strategies (SCSs), required by the Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728, Statutes of 2008). Under SB 375, MPOs must prepare SCSs as part of their regional transportation plan to meet regional GHG reduction targets set by CARB for passenger vehicles in 2020 and 2035. The SCSs contain land use, housing, and transportation strategies that allow regions to meet their GHG emissions reductions targets.



To engage communities in efforts to reduce GHG emissions, CARB has partnered with Energy Upgrade California on the CoolCalifornia Challenge. It is a competition among California cities to reduce their carbon footprints and build more vibrant and sustainable communities. Three challenges have been completed. Most recently, the 2015–2016 Challenge included 22 cities and engaged nearly 3,200 households, each of which took actions to reduce energy use and carbon GHG emissions. In total, the participants reported savings of 5,638 MTCO₂ from completed actions, equivalent to emissions from more than 1,000 cars or from electricity used by more than 2,500 California homes in a year.

State agencies support these local government actions in several ways:

- CoolCalifornia.org is an informational website that provides resources that assist local governments, small businesses, schools, and households to reduce GHG emissions. The local government webpage includes carbon calculators, a climate planning resource guide, a Funding Wizard that outlines grant and loan programs, and success stories. It also features ClearPath California, a no-cost GHG inventory, climate action plan development, and tracking tool developed through the Statewide Energy Efficiency Collaborative in coordination with CARB and the Governor's Office of Planning and Research (OPR).
- Chapter 8 of OPR's General Plan Guidelines²³⁹ provides guidance for climate action plans and

²³⁵ Statewide Energy Efficiency Collaborative. 2016. State of Local Climate Action: California 2016.

californiaseec.org/wp-content/uploads/2016/10/State-of-Local-Climate-Action-California-2016_Screen.pdf

²³⁶ Governor's Office of Planning and Research. 2016. 2016 Annual Planning Survey Results. November.

www.opr.ca.gov/docs/2016_APS_final.pdf

²³⁷ These reductions include reductions from both state and local measures.

²³⁸ Examples include: (1) Bay Area Air Quality Management District (BAAQMD). 2016 Clean Air Plan and Regional Climate Protection Strategy. Available at: www.baaqmd.gov/plans-and-climate/air-quality-plans/plans-under-development; (2) California Air Pollution Control Officers Association. California Emissions Estimator Model (CalEEMod). Available at: www.caleemod.com/; (3) San Joaquin Valley Air Pollution Control District. Grants and Incentives. Available at: valleyair.org/grants/; (4) BAAQMD. Grant Funding. Available at: www.baaqmd.gov/grant-funding; (5) South Coast Air Quality Management District. Funding. Available at: www.aqmd.gov/grants-bids/funding; (6) Sacramento Metropolitan Air Quality Management District. Incentive Programs. Available at: www.airquality.org/Residents/Incentive-Programs.

²³⁹ <http://opr.ca.gov/planning/general-plan/>

other plans linked to general plans, which address the community scale approach outlined in CEQA Guidelines Section 15183.5(b), Plans for the Reduction of Greenhouse Gas Emissions.

- OPR hosts the Integrated Climate Adaptation and Resiliency Program, which is developing resources and case studies that outline the co-benefits of implementing emissions reduction strategies and addressing the impacts of climate change.
- CARB is developing a centralized database and interactive map that will display the current statewide status of local government climate action planning. Users can view and compare the details of emission inventories, planned GHG reduction targets and strategies, and other climate action details specific to each local government. This information will help jurisdictions around California identify what climate action strategies are working in other, similar jurisdictions across the State, and will facilitate collaboration among local governments pursuing GHG reduction strategies and goals. This database and map will be featured on the CoolCalifornia.org website and are anticipated to be available in 2017.
- Additional information on local government activities is available on Cal-Adapt (www.cal-adapt.org) and OPR (www.opr.ca.gov)

Further, a significant portion of the \$3.4 billion in cap-and-trade expenditures has either directly or indirectly supported local government efforts to reduce emissions, including, for example, the Affordable Housing and Sustainable Communities (AHSC) program and approximately \$142 million for project implementation and planning grants awarded under the Transformative Climate Communities program.

Climate Action through Local Planning and Permitting

Local government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals, and can also provide important co-benefits, such as improved air quality, local economic benefits, more sustainable communities, and an improved quality of life. To support local governments in their efforts to reduce GHG emissions, the following guidance is provided. This guidance should be used in coordination with OPR's General Plan Guidelines guidance in Chapter 8, Climate Change.²⁴⁰ While this guidance is provided out of the recognition that local policy makers are critical in reducing the carbon footprint of cities and counties, the decision to follow this guidance is voluntary and should not be interpreted as a directive or mandate to local governments.

Recommended Local Plan-Level Greenhouse Gas Emissions Reduction Goals

CARB recommends statewide targets of no more than six metric tons CO₂e per capita by 2030 and no more than two metric tons CO₂e per capita by 2050.²⁴¹ The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer term State emissions reduction goal of 80 percent below 1990 levels by 2050.²⁴² The statewide per capita targets are also consistent with Executive Order S-3-05, B-30-15, and the Under 2 MOU that California originated with Baden-Württemberg and has now been signed or endorsed by 188 jurisdictions representing 39 countries and six continents.^{243,244} Central to the Under 2 MOU is that all signatories agree to reduce their GHG emissions to two metric tons CO₂e per capita by 2050. This limit represents California's and these other governments' recognition of their "fair share" to reduce GHG emissions to the scientifically based levels to limit global warming below two degrees Celsius. This limit is also consistent with the Paris Agreement, which sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to below 2°C.²⁴⁵

CARB recommends that local governments evaluate and adopt robust and quantitative locally-appropriate

²⁴⁰ <http://opr.ca.gov/planning/general-plan/>.

²⁴¹ These goals are appropriate for the plan level (city, county, subregional, or regional level, as appropriate), but not for specific individual projects because they include all emissions sectors in the State.

²⁴² This number represents the 2030 and 2050 targets divided by total population projections from California Department of Finance.

²⁴³ <http://under2mou.org/> California signed the Under 2 MOU on May 19, 2015. See under2mou.org/wp-content/uploads/2015/05/California-appendix-English.pdf and under2mou.org/wp-content/uploads/2015/05/California-Signature-Page.pdf.

²⁴⁴ The Under 2 MOU signatories include jurisdictions ranging from cities to countries to multiple-country partnerships. Therefore, like the goals set forth above for local and regional climate planning, the Under 2 MOU is scalable to various types of jurisdictions.

²⁴⁵ UNFCCC. The Paris Agreement. unfccc.int/paris_agreement/items/9485.php

goals that align with the statewide per capita targets and the State’s sustainable development objectives and develop plans to achieve the local goals. The statewide per capita goals were developed by applying the percent reductions necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the State’s 1990 emissions limit established under AB 32.

Numerous local governments in California have already adopted GHG emissions reduction goals for year 2020 consistent with AB 32. CARB advises that local governments also develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals. Emissions inventories and reduction goals should be expressed in mass emissions, per capita emissions, and service population emissions. To do this, local governments can start by developing a community-wide GHG emissions target consistent with the accepted protocols as outlined in OPR’s General Plan Guidelines Chapter 8: Climate Change. They can then calculate GHG emissions thresholds by applying the percent reductions necessary to reach 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to their community-wide GHG emissions target. Since the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State, it is appropriate for local jurisdictions to derive evidence-based local per capita²⁴⁶ goals based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets. The resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives. The recommendation for a community-wide goal expands upon the reduction of 15 percent from “current” (2005-2008) levels by 2020 as recommended in the 2008 Scoping Plan.²⁴⁷

In developing local plans, local governments should refer to “The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions,”²⁴⁸ (community protocol) which provides detailed guidance on completing a GHG emissions inventory at the community scale in the United States – including emissions from businesses, residents, and transportation. Quantification tools such as ClearPath California, which was developed with California agencies, also support the analysis of community-scale GHG emissions. Per the community protocol, these plans should disclose all emissions within the defined geographical boundary, even those over which the local government has no regulatory authority to control, and then focus the strategies on those emissions that the jurisdiction controls. For emissions from transportation, the community protocol recommends including emissions from trips that extend beyond the community’s boundaries. Local plans should also include the carbon sequestration values associated with natural and working lands, and the importance of jurisdictional lands for water, habitat, agricultural, and recreational resources. Strategies developed to achieve the local goals should prioritize mandatory measures that support the Governor’s “Five Pillars” and other key state climate action goals.²⁴⁹ Examples of plan-level GHG reduction actions that could be implemented by local governments are listed in Appendix B. Additional information and tools on how to develop GHG emissions inventories and reduction plans tied to general plans can be found in OPR’s General Plan Guidelines and at CoolCalifornia.org.

These local government recommendations are based on the recognition that California must accommodate population and economic growth in a far more sustainable manner than in the past. While state-level investments, policies, and actions play an important role in shaping growth and development patterns, regional and local governments and agencies are uniquely positioned to influence the future of the built environment and its associated GHG emissions. Greenhouse gas emissions reduction strategies in Climate Action Plans (CAPs) and other local plans can also lead to important co-benefits, such as improved air quality, local economic benefits such as green jobs, more mobility choices, improved public health and quality of life, protection of locally, statewide, and globally important natural resources, and more equitable sharing of these benefits across communities.

Contributions from policies and programs, such as renewable energy and energy efficiency, are helping to achieve the near-term 2020 target, but longer-term targets cannot be achieved without land use decisions that allow more efficient use and management of land and infrastructure. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth, economic growth, and the changing needs of their jurisdictions. Land use decisions affect GHG emissions associated with transportation, water use, wastewater treatment, waste generation and treatment, energy consumption, and conversion of natural and working lands. Local land use decisions play a particularly

²⁴⁶ Or some other metric that the local jurisdiction deems appropriate (e.g., mass emissions, per service population)

²⁴⁷ 2008 Scoping Plan, page 27, www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

²⁴⁸ <http://icleiusa.org/publications/us-community-protocol/>

²⁴⁹ www.arb.ca.gov/cc/pillars/pillars.htm

critical role in reducing GHG emissions associated with the transportation sector, both at the project level, and in long-term plans, including general plans, local and regional climate action plans, specific plans, transportation plans, and supporting sustainable community strategies developed under SB 375.

While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals. In its evaluation of the role of the transportation system in meeting the statewide emissions targets, CARB determined that VMT reductions of 7 percent below projected VMT levels in 2030 (which includes currently adopted SB 375 SCSs) are necessary. In 2050, reductions of 15 percent below projected VMT levels are needed. A 7 percent VMT reduction translates to a reduction, on average, of 1.5 miles/person/day from projected levels in 2030. It is recommended that local governments consider policies to reduce VMT to help achieve these reductions, including: land use and community design that reduces VMT; transit oriented development; street design policies that prioritize transit, biking, and walking; and increasing low carbon mobility choices, including improved access to viable and affordable public transportation and active transportation opportunities. It is important that VMT reducing strategies are implemented early because more time is necessary to achieve the full climate, health, social, equity, and economic benefits from these strategies.

Once adopted, the plans and policies designed to achieve a locally-set GHG goal can serve as a performance metric for later projects. Sufficiently detailed and adequately supported GHG reduction plans (including CAPs) also provide local governments with a valuable tool for streamlining project-level environmental review. Under CEQA, individual projects that comply with the strategies and actions within an adequate local CAP can streamline the project-specific GHG analysis.²⁵⁰ The California Supreme Court recently called out this provision in CEQA as allowing tiering from a geographically specific GHG reduction plan.²⁵¹ The Court also recognized that GHG determinations in CEQA should be consistent with the statewide Scoping Plan goals, and that CEQA documents taking a goal-consistency approach may soon need to consider a project's effects on meeting the State's longer term post-2020 goals.²⁵² The recommendation above that local governments develop local goals tied to the statewide per capita goals of six metric tons CO₂e by 2030 and no more than two metric tons CO₂e per capita by 2050 provides guidance on CARB's view on what would be consistent with the 2017 Scoping Plan and the State's long-term goals.

Production based inventories and emissions reduction programs are appropriate for local communities wanting to mitigate their emissions pursuant to CEQA Section 15183.5(b). Consumption based inventories are complementary to production based inventories and are appropriate as a background setting, disclosure, and as an outreach tool to show how personal decisions may change a person's or household's contribution to climate change. For additional information, see the OPR General Plan Guidelines.²⁵³

Project-Level Greenhouse Gas Emissions Reduction Actions and Thresholds

Beyond plan-level goals and actions, local governments can also support climate action when considering discretionary approvals and entitlements of individual projects through CEQA. Absent conformity with an adequate geographically-specific GHG reduction plan as described in the preceding section above, CARB recommends that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development. There are recent examples of land use development projects in California that have demonstrated that it is feasible to design projects that achieve zero net additional GHG emissions. Several projects have received certification from the Governor under AB 900, the Jobs and Economic Improvement through Environmental Leadership Act (Buchanan, Chapter 354, Statutes of 2011), demonstrating an ability to design economically viable projects that create jobs while contributing no net additional GHG emissions.²⁵⁴ Another example is the Newhall

²⁵⁰ CEQA Guidelines, § 15183.5, sub. (b).

²⁵¹ Center for Biological Diversity v. California Dept. of Fish and Wildlife (2015) 62 Cal.4th 204, 229–230.

²⁵² Id. at pp. 223–224.

²⁵³ <http://opr.ca.gov/planning/general-plan/>.

²⁵⁴ Governor's Office of Planning and Research. California Jobs. <http://www.opr.ca.gov/ceqa/california-jobs.html>

Ranch Resource Management and Development Plan and Spineflower Conservation Plan,²⁵⁵ in which the applicant, Newhall Land and Farming Company, proposed a commitment to achieve net zero GHG emissions for a very large-scale residential and commercial specific planned development in Santa Clarita Valley.

Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with this Scoping Plan, the State's long-term GHG goals, and climate change science.²⁵⁶

To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally. For example, on-site design features to be considered at the planning stage include land use and community design options that reduce VMT, promote transit oriented development, promote street design policies that prioritize transit, biking, and walking, and increase low carbon mobility choices, including improved access to viable and affordable public transportation, and active transportation opportunities. Regionally, additional GHG reductions can be achieved through direct investment in local building retrofit programs that can pay for cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting, energy efficient appliances, energy efficient windows, insulation, and water conservation measures for homes within the geographic area of the project. These investments generate real demand side benefits and local jobs, while creating the market signals for energy efficient products, some of which are produced in California. Other examples of local direct investments include financing installation of regional electric vehicle (EV) charging stations, paying for electrification of public school buses, and investing in local urban forests.

Local direct investments in actions to reduce GHG emissions should be supported by quantification methodologies that show the reductions are real, verifiable, quantifiable, permanent, and enforceable. Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits. CAPCOA has developed the GHG Reduction Exchange (GHG Rx) for CEQA mitigation, which could provide credits to achieve additional reductions. It may also be appropriate to utilize credits issued by a recognized and reputable voluntary carbon registry. Appendix B includes examples of on-site project design features, mitigation measures, and direct regional investments that may be feasible to minimize GHG emissions from land use development projects.

California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use.²⁵⁷ GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches.²⁵⁸ Further, the State's understanding of transportation impacts continues to evolve. The CEQA Guidelines are being updated to focus the analysis of transportation impacts on VMT. OPR's Technical Advisory includes methods of analysis of transportation impacts, approaches to setting significance thresholds, and includes examples of VMT mitigation under CEQA.²⁵⁹

²⁵⁵ <https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=NewhallRanchFinal>

²⁵⁶ CARB provided some guidance on development project thresholds in a paper issued in October 2008, which included a concept utilizing a bright-line mass numeric threshold based on capturing approximately 90 percent of emissions in that sector and a concept of minimum performance based standards. Some districts built upon that work to develop thresholds. For example, Santa Barbara County adopted a bright-line numeric threshold of 1,000 MTCO₂e/yr for industrial stationary-source projects, and Sacramento Metropolitan Air Quality Management District adopted a 10,000 MTCO₂e/yr threshold for stationary source projects and a 1,100 MTCO₂e/yr threshold for construction activities and land development projects in their operational phase. CARB is not endorsing any one of these approaches, but noting them for informational purposes.

²⁵⁷ Robert Cervero, Jim Murakami; Effects of Built Environment on Vehicle Miles Traveled: Evidence from 370 US Urbanized Areas. *Environment and Planning A*, Vol 42, Issue 2, pp. 400-418, February-01-2010; Ewing, R., & Rong, F. (2008). The impact of urban form on U.S. residential energy use. *Housing Policy Debate*, 19 (1), 1-30.

²⁵⁸ CAPCOA, *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*, August, 2010.

²⁵⁹ <http://www.opr.ca.gov/ceqa/updates/sb-743/>

Implementing the Scoping Plan

This Scoping Plan outlines the regulations, programs, and other mechanisms needed to reduce GHG emissions in California. CARB and other State agencies will work closely with State and local agencies, stakeholders, Tribes, and the public to develop regulatory measures and other programs to implement the Scoping Plan. CARB and other State agencies will develop regulations in accordance with established rulemaking guidelines. Per Executive Order B-30-15, as these regulatory measures and other programs are developed, building programs for climate resiliency must also be a consideration. Additionally, agencies will further collaborate and work to provide the institutional support needed to overcome barriers that may currently hinder certain efforts to reduce GHG emissions and to support the goals, actions, and measures identified for key sectors in Chapter 4. Table 17 provides a high-level summary of the Climate Change Policies and Measures discussed in the Scoping Plan, including, but not limited to, those identified specifically to achieve the 2030 target.

TABLE 17: CLIMATE CHANGE POLICIES AND MEASURES

Recommended Action	Lead Agency
Implement SB 350 by 2030: <ul style="list-style-type: none"> • Increase the Renewables Portfolio Standard to 50 percent of retail sales by 2030 and ensure grid reliability. • Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. • Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in IRPs to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly-owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs. 	CPUC, CEC, CARB
Implement Mobile Source Strategy (Cleaner Technology and Fuels): <ul style="list-style-type: none"> • At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025. • At least 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030. • Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean Cars regulations. • Medium- and heavy-duty GHG Phase 2. • Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20 percent of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100 percent of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO_x standard. • Last Mile Delivery: New regulation that would result in the use of low NO_x or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5 percent of new Class 3-7 truck sales in local fleets starting in 2020, increasing to 10 percent in 2025 and remaining flat through 2030. • Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion." 	CARB, CalSTA, SGC, CalTrans CEC, OPR, Local agencies
Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).	CARB
By 2019, adjust performance measures used to select and design transportation facilities. <ul style="list-style-type: none"> • Harmonize project performance with emissions reductions, and increase competitiveness of transit and active transportation modes (e.g. via guideline documents, funding programs, project selection, etc.). 	CalSTA and SGC, OPR, CARB, GoBiz, IBank, DOF, CTC, Caltrans
By 2019, develop pricing policies to support low-GHG transportation (e.g. low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts).	CalSTA, Caltrans, CTC, OPR/SGC, CARB

Recommended Action	Lead Agency
Implement California Sustainable Freight Action Plan: <ul style="list-style-type: none"> Improve freight system efficiency. Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030. 	CalSTA, CalEPA, CNRA, CARB, CalTrans, CEC, GoBiz
Adopt a Low Carbon Fuel Standard with a CI reduction of 18 percent.	CARB
Implement the Short-Lived Climate Pollutant Strategy by 2030: <ul style="list-style-type: none"> 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels. 50 percent reduction in black carbon emissions below 2013 levels. 	CARB, CalRecycle, CDFR, SWRCB, Local air districts
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	CARB, CalRecycle, CDFR, SWRCB, Local air districts
Implement the post-2020 Cap-and-Trade Program with declining annual caps.	CARB
By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink: <ul style="list-style-type: none"> Protect land from conversion through conservation easements and other incentives. Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments Establish scenario projections to serve as the foundation for the Implementation Plan 	CNRA and departments within, CDFR, CalEPA, CARB
Establish a carbon accounting framework for natural and working lands as described in SB 859 by 2018	CARB
Implement Forest Carbon Plan	CNRA, CAL FIRE, CalEPA and departments within
Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	State Agencies & Local Agencies

A Comprehensive Approach to Support Climate Action

Ultimately, successfully tipping the scales in the fight against climate change relies on our ability to incentivize clean technologies in the marketplace and to make other climate strategies clearly understood and easily accessible. We must support and guide our businesses as they continue to innovate and make clean technologies ever more attractive to ever more savvy consumers. Until the point that clean technologies become the best and lowest cost option—which is clearly on the horizon for many technologies, including renewable energy and electric cars—we must continue to support emerging markets through incentives and outreach efforts. More than just coordinating among agencies and providing institutional support as described above, we will succeed if we tackle climate change from all angles—through regulatory and policy development, targeted incentives, and education and outreach.

Regulations and Programmatic Development

Our decade of climate leadership has demonstrated that developing mitigation strategies through a public process, where all stakeholders have a voice, leads to effective actions that address climate change and yield a series of additional economic and environmental co-benefits to the State. As we implement this Scoping Plan, State agencies will continue to develop and implement new and existing programs, as described herein. During any rulemaking process, there are many opportunities for both informal interaction with technical staff in meetings and workshops, and formal interaction at Board meetings, Commission business meetings, monthly public meetings, and others. Each State agency will consider all information and stakeholder input during the rulemaking process. Based on this information, the agency may modify proposed measures to reflect the status of technological development, the cost of the measure, the cost-effectiveness of the measures, and other factors before presenting them for consideration and adoption.

Further, to achieve cost-effective GHG reductions, California State agencies must consider the environmental impact of small businesses and provide mechanisms to assist businesses as GHG reduction measures are

implemented. CARB provides resources and tips for small businesses to prevent pollution, minimize waste, and save energy and water on CoolCalifornia.org. California's small businesses and their employees represent a valuable economic resource in the State and "greening" existing businesses is not only achievable, but sets an example for new businesses which will prove significant as California transitions to a low carbon state.

State agencies conduct environmental and environmental justice assessments of our regulatory actions. Many of the requirements in AB 32 overlap with traditional agency evaluations. In adopting regulations to implement the measures recommended in the Scoping Plan, or including in the regulations the use of market-based compliance mechanisms to comply with the regulations, agencies will ensure that the measures have undergone the aforementioned screenings and meet the requirements established in California Health and Safety Code Section 38562(b)(1-9) and Section 38570(b)(1-3).

Incentive Programs

Financial incentives and direct funding are critical components of the State's climate framework. In particular, incentives and funding are necessary to support GHG emissions reductions strategies for priority sectors, sources, and technologies. Although California has a number of existing incentive programs, available funding is limited. It is critical to target public investments efficiently and in ways that encourage integrated, system wide solutions to produce deep and lasting public benefits. Significant investments of private capital, supported by targeted, priority investments of public funding, are necessary to scale deployment and to maximize benefits. Public investments, including through decisions related to State pension fund portfolios, can help incentivize early action to accelerate market transition to cleaner technologies and cleaner practices, which can also be supported by regulatory measures.

Many existing State funding programs work in tandem to reduce emissions from GHGs, criteria pollutants, and toxic air contaminants, and are helping to foster the transition to a clean energy economy and protect and manage land for carbon sequestration. State law, including Senate Bill 535 (De León, Chapter 830, Statutes of 2012) and Assembly Bill 1550 (Gomez, Chapter 369, Statutes of 2016) also requires focused investment in low income and disadvantaged communities.

The State will need to continue to coordinate and utilize funding sources, such as the Greenhouse Gas Reduction Fund (cap-and-trade auction proceeds), the Alternative and Renewable Fuel and Vehicle Technology Program (AB 118), Electric Program Investment Charge (EPIC) Program, Carl Moyer Program, Air Quality Improvement Program, and Proposition 39 to expand clean energy investments in California and further reduce GHG and criteria emissions. Additionally, programs including the Bioenergy Feed-In Tariff, created by Senate Bill 1122 (Rubio, Chapter 612, Statutes of 2012), Low Carbon Fuel Standard, Cap-and-Trade, Self-Generation Incentive Program, Federal Renewable Fuel Standard, utility incentives pursuant to Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012), and others provide important market signals and potential revenue streams to support projects to reduce GHG emissions.

These programs represent just a portion of the opportunities that exist at the federal, State, and local levels to incentivize GHG emissions reductions. The availability of dedicated and long-lasting funding sources is critical to help meet the State's climate objectives and help provide certainty and additional partnership opportunities at the national, State, Tribal, regional, and local levels for further investing in projects that have the potential to expand investments in California's clean economy and further reductions in GHG emissions.

Public Education and Outreach Efforts

California State agencies are committed to meaningful opportunities for public input and effective engagement with stakeholders and the public through the development of the Scoping Plan, and as measures are implemented through workshops, other meetings, and through the formal rulemaking process. Additionally, the State has broad public education and outreach campaigns to support markets for key technologies, like ZEVs and energy efficiency, as well as resources to support local and voluntary actions, such as CoolCalifornia.org.

In developing this Scoping Plan, there has been extensive outreach with environmental justice organizations and disadvantaged communities. The EJAC launched a community engagement process starting in July 2016, conducting 19 community meetings throughout the State and collecting hundreds of individual comments. To enhance the engagement opportunity, CARB coordinated with local government agencies and sister State agencies to hold collaborative discussions with local residents about specific climate issues that impact their

lives. This effort was well received and attended by local community residents and initiated a new community engagement endeavor for CARB. Recognizing the value of the input received and the opportunity to present California's climate strategy to communities across the State, CARB intends to continue this community involvement to generate awareness about California's climate strategy and be responsive to specific community needs as climate programs are implemented.



EDUCATION AND ENVIRONMENT INITIATIVE

The California Environmental Protection Agency (CalEPA), the California Department of Education, and the California Natural Resources Agency have developed an environmental curriculum that is being taught in more than half of California's school districts. The [Education and Environment Initiative](#) (EEI) provides California's teachers with tools to educate students about the natural environment and how everyday choices can improve our planet and save money.

Conclusion

This Scoping Plan continues more than a half-century of California's nation-leading efforts to clean our air, our water and improve the environment. But, climate change poses a challenge of unprecedented proportions that will, in one way or another, impact all Californians whether they are city dwellers in Los Angeles, San Diego or San Francisco, farmers in Salinas or the Central Valley, or the millions of Californians who live in the Sierra or in the desert areas.

This is the State's climate action plan, and in a very real sense it belongs to all those Californians who are feeling, and will continue to feel, the impacts of climate change. Californians want to see continued effective action that addresses climate change and benefits California – this Plan responds to both of these goals. The Plan was developed by the coordinated consensus of State agencies, but it is really California's Plan, because over the coming decades the approaches in this document will be carried out by all of us.

In this Scoping Plan, every sector in our thriving economy plays a crucial role. Tribes, cities, and local governments are already rising to the challenge, and will play increasingly important roles with everything from low-carbon and cleaner transit, to more walkable streets and the development of vibrant urban communities.

We will see a remarkable transformation of how we move throughout the state, away from cars that burn fossil fuels to cleaner, electric cars that will, in some cases, even drive themselves. Freight will be moved around the state by trucks that are vastly cleaner than those on the road now, with our ports moving towards zero- and near-zero emissions technologies. The heavily traveled Los Angeles-San Francisco corridor will be serviced by comfortable, clean and affordable high speed rail.

In addition to reducing GHGs, these efforts will slash pollution now created from using gasoline and diesel fuel statewide, with the greatest benefits going to the disadvantaged communities of our state which are so often located adjacent to ports, railyards, freight distribution centers and freeways. And, thanks to the continued investment of proceeds from the Cap-and-Trade Program in these same communities, we can continue to work on bringing the benefits of clean technology – whether electric cars or solar roofs – to those in our state who need them the most.

Climate change presents us with unprecedented challenges – challenges that cannot be met with traditional ways of thinking or conventional solutions. As Governor Brown has recognized, meeting these challenges will require "courage, creativity and boldness." The last ten years proved to ourselves, and the world, that Californians recognize the danger of climate change. It has also demonstrated that developing mitigation strategies through a public process where all stakeholders have a voice leads to effective actions that address climate change while yielding a series of co-benefits to the state. This Scoping Plan builds on those early steps and moves into a new chapter that will deliver a thriving economy and a clean environment to our children and grandchildren. It is a commitment to the future, but it begins today by moving forward with the policies in this Plan.

ABBREVIATIONS

AB	Assembly Bill
AC	air conditioning
AEO	Annual Energy Outlook
AHSC	Affordable Housing and Sustainable Communities
ARFVTP	Alternative and Renewable Fuel and Vehicle Technology Program
BARCT	best available retrofit control technology
BAU	business-as-usual
BC	British Columbia
BEV	Battery-electric vehicle
CARB	California Air Resources Board
CAISO	California Independent System Operator
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards
CalPERS	California Public Employees' Retirement System
CalSTA	California State Transportation Agency
CalSTRS	California State Teachers' Retirement System
CAP	Climate Action Plan
CARE	California Alternate Rates for Energy Program
CDFA	California Department of Food and Agriculture
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFT	Clean Fuels and Technology
CH ₄	Methane
CI	carbon intensity
CNRA	California Natural Resources Agency
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COPD	chronic obstructive pulmonary disease
CPUC	California Public Utilities Commission
CSI	California Solar Initiative
dge	diesel gallon equivalent
DWR	California Department of Water Resources
EA	Environmental Analysis
EEI	Education and Environment Initiative
EIR	Environmental Impact Report
EJAC	Environmental Justice Advisory Committee

EO	Executive Order
EPIC	Electric Program Investment Charge Program
F-gases	fluorinated gases
FCEV	Fuel-cell electric vehicle
FERA	Family Electric Rate Assistance
GCF	Governors' Climate and Forests Task Force
GDP	gross domestic product
GGRF	Greenhouse Gas Reduction Fund
GHG	greenhouse gas
GoBiz	Governor's Office of Business and Economic Development
GWP	global warming potential
HCD	California Department of Housing and Community Development
HFC	Hydrofluorocarbon
HVAC	heating, ventilation and air conditioning
ICAP	International Carbon Action Partnership
IEPR	Integrated Energy Policy Report
IOU	investor-owned utility
IPCC	United Nations Intergovernmental Panel on Climate Change
IRP	integrated resource plan
IWG	Interagency Working Group on the Social Cost of Greenhouse Gases
LCFS	Low Carbon Fuel Standard
LCTOP	Low Carbon Transit Operations Program
LDV	light-duty vehicle
LED	light-emitting diode
LIWP	Low-Income Weatherization Program
LOS	level of service
MMTCO _{2e}	million metric tons of carbon dioxide equivalent
MOU	memorandum of understanding
MPO	metropolitan planning organization
MRR	Regulation for the Mandatory Reporting of GHG Emissions
MTCO ₂	metric tons of carbon dioxide
MW	Megawatt
N ₂ O	nitrous oxide
NAICS	North American Industry Classification System
NEM	Net-Energy Metering
NF ₃	nitrogen trifluoride
NO _x	nitrogen oxide
NZE	near-zero emission
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research

PEV	plug-in electric vehicle
PHEV	Plug-in hybrid electric vehicle
PFC	Perfluorocarbon
PM	particulate matter
PM _{2.5}	fine particulate matter
PMR	Partnership for Market Readiness
REMI	Regional Economic Models, Inc.
RES-BCT	Renewable Energy Bill Credit
RNG	renewable natural gas
RPS	renewable portfolio standard
RTP	regional transportation plan
SB	Senate bill
SCS	Sustainable Communities Strategies
SC-CO ₂	social cost of carbon
SF ₆	sulfur hexafluoride
SGC	Strategic Growth Council
SGIP	Self-Generation Incentive Program
SLCP	Short-lived climate pollutant
SWRCB	State Water Resources Control Board
TBD	to be determined
TCU	Transportation Communications and Utilities
TIRCP	Transit and Intercity Rail Capital Program
UCLA	University of California, Los Angeles
UHI	urban heat island
UIC	International Union of Railways
UNFCCC	United Nations Framework Convention on Climate Change
USDA	U.S. Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
WWTP	waste water treatment plant
ZE	zero emission
ZEV	zero emission vehicles

California's 2030 Vision

CAP-AND-TRADE

Firm limit on 80% of emissions



CLEAN ENERGY

At least 50% renewable electricity

Double energy efficiency in existing buildings

CLEAN FUELS

18% carbon intensity reduction

High density, transit-oriented housing

NATURAL & WORKING LANDS RESTORATION
15-20 million metric tons of reductions

Walkable & bikable communities

On-road oil demand reduced by half

CLEAN TRANSIT
100% of new bus are zero-emission

REDUCE "SUPER POLLUTANTS"
40% reduction in methane and HFCs

CLEAN CARS
Over 4 million affordable electric cars on the road

SUSTAINABLE FREIGHT
Transitioning to zero emissions everywhere feasible, and near-zero emissions with renewable fuels everywhere else

Attachment F
CARB Notice of Public
Availability of Modified Text and
Availability of Additional
Documents and Information,
Proposed Amendments to the
Proposed Clean Trucks
Regulation



State of California
AIR RESOURCES BOARD

**Notice of Public Availability of Modified Text
and Availability of Additional Documents and Information**

**PROPOSED AMENDMENTS TO THE PROPOSED ADVANCED CLEAN TRUCKS
REGULATION**

Public Hearing Date: December 12, 2019
Public Availability Date: April 28, 2020
Deadline for Public Comment: May 28, 2020

At its December 12, 2019, public hearing, the California Air Resources Board (CARB or Board) considered staff's proposed adoption of new sections 1963, 1963.1, 1963.2, 1963.3, 1963.4, 1963.5, 2012, 2012.1, 2012.2, and 2012.3, title 13 California Code of Regulations. These new sections comprise the Advanced Clean Trucks (ACT) rulemaking, which seeks to accelerate the widespread adoption of zero-emission vehicles (ZEVs) in the medium-and heavy-duty truck sector and reduce the amount of harmful emissions generated from on-road mobile sources.

At the public hearing, the Board directed staff to consider modifications to the manufacturer mandate that would increase the number of zero-emission trucks sold and deployed, give consideration to the Truck and Engine Manufacturers Association proposal of 100% ZEV sales by market segment, extend near-zero emission vehicle credit, and accelerate emissions benefits in disadvantaged communities. The Board also directed staff to work with industry to streamline the reporting requirement, expedite the establishment of complementary zero-emission fleet rules, and establish pathways to the Governor's 2045 carbon neutrality goal.

Pursuant to Government Code section 11346.8, CARB staff is making modified regulatory language, conforming modifications, and additional supporting documents and information available for public comment for 30 days. The Executive Officer will consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days, the minimum required per section 11346.8. The Executive Officer will evaluate all comments received during the public comment periods, including comments raising significant environmental issues, and prepare written responses to such comments as required by CARB's certified regulations at California Code of Regulations, title 17, sections 60000-60008 and Government Code section 11346.9(a). The Executive Officer, at a subsequently scheduled public hearing, will present staff's written responses to environmental comments and the final environmental analysis for consideration for approval, along with the finalized regulation for consideration for adoption.

All regulatory documents for this rulemaking are available online at the following CARB website:

<https://ww2.arb.ca.gov/rulemaking/2019/advancedcleantrucks>

The text of the modified regulatory language is shown in Attachment A. The originally proposed regulatory language is shown as “normal type” to be added to the California Code of Regulations. New deletions and additions to the originally proposed language are shown in ~~strike through~~ to indicate deletions and underline format, respectively.

In the Final Statement of Reasons, staff will respond to all comments received on the record during the comment periods. The Administrative Procedure Act requires that staff respond to comments received regarding all noticed changes. Therefore, staff will only address comments received during this 30-day comment period that are responsive to this notice, documents added to the record, or the changes detailed in Attachment A.

Summary of Proposed Modifications

Staff proposes changes to increase the number of ZEVs sold by manufacturers in California and to streamline reporting requirements for large fleets as directed by the Board.

For the proposed manufacturer ZEV sales requirement, staff proposes changes to sections 1963 through 1963.5 to strengthen ZEV sales requirements and to provide a clear market signal on the pathway to reach carbon neutrality by 2045 in California, which is consistent with Board direction and many public comments received for the ACT rulemaking. These changes are critical to California achieving its future ZEV adoption goals and to meet both climate and health-based air quality targets.

Staff proposes increasing the percentage of ZEV sales in California across all vehicle groups from 2024 to 2030 and to increase the percentage requirements from 2030 to 2035 rather than keeping them constant during that period. Staff proposes including pickups in the ZEV sales requirement for the Class 2b-3 vehicle group beginning with the 2024 model year, rather than excluding them until 2027. This change will increase the number of minimum ZEVs required to be sold in the Class 2b-3 vehicle group in 2024 through 2026 and is supported by new information in recent market announcements showing that a number of zero emission pickup and additional van models will be commercially available from several manufacturers well before the 2024 model year. Changes in the Class 2b-3 vehicle group are necessary to ensure strong market signals align with future demand for ZEVs. Proposed increases in the Class 7 and 8 tractor group sales percentages are necessary to ensure there are sufficient tractor sales to meet the goal of achieving an all zero-emission drayage fleet by 2035 which would directly benefit disadvantaged communities. In combination, these changes would increase ZEV sales in all vehicle size categories and would provide a clear path towards achieving carbon neutrality by 2045.

Staff also proposes changes that would provide additional flexibility for manufacturers that produce a small number of tractors each year, and changes to ZEV and NZEV credit lifetimes to align credit life for manufacturers with California's Greenhouse Gas Phase 2 regulations. Staff also proposes extending NZEV credit for an additional five years from 2030 to 2035 for NZEVs that achieve more than 75 miles of all-electric range. A number of additional changes are being made to clarify definitions, better explain credit accounting and retirement order, prevent double counting of NZEV credits with the Advanced Clean Cars regulation, and non-substantive changes.

For the proposed large entity reporting requirement, staff proposes changes to sections 2012 through 2012.3 to streamline reporting while ensuring key data are still collected to support future ZEV fleet regulations. The changes would limit the required reporting to vehicle owners and brokers. Staff proposes removing the entirety of section 2012.2, which would eliminate reporting facility-based information along with weekly truck trip counts. CARB will still seek to gather this information through other means, including potentially a separate non-regulatory contracted survey.

Staff also proposes lowering the vehicle count threshold for the reporting requirement to fleets with 50 or more trucks and buses rather than the originally proposed 100 vehicle fleet size; this will ensure representative sampling of truck usage across more fleets. Staff proposes including language that specifies a period of time for entities to respond to requests for clarification of apparent anomalies in reported information, to the extent they exist. A number of other changes include clarifying definitions, removing references to the facility reporting information, clarifying that personal residence information is not part of the reporting requirement, and adding language providing example methods to assist when responding to questions.

These changes are necessary to meet Board direction by strengthening ZEV sales requirements consistent with vehicle availability and technological feasibility. These changes would ensure long term market signals are placed to help achieve carbon neutrality in California by 2045. Additionally, streamlining and clarifying large entity reporting is necessary to meet Board direction and stakeholder concerns, while ensuring critical information is gathered to support future rulemakings.

The following summary does not include all modifications to correct typographical or grammatical errors, changes in numbering or formatting, nor does it include all of the non-substantive revisions made to improve clarity.

A. Modifications to Section 1963. Purpose, Applicability, Definition, and General Requirements.

Most of the changes to section 1963 and its subsections further clarify the intent of the original language. They include edits making it clear that yard tractors are included in the Class 4-8 vehicle group, parts and powertrain suppliers are excluded from the definition of a vehicle manufacturer, and other changes to definitions in conjunction with the extension of credits for near-zero-emission vehicles (NZEV).

1. In section 1963(a), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Staff also proposes specifying that the purpose applies to sections 1963, 1963.1, 1963.2, 1963.3, 1963.4, and 1963.5. This is necessary to avoid confusion to which sections the purpose is describing.
2. In section 1963(b), staff proposes adding “on-road” to clarify that the provisions of this sections apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
3. In section 1963(c), a number of definitions have been added, deleted, or modified:
 - a. In section 1963(c)(1), staff proposes modifying the definition of “all-electric range” to mean the number of miles a vehicle can travel using stored on-board electricity, and to eliminate the reference to the CA Phase II GHG regulation definition of “all-electric range”. This is necessary to avoid confusion about whether the definition of “all-electric range” includes the minimum range limits identified in CA Phase II GHG. Additionally, staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
 - b. In section 1963(c)(2), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
 - c. In section 1963(c)(3), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
 - d. In section 1963(c)(4), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
 - e. In section 1963(c)(5), staff proposes adding language to clarify that the Class 4-8 group includes “yard tractors,” as defined in section 1963(c)(21). This is necessary as the duty cycle of yard tractors is characterized by low speed operation at a central location and are

suitable for early electrification, similar to other vehicles in the Class 4-8 group. Staff also proposes adding “on-road” to clarify that the provisions of this section apply solely to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.

- f. In section 1963(c)(6), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
- g. In section 1963(c)(7), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Additionally, staff proposes changing the bottom threshold GVWR for Class 6 to apply to vehicles with 19,501 lbs. GVWR instead of 19,001 lbs. GVWR. This is necessary to clarify staff’s original intent in matching the GVWR thresholds with commonly accepted EPA vehicle class definitions.
- h. In section 1963(c)(8), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
- i. In section 1963(c)(9), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
- j. In section 1963(c)(10), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Additionally, staff proposes changing the bottom threshold GVWR for Class 8 to apply to vehicles with 33,001 lbs. GVWR instead of 33,000 lbs. GVWR. This is necessary to clarify staff’s original intent in matching the GVWR thresholds with commonly accepted EPA vehicle class definitions.
- k. In section 1963(c)(11)(A), staff proposes removing language that refers to California Vehicle Code section 350 for the definition of “GVWR.” This is necessary to avoid confusion as this reference is redundant with the “GVWR” definition in renumbered section 1963(c)(13).

- l. In renumbered section 1963(c)(13), staff proposes adding language in the text to modify the provisions of this section to be the definition of “Gross Vehicle Weight Rating” or “GVWR” instead of “Gross Vehicle Weight Rating (GVWR).” This is necessary to avoid confusion and use consistent styling with other definitions with acronyms.
- m. In renumbered section 1963(c)(14), staff proposes changing the definition of “manufacturer” to exclude persons who supply parts to the importer or vehicle manufacturer of record from the provisions of this section. This change is necessary so that entities that do not assemble vehicles are not inadvertently included. Staff also proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
- n. In renumbered section 1963(c)(14), staff proposes removing the phrase “including a trailer” from the definition of manufacturer, which is necessary to clarify staff’s original intent of not including manufacturers that exclusively manufacture trailers as regulated parties.
- o. In renumbered section 1963(c)(16), staff proposes adding “or NZEV” to clarify that this is the abbreviation for “Near-zero-emission vehicle”. This is necessary to avoid confusion and use consistent styling with other definitions with acronyms.
 - 1. In section 1963(c)(15)(A), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Staff also proposes removing reference to “minimum” for all-electric range, as minimum all-electric range is not defined in section 1963(c)(1). This is necessary to avoid conflict with the minimum all-electric range requirements in newly added section 1963.2(b)(2).
 - 2. In section 1963(c)(15)(B), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Staff also proposes removing reference to “minimum” for all-electric range, as minimum all-electric range is not defined in section 1963(c)(1). This is necessary to avoid conflict with the

minimum all-electric range requirements in newly added section 1963.2(b)(2).

- p. Former section 1963(c)(17) is proposed to be removed. This is necessary because the definition for “pickup truck” is no longer used within the regulation language due to changes made to the Class 2b-3 vehicle group to strengthen the ZEV sales requirements.
 - q. In section 1963(a)(18), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent not to include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. Staff also proposes removing “definitions” as it is redundant with the language in the subsections of 1963(a)(17).
 - r. In section 1963(a)(19), staff proposes stating that “on-road vehicles” have the same definition as “vehicles”. This is necessary to clarify staff’s original intent that this regulation applies to vehicles intended for on-road or on-highway usage and does not apply to off-road vehicles. Staff also proposes adding “new” to clarify that the definition of the word “vehicle” only applies to new vehicles. This is necessary to clarify the original intent to not include used vehicles that are sold when calculating credits, deficits, and exemptions.
 - s. In section 1963(c)(20), staff proposes modifying the “yard tractor” definition to mean a vehicle originally designed to be operated on-road and that has a movable fifth wheel, but may not be hydraulically elevated in future ZEV designs. This is necessary to ensure zero-emission yard tractors, which do not have engines and may not have hydraulically-powered fifth wheels, are included in deficit and credit generation calculations.
 - t. In section 1963(c)(21), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
4. In section 1963(d), staff proposes removing subsections (1), (1)(A), (1)(B), and any references to these subsections. In addition, staff proposes adding language that specifies that ZEV and NZEV credits retired must equal or exceed total annual deficits each model year using methods specified in section 1963.3. This modification is necessary due to the proposed restructuring of section 1963.3 which makes sections (1), (1)(A), and (1)(B) unnecessary, and to simplify and clarify the language requiring credits retired to meet or exceed deficits.

5. In section 1963(e), staff proposes modifying the Low Volume Exemption by defining that the calculation to determine whether a manufacturer is low volume begins with the 2024 model year. This is necessary because the original proposal did not specify when this calculation began, which created an unintentional open ended requirement for any manufacturer that had ever exceeded the threshold in the past to be included even if they more recently qualified to use the exemption. Staff also proposes specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations.
6. In section 1963(f), staff proposes removing language referring to section 1963(e). This is necessary to correct an error in the original proposal that would have prevented exempt manufacturers from voluntarily electing to generate credits.

B. Modifications to Section 1963.1. Deficits.

Subsections of Section 1963.1 have been rearranged to account for the removal of the pickup truck exclusion and the addition of clarifying language that would specify how to round credits and how to account for different types of credits.

1. In renumbered section 1963.1(a), staff proposes removing language referring to the aggregation of annual deficits incurred. This modification is necessary due to this provision being redundant and covered elsewhere in the newly proposed regulation language. Staff also proposes adding language that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement. In addition, staff proposes adding language specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations. Staff also proposes specifying that deficits are incurred upon sale to the ultimate purchaser. This is necessary to clarify when exactly the deficit is generated.
2. Staff proposes former section 1963.1(a)(1)(A) be removed so that pickup trucks are included in deficit calculations starting in the 2024 model year instead of excluding them until the 2027 model year. This change is necessary to increase the number of ZEVs required to be sold in the Class 2b-3 Group as directed by the Board. Recent announcements from several manufacturers demonstrate that zero-emission heavy-duty pickup

trucks will be commercially available well before 2024, which was not anticipated in the original proposal. The rationale and necessity of this change is discussed in detail in Attachment B.

3. In renumbered section 1963.1(b), staff proposes changing language on how deficits are calculated for clarity. This change is necessary to make the language consistent with credit calculation language. In addition, staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
4. In renumbered section 1963.1(b), Table A-1, staff proposes increasing existing ZEV sales percentages between 2024 and 2030 and to continue increasing the sales requirements through the 2035 model year instead of maintaining a constant percentage requirement after 2030. This modification is necessary to increase the expected ZEV population in California as directed by the Board, consistent with new developments in the market and newly released studies indicating greater than originally expected feasibility of ZEV technologies in a wider variety of use cases. Rationale and necessity for these changes are discussed in depth in Attachment B. Staff also proposes removing the footnote that refers to the exclusion of pickup trucks, which is necessary for consistency with removing former section 1963.1(a)(1)(A) to include pickup trucks starting in 2024.
5. In renumbered section 1963.1(b), Table A-2, staff proposes changing the heading descriptions of the table to indicate which vehicle group the vehicles would belong to. This change is necessary because previously it was unclear which columns applied to yard tractors, so staff used the defined vehicle group categories to specify to which columns various vehicle classes apply. Staff also proposes changing the weight class modifier for Class 2b-3 vehicles to 0.8. This change is necessary as there is a higher risk to manufacturers that produce vehicles in this category due to relatively high proportion of personal-use and small fleet purchasers of pickups and vans. Smaller fleets are expected to have additional challenges adopting electric vehicles. The change provides more flexibility to offset required ZEV sales in other vehicle groups. Staff also proposes changing the weight class modifier for vehicles in the Class 7-8 tractor group from 2.0 to 2.5. The weight class modifiers were developed based on the emissions per mile of different vehicle classes and as a result tractors and Class 8 straight trucks had the same modifier. However, because tractors have higher annual mileages than other vehicles, conventional tractors generate more emissions and electric tractors generate greater emission benefits on a per vehicle basis. This change is necessary to provide better emissions equity when moving

credits between vehicle groups, and to encourage manufacturers to produce tractors that can provide more benefits in disadvantaged communities.

6. In new section 1963.1(c), staff proposes adding language to describe rounding for the summed number of deficits for a vehicle group, which is necessary to be consistent with the method of rounding for credits.
 7. In new section 1963.1(d), staff proposes adding language that specifies that deficits generated from Class 7-8 tractors are accounted separately from other deficits. This addition is necessary because compliance requirements as outlined in section 1963.3 generally require Class 7-8 tractor deficits to be offset by Class 7-8 tractor credits, and therefore the deficits must be accounted for separately to accurately track this requirement.
- C. Changes to 1963.2. Credit Generation, Banking, and Trading

Most changes to the subsections of Section 1963.2 are clarifications to improve consistency with other sections of the regulation and to ensure that the same NZEV may not be double counted by receiving credit in the Advanced Clean Cars regulation and the proposed regulation simultaneously.

1. In section 1963.2(a), staff proposes adding language specifying sales are “produced and delivered for sale in California”. This is necessary to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations. Staff also proposes specifying that ZEV credits are earned once a new vehicle is sold to an ultimate purchaser. This is necessary to ensure vehicles do not remain on dealer lots and are placed in service by an ultimate purchaser.
2. In section 1963.2(b), staff proposes changing the final model year of NZEV credit generation from 2030 to 2035. This is necessary to meet Board direction to encourage further development of near-zero-emission technologies which could enable widespread electrification for vehicles that may not always have access to charging stations or hydrogen fueling stations. staff proposes adding language specifying sales are “produced and delivered for sale in California”. This is necessary to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations. Staff also proposes specifying that NZEV credits are earned once a new vehicle is sold to an ultimate purchaser. This is necessary to ensure vehicles do not remain on dealer lots and are placed in service by an ultimate purchaser.
 - a. In new section 1963.2(b)(2), staff proposes adding language to have the NZEV credit calculation take into account a minimum all-electric

range, which will be an all-electric range that meet or exceed the criteria specified in 17 CCR section 95663(d) until the end of the 2029 model year, at which point the minimum all-electric range will be 75 miles. This change is necessary to establish a performance threshold for NZEVs that align with other regulations until the end of the 2029 model year, at which point a more robust all-electric range requirement will be established to promote technology advancements.

3. In section 1963.2(c), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits. Staff also proposes adding language to specify that credit rounding is applicable to the sum of the credits generated each model year. This change is necessary to establish a rounding convention that will avoid disparate credit calculations resulting from manufacturers using rounding at different points in the credit generation calculation.
4. In section 1963.2(d), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits. Staff also proposes removing language indicating that only credits to be generated in excess of deficits may be banked. This change is necessary as credits and deficits are being calculated and accounted for independently, thus the language is not needed.
5. In section 1963.2(e), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits.
6. In section 1963.2(f), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits. Staff also proposes replacing the stated vehicle groups with "other credits", which is necessary to improve readability of the language.
7. In section 1963.2(g), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits.
8. In section 1963.2(g)(1), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits.
9. In section 1963.2(g)(2), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff's original intent that this provision applies to both types of credits. Staff also proposes

revising language to change the expiration of credits from four to five model years after they are generated for credits generated beginning in the 2024 model year. This change is necessary to align credit lifetime with the California and Federal Phase 2 GHG regulations.

10. In section 1963.2(h), staff proposes adding “on-road” to clarify that the provisions of this section apply to on-road vehicles. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement.
11. In section 1963.2(i), staff proposes revising language to clarify that both ZEVs and NZEVs may only generate credits in either the Advanced Clean Trucks Regulation (13 CCR 1963.2) or the Advanced Clean Cars Regulation (13 CCR 1962.2) for each vehicle, not both. This change is necessary to prevent double counting of credits and thus reducing expected emissions benefits. Staff also proposes adding language that requires manufacturers to comply with reporting requirements specified in subsection 1963.4(c), which is necessary to inform staff of the specific regulation they will claim credit under for any Class 2b-3 vehicles. Staff also proposes adding language specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations.

D. Modifications to Section 1963.3. Compliance Determination.

Along with clarifying edits, some subsections of Section 1963.3(c) have been rearranged, added, or removed to outline that the retirement order of credits is primarily determined by the model year of expiration followed by NZEV credits and ZEV credits. A new section was added to provide flexibility for manufacturers that produce a very small number of Class 7-8 Tractors by including a provision to meet compliance by retiring credits generated from non-tractor ZEV sales.

1. In section 1963.3(a), staff proposes modifying language on how compliance for a manufacturer is determined, which is necessary to improve readability and clarity.
2. In section 1963.3(b), staff proposes clarifying that the manufacturer has until the end of the next model year to make up a deficit rather than only a few months as originally drafted in error.
3. In section 1963.3(c), staff proposes adding language that refers to a newly added subsection 1963.3(c)(3) containing an exception in the credit retirement order, which is necessary to allow manufacturers who incur a

small number of deficits in the Class 7-8 tractor group to use credits from other vehicle groups to achieve compliance.

- a. In newly added and renumbered section 1963.3(c)(1), staff proposes adding language specifying that credits must be retired in order of model year beginning with the earliest expiring credit. This modification is necessary to change the credit retirement order to reduce the potential that a manufacturer's credits would expire without the opportunity to use them.
- b. In renumbered section 1963.3(c)(2), staff proposes modifying language in the text that would specify that NZEV credits must be used before ZEV credits for each weight class group. This change, as well as changes in the subsections of 1963.3(c)(2), are necessary to avoid scenarios where a manufacturer's credits could expire without the opportunity to use them since there is a cap on how many can be used each year.
 1. In renumbered section 1963.3(c)(2)(A)-(C), staff proposes adding language that makes these subsections applicable to NZEVs. This modification would specify that, when retiring credits by order of credit type, manufacturers must first retire credits generated by NZEVs in the Class 7-8 tractor vehicle group to offset Class 7-8 tractor deficits, after taking into account all limitations.
 2. In newly added subsection 1963.3(c)(2)(D-F), staff proposes adding language that makes these subsections occur after renumbered section 1963.3(c)(2)(C) and applicable to ZEVs. This addition is necessary to specify that, when retiring credits by order of credit type, manufacturers must retire credits generated by ZEVs after accounting for NZEV credits for each vehicle group.
4. Staff proposes removing former section 1963.3(c)(2), which is necessary as the provisions detailed in this section have been moved to newly added section 1963.3(c)(1).
5. Staff proposes removing former section 1963.3(c)(3), which is necessary as the provisions detailed in this section have been moved to the relevant subsections of renumbered section 1963.3(c)(2).
6. In newly added and renumbered section 1963.3(c)(3), staff proposes adding language on how manufacturers who have up to 25 deficits in the Class 7-8 Tractors vehicle group may use credits generated from other vehicle groups to offset these deficits. This change is necessary to

address manufacturer concerns that it does not make economic sense that manufacturers who sell relatively few vehicles in the Class 7-8 Tractors vehicle group should have to produce even fewer zero-emission tractors to achieve compliance.

7. In section 1963.3(d), staff proposes changing the language to specify no more than 50 percent of the Class 2b-3 and Class 4-8 deficits may be met with NZEV credits. This is necessary to avoid a potential loop-hole that could allow a manufacturer to exceed the 50 percent limit as originally worded. In addition, staff proposes using the phrase “annual summed deficits” to match the rest of the regulation text.
8. In section 1963.3(e), staff proposes modifying the requirement that Class 7-8 tractor deficits may only be met with tractor credits to incorporate the new flexibility outlined in section 1963.3(c)(3).

E. Modifications to Section 1963.4. Reporting and Recordkeeping

A section of 1963.4 referring to the pickup truck exclusion has been removed to reflect changes in other sections of the regulation language and the remaining sections are renumbered. Another notable change is the credit transfer reporting deadline, which is now 90 days following the end of the model year as opposed to March 31st of each calendar year. This change will align reporting with the model year definition already established in other regulations as well as make the language consistent across different sections of the regulation language.

1. In section 1963.4(a), staff proposes adding language that clarifies that reporting must be completed no later than 90 days following the end of each model year. This is necessary to clarify the reporting deadline and to better match with the reporting deadlines of the California Phase II GHG regulation, thus reducing the burden of reporting for multiple rules. In addition, staff proposes adding language specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations.
 - a. Staff proposes removing former section 1963.4(a)(2) since the provisions detailed within this section are no longer applicable after the removal of the pickup truck exemption.
 - b. In renumbered section 1963.4(a)(3), staff proposes replacing “yard truck” with “yard tractor” which is necessary to be consistent with the term used for the definition. Staff also proposes removing the

requirement to report pickup trucks as it is no longer needed after the removal of the pickup truck exemption.

- c. In renumbered section 1963.4(a)(5), staff proposes adding language specifying sales volume for vehicles “produced and delivered for sale in California”. This is necessary to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations.
2. In section 1963.4(b), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff’s original intent that this provision applies to both types of credits.
3. In section 1963.4(b)(1), staff proposes modifying language to clarify that manufacturers must report credit transfers no later than 90 days following the end of the model year to demonstrate compliance. This change is necessary to match the timeline for other reporting deadlines in the regulation text and to simplify language.
4. In section 1963.4(b)(2), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff’s original intent that this provision applies to both types of credits.
5. In section 1963.4(b)(2)(E), staff proposes specifying that this section applies to ZEV or NZEV credits. This is necessary to clarify staff’s original intent that this provision applies to both types of credits.
6. In section 1963.4(c), staff proposes clarifying that manufacturers must declare which regulation Class 2b-3 ZEV or NZEV vehicles will generate credits towards compliance no later than 90 days following the end of the model year. This change is necessary to match the timeline for other reporting deadlines in the regulation text.
 - a. In section 1963.4(c)(1), staff proposes adding language specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with language in the Phase 2 GHG and Advanced Clean Cars regulations .
 - b. In section 1963.4(c)(2), staff proposes adding language specifying sales are of “on-road vehicles produced and delivered for sale in California”. This is necessary to clarify the original intent to not include off-road vehicles and equipment as part of the ZEV manufacturer sales requirement, and to remain consistent with

language in the Phase 2 GHG and Advanced Clean Cars regulations .

7. In section 1963.4(d), staff proposes clarifying that manufacturers must maintain records for eight years after the end of the model year the vehicles were produced. This change is necessary to match recordkeeping requirements of other CARB zero-emission vehicle regulations to reduce the burden of recordkeeping. Additionally, staff proposes adding a requirement that manufacturers keep records documenting vehicle delivery to the ultimate purchaser's location in California. This is necessary as often fleets will place an order for vehicles at their headquarters location and manufacturers will deliver vehicles to the fleet's locations, including California certified vehicles to California. The purpose of this requirement is to provide a mechanism to verify that vehicles that are delivered to and placed in service in California even if they are purchased outside of the state.
8. In newly added section 1963.4(e), staff proposes adding language to allow manufacturers to group non-ZEV or non-NZEV sales information together without providing specific VINs. This is necessary to more closely match California Phase II GHG reporting, which staff originally intended.

F. Modifications to Section 1963.5. Enforcement

1. In section 1963.5, staff proposes replacing references to "CARB" with references to the "Executive Officer." These changes are necessary to provide consistency in meaning for respondents to know to whom information should be submitted.
2. In section 1963.5(a)(3)(A), staff proposes removing "production", which is necessary to reflect the original intent that production data were not intended to be collected, and therefore are not subject to public disclosure per the requirements of this section. Staff also proposes specifying that the sales information disclosed is based on volume of on-road vehicles produced and delivered for sale in California to match the information manufacturers will be reporting and to be consistent with language in the Phase 2 GHG and Advanced Clean Cars regulation.
3. In newly added section 1963.5(a)(4), staff proposes adding language that specifies what happens in the event a manufacturer has failed to meet their credit and deficit requirements and how to calculate the number of vehicles in violation. This is necessary to provide stakeholders clarity in the event of manufacturer noncompliance and ensuring a consistent methodology in determining how what the penalty should be based off of.

G. Modifications to Section 2012. Large Entity Reporting Requirement

Proposed changes in Section 2012 include modifying the scope of the regulation to limit reporting to large entities with one or more vehicles with a GVWR greater than 8500 lbs. under common ownership and control, reducing the fleet size threshold from 100 to 50 for fleets and brokers, and deletion of the sections pertaining to facility characteristics, including where trucks are not domiciled, contracting practices, and truck trip counts. Other changes include examples to assist with compiling requested responses, additional exemptions for military tactical vehicles and facilities, and conforming changes to definitions and numbering.

1. In section 2012(a), staff proposes modifying the purpose language to apply to the sections 2012, 2012.1, and 2012.2 rather than “this article”, which is necessary to avoid confusion about which the purpose applies.
2. In section 2012(b), staff proposes adding the word “entities” to the statement, which is necessary to clarify that the regulation applies to entities specified in subsections 2012(b)(1)-(5).
 - a. In section 2012(b)(1), staff proposes clarifying which entities must report consistent with the removal of former section 2012.2, which is necessary to reduce the burden of reporting for entities that are not brokers and do not operate trucks. This modification is in response to Board direction and stakeholder feedback seeking a more streamlined reporting requirement. The language excluding entities that own but do not operate facilities in California was deleted as it is no longer needed since reporting would be limited to vehicle owners and brokers. Staff also proposes adding language limiting the subsection applicability to entities that operated a facility in California in 2019, and that had one or more vehicles operated under common ownership and control. This is necessary to reduce the burden of reporting for businesses that do not have a physical presence in California or that do not operate or dispatch vehicles in the state.
 - b. In section 2012(b)(2), staff proposes adding language limiting the subsection applicability to entities that had vehicles under common ownership or control. This is necessary to ensure separate entities with less than the threshold number of trucks that may operate as a single business are counted together for purposes of determining the threshold.
 - c. In sections 2012(b)(2) and 2012(b)(3), staff proposes modifying the applicability threshold from 100 down to 50 or more vehicles owned or controlled by fleets, and from 100 down to 50 or more vehicles directed by brokers. These modifications are necessary to ensure that more truck fleets provide information which will be used to better determine how to craft future ZEV fleet rules.

- d. In section 2012(b)(3), staff proposes adding language clarifying that brokers or entities dispatching vehicles must have operated a facility in California during 2019 to be subject to the regulation. This is necessary to reduce the burden of reporting for businesses that do not have a physical presence in California.
 - e. In section 2012(b)(4) and 2012(b)(5), staff proposes adding language to make it clear that the reporting requirement applies to federal, state, and local agencies who owned or controlled at least one vehicle over 8,500 lbs. GVWR and operated a facility in California in the 2019 calendar year. This is necessary to reduce the burden of reporting for businesses that do not have a physical presence in California or that do not operate or dispatch vehicles in the state.
3. In section 2012(c), staff proposes adding facilities and vehicles to the list of exemptions, which is necessary to account for newly added exemptions for certain vehicles and facilities described in sections 2012(c)(4) and 2012(c) (5).
- a. In section (c)(1), staff proposes adding language in the regulation to clarify that the school buses being used by K-12 schools and school districts are defined in California Vehicle Code section 545, which is necessary as school buses were not defined in the original proposal in error.
 - b. In section 2012(c)(2), staff proposes adding language to more clearly specify that the Innovative Clean Transit (ICT) regulation is part of title 13 of the California Code of Regulations, and that transit buses and other vehicles that exclusively support transit service are exempt from the reporting requirement. This is necessary to make it clear what vehicles are excluded from the reporting requirements when transit service is provided by a city or other entity that also uses trucks for other purposes.
 - c. In section 2012(c)(3), staff proposes modifying language to specify that light-duty vehicles that are dispatched but not owned by transportation network companies are exempt from the reporting requirements. This is necessary to clarify that any vehicles that might be owned by transportation network companies would still need to be reported.
 - d. In new section 2012(c)(4), staff proposes adding language to exempt military tactical vehicles and military tactical facilities. This is necessary to address concerns raised by stakeholders about national security.
 - e. In new section 2012(c)(5), staff proposes adding language that excludes vehicles awaiting sale, which is necessary because they

would not contribute any meaningful information regarding the use of medium and heavy-duty vehicles in California.

- f. In new section 2012(c)(6), staff proposes adding language that excludes emergency vehicles. This is necessary as authorized emergency vehicles are exempt from regulations regarding motor vehicle pollution control devices per Vehicle Code section 27156.2 so gathering this information would not aid in developing future fleet regulations.

4. Changes in 2012(d). Definitions

- a. Staff proposes removing former section 2012(d)(1) which is necessary as the language has been incorporated in section 2012(d)(22), which defines “vehicle home base.”
- b. In new section 2012(d)(1), staff proposes adding language on the definition of a “backup vehicle,” which is necessary to address stakeholder concerns that the term was previously undefined.
- c. In section 2012(d)(2), staff proposes adding language to clarify that the broker definition is a person that has the relevant broker authority from the Federal Motor Carrier Safety Association. This change is necessary for consistency with the federal definition of a “broker.”
- d. In renumbered section 2012(d)(3), staff proposes adding language on the definition of “common ownership or control.” This is necessary for consistency with established definitions in 13 CCR section 2025 and to clarify the responsible reporting entity in other sections of the regulation language.
- e. In newly added and renumbered section 2012(d)(5), staff proposes adding language to define “dispatched,” which is necessary to address stakeholder concerns that the term was previously undefined.
- f. In newly added and renumbered section 2012(d)(6), staff proposes adding a definition for “Executive Officer.” This is necessary to identify to whom entities must submit the data required by the regulation.
- g. In renumbered section 2012(d)(8)(G), staff proposes modifying the definition of restaurant to include only those businesses where the “primary purpose is serving meals or refreshments”. This is necessary to clarify the original intent that other businesses that have other primary business purposes but offer purchase of meals or refreshments, such as gas stations, are not included in this definition.

- h. In renumbered section 2012(d)(9), staff proposes adding language that specifies that it applies to vehicles that are self-propelled and under ownership or control of the fleet. This change is necessary to make the provisions of this section consistent with other sections in the regulation. Staff also proposes clarifying that long-term leases or rentals of vehicles for usage of a period of one or more years are part of the fleet. This change is necessary to clarify the applicability of the term fleet to leased vehicles. Staff proposes removing language that refers to the following subsections, as they are not used and are being removed as described below.
1. Former subsection 2012(d)(6)(A) is proposed to be removed as the term “federal fleet” is not used elsewhere in the regulation language.
 2. Former subsection 2012(d)(6)(B) is proposed to be removed as the provisions relating to “rental or leased fleet” is not used elsewhere in the regulation language.
- i. In renumbered section 2012(d)(10)(B), staff proposes adding language to clarify that long-term leases or rentals of vehicles for usage of a period of one or more years are part of the owner’s fleet. This change is necessary to clarify the applicability of the leasing agreement.
- j. In renumbered section 2012(d)(16)(B), staff proposes expanding the definition of “responsible official” to include any individual that is a delegate or a designee of the appropriate decision making official. This change is necessary to address stakeholders concerns about unnecessary burden of narrowing the definition to a single individual in a large organization when other qualified staff are in a better position to confirm the responses are accurate.
- k. Staff proposes removing former section 2012(d)(15) as the definition of “subcontractor” is no longer used in the regulation language.
- l. In section 2012(d)(18), staff proposes expanding the definition of “subhauler” to include brokers, and including not-for-hire entities as the hiring agents. This is necessary to ensure information is gathered about all types of motor carrier and broker entities that contract out for subhaulers.
- m. In renumbered section 2012(d)(20), staff proposes adding a definition of “vehicle” to clarify that only self-propelled equipment that is designed for use on highways is included and does not include motorcycles. This is necessary to address stakeholder concerns, as the term vehicle was not previously defined and stakeholders believed staff intended to

have entities report trailers, off-road equipment, or motorcycles in the regulation.

- n. In section 2012(d)(21), staff proposes removing school buses and substituting “yard goat” for “yard tractor” for consistency with other language changes, and because school buses were intended to be exempt from reporting under this regulation. Staff also proposes adding two additional body types for garbage trucks, and bifurcating on-road from off-road yard tractors. This change is necessary to respond to stakeholder comments that the existing body type selections for garbage trucks were insufficient to cover the breadth of garbage operations, and to address the need to gather data from on-road yard tractors separately from off-road yard tractors.
 - o. In new section 2012(d)(22), staff proposes adding the definition of “Vehicle home base” to make it more clear what facility location should be used when responding to questions about the vehicles at a facility. This change is necessary to combine the prior definitions that described the domiciled facility and assigned facility to clarify when each description applies. This change also clarifies that the home base is not a personal residence and can only be a location operated by the entity and minimizes any security concerns.
 - p. In renumbered sections 2012(d)(24)(A) through 2012(d)(24)(D), staff proposes clarifying definitions of vehicle categories “Light duty”, “Class 2b-3”, “Class 4-6”, and “Class 7-8” to indicate that all the vehicles are self-propelled motor vehicle designed for on-highway use. This is necessary to address stakeholder concerns that off-road equipment or trailers could be interpreted to be required to report.
5. Changes in 2012(e), General Requirements.
- a. In section 2012(e)(1), staff proposes adding language specifying that information required under section 2012.1, General Entity Information Reporting, and section 2012.2, Vehicle Usage by Facility Reporting, may be submitted separately for each subsidiary or joint venture that have at least one medium or heavy-duty vehicle under common ownership or control. Staff also proposes requiring subsidiaries with brokerage or motor carrier authority to be reported even if no vehicles are owned by that subsidiary. Additionally, staff proposes adding guidance language allowing vehicles under common ownership or control of different entities to be submitted separately by each fleet owner if they so choose. These changes are necessary to clarify potential ambiguities and contradictory language that would have required subsidiaries to report separately, which was not staff’s original intent. Additionally, these changes are necessary to streamline the

applicability of reporting requirements so they only apply to subsidiaries that own vehicles, thus preventing unnecessary data collection. Staff also proposes allowing the fleet owner to submit information that is up-to-date at any time after January 1, 2019, to make it easier for the fleet to use historical records that may already be available. Staff intend to allow respondents to optionally provide information detailing any unusual characteristics or explanations of data provided.

- b. In section 2012(e)(3), staff proposes substituting “official” for “person”, which is necessary for consistency with other regulation language and to match the appropriate definition. Staff also propose removing the word “individual” as it is not necessary. In addition, staff proposes referring to the recordkeeping example specified in section 2012.2. This is necessary to provide additional clarity and maintain internal consistency in the regulation.
 1. In section 2012(e)(3)(A), staff proposes changes to clarify the records are for on-road owned vehicles and off-road yard tractors, which is necessary to make sure that records are kept for off-road yard tractors, which have been added as part of the reporting requirement in previously described modifications, and that entities must keep other records if used to determine their responses. This is necessary to allow entities that do not collect the information in the specified formats to sufficiently support their responses.
 2. In newly added and renumbered section 2012(e)(3)(B), staff proposes adding language to require records be kept for off-road yard tractors, which is necessary to make sure that records are kept off-road yard tractors, which have been added as part of the reporting requirement in previously described modifications. Additionally, staff proposes adding language requiring recordkeeping for vehicles that are not owned but are dispatched by an entity, which is necessary to ensure that data is collected from brokers, which will assist in the development of future regulations, as available data on brokers, and the volumes of vehicles and entities they contract with, is limited.
 3. In renumbered section 2012(e)(3)(C), staff proposes adding language to clarify that reporting entities should keep the vehicle registration for each vehicle owned by California fleets used to determine their responses. This is necessary to establish that this information is only expected from vehicles owned by the entity, and prevents brokers or other

contracting entities from having to supply the information, which was a stakeholder concern.

4. In renumbered section 2012(e)(3)(D), staff proposes removing language that would have required records be kept on contracts for ground transportation needs, as these records are no longer relevant due to the removal of facility category reporting section. Additionally, staff proposes adding language stating that other records are acceptable to submit besides those specifically listed, as long as the records contain the information the entity used to determine their responses. This is necessary to allow entities that do not collect the information in the specified formats to sufficiently support their responses. Staff also proposes modifying language to replace references to “subcontractors” with “entities”. This change is necessary due to the term “subcontractors” no longer being used.
- c. In new section 2012(e)(4), staff proposes adding language that would require fleets to respond to CARB audit requests within 14 days. This change is necessary to make it clear that staff intend to reach out to respondents to clarify apparent anomalies in the reported data to better understand if there may have been an inadvertent error or if the fleet operation differs significantly from another similar fleet. The timeframe to respond would make it clear what the period for a timely response is, and would ensure data is corrected or clarified quickly so staff can process the information being received in a very short timeframe.

H. Modification to Section 2012.1. General Entity Information Reporting.

Changes to Section 2012.1 focus primarily on clarifying existing sections, modifying or adding sections to account for the addition of regulation language relating to brokers, as well as renumbering subsections of Section 2012.1 to account for these changes.

1. In section 2012.1(a)(1), staff proposes adding language that would require fictitious business names to be reported, if applicable. This change is made in response to stakeholders stating they operate under a trade name, assumed business name, or doing business as (DBA).
2. In renumbered section 2012.1(a)(2), staff proposes adding “or P.O. box” to clarify that mailing address can contain either a street address or P.O. box for reporting, which is necessary for companies that prefer to use a mailing P.O. box number for communications with CARB. Staff additionally proposes adding “state” as a field for respondents to provide

as part of their mailing address, which is necessary to allow collection of complete mailing addresses.

3. In newly added and renumbered section 2012.1(a)(7), staff proposes adding language to include federal tax identification of the corporate parent company or other entity with which the respondent has vehicles under common ownership or control, which is necessary to improve the ability to match records to corporate parent linkages or business relationships where vehicles are under common ownership or control.
4. In renumbered section 2012.1(a)(9), staff proposes adding language to clarify that only active accounts with TRUCRS IDs need to be submitted, if applicable. This is necessary as inactive IDs would not offer any practical benefits for reporting purposes.
5. In renumbered section 2012.1(a)(10), staff proposes adding “Federal” to clarify that the federal taxpayer identification number is to be provided for reporting, which is necessary to avoid confusion.
6. In renumbered section 2012.1(a)(12), staff proposes clarifying that the provisions of this section are for non-governmental entities as opposed to non-governmental agencies, which is necessary to avoid confusion and ensure all non-governmental entities report their revenues.
7. In newly added and renumbered section 2012.1(a)(13), staff proposes adding a new question requiring entities to report whether they have broker authority from the Federal Motor Carrier Safety Administration. This change is necessary to identify and collect data from brokers to develop future regulations, as available data on brokers and the volumes of vehicles and entities they contract with is limited.
8. In renumbered section 2012.1(a)(15), staff proposes adding language to substitute “entities” for “subcontractors” and remove all references to subcontractors in this section. This change is necessary due to the term “subcontractors” no longer being used, and to improve clarity. Staff also proposes modifying language to make it clear the count requested only applies to those who use vehicles over 8,500 lbs. GVWR, and that respondents can answer for 2019 or 2020. Staff intend to allow respondents to optionally provide information detailing any unusual characteristics or explanations of data provided. Additionally, staff proposes clarifying that respondents should only count entities that represented the respondent entity’s brand. These changes are necessary to provide flexibility for entities to respond using relevant and timely information they may have already collected, to limit the scope of responses to only those for which the respondent entities are reasonably expected to have data, and to specify only those contracts which are to

serve the entity's customers on the entity's behalf e.g. a contractor for FedEx who serves FedEx's customers using a vehicle with FedEx's logo.

9. In renumbered section 2012.1(a)(16), staff proposes adding language that clarifies entities with broker authority are included. Additionally, staff proposes adding language stating that entities that do not have motor carrier or broker authorities should indicate that the questions do not apply. These changes are necessary to ensure brokers answer the questions needed to gather data to develop future regulations, as available data on brokers and the volumes of vehicles and entities they contract with are limited. Language was added to give respondents more flexibility to respond to the subsections for either the 2019 or the 2020 calendar year. This change is necessary to provide flexibility for entities to respond using information they may have already collected. Staff intend to allow respondents to optionally provide information detailing any unusual characteristics or explanations of data provided.
10. In renumbered section 2012.1(a)(16)(A), staff proposes adding language clarifying the subsection only applies to contracts with subhaulers that "transport goods or other property" and does not apply to other types of contracts such as for services, repairs, or maintenance work. This is necessary to limit responses to the originally intended scope of the question and to address stakeholder concerns about the broad scope of the wording of the original proposal.
11. In renumbered section 2012.1(a)(16)(C), staff proposes adding language clarifying that the subsection only applies to vehicles operated under the hiring entity's motor carrier authority. This is necessary to limit responses to only those operating under the entity's motor carrier authority, which was the originally intended scope, rather than brokerage or other authority.
12. Staff proposes to remove former section 2012.1(a)(17). This information would already be collected under the requirements of renumbered section 2012.2. This is necessary due to direction from the Board to streamline the reporting process.
13. In renumbered section 2012.1(a)(19), staff proposes modifying the language to indicate it only applies to vehicles over 8,500 lbs. GVWR and allows the respondent to use either 2019 or 2020 information, while updating the response to indicate it is only for vehicles that do not have a vehicle home base in California. These changes are necessary to provide flexibility to entities to use information that they may already have on hand for prior years. Staff intend to allow respondents to optionally provide information detailing any unusual characteristics or explanations of data provided.

14. In newly added section 2012.1(a)(20), staff proposes adding language requiring respondents to identify the year the data used to respond to questions was from. This is necessary to be able to add a time frame context to data collected for analysis purposes, and to be able to compare data across different time frames.

- I. Staff proposes removing former section 2012.2, Facility Category Reporting since the rule will no longer require grouped facility information to be reported. This change is necessary due to direction from the Board to streamline the reporting process. Instead, staff plan to collect the information via alternative means, likely through a contract in coordination with stakeholders.
- J. Modifications to Renumbered Section 2012.2. Vehicle Usage by Facility Reporting.

Staff proposes adding language that clarifies the entities responsible for reporting, such as brokers and entities that own or operate vehicles under common ownership and control. Staff also proposes removing language regarding an exemption for military vehicles, because that language has been moved to other sections of the regulation.

Changes to the subsections of renumbered Section 2012.2 focus mostly on clarifying language and the addition of examples to provide more guidance on how to fill out responses.

1. In renumbered section 2012.2(a), staff proposes replacing the phrasing “assigned and domiciled” with “vehicle home base”. This change is necessary due to updated definitions.
 - a. In section 2012.2(a)(1), staff proposes adding “state” as a field for respondents to provide as part of their facility address, which is necessary to allow collection of complete facility addresses.
 - b. In section 2012.2(a)(6)(D), staff proposes adding language to clarify that chargers with a power level of Level 2 or greater are to be included. This is necessary to avoid a potential situation where an entity reports every wall outlet as a Level 1 charger.
 - c. In renumbered section 2012.2(a)(7), staff proposes modifying the text from “less than 10 years ago” to “on or after January 1, 2010” which is necessary to give a more definite timeline for when to report infrastructure installations.
 - d. In renumbered section 2012.2(a)(8), staff proposes removing some language that is unnecessary to improve readability.

2. In renumbered section 2012.2(b), staff proposes removing language that specified that information must be reported for the entity's fleet as it consisted on January 1, 2021. This change is necessary due to changes to section 2012(e) that allow entities to report their fleet as comprised at any time after January 1, 2019. Staff intend to allow respondents to optionally provide information detailing any unusual characteristics or explanations of data provided. Staff proposes modifying the applicability of the section to apply to only vehicle home bases with vehicles over 8,500 lbs. GVWR, and to clarify that all vehicles over 8,500 lb. GVWR, including off-road yard tractors, must have usage information reported per the provisions of the section. This is necessary to be consistent with revisions of "facility" locations to vehicle home bases elsewhere in the regulation. It is also necessary to ensure only locations with vehicles over 8,500 lbs. GVWR are included in the responses to streamline the requirements per Board direction, while collecting detailed information about all vehicles over 8,500 lb. GVWR present at those locations to ensure staff have robust data samples to inform future rulemakings. Staff also proposes including language to allow fleets to report each vehicle individually instead of grouping similar vehicles together. This is necessary to respond to stakeholder requests indicating that some data is easier to gather on a vehicle-by-vehicle basis. Staff also proposes requiring entities who direct vehicles under their brokerage authority to report information about those vehicles separately from their own vehicles. This change is necessary because of the proposed change requiring that regulated entities report information about vehicles they dispatch, but entities are not expected to have certain information about those vehicles outside their contract. Staff also proposes moving the existing guidance language into later subsections which is necessary to improve readability and to further expand guidance on how to determine responses with existing fleet information.
 - a. In renumbered section 2012.2(b)(2), staff proposes adding language that would clarify how to determine the percentage of vehicles in determining responses to subsections of 2012.2(b)(2). This change is intended to provide more guidance on different methods that could be used to streamline reporting by using existing data. This is necessary to establish expectations for how entities should respond to questions that otherwise could be interpreted in different ways. Staff also proposes adding clarification language that would make certain questions optional for yard tractors, which is necessary because yard tractors typically do not record usage in miles, and would make gathering data for the newly optional questions irrelevant. Staff proposes adding language stating that backup or non-operational vehicles should not be included in calculating mileage in responding to the subsequent subsections, which is necessary to prevent skewed data from being collected.

1. In renumbered section 2012.2(b)(2)(A) through 2012.2(b)(2)(E), staff proposes adding language to clarify that miles per day is an average. This change is intended to provide more flexibility for respondents by allowing them to determine an average using existing data instead of an exact number. This is necessary to establish expectations for how entities should respond to questions that otherwise could be interpreted in different ways. Additionally, staff proposes modifying the categories to allow respondents to bin responses by easier to determine methods. This is necessary to respond to stakeholder concerns about how to respond for vehicle groups that can be interpreted as operating in multiple different bins with the current phrasing.
2. In renumbered section 2012.2(b)(2)(F), staff proposes adding an example that would clarify the provisions of this section. This change is intended to provide more guidance on interpreting what a predictable usage pattern might look like for a fleet. This is necessary to establish expectations for how entities should respond to questions that otherwise could be interpreted in different ways.
3. In renumbered section 2012.2(b)(2)(H), staff proposes adding language that changes facility to vehicle home base for improved clarity. Staff also proposes adding an example that would clarify the provisions of this section. This is necessary to establish expectations for how entities should respond to questions that otherwise could be interpreted in different ways.
4. In renumbered section 2012.2(b)(2)(J), staff proposes modifying the question to ask whether most of the vehicles in the group operate within a 50-mile radius daily as a best estimate, because it is not a metric that is normally tracked by most fleets. The response would be “yes or no” and entities would not need to make a percentage estimate for the vehicle group. This is necessary to establish expectations for how entities should respond to questions that otherwise could be interpreted in different ways.
5. In renumbered section 2012.2(b)(2)(O), staff proposes modifying language that requests the “approximate” percentage of the “vehicle group” that supports emergence operations. This is necessary because staff recognized the number will vary based on interpretation of the question and the timeframe entities choose to form a response to this

question, but will still be helpful in identifying potential barriers to electrification if infrastructure is not widely available. Staff also proposes adding some examples of emergency operations, which is necessary to clarify that emergency operation does not include routine operations associated with emergency systems or vehicles that are dispatched on short notice for common occurrences that are not associated with emergency events due to acts of nature.

- b. In renumbered section 2012.2(b)(4), staff proposes to change “vehicle group” to “vehicle type”. This is necessary to better characterize the purchasing patterns of different vehicle body types. Staff also proposes adding the word “typically” regarding how long vehicles are kept after acquisition. This is necessary to provide guidelines on how staff expects regulated entities to respond. Adding “typically” indicates that this question is intended to reflect general business practices for the most appropriate response bin and staff recognize it could change in the future for a variety of reasons.
- c. In new section 2012.2(b)(5), staff proposes adding a new question that would require entities to report whether they are the fleet owner for each vehicle group, or whether the vehicle group is dispatched under the entity’s brokerage authority. This language is necessary to differentiate vehicles dispatched by brokers from those that are owned.
- d. In new section 2012.2(b)(6), staff proposes adding a new question that would require entities to report the start and end date of the analysis period they selected when determining responses to the other questions in the section. This is necessary for staff to have the timeframe context for entity responses to be able to accurately analyze the data collected.
- e. In new section 2012.2(b)(7), staff proposes adding language that clarifies the time period entities should select when answering questions about daily operations. This is necessary to provide guidance that stakeholders have asked for in how staff expects regulated entities to collect information for varying business models. This language was moved from renumbered section 2012(b) to improve readability.
- f. In new section 2012.2(b)(8), staff proposes adding language that states entities may repeat the information reported for a vehicle or group of vehicles at one home base for similar vehicles at another home base if the entity determines the vehicles group operations are substantially similar at other locations. This change is necessary to reduce the data analysis burden for fleets that have similar usage at

multiple locations. This language was moved from renumbered section 2012.2(b) to improve readability.

- g. In new section 2012.2(b)(9), staff proposes inserting new language that further clarifies that brokers are only expected to provide information about vehicle usage for vehicles that are dispatched by a broker and to clarify that vehicle operational information would be based solely on information under the contract between the truck owner and the broker. This is necessary to provide expectations for brokers that would not have information about trucks that they do not own.

In addition to the modifications described above, modifications correcting numbering, grammar, punctuation and spelling have been made throughout the proposed changes. These changes are non-substantive.

Environmental Analysis

These proposed modifications to the proposed regulation do not change the existing environmental analysis of the reasonably foreseeable methods by which regulated entities will achieve compliance with the proposed regulation. The reasonably foreseeable methods of compliance were analyzed in their entirety in the Draft Environmental Analysis (Draft EA) in Appendix D of the Staff Report. In general, these proposed modifications will expand the project scope by increasing the number of zero-emission vehicles sold into California, which will in turn increase the environmental benefits related to greenhouse gas reductions and air quality improvements. However, since these proposed modifications will not alter the existing compliance responses identified in the Draft EA, there is no requirement to conduct additional environmental analysis under section 15187 of the CEQA Guidelines. As a result, the Draft EA's findings, overall significance conclusions, mitigation measures and alternatives adequately address the environmental review for the proposed modifications. Therefore, CARB staff has determined that the proposed modifications would not result in any of the circumstances requiring recirculation of the Draft EA as set forth in section 15088.5 of the CEQA Guidelines.

Additional Documents Added to the Record

In the interest of completeness, staff has also added to the rulemaking record and invites comments on the following additional documents:

1. Updated Analysis Regarding Increased Manufacturer Zero-Emission Vehicles Sales Requirements (included as Attachment B to this notice).
2. Updated Costs and Benefits Analysis (included as Attachment C to this notice).

3. Emissions Inventory Methods and Results for the Proposed Advanced Clean Trucks Regulation Proposed Modifications (included as Attachment D to this notice).
4. (Atlas, 2020) Atlas Public Policy, Assessing Financial Barriers to Adoption of Electric Trucks, 2020. (web link: <https://atlaspolicy.com/wp-content/uploads/2020/02/Assessing-Financial-Barriers-to-Adoption-of-Electric-Trucks.pdf>)
5. (Avista, 2019) Avista Corp. Electric Vehicle Supply Equipment Pilot Final Report, 2019. (web link: <https://www.myavista.com/-/media/myavista/content-documents/energy-savings/electricvehiclesupplyequipmentpilotfinalreport.pdf?la=en>)
6. (Bollinger Motors, 2020a) Bollinger Motors, Bollinger B1, 2020. (web link: <https://bollingermotors.com/bollinger-b1/>)
7. (Bollinger Motors, 2020b) Bollinger Motors, Bollinger B2, 2020. (web link: <https://bollingermotors.com/bollinger-b2/>)
8. (CARB, 2019a) California Air Resources Board, Economic Cost Spreadsheet for the October 2019 Advanced Clean Trucks Staff Proposal, 2019.
9. (CARB, 2019b) California Air Resources Board, Emissions Inventory Spreadsheet for the October 2019 Advanced Clean Trucks Staff Proposal, 2019.
10. (CARB, 2020a) California Air Resources Board, Economic Cost Spreadsheet for the 2020 Advanced Clean Trucks Proposed Modifications, 2020.
11. (CARB, 2020b) California Air Resources Board, Emissions Inventory Spreadsheet for the 2020 Advanced Clean Trucks Proposed Modifications, 2020.
12. (Daimler, 2019) Daimler, Electrified segment founder: the new Mercedes-Benz eSprinter, 2019. (web link: <https://media.daimler.com/marsMediaSite/en/instance/ko.xhtml?oid=45225215&is=L2VuL2luc3RhbmNIL2tvLnhodG1sP29pZD05MjY2MjYyJnJlbEIkPTYwODI5JmZyb21PaWQ9OTI2NjI2MiZib3JkZXJzPXRydWUmcmVzdWx0SW5mb1R5cGVJZD00MDYyNiZ2aWV3VHlwZT1saXN0JnNvcnREZWZpbml0aW9uPVBVQkxJU0hFRF9BVC0yJnRodW1iU2NhbGVJbmRleD0wJnJvd0NvdW50c0luZGV4PTU!&rs=11>)
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21. (ICF, 2019) ICF International, Comparison of Medium-Duty and Heavy-Duty Technologies in California, 2019. (web link: https://caletc.com/wp-content/uploads/2019/12/ICF-Truck-Report_Final_December-2019.pdf)
22. (Kenworth, 2020) Kenworth, Kenworth Announces Collaboration with Dana on Electric Truck Powertrain Development, 2020. (web link: <https://dana.mediaroom.com/2020-01-08-Kenworth-Announces-Collaboration-with-Dana-on-Electric-Truck-Powertrain-Development>)
23. (LBNL, 2019) Lawrence Berkeley National Lab, Clean Truck Standards Consistent with Carbon Neutrality Are Economically and Environmentally Compelling, 2019. (web link: <https://www.arb.ca.gov/lists/com-attach/108-act2019-WzoHYlInVSsCZ1U6.zip>)
24. (Mack, 2020) Mack, Mack Trucks Demonstrates Mack® LR Electric Model for New York City Department of Sanitation, 2020. (web link: <https://www.macktrucks.com/mack-news/2020/mack-trucks-demonstrates-mack-lr-electric-model-for-new-york-city-department-of-sanitation/>)
25. (NACFE, 2019a) North American Council for Fuel Efficiency, Regional Haul, 2019 (web link: <https://nacfe.org/regional-haul/>)
26. (NACFE, 2019b) North American Council for Fuel Efficiency, Viable Class 7/8 Electric, Hybrid, and Alternative Fuel Tractors, 2019 (web link: <https://nacfe.org/future-technology/viable-class-7-8/>)
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31. (Rivian, 2020) Rivian, Comments on the Control of Air Pollution from New Motor Vehicles: Heavy-Duty Standards Advanced Notice of Proposed Rulemaking, 2020. (web link: <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2019-0055-0272&attachmentNumber=1&contentType=pdf>)
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38. (Volvo, 2020) Volvo Trucks, Volvo Trucks North America Demonstrates Pilot All-Electric VNR Models as Part of Volvo LIGHTS Innovation Showcase, 2020. (web link: <https://www.volvotrucks.us/news-and-stories/press-releases/2020/february/all-electric-vnr-models/>)

These documents are available for inspection by contacting Bradley Bechtold, Regulations Coordinator, at (916) 322-6533.

Agency Contacts

Inquiries concerning the substance of the proposed regulation may be directed to Craig Duehring, Air Resources Supervisor, In-Use Control Measures Section, at (916) 323-2361 or Paul Arneja, Air Resources Engineer, In-Use Control Measures Section, at (916) 322-5616.

Public Comments

Written comments will only be accepted on the modifications identified in this Notice.

Comments may be submitted by postal mail or by electronic submittal no later than the due date to the following:

Postal mail: Clerk's Office, California Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Please note that under the California Public Records Act (Gov. Code § 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

In order to be considered by the Executive Officer, comments must be directed to CARB in one of the two forms described above and received by CARB no later than the deadline date for public comment listed at the beginning of this notice. Only comments relating to the above-described modifications to the text of the regulations shall be considered by the Executive Officer.

If you need this document in an alternate format or another language, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 no later than five (5) business days from the release date of this notice. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Si necesita este documento en un formato alternativo u otro idioma, por favor llame a la oficina del Secretario del Consejo de Recursos Atmosféricos al (916) 322-5594 o envíe un fax al (916) 322-3928 no menos de cinco (5) días laborales a partir de la fecha del lanzamiento de este aviso. Para el Servicio Telefónico de California para Personas con Problemas Auditivos, ó de teléfonos TDD pueden marcar al 711.

CALIFORNIA AIR RESOURCES BOARD



Richard W. Corey
Executive Officer

Date: April 28, 2020

Attachments

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see CARB's website at www.CARB.ca.gov.

Attachment G

CARB, Offset Project Registries





This page last reviewed February 15, 2018

Offset Project Registries

Background

The Cap-and-Trade Regulation allows ARB to approve Offset Project Registries to help administer parts of the Compliance Offset Program. Offset Project Registries must meet specific regulatory criteria to be approved under the Regulation. Offset Project Registries will help facilitate the listing, reporting, and verification of offset projects developed using the Compliance Offset Protocols, and issue registry offset credits. Registry offset credits **cannot** be used for compliance with the Cap-and-Trade Program. Registry offset credits must be converted to ARB offset credits to be eligible for use in the Cap-and-Trade Program.

List of ARB Approved Offset Project Registries

All offset projects developed under an ARB Compliance Offset Protocol must be listed with an ARB approved Offset Project Registry. Offset Project Registries will help facilitate the listing, reporting, and verification of compliance offset projects, and issue registry offset credits. A list of approved Offset Project Registries can be found below.

- [American Carbon Registry \(ACR\)](#)
- [Climate Action Reserve \(CAR\)](#)
- [Verra](#) (formerly Verified Carbon Standard)

Guidance and Frequently Asked Questions (FAQs) for Offset Project Registries

ARB has developed guidance for Offset Project Registries. This guidance is intended to help Offset Project Registries and other offset program participants understand the role of the Offset Project Registries and how they interact with ARB and Offset Project Operators. In addition, ARB will develop Frequently Asked Questions (FAQs) that will be continuously updated as answers to specific questions are established. FAQs will be developed for general issues around Offset Project Registries.

- ***(Coming Soon!) Guidance for Approved Offset Project Registries***
- ***(Coming Soon!) FAQs on Offset Project Registry Related Issues***

Forms Made Available by Offset Project Registries

ARB has developed forms for use in the Compliance Offset Program. These forms may be used by program participants for submitting information related to listing, reporting, verification, and issuance of ARB offset credits. ARB will make all forms available on the [Compliance Offset Program Forms web page](#). In addition, each approved Offset Project Registry will make all forms available on its own public web page.

Application for Potential Offset Project Registries

Offset Project Registries must be approved by ARB to perform registry services under ARB's Compliance Offset Program. To become approved, potential Offset Project Registries must submit an application and meet the requirements for education and experience as defined in section 95986 of the Regulation.

- The application below must be completed and submitted to ARB to begin the Offset Project Registry application process. If the applicant satisfies all the requirements of the regulation, they will be notified of the dates and times of approved ARB Compliance Offset Program and Compliance Offset Protocol training classes. Upon successful completion of training classes by Registry Staff the Executive Officer may approve the Offset Project Registry. Submission of this form and checking the appropriate box in Part IV will also suffice for applying to be an Early Action Offset Program.
- [Application for Offset Project Registry Approval](#)

For questions or comments, please contact Stephen Shelby at (916) 327-8228 or via email at sshelby@arb.ca.gov.



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Gavin Newsom
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Attachment: WLC ResponsestoAppeal_9JUNE2020_Part 1 (4074 : World Logistics Center)

Attachment H

17 California Code of Regulations Section 95986(c)



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Subarticle 13. ARB Offset Credits and Registry Offset Credits (Refs & Annos)

17 CCR § 95986

**§ 95986. Executive Officer Approval Requirements for Offset Project
Registries.**

(a) The approval requirements specified in this subarticle apply to all Offset Project Registries that will operate to provide registry services under this article.

(b) The Executive Officer may approve Offset Project Registries that meet and maintain the requirements specified in this section.

(1) Offset Project Registry Approval Application. To apply for approval as an Offset Project Registry, the applicant shall submit the following information to the Executive Officer:

(A) Name of applicant;

(B) Name of president or chief executive officer;

(C) List of all board members, if applicable;

(D) Addresses of offices located in the United States;

(E) Documentation that the applicant carries at least five million U.S. dollars of professional liability insurance; and

(F) List of any judicial proceedings and administrative actions filed against the applicant within the previous five years, with a detailed explanation as to the nature of the

Attachment I
CNRA, Final Statement of
Reasons for Regulatory Action,
Amendments to the State CEQA
Guidelines Addressing Analysis
and Mitigation of Greenhouse
Gas Emissions Pursuant to
SB97



CALIFORNIA NATURAL RESOURCES AGENCY



FINAL STATEMENT OF REASONS FOR REGULATORY ACTION

**Amendments to the State CEQA Guidelines
Addressing Analysis and Mitigation of Greenhouse Gas
Emissions Pursuant to SB97**

December 2009

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**CALIFORNIA NATURAL RESOURCES AGENCY
FINAL STATEMENT OF REASONS FOR REGULATORY ACTION**

December 2009

INTRODUCTION

The California Natural Resources Agency (“the Resources Agency”) has adopted certain amendments and additions to certain guidelines implementing the California Environmental Quality Act (Public Resources Code section 21000 *et seq.*) (“CEQA”). Specifically, these amendments implement the Legislature’s directive in Public Resources Code section 21083.05 (enacted as part of SB97 (Chapter 185, Statutes 2007)). That section directs the Resources Agency to “certify and adopt guidelines prepared and developed by the Office of Planning and Research” “for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions[.]” (Pub. Resources Code, § 21083.05(a)-(b).)

CEQA generally requires public agencies to review the environmental impacts of proposed projects, and, if those impacts may be significant, to consider feasible alternatives and mitigation measures that would substantially reduce significant adverse environmental effects. Section 21083 of the Public Resources Code requires the adoption of guidelines to provide public agencies and members of the public with guidance about the procedures and criteria for implementing CEQA. The guidelines required by section 21083 of the Public Resources Code are promulgated in the California Code of Regulations, title 14, sections 15000-15387 (the “Guidelines” or “State CEQA Guidelines”). Public agencies, project proponents, and third parties who wish to enforce the requirements of CEQA, rely on the Guidelines to provide a comprehensive guide on compliance with CEQA. Subdivision (f) of section 21083 requires the Resources Agency, in consultation with the Office of Planning and Research (“OPR”), to certify, adopt and amend the Guidelines at least once every two years.

Section 21083.05, as noted above, requires the promulgation of Guidelines specifically addressing analysis and mitigation of the effects of greenhouse gas emissions. The Resources Agency has adopted the following changes to the Guidelines (“Amendments”) to implement that directive:

Add sections: 15064.4, 15183.5 and 15364.5.

Amend sections: 15064, 15064.7, 15065, 15086, 15093, 15125, 15126.2,
15126.4, 15130, 15150, 15183, Appendix F and Appendix G.

In addition to guidelines implementing SB97, some of the amendments listed above are non-substantive corrections.

The Resources Agency considered reasonable alternatives to the Amendments. The Resources Agency has determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 and to update the Guidelines to reflect recent case law. Thus, the Amendments add no additional substantive requirements; rather, the Guidelines merely assist lead agencies in complying with CEQA's existing requirements. The Resources Agency rejected the no action alternative because it would not respond to the Legislature's directive in SB97. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts are due to existing requirements of CEQA and not the Amendments.

The Resources Agency also initially determined that the Amendments would not have a significant adverse economic impact on business. The Resources Agency has determined that this action would have no impacts on project proponents. However, the Resources Agency is aware that certain of the statutory changes enacted by the Legislature and judicial decisions, described in greater detail below, that are reflected in the Amendments could have an economic impact on project proponents, including businesses. Among other things, project proponents could incur additional costs in assisting lead agencies to comply with CEQA's requirement for analysis of greenhouse gas emissions. However, the Amendments to the Guidelines merely reflect these legislative and judicial requirements, and the Resources Agency knows of no less costly alternative. The Amendments clarify and update the Guidelines to be consistent with legislative enactments that have modified CEQA, and recent case law interpreting it, but does not impose any new requirements. Therefore, the Amendments would not have a significant, adverse economic impact on business.

Some comments were submitted during the public comment period and during the public hearings on the Proposed Amendments suggesting that the adverse economic impacts could result. For example, some suggested that the addition of forestry resources to the Appendix G checklist may increase the regulatory burden on the agricultural industry. Others suggested that application of the Guidelines to renewable energy projects or those implementing AB32 may be counterproductive. Despite those suggestions, no evidence was presented to the Resources Agency supporting those claims. Moreover, those comments did not provide any rationale challenging the Resources Agency's position that the Proposed Amendments implement existing requirements. Therefore, having considered all of the comments submitted on the Proposed Amendments, the Resources Agency concludes that its initial determination that the proposed action will not have a significant adverse economic impact remains correct.

The Amendments do not duplicate or conflict with any federal statutes or regulations. CEQA is similar in some respects to the National Environmental Policy Act ("NEPA"), 42 U.S.C. sections 4321-4343. Federal agencies are subject to NEPA, which

requires environmental review of federal actions. State and local agencies are subject to CEQA, which requires environmental review before state and local agencies may approve or decide to undertake discretionary actions and projects in California. Although both NEPA and CEQA require an analysis of environmental impacts, the substantive and procedural requirements of the two statutes differ. Most significantly, CEQA requirements for feasible mitigation of environmental impacts exceed NEPA's mitigation provisions. A state or local agency must complete a CEQA review even for those projects for which NEPA review is also applicable, although Guidelines sections 15220-15229 allow state, local and federal agencies to coordinate review when projects are subject to both CEQA and NEPA. Because state and local agencies are subject to CEQA unless exemptions apply, and because CEQA and NEPA are not identical, guidelines for CEQA are necessary to interpret and make specific provisions of SB97 and do not duplicate the Code of Federal Regulations.

FINAL STATEMENT OF REASONS

The Administrative Procedure Act requires that an agency prepare a final statement of reasons supporting its proposed regulation. The final statement of reasons updates the information contained in the initial statement of reasons, contains final determinations as to the economic impact of the regulations, and provides summaries and responses to all comments regarding the proposed action. The initial statement of reasons, as updated and revised, are contained in full in this final statement of reasons. The summaries and responses to comments are included in the Natural Resources Agency's file of this rulemaking proceeding.

Below is a brief background on the science relating to the effects of greenhouse gas emissions, as well as the various initiatives that California is implementing to reduce those emissions. Following that background, OPR's public engagement process and the Natural Resources Agency's rulemaking process is briefly described. Next, this Final Statement of Reasons explains the purpose and necessity of each proposed change to the Guidelines. Finally, Thematic Responses, addressing the major themes that were raised in public comments, are provided.

BACKGROUND ON THE EFFECTS OF GREENHOUSE GAS EMISSIONS AND CALIFORNIA'S EFFORTS TO REDUCE THOSE EMISSIONS

This section provides a brief background on the potential effects of greenhouse gas emissions and California's efforts to reduce those emissions.

What Are Greenhouse Gases?

Certain gases in Earth's atmosphere naturally trap solar energy to maintain global average temperatures within a range suitable for terrestrial life. Those gases – which primarily include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons,

perfluorocarbons and sulfur hexafluoride – act as a greenhouse on a global scale. (Health and Safety Code, § 38505(g).) Thus, those heat-trapping gases are known as greenhouse gases (“GHG”).

The Legislature defined “greenhouse gases” to include the six gases mentioned above in California’s Global Warming Solutions Act. (Health & Saf. Code, § 38500 et seq.) Similarly, the U.S. EPA has found that those same six gases could be regulated under the authority of the Clean Air Act. According to the U.S. EPA:

(1) These six greenhouse gas share common properties regarding their climate effects; (2) these six greenhouse gases have been estimated to be the primary cause of human-induced climate change, are the best understood drivers of climate change, and are expected to remain the key driver of future climate change; (3) these six greenhouse gases are the common focus of climate change science research and policy analyses and discussions; [and] (4) using the combined mix of these gases as the definition (versus an individual gas-by-gas approach) is consistent with the science, because risks and impacts associated with greenhouse gas-induced climate change are not assessed on an individual gas approach....

(EPA, Endangerment Finding, 74 Fed. Reg. 66496, 66517 (December 15, 2009).) The United Nations Framework Convention on Climate Change also addresses these six gases. (*Id.* at p. 66519.)

What Causes Greenhouse Gas Emissions?

The incremental contributions of GHGs from innumerable direct and indirect sources result in elevated atmospheric GHG levels. (EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904 (April 24, 2009) (“cumulative emissions are responsible for the cumulative change in the stock of concentrations in the atmosphere”); see also 74 Fed. Reg. 66496, 66538 (same in Final Endangerment Finding).) Some GHG emissions occur through natural processes such as plant decomposition and wildfires. One large source of GHG emissions, for example, is wildfire on forestlands and rangelands, which release carbon as a result of material being burned. (California Board of Forestry and Fire Protection, *2008 Strategic Plan and Report to the CARB on Meeting AB32 Forestry Sector Targets* (October, 2008), at p. 2.)

Human activities, such as motor vehicle use, energy production and land development, also result in both direct and indirect emissions that contribute to highly elevated concentrations of GHGs in the atmosphere. (California Energy Commission, *Inventory of California Emissions and Sinks: 1990 to 2004* (2006).)¹ Transportation

¹ Multiple statewide emission inventories covering the same period of time may vary. This is largely due to inventories characterizing an emission source by sectors (e.g. agriculture, cement, transportation, etc.) which may not be treated the same depending on the methodology used and access to information. Thus,

alone is estimated to account for nearly 40 percent of California's GHG emissions. (California Air Resources Board, *Climate Change Proposed Scoping Plan* (2008), at p. 11 ("Scoping Plan"); California Energy Commission 2007, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF ("2007 IEPR") at p. 18, Figure 1-2.) Emissions attributable to transportation result largely from development that increases, rather than decreases, vehicle miles traveled: low density, unbalanced land uses separating jobs and housing, and a focus on single-occupancy vehicle travel. (California Energy Commission, *The Role of Land Use In Meeting California's Energy and Climate Change Goals*. (2007) at p. 9.) In approaching regulation of GHG emissions in California, for example, the California Air Resources Board ("ARB") proposes to regulate various economic sectors that are known to emit GHGs, including electric power, transportation, industrial sources, landfills, commercial and residential sectors, agriculture and forestry. (Scoping Plan, Appendix F.) With a growing population and economy, California's total GHG emissions continue to increase. As explained below, this rapid rate of increase in GHG emissions is causing a change in the composition of atmospheric gases that may cause life threatening adverse environmental consequences.

What Effects May Result from Increased Greenhouse Gas Emissions?

Several measurable effects, including, among others, an increase in global average temperatures have been attributed to increases in GHG emissions resulting from human activity. (Intergovernmental Panel on Climate Change, *Working Group 1 Report: The Physical Science Basis* (2001), at p. 101.) Evidence further indicates that a warmer planet may in turn lead to changes in rainfall patterns, a retreat of polar icecaps, a rise in sea level, and changes in ecosystems supporting human, animal and plant life. (U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*, April 17, 2009 ("Technical Support Document"), at pp. ES-1 to ES-3.) Climate change is not the only effect of increased GHG emissions. Impacts to human health and ocean acidification are also attributed to increasing concentrations of GHGs in the Earth's atmosphere. (*Id.* at p. 57.)

Globally elevated concentrations of GHGs have been observed to induce a range of associated effects. For example, the effects of atmospheric warming include, but are not limited to, increased likelihood of more frequent and intense natural disasters, increased drought, and harm to agriculture, wildlife, and ecological systems. (Technical Support Document at pp. ES-1, ES-6.) According to a report prepared for the California Climate Change Center:

Climate change is likely to affect the abundance, production, distribution, and quality of ecosystem services throughout the State of California

two statewide emissions inventories may be different depending on the agency that created them or its intended application. The CARB is in the process of updating its statewide data and methodologies to be consistent with international and national guidelines. The typical emissions inventory covers 1990 to 2004.

including the delivery of abundant and clean water supplies to support human consumption and wildlife, climate stabilization through carbon sequestration, the supply of fish for commercial and recreational sport fishing. For example, as described in this report, areas of the state suitable for forage production to support cattle grazing in natural areas could shift as some parts of the state become too dry to support forage and others become wetter. The ability of the State's forests to sequester carbon and support climate stabilization could be hindered as productivity decreases and fires increase. And increased water temperatures in streams due to a decrease in provision of fresh water could seriously reduce salmon reproduction and subsequently reduce the number of salmon available for commercial and recreational harvest. Also, areas of the state suitable for forage production to support cattle grazing in natural areas could shift as some parts of the state become too dry to support forage and others become wetter. All of these ecosystem services have economic value and that value and its distribution is likely to change under a changing climate.

(Rebecca Shaw, et al., for the California Climate Change Center, *The Impact of Climate Change on California's Ecosystem Services*, March 2009, CEC-500-2009-025-D, at p. 1.)

The effects of increased GHG concentrations are already being felt in California. For example, global atmospheric changes are causing sea levels to rise. An increase of approximately 8 inches has been recorded at the Golden Gate Bridge over the past 100 years. Such sea level rise threatens low coastal areas with inundation and increased erosion. (Scoping Plan, at p. 10.)

While sea levels continue to rise, the Sierra snowpack has been shrinking. Average annual runoff from spring snowmelt has decreased 10% in the last 100 years. Because snow in the Sierra acts as a reservoir, holding winter water for use later in the year, reduced snowpack creates greater potential for summer droughts and reduced hydroelectricity generation. (Office of Environmental Health and Hazard Assessment, April, 2009, Indicators of Climate Change in California, at p. 76.) Climate change is also thought to account for changes in the timing of California's major precipitation events. As explained in a report prepared for the California Climate Change Center:

reservoirs were designed to store only a fraction of the state's entire yearly precipitation, under the assumption that the annual mountain snowpack would melt at roughly the same time every year. During anomalously high rain or snowmelt events, reservoirs must not only store water, but also discharge excess water to avoid flooding. Water must sometimes be discharged in anticipation of large events to reduce flood risk. The dual functions of storage and flood management require reservoir managers to carefully balance factors such as precipitation, snowmelt timing, reservoir storage capacity, and demand. Even if future precipitation remains

unchanged, shifts in snowmelt timing can affect California's water supply during the warm season due to reservoir storage capacity constraints.

(Sarah Kapnick and Alex Hall, for the California Climate Change Center, *Observed Changes in the Sierra Nevada Snowpack: Potential Causes and Concerns*, March 2009, CEC-500-2009-016-D, at p. 1.)

Climate change is also expected to increase the number and intensity of forest fires. (Technical Support Document, at p. 91; see *also* Indicators of Climate Change (2009) at p. 131.) A generally warmer climate is associated with a longer summer season, which in turn dries vegetation and fuels making ignition easier and hastens wildfire spread. (*Ibid*; see also A. L. Westerling, for the California Climate Change Center, *Climate Change, Growth and California Wildfire*, March 2009, CEC-500-2009-046-D, at pp. 1-2.) Not only do wildfires release additional carbon and increase air pollutants, but they also cause indirect effects. For example, wildfires reduce vegetative cover leading to increased water runoff, which has affected watersheds and dampens the effectiveness of California's water works infrastructure. This will degrade California's water quality and challenge water treatment operations to provide safe drinking water. Adverse health impacts from heat-related illnesses are expected with hotter temperatures, and, due to poorer air quality, lung disease, asthma, and other respiratory and circulatory problems will be exacerbated. (California Climate Action Team, Executive Summary Report to Governor Schwarzenegger and the California Legislature (2006) at pp. xii to xiii, 27.); see also Technical Support Document, at pp. ES-4, 69-71.)

Why is California Involved in Greenhouse Gas Regulation?

California is vulnerable to the effects of global warming, and, despite its global nature, action to curb GHG emissions is needed on a statewide level. The legislative findings in Assembly Bill 32 (Chapter 448, Statutes 2006) ("AB32"), for example, state:

... Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

... Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

(Health & Safety Code, § 38501(a), (b).) The Legislature further declared: “action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.” (*Id.* at subd. (d).) As the world’s fifteenth largest emitter of GHGs from human activity and natural sources, California is uniquely positioned to act to reduce GHGs. (Scoping Plan, at pp. 11.)

Reducing greenhouse gas emissions is a necessary response to the threats posed by climate change. Efforts to reduce emissions may result in other significant benefits as well. Governor Schwarzenegger laid out the case for action to reduce greenhouse gas emissions in Executive Order S-3-05:

... California-based companies and companies with significant activities in California have taken leadership roles by reducing greenhouse gas (GHG) emissions, including carbon dioxide, methane, nitrous oxide and hydrofluorocarbons, related to their operations and developing products that will reduce GHG emissions; ...

... [C]ompanies that have reduced GHG emissions by 25 percent to 70 percent have lowered operating costs and increased profits by billions of dollars; ...

... [T]echnologies that reduce greenhouse gas emissions are increasingly in demand in the worldwide marketplace, and California companies investing in these technologies are well-positioned to profit from this demand, thereby boosting California's economy, creating more jobs and providing increased tax revenue; ...

... [M]any of the technologies that reduce greenhouse gas emissions also generate operating cost savings to consumers who spend a portion of the savings across a variety of sectors of the economy; this increased spending creates jobs and an overall benefit to the statewide economy.

Thus, the Governor, Legislature and private sector have concluded that action to reduce greenhouse gas emissions is necessary and beneficial for the State.

What is California Doing to Reduce its Greenhouse Gas Emissions?

Action to curb greenhouse gas emissions is taking place on many fronts. As described above, the private sector has already taken important steps to increase efficiency and lower costs associated with such emissions. Many local governments have also adopted, or are currently developing, various plans and programs designed to reduce community-wide GHG emissions. (Office of Planning and Research, *The California Planner’s Book of Lists* (January 2009) (“Book of Lists”), at pp. 92-100; see also Scoping Plan, at p. 26.) Due to its potential vulnerability to the effects of GHG

emissions, and the wide variety of GHG emissions sources within its borders, California has enacted several laws and programs designed to reduce the State's GHG emissions. Several major legislative initiatives are described below.

AB32 – The Global Warming Solutions Act

Assembly Bill 32 (Chapter 448, Statutes 2006) is a key piece of California's effort to reduce its GHG emissions. AB32 requires the California Air Resources Board ("ARB") to establish regulations designed to reduce California's GHG emissions to 1990 levels by 2020. (Health & Safety Code, § 38550.) On December 11, 2008, ARB adopted its Scoping Plan, setting forth a framework for future regulatory action on how California will achieve that goal through sector-by-sector regulation. (ARB, Resolution No. 08-47; see also Health & Safety Code, § 38561.) ARB must adopt, no later than January 1, 2012, rules and regulations to implement the GHG emissions reductions envisioned in the Scoping Plan. (Health & Safety Code, § 38562.)

The AB32 Scoping Plan outlines a set of actions designed to reduce overall GHG emissions in California to 1990 levels by 2020. The Scoping Plan presents GHG emission reduction strategies that combine regulatory approaches, voluntary measures, fees, policies, and programs. Reduction strategies are expected to evolve as technologies develop and progress toward the State's goal is monitored. Thus, the Scoping Plan sets forth the outline of California's strategy to reduce GHG emissions on a statewide basis.

SB375

As noted above, nearly 40 percent of California's GHG emissions come from the State's transportation sector. (Chapter 728, Statutes 2007, § 1(a).) Technology innovation and lower-carbon fuels alone will not reduce transportation-related emissions sufficiently for California to reach the reduction goals set out in AB32. (*Id.* at § 1(c).) Therefore, in SB375, California enacted several measures to reduce vehicular emissions through land-use planning.

Specifically, SB375 requires ARB to develop "greenhouse gas emission reduction targets for the automobile and light truck sector" for each metropolitan planning organization (MPO). (Gov. Code, § 65080(b)(2)(A).) Once that target is set, each MPO must develop a sustainable communities strategy (SCS), as part of its regional transportation plan, that will set forth a development pattern that will achieve the reduction target approved by the ARB. (*Id.* at subd. (b)(2)(B).) The MPO's transportation planning activities must be consistent with the adopted SCS. (*Id.* at subd. (b).) While an SCS does not supersede a local government's land use authority, SB375 created an exemption from CEQA for local transit-oriented residential projects that are consistent with the applicable SCS as an incentive. (*Id.* at subd. (b)(2)(J); Pub. Resources Code, § 21155.1.)

CEQA and SB97

While AB32 and SB375 target specific types of emissions from specific sectors, the California Environmental Quality Act (“CEQA”) regulates nearly all governmental activities and approvals. CEQA generally requires that a lead agency analyze the potential adverse environmental impacts of their decisions, and, if those impacts are determined to be significant, to avoid those impacts through mitigation or project alternatives. As awareness of the causes and effects of GHG emissions has increased, those effects began to be addressed in environmental analyses on a project-level basis. Federal courts, moreover, have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Uncertainty developed, however, among public agencies regarding how GHG emissions should be analyzed in environmental documents prepared pursuant to CEQA.

To provide greater certainty to lead agencies, Governor Schwarzenegger signed Senate Bill 97 (Chapter 148, Statutes 2007). (Governor Schwarzenegger’s Signing Message, SB 97.) That statute, among other things, constitutes the Legislature’s recognition that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. Pursuant to SB97, OPR developed, and the Resources Agency will adopt, amendments to the State CEQA Guidelines to address analysis and mitigation of the potential effects of GHG emissions in CEQA documents and processes. As new information or criteria established by ARB in the AB 32 process becomes available, OPR and the Resources Agency will periodically update the CEQA Guidelines to account for that new information. This rulemaking package responds to the Legislature’s directive in SB97.

Questions concerning the relationship between AB32, SB375 and CEQA were raised in public comments on the Proposed Amendments. The Resources Agency developed responses to those questions in the Responses to Comments, which are appended to this Final Statement of Reasons. Further discussion of the relationship between AB32, SB375 and CEQA is provided in the Thematic Responses at the end of this Final Statement of Reasons.

BACKGROUND ON THE DEVELOPMENT OF THE PROPOSED AMENDMENTS

OPR developed the Proposed Amendments pursuant to Public Resources Code section 21083.05, which states in part:

On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption.

In developing the Proposed Amendments, OPR actively sought the input, advice, and assistance of numerous interested parties and stakeholder groups. (Letter from OPR Director, Cynthia Bryant, to Secretary for the Natural Resources Agency, Mike Chrisman, April 13, 2009.) Specifically, OPR met with representatives of numerous agencies and organizations to discuss the perspectives of the business community, the environmental community, local governments, non-governmental organizations, state agencies, public health officials, CEQA practitioners and legal experts. In addition, OPR took advantage of numerous regional and statewide conferences to raise awareness about CEQA and GHG emissions among diverse audiences and to seek their input. These activities satisfy the provisions of Government Code section 11346.45 which require early public involvement in complex proposals.

After publishing a preliminary draft, on January 8, 2009, OPR continued to conduct extensive public outreach, including two public workshops, to receive input on the Preliminary Amendments. Both public workshops were well attended, drawing over two hundred participants representing various California business interests, environmental organizations, local governments, attorneys and consultants. In addition to oral comments at its workshops, OPR received over eighty written comment letters.

Some comments suggested additional amendments to the CEQA Guidelines. Other comments sought clarification of the language in the preliminary amendments. OPR incorporated those suggestions and clarifications to the extent possible and appropriate into its April 13, 2009, submittal to the Resources Agency. Some suggestions were not appropriate for inclusion, however, due to conflict with existing statutory authority and/or case law. For example, some comments submitted to OPR during its public workshops indicated that the Guidelines should be addressed to “Climate Change” rather than just the effects of GHG emissions. The focus in the Guidelines on GHG emissions is appropriate for at least three reasons.

First, the Legislative authorization for the Proposed Amendments refers specifically to guidelines on the “mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions.” (Pub. Resources Code, § 21083.05.) Had the Legislature intended the Guidelines to address climate change or global warming specifically, it presumably would have so indicated. Second, the precise “effect” of GHG emissions from a project is a factual matter for the lead agency to determine. Such effects may include “climate change,” “global warming” and other changes in the physical environment (increased ocean acidity or sea-level rise, for example). (EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886 (April 24, 2009), Technical Support Document, at pp. ES-2 to ES-3; see further discussion at pages 4-5, above.) Thus, rather than limit analysis to a particular effect, the proposed Guidelines on GHG emissions are consistent with the treatment of air pollutants in the existing Appendix G, which focus largely on the concentration of pollutants. (See, e.g., existing State CEQA Guidelines, Appendix G, III.d.) Third, the focus in a cumulative impacts analysis is “whether any additional effect caused by the proposed project should be considered significant given the existing cumulative effect.” (*CBE, supra*, 103 Cal. App. 4th at 118.)

Thus, the Proposed Amendments appropriately focus on a project's potential incremental contribution of GHGs rather than on the potential effect itself (i.e., climate change). Notably, however, the Proposed Amendments expressly incorporate the fair argument standard. (See, e.g., proposed Section 15064.4(b)(3).) Thus, if there is any substantial evidence supporting a fair argument that a project's GHG emissions may result in any adverse impacts, including climate change, the lead agency must resolve that concern in an EIR.

THE NATURAL RESOURCES AGENCY'S RULEMAKING PROCESS

The Natural Resources Agency commenced the rulemaking process on the Amendments on July 3, 2009, by publishing its Notice of Proposed Action in the California Regulatory Notice Register. (2009 No. 27-Z.) In addition, the Notice of Proposed Action was mailed to over 640 interested parties, and notices were e-mailed to those parties that requested electronic notification. The Natural Resources Agency also posted the Notice, Proposed Text and Initial Statement of Reasons on its website, and invited public comments on the proposed amendments between July 3, 2009, and August 20, 2009. Public hearings were held on August 18, 2009, and August 20, 2009, in Los Angeles and Sacramento, respectively, at which verbal and written comments and presentations were accepted. To ensure that all interested parties were able to provide written comments if they so chose, the Natural Resources Agency extended the public comment period to August 27, 2009. The Natural Resources Agency received over 80 comment letters on the proposed amendments.

Following review of all public comments received during the public review period and at the public hearings, the Natural Resources Agency determined that further revisions to the proposed text were appropriate. It, therefore, mailed a Notice of Proposed Changes to all hearing attendees and all persons that requested notice. Electronic notices were e-mailed to those requesting such notification. The Notice of Proposed Changes, Revised Text of the proposed amendments, comment letters, and all prior rulemaking documents were posted on the Natural Resources Agency's website. Since all revisions to the proposed amendments were sufficiently related to the originally noticed text, public comment was invited between October 23, 2009, and November 10, 2009. The Natural Resources Agency received over 20 comment letters on the revisions to the proposed amendments.

Following the close of the second public comment period, the Natural Resources Agency reviewed and considered all written comments. The Secretary for Natural Resources determined that, other than two non-substantive, clarifying changes in sections 15126.2(a) and 15126.4(c), described below, no further revisions to the proposed amendments was necessary. Secretary Mike Chrisman adopted the amendments described in this Final Statement of Reasons in December 2009.

Throughout the rulemaking process, staff of the Natural Resources Agency met with all interested parties requesting in person meetings. It also attended and presented at various conferences hosted by, among others, the California Chapter of

the American Planning Association, the California State Bar's Environmental Law Conference, County Counsels Association of California, several county bar association meetings and local government forums to provide updates on the proposed amendments and to ensure widespread participation in the Natural Resources Agency's rulemaking process.

Copies of all relevant rulemaking documents, including hearing transcripts, notices, and agendas, are included in the record of proceedings.

ADOPTED AMENDMENTS

Analysis of GHG emissions in a CEQA document presents unique challenges to lead agencies. Such analysis must be consistent with existing CEQA principles, however. Therefore, the Amendments comprise relatively modest changes to various portions of the existing CEQA Guidelines. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis. Other modifications clarify existing law that may apply both to analysis of GHG emissions as well as more traditional CEQA analyses. The incremental approach in the Amendments is consistent with Public Resources Code section 21083(f), which directs OPR and the Resources Agency to regularly review the Guidelines and propose amendments as necessary.

The Legislature expressly left development of the Guidelines to the discretion of OPR and the Resources Agency. That discretion is governed by the Government Code, which requires that any administrative regulations be consistent, and not conflict, with existing statutory authority. (Gov. Code, § 11342.2.) Thus, the Resources Agency intends, as did OPR, the Amendments to incorporate existing law, and where necessary “to implement, interpret, make specific or otherwise carry out the provisions of the statute.” (*Ibid.*) In addition, the Guidelines must be “reasonably necessary” to carry out a legislative directive. (*Ibid.*) Because the determination of “reasonable necessity” implicates an agency’s expertise, courts will defer to an agency’s findings of necessity unless the action is arbitrary, capricious or without reasonable basis. (*Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 109 (“CBE”).)

The Amendments include changes to or additions of fourteen sections of the existing Guidelines, as well as changes to Appendices F (Energy Conservation) and G (Environmental Checklist Form). The Amendments are discussed below.

SECTION 15064. DETERMINING THE SIGNIFICANCE OF THE ENVIRONMENTAL EFFECTS CAUSED BY A PROJECT.

Specific Purposes of the Amendment

Amendments are proposed to two subdivisions of the existing section 15064. The first, to subdivision (f)(5), is a grammatical correction that qualifies as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).) The second set of amendments is to subdivision (h)(3). The latter amendments are described in detail below.

Cumulative Impacts

Existing subdivision (h)(3) allows an agency to find that a project’s potential cumulative impacts are less than significant due to compliance with requirements in a plan or mitigation program. (*CBE, supra*, 103 Cal.App.4th at 111 (“a lead agency’s use of existing environmental standards in determining the significance of a project’s environmental impacts is an effective means of promoting consistency in significance determinations and integrating CEQA environmental review activities with other environmental program planning and regulation”).) In effect, that section creates a rebuttable presumption that compliance with certain plans and regulations reduces a project’s potential incremental contribution to a cumulative effect to a level that is not cumulatively considerable.

The existing Guidelines text includes several criteria that define which plans or programs may create such a presumption. To satisfy those criteria, a plan or program must: (1) have been previously approved, (2) contain specific requirements that avoid or substantially lessen the cumulative problem within a defined geographic area, and (3) be either specified in law or approved by a public agency with jurisdiction over affected resources. These criteria ensure that the presumption applies only where plans or programs have undergone public scrutiny and include binding requirements to address a cumulative problem. The existing text lists three types of plans as examples that may be relied upon for a cumulative analysis. The word “e.g.” in the existing text indicates, however, that the list is not exclusive. The Third District Court of Appeal upheld what is now section 15064(h)(3) in the *CBE* decision. (*CBE, supra*, 103 Cal.App.4th at 115-116.)

Use of Plans and Regulations in a Cumulative Impacts Analysis

The Proposed Amendments include two changes to subdivision (h)(3). First, the Amendments would add several plans and regulations to the list of examples. The Proposed Amendments would add “habitat conservation plan, natural community conservation plan, [and] plans or regulations for the reduction of greenhouse gas emissions” to the list of plans and programs that may be considered in a cumulative

impacts analysis. As explained below, the Resources Agency finds that the added plans and regulations satisfy the criteria in the existing text.

“Habitat conservation plans” are defined in the federal Endangered Species Act, and typically include specific requirements to protect listed species within a defined geographic area. (16 U.S.C. § 1539.) Though a habitat conservation plan (“HCP”) may be prepared to address the impacts of one particular project, HCPs may also be, and often have been, prepared to address the impacts of cumulative development within a defined area. (Fish and Wildlife Service and National Marine Fisheries Service, *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (November 4, 1996), at pp. 1-6 to 1-7, 1-14 to 1-15.) Most HCPs, other than “low effect HCPs,” will also likely need to undergo environmental review under the National Environmental Policy Act. (*Id.* at Ch. 5.) In such cases, an applicable HCP may appropriately be used in a cumulative impacts analysis as described in subdivision (h)(3).

“Natural community conservation plans” (“NCCPs”) are defined in the California Natural Community Conservation Planning Act. (Fish & G. Code, §§ 2800 et seq.) The purpose of an NCCP is to conserve natural communities at the ecosystem scale while accommodating compatible land uses. An NCCP includes, among others, measures to avoid or minimize impacts to natural communities, conservation obligations, and compliance monitoring. An NCCP is adopted by the Department of Fish and Game as well as local agencies with land use authority in a defined area. As discretionary acts of public agencies, NCCPs must undergo environmental review pursuant to CEQA. Thus, NCCPs satisfy the criteria in existing subdivision (h)(3).

The Legislature recognized local GHG planning efforts in Health & Safety Code section 38561(c) by directing the California Air Resources Board (ARB) to consider such programs in developing its Scoping Plan. Greenhouse gas emission reduction plans are not currently specified in law. However, the ARB’s Climate Change Scoping Plan includes a recommended reduction target for local governments and community-level emissions of 15 percent by 2020. (California Air Resources Board, *Climate Change Proposed Scoping Plan* (2008), at p. 27 (“Scoping Plan”).) The Scoping Plan also recognized the important role local greenhouse gas reduction plans would play in achieving statewide reductions. The Scoping Plan itself suggests elements that such plans should include. (Scoping Plan, Appendix C, at p. C-49.)

Independent of the Scoping Plan, many local governments have adopted, or are currently developing, various plans and programs designed to curb GHG emissions. (Office of Planning and Research, *The California Planner’s Book of Lists* (January 2009) (“Book of Lists”), at pp. 92-100; see also Scoping Plan, at p. 26.) Other public agencies, such as school districts and public universities, may also adopt greenhouse gas reduction plans to govern their own activities. Provided that such plans contain specific requirements with respect to resources that are within the agency’s jurisdiction to avoid or substantially lessen the agency’s contributions to GHG emissions, both from its own projects and from private projects it has approved or will approve, such plans may be appropriately relied on in a cumulative impacts analysis. Additional guidance regarding

the characteristics of greenhouse gas reduction plans that may be used in this context is provided in the proposed Section 15183.5, and is explained in greater detail below. Thus, greenhouse gas reduction plans satisfying such criteria would satisfy the criteria in existing subdivision (h)(3).

Finally, requirements addressing a cumulative problem may also take the form of regulations. AB 32, for example, requires ARB to adopt regulations that achieve the maximum technologically feasible and cost effective GHG reductions to reach the adopted state-wide emissions limit. (Health & Safety Code, § 38560.) Pursuant to Health and Safety Code section 38560(b), ARB will adopt a first set of regulations by January 1, 2010. Thus, a lead agency may consider whether ARB's GHG reduction regulations satisfy the criteria in existing subdivision (h)(3).

While section 15064(h)(3) creates a presumption that, where a plan, program or regulation governs a project's GHG emissions, and the project complies with those requirements, those emissions are not cumulatively considerable. That presumption is rebuttable, however. The Proposed Amendments do not alter the standard, reflected in the existing Guidelines, that if substantial evidence supports a fair argument that, despite compliance with the requirements in a plan or program, a project may have a significant effect on the environment, then an EIR must be prepared.

Demonstrating How the Plan, Program or Regulation Addresses Cumulative Impacts

In addition to augmenting the list of plans, programs and regulations that give rise to the presumption that a project's contribution is not cumulatively considerable, the Amendments also contain explanatory language designed to ensure that the plan or regulation relied on in a cumulative impacts analysis actually addresses the cumulative effect of concern for the particular project under consideration. This language is necessary to avoid misapplication of subdivision (h)(3). For example, shortly after ARB identified early action items, some lead agencies determined that a project's contribution of GHG emissions was not cumulatively considerable because the project was not inconsistent with the early action items. (See, e.g., Tentative Ruling, San Bernardino County Superior Court Case Nos. 810232, 800607 (ruling that consistency with CAT Strategies alone does not provide sufficient information about the potential impacts of a project); see also California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, March 2006, at pp. 39-63.) Such an analysis, however, would fail to account for emissions that are not addressed by the early action items. Because those early action items largely addressed industrial-type emissions, consistency with the early action items would have little relevance for a residential subdivision project. Likewise, consistency with plans that are purely aspirational (i.e., those that include only unenforceable goals without mandatory reduction measures), and provide no assurance that emissions within the area governed by the plan will actually address the cumulative problem, may not achieve the level of protection necessary to give rise to this subdivision's presumption. Thus, by requiring that lead agencies draw a link between the project and the specific provisions of a binding plan or regulation, section 15064(h)(3) would ensure that

cumulative effects of the project are actually addressed by the plan or regulation in question.

Demonstrating that compliance with a plan addresses a cumulative problem is already impliedly required by CEQA. For example, an initial study must include sufficient information to support its conclusions. (State CEQA Guidelines, § 15063(d)(3).) Similarly, section 15128 requires a lead agency to explain briefly the reasons that an impact is determined to be less than significant and therefore was not analyzed in an EIR. The added sentence, therefore, reflects existing law and is necessary to ensure that plans are not misapplied in a CEQA analysis.

Policy Goals

Inclusion of additional plans and programs to the list of examples supports two policy goals. First, an expanded list promotes integration of various regulatory mechanisms to reduce duplication. (See, e.g., Pub. Resources Code, § 21003(a) (state policy is that “[l]ocal agencies integrate the requirements of [CEQA] with planning and environmental review procedures otherwise required by law or by local practice ...”), (f) (“[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment”).) Second, the addition of GHG emissions reduction plans and regulations for the reduction of GHG emissions reflects the view of both the OPR and the Resources Agency that the effects of GHG emissions resulting from individual projects are best addressed and mitigated at a programmatic level.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Guidelines must address the determination of whether the “possible effects of a project are individually limited but cumulatively considerable.” (*Id.* at § 21083(b)(2).) Due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis. (See, e.g., EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904 (April 24, 2009) (“cumulative emissions are responsible for the cumulative change in the stock of concentrations in the atmosphere”); California Air Pollution Control Officers Association, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (January 2008) (“CAPCOA White Paper”), at p. 35 (“GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective”).) Existing section 15064(h) governs the analysis of cumulative effects in an initial study. The proposed amendments to section 15064(h)(3), on determining the significance of cumulative impacts in an initial study, are therefore necessary to carry out this legislative directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and that the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).)² Thus, the Amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

² Federal court decisions interpreting NEPA is persuasive authority in CEQA cases. (*Western Placer Citizens for an Ag. & Rur. Env. v. County of Placer* (2006) 144 Cal.App. 4th 890, 902.)

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15064.4. DETERMINING THE SIGNIFICANCE OF IMPACTS FROM GREENHOUSE GAS EMISSIONS

Specific Purposes of the Amendment

A key component of environmental analysis under CEQA is the determination of significance. (Pub. Resources Code § 21002; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1106-07.) Guidelines on the analysis of GHG emissions must, therefore, include provisions on the determination of significance of those emissions.

New section 15064.4, on the determination of significance of GHG emissions, reflects the existing CEQA principle that there is no iron-clad definition of “significance.” (State CEQA Guidelines, § 15064(b); *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1380-81 (“*Berkeley Jets*”).) Accordingly, lead agencies must use their best efforts to investigate and disclose all that they reasonably can regarding a project’s potential adverse impacts. (*Ibid*; see also State CEQA Guidelines, § 15144.) Section 15064.4 is designed to assist lead agencies in performing that required investigation. In particular, it provides that lead agencies should quantify GHG emissions where quantification is possible and will assist in the determination of significance, or perform a qualitative analysis, or both as appropriate in the context of the particular project, in order to determine the amount, types and sources of GHG emissions resulting from the project. Regardless of the type of analysis performed, the analysis must be based “to the extent possible on scientific and factual data.” In addition, lead agencies should also consider several factors. The specific provisions of section 15064.4 are discussed below.

Quantitative Analysis

Subdivision (a) of section 15064.4 states that lead agencies should calculate or estimate the GHG emissions resulting from the proposed project. This directive reflects the holding in the *Berkeley Jets* case, which required a Port Commission to quantify emissions of toxic air contaminants even in the absence of a universally accepted methodology for doing so. (*Berkeley Jets, supra*, 91 Cal.App.4th at p. 1370 (“The fact that a single methodology does not currently exist that would provide the Port with a precise, or ‘universally accepted,’ quantification of the human health risk from TAC exposure does not excuse the preparation of any health risk assessment—it requires the Port to do the necessary work to educate itself about the different methodologies that are available”) (emphasis in original).) That case also required quantitative analysis of single-event noise, even though the applicable thresholds were expressed as cumulative noise levels. (*Id.* at 1382.) Quantification was required in that context in order to identify existing noise levels, the number of additional flights, the frequency of those flights, the degree to which the increased flights would cause increased noise levels at a given location, and ultimately, the community’s reaction to that noise. (*Ibid.*) In other words, quantification would assist the lead agency in determining whether the increased noise would be potentially significant. (*Ibid.* (“CEQA requires that the Port

and the inquiring public obtain the technical information needed to assess whether the ADP will merely inconvenience the Airport's nearby residents or damn them to a somnambulate-like existence"); see also *Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1109 ("in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect".)

With the foregoing principles in mind, the quantification called for in proposed section 15064.4(a)(1) is reasonably necessary to ensure an adequate analysis of GHG emissions using available data and tools, in accordance with Public Resources Code Section 21083.05. Even where a lead agency finds that no numeric threshold of significance applies to a proposed project, the holdings in the *Berkeley Jets* and *Protect the Historic Amador Waterways* cases, described above, require quantification of emissions if such quantification will assist in determining the significance of those emissions. OPR and the Resources Agency find that quantification will, in many cases, assist in the determination of significance, as explained below. (State CEQA Guidelines, § 15142 ("An EIR shall be prepared using an interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the consideration of qualitative as well as quantitative factors".).)

First, quantification of GHG emissions is possible for a wide range of projects using currently available tools. Modeling capabilities have improved to allow quantification of emissions from various sources and at various geographic scales. (Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change Through the California Environmental Quality Act Review*, Attachment 2: Technical Resources/Modeling Tools to Estimate GHG Emissions (June 2008); CAPCOA White Paper, at pp. 59-78.) Moreover, one of the models that can be used in a GHG analysis, URBEMIS, is already widely used in CEQA air quality analyses. (CAPCOA White Paper, at p. 59.) Second, quantification informs the qualitative factors listed in proposed section 15064.4(b). Third, quantification indicates to the lead agency, and the public, whether emissions reductions are possible, and if so, from which sources. Thus, if quantification reveals that a substantial portion of a project's emissions result from energy use, a lead agency may consider whether design changes could reduce the project's energy demand.

Proposed section 15064.4(a)(1) also reflects existing case law that reserves for lead agencies the precise methodology to be used in a CEQA analysis. (See, e.g., *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 371-373.) As indicated above, a wide variety of models exist that could be used in a GHG analysis. (CAPCOA White Paper, at pp. 59-78.) Further, not every model will be appropriate for every project. For example, URBEMIS may be an appropriate tool to analyze a typical residential subdivision or commercial use project, but some public utilities projects, such as waste-water treatment plants, may require more specialized models to accurately estimate emissions. (*Id.* at pp. 60-65.) The requirement to

disclose any limitations in the model or methodology chosen also reflects the standard for adequacy of EIRs in existing State CEQA Guidelines section 15151.

Qualitative and Performance Standard Based Analysis

As explained in greater detail below in the Thematic Responses, CEQA does not require quantification of emissions in every instance. If the lead agency determines that quantification is not possible, would not yield information that would assist in analyzing the project's impacts and determining the significance of the GHG emissions, or is not appropriate in the context of the particular project, section 15064.4(a) would allow the lead agency to consider qualitative factors or performance standards. Consideration of qualitative factors is appropriate for several reasons. First, CEQA directs lead agencies to consider qualitative factors. (Pub. Resources Code, § 21001(g) (CEQA's purpose includes to: "require governmental agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs and to consider alternatives to proposed actions affecting the environment".) Second, existing section 15064.7 of the State CEQA Guidelines indicate that thresholds of significance may be qualitative, which implies that a determination of significance without a threshold could also evaluate qualitative factors. Third, the existing CEQA Guidelines state that the determination of significance requires a lead agency to use its judgment based on *all* relevant information. (State CEQA Guidelines, § 15064(b); see also *id.* at §§ 15064.7 (thresholds may be qualitative), 15142 (analysis should be interdisciplinary and both qualitative and quantitative).)

Subdivision (a) would also allow a lead agency to rely on performance-based standards to assist in the determination of significance. Just as with quantification, the purpose of engaging in a qualitative or performance standard based analysis is to develop information relevant to a significance determination. Several examples exist of the types of performance standards that might appropriately be used in determining the significance of greenhouse gas emissions. Proposed section 15183.5(b)(1)(D), for example, contemplates that a plan for the reduction of greenhouse gas emissions may contain performance based standards. Where such standards are developed as part of such a plan, a lead agency would have evidence indicating that compliance with such standards would indicate that the impact of greenhouse gas emissions would be less than significant. Further, in adopting SB375, the Legislature acknowledged that regional transportation plans, and the environmental impact reports prepared to analyze those plans, may contain performance standards that would apply to transit priority projects. (See, e.g., Public Resources Code, § 21155.2.) Other potential examples include the Bay Area Air Quality Management District's proposed Best Management Practices for Construction Greenhouse Gas Emissions (calling for use of alternative fuels, local building materials and recycling), and the California Public Utilities Commission's Performance Standard for Power Plans (requiring emissions no greater than a combined cycle gas turbine plant). Compliance with such standards may be relevant to the significance determination, when considered in conjunction with the

project's total projected emissions. Section 15064.4(a) was revised in response to comments to clarify that lead agencies may rely on quantitative or qualitative analyses, or both, in part to emphasize that qualitative analyses and performance standards may be useful supplements to a quantitative analysis.

Similar to use of a significance threshold, a lead agency must exercise care to ensure that performance standards do not replace a full analysis of all potential emissions. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109 (“in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect”).) For example, while a Platinum LEED® rating could assist a lead agency in determining whether emissions related to a building’s energy use may be significant, that performance standard may not reveal sufficient information to evaluate transportation-related emissions associated with that proposed project.

As indicated above, even a qualitative analysis must be based to the extent possible on scientific and factual data. Further, the type of analysis that is required will depend on the context of a particular project. Given the multitude of different project types and sizes, and different agencies subject to CEQA, the CEQA Guidelines, which are general by necessity, cannot specify precisely when a quantitative analysis may be required or a qualitative analysis may be appropriate. The following hypothetical examples may illustrate, however, how section 15064.4(a) could operate:

Project 1: a small habitat restoration project is proposed in a remote part of California. Workers would drive to the site where they would camp for the duration of the project. Some gas-powered tools and machinery may be required. Cleared brush would either be burned or would decay naturally.

Project 2: a large commercial development is proposed in an suburban context. Heavy-duty machinery would be required in various construction phases spanning many months. Following construction, the development would rely on electricity, water and wastewater services from the local utilities. Natural gas burners would be used on site. The development would employ several hundred workers and attract thousands of customers daily. A traffic study has been prepared for the project. The local air quality management district’s guidance document recommends that projects of similar size and character should use of URBEMIS, or another similar model, to estimate the air quality impacts of the development.

In the context of Project 2 a quantitative analysis would likely be appropriate. The URBEMIS model, which would likely be used to analyze other emissions, could also be used to estimate emissions from both project-related transportation and on-site indirect emissions (landscaping, hot-water heaters, etc.) Modeling is typically done for projects of like size and character. Other models are readily available to estimate emissions associated with utility use. In the context of Project 2, a lead agency may

find it difficult to demonstrate a good faith effort through a purely qualitative analysis. (See, e.g., *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370.)

In the context of Project 1, however, a qualitative analysis would likely be appropriate. Project 1's emissions are not easily modeled, and the Project is small in scale. While it may be technically possible, quantification of the emissions may not reveal any additional information that indicates the significance of those emissions or how they may be reduced that could not be provided in a qualitative assessment of emissions sources. (See, e.g., Public Resources Code, § 21003(f) ("public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment").)

Factors Potentially Indicating Significance

The qualitative factors listed in the proposed section 15064.4(b) are intended to assist lead agencies in collecting and considering information relevant to a project's incremental contribution of GHG emissions and the overall context of such emissions. Notably, while subdivision (b) provides a list of factors that should be considered by public agencies in determining the significance of a project's GHG emissions, other factors can and should be considered as appropriate.

Determine Whether Emissions Will Increase or Decrease

The first factor in subdivision (b), for example, asks lead agencies to consider whether the project will result in an increase or decrease in different types of GHG emissions relative to the existing environmental setting. All project components, including construction and operation, equipment and energy use, and development phases must be considered in this analysis. (State CEQA Guidelines, § 15378 (project includes "the whole of the action").) For example, a mass transit project may involve GHG emissions during its construction phase, but substantial evidence may also indicate that it will cause existing commuters to switch from single-occupant vehicles to mass transit use. Operation of such a project may ultimately result in a decrease in GHG emissions. Such analysis, provided that it is supported with substantial evidence and fully accounts for all project emissions, may support a lead agency's determination that GHG emissions associated with a project are not cumulatively considerable.

This section's reference to the "existing environmental setting" reflects existing law requiring that impacts be compared to the environment as it currently exists. (State CEQA Guidelines, § 15125.) This clarification is necessary to avoid a comparison of the project against a "business as usual" scenario as defined by ARB in the Scoping Plan. Such an approach would confuse "business as usual" projections used in ARB's Scoping Plan with CEQA's separate requirement of analyzing project effects in

comparison to the environmental baseline. (*Compare* Scoping Plan, at p. 9 (“The foundation of the Proposed Scoping Plan’s strategy is a set of measures that will cut greenhouse gas emissions by nearly 30 percent by the year 2020 as compared to business as usual”) *with Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278 (existing environmental conditions normally constitute the baseline for environmental analysis); see also *Center for Bio. Diversity v. City of Desert Hot Springs*, Riverside Sup. Ct. Case No. RIC464585 (August 6, 2008) (rejecting argument that a large subdivision project would have a “beneficial impact on CO2 emissions” because the homes would be more energy efficient and located near relatively uncongested freeways).) Business as usual may be relevant, however, in the discussion of the “no project alternative” in an EIR. (State CEQA Guidelines, § 15126.6(e)(2) (no project alternative should describe what would reasonably be expected to occur in the future in the absence of the project).)

Notably, section 15064.4(b)(1) is not intended to imply a zero net emissions threshold of significance. As case law makes clear, there is no “one molecule rule” in CEQA. (CBE, *supra*, 103 Cal.App.4th at 120.)

Thresholds of Significance

The second factor in subdivision (b) asks whether a project exceeds a threshold of significance for GHG emissions. Section 21000(d) of the Public Resources Code expressly directs public agencies to identify whether there are any critical thresholds for health and safety to identify those areas where the capacity of the environment is limited. A threshold is an “identifiable quantitative, qualitative or performance level” at which impacts are normally less than significant. (State CEQA Guidelines, § 15064.7(a); see also *Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1107.) Lead agencies may rely on thresholds developed by other agencies that have particular expertise in the subject matter under consideration. (See, e.g., State CEQA Guidelines, Appendix G, Sample Question III (“[w]here available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make” a significance determination).) For example, a lead agency may look to standards included in a Basin Plan to assist in the determination of whether water quality impacts are significant. (*Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1107 (“[s]uch thresholds can be drawn from existing environmental standards, such as other statutes or regulations”).)

Several agencies have developed, or are in the process of developing, thresholds of significance for GHG emissions.³ For example, thresholds are currently being developed, or have already been adopted by the Bay Area Air Quality Management District for operations and construction,⁴ the City of Davis for residential

³ Reference to these thresholds and proposed thresholds does not reflect an endorsement of those thresholds; rather, they are cited solely for the purpose of demonstrating that agencies are developing such thresholds.

⁴ BAAQMD CEQA Guidelines Update: work in progress - <http://www.baaqmd.gov/pln/ceqa/index.htm>.

developments,⁵ and the South Coast Air Quality Management District for industrial projects.⁶ Regardless of the threshold chosen, however, this section does not alter the pre-existing rule under CEQA that if substantial evidence supports a fair argument that a project may result in significant impacts, despite compliance with a threshold, an EIR must be prepared. (*Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 342.) Further, “in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect.” (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109.)

Consistent with the above, if relying on a threshold developed by another agency, lead agencies must exercise caution in selecting a threshold to ensure that the threshold is appropriately applied. For CEQA purposes, a threshold identifies a level below which an environmental impact will normally be less than significant. (State CEQA Guidelines, § 15064.7(a).) Some agencies have adopted “thresholds” pursuant to other laws that may not be applicable in the CEQA context. ARB has adopted several thresholds pursuant to AB32, for example, to address specific purposes that are unrelated to CEQA. For example, the *de minimis* threshold governs the level at which emissions will be regulated by ARB’s AB32 regulations. (Health & Safety Code, § 38561(e); Scoping Plan, at pp. 96-97.) CEQA does not permit use of a *de minimis* threshold, however. (*CBE, supra*, 103 Cal.App.4th at p. 121.) Additionally, the Reporting Threshold is the level at which emissions from large industrial sources are required to be reported. (Scoping Plan, at pp. 108-109; see also CARB Board Resolution 07-54 (2007).) Again, this reporting threshold reflects a policy decision regarding regulation by the ARB, but does not address the level at which environmental harm may occur, and does not satisfy a lead agency’s duties under CEQA related to review of projects which may result in significant adverse environmental impacts.

Consistency with a Plan or Regulation

Finally, the third factor in subdivision (b) directs consideration of the extent to which a project complies with a plan or regulation to reduce GHG emissions. That section further states, however, that to be used for the purpose of determining significance, a plan must contain specific requirements that result in reductions of GHG emissions to a less than significant level. This clarification is necessary because of the wide variety of climate action plans and GHG reduction plans that are currently being adopted by public agencies. ARB, for example, recently adopted its statewide Scoping Plan. That plan may not be appropriate for use in determining the significance of individual projects, however, because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping

⁵ City of Davis (2009) Greenhouse Gas Emission Threshold and Standards for New Residential Development; Accessed 5/27/09, http://cityofdavis.org/pgs/sustainability/pdfs/15_4.21.09_GHG%20Standards.pdf

⁶ SCAQMD (2008) Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, Accessed 5/27/09 <http://www.aqmd.gov/hb/2008/December/081231a.htm>.

Plan. (Scoping Plan, at p. 9.) Regulations that will require actual reductions of GHG emissions may not be adopted until 2012. (*Ibid.*) Once those regulations are adopted and being implemented, they may, if appropriate, be used to assist in the determination of significance, similar to the current use of air quality, water quality and other similar environmental regulations. (*CBE, supra*, 103 Cal. App. 4th at 111 (“a lead agency’s use of existing environmental standards in determining the significance of a project’s environmental impacts is an effective means of promoting consistency in significance determinations and integrating CEQA environmental review activities with other environmental program planning and regulation”).)

In addition to the regulations that will be developed to implement the Scoping Plan, this factor would also allow lead agencies to consider plans that are developed to reduce GHG emissions on a regional or local level. (Scoping Plan, at p. 26.) The proposed section 15064.4(b)(3) is intended to be read in conjunction with the section 15064(h)(3), as proposed to be amended, and proposed section 15183.5. Those sections each indicate that local and regional plans may be developed to reduce GHG emissions. If such plans reduce community-wide emissions to a level that is less than significant, a later project that complies with the requirements in such a plan may be found to have a less than significant impact.

Notably, CEQA does not provide a specific definition of “comply” in the context of determining a project’s consistency with a particular plan. Some guidance may be gleaned, however, from case law interpreting the requirement that a local government’s activities be consistent with its General Plan. In that context, a “zoning ordinance [for example] is consistent with the city’s general plan where, considering all of its aspects, the ordinance furthers the objectives and policies of the general plan and does not obstruct their attainment.” (*City of Irvine v. Irvine Citizens Against Overdevelopment* (1994) 25 Cal. App. 4th 868, 879.) Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. Thus, for example, a subdivision project could not demonstrate “consistency” with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision. (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) A key component of environmental analysis under CEQA is the determination of significance. (*Id.* at § 21002; *Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at

1106-07.) The new section 15064.4, on determining the significance of impacts of GHG emissions, is therefore necessary to carry out this legislative directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the Amendments were proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).)⁷ Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

⁷ Federal court decisions interpreting NEPA is persuasive authority in CEQA cases. (*Western Placer Citizens for an Ag. & Rur. Env. v. County of Placer* (2006) 144 Cal.App. 4th 890, 902.)

SECTION 15064.7. THRESHOLDS OF SIGNIFICANCE

Specific Purposes of the Amendment

Proposed subdivision (c) of section 15064.7 would allow a lead agency to adopt a threshold developed by another agency, or recommended by experts, provided that such threshold is supported with substantial evidence. This proposed regulation is reasonably necessary because many lead agencies perform general governmental functions, and may lack the specific expertise necessary to develop their own thresholds of significance for GHG emissions. Such agencies may rely on thresholds developed by other agencies with specialized expertise (such as an air quality management district) in conducting their CEQA analyses. (OPR, Thresholds of Significance: Criteria for Defining Environmental Significance, September 1994, at p. 7.) In fact, Appendix G of the State CEQA Guidelines expressly encourages lead agencies to rely on thresholds established by local air quality management districts. (State CEQA Guidelines, Appendix G, Question III.)

Several local and regional air districts are in the process of developing thresholds for GHG emissions. As noted above, for example, thresholds are currently being developed, or have already been adopted by the Bay Area Air Quality Management District for operations and construction, the City of Davis for residential developments, and the South Coast Air Quality Management District for industrial projects. Lead agencies within the jurisdiction of an air district, or other agency, that adopts a GHG emissions threshold may adopt such a threshold as its own. In adopting any threshold of significance, including one developed by an expert or agency with specialized expertise, the lead agency must support the threshold with substantial evidence in the administrative record. (State CEQA Guidelines, § 15064.7(b).)

Independent experts may also develop such thresholds for use by public agencies. For example, the California Air Pollution Control Officers Association has published a White Paper on developing thresholds of significance for GHG emissions. (CAPCOA White Paper, at pp. 31-58.) A lead agency could potentially use CAPCOA's suggestions in developing its own thresholds. Because any threshold must be supported with substantial evidence, and must be adopted through a public process, any threshold recommended by an expert that is ultimately adopted will undergo sufficient scrutiny to ensure its legitimacy. (State CEQA Guidelines, § 15064.7(b).)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) Defining "significance" is a critical step in the lead agency's impact analysis and therefore needs to be addressed as part of the Proposed Action. Section 21000(d) of the Public Resources Code encourages the development of thresholds. These sections together

require OPR and the Resources Agency to develop and adopt regulations governing the adoption of thresholds of significance for GHG emissions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15065. MANDATORY FINDINGS OF SIGNIFICANCE

Specific Purposes of the Amendment

The amendment to section 15065(b)(1) would change the word “preliminary” to “public.” The purpose of this amendment is to make section 15065 consistent with section 21064.5 of the Public Resources Code. The latter provision defines a mitigated negative declaration to be a negative declaration where mitigation measures are added to a project “before the proposed negative declaration and initial study are released for *public* review[.]” (State CEQA Guidelines, § 15070(b)(1).) In contrast, existing CEQA Guidelines section 15065(b)(1), dealing with mandatory findings of significance, would require a commitment to mitigation prior to “preliminary” review. “Preliminary Review,” as that term is used in section 15060, refers to a period following receipt of an application during which a lead agency determines whether an exemption applies to the project or whether an EIR would clearly be prepared. Read literally, existing section 15065 would require a commitment to mitigation before an initial study is even conducted. Because the statutory definition of mitigated negative declaration contemplates that mitigation measures may be developed during the preparation of the initial study prior to public review, the change in 15065 from “preliminary” to “public” is appropriate.

Necessity

Section 21083 of the Public Resources Code directs OPR to develop, and the Resources Agency to adopt, guidelines on the implementation of CEQA. The Amendment is necessary to ensure that those guidelines are consistent with relevant statutory definitions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency’s Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency’s determination that the Amendments would make the existing Guidelines easier to follow as a result of greater internal consistency. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific existing statutory CEQA provisions and/or case law interpreting CEQA. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater consistency within the Guidelines, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15086. CONSULTATION CONCERNING DRAFT EIR

The revision to this section is a non-substantive correction to this section's reference to the California Air Resources Board. This revision, therefore, qualifies as a "change without regulatory effect" pursuant to section 100(a)(4) of the Office of Administrative Law's regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).)

SECTION 15093. STATEMENT OF OVERRIDING CONSIDERATIONS

Specific Purposes of the Amendment

Section 21081(b) of the Public Resources Code provides that a lead agency may approve or carry out a project with significant and unavoidable impacts only after the lead agency makes a finding that “specific overriding economic, legal, social, technical or other benefits of the project outweigh the significant effects on the environment.” The State CEQA Guidelines describes the factors that a lead agency must weigh in determining whether to approve a project with adverse environmental effects:

CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian. An agency shall prepare a statement of overriding considerations as described in Section 15093 to reflect the ultimate balancing of competing public objectives when the agency decides to approve a project that will cause one or more significant effects on the environment.

(State CEQA Guidelines, § 15021(d).) The California Supreme Court has further observed that “an agency’s decision that the specific benefits a project offers outweigh any environmental effects that cannot feasibly be mitigated ... lies at the core of the lead agency’s discretionary responsibility under CEQA....” (*City of Marina v. Board of Trustees of Cal. State Univ* (2006) 39 Cal.4th 341, 368.)

In the context of GHG emissions, some projects may cause adverse environmental impacts but still provide an overall benefit of reducing GHG emissions on a statewide or regional level. For example, a city may make a policy choice to allow increased housing density within a jobs-rich region in order to reduce region-wide GHG emissions from vehicles and transportation. (See, e.g., 2007 IEPR, at p. 210.) Though the introduction of new housing within the jurisdiction may result in near-term or local adverse impacts related to GHG emissions, doing so may assist the region as a whole in meeting region-wide reduction targets. Thus, subdivision (a) of section 15093 was revised to expressly allow a lead agency to consider this type of environmental benefit of a project in making a statement of overriding considerations.

The revision to section 15093(a) accomplishes two objectives. First, it reminds lead agencies and the public that even a project that appears environmentally beneficial may itself cause adverse environmental impacts, and such impacts must undergo full CEQA review, and, if applicable, a statement of overriding considerations. Second, it discourages purely local interests from dominating consideration of a project by expressly allowing a lead agency to consider region- and statewide benefits of a project. Further, “economic, legal, social, technical and other benefits” could be interpreted to refer to local benefits. This addition would ensure that lead agencies may consider

regional and statewide benefits in considering a project's adverse impacts. Finally, the proposed addition makes clear, consistent with section 15021(d) of the existing State CEQA Guidelines, that the lead agency may consider environmental benefits to balance a project's significant adverse environmental effects that remain even after the adoption of all available feasible mitigation measures.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) If a lead agency determines that a project's GHG emissions will result in significant and unavoidable impacts, a lead agency may only approve the project if it makes specified findings. (*Id.* at § 21081(b).) This amendment is necessary to ensure that a lead agency considers state-wide and regional benefits of a project in addition to purely local benefits. Because consideration of state-wide and region-wide benefits may also apply to impacts unrelated to GHG emissions, the amendment was worded broadly to address any significant environmental impact.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and/or make specific statutory CEQA provisions and case law interpreting CEQA for making statements of overriding considerations. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California.

SECTION 15125. ENVIRONMENTAL SETTING

Specific Purposes of the Amendment

Section 15125 reflects existing law requiring examination of project impacts in relation to the existing environment. Subsection (d) states that lead agencies should consider whether the proposed project is inconsistent with applicable local and regional plans. That subsection provides a non-exclusive list of plans for potential consideration. The Amendments would add specific plans, regional blueprint plans and greenhouse gas reduction plans to subdivision (d). The added plans are necessary to ensure that GHG emissions analyses in such plans are addressed.

Specific Plans

Specific Plans address a defined geographic area within the area covered by a General Plan. (Gov. Code, § 65450 (“After the legislative body has adopted a general plan, the planning agency may, or if so directed by the legislative body, shall, prepare specific plans for the systematic implementation of the general plan for all or part of the area covered by the general plan”).) Specific Plans must contain “[s]tandards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable.” (*Id.* at § 65451(a)(3).) Thus, given that so many local governments are addressing GHG emissions in their policy documents, and that Specific Plans must contain standards and criteria, it is likely that Specific Plans may address GHG emissions, and consistency with adopted Specific Plans should be considered in EIRs.

Regional Blueprint Plans

Regional Blueprint Plans are being developed in many of California’s Metropolitan Planning Organizations through grants provided by the California Department of Transportation. While originally designed to address transportation efficiencies, Regional Blueprint Plans typically involve smart growth planning with an aim to reducing vehicle miles traveled at a regional level. As a result, Regional Blueprint Plans can provide information regarding the region’s existing transportation setting and identify methods to reduce region-wide transportation-related impacts. (Scoping Plan, Appendix C, at pp. C-74-C-84.) Land use decisions impact many sectors responsible for GHG emissions, including transportation, electricity, water, waste, and others. However, the primary impact of land use development on GHG emissions relates to vehicle use. (Land Use Subcommittee of the Climate Action Team, *LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation* (2008), at p. 13.) Blueprint Plans highlight this relationship between land use and transportation and how this relationship may impact a local community’s and region’s GHG emissions. Analysis of GHG reduction is not required by Blueprint grants but it is recommended. Therefore, Blueprint Plans provide an indication of the GHG emissions potentially created or reduced by the plan. (LUSCAT (2009), at p. 30.) Given the large percentage of GHG emissions that result from transportation in

California, a project's consistency with a Regional Blueprint Plan can provide information indicating whether the project could have significant environmental impacts related to GHG emissions. (*Ibid.*) Regional Blueprint Plans may, therefore, provide evidence to assist the lead agency in determining whether a project may tend to increase or decrease GHG emissions relative to the existing baseline. Thus, where such a plan has been developed and adopted by an MPO, lead agencies may find it useful to evaluate the project's consistency with that Blueprint Plan.

Plans for the Reduction of Greenhouse Gas Emissions

The Amendments would add plans for the reduction of greenhouse gas emissions to the list of plans in section 15125(d). Many local and regional plans now include policies relating to, and analyses of, GHG emissions. (OPR, Book of Lists, at pp. 92-100; Scoping Plan, at p. 26.) Many such plans include detailed information on the jurisdiction's inventory of GHG emissions and measures to reduce such emissions. (*Ibid.*) Such plans may also include prescriptions for specific mitigation measures to address GHG emissions. (Scoping Plan, Appendix C, at p. C-49.) Where such a plan has been developed and adopted within the relevant jurisdiction, a project's inconsistency with that plan could be an indication of potential adverse environmental impacts.

Notably, while section 15125(d) requires an EIR to discuss any inconsistencies of a project with the listed plans, it does not mandate a finding of significance resulting from any identified inconsistencies. The plans simply provide information regarding the project's existing setting and inconsistency may be an indication of potentially significant impacts. The determination of significance is to be made by the lead agency.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines addressing the mitigation of GHG emissions and the effects of the GHG emissions. (Pub. Resources Code, § 21083.05.) As indicated above, one potential indicator of a project's potential GHG emissions impacts is whether the project is consistent with applicable plans that have addressed that impact. Thus, the addition of plans that may address GHG emissions to the list of plans in the existing section 15125 is reasonably necessary to ensure that such analysis occurs.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to

implement the Legislature’s directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analyzing the effects of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental information where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15126.2. CONSIDERATION AND DISCUSSION OF SIGNIFICANT ENVIRONMENTAL EFFECTS.

Amendments are proposed to two subdivisions of the existing section 15126.2. The first, to subdivision (c), adds a cross-reference to the Public Resources Code and another section of the State CEQA Guidelines. This revision, therefore, qualifies as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).) The second change, made in response to public comments, adds a sentence to the end of existing subdivision (a). That change is described in greater detail below.

Specific Purposes of the Amendment

Several comments submitted as part of the Natural Resources Agency’s SB97 rulemaking process urged it to develop guidance addressing the analysis of the impacts of climate change on a project. These comments similarly suggested that such guidance was appropriate in light of the release of the draft California Climate Adaptation Strategy (Adaptation Strategy), developed pursuant to Executive Order S-13-2008. In considering such comments, it is important to understand several key differences between the Adaptation Strategy and the California Environmental Quality Act. First, the Adaptation Strategy is a policy statement that contains recommendations; it is not a binding regulatory document. Second, the Adaptation Strategy focuses on how the State can plan for the effects of climate change. CEQA’s focus, on the other hand, is the analysis of a particular project’s greenhouse gas emissions on the environment, and mitigation of those emissions if impacts from those emissions are significant. Given these differences, CEQA should not be viewed as the tool to implement the Adaptation Strategy; rather, as indicated in the Strategy’s key recommendations, advanced programmatic planning is the primary method to implement the Adaptation Strategies.

There is some overlap between CEQA and the Adaptation Strategy, however. As explained in both the Initial Statement of Reasons and in the Adaptation Strategy, section 15126.2 may require the analysis of the effects of a changing climate under certain circumstances. (Initial Statement of Reasons, at pp. 68-69.) In particular, Section 15126.2 already requires an analysis of placing a project in a potentially hazardous location. Further, several questions in the Appendix G checklist already ask about wildfire and flooding risks. Many comments on the proposed amendments asked for additional guidance, however.

Having reviewed all of the comments addressing the effects of climate change, the Natural Resources Agency revised the proposed amendments to include a new sentence in Section 15126.2 clarifying the type of analysis that would be required. Existing section 15126.2(a) provides an example of a potential hazard requiring analysis: placing a subdivision on a fault line. The new sentence adds further examples, as follows:

Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

According to the Office of Planning and Research, at least sixty lead agencies already require this type of analysis. (California Governor's Office of Planning and Research, State Clearinghouse, The California Planners' Book of Lists (January, 2009), at p. 109.) This addition is reasonably necessary to guide lead agencies as to the scope of analysis of a changing climate that is appropriate under CEQA.

As revised, section 15126.2 would provide that a lead agency should analyze the effects of bringing development to an area that is susceptible to hazards such as flooding and wildfire, both as such hazards currently exist or may occur in the future. Several limitations apply to the analysis of future hazards, however. For example, such an analysis may not be relevant if the potential hazard would likely occur sometime after the projected life of the project (i.e., if sea-level projections only project changes 50 years in the future, a five-year project may not be affected by such changes). Additionally, the degree of analysis should correspond to the probability of the potential hazard. (State CEQA Guidelines, § 15143 ("significant effects should be discussed with emphasis in proportion to their severity and probability of occurrence".)) Thus, for example, where there is a great degree of certainty that sea-levels may rise between 3 and 6 feet at a specific location within 30 years, and the project would involve placing a wastewater treatment plant with a 50 year life at 2 feet above current sea level, the potential effects that may result from inundation of that plant should be addressed. On the other extreme, while there may be consensus that temperatures may rise, but the magnitude of the increase is not known with any degree of certainty, effects associated with temperature rise would not need to be examined. (State CEQA Guidelines, § 15145 ("If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact".)) Lead agencies are not required to generate their own original research on potential future changes; however, where specific information is currently available, the analysis should address that information. (State CEQA Guidelines, § 15144 (environmental analysis "necessarily involves some degree of forecasting. While seeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can".))

The decision in *Baird v. County of Contra Costa* (1995) 32 Cal.App.4th 1464, does not preclude this analysis. In that case, the First District Court of Appeal held that a county was not required to prepare an EIR due solely to pre-existing soil contamination that the project would not change in any way. (Id. at 1468.) No evidence supported the petitioner's claim that the project would "expose or exacerbate" the pre-existing contamination, which was located several hundred to several thousand feet from the project site. (Id. at n. 1.) Moreover, the project would have no other significant effects on the environment, and other statutes exist to protect residents from contaminated soils. Thus, the question confronting that court was whether pre-existing contamination near the project was, by itself, enough to require preparation of an EIR. It held that, in those circumstances, an EIR was not required. That court also acknowledged, however, that where there is a potential for ultimately changing the environment, an EIR could be required. (Id. at p. 1469.) Thus, unlike the circumstances in the *Baird* case, the analysis required in section 15126.2(a) would occur if an EIR was otherwise required. Similarly, the addition to that section contemplates hazards which the presence of a project could exacerbate (i.e., potential upset of hazardous materials in a flood, increased need for firefighting services, etc.).

This revision was described in the Natural Resources Agency's Notice of Proposed Changes and the public was invited to present comments on that change. The Natural Resources Agency determined that the change was sufficiently related to the original proposal described in the Notice of Proposed Action, so a fifteen day comment period was appropriate. It is sufficiently related because the Notice of Proposed Action explained that the rulemaking activity was intended to address the directive in SB97 to provide guidelines on the analysis of the "effects of greenhouse gas emissions." As explained in the Initial Statement of Reasons, the Natural Resources Agency initially chose not to provide specific guidance on the analysis of the effects of placing development in an area subject to the effects of climate change because the Agency interpreted existing section 15126.2(a) to already require that analysis under certain circumstances. As indicated above, however, many comments on the proposed amendments suggested revisions to section 15126.2(a) to provide additional guidance. The areas susceptible to hazards include those that may result from a changing climate. Thus, the change is sufficiently related that a reasonable person would be put on notice that such a change could occur as a result of the rulemaking activity described in the Notice of Proposed Action.

Finally, following review of comments on this revision, the Natural Resources Agency clarified that this analysis applies only to "potentially significant" effects of locating developing in areas susceptible to hazards. Because this revision clarifies the last sentence in section 15126.2(a), consistent with the Public Resources Code, and does not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines addressing the analysis of the effects of GHG emissions. (Pub. Resources Code, § 21083.05.) As explained above, the effects of GHG emissions include flooding, sea-level rise and wildfires. Thus, the addition of a clarifying sentence to existing section 15126.2(a), requiring analysis of the effects of placing developing in hazardous locations, is reasonably necessary to ensure that such analysis occurs with respect to areas subject to potential hazards resulting from climate change.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analyzing the effects of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to

investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the analysis that may be required of the potential effects of climate change on a project, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15126.4. CONSIDERATION AND DISCUSSION OF MITIGATION MEASURES PROPOSED TO MINIMIZE SIGNIFICANT EFFECTS.

Specific Purposes of the Amendment

Section 21083.05 of the Public Resources Code expressly requires OPR and the Resources Agency to develop regulations on the “mitigation of greenhouse gas emissions.” The goals of this legislative mandate are to (1) reduce GHG emissions and (2) to provide consistency in the development of GHG emissions reduction measures. There is no indication, however, that the Legislature intended to alter any existing laws governing mitigation under CEQA. The Amendments, therefore, interpret and make specific existing CEQA law and regulations for mitigation of significant impacts resulting from GHG emissions.

Existing section 15126.4 provides guidance on CEQA’s general mitigation requirements. To emphasize that mitigation of GHG emissions is subject to those existing CEQA requirements, OPR and the Natural Resources Agency added a new subdivision (c) to the existing section 15126.4. The Amendments identify five general methods of mitigation that may be tailored to the specific circumstances surrounding a specific project. In response to public comments, the Natural Resources Agency provided additional guidance, described below, in the lead-in sentences introducing those five broad categories of mitigation.

Mitigation of Greenhouse Gas Emissions

Comments submitted on the Amendments indicated general concerns that mitigation for GHG emissions may not be effective or reliable. To further clarify the existing mitigation requirements that would apply to measures to reduce greenhouse gas emissions, the Natural Resources Agency revised the lead-in sentences in subdivision (c). Specifically, the Natural Resources Agency added that all mitigation must be supported with substantial evidence and be capable of monitoring or reporting. This addition reflects the requirement in Public Resources Code that a lead agency’s findings on mitigation be supported with substantial evidence and that it must adopt a mitigation monitoring and reporting program along with the project if mitigation measures are required. (Public Resources Code, §§ 21081(a)(1), 21081.6.)

In response to comments, the Natural Resources Agency had originally also proposed to add a sentence indicating that only emissions reductions that were not required by some other law or contract could qualify as mitigation. In response to comments on that proposed revision, that sentence is no longer proposed to be added to the lead-in section; rather, subdivision (c)(3) will be clarified, as described below.

Mitigation Identified in an Existing Plan

The first type of mitigation of GHG emissions that may be considered includes measures identified in an existing plan. As indicated above, many agencies are

beginning to address GHG emissions at a planning level. (OPR, Book of Lists, at pp. 92-100.) Some of those GHG reduction plans include specific measures that may be applied on a project-by-project basis. (*Ibid*; see also Scoping Plan, Appendix C, at p. C-49.) Proposed subdivision (c)(1), therefore, would encourage lead agencies to look to adopted plans for sources of mitigation measures that could be applied to specific projects.

Project Design Features

The second type of measure that a lead agency should consider is project design features that will reduce project emissions. Various project design features could be used to reduce GHG emissions from a wide variety of projects. The CAPCOA White Paper provides examples of various project design features that may reduce emissions from commercial and residential buildings. (CAPCOA White Paper, at pp. B-13 to B-18.) For example, according to the California Energy Commission, “[r]esearch shows that increasing a community’s density and its accessibility to jobs centers are the two most significant factors for reducing vehicle miles traveled,” which is an important component of reducing statewide emissions. (California Energy Commission 2007, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF (“2007 IEPR”), at p. 12; see also CEC, *The Role of Land Use in Meeting California’s Energy and Climate Goals* (2007) at p. 20.) This subdivision also refers specifically to measures identified in Appendix F, which include a variety of measures designed to reduce energy use. By encouraging lead agencies to consider changes to the project itself, this subdivision further encourages the realization of co-benefits such as reduced energy costs for project occupants, increased amenities for non-vehicular transportation, and others. Thus, project design can reduce GHG emissions directly through efficiency and indirectly through resource conservation and recycling. (Green Building Sector Subgroup of the Climate Action Team, Scoping Plan Measure Development and Cost Analysis (2008) at p. 6 to 9.)

Off-Site Measures

The third type of measures addressing GHG emissions is off-site measures including offsets. Proposed subdivision (c)(3) recognizes the availability of various off-site mitigation measures. Such measures could include, among others, the purchase of carbon offsets, community energy conservation projects, and off-site forestry projects. (See, e.g., South Coast Air Quality Management District, SoCal Climate Solutions Exchange (June 2008), at pp.1; Rodeo Refinery Settlement Agreement, BAAQMD Carbon Offset Fund; Recommendations of the ETAAC, Final Report (February 2008) at pp. 9-5; ARB, Staff Report: Proposed Adoption of California Climate Action Registry Forestry Greenhouse Gas Protocols for Voluntary Purposes (October 17, 2007), at p. 15 (“[t]he three protocols together – the [sector, project, and certification protocols – are a cohesive and comprehensive set of methodologies for forest carbon accounting, and furthermore contain all the elements necessary to generate high quality carbon credits”); see also Scoping Plan, Appendix C, at pp. C-21 to C-23.) Off-site mitigation may be appropriate under various circumstances. For example, such mitigation may be

appropriate where a project is incapable of design modifications that would sufficiently reduce GHG emissions within the project boundaries. In that case, a lead agency could consider whether emissions reductions may be achieved through such measures as energy-efficiency upgrades within the community or reforestation programs.

The reference to “offsets” in subdivision(c)(3) generated several comments during the public review period. The offsets concept is familiar in other aspects of air quality regulation. The Federal Clean Air Act, for example, provides that increases in emissions from new or modified sources in a nonattainment area must be offset by reductions in existing emissions within the nonattainment area. (See, e.g., 42 U.S.C. § 7503(a)(1)(A).) California laws also apply to offsets and emissions credits. (See, e.g., Health & Saf. Code, § 39607.5.) Those other laws generally require that emissions offsets must be “surplus” or “additional”. Comments on the proposed amendments suggested that to be used for CEQA mitigation purposes, offsets should also be “additional.” Thus, the Natural Resources Agency further refined the revisions it publicized on October 23, 2009, by deleting the lead-in sentence stating that “Reductions in emissions that are not otherwise required may constitute mitigation pursuant to this subdivision,” and amending subdivision (c)(3) to state that mitigation may include “Off-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions[.]”

Moving this concept from the general provisions on mitigation of greenhouse gas emissions to the provision on offsets does not materially alter the rights or conditions in the originally proposed text because the “not otherwise required” concept would only make sense in the context of offsets. Because this revision clarifies section 15126.4(c)(3), consistent with the Public Resources Code and cases interpreting it, and does not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Sequestration

The fourth type of GHG emissions mitigation measure is sequestration. Indeed, one way to reduce a project’s GHG emissions is to sequester project-related GHG emissions and thereby prevent them from being released into the atmosphere. At present, the most readily available, and accountable, way to sequester GHGs is forest management. California forests have a “unique capacity to remove [carbon dioxide, a GHG,] from the air and store it long-term as carbon.” (Scoping Plan, Appendix C, at p. C-165.) Forest sequestration functions are, therefore, a key part of the ARB’s Scoping Plan and reduction effort. (Scoping Plan, at pp. 64-65.)

The California Climate Action Team has also identified several forest-related sequestration strategies, including, reforestation, conservation forest management, conservation (i.e., avoided development), urban forestry, and fuels management and biomass. (ARB, Staff Report: Proposed Adoption of California Climate Action Registry

Forestry Greenhouse Gas Protocols for Voluntary Purposes (October 17, 2007), at pp. 6-7.) ARB has adopted Forest Protocols for large forestry projects. (ARB, Resolution 07-44 (adopting California Climate Action Registry Forestry Sector Protocol (September 2007), Forest Project Protocol (September 2007) and Forest Verification Protocol (May 2007).) ARB has also adopted Urban Forest Protocols for urban forestry projects. (California Climate Action Registry, Urban Forest Project Reporting Protocol and Verification Protocol (August 2008) (ARB adopted on September 25, 2008).) Such projects could be located on the project site or off-site. (Urban Forest Project Reporting Protocol, at pp. 4-5.) The protocols include methods of measuring the ability of various forestry projects to store capture and store carbon.

Consistent with section 15126.4(a), a lead agency must support its choice of, and its determination of the effectiveness of, any reduction measures with substantial evidence. Substantial evidence in the record must demonstrate that any mitigation program or measure is will result in actual emissions reductions. As a practical matter, where a mitigation program or measure is consistent with protocols adopted or approved by an agency with regulatory authority to develop such a program, a lead agency will more easily be able to demonstrate that off-site mitigation will actually result in emissions reductions. Examples of such protocols include the forestry protocols described above. Where a mitigation proposal cannot be verified with an existing protocol, a greater evidentiary showing may be required.

Measures to be Implemented on a Project-by-Project Basis

Finally, the fifth type of measure that could reduce GHG emissions at a planning level is the development of binding measures to be implemented on a project-specific basis. As explained in greater detail in the discussion of proposed section 15183.5, below, ARB's Scoping Plan strongly encourages local agencies to develop plans to reduce GHG emissions throughout the community. In addition, the CEC's Power Plant Siting Committee is assessing the impacts of GHG emission from proposed new power plants and how they can be mitigated. Comments received during the CEC's informational proceedings warranted a lengthy discussion on the practical application of a programmatic approach to mitigating GHG emissions from new power plants. (CEC, *Committee Guidance on Fulfilling California Environmental Quality Act Responsibilities for Greenhouse Gas Impacts in Power Plant Siting Applications* (2009) at p. 26 to 28.) Existing State CEQA Guidelines sections 15168(b)(4) and 15168(c)(3) recognize that programmatic documents provide an opportunity to develop mitigation plans that will apply on a project-specific basis. Proposed subdivision (c)(5) recognizes that, for a planning level decision, appropriate mitigation of GHG emissions may include the development of a program to be implemented on a project-by-project basis. (State CEQA Guidelines, § 15126.4(a)(2) (“[i]n the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation or project design”).)

This type of mitigation is subject to the limits of existing law, however. Thus, proposed subdivision (c)(5) should not be interpreted to allow deferral of mitigation.

Rather, it is subject to the rule in existing section 15126.4(a)(1)(B) that such measures “may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way.” (See also *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal. App. 4th 645, 670-71.)

Suggestions Rejected

During its public involvement process, OPR received comments on its preliminary draft of the proposed amendments related to mitigation. Some comments suggested provisions that were not included in these Proposed Amendments. Several comments, for example, suggested that the Guidelines provide a specific “hierarchy” of mitigation requiring lead agencies to mitigate GHG emissions on-site where possible, and to allow consideration and use of off-site mitigation only if on-site mitigation is impossible or insufficient. OPR and the Resources Agency recognize that there may be circumstances in which requiring on-site mitigation may result in various co-benefits for the project and local community, and that monitoring the implementation of such measures may be easier. However, CEQA leaves the determination of the precise method of mitigation to the discretion of lead agencies. (State CEQA Guidelines, § 15126.4(a)(1)(B); see also *San Franciscans Upholding the Downtown Plan v. City & Co. of San Francisco* (2002) 102 Cal. App. 4th 656, 697.)

Several comments also suggested that mitigation for GHG emissions must be “real, permanent, quantifiable, verifiable, and enforceable.” The Proposed Amendments do not include such standards, however, for several reasons. The proposed standard appears to have been derived from section 38562(d) of the Health and Safety Code, which prescribes requirements for regulations to be promulgated to implement AB32. AB32 is a separate statutory scheme, and, as noted above, there is no indication that the legislature intended to alter standards for mitigation under CEQA. Similarly, standards for mitigation under CEQA already exist and are set out in section 15126.4(a). Specifically, mitigation must be fully enforceable, which implies that the measure is also real and verifiable. Additionally, substantial evidence in the record must support an agency’s conclusion that mitigation will be effective, and in the context of an EIR, courts will defer to an agency’s determination of a measure’s effectiveness. (*Environmental Council of Sacramento v. City of Sacramento* (2006) 147 Cal.App.4th 1018, 1041 (mitigation ratio is supportable even at less than 1:1 given the project’s circumstances); *Ass’n of Irrigated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1398 (lead agency has discretion to resolve dispute regarding the effectiveness of an EIR’s mitigation measures).) No existing law requires CEQA mitigation to be quantifiable. Rather, mitigation need only be “roughly proportional” to the impact being mitigated. (State CEQA Guidelines, § 15126.4(a)(4)(B); see also *id.* at § 15142.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the mitigation of GHG emissions. (Pub. Resources Code, § 21083.05.) The proposed subdivision (c) sets out types of mitigation of GHG emissions that a lead agency may consider. Thus, that subdivision is reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the proposed action and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the proposed action. This conclusion is based on the Resources Agency's determination that the proposed action is necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the proposed action adds no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The proposed action interprets and makes specific statutory CEQA provisions and/or case law interpreting CEQA for mitigating the impacts of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th

Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the proposed action does not add any substantive requirements, it will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15130. DISCUSSION OF CUMULATIVE IMPACTS

Specific Purposes of the Amendment

The Proposed Amendments include two revisions to the existing section 15130 of the State CEQA Guidelines. The two proposed amendments are described below.

Section 15130(b)(1)(B)

Section 21083(b) of the Public Resources Code requires that an EIR be prepared if the “possible effects of a project are individually limited but cumulatively considerable.” That section further defines “cumulatively considerable” to mean that “the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.”

In determining whether a project may have significant cumulative impacts, a lead agency must engage in a two-step process. First, it must determine the extent of the cumulative problem. To do so, a lead agency must examine the “effects of past projects, the effects of other current projects, and the effects of probable future projects.” Once it does so, the lead agency then determines whether the project’s incremental contribution to that problem is cumulatively considerable. Section 21100(e) further provides that “[p]reviously approved land use documents, including but not limited to, general plans, specific plans, and local coastal plans, may be used in a cumulative impact analysis.”

The existing Guideline section 15130(b) addresses the first step of the process. It offers two options for estimating the effects resulting from past, present and reasonably foreseeable projects. A lead agency may either rely on a list of such projects, or a summary of projections to estimate cumulative impacts. Existing section 15130(b)(1)(B) allows a lead agency to rely on projections in a land use document or certified environmental document that addresses the cumulative impact under consideration.

The proposed amendments would clarify that plans providing such projections need not be limited to land use plans, so long as the plan evaluates the relevant cumulative effect. The proposed amendments would also allow a lead agency to rely on information provided in regional modeling programs. The best projections of the cumulative effect of GHG emissions may be available in up-to-date models such as the International Council for Local Environmental Initiative’s Local Government GHG Protocol⁸ and the California Climate Action Reserve’s Registry general,⁹ industry¹⁰ and

⁸ ICLEI (2008) Local Government Operations Protocol; Accessed 6/08/09, <http://www.icleiusa.org/action-center/tools/lgo-protocol-1>

⁹ California Climate Action Registry (2009) General Reporting Protocol: Accessed 6/08/09, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

project type protocols.¹¹ Such projections may also be supplied in plans that are not strictly “land use” plans. For example, regional transportation plans in certain areas will ultimately include sustainable community strategies which will include projections a region’s GHG emissions and related cumulative effects. (Gov Code, § 65080(b)(2).) Finally, some agencies are beginning to develop GHG reduction plans or climate action plans that may also include such projections. (ARB, Scoping Plan, Appendix C, at p. C-49; OPR, Book of Lists, at pp. 92-100.)

The proposed amendments are consistent with section 21083 of the Public Resources Code and CEQA case law. Section 21083 requires consideration of “the effects of past projects, the effects of other current projects, and the effects of probable future projects.” Projections in the listed types of plans and models may include inventories of existing emissions and projected future emissions. Section 21100 of the Public Resources Code provides that land use plans “may” be used in a cumulative impacts analysis, but that section does not purport to limit the types of plans that can be used in a cumulative impacts analysis to land use plans. Finally, case law has supported reliance on projections provided by industry, for example, to satisfy the requirement for a discussion of impacts caused by closely related projects. (*Ass’n of Irrigated Residents, supra*, 107 Cal. App. 4th at 1404.)

While models may provide the most up to date information, lead agencies should still look first to information provided in adopted or certified environmental documents. First, such information has already gone through a public and agency review process. Second, to the extent the model provides information that is not provided in the prior environmental document, the relationship of the model and applicable plans must be explained, along with any changes in circumstances.

Section 15130(d)

The Office of Planning and Research had originally proposed the addition of certain plans to section 15130(d). That section states that previously approved land use plans may be used in a cumulative impacts analysis. Those additions were inadvertently excluded from the proposed amendments that were made available for public review on July 3, 2009. Therefore, the revisions were added to revisions that were made publicly available on October 23, 2009.

The added plans include regional transportation plans and plans for the reduction of greenhouse gas emissions. This change is sufficiently related to the proposal that was originally published. Those plans were proposed for addition to other sections of the proposed amendments, for example, and comments were submitted regarding the use of such plans in cumulative impacts analysis. Plans for the reduction of greenhouse gas emissions were described under section 15064(h)(3), above. Regional

¹⁰ California Climate Action Registry (2005) Industry Specific Protocols: Accessed 06/08/09, <http://www.climateregistry.org/tools/protocols/industry-specific-protocols.html>

¹¹ California Climate Action Registry (2007) Project Protocols: Accessed 06/08/09, <http://www.climateregistry.org/tools/protocols/project-protocols.html>

transportation plans may contain information regarding transportation-related greenhouse gas emissions that may be useful in a cumulative impacts analysis. As explained above, regional transportation plans in certain areas will ultimately include sustainable community strategies which will include projections a region's GHG emissions and related cumulative effects. (Gov Code, § 65080(b)(2).) Thus, these additions are reasonably necessary to ensure that public agencies perform a cumulative impacts analysis of greenhouse gas emissions as required by Public Resources Code section 21083.05. The additions are also consistent with Public Resources Code section 21100(e) which provides that previously adopted land use plans may be used in a cumulative impacts analysis.

Section 15130(f)

The Natural Resources Agency originally proposed to add subdivision (f) to section 15130 to clarify that sections 21083 and 21083.05 of the Public Resources Code do not require a detailed analysis of GHG emissions solely due to the emissions of other projects. (State CEQA Guidelines, § 15130(a)(1); *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786, 799.) Rather, proposed subdivision (f) would have provided that a detailed analysis is required when evidence shows that the incremental contribution of the project's GHG emissions is cumulatively considerable when added to other cumulative projects. (*CBE, supra*, 103 Cal.App.4th at 119-120.) In essence, the proposed addition would be a restatement of law as applied to GHG emissions. Analysis of GHG emissions as a cumulative impact is consistent with case law arising under the National Environmental Policy Act. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Other portions of these proposed Guidelines address how lead agencies may determine whether a project's emissions are cumulatively considerable. (See, e.g., Proposed Sections 1506(h)(3) and 15064.4.)

Public comments noted, however, that the new subdivision merely restated the law, and was capable of misinterpretation. The Natural Resources Agency, therefore, determined that because other provisions of the Amendments address the analysis of greenhouse gas emissions as a cumulative impact, and because the reasoning of those is fully explained in the Initial Statement of Reasons, subdivision (f) should not be added to the CEQA Guidelines. The deletion was reflected in the revisions that were made available for further public review and comment on October 23, 2009.

Necessity

Sections 21083 and 21083.05 of the Public Resources Code respectively require that an EIR analyze cumulative impacts and that the effects of GHG emissions be analyzed in CEQA documents. The Amendments include guidance to assist lead agencies to evaluate the cumulative impacts of GHG emissions where an EIR is required. Thus, the Amendments are reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the

amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15150. INCORPORATION BY REFERENCE

Specific Purposes of the Amendment

The existing CEQA Guidelines allow lead agencies to incorporate information from other documents by reference. (State CEQA Guidelines, § 15150.) Doing so permits a lead agency to avoid repetitious analysis of general matters and to reduce paperwork. (Pub. Resources Code § 21003 (it is state policy that “persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment”).) Existing Guidelines section 15150(f) provides that “[i]ncorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand.”

The key requirements for documents that may be incorporation by reference are set forth in the statutory definition of “EIR.” (Pub. Resources Code, § 21061.) Those requirements include:

- The incorporated information is a matter of public record or is generally available to the public; and
- The incorporated information is reasonably available for inspection at a public place or public building.

Descriptions of global, statewide and regional GHG emissions are particularly well-suited to incorporation by reference. Such descriptions can be technical and lengthy. (Public Policy Institute of California, Climate Policy at the Local Level: A Survey of California’s Cities and Counties (November 2008), at pp. 24-32 (describing barriers and constraints to adoption of climate action plans and policies).) General descriptions may also remain current enough to be used in several successive environmental documents. In fact, OPR has found that many agencies are addressing GHG emissions in programmatic documents that could be incorporated by reference into later documents. (OPR, Book of Lists, at pp. 92-100.) Thus, the Resources Agency and OPR find that addition of subdivision (e)(4) is reasonably necessary to effectuate the legislative directive that public agencies conduct environmental review in the most efficient manner possible.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Legislature has further directed that resources be conserved wherever possible in the analysis of environment impacts. (*Id.* at § 21003.) Thus, the amendment to add GHG

analyses to the list of documents that may be incorporated by reference is reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the proposed action adds no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15183. PROJECTS CONSISTENT WITH A COMMUNITY PLAN OR ZONING

Specific Purposes of the Amendment

Section 21083.3 of the Public Resources Code provides that projects that are consistent with a General Plan, Community Plan or Zoning may not need to analyze cumulative effects that have already been analyzed in an EIR on the prior planning or zoning action. The exemption may apply, for example, where “uniformly applied development policies or standards” will substantially mitigate a cumulative effect. (Pub. Resources Code, § 21083.3(d).) The statute does not define what types of development policies or standards may be used in this context. It does provide, however, that such standards or policies must have been adopted by the lead agency with a finding, supported with substantial evidence, that the policy or standard will substantially mitigate the environmental effect under consideration. (*Ibid.*) Existing Guidelines section 15183 provides several non-exclusive examples of policies and standards that might apply in the context of section 21083.3, including grading ordinances and floodplain protection ordinances.

The inclusion of “[r]equirements for reducing greenhouse gas emissions, as set forth in adopted land use plans, policies or regulations” among the list of examples of “uniformly applied development policies or standards” is consistent with the direction in section 21083.3. First, the text provides that such requirements would be “adopted” by the lead agency. Second, they would be “development policies or standards” because the requirements would be contained in an adopted “land use plan, policy or regulation.” Finally, such requirements could substantially mitigate the effects of GHG emissions by “reducing greenhouse gas emissions” in the adopting jurisdiction. (Proposed Section 15183.5(b) would provide elements that may be included in a GHG emissions reduction plan that might be used in the context of section 15183.)

One comment submitted during OPR’s public involvement process questioned whether such requirements relating to reductions in GHG emissions would be kept current. (See, e.g., Letter from Joyce Dillard to OPR, January 26, 2009.) Section 21083.3 specifically provides, however, that such requirements would not apply in this context if “substantial new information shows that the policies or standards will not substantially mitigate the environmental effect.” (Pub. Resources Code, § 21083.3(d).) Therefore, lead agencies have an incentive to ensure that their policies remain current.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The addition to section 15183 is reasonably necessary to carry out the legislature’s intent that projects that are consistent with General Plans, Community Plans and Zoning benefit from streamlined CEQA review. Several jurisdictions are beginning to include requirements for reducing GHG emissions in their general plans. (OPR, Book of Lists,

at pp. 92-100; Scoping Plan, Appendix C, at p. C-49.) The addition is also reasonably necessary to effectuate the legislature’s intent that OPR and the Resources Agency provide guidance on how to analyze GHG emissions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency’s Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency’s determination that the Amendments are necessary to implement the Legislature’s directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Murieltans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to

SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15183.5. TIERING AND STREAMLINING THE ANALYSIS OF GREENHOUSE GAS EMISSIONS

Specific Purposes of the Amendment

In adopting SB375, the Legislature found that “[n]ew provisions of CEQA should be enacted so that the statute encourages ... local governments to make land use decisions that will help the state achieve its climate goals under AB 32[.]” (Statutes 2008, Ch. 728, § 1(f).) ARB’s Scoping Plan similarly recognizes the important role that local governments play in reducing the State’s GHG emissions. (ARB, Scoping Plan, at p. 26.) In particular, local government “[d]ecisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors.” (*Ibid.*) Decision-making on urban growth and land use planning begins with local general plans. (Gov. Code, § 65030.1 (“The Legislature ... finds that decisions involving the future growth of the state, most of which are made and will continue to be made at the local level, should be guided by an effective planning process, including the local general plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related physical, social and economic development factors”).)

GHG emissions may be best analyzed and mitigated at a programmatic level. “For local government lead agencies, adoption of general plan policies and certification of general plan EIRs that analyze broad jurisdiction-wide impacts of GHG emissions can be part of an effective strategy for addressing cumulative impacts and for streamlining later project-specific CEQA reviews.” (OPR, Technical Advisory: CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review, June 19, 2008, at p. 8.) Other lead agencies may also address GHG emissions programmatically in long range development plans, facilities master plans, and other long-range planning documents.

This emphasis on long-range planning is consistent with state policy expressed in CEQA. The Legislature has clearly stated its preference that lead agencies tier environmental documents wherever feasible. (Pub. Resources Code, § 21093(b).) Specifically:

The Legislature finds and declares that tiering of environmental impact reports will promote construction of needed housing and other development projects by (1) streamlining regulatory procedures, (2) avoiding repetitive discussions of the same issues in successive environmental impact reports, and (3) ensuring that environmental impact reports prepared for later projects which are consistent with a previously approved policy, plan, program, or ordinance concentrate upon environmental effects which may be mitigated or avoided in connection with the decision on each later project. The Legislature further finds and

declares that tiering is appropriate when it helps a public agency to focus upon the issues ripe for decision at each level of environmental review and in order to exclude duplicative analysis of environmental effects examined in previous environmental impact reports.

(Pub. Resources Code, § 21093(a).) The Amendments, therefore, include the addition of a new section 15183.5 to address both tiering and streamlining of GHG analyses, as well as the proper use of GHG reduction plans in CEQA analyses. Explanation of the rationale of each new subdivision is provided below.

Existing Methods of Streamlining and Tiering

Because GHG emissions raise a cumulative concern, analysis of such emissions in a long-range planning document lends itself to tiering and use in later project-specific environmental review. (Pub. Resources Code, § 21093.) The Legislature has created several tiering and streamlining methods, reflected in various provisions of the existing State CEQA Guidelines, that can reduce duplication in the analysis of GHG emissions. Subdivision (a) clarifies that existing provisions in the State CEQA Guidelines regarding tiering and streamlining may be applied to the analysis of GHG emissions.

Greenhouse Gas Emissions Reduction Plans

Many jurisdictions are beginning to address GHG emissions reductions in “climate action plans” and “gas emissions reduction plans.” (OPR, Book of Lists, at pp. 92-100; see also, Scoping Plan, Appendix C, at p. C-49.) ARB’s Scoping Plan specifically encourages local governments to develop such plans, and has created a local government operations protocol to assist in that effort. (Scoping Plan, at p. 26.) A community-wide emissions protocol is also under development.

Some comments raised during OPR’s public involvement process expressed concern that due to a lack of legislative criteria for such plans, existing provisions in the CEQA Guidelines regarding cumulative impacts may be misused. (See, e.g., Letter from Center for Biological Diversity, et al., to OPR, February 2, 2009, at p. 2.) For example, without specific guidance, a lead agency could erroneously rely on a plan with purely aspirational intent to determine that a later project’s cumulative impact is less than significant pursuant to section 15064(h)(3). The proposed subdivision (b) provides criteria to assist lead agencies in determining whether an existing greenhouse gas reduction plan is an appropriate document to use in a cumulative impacts analysis under CEQA.

The existing CEQA Guidelines allow lead agencies to rely on plans for cumulative analysis where the plan has been adopted in a public review process and contains specific requirements to avoid or substantially lessen a cumulative problem. (State CEQA Guidelines, § 15064(h)(3).) The criteria set out in proposed subdivision (b)(1) are designed to ensure that a greenhouse gas reduction plan would satisfy the

requirements described in sections 15064(h)(3) and 15130(d), for the reasons described below.

Criteria (A) and (C) are necessary to define the scope of GHG emissions within the defined geographic area and the incremental contribution of activities that will occur within that area to those emissions. (State CEQA Guidelines, § 15064(h)(3) (plan addresses cumulative impacts “within the geographic area in which the project is located”).) Criterion (B) establishes a benchmark to assist the lead agency in determining whether the plan provisions will avoid or substantially lessen cumulative effects of the area’s GHG emissions. (*Ibid.* (plan “provides specific requirements that will avoid or substantially lessen the cumulative problem”).) Criteria (D) and (E) are necessary to demonstrate that the plan will actually avoid or substantially lessen the cumulative effects of those emissions. (*Ibid.*) Finally, criterion (F) reflects the requirement in sections 15064(h)(3) and 15130(d) that the plan be adopted through a public review process, as well as case law requiring that mitigation plans themselves undergo environmental review. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal. App. 4th 1026, 1053 (mitigation “programs may offer the best solution to environmental planning challenges, by providing some certainty to developers while adequately protecting the environment” but “in order to provide a lawful substitute for the ‘traditional’ method of mitigating CEQA impacts, that is, a project-by-project analysis, the fee program must be evaluated under CEQA”).) Notably, the criteria provided in subdivision (b) are largely consistent with the elements that ARB recommends be included in a greenhouse gas reduction plan. (ARB, Scoping Plan, Appendix C, at p. C-49.)

Subdivision (b)(2) describes the uses and limitations of plans for the reduction of greenhouse gas emissions in a cumulative impacts analysis for later projects. Specifically, it provides a safeguard to ensure that the later activity was actually addressed in the plan for the reduction of greenhouse gas emissions, and that any applicable requirements of the plan are incorporated into the later project. This requirement is similar the requirement in case law that a lead agency determine that a particular threshold appropriately addresses the impact of concern. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109 (“in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect”).) Finally, subdivision (b)(2) makes specific the requirement that, while the existence of an applicable plan for the reduction of greenhouse gas emissions may create a presumption that compliance with that plan will reduce the incremental contribution of later activities to a less than cumulatively considerable level, the existence of substantial evidence supporting a fair argument to the contrary may still require preparation of an EIR.

Special Situations

Subdivision (c) provides necessary clarification of the partial exemption provided in sections 21155.2 and 21159.28 of the Public Resources Code, enacted as part of SB375 (see description above). The limitation on analysis of global warming applies only to the effects caused by GHG emissions from cars and light duty trucks. That limitation should be read in conjunction with section 21083.05 of the Public Resources Code and State CEQA Guideline sections 15064.4 and 15126.4 which require analysis of all sources of GHG emissions and mitigation if those emissions are significant. Thus, projects that qualify for the limitation in sections 21155.2 and 21159.28 must still analyze emissions resulting from, as applicable, energy use, land conversion, and other direct and indirect sources of emissions. This clarification is reasonably necessary to effectuate the legislative directive in section 21083.3 that OPR and Resources develop guidelines on the analysis of GHG emissions and to avoid confusion regarding the streamlining provisions provided by SB375.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Legislature has also directed that EIRs be tiered wherever possible, and that duplication be minimized. (*Id.* at §§ 21003, 21093, 21094.) Section 15183.5, which provides guidance on tiering and streamlining of GHG emissions analyses, is therefore reasonably necessary to carry out these directives.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the Amendments are proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent

of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the Amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15364.5. GREENHOUSE GAS

Specific Purposes of the Amendment

The Legislature has not included a definition of “greenhouse gases” in CEQA, though it did include a definition in AB32. (Health & Saf. Code, § 38505(g).) Thus, new section 15364.5 adds a definition of greenhouse gases. The specified gases are consistent with existing law as they are defined to include those identified by the Legislature in section 38505(g) of the Health and Safety Code.

Notably, the definition in AB32 states that GHG “includes all of the following...” In so stating, the Legislature implies that other gases may also be considered GHGs. The ARB’s Scoping Plan also acknowledges that other gases contribute to climate change. (Scoping Plan, at p. 11.) In fact, the EPA’s Endangerment Finding explained that several other gases share attributes with GHGs but would not be appropriate for regulation under the Clean Air Act at this time. (EPA Endangerment Finding, at pp. 18896-98.) Therefore, similar to the statutory definition of GHGs in AB32, the definition in the Amendments is not exclusive to the six primary GHGs. The purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects. This approach is consistent with the Supreme Court’s directive that CEQA be interpreted to provide the fullest possible protection to the environment. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 390.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) Section 15364.5 is necessary to make specific the instruction to analyze GHG emissions because it states which gases are considered to be “greenhouse gases” and should be included in the analysis.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency’s Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency’s determination that the Amendments are necessary to implement the Legislature’s directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action

alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

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Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the addition of this section is intended to reduce the costs of environmental review on lead agencies and project applicants by assisting lead agencies in determining which gases should be included in an analysis.

APPENDIX F. ENERGY CONSERVATION

Specific Purposes of the Amendment

CEQA's requirement to analyze and mitigate energy impacts of a project is substantive, and is not merely procedural. (*People v. County of Kern* (1976) 62 Cal.App.3d 761, 774.) Despite the requirement, lead agencies have not consistently included such analysis in their EIRs. (Remy et al., Guide to CEQA, 11th Ed. 2007, at pp. 1007-1008, n. 34.) The following revisions to Appendix F are, therefore, reasonably necessary to ensure that lead agencies comply with the substantive directive in section 21100(b)(3).

Introduction

The revisions to the introduction section include a cross-reference to section 21100(b)(3) of the Public Resources Code to direct lead agencies to the statutory directive underlying Appendix F. This section also includes an addition to make clear that energy impacts that have already been analyzed may not need to be repeated in later EIRs. This sentence is consistent with the Legislative intent in CEQA that information in existing environmental review be used to “reduce delay and duplication in preparation of subsequent environmental impact reports.” (Pub. Resources Code, § 21003(d).)

EIR Contents

The amendments to Appendix F revise the section on EIR Contents to clarify that lead agencies “shall” analyze energy conservation in their EIRs. The word “shall” indicates that the duty is mandatory, and makes Appendix F consistent with Public Resources Code section 21100(b)(3). While Appendix F is revised to make clear that an energy analysis is mandatory, the amendments to this section would also make clear that the energy analysis is limited to effects that are applicable to the project.

“Lifecycle”

The amendments to Appendix F remove the term “lifecycle.” No existing regulatory definition of “lifecycle” exists. In fact, comments received during OPR’s public workshop process indicate a wide variety of interpretations of that term. (Letter from Terry Rivasplata et al. to OPR, February 2, 2009, at pp. 5, 12 and Attachment; Letter from Center for Biological Diversity et al. to OPR, February 2, 2009, at pp. 17.) Thus, retention of the term “lifecycle” in Appendix F could create confusion among lead agencies regarding what Appendix F requires.

Moreover, even if a standard definition of the term “lifecycle” existed, requiring such an analysis may not be consistent with CEQA. As a general matter, the term could refer to emissions beyond those that could be considered “indirect effects” of a project as that term is defined in section 15358 of the State CEQA Guidelines.

Depending on the circumstances of a particular project, an example of such emissions could be those resulting from the manufacture of building materials. (CAPCOA White Paper, at pp. 50-51.) CEQA only requires analysis of impacts that are directly or indirectly attributable to the project under consideration. (State CEQA Guidelines, § 15064(d).) In some instances, materials may be manufactured for many different projects as a result of general market demand, regardless of whether one particular project proceeds. Thus, such emissions may not be “caused by” the project under consideration. Similarly, in this scenario, a lead agency may not be able to require mitigation for emissions that result from the manufacturing process. Mitigation can only be required for emissions that are actually caused by the project. (State CEQA Guidelines, § 15126.4(a)(4).) Conversely, other projects may spur the manufacture of certain materials, and in such cases, consideration of the indirect effects of a project resulting from the manufacture of its components may be appropriate. A lead agency must determine whether certain effects are indirect effects of a project, and where substantial evidence supports a fair argument that such effects are attributable to a project, that evidence must be considered. However, to avoid potential confusion regarding the scope of indirect effects that must be analyzed, the term “lifecycle” has been removed from Appendix F.

Types of Energy Use

The amendments to Appendix F clarify that project design may achieve energy savings through measures related to water use and solid waste disposal. (California Energy Commission, Water Supply-Related Electricity Demand in California, CEC 500-2007-114 (November 2007), at p. 3 (reporting that water related energy use, including water movement, treatment and heating, annually accounts for approximately 20 percent of California’s electricity consumption); Scoping Plan, Appendix C, at pp. C-158 to C-160.) The addition of these potential sources of energy reductions is consistent with the direction in section 21100(b)(3) to identify mitigation measures to reduce inefficient consumption of energy.

Grammar and Syntax

Finally, several minor revisions to Appendix F were made to improve grammar and syntax. Such revisions qualify as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).)

Necessity

The Legislature directed OPR and the Natural Resources Agency to develop guidelines on the analysis and mitigation of GHG emissions. (Pub. Resources Code, § 21083.05.) Since a significant source of GHG emissions results from energy use (consumption), these Amendments appropriately addressed energy use and conservation as a subject for CEQA analysis. Additionally, the legislature requires that lead agencies analyze energy use in their EIRs. (*Id.* at § 21100(b)(3).) The

amendments to Appendix F are, therefore, necessary to ensure that lead agencies implement these directives.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA's requirements for analysis and mitigation of energy use. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California.

APPENDIX G. INITIAL STUDY CHECKLIST

Specific Purposes of the Amendment

The Amendments include revisions to several portions of Appendix G, which contains a sample environmental checklist that lead agencies may use to satisfy the requirement to prepare an initial study. The amendments and their necessity are described below.

Note Regarding Use of the Checklist

The amendments would add a note to the beginning of Appendix G to clarify the checklist contained therein is only a sample that may be modified as necessary to suit the lead agency and to address the particular circumstances of the project under consideration. The addition is necessary for two reasons. First, several lead agencies have expressed concern that the checklist does not reflect the circumstances existing in that particular agency. (See, e.g., Letter from Napa County – Department of Conservation, Development, and Planning to OPR, January 26, 2009; Letter from County of San Bernardino - Land Use Services Department to OPR, February 2, 2009.) Second, the Third District Court of Appeal recently issued an opinion that clarified that all substantial evidence regarding potential impacts of a project must be considered, even if the particular potential impact is not listed in Appendix G. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109.) Thus, the note emphasizes that Appendix G does not mandate a particular form that must be used for an Initial Study; rather, it provides merely an example.

Forest Resources

The amendments would add several questions addressing forest resources in the section on Agricultural Resources. Forestry questions are appropriately addressed in the Appendix G checklist for several reasons. First, forests and forest resources are directly linked to both GHG emissions and efforts to reduce those emissions. For example, conversion of forests to non-forest uses may result in direct emissions of GHG emissions. (See, e.g., California Energy Commission Baseline GHG Emissions for Forest, Range, and Agricultural Lands in California (March, 2004) at p. 19.) Such conversion would also remove existing carbon stock (i.e., carbon stored in vegetation), as well as a significant carbon sink (i.e., rather than emitting GHGs, forests remove GHGs from the atmosphere). (Scoping Plan, Appendix C, at p. C-168.) Thus, such conversions are an indication of potential GHG emissions. Changes in forest land or timberland zoning may also ultimately lead to conversions, which could result in GHG emissions, aesthetic impacts, impacts to biological resources and water quality impacts, among others. Thus, these additions are reasonably necessary to ensure that lead agencies consider the full range of potential impacts in their initial studies. In the same way that an EIR must address conversion of prime agricultural land or wetlands as part of a project (addressing the whole of the action requires analyzing land clearance in advance of project development), so should it analyze forest removal.

During OPR's public involvement process, some commenters suggested that conversion of forest or timber lands to agricultural uses should not be addressed in the Initial Study checklist. (Letter from California Farm Bureau Federation to OPR, February 2, 2009; Letter from County of Napa, Conservation, Development and Planning Department, to OPR, January 26, 2009.) As explained above, the purpose of the Amendments is to implement the Legislative directive to develop Guidelines on the analysis and mitigation of GHG emissions. Although some agricultural uses also provide carbon sequestration values, most agricultural uses do not provide as much sequestration as forest resources. (Climate Action Team, *Carbon Sequestration* (2009), Chapter 3.3.8 at p. 3.21; California Energy Commission, *Baseline GHG Emissions for Forest, Range, and Agricultural Lands in California* (2004), at p. 2.) Therefore, such a project could result in a net increase in GHG emissions, among other potential impacts. Thus, such potential impacts are appropriately addressed in the Initial Study checklist. See the Thematic Responses, below, for additional discussion of this issue.

Greenhouse Gas Emissions

The additions also include two questions related to GHG emissions. These questions are necessary to satisfy the Legislative directive in section 21083.05 that the effects of GHG emissions be analyzed under CEQA. The questions are intended to provoke a full analysis of such emissions where appropriate. More detailed guidance on the context of such an analysis is provided in other sections throughout the Guidelines. Despite the detailed provisions in the Guidelines themselves, questions related to GHG emissions should also appear in the checklist because some lead agencies will not seriously consider an environmental issue unless it is specifically mentioned in the checklist. (*Protect the Historic Amador Waterways, supra*, 116 Cal. App. 4th at 1110.)

Transportation

The Amendments make four primary changes to the questions involving transportation and traffic.

First, question (a) changes the focus from an increase in traffic at a given location to the effect of a project on the overall circulation system in the project area. This change is appropriate because an increase in traffic, by itself, is not necessarily an indicator of a potentially significant *environmental* impact. (Ronald Miliam, AICP, *Transportation Impact Analysis Gets a Failing Grade When it Comes to Climate Change and Smart Growth*; see also Land Use Subcommittee of the Climate Action Team LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation Report (May, 2008) at pp. 31, 36.) Similarly, even if some projects may result in a deterioration of vehicular level of service – that is, delay experienced by drivers – the overall effectiveness of the circulation system as a whole may be improved. (*Ibid.*) Such projects could include restriping to provide bicycle lanes or creating dedicated bus lanes. Even in such cases, however, any potential adverse air

quality or other impacts would still have to be addressed as provided in other sections of the checklist. Finally, the change to question (a) also recognizes that the lead agency has discretion to choose its own metric of analysis of impacts to intersections, streets, highways and freeways. (Pub. Resources Code, § 21081.2(e); *Eureka Citizens for Responsible Gov't v. City of Eureka, supra*, 147 Cal.App.4th at 371-373 (lead agency has discretion to choose its methodology).) Thus, “level of service” may or may not be the applicable measure of effectiveness of the circulation system.

Second, the revision to question (b) clarifies the role of a congestion management program in a CEQA analysis. Specifically, it clarifies that a congestion management program contains many elements in addition to a level of service designation. (Gov. Code § 65088 et seq.) The clarification is also necessary to address any projects within an “in-fill opportunity zone” that may be exempted from level of service requirements. (*Id.* at § 65088.4.)

Third, the amendments eliminate the existing question (f) regarding parking capacity. Case law recognizes that parking impacts are not necessarily environmental impacts. (*San Franciscans Upholding the Downtown Plan v. City and County of San Francisco, supra*, 102 Cal.App.4th at 697.) The focus of the Initial Study checklist should be on direct impacts of a project. Therefore, the question related to parking is not relevant in the initial study checklist. As noted above, however, if there is substantial evidence indicating adverse indirect environmental impacts from a project related to parking capacity, the lead agency must address such potential impacts regardless of whether the checklist contains parking questions. (*Ibid.*) Additional discussion of this issue is included in the Thematic Responses, below.

Finally, the amendments revise existing question (g), now question (f), to address the performance and safety of certain modes of alternative transportation. These revisions were made in response to comments received on the Amendments. While the primary objective of the Amendments is to provide guidance on the analysis and mitigation of greenhouse gas emissions, this revision was determined to be necessary to support the use of alternative transportation.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) An initial study may be used to assist in the determination of whether a project may have a significant effect on the environment. (*Protect the Historic Amador Waterways, supra*, 116 Cal. App. 4th at 1110.) Appendix G of the State CEQA Guidelines is intended to provide a sample of an initial study that lead agencies may use. (*Ibid.*) Amendment of Appendix G to include questions that will assist a lead agency in determining whether a project may result in significant impacts related to GHG emissions is, therefore, necessary to carry out the Legislature’s directive in section 21083.05 of the Public Resources Code.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the

amendments to Appendix G are intended to reduce the costs of environmental review on lead agencies and project applicants by assisting lead agencies in determining which topics should be addressed in an Initial Study.

NON-SUBSTANTIAL CHANGES

On October 23, 2009, the Natural Resources Agency made available for public review certain changes to its originally proposed amendments. Those changes were described in the Notice of Proposed Changes. In response to comments on those changes, the Natural Resources Agency has made two non-substantial changes. Because those changes clarify the text that was made available for public review, and do not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, the revisions are nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.) Those revisions are described below.

Section 15126.2(a)

As explained in the Notice of Proposed Changes, the revisions to the proposed text included a clarifying sentence in section 15126.2 indicating that an environmental impact report should analyze the effect of placing a project in areas susceptible to hazardous conditions. That revision specifically lists types of areas (including floodplains, coastlines and wildfire risk areas) that may be most impacted by the effects of a changing climate. The revision would also clarify that analysis of such hazards is appropriate where such areas are specified in authoritative hazard maps, risk assessments or land use plans.

The Natural Resources Agency further revised section 15126.2(a) in response to comments. That section was revised as follows:

Similarly, the EIR should evaluate **the any potentially significant** impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

This change does not alter the rights, responsibilities, conditions, or prescriptions contained in the originally proposed text because the Public Resources Code already provides that an EIR is only required for those impacts that are potentially significant. (Public Resources Code, § 21002.1(a).) Because this revision clarifies the last sentence in section 15126.2(a), consistent with the Public Resources Code, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Section 15126.4(c)

The Natural Resources Agency also further revised text related to mitigation that was made publicly available as described in the October 23, 2009, Notice of Proposed Changes in response to comments on that text. The revision clarifies that the qualification that measures to mitigate greenhouse gas emissions must not otherwise be required applies in the context of offsets and is not intended to contradict case law recognizing that changes in a project that are required to comply with existing environmental standards may qualify as mitigation. Thus, section 15126.4(c) was revised as follows:

(c) Mitigation Measures Related to Greenhouse Gas Emissions.

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. ~~Reductions in emissions that are not otherwise required may constitute mitigation pursuant to this subdivision.~~ Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

(1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

(2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;

(3) Off-site measures, including offsets **that are not otherwise required**, to mitigate a project's emissions;

(4) Measures that sequester greenhouse gases;

(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

This change does not alter the rights, responsibilities, conditions, or prescriptions contained in the originally proposed text because the Public Resources Code already provides that to be considered mitigation, a measure must be tied to impacts resulting from the project. Section 21002 of the Public Resources Code, the source of the

requirement to mitigate, states that “public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]” Similarly, section 21081(a)(1) specifies a finding by the lead agency in adopting a project that “[c]hanges or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.” Both statutory provisions expressly link the changes to be made (i.e., the “mitigation measures”) to the significant effects of the project. Because this revision clarifies section 15126.4(c), consistent with the Public Resources Code, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

THEMATIC RESPONSES

Several themes emerged in the comments submitted on the Natural Resources Agency’s proposed amendments to the CEQA Guidelines addressing greenhouse gas emissions. While the Natural Resources Agency has responded individually to each comment it received, the following provides general responses to several issues that were raised repeatedly in the comments.

Quantitative versus Qualitative Analysis

Many comments focused on section 15064.4’s recognition of lead agency discretion in determining whether to analyze a project’s greenhouse gas emissions using either qualitative or quantitative methods, or both. Some comments suggested that a qualitative analysis would not satisfy CEQA’s informational mandates. Other comments indicated that qualitative analysis is consistent with CEQA, and may be particularly appropriate in the context of a negative declaration. Other comments asked for examples of how performance standards could be used in such an analysis. As explained in the Initial Statement of Reasons, the Natural Resources Agency finds that CEQA leaves to lead agencies the choice of the most appropriate methodology to analyze a project’s impacts, and that rule should continue to apply in the context of greenhouse gas emissions. The reasoning supporting this determination is set forth below.

First, nothing in CEQA prohibits use of a qualitative analysis or requires the use of a quantitative analysis. As explained in the Initial Statement of Reasons, CEQA directs lead agencies to consider qualitative factors. (Initial Statement of Reasons, at p. 19; Public Resources Code, § 21001(f).) Further, the existing CEQA Guidelines recognize that thresholds of significance, which are used in the determination of significance, may be expressed as quantitative, qualitative or performance-based standards. (State CEQA Guidelines, § 15064.7.) Moreover, even where quantification is technically or theoretically possible, “CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commentors.” (State CEQA Guidelines, § 15204(a); see also *Ass’n of*

Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383, 1396-1398; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1996) 27 Cal.App.4th 713, 728.)¹²

Second, the comments do not appropriately distinguish between the determination of significance and the informational standards governing the preparation of environmental documents. The purpose of section 15064.4 is to assist the lead agency in determining whether a project's greenhouse gas emissions may be significant, which would require preparation of an EIR, and if an EIR is prepared, to determine whether such emissions are significant, which would require the imposition of feasible mitigation or alternatives. The existing CEQA Guidelines contain several provisions governing the informational standards that apply to various environmental documents. Conclusions in an initial study, for example, must be "briefly explained to indicate that there is some evidence to support" the conclusion. (State CEQA Guidelines, § 15063(d) (emphasis added).) Similarly, if an EIR is prepared, a determination that an impact is not significant must be explained in a "statement briefly indicating the reasons that various possible significant effects of a project" are in fact not significant. (State CEQA Guidelines, § 15128 (emphasis added).) If the impact is determined to be significant, the impact "should be discussed with emphasis in proportion to their severity and probability of occurrence." (State CEQA Guidelines, § 15143.) The explanation of significance in an EIR must be "prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences" and must demonstrate "adequacy, completeness, and a good faith effort at full disclosure." (State CEQA Guidelines, § 15151.) In sum, while proposed section 15064.4(a) reflects the requirement that a lead agency base its significance determination on substantial evidence, whether quantitative, qualitative or both, it does not, as some comments appear to fear, alter the rules governing the sufficiency of information in an environmental document.

Third, the discretion recognized in section 15064.4 is not unfettered. A lead agency's analysis, whether quantitative or qualitative, would be governed by the standards in the first portion of section 15064.4. The first sentence applies to the context of greenhouse gas emissions the general CEQA rule that the determination of significance calls for a careful judgment by the lead agency. (Proposed § 15064.4(a) ("[t]he determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064".)) The second sentence sets forth the requirement that the lead agency make a good-faith effort to describe, calculate or estimate the amount of greenhouse gas emissions

¹² Notably, as administrative regulations, the development of the proposed regulations is governed by the Administrative Procedures Act. Government Code section 11340.1(a) states the Legislature's intent that administrative regulations substitute "performance standards for prescriptive standards wherever performance standards can be reasonably expected to be as effective and less burdensome, and that this substitution shall be considered during the course of the agency rulemaking process." Thus, absent authority in CEQA that would prohibit a qualitative analysis, section 15064.4 appropriately recognizes a lead agency's discretion to determine what type of analysis is most appropriate to determine the significance of a project's greenhouse gas emissions.

resulting from a project. That sentence has been further revised, as explained in greater detail below, to provide that the description, calculation or estimation is to be based “to the extent possible on scientific and factual data.” The third sentence advises that the exercise of discretion must be made “in the context of a particular project.” Thus, as provided in existing section 15146, the degree of specificity required in the analysis will correspond to the degree of specificity involved in the underlying project. In other words, even a qualitative analysis must demonstrate a good-faith effort to disclose the amount and significance of greenhouse gas emissions resulting from a project.

Fourth, the discretion recognized in proposed section 15064.4 would not enable a lead agency to ignore evidence submitted to it as part of the environmental review process. For example, if a lead agency proposes to adopt a negative declaration based on a qualitative analysis of the project’s greenhouse gas emissions, and a quantitative analysis is submitted to that lead agency supporting a fair argument that the project’s emissions may be significant, an EIR would have to be prepared. The same holds true if a lead agency proposes to adopt a negative declaration based on a quantitative analysis, and qualitative evidence supports a fair argument that the project’s emissions may be significant. (*Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1382; *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal. App. 3d 872, 881-882 (citizens' personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards).) Similarly, even if an EIR is prepared, a lead agency would have to consider and resolve conflicts in the evidence in the record. (State CEQA Guidelines, § 15151 (“EIR should summarize the main points of disagreement among the experts”); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109.)

Finally, regarding performance standards, several examples exist of the types of performance standards that might appropriately be used in determining the significance of greenhouse gas emissions. Proposed section 15183.5(b)(1)(D), for example, contemplates that a plan for the reduction of greenhouse gas emissions may contain performance based standards. Where such standards are developed as part of such a plan, a lead agency would have evidence indicating that compliance with such standards would indicate that the impact of greenhouse gas emissions would be less than significant. Further, in adopting SB375, the Legislature acknowledged that regional transportation plans, and the environmental impact reports prepared to analyze those plans, may contain performance standards that would apply to transit priority projects. (See, e.g., Public Resources Code, § 21155.2.) Other potential examples¹³ include the Bay Area Air Quality Management District’s proposed Best Management Practices for Construction Greenhouse Gas Emissions (calling for use of alternative fuels, local building materials and recycling), and the California Public Utilities Commission’s Performance Standard for Power Plans (requiring emissions no greater

¹³ The Natural Resources Agency does not necessarily endorse the use of these performance standards. Lead agencies must determine whether a particular standard is appropriate based on the substantial evidence supporting it and the context of the particular project.

than a combined cycle gas turbine plant). As with either a qualitative or quantitative analysis, reliance on performance standards must be supported with “scientific or factual data” indicating that compliance with the standard will ensure that impacts of greenhouse gas emissions are less than significant.

In sum, the proposed section 15064.4(a) appropriately reflects the standards in CEQA governing the determination of significance and the discretion CEQA leaves to lead agencies to determine how to analyze impacts. Mandating that lead agencies must quantify emissions whenever quantification is possible would be a departure from the CEQA statute.

Existing Environmental Setting

Several comments focused on the phrase “existing environmental setting” in section 15064.4(b)(1). Some comments urged, for example, that only “net” emissions should be considered. Comments from energy producers suggested that the phrase “existing environmental system” should encompass the entire energy system, which extends beyond California’s borders. Some comments suggested that section 15064.4 should include a lifecycle analysis.

Section 15064.4(b)(1) advises lead agencies to consider the extent to which a project would increase or decrease greenhouse gas emissions compared to the existing environmental setting. In performing this analysis, a lead agency must account for all project phases, including construction and operation, as well as indirect and cumulative impacts. (State CEQA Guidelines, §§ 15063(a) (“[a]ll phases of project planning, implementation, and operation must be considered in the initial study...”), 15064(h) (addressing cumulative impacts), 15126 (“[a]ll phases of a project must be considered when evaluating its impact on the environment: planning, acquisition, development, and operation”), 15358(a)(2) (defining “effects” to include indirect effects), 15378.) The “setting” to be described varies depending on the project and the potential environmental resources that it may affect. In *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, for example, the lead agency failed to adequately describe the environmental setting by limiting its discussion primarily to the southern portions of its water system. Framing the setting narrowly resulted in impacts to the northern portion of the water system being ignored. Finding that section 15125 is to be construed broadly to ensure the fullest protection to the environment, the court in that case held that the lead agency was required to disclose that increased use of the southern portion of the water system would require greater diversions from the northern portion, and to analyze the impacts on species in the northern portion of the system. (*Id.* at pp. 873-875.) In the context of power generation, to the extent that a project may cause changes in greenhouse gas emissions in an existing power system, and substantial evidence substantiates such changes, those changes may be considered pursuant to section 15064.4(b)(1).

Similarly, if an agency has performed an analysis that demonstrates that a particular process for waste treatment does not result in an increase in greenhouse gas emissions compared to biogenic emissions that already occurs in the atmosphere, that evidence may support a conclusion that the project would not cause an increase in greenhouse gas emissions. Thus, to the extent a lead agency does not consider biogenic emissions to be new emissions, and its analysis is supported with substantial evidence, the text in section 15064.4(b)(1) would be broad enough to encompass those emissions, subject to the limitation that such analysis could not be used in a way that would mask the effects of emissions associated with the project. For example, if the emissions occurring in the short-term will have impacts that differ from emissions occurring in the future, those differences may need to be analyzed.

Finally, some comments suggested that the Guidelines should authorize a “net” or “lifecycle” analysis for projects that operate within a closed system. Nothing in section 15064.4 precludes such analysis where such analysis complies with the provision of section 15064, and where substantial evidence supports the ultimate conclusions and findings. However, since a “net” analysis may only be appropriate or possible in limited cases, the Natural Resources Agency deliberately chose to draft section 15064.4 broadly. Additionally, in some situations, a true “net” analysis may not be technically feasible or scientifically possible, and determination of an appropriate baseline for determining a “net” effect may be difficult.

As explained below, the Natural Resources Agency has deliberately avoided the term “lifecycle,” however, to the extent an agency equates “lifecycle” with what occurs in the existing environmental setting, section 15064.4 authorizes lead agencies to consider such evidence.

Thresholds of Significance

Some comments expressed concern that the proposed amendments did not establish a statewide threshold of significance. Others suggested that most lead agencies are not qualified to establish their own thresholds, and if they do adopt thresholds, they should be required to adopt the most stringent threshold possible.

The CEQA Guidelines do not establish thresholds of significance for other potential environmental impacts, and SB97 did not authorize the development of a statewide threshold as part of this CEQA Guidelines update. Rather, the proposed amendments recognize a lead agency’s existing authority to develop, adopt and apply their own thresholds of significance or those developed by other agencies or experts. As set forth in the existing section 15064.7, a threshold is “an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” Because a threshold would be used in the determination of significance,

the threshold would need to be supported with substantial evidence. (State CEQA Guidelines, § 15064.7(b).)

As explained in a recent decision of the Third District Court of Appeal, “[p]ublic agencies are ... encouraged to develop thresholds of significance for use in determining whether a project may have significant environmental effects.” (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108.) Nothing in CEQA requires that thresholds be developed by experts or expert agencies; however, “thresholds can be drawn from existing environmental standards, such as other statutes or regulations.” (*Id.* at p. 1107.) Regardless of who develops the threshold, if an agency adopts a threshold, it must be supported with substantial evidence. (State CEQA Guidelines, § 15064.7(b).) Additionally, “thresholds cannot be used to determine automatically whether a given effect will or will not be significant[;]” “[i]nstead, thresholds of significance can be used only as a measure of whether a certain environmental effect “will normally be determined to be significant” or “normally will be determined to be less than significant” by the agency. (Guidelines, § 15064.7, subd. (a), italics added.)” (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at pp. 1108-1109.) Proposed subdivision (c) of section 15064.7 recognizes the principles described above by expressly recognizing that experts and expert agencies may be developing thresholds that other public agencies may find useful in their own CEQA analyses, but requiring, as a safeguard, that any such threshold be supported with substantial evidence.

Notably, nothing in either AB32 or SB97 requires a finding of significance for any particular level of increase in greenhouse gas emissions. AB32, and regulations implementing that statute, will require reductions in emissions from certain sectors in the economy, but do not preclude new emissions. Moreover, as explained in the Initial Statement of Reasons, the proposed amendments do not establish a zero emissions threshold of significance because “there is no ‘one molecule rule’ in CEQA. (*CBE, supra*, 103 Cal.App.4th at 120.)” (Initial Statement of Reasons, at p. 20.)

Some comments suggested that any numeric thresholds that are developed should not be set at such a low level that adverse economic impacts would result. While economic issues are appropriate in the determination of feasibility of mitigation and alternatives, it is not appropriate in the determination of significance (see, e.g., Public Resources Code, § 21002), so a threshold should not be designed with economic impacts in mind. Moreover, even a “high” threshold would not relieve agencies of the requirement to consider any evidence indicating that a project may have a significant effect despite falling below a threshold. (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109; *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 342.)

Mitigation Hierarchy

CEQA's substantive mandate requires that "public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]" (Public Resources Code, § 21002.) The statute defines feasible to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Public Resources Code, § 21061.1.) The Legislature further provided that a lead agency may use its lawful discretion to mitigate significant impacts to the extent provided by other laws:

In mitigating or avoiding a significant effect of a project on the environment, a public agency may exercise only those express or implied powers provided by law other than this division. However, a public agency may use discretionary powers provided by such other law for the purpose of mitigating or avoiding a significant effect on the environment subject to the express or implied constraints or limitations that may be provided by law.

(Public Resources Code, § 21004.) Cities and counties may rely on their constitutional police powers, for example, while the ability of other agencies to require mitigation may be limited by the scope of their statutory authority. Mitigation is also subject to constitutional limitations; i.e., there must be a nexus between the mitigation measure and the impact it addresses, and the mitigation must be roughly proportional to the impact of the project. (*Nollan v. California Coastal Comm'n* (1987) 483 U.S. 825; *Dolan v. City of Tigard* (1994) 512 U.S. 374; State CEQA Guidelines, § 15126.4(a)(4).)

CEQA itself imposes very few limitations on a lead agency's discretion to impose mitigation. For example, agencies may not mitigate the effects of a housing project by reducing the proposed number of units if other feasible mitigation measures are available. (Public Resources Code, § 21159.26.) Similarly, the Legislature has prescribed specific types of mitigation in only very limited circumstances; i.e., impacts to archeological resources and oak woodlands. (Public Resources Code, §§ 21083.2, 21083.4.)

SB 97 specifically called for guidelines addressing the mitigation of greenhouse gas emissions. In doing so, however, the Legislature did not alter a lead agency's discretion, authority or limitations on the imposition of mitigation where the impacts of a project's greenhouse gas emissions are significant. Thus, as explained in the Initial Statement of Reasons, the existing CEQA rules apply to the mitigation of greenhouse gas emissions.

Within the scope of a lead agency's existing authority, the CEQA Guidelines already contain provisions that recognize a lead agency's obligation to balance various factors in determining how or whether to carry out a project. (State CEQA Guidelines, § 15021(d).) Further, the Guidelines already require that "[w]here several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified." (State CEQA Guidelines, § 15126.4(a)(1)(B).)

Additionally, public agencies are directed to adopt their own implementing procedures, consistent with CEQA and the State CEQA Guidelines, which could set forth the types of mitigation that a particular agency finds to be most appropriate for projects subject to its approval. (State CEQA Guidelines, § 15022.) The Natural Resources Agency cannot, however, state in the State CEQA Guidelines that all lead agencies have the authority to prioritize types of mitigation measures, or to establish any particular priority order for them. Each lead agency must determine the scope of its own authority based on its own statutory or constitutional authorization.

Reliability and Effectiveness of Mitigation

Some comments expressed concern about the reliability and efficacy of some mitigation strategies. In response to such comments, the Natural Resources Agency further revised section 15126.4(c) to expressly require that any measures, in addition to being feasible, must be supported with substantial evidence and be capable of monitoring or reporting. (See Revised Section 15126.4(c) (October 23, 2009).) This addition reflects the requirements in Public Resources Code section 21081.5 that findings regarding mitigation be supported with substantial evidence and the monitoring or reporting requirement in section 21081.6.

The text of proposed section 15126.4(c), addressing mitigation of greenhouse gas emissions, also requires that mitigation measures be effective. The first sentence of that section requires that mitigation be “feasible.” Further, the statute defines “feasible” to mean “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.” (Public Resources Code, § 21061.1 (emphasis added); see also State CEQA Guidelines § 15364 (adding “legal” factors to the definition of feasibility.) A recent decision of the Third District Court of Appeal confronting questions regarding the effectiveness of a mitigation measure explained: “concerns about whether a specific mitigation measure ‘will actually work as advertised,’ whether it ‘can ... be carried out,’ and whether its ‘success ... is uncertain’ go to the feasibility of the mitigation measure[.]” (*California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal. App. 4th 603, 622-623.) Thus, by requiring that lead agencies consider feasible mitigation of greenhouse gas emissions, section 15126.4(c) already requires that such measures be effective.

Off-site Mitigation and Offsets

Relatively little authority addresses the question of how close of a causal connection must exist between off-site emissions reductions and project implementation in order to be adequate mitigation under CEQA. CEQA requires lead agencies to mitigate or avoid the significant effects of proposed projects where it is feasible to do so. While the CEQA statute does not define mitigation, the State CEQA Guidelines define mitigation to include:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

(State CEQA Guidelines, § 15370.) As subdivision (e) implies, off-site measures may constitute mitigation under CEQA, and such measures have been upheld as adequate mitigation in CEQA case law. (See, e.g., *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal. App. 4th 603, 619-626.)

Whether on-site or off-site, to be considered mitigation, the measure must be tied to impacts resulting from the project. Section 21002 of the Public Resources Code, the source of the requirement to mitigate, states that “public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]” Similarly, section 21081(a)(1) specifies a finding by the lead agency in adopting a project that “[c]hanges or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.” Both statutory provisions expressly link the changes to be made (i.e., the “mitigation measures”) to the significant effects of the project. Courts have similarly required a link between the mitigation measure and the adverse impacts of the project. (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal. App. 4th 99, 128-131 (EIR must discuss “the history of water pumping on [the off-site mitigation] property and its feasibility for providing an actual offset for increased pumping on the [project] property”).) The text of sections 21002 and 21081, and case law requiring a “nexus” between a measure and a project impact, together indicate that “but for” causation is a necessary element of mitigation. In other words, mitigation should normally be an activity that occurs in order to minimize a particular significant effect. Or, stated another way and in the context of greenhouse gas emissions, emissions reductions that would occur without a project would not normally qualify as mitigation.

Notably, this interpretation of the CEQA statute and case law is consistent with the Legislature’s directive in AB32 that reductions relied on as part of a market-based compliance mechanism must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission

reduction that otherwise would occur.” (Health and Safety Code, § 38562(d)(2).) While AB32 and CEQA are separate statutes, the additionality concept may be applied analytically in the latter as follows: greenhouse gas emission reductions that are otherwise required by law or regulation would appropriately be considered part of the existing baseline. Pursuant to section 15064.4(b)(1), a new project’s emissions should be compared against that existing baseline.

Thus, in light of the above, and in response to concerns raised in the comments, the Natural Resources Agency has revised section 15126.4(c)(3) to state that mitigation includes: “Off-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions[.]” This provision is intended to be read in conjunction with the statutory mandate in Public Resources Code sections 21002 and 21081 that mitigation be tied to the effects of a project.

This provision would not limit the ability of a lead agency to create, or rely on the creation of, a mechanism, such as an offset bank, created prospectively in anticipation of future projects that will later rely on offsets created by those emissions reductions. The Initial Statement of Reasons referred, for example, to community energy conservation projects. (Initial Statement of Reasons, at p. 38.) Such a program could, for example, identify voluntary energy efficiency retrofits that would not occur absent implementation of the program, and then fund the retrofits through the sale of offsets that would occur as a result of the retrofit. Emissions reductions that occur as a result of a regulation requiring such reduction, on the other hand, would not constitute mitigation.

Some comments opined that offsets are highly uncertain and of questionable legitimacy. The Initial Statement of Reasons, however, cites several sources discussing examples of offsets being used in a CEQA context. Further, the ARB Scoping Plan describes offsets as way to “provide regulated entities a source of low-cost emission reductions, and ... encourage the spread of clean, efficient technology within and outside California.” (Scoping Plan, Appendix C, at p. C-21.) The Natural Resources Agency finds that the offset concept is consistent with the existing CEQA Guidelines’ definition of “mitigation,” which includes “[r]ectifying the impact by repairing, rehabilitating, or restoring the impacted environment” and “[c]ompensating for the impact by replacing or providing substitute resources or environments.” (State CEQA Guidelines, §§ 15370(c), (e).)

While the proposed amendments recognize offsets as a potential mitigation strategy, they do not imply that offsets are appropriate in every instance. The efficacy of any proposed mitigation measure is a matter for the lead agency to determine based on the substantial evidence before it. Use of the word “feasible” in proposed Section 15126.4(c) requires the lead agency to find that any measure, including offsets, would be “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” (State CEQA Guidelines, § 15364.)

Thus, the Natural Resources Agency finds that by expressly requiring that any mitigation measure be feasible, supported with substantial evidence, and capable of monitoring or reporting, section 15126.4(c) adequately addresses the concern stated in the comment that offsets may be of questionable legitimacy.

Use of Plans for the Reduction of Greenhouse Gas Emissions in a Cumulative Impacts Analysis

Section 15183.5 was developed to address tiering and streamlining the analysis of greenhouse gas emissions. Subdivision (a) highlights existing tiering and streamlining mechanisms in CEQA that may be used to address the analysis and mitigation of greenhouse gas emissions. Those mechanisms are often used for general plans and other long range planning documents. Subdivision (a) therefore recognizes that lead agencies may choose to include a programmatic analysis of greenhouse gas emissions in those long range plans. That subdivision did not create any new tiering or streamlining provisions; rather, it cross-references existing mechanisms. Each mechanism has its own benefits and drawbacks, and the use of any analysis of greenhouse gas emissions contained in such a document would be governed by the specific provisions cited in subdivision (a).

Subdivision (b), on the other hand, acknowledges that, in addition to the long range documents mentioned in subdivision (a), some agencies are voluntarily developing stand-alone plans focused specifically on the reduction of greenhouse gas emissions. Subdivision (b) is not a tiering mechanism. Tiering is governed by section 15152 of the existing CEQA Guidelines. The purpose of section 15183.5(b) is much narrower. Because climate action plans and greenhouse gas reduction plans are voluntary, and not subject to any legislative criteria or requirements, subdivision (b) was developed “to assist lead agencies in determining whether an existing greenhouse gas reduction plan is an appropriate document to use in a cumulative impacts analysis under CEQA.” (Initial Statement of Reasons, at p. 54.) Specifically, a project that is consistent with a plan that satisfies the criteria in subdivision (b) may benefit from the presumption created in sections 15064(h)(3) and 15130(d) that the project’s cumulative impacts are less than significant due to compliance with the plan. Subdivision (b) does not create or authorize any plans; rather, it provides a tool to determine whether a plan for the reduction of greenhouse gas emissions may be used in a cumulative impacts analysis as provided in section 15064(h)(3) or 15130(d). Section 15183.5(b) does not require that public agencies develop plans for the reduction of greenhouse gas emissions, nor does it prohibit public agencies from developing individual ordinances and regulations to address individual sources of greenhouse gas emissions.

As an example, if a general plan EIR analyzed and mitigated greenhouse gas emissions, a lead agency would likely use the specific streamlining provision applicable to general plan EIRs in section 15183, and not the more general provision in 15183.5(b). A stand alone “climate action plan” that was not analyzed in a program EIR, master EIR, or other mechanism identified in 15183.5(a) may still be used in a

cumulative impacts analysis pursuant to sections 15064(h)(3) or 15130(d), but only if that climate action plan contains the elements listed in section 15183.5(b)(1).

Some comments suggested that section 15183.5(b) should identify specific types of plans to which it would apply. That section was developed precisely because plans for the reduction of greenhouse gas emissions are not specified in law and are so varied. They have been variously titled “climate action plans”, “sustainability plans”, “greenhouse gas reduction plans”, etc. Contents of such plans also vary widely. Thus, the Natural Resources Agency cannot specifically identify which plans satisfy the criteria in subdivision (b). That determination must be made by the individual lead agency based on whether the specific plan under consideration satisfies each of the criteria in subdivision (b)(1).

Notably, public agencies are required to develop their own procedures to implement CEQA. (State CEQA Guidelines, § 15022.) If a lead agency determines that it does not have a plan for the reduction of greenhouse gas emissions that contains the criteria set forth in section 15183.5(b), but its collective policies, ordinances and other requirements nevertheless ensure that the incremental contribution of individual projects is not cumulatively considerable, and substantial evidence supports that determination, it could include such an explanation and support in its own implementing procedures.

Some comments questioned how a Sustainable Communities Strategy or Alternative Planning Strategy should be treated in light of section 15183.5. SB375 encourages programmatic analysis and planning for greenhouse gas emissions from cars and light-duty trucks, and provides specific CEQA streamlining benefits for certain types of projects that are consistent with a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy (APS). Given the specificity of those statutory provisions, sections 21155 through 21155.3 and 21159.28 of the Public Resources Code in particular, the Office of Planning and Research and the Natural Resources Agency did not find that additional guidance on those provisions was necessary at this time. Proposed section 15183.5(c), however, clarifies that while certain projects consistent with an SCS or APS may not need to analyze greenhouse gas emissions from cars and light-duty trucks, emissions from other sources still may require analysis and mitigation. As SB97 requires the CEQA Guidelines to be updated every two years to incorporate new information, additional guidance regarding the relationship between CEQA and SB375 may be developed as necessary. (See also the discussion of AB32, SB375 and CEQA, above.)

Definition of Greenhouse Gas Emissions

Several comments objected to the definition of greenhouse gas emissions in the Guidelines. Some suggested that it should be strictly limited to the gases identified in AB32. Other thought it should include all potential greenhouse gas emissions. Still others wanted to exclude biogenic emissions from the definition.

As explained in the Initial Statement of Reasons, the definition of greenhouse gases in AB32 states that GHG “includes all of the following...” (Health and Safety Code, § 38505(g).) The Legislature thus implied that other gases may also be considered GHGs. Further, the ARB Scoping Plan also acknowledged that other gases contribute to climate change. (Scoping Plan, at p. 11.) Consistent with the definition in the Health and Safety Code, the proposed definition in the Proposed Amendments is not exclusive to the six primary GHGs. The purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects. This approach is consistent with the Supreme Court’s directive that CEQA be interpreted to provide the fullest possible protection to the environment. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 390.)

While the definition could not be strictly limited to the six gases identified in AB32, the Natural Resources Agency concluded that specific mention of other potential greenhouse gases was also not appropriate. Notably, the federal Environmental Protection Agency limited its proposed endangerment finding to those same six listed gases. It did so because the six gases are well studied, and have been the focus of climate change research. (Federal Register, v. 74, 18886, 18895 (April 24, 2009).) It is not necessary to list each of the known potential greenhouse gases because the proposed definition in section 15364.5 is written broadly, stating that the greenhouse gas emissions “are not limited to” the listed examples. As further explained in the Initial Statement of Reasons, the “purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects.” (Initial Statement of Reasons, at p. 58.) Because the CEQA Guidelines must be updated periodically to reflect developments relating to greenhouse gas emissions, the Natural Resources Agency may expand the definition of greenhouse gas emissions if necessary to reflect the most current science and practice.

The Natural Resources Agency also concluded that the definition of greenhouse gas emissions should not differentiate between biogenic and anthropogenic emissions. SB97 does not distinguish between the sources of greenhouse gas emissions. Notably, neither AB32 nor the Air Resources Board’s Scoping Plan distinguishes between biogenic and anthropogenic sources of greenhouse gas emissions. On the contrary, the Scoping Plan identifies methane from, among other sources, organic wastes decomposing in landfills as a source of emissions that should be controlled. (Scoping Plan, at pp. 62-63.)

Forestry

Some comments objected to the inclusion of questions related to forest resources in the Appendix G questions in the section on agricultural resources.

SB97 called for guidance on the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions. (Public Resources Code, § 21083.05.) As explained in the Initial Statement of Reasons, forest conversions may result in direct greenhouse gas emissions. Further, such conversions remove existing forest stock and the potential for further carbon sequestration. (Initial Statement of Reasons, at p. 63.) Sequestration is recognized as a key mitigation strategy in the Air Resources Board’s Scoping Plan. (Scoping Plan, Appendix C, at p. C-168.)

The addition of questions related to forestry does not target the establishment of agricultural operations. The questions ask about *any* conversion of forests, not just conversions to other agricultural operations. Moreover, analysis of impacts to forestry resources is already required. The Legislature has declared that “forest resources and timberlands of the state are among the most valuable of the natural resources of the state” and that such resources “furnish high-quality timber, recreational opportunities, and aesthetic enjoyment while providing watershed protection and maintaining fisheries and wildlife.” (Public Resources Code, § 4512(a)-(b).) Because CEQA defines “environment” to include “land, air, water, minerals, flora, fauna, noise, [and] objects of historic or aesthetic significance” (Public Resources Code, section 21060.5), and because forest resources have been declared to be “the most valuable of the natural resources of the state,” projects affecting such resources must be analyzed, whether or not specific questions relating to forestry resources appear in Appendix G. (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109.) In effect, suggestions that the Appendix G questions be limited to conversions to “non-agricultural uses” ask the Natural Resources Agency to adopt changes that are inconsistent with CEQA, which it cannot do.

Questions related to greenhouse gas emissions in Appendix G are not sufficient to address impacts related to forestry resources. As explained in the Initial Statement of Reasons, not only do forest conversions result in greenhouse gas emissions, but may also “remove existing carbon stock (i.e., carbon stored in vegetation), as well as a significant carbon sink (i.e., rather than emitting GHGs, forests remove GHGs from the atmosphere).” (Initial Statement of Reasons, at p. 63.) Further, conversions may lead to “aesthetic impacts, impacts to biological resources and water quality impacts, among others.” The questions related to greenhouse gas emissions would not address such impacts. Thus, the addition of forestry questions to Appendix G is appropriate both pursuant to SB97 and the Natural Resources Agency’s general authority to update the CEQA Guidelines pursuant to Public Resources Code section 21083(f).

“Level of Service” and Transportation Impact Analysis

The Natural Resources Agency acknowledges the concern expressed by some comments that the use of level of service metrics in CEQA analysis has led to an auto-centric focus. The Office of Planning and Research and the Natural Resources Agency have participated in extensive outreach with stakeholder groups to revise question (a) in the transportation section of Appendix G to accomplish the following goals:

- Assess traffic impacts on intersections, streets, highways and freeways as well as impacts to pedestrian, non-vehicular and mass-transit circulation
- Recognize a lead agency's discretion to choose methodology, including LOS, to assess traffic impacts
- Harmonize existing requirements in congestion management programs, general plans, ordinances, and elsewhere

In response to public comments submitted on proposed amendments, the Natural Resources Agency further refined question (a) to shift the focus from the capacity of the circulation system to consistency with applicable plans, policies that establish objective measures of effectiveness.

Some comments advocated leaving the existing text in question (a) of the transportation section of Appendix G intact. As explained in the Initial Statement of Reasons,

[Q]uestion (a) changes the focus from an increase in traffic at a given location to the effect of a project on the overall circulation system in the project area. This change is appropriate because an increase in traffic, by itself, is not necessarily an indicator of a potentially significant environmental impact. (Ronald Miliam, AICP, Transportation Impact Analysis Gets a Failing Grade When it Comes to Climate Change and Smart Growth; see also Land Use Subcommittee of the Climate Action Team LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation Report (May, 2008) at pp. 31, 36.) Similarly, even if some projects may result in a deterioration of vehicular level of service – that is, delay experienced by drivers – the overall effectiveness of the circulation system as a whole may be improved. (*Ibid.*) Such projects could include restriping to provide bicycle lanes or creating dedicated bus lanes. Even in such cases, however, any potential adverse air quality or other impacts would still have to be addressed as provided in other sections of the checklist. Finally, the change to question (a) also recognizes that the lead agency has discretion to choose its own metric of analysis of impacts to intersections, streets, highways and freeways. (Pub. Resources Code, § 21081.2(e); *Eureka Citizens for Responsible Gov't v. City of Eureka, supra*, 147 Cal.App.4th at 371-373 (lead agency has discretion to choose its methodology).) Thus, “level of service” may or may not be the applicable measure of effectiveness of the circulation system.

(Initial Statement of Reasons, at pp. 64-65.) Further, evidence presented to the Natural Resources Agency indicates that “mitigation” of traffic congestion may lead to even greater environmental impacts than might result from congestion itself. (See, e.g.,

Cervero, Robert. (July, 2001). *Road Expansion, Urban Growth, and Induced Travel: A Path Analysis*. Journal of the American Planning Association, Vol. 69 No. 2. American Planning Association (confirming “induced demand” phenomenon associated with capacity improvements.)

While the terms “volume to capacity ratio” and “congestion at intersections” no longer appear in question (a), nothing precludes a lead agency from including such measures of effectiveness in its own general plan or policies addressing its circulation system. Though the Office of Planning and Research originally recommended specifying “vehicle miles traveled” as a question in Appendix G, it later revised its recommendation to allow lead agencies to choose their own measures of effectiveness. (Letter from OPR Director, Cynthia Bryant, to Secretary for the Natural Resources Agency, Mike Chrisman, April 13, 2009.) Thus, as revised, question (a) accommodates lead agency selection of methodology, including, as appropriate, vehicle miles traveled, levels of service, or other measures of effectiveness.

Other comments objected to any mention of the phrase “level of service” in question (b) of the transportation section of the Appendix G checklist. That question, as revised, would ask whether a project would conflict with the provisions of a congestion management program. The Government Code, beginning at section 65088, requires Congestion Management Agencies, in urbanized areas, to adopt Congestion Management Programs covering that agency’s cities and county, and in consultation with local governments, transportation planning agencies, and air quality management districts. A CMP must, pursuant to statute, contain level of service standards for certain designated roadways. A CMP must also include a land use analysis program to assess the impact of land use decisions on the regional transportation system. A CMA may require that land use analysis to occur through the CEQA process. Thus, level of service standards cannot be deleted from the Appendix G checklist altogether. The proposed amendments did, however, amend question (b) to put level of service standards in the broader context of the entire CMP, which should also contain travel demand measures and other standards affecting the circulation system as a whole. Beyond this amendment, however, the Natural Resources Agency cannot remove level of service standards entirely from the Appendix G checklist.

Notably, the primary purpose of the proposed amendments is to update the CEQA Guidelines on the analysis and mitigation of greenhouse gas emissions. While certain changes to Appendix G were proposed pursuant to the Natural Resources Agency’s general authority to update the CEQA Guidelines, those changes were modest and were intended to address certain misapplications of CEQA in a way that hinders the type of development necessary to reduction of greenhouse gas emissions. Transportation planning and impact analysis continues to evolve, as new multimodal methods of analysis and guidelines on the integration of all modes of transportation and users into the circulation system are being developed. Additional updates to Appendix G may be appropriate in the future to address those developments.

Parking

As explained in the Initial Statement of Reasons, the Natural Resources Agency concluded that the question related to parking adequacy should be deleted from the Appendix G checklist in part as a result of the decision in *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656. The court in that case distinguished the social impact of inadequate parking from actual adverse environmental impacts. In particular, that court explained:

[T]here is no statutory or case authority requiring an EIR to identify specific measures to provide additional parking spaces in order to meet an anticipated shortfall in parking availability. The social inconvenience of having to hunt for scarce parking spaces is not an environmental impact; the secondary effect of scarce parking on traffic and air quality *is*. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. An EIR need only address the *secondary physical* impacts that could be triggered by a social impact.

(*Id.* at p. 698 (emphasis in original).) The Natural Resources Agency is aware of no authority requiring an analysis of parking adequacy as part of a project's environmental review. Rather, the Agency concurs with the court in the *San Franciscans* case that inadequate parking is a social impact that may, depending on the project and its setting, result in secondary effects. Consistent with existing CEQA Guidelines section 15131(a), deletion of the parking adequacy question from Appendix G checklist will ensure that the "focus of the analysis shall be on the physical changes." Specifically, the Appendix G checklist contains questions asking about possible project impacts to air quality and traffic.

Some comments pointed to examples of potential adverse impacts that could result from parking shortages, such as double-parking and slower circulation speeds, and referred specifically to a study of "cruising" behavior by Donald Shoup that noted that cruising could result in emissions of carbon dioxide. The relationship between parking adequacy and air quality is not as clear or direct as some comments imply. Mr. Shoup, for example, submitted comments to the Natural Resources Agency supporting the deletion of the parking question. (See, Letter from Donald Shoup, Professor of Urban Planning, University of California, Los Angeles, October 26, 2009.) In those comments, Mr. Shoup opines that cruising results not from the number of parking spaces associated with a project, but rather from the price associated with those parking spaces. (*Ibid.*) The Natural Resources Agency also has evidence before it demonstrating that providing parking actually causes greater emissions due to induced demand. The California Air Pollution Control Officers Association CEQA White Paper, for example, suggests reducing available parking as a way to reduce greenhouse gas emissions. (Greg Tholen, et al. (January, 2008). CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. California Air Pollution Control Officers Association, at Appendix B, pp. 8-9.)

Moreover, parking analyses do not typically address either air quality or traffic impacts; rather, such analyses often focus on the number of parking spaces necessary to satisfy peak demand, which is often established by a local agency as a parking ratio (i.e., one space per 250 square feet of office space). (See, e.g., Shoup, Donald. (1999). In Lieu of Required Parking. Journal of Planning Education and Research, Vol. 18 No. 4. Association of Collegiate Schools of Planning, at p. 309.) Thus, the question in Appendix G related to parking adequacy does not necessarily lead to the development of information addressing actual environmental impacts.

In sum, nothing in the CEQA statute, or cases interpreting that statute, require an analysis of parking demand. Further, parking supply is not a reasonable proxy for direct physical impacts associated with a project because parking supply may in some circumstances adversely affect air quality and traffic while in other circumstances, it may create air quality and traffic benefits. Thus, maintaining the parking question in the general Appendix G checklist is not necessary to effectuate the purposes of the CEQA statute.

The Natural Resources Agency acknowledges, however, that parking supply may lead to social impacts that agencies may wish to regulate. Cities and counties can, and do, include parking related policies in their municipal ordinances and general plans. (See, e.g., Office of Planning and Research, General Plan Guidelines, at pp. 59-60.) To the extent an agency has developed parking related policies in a general plan, zoning ordinance, or other regulation, consistency with those policies could be analyzed as a potential land use impact. Public agencies must, moreover, develop their own procedures to implement CEQA, and so may include parking-related questions in their own checklist if appropriate in their own circumstances. (State CEQA Guidelines, §§ 15022, 15063(f).)

AB32, SB375 and CEQA

Many comments suggested various links between CEQA, AB32 and SB375. While there is some overlap between the statutes, each contains its own requirements and serves its own purposes. While recognizing the role of regulatory programs in addressing cumulative impacts analysis in CEQA, the Proposed Amendments deliberately avoided linking the determination of significance under CEQA to compliance with AB32. The following addresses the CEQA effect of compliance with AB32 and SB375.

The Effect of Consistency with the Scoping Plan and the Regulations Implementing AB32

The Initial Statement of Reasons explained that the Scoping Plan “may not be appropriate for use in determining the significance of individual projects ... because it is conceptual at this stage and relies on the future development of regulations to

implement the strategies identified in the Scoping Plan.” (Initial Statement of Reasons, at p. 14.) Compliance with the regulations implementing the Scoping Plan, on the other hand, might be relevant in determining the significance of a project’s emissions, if the particular regulation or regulations specifically addresses the emissions from the project. (*Ibid.*) Compliance with regulations is specifically addressed in section 15064(h)(3) and 15064.4(b)(3).

Specifically, both sections provide that a lead agency may consider compliance with such regulations, and if relying on regulations to determine that an impact is less than significant, the lead agency must explain how that particular regulation addresses the impact of the project. Both sections also recognize that a lead agency must still consider whether any evidence supports a fair argument that a project may still have a significant impact despite compliance with the regulation.

The Effect of Consistency with Plans for the Reduction of Greenhouse Gas Emissions, Sustainable Communities Strategies and Alternative Planning Strategies.

Several comments questioned whether the references in the Proposed Amendments to “greenhouse gas reduction plans” were intended to include a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS).

SB375 created both the SCS and APS as strategies to be adopted by metropolitan planning organizations for the purpose of achieving greenhouse gas emissions reductions targets established by the California Air Resources Board. SB375 inserted specific provisions into CEQA governing the review of projects that are consistent with an APS or SCS. (See, e.g., Public Resources Code, §§ 21155-21155.3, 21159.28.) Because of the specificity of those provisions, the Office of Planning and Research and the Natural Resources Agency determined that no further guidance was needed in the Proposed Amendments to address the use of an SCS or APS.

As explained in the Initial Statement of Reasons, however, OPR and the Natural Resources Agency observed that many jurisdictions were adopting plans specifically for the purpose of addressing and reducing greenhouse gas emissions. (Initial Statement of Reasons, at pp. 12-13.) Those plans may be titled Climate Action Plans, Greenhouse Gas Reduction Plans, Sustainability Plans, etc. While recognizing the great variety of such plans, as well as the lack of legislative or other direction regarding the content of such plans, OPR and the Natural Resources Agency proposed the addition of a new Guidelines section 15183.5(b) to establish criteria for those plans if they are to be used in a CEQA cumulative impacts analysis as provided in sections 15064(h)(3) and 15130(d). The proposed amendments to section 15064(h)(3) and addition of section 15183.5(b) were not intended to limit or affect the use of an APS or SCS as provided in the Public Resources Code.

SB375 included provisions that would exempt certain types of projects from CEQA, and would apply the substantial evidence standard of review to other types of projects reviewed under a Sustainable Communities Environmental Assessment. Some

comments raised concerns that the proposed amendments, and section 15064(h)(3) in particular, may conflict with those provisions of SB375. The last sentence of Section 15064(h)(3), which acknowledges the application of the fair argument standard in the determination of whether to prepare an EIR, complies with existing law. (*CBE, supra*, 103 Cal.App.4th at 115-116.) SB375's specific statutory provisions, and not section 15064(h)(3), would control for a project that satisfies the conditions in those provisions. Thus, there is no conflict between the existing language in Section 15064(h)(3) and SB375.

Comments were also raised about the application of section 15125(d), which requires a discussion of a project's consistency with applicable regional plans, to an APS or SCS. One comment suggested that, for CEQA purposes, an SCS and APS are interchangeable. The Natural Resources Agency disagrees. An Alternative Planning Strategy is not a land use plan with which land use consistency should be analyzed under CEQA. (Government Code, § 65080(b)(2)(H)(v).) For that reason, the Natural Resources Agency deliberately did not propose to add "Alternative Planning Strategy" to the list of plans to be considered in an environmental setting pursuant to section 15125. There is no similar statement precluding analysis of consistency with a Sustainable Communities Strategy, however. Thus, the reference to a "regional transportation plan" in the existing section 15125(d) remains appropriate. As explained above, and the Initial Statement of Reasons, the reference to "plans for the reduction of greenhouse gas emissions" is intended to cover a broad range of plans that may be adopted by state and local agencies. The specific statutory provisions governing an Alternative Planning Strategy or Sustainable Communities Strategy would, however, control.

Similarly, some comments expressed concern regarding the application of the new Appendix G question asking about a project's consistency with applicable plans for the reduction of greenhouse gas emissions. That Appendix G question, as revised, asks whether a project would: "Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?" (Emphasis added.) In response to comments, the Natural Resources Agency replaced the word "any" with the word "an" to clarify that only a plan determined to be applicable by the lead agency, and not any plan developed by any person or entity, should be considered in determining whether a project would result in a significant impact relating to greenhouse gas emissions. Government Code section 65080(b)(2)(H)(v) states: an "alternative planning strategy shall not constitute a land use plan, policy, or regulation, and the inconsistency of a project with an alternative planning strategy shall not be a consideration in determining whether a project may have an environmental effect" for CEQA purposes. By operation of that Government Code Section 65080(b)(2)(H)(v), an alternative planning strategy would not constitute "an applicable plan" for purposes of the Appendix G question. Notably, as explained in the Initial Statement of Reasons, the Appendix G checklist is meant to provide a sample checklist of questions designed to provoke thoughtful consideration of general environmental concerns. (Initial Statement of Reasons, at p. 63.) Because it is provided as a sample only, the Office of Planning and Research and the Natural Resources Agency found that it would not be possible to

identify with specificity each plan that or may not apply to a particular jurisdiction or project.

Lead agencies, however, have discretion to revise the checklist in a way that is most appropriate for their own jurisdiction. If an individual agency in a region where an APS was prepared finds it necessary or desirable to restate Government Code Section 65080(b)(2)(H)(v) in its own checklist, it may do so. Further, while inconsistency with an APS is not, by itself, an indication of a potentially significant impact, other project characteristics would need to be considered as indicated in Section 15064.4 and other provisions of the CEQA Guidelines. Because Government Code Section 65080(b)(2)(H)(v) already provides that an APS is not a land use plan for CEQA purposes, and the Appendix G question asks only about “an applicable plan,” the question need not specify an exception for an APS.

The Effect of Compliance with Regulations Implementing AB32 or Other Laws Intended to Reduce Greenhouse Gas Emissions

Some comments urged that lead agencies should be able to rely on sector-wide reductions in emissions that may result from implementation of AB32 and other regulations in mitigating an individual project’s impacts. Those comments appeared to conflate the requirement that a lead agency consider cumulative impacts (i.e., the impacts resulting from a project’s emissions when added to other past, present and reasonably foreseeable future emissions) with the requirement that a lead agency mitigate the significant effects of a project. The proposed amendments contain several provisions addressing the analysis of greenhouse gas emissions as a cumulative effect. For example, Section 15064(h)(3) and 15130(d) would encourage lead agencies to use existing plans for the reduction of greenhouse gas emissions in cumulative impacts analysis. Additionally, Section 15130(b)(1)(B) is proposed for amendment to allow lead agencies to use projections of emissions contained in certain plans and models. Thus, the proposed amendments would allow a lead agency to consider a project in the context of other emissions resulting from the same or other sectors.

To the extent comments suggested that reductions in emissions resulting from implementation of AB32 elsewhere can mitigate the significant effects of a separate project under CEQA, the Natural Resources Agency disagrees. (See discussion below on off-site mitigation.)

A project’s compliance with regulations or requirements implementing AB32 or other laws and policies is not irrelevant. Section 15064.4(b)(3) would allow a lead agency to consider compliance with requirements and regulations in the determination of significance of a project’s greenhouse gas emissions. Lead agencies should note, however, that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant.

Projects That Implement AB32 or Otherwise Assist in Achieving the State's Emissions Reductions Goals

Finally, some comments noted that projects implementing AB32, or that would somehow assist the State in achieving a low-carbon future, should not be considered significant under CEQA, and that requiring such projects to mitigate their emissions would frustrate implementation of AB32. CEQA requires analysis and mitigation of a project's significant adverse environmental impacts, even if that project may be considered environmentally beneficial overall. As the Third District Court of Appeal recently explained:

“[I]t cannot be assumed that activities intended to protect or preserve the environment are immune from environmental review. [Citations.]”
There may be environmental costs to an environmentally beneficial project, which must be considered and assessed.

(*Cal. Farm Bureau Fed. v. Cal. Wildlife Cons. Bd.* (2006) 143 Cal. App. 4th 173, 196.) Nothing in SB97 altered this rule. Thus, lead agencies must consider whether the greenhouse gas emissions resulting from beneficial projects may be significant, and if so, whether any feasible measures exist to mitigate those emissions. If such emissions are found to be significant and unavoidable, proposed amendments to section 15093 would expressly allow lead agencies to consider the region-wide and statewide environmental benefits of a project in determining whether project benefits outweigh its adverse environmental impacts.

“Adaptation” and Analysis of the Effects of Climate Change on a Project

Several comments submitted as part of the Natural Resources Agency's SB97 rulemaking process urged it to incorporate the California Climate Adaptation Strategy (Adaptation Strategy) into the CEQA Guidelines. In considering such comments, it is important to understand several key differences between the Adaptation Strategy and the California Environmental Quality Act. First, the Adaptation Strategy is a policy statement that contains recommendations; it is not a binding regulatory document. Second, the Adaptation Strategy focuses on how the State can plan for the effects of climate change. CEQA's focus, on the other hand, is the analysis of a particular project's greenhouse gas emissions on the environment, and mitigation of those emissions if impacts from those emissions are significant. Given these differences, CEQA should not be viewed as the tool to implement the Adaptation Strategy; rather, as indicated in the Strategy's key recommendations, advanced programmatic planning is the primary method to implement the Adaptation Strategies.

There is some overlap between CEQA and the Adaptation Strategy, however. As explained in both the Initial Statement of Reasons and in the Adaptation Strategy, section 15126.2 may require the analysis of the effects of a changing climate under certain circumstances. (Initial Statement of Reasons, at pp. 68-69.) In particular,

Section 15126.2 already requires an analysis of placing a project in a potentially hazardous location. Further, several questions in the Appendix G checklist already ask about wildfire and flooding risks. Many comments on the proposed amendments asked for additional guidance, however.

Having reviewed all of the comments addressing the effects of climate change, the Natural Resources Agency revised the proposed amendments to include a new sentence in Section 15126.2 clarifying the type of analysis that would be required. Existing section 15126.2(a) provides an example of a potential hazard requiring analysis: placing a subdivision on a fault line. The new sentence adds further examples, as follows:

Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

According to the Office of Planning and Research, at least sixty lead agencies already require this type of analysis. (California Governor's Office of Planning and Research, State Clearinghouse, The California Planners' Book of Lists (January, 2009), at p. 109.) This addition is reasonably necessary to guide lead agencies as to the scope of analysis of a changing climate that is appropriate under CEQA.

As revised, section 15126.2 would provide that a lead agency should analyze the effects of bringing development to an area that is susceptible to hazards such as flooding and wildfire, both as such hazards currently exist or may occur in the future. Several limitations apply to the analysis of future hazards, however. For example, such an analysis may not be relevant if the potential hazard would likely occur sometime after the projected life of the project (i.e., if sea-level projections only project changes 50 years in the future, a five-year project may not be affected by such changes). Additionally, the degree of analysis should correspond to the probability of the potential hazard. (State CEQA Guidelines, § 15143 ("significant effects should be discussed with emphasis in proportion to their severity and probability of occurrence".)) Thus, for example, where there is a great degree of certainty that sea-levels may rise between 3 and 6 feet at a specific location within 30 years, and the project would involve placing a wastewater treatment plant with a 50 year life at 2 feet above current sea level, the potential effects that may result from inundation of that plant should be addressed. On the other extreme, while there may be consensus that temperatures may rise, but the magnitude of the increase is not known with any degree of certainty, effects associated with temperature rise would not need to be examined. (State CEQA Guidelines, § 15145 ("If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact".)) Lead agencies are not required to generate their own original research on potential future changes; however, where specific information is currently available, the analysis should address that information. (State CEQA

Guidelines, § 15144 (environmental analysis “necessarily involves some degree of forecasting. While seeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can”).)

The decision in *Baird v. County of Contra Costa* (1995) 32 Cal.App.4th 1464, does not preclude this analysis. In that case, the First District Court of Appeal held that a county was not required to prepare an EIR due solely to pre-existing soil contamination that the project would not change in any way. (*Id.* at 1468.) No evidence supported the petitioner’s claim that the project would “expose or exacerbate” the pre-existing contamination, which was located several hundred to several thousand feet from the project site. (*Id.* at n. 1.) Moreover, the project would have no other significant effects on the environment, and other statutes exist to protect residents from contaminated soils. Thus, the question confronting that court was whether pre-existing contamination near the project was, by itself, enough to require preparation of an EIR. It held that, in those circumstances, an EIR was not required. That court also acknowledged, however, that where there is a potential for ultimately changing the environment, an EIR could be required. (*Id.* at p. 1469.) Thus, unlike the circumstances in the *Baird* case, the analysis required in section 15126.2(a) would occur if an EIR was otherwise required. Similarly, the addition to that section contemplates hazards which the presence of a project could exacerbate (i.e., potential upset of hazardous materials in a flood, increased need for firefighting services, etc.).

Finally, while the revision in section 15126.2 is consistent with the general objective of the Adaptation Strategy and is consistent with the limits of CEQA, not all issues addressed in the Adaptation Strategy are necessarily appropriate in a CEQA analysis. Thus, the revision in section 15126.2 should not be read as implementation of the entire Adaptation Strategy. Unlike hazards that can be mapped, other issues in the Adaptation Strategy, such as the health risks associated with higher temperatures, are not capable of an analysis that links a project to an ultimate impact. Habitat modification and changes in agriculture and forestry resulting from climate change similarly do not appear to be issues that can be addressed on a project-by-project basis in CEQA documents. Water supply variability is an issue that has already been addressed in depth in recent CEQA cases. (See, e.g., *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 434-435 (“If the uncertainties inherent in long-term land use and water planning make it impossible to confidently identify the future water sources, an EIR may satisfy CEQA if it acknowledges the degree of uncertainty involved, discusses the reasonably foreseeable alternatives—including alternative water sources and the option of curtailing the development if sufficient water is not available for later phases—and discloses the significant foreseeable environmental effects of each alternative, as well as mitigation measures to minimize each adverse impact.”).) Further, legislation has been developed to ensure that lead agencies identify adequate water supplies to serve projects many years in the future under variable water conditions. (See, e.g., Water Code, § 10910 *et seq.*; Government Code, § 66473.7.) Thus, the analysis called for in section 15126.2(a) should be directed primarily at hazards, and not all aspects of the Adaptation Strategy.

Additional Changes

Several comments suggested revisions or requested clarification of issues that were not addressed in this rulemaking package. The Initial Statement of Reasons explained:

[T]he Proposed Amendments suggest relatively modest changes to various portions of the existing CEQA Guidelines. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis. Other modifications are suggested to clarify existing law that may apply both to analysis of GHG emissions as well as more traditional CEQA analyses. The incremental approach in the Proposed Amendments is consistent with Public Resources Code section 21083(f), which directs OPR and the Resources Agency to regularly review the Guidelines and propose amendments as necessary.

(Initial Statement of Reasons, at p. 9.) Additionally, Public Resources Code section 21083.05(c) requires that the CEQA Guidelines be updated periodically “to incorporate new information or criteria established by the State Air Resources Board pursuant to” AB32. Therefore, the CEQA Guidelines will continually be updated to reflect evolving information and practice and to address developments regarding analysis of greenhouse gas emissions in the courts.

Determination Regarding Impacts on Local Government and School Districts

The Natural Resources Agency has determined that the Amendments to the State CEQA Guidelines do not impose additional requirements or costs on local government or school districts. Among other things, Public Resources Code section 21083.05 (reflected in amendments to State CEQA Guidelines sections 15064.4, 15064.7(c), 15126.4(c), 15130, 15183.5, 15364.5, and Appendix G) clarifies that CEQA requires analysis of a project’s greenhouse gas emissions. Public Resources Code sections 21002 and 21004 (reflected in State CEQA Guidelines section 15126.4) require a lead agency to impose feasible mitigation where a project will cause significant adverse environmental impacts. Public Resources Code sections 21003 and 21093 (reflected in the amendments to State CEQA Guidelines sections 15064, 15125, 15130, 15150 and 15183, and new State CEQA Guidelines sections 15064.4 and 15183.5) encourage lead agencies to tier environmental impact reports wherever possible and to use existing analyses to reduce duplication and expense. The decision in *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370, 1382 (reflected in proposed State CEQA Guidelines section 15064.4), requires that potential adverse impacts be quantified where it is possible to do so and quantification will assist in the determination of significance of the impact.

The Amendments to the State CEQA Guidelines described above merely reflect existing legislative requirements and judicial decision interpreting those requirements. Therefore, this rulemaking activity does not itself impose any costs on local government or school districts.

Determination Regarding Potential Economic Impacts Directly Affecting Business

The Natural Resources Agency has determined that the Amendments will not have a significant, statewide adverse economic impact directly affecting business. The guidelines required by sections 21083 and 21083.05 of the Public Resources Code are promulgated in the California Code of Regulations, title 14, sections 15000-15387 (the “State CEQA Guidelines”). The Natural Resources Agency has determined that most of the amendments will have no impacts on business.

CEQA applies to activities of public agencies, including projects that are funded, proposed, or approved by public agencies. Thus, the amendments to the State CEQA Guidelines would apply to public agencies, and not directly to businesses. The Natural Resources Agency is aware, however, that certain requirements reflected in the amendments that have been enacted by the Legislature and developed in case law interpreting CEQA could have an indirect economic impact on business. Among other things, project proponents could incur additional costs in assisting lead agencies to comply with the requirement to quantify greenhouse gas emissions, if possible, as part of an analysis of the effects of such emissions. Project proponents may also incur costs in implementing mitigation measures to reduce such emissions. However, the amendments to the Guidelines merely reflect existing requirements. (See, e.g., Pub. Resources Code, §§ 21004 (“a public agency may use discretionary powers ... for the purpose of mitigating or avoiding a significant effect on the environment”), 21083.05 (requiring the development of guidelines on the analysis and mitigation of greenhouse gas emissions “as required by this division”); *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370, 1382 (potential hazardous emissions and noise impacts must be quantified where it is possible to do so and quantification will assist in the determination of significance of the impact).)

Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating greenhouse gas emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, *Riverside Co. Sup. Ct. Case No. RIC463320* (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, *Sacramento Sup. Ct. Case No. 07CS00967* (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-

1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative.) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Additionally, some of amendments included in this rulemaking activity may tend to reduce costs associated with environmental analysis of greenhouse gas emissions. For example, the amendments to the Guidelines encourage tiering and streamlining of existing environmental analyses to the extent possible in order to reduce duplication. Such tiering and streamlining mechanisms are also consistent with existing law. (See, e.g., Pub. Resources Code, § 21093 (lead agencies shall tier environmental impact reports wherever possible).)

The amendments update the State CEQA Guidelines to be consistent with legislative enactments and judicial decisions that have modified CEQA, but do not themselves impose any new requirements. Therefore, the amendments do not have a significant, adverse economic impact directly affecting business.

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Attachment J

Climate Action Reserve Website

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Projects

Greenhouse gas (GHG) reduction projects must reduce emissions or increase sequestration of GHGs in a manner that is real, permanent, verifiable and additional. Additionality is a concept from international GHG project accounting principles that requires a project activity is additional to “business as usual” and would not have occurred in the absence of an incentive provided by a GHG offsets market.

GHG reduction projects registered on the Reserve must be verified by an independent third party as adhering to criteria established in the Reserve [protocols](#). After a project has been positively verified and approved by the Reserve, it is officially registered on the Reserve and issued offset credits known as Climate Reserve Tonnes (CRTs).

To open an account with the Climate Action Reserve, please visit:

- [Open an Account](#)

To register a project with the Climate Action Reserve, please visit:

For more information about projects registered on the Reserve and the transaction of credits, please visit:

- [View Projects](#)
- [View CRTs Issued](#)
- [Serial Number Guide](#)
- [Retired CRTs](#)

Map of Projects

Map updated on April 28, 2020.

The Reserve Offset Projects Map provides a user-friendly visual of where projects are located. The map is organized into two layers noting which projects are compliance eligible under California Air Resources Cap-and-Trade Program and which are voluntary projects under the Climate Action Reserve Offsets Program. The map includes projects that have the status of Listed, Registered or Completed.

User Tips:

- For best results, please view a larger map by clicking on the “View larger map” option on the bottom left corner.
- Use the arrow button on the top left corner to open the Legend.
- Map layers can be (de)activated by clicking on the checkbox on the left of the layer’s name.
- Click the drop-down arrow of each active layer to view the map legend.
- Zoom, point, and click on a project icon to view a pop-up window with project information, including the project’s web page on the Reserve’s Project Registry. The project web page includes links to project documentation.

Attachment K

Climate Action Reserve, Protocols





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(<https://www.climateactionreserve.org>)

CALIFORNIA OFFSET PROJECT REGISTRY
(<https://www.climateactionreserve.org/how/california-voluntary-offset-project-registry>)
VOLUNTARY OFFSET PROJECT REGISTRY
(<https://www.climateactionreserve.org/how/projects-compliance-projects/>)

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(<https://www.climateactionreserve.org/resources>)
ABOUT US
(<https://www.climateactionreserve.org/resources>)



PROGRAM

(<https://www.climateactionreserve.org/how/program/>)

Protocols

PROJECTS

(<https://www.climateactionreserve.org/how/projects/>)

PROTOCOLS

(<https://www.climateactionreserve.org/how/protocols/>)

Protocols	Active Version	Date Issued	Development Status
Adipic Acid Production (https://www.climateactionreserve.org/how/protocols/adipic-acid-production/)	Draft 1.0	TBD	In development
Canada Grassland Protocol (https://www.climateactionreserve.org/how/protocols/canada-grassland/)	1.0	October 16, 2019	Approved
Coal Mine Methane Protocol (https://www.climateactionreserve.org/how/protocols/current-coal-mine-methane-project-protocol/)	1.1	October 26, 2012	Approved
Forest Enrichment Protocol (https://www.climateactionreserve.org/how/protocols/current-forest-project-protocol/)	5.0	October 16, 2019	Approved
Grassland Protocol (https://www.climateactionreserve.org/how/protocols/grassland/)	2.1	February 13, 2020	Approved
Mexico Boiler Efficiency Protocol (https://www.climateactionreserve.org/how/protocols/mexico-boiler-efficiency/)	1.0	November 1, 2016	Approved
Mexico Forest Protocol (https://www.climateactionreserve.org/how/protocols/mexico-forest/)	2.0	March 30, 2020	Approved
Mexico Boilers Protocol (https://www.climateactionreserve.org/how/protocols/current-landfill-project-protocol-mexico/)	1.1	September 13, 2011	Approved
Mexico Livestock Protocol (https://www.climateactionreserve.org/how/protocols/current-livestock-project-protocol-mexico/)	2.0	September 29, 2010	Approved
Mexico Ozone Depleting Substances Protocol (https://www.climateactionreserve.org/how/protocols/mexico-ozone-depleting-substances-project-protocol/)	1.0	April 28, 2015	Approved
Mexico Livestock Protocol (https://www.climateactionreserve.org/how/protocols/current-nitric-acid-production-project-protocol/)	2.2	April 18, 2019	Approved
Mexico Ozone Depleting Substances Protocol (https://www.climateactionreserve.org/how/protocols/nitrogen-management/)	2.0	October 17, 2018	Approved

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Ozone-Depleting-Substances/	Organic Waste Composting	1.1	July 29, 2013	Approved
Nitric Acid Production Protocol	Organic Waste Digestion	2.1	January 16, 2014	Approved
Nitrogen Management Protocol	Ozone Depleting Substances	2.0	June 27, 2012	Approved
Organic Waste Composting Protocol	Rice Cultivation	1.1	June 3, 2013	Approved
Organic Waste Digestion Protocol	Soil Enrichment	Draft 1.0	TBD	In workgroup development process
Ozone Depleting Substances Protocol	Urban Forest Management	1.1	April 18, 2019	Approved
Rice Cultivation Protocol	Urban Tree Planting	2.0	June 25, 2014	Approved
U.S. Landfill Protocol	U.S. Livestock	4.0	January 23, 2013	Approved

[Urban Forest](https://www.climateactionreserve.org/how/protocols/urban-forest/)
[\(https://www.climateactionreserve.org/how/protocols/urban-forest/\)](https://www.climateactionreserve.org/how/protocols/urban-forest/)

[FUTURE PROTOCOL DEVELOPMENT](https://www.climateactionreserve.org/how/future-protocol-development/)
[\(https://www.climateactionreserve.org/how/future-protocol-development/\)](https://www.climateactionreserve.org/how/future-protocol-development/)

[VERIFICATION](https://www.climateactionreserve.org/how/verification/)
[\(https://www.climateactionreserve.org/how/verification/\)](https://www.climateactionreserve.org/how/verification/)

[TRAININGS](https://www.climateactionreserve.org/how/trainings/)
[\(https://www.climateactionreserve.org/how/trainings/\)](https://www.climateactionreserve.org/how/trainings/)

[CALIFORNIA COMPLIANCE OFFSET PROGRAM](https://www.climateactionreserve.org/how/california-compliance-projects/)
[\(https://www.climateactionreserve.org/how/california-compliance-projects/\)](https://www.climateactionreserve.org/how/california-compliance-projects/)

[OFFSETS MARKETPLACE](https://www.climateactionreserve.org/how/offsets-marketplace/)
[\(https://www.climateactionreserve.org/how/offsets-marketplace/\)](https://www.climateactionreserve.org/how/offsets-marketplace/)

[NEWSLETTER SIGN UP \(https://www.climateactionreserve.org/news-and-events/newsletter/\)](https://www.climateactionreserve.org/news-and-events/newsletter/) |
[CONTACT \(https://www.climateactionreserve.org/contact-us\)](https://www.climateactionreserve.org/contact-us/) |
[SUPPORT THE RESERVE \(https://www.climateactionreserve.org/about-us/support-the-reserve/\)](https://www.climateactionreserve.org/about-us/support-the-reserve/)

Attachment L

Climate Action Reserve, Reserve Offset Program Manual

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**CLIMATE
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RESERVE**

Reserve Offset Program Manual

November 12, 2019

NOTE TO USERS:

From time to time, the Climate Action Reserve updates this manual. Please make sure you are using the latest version, available at www.climateactionreserve.org.

For information, comments or questions, please email reserve@climateactionreserve.org.

Climate Action Reserve
www.climateactionreserve.org

Released November 12, 2019

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1 Introduction

The voluntary carbon market has the potential to significantly facilitate efforts to reduce greenhouse gases in the atmosphere and to help mitigate climate change. At the same time, there has been a great need for increased environmental integrity, transparency, rigor, and accuracy in this market. The Climate Action Reserve (Reserve) was created to meet this need by providing a rigorous set of protocols, guidelines, and tools to support the voluntary carbon market. The Reserve is intended to increase certainty and build confidence in the greenhouse gas (GHG) reduction market on the part of investors, project developers, the environmental community, and the public.

The Reserve Offset Program Manual summarizes the Reserve's overarching principles, its general project accounting guidelines, and its rules and procedures for registering projects and creating offset credits for the voluntary market. It also describes the process used by the Reserve to develop protocols for determining the eligibility of, and quantifying reductions from, carbon offset projects.

Detailed information on the Reserve's general operating procedures and verification program can be found in the following documents:

- Climate Action Reserve User Guide
<http://www.climateactionreserve.org/open-an-account/>
- Climate Action Reserve Terms of Use
<http://www.climateactionreserve.org/open-an-account/>
- Climate Action Reserve Verification Program Manual
<http://www.climateactionreserve.org/how/program/program-manual/>

Guidance in this Reserve Offset Program Manual is limited to the Reserve's program serving the voluntary carbon market. For information on the Reserve's role as an Early Action Offset Program and Offset Project Registry for the California Compliance Offset Program, please see the following resources:

- Climate Action Reserve California Compliance Offset Program website
<http://www.climateactionreserve.org/how/california-compliance-projects/>
- California Air Resources Board Compliance Offset Program website
<http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

1.1 The Climate Action Reserve

The Climate Action Reserve is an offsets program working to ensure integrity, transparency, and financial value in the North American carbon market. It does this by establishing regulatory-quality standards for the development, quantification, and verification of GHG emission reduction projects in North America; issuing carbon offset credits known as Climate Reserve Tonnes (CRTs) generated from such projects; and tracking the transaction of credits over time in a transparent, publicly-accessible system. Adherence to the Reserve's high standards ensures that emission reductions associated with projects are real, permanent, and additional, thereby instilling confidence in the environmental benefit, credibility, and efficiency of the U.S. carbon market.

At the heart of the Reserve is a publicly accessible web-based system where owners and developers of carbon offset projects can register project information along with verification

Please ensure that you are using the latest version of the Reserve Offset Program Manual at <http://www.climateactionreserve.org/how/program/program-manual/>

reports demonstrating GHG emission reductions. Emission reductions are verified as CRTs, which provide title assurance and unique serial number identifiers to assure that each metric ton is counted and retired only once.

The Reserve uses a rigorous, open, and comprehensive process for developing all of its protocols. The Reserve's primary focus is on accurate and conservative GHG accounting to ensure that the emission reductions it certifies are real, permanent, additional, verifiable, and enforceable.

1.2 Reserve Program Principles

The Reserve's program rules and procedures, eligibility criteria, and quantification and verification protocols are designed to ensure that GHG emission reductions certified by the Reserve are:

- **Real:** Estimated GHG reductions should not be an artifact of incomplete or inaccurate emissions accounting. Methods for quantifying emission reductions should be conservative to avoid overstating a project's effects. The effects of a project on GHG emissions must be comprehensively accounted for, including unintended effects (often referred to as "leakage").
- **Additional:** GHG reductions must be additional to any that would have occurred in the absence of the Climate Action Reserve, or of a market for GHG reductions generally. "Business as usual" reductions – i.e., those that would occur in the absence of a GHG-reduction market – should not be eligible for registration.
- **Permanent:** In order to function as offsets to GHG emissions, GHG reductions must effectively be "permanent." This means, in general, that any net reversal in GHG reductions used to offset emissions must be fully accounted for and compensated through the achievement of additional reductions.
- **Verified:** GHG reductions must result from activities that have been verified on an *ex post* basis. Verification requires third-party review of monitoring data for a project to ensure the data are complete and accurate.
- **Owned Unambiguously:** No parties other than the registered project developer must be able to reasonably claim ownership of the GHG reductions.

In addition, the Reserve strives to ensure that the offset projects it registers are **not harmful**. Project activities should not cause or contribute to negative social, economic or environmental outcomes and ideally should result in benefits beyond climate change mitigation. Projects are encouraged to identify, measure, and report on any non-GHG benefits of the project activities, such as alignment with the United Nations' Sustainable Development Goals or other identified co-benefits.¹

Finally, the Reserve strives for **practicality**, by integrating rigorous requirements with time- and cost-minimizing steps for project developers. Practicality involves alleviating potential barriers to GHG project implementation without compromising credibility.

¹ More information on the UN Sustainable Development Goals may be found at: <https://sustainabledevelopment.un.org/sdgs>.

2 Program Level GHG Reduction Accounting Guidelines

The Reserve develops protocols specifying eligibility criteria and detailing steps to estimate, monitor, and verify GHG reductions achieved by specific types of projects. While each project protocol contains guidance specific to individual project types, Reserve protocols also adhere to general project accounting principles. This section describes the Reserve's standardized project accounting guidelines that are the foundation for all project protocols.

2.1 General Approach, Principles, and References

The Reserve strives to develop protocols that are “standardized” in nature, meaning they apply standardized factors and eligibility rules to the extent possible while maintaining sufficient rigor and accuracy. In addition, the form and content of Reserve protocols follow internationally established accounting principles and standards.

2.1.1 Standardized Offset Crediting

A core objective of the Climate Action Reserve is to adopt “standardized” approaches to offset crediting. Standardized offset crediting has two main elements:²

1. Determining the eligibility and additionality of projects using standard criteria, rather than project-specific assessments.
2. Quantifying GHG emission reductions using standard baseline assumptions, emission factors, and monitoring methods.

The main goal of standardized offset crediting is to minimize the subjective judgment required in evaluating whether a project should receive credit for emission reductions, and in determining how much credit it should receive. Compared to project-specific assessment and analysis, standardized crediting reduces transaction costs for project developers, alleviates uncertainties for investors, and increases the transparency of project approval and verification decisions. Furthermore, the Reserve believes that appropriately designed standardized protocols can be as rigorous as project-specific approaches in ensuring additionality and environmental integrity (see Section 2.4.1 below for further discussion of standardized additionality tests).

Three challenges with standardized crediting are worth noting. First, developing standardized methods for determining additionality and estimating baselines requires significant upfront research and analysis. In order to avoid the need for extensive data collection and analysis on a project-by-project basis, the Reserve invests significant time and resources to establish credible benchmarks and emission factors that can be applied to similar projects throughout an entire industry or sector. The Reserve may frequently build off existing project-specific methodologies, but in general will augment these methodologies with further analysis to establish standardized tests and metrics.

Second, because “business as usual” activities can vary significantly across different geographic areas, standardized benchmarks and factors for one region will not necessarily be appropriate for other regions. Therefore, standardized protocols will almost always apply to a specific, limited geographic area. Every Reserve protocol specifies the geographic region(s) to

² For further reference, see Broekhoff, D., 2007. *Expanding Global Emissions Trading: Prospects for Standardized Carbon Offset Crediting*. International Emissions Trading Association, Geneva.

which it applies. In adapting protocols for other geographic regions, the Reserve engages in a full stakeholder process designed to assess and incorporate region-specific benchmarks and factors.

Third, not all possible offset project types are equally amenable to standardized crediting.³ For some types of projects, determining additionality and estimating baseline emissions cannot be done credibly and accurately on a standardized basis. In general, the Reserve will avoid developing protocols for these project types. Alternatively, the Reserve may incorporate project-specific methods or variables into standardized protocols as appropriate, or limit the scope of protocols to address only activities and conditions for which standardized approaches are feasible.

2.1.2 Reference Standards

The Reserve's offset project protocols are designed to be consistent with the principles, requirements, and guidance of two overarching standards for project-based GHG accounting:⁴

- International Organization for Standardization (ISO) 14064, Part 2
- The World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) Greenhouse Gas Protocol for Project Accounting

Both standards contain consistent general requirements for quantifying reductions in GHG emissions (or increases in carbon sequestration) that result from project-based activities, including requirements for:

1. Establishing GHG accounting boundaries
2. Estimating baseline emissions
3. Determining project-case emissions
4. Monitoring project activities

Although the ISO and WRI/WBCSD standards are largely consistent in their basic requirements, they have different terminologies and structures. Reserve protocols may utilize terminology from either or both standards depending on circumstances. The structure and general content of Reserve protocols are presented in the remainder of this section.

2.2 GHG Accounting Principles

There is now strong international consensus around a core standard set of overarching principles to guide decisions about the accounting, quantification, and reporting of project-based GHG reductions. These consensus principles are listed and defined in both the ISO and WRI/WBCSD standard referenced above. Definitions of these principles differ slightly between the two standards; the Reserve interprets the principles as follows in developing its protocols:

³ *Ibid.*

⁴ International Organization for Standardization, 2019. *ISO 14064, Part 2: "Specification with guidance at the project level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements."* International Organization for Standardization, Geneva, Switzerland; World Resources Institute and World Business Council for Sustainable Development, 2005. *The GHG Protocol for Project Accounting*, World Resources Institute, Washington, DC.

- **Relevance:** Data, methods, criteria, assumptions, and accounting boundaries should be chosen based on their “intended use.” For the Reserve, this means protocols are designed around standardized, practical approaches to GHG accounting while still adhering to other core accounting principles.
- **Completeness:** All relevant information should be considered when developing criteria and procedures, and all relevant GHG emissions and removals should be accounted for. Reserve protocols comprehensively identify the GHG sources, sinks, and reservoirs affected by project activities and require accounting for all significant changes in GHG emissions or removals that may result from a project. Where there are multiple baseline possibilities, protocols must thoroughly address identification and quantification methods for each possibility.
- **Consistency:** Data, methods, criteria, and assumptions should allow meaningful and valid comparisons of the GHG reductions achieved by different projects. Reserve protocols are standardized to apply consistent GHG accounting and monitoring methods to all projects of the same type. Reserve protocols are also designed to reflect similarly rigorous and conservative accounting methods and assumptions for all project types.
- **Transparency:** Sufficient information should be disclosed to allow reviewers and stakeholders to make decisions about the credibility and reliability of GHG reduction claims with reasonable confidence. Access to sufficient and appropriate GHG-related information is critical for assuring users of the Reserve that a project’s GHG reduction claims are credible. To this end, the Reserve uses an open, consultative process for developing protocols; makes protocols publicly available; requires regular, rigorous, and complete reporting from registered projects; and provides a publicly accessible database detailing all relevant information used to quantify GHG reductions for each registered project. In addition, the Reserve’s standardized protocols reduce ambiguities associated with how project-related information is interpreted.
- **Accuracy:** Uncertainties and bias should be reduced as far as is practical. Greater accuracy in estimating GHG emissions and reductions will help ensure credibility of GHG reduction claims. Reserve protocols require that quantification of GHG reductions and monitoring of GHG emissions and other variables be conducted within acceptable levels of uncertainty. All GHG reduction estimates must pass rigorous review by an independent verification body. Where accuracy is difficult to achieve, Reserve protocols will err on the side of being conservative with GHG reduction estimates.
- **Conservativeness:** Conservative assumptions, values, and procedures should be used to ensure that GHG reductions are not over-estimated. Reserve protocols employ conservative estimation methods whenever data and assumptions are uncertain and measures to reduce uncertainty would be impractical.

2.3 Project Definition

A GHG project is a specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon or enhance GHG removals from the atmosphere.⁵ A GHG project is considered to be a “carbon offset” project if the GHG reductions or removals it generates are used to compensate for GHG emissions occurring elsewhere.⁶ Projects that meet

⁵ World Resources Institute (WRI), World Business Council for Sustainable Development (WBCSD), 2005. *The GHG Protocol for Project Accounting*. World Resources Institute, Washington, D.C.

⁶ Offset Quality Initiative, 2008. *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy*. Available at: <http://www.offsetqualityinitiative.org/>.

the Reserve's standards are issued emission reduction or removal credits, and those credits act as offsets when they are certified and retired in the Reserve's online registry. The Reserve's primary purpose is to certify GHG reductions as carbon offsets.

Every Reserve protocol clearly defines the type of activity (or activities) that constitute a GHG reduction project. A clear project definition ensures that GHG quantification methods prescribed by the protocol are applied only where they are relevant and appropriate. The "project definition" section of each protocol specifies the kinds of activities that must be undertaken to reduce GHG emissions (or increase removals), the required conditions that must be met for these activities, and the necessary elements of project design and implementation.

2.3.1 Project Types

The Reserve only registers GHG projects that follow project protocols that have been developed by the Reserve. In other words, only projects meeting the requirements of project protocols that have been approved and adopted by the Reserve's Board are eligible for registration on the Reserve. The Reserve may establish linkages with additional programs in the future to allow other projects to be registered.

Approved project protocols and information on additional project protocols in development are available for download at <http://www.climateactionreserve.org/how/protocols/>.

2.4 Project Eligibility Criteria

Eligibility criteria specify essential characteristics a project must have in order to register with the Reserve, as well as the conditions under which the Reserve will issue CRTs to a project. In Reserve protocols, eligibility criteria serve three main purposes:

1. To ensure that baseline estimation methods and emission factors prescribed by the protocol are relevant and appropriate. Reserve protocols use standardized baseline estimation methods that are calibrated to specific geographic regions; to be eligible, projects must be located in an appropriate geographic region.
2. To ensure that projects are "additional." To test for additionality, the Reserve employs objective criteria designed to distinguish additional projects from those that would have happened anyway (i.e., in the absence of an offset market). These criteria fall into two categories: (1) a legal requirement test, and (2) a performance standard test. These tests are explained and described further below.
3. To ensure that projects adhere to all applicable laws and do not cause adverse environmental, social or economic impacts.

Generally, the Reserve seeks to specify eligibility criteria that are as standardized and objective as possible. This means that criteria will be designed to require a minimum amount of subjective judgment in determining whether a project is eligible.

2.4.1 Additionality Determinations

Within existing carbon offset programs, there are two basic approaches to determining "additionality": project-specific and standardized. The Reserve applies a standardized approach to determining additionality, where performance standards and other conditions or criteria that projects must meet in order to be considered additional are determined by the Reserve. These standards and criteria are established separately for each project type and are designed to exclude non-additional (or "business as usual") projects from eligibility. In all cases, projects that

are required by law or regulation are excluded. Other criteria and conditions are specified in each project protocol.

This approach differs from some other offset programs, where additionality is assessed using information and analysis specific to each project (see Box 1). It avoids the need to subjectively interpret individual project developers' assertions about additionality and sends a clear signal to market participants about which projects will be eligible and which ones will not. Like any testing method, however, it is potentially subject to error. The Reserve strives to establish rigorous standards for additionality that serve to exclude the vast majority of non-additional projects. At the same time, the Reserve acknowledges that no system of testing for additionality is perfect, and it reserves the right to update and modify additionality criteria over time in light of new data and information.

Box 1. Project-Specific vs. Standardized Additionality Tests

Project-specific approaches to determining additionality seek to assess, by weighing certain kinds of evidence, whether a project in fact differs from a hypothetical baseline scenario in which there is no carbon offset market. Generally, a project and its possible alternatives are subjected to a comparative analysis of their implementation barriers and/or expected benefits (e.g., financial returns). If an option other than the project itself is identified as the most likely alternative for the "business as usual" (or "baseline") scenario, the project is considered additional. The Kyoto Protocol's Clean Development Mechanism (CDM), a global carbon offset program for projects in developing countries, requires project-specific additionality tests.

Standardized, or performance-based, approaches to additionality evaluate projects against a consistent set of criteria designed to exclude non-additional projects and include additional ones on a sector-wide basis. For example, standardized tests could involve determinations that a project:

- Is not mandated by law
- Exceeds common practice
- Involves a particular type of high-performing technology
- Has an emission rate lower than most others in its class (e.g., relative to a performance standard)

From a regulatory perspective, standardized performance-based additionality tests are advantageous in that they are less subjective and administratively easier to implement than project-specific tests. Additionally, they can reduce transaction costs for project developers, alleviate uncertainties for investors, and increase the transparency and consistency of regulatory decisions. For further discussion of these two approaches, see Broekhoff, D., 2007. *Expanding Global Emissions Trading: Prospects for Standardized Carbon Offset Crediting*. International Emissions Trading Association, Geneva.

The Reserve incorporates standardized additionality tests in all of its protocols. These tests generally have two components: a legal requirement test and a performance standard test.

2.4.1.1 Legal Requirement Test

Projects are very likely to be non-additional if their implementation is required by law. A legal requirement test ensures that eligible projects (and/or the GHG reductions they achieve) would not have occurred anyway in order to comply with federal, state or local regulations, or other legally binding mandates. A project passes the legal requirement test when there are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions

or other legally binding mandates requiring its implementation, or requiring the implementation of similar measures that would achieve equivalent levels of GHG emission reductions.

In Reserve protocols, the specific provisions of the legal requirement test may differ depending on the project type. During protocol development, the Reserve performs a review of existing and pending regulations to identify any specific regulatory requirements that would mandate the implementation of project activities covered by the protocol. If such requirements are identified, then project activities in relevant jurisdictions may be categorically excluded from eligibility.

In addition, Reserve protocols require project developers to review and determine whether federal, state or local regulations and other legal requirements (including local agency ordinances or rulings) require the implementation of their project. This review is always required at the time a project is registered and may be required each verification period thereafter depending on the protocol. Generally, Reserve protocols will stipulate the following:

- Project monitoring plans must include procedures that the project developer will follow to periodically ascertain and demonstrate that the project passes the legal requirement test.
- Project developers must submit a signed Attestation of Voluntary Implementation form stipulating that the project is not required by law.

2.4.1.2 Performance Standard Test

Projects that are not legally required may still be non-additional if they would have been implemented for other reasons, e.g., because they are attractive investments irrespective of carbon offset revenues. Performance standard tests are intended to screen out this potential set of projects. In developing performance standards, the Reserve considers financial, economic, social, and technological drivers that may affect decisions to undertake a particular project activity. Standards are specified such that the large majority of projects that meet the standard are unlikely to have been implemented due to these other drivers. In other words, incentives created by the carbon market are likely to have played a critical role in decisions to implement projects that meet the performance standard.

Although performance standard tests do not require individual project assessments of financial returns and implementation barriers, they are designed to reflect these factors in determining which projects are additional. Projects that pass a performance standard test should be those that – in the absence of a carbon offset market – would have insufficient financial returns or would face other types of insurmountable implementation barriers.

In Reserve protocols, performance standards may be specified in several ways:

- *Emission rate thresholds.* For some project types, a performance standard may be specified in terms of a rate of GHG emissions (usually per unit of production of some product or service, e.g., tonnes of CO₂ per megawatt-hour). Generally, the threshold rate would be based on a level of performance that is significantly better than average for the industry or sector. Projects that have lower emission rates than the threshold, for example, would be considered additional.
- *Practice- or technology-based thresholds.* Performance standards may also be specified in terms of a specific practice or technology that is rarely or never implemented in the absence of a carbon offset market. Such standards are generally based on surveys of

the market penetration rates of candidate practices or technologies. Projects employing a qualifying technology or practice are automatically considered additional.

- *Other qualifying conditions or criteria.* Performance standards may also incorporate, or be based on, other specific qualifying conditions that a project must meet in order to be considered eligible. Conditions may include characteristics related to the project site, specifications for a particular eligible technology or practice, or other contextual factors. Projects meeting the conditions would be considered additional.

Several specifications may be combined in a single performance standard test. For example, a protocol may define a performance standard in terms of a specific type of technology that has an emission rate below a certain threshold and is implemented at an eligible project location.

Performance standard tests are developed through extensive analysis of standard practices and technology deployment in industry sectors related to a project type. They may also be based on an assessment of “typical” financial, implementation, and operating conditions facing a certain type of project. Most Reserve protocols contain an appendix explaining and summarizing the analyses undertaken to establish the protocol’s performance standard.

The Reserve has no predefined threshold for determining an acceptable performance standard. Rather, establishing performance standards involves balancing the need to restrict eligibility for non-additional projects with the goal of allowing additional (and otherwise eligible) projects to participate. Setting a threshold always involves making tradeoffs between these two goals and may also involve considerations about the size of the market for carbon credits and the potential supply of reductions available from certain project types.⁷ See Box 2 for further discussion and a hypothetical example.

⁷ For further discussion of setting thresholds and establishing the parameters for additionality tests, see Trexler, M., D. Broekhoff, and L. Kosloff, 2006. “A Statistically-Driven Approach to Offset-Based GHG Additionality. Determinations: What Can We Learn?” in *Sustainable Development Law & Policy*, Volume VI, Issue 2, Winter 2006.

Box 2. Determining Acceptable Performance Standard Thresholds

A common rule of thumb for establishing performance standards is that they should make eligible only technologies or practices that are not “common practice.” However, “common practice” is often difficult to define. Instead of adopting a simple rule for defining “common practice” (as a threshold market penetration rate, for example) the Reserve requires setting performance standards based on an overall assessment of the market for GHG reductions and the risk of crediting too many non-additional reductions.

For example, suppose a particular emission-reducing technology has a market penetration rate of five percent. Colloquially, such a technology would not be considered “common practice.” However, if a threshold were established allowing all instances of this technology to be eligible for offset crediting, we could expect existing users of the technology to apply for credit despite the fact that they were employing it already, without any incentives from the carbon market. This will have consequences for the integrity of the carbon market. Whether such consequences are serious depends on the potential supply of reductions from this technology compared to overall demand for reductions. If five percent of the market would result in hundreds of millions of tonnes of GHG reductions, for example, then a simple technology-based threshold would be too lenient, and the Reserve would explore using additional criteria that could further exclude “business as usual” instances of the technology despite its relative rarity. If five percent of the market would result in only a few thousand tonnes of GHG reductions, then the Reserve may consider a simple technology-based threshold acceptable.

2.4.2 Project Location

Projects throughout the United States are eligible to be registered with the Reserve. Some project types are also eligible in Mexico. Project developers should check the project location eligibility requirements specified in each project protocol.

2.4.3 Project Start Date

In general, the start date for a project will correspond to the start of the activity that generates GHG reductions (sometimes referred to as “start of operations”). Specific requirements for determining the start date of a project are contained in each protocol.

The Reserve limits the eligibility of projects according to their start dates. Start date restrictions are intended to accommodate “early actors” for a period of time following the adoption of new protocols, but to otherwise restrict eligibility to new projects. The Reserve’s general policy is as follows:

1. For qualifying projects that have not previously been listed or registered on a greenhouse gas registry or program:
 - a. For a period of 12 months following the adoption by the Reserve Board of any new protocol, the Reserve will accept projects for listing with start dates (as defined in the protocol) that are no more than 24 months earlier than the date of the Reserve protocol’s adoption. These are considered pre-existing projects.
 - b. After the 12-month period following the date of the Reserve protocol’s adoption, the Reserve will accept projects for listing with start dates (as defined in the protocol) that are no more than six months prior to the date on which they are submitted. A project submitted within six months of its start date is considered a “new” project.

2. For qualifying projects that have previously been listed or registered on a greenhouse gas registry or program:
 - a. Projects with start dates (as defined in a relevant Reserve protocol) on or after January 1, 2001 but more than 24 months earlier than the date of adoption of a relevant new Reserve protocol – and which were listed or registered with another registry or program at least 24 months earlier than the date of adoption of the new Reserve protocol – may apply for transfer to the Reserve. These are considered pre-existing projects.
 - b. Projects with start dates (as defined in a relevant Reserve protocol) that are no more than 24 months before and no more than 12 months after the date of adoption of a relevant new Reserve protocol – and that were listed or registered with another registry or program no more than 12 months after the date of adoption of the new Reserve protocol – may apply for transfer to the Reserve.
 - c. Projects with start dates (as defined in a relevant Reserve protocol) that are more than 12 months after the date of adoption of a relevant new Reserve protocol, and that were listed or registered with another registry or program within six months of the project start date, may apply for transfer to the Reserve.

The Reserve considers a protocol to be “new” if it:

- Covers an entirely new project type not covered by any of the Reserve’s existing protocols;
- Creates a wholly new category of eligible projects under an existing protocol (in which case only the new project category would qualify for a 12-month period of “early actor” eligibility); or
- Significantly expands the geographic coverage of the protocol (in which case only projects in newly covered geographic areas would qualify for a 12-month period of “early actor” eligibility).

If a new version of a protocol is adopted (e.g., updating from Version 1.0 to Version 2.0), this does not necessarily mean it will be considered a “new” protocol.

2.4.4 Project Crediting Period

The project “crediting period” defines the period of time over which a project’s GHG reductions are eligible to be verified as CRTs. In general, the start of a project’s crediting period will correspond to its start date.

The length of a project’s crediting period is defined in each project protocol. For most non-sequestration projects registered with the Reserve, there is a 10-year crediting period that may be renewed one time for a maximum of two 10-year crediting periods. For sequestration projects, the crediting period may be up to 100 years. Refer to each project protocol for specific details on allowable crediting periods. A non-forest project may end its crediting period at any time prior to the limit specified in the protocol, but must abide by any monitoring requirements necessary to ensure permanence, if applicable.

If a project wishes to apply for eligibility under a renewed crediting period, it must do so by re-submitting project submittal forms no sooner than six months before the end of the project’s

ongoing crediting period and paying the project submittal fee. The project must meet all of the eligibility requirements of the most current version of the applicable protocol at the time of re-submittal to be eligible for a renewed crediting period.

Note that projects registered under early protocol versions that do not have provisions for a second crediting period can apply for one under the most current version of the protocol, if the most current version allows for a second crediting period.

Notwithstanding any pre-defined crediting period, projects that become required by law will not be eligible to receive CRTs for the reductions they generate, unless otherwise specified in the protocol. Thus, in most cases, if a project becomes subject to a regulation, ordinance or permitting condition that effectively requires its implementation, the project can no longer be considered additional and its crediting period will be terminated. The crediting period will likewise be terminated if the emission sources affected by a project are included under an emissions cap (e.g., under a state or federal cap-and-trade program) or GHG emissions from the project/project site are directly regulated by a local, state or federal agency. As specified in each protocol, emission reductions may be reported to the Reserve until the date that a regulation or emissions cap takes effect.

Details on the allowable crediting period as well as crediting period renewals for each type of project recognized by the Reserve are contained in each protocol.

Once a project has reached the end of its crediting period(s) and is no longer being issued CRTs, the project is considered “completed.” Although the project is completed, project information remains publicly available through the Reserve software indefinitely.

2.4.5 Bundling of Projects

Only certain types of Reserve-recognized GHG projects may be bundled for registration and reporting purposes. Generally, each GHG project, as defined by the project definition and/or project boundary (described in each protocol), must register separately with the Reserve. However, protocols for certain project types may allow project boundaries to span multiple activities or locations. For example, the Livestock Project Protocol covers centralized manure digesters by allowing the project boundary to include all individual livestock operations that contribute manure to the centralized processing facility, as well as the centralized facility itself. The Reserve has also developed aggregation guidelines for U.S. and Mexico forest projects, which allow forest inventory and verification requirements to be streamlined for individual projects. Grassland projects may go through joint verification and reporting by participating in the cooperative option described in that protocol.

Project developers should check specific project protocols and associated guidance documents for direction on whether and how joint reporting and verification is allowed.

2.4.6 Regulatory Compliance and Environmental and Social Safeguards

The Reserve requires project developers to demonstrate that their GHG projects will not undermine progress on other environmental issues such as air and water quality, endangered species and natural resource protection, and environmental justice. When registering a project, the project developer must attest that the project was in material compliance with all applicable laws, including environmental regulations, during the verification period. The project developer is also required to disclose any and all instances of non-compliance – material or otherwise – of the project with any law to the Reserve and the verification body.

If a project or project activities have caused a material violation, then CRTs will not be issued for GHG reductions that occurred during the period(s) when the violation occurred. Individual violations due to “acts of nature” or due to administrative or reporting issues (such as an expired permit without any other associated violations or tardiness in filing documentation) are not considered material and will not affect CRT crediting. If it is determined that a project was out of compliance after CRTs have been issued, CRTs may be cancelled for the time period of non-compliance.

A violation is considered to be “caused” by a project or project activities if it can be reasonably argued that the violation would not have occurred in the absence of the project activities. If there is any question of causality, the project developer shall disclose the violation to the verifier.

In addition, individual protocols may contain requirements designed specifically to ensure environmental and social safeguards. Individual protocols may allow for project developers to report measures taken to avoid negative impacts. Individual protocols may also encourage project developers to report on the potential environmental co-benefits of their projects, such as reductions in other air pollutants, improvements in water quality, enhancement of wildlife habitat, etc.

In developing environmental and social safeguard criteria and requirements for specific protocols, the Reserve applies the following general principles:

Common Agency

Environmental and social harms will only be considered in determining project eligibility⁸ to the extent that they can be attributed to the same agents (e.g., project developers, implementers or operators) in charge of implementing the project. Harms that may occur concurrently with a project, but are caused by other actors, will not be a factor in determining eligibility. The agents responsible, individually or collectively, for implementing projects will be determined during the protocol development process in consultation with stakeholders.

Proximity

Only environmental and social harms directly associated with a project activity (i.e., either physically or causally proximate) will be considered:

- Harms directly caused by project activities, regardless of where the harms physically occur, will be a factor in determining eligibility.
- Harms physically proximate to project activities but not directly caused by those activities may also be considered in determining eligibility if they are caused by agents responsible for project implementation. Such harms will be considered only if the agents are *required by the relevant protocol* to be involved in project implementation. Required agents will be specified in the Reserve’s protocols, e.g., as part of the project definition or definition of eligible “project developers.” If an agent is allowed, but not required, to be involved in project implementation, then physically proximate harms caused by that agent will not be considered (even if such an agent is directly involved with a particular project).

⁸ Either initial eligibility or eligibility to receive credits.

- Harms caused by agents in charge of implementing a project that occur at sites or facilities not linked or co-located with the project will *not* be a factor in determining eligibility.

Both agency and proximity of effects will be considered in the protocol screening and development processes to identify and set clear standards for the application of this policy.

In determining whether environmental and social harms are occurring, the Reserve will use the following criteria:

Legal Obligation

The Reserve will rely first and foremost on legal requirements within the jurisdiction(s) where the project is implemented. Project agents that are found to be out of material compliance with applicable laws, regulations or other legal mandates that apply to the project itself or activities proximate to the project will be penalized.

“Do No Harm” Beyond Legal Requirements

In some cases, the Reserve may determine, in consultation with stakeholders, that existing legal requirements are insufficient to guarantee protection against important environmental and social harms. In these cases, the Reserve may include additional criteria in protocols to ensure that projects will not give rise to these harms, or may screen out certain project types or activities from eligibility under a protocol altogether.

The Reserve coordinates with government agencies and environmental representatives to ensure that its climate-oriented projects complement other environmental policies and programs.

2.5 Defining the GHG Assessment Boundary

The GHG Assessment Boundary delineates the GHG sources, sinks, and reservoirs (SSRs)⁹ that must be assessed in order to determine the total net change in GHG emissions caused by a GHG reduction project.¹⁰ GHG Assessment Boundaries are defined for each type of project activity addressed in a Reserve protocol.

The GHG Assessment Boundary is not a boundary related to a project’s physical location. Instead, it encompasses all SSRs that could be significantly affected by a project activity, regardless of where such SSRs are located or who owns or controls them. A comprehensive and clearly defined GHG Assessment Boundary is required in order to provide a complete accounting of the net GHG reductions achieved by a project. All SSRs within the GHG Assessment Boundary are included in the calculation of GHG reductions.

SSRs are only included in the GHG Assessment Boundary if a project activity will have a *significant* effect on their associated GHG emissions or removals. The Reserve determines significance based on an assessment of the range of possible outcomes for a relevant SSR.

⁹ Terminology is from International Organization for Standardization, 2005. *ISO 14064, Part 2: “Specification with guidance at the project level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements.”* International Organization for Standardization, Geneva, Switzerland.

¹⁰ See World Resources Institute and World Business Council for Sustainable Development, 2005. *The GHG Protocol for Project Accounting*, World Resources Institute, Washington, DC.

There is no numerical threshold for significance. Inclusion or exclusion of SSRs is determined for each protocol based on the principles of completeness, accuracy, and conservativeness, and the need for practicality (e.g., related to measurement and monitoring costs). In general, relevant SSRs will only be excluded from the GHG Assessment Boundary if:

1. Projects are likely to reduce GHG emissions (or increase removals) at a SSR, so that excluding the SSR would be conservative (i.e., doing so would result in an underestimation of total net GHG reductions for the project); or
2. The total increase in GHG emissions from *all* excluded SSRs is likely to be less than five percent of the total GHG reductions achieved by a project.¹¹

For each included SSR, the protocols:

- Identify whether the SSR is present in the baseline, project case or both
- Identify whether and how GHG emissions, removals or storage from the SSR will be measured, calculated or estimated
- If GHG emissions, removals or storage will be estimated, justify why values will be estimated rather than measured (or calculated from other measurements)

Each protocol contains a table that:

- Lists all SSRs potentially affected by a project
- Explains or describes the SSR
- Indicates whether each SSR is included in the GHG Assessment Boundary
- Justifies instances where an SSR is excluded from the GHG Assessment Boundary
- Briefly describes how GHG emission values for the SSR will be determined, and justifies instances where such values will be estimated

Most protocols also contain a schematic diagram showing how different SSRs are related to each other and indicating which SSRs are included in or excluded from the GHG Assessment Boundary.

The Reserve does not restrict the GHGs that may be considered within the GHG Assessment Boundary. Any gas that has been determined by the IPCC to have a radiative forcing effect on the atmosphere may be considered for inclusion in a protocol. Reserve protocols may address gases other than the six GHGs regulated under the Kyoto Protocol (i.e., CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs).

2.5.1 Physical Project Boundaries

For some types of projects, it is necessary to define a physical boundary for a project in addition to a GHG Assessment Boundary. Physical boundaries are defined in terms of the physical area affected by a project activity and possibly specific equipment or facilities involved. Protocols will only require identification of a physical boundary where a physical boundary is necessary to quantify the magnitude of GHG emissions, removals or storage associated with one or more SSRs included in the GHG Assessment Boundary. The primary example would be forest

¹¹ If excluding SSRs is unavoidable for practical reasons, then calculation and estimation methods related to included SSRs must be made suitably conservative in order to avoid overestimating total net GHG reductions.

projects, where the amount of carbon stored by a project depends on the area of land on which the project activity takes place.

2.5.2 Leakage Accounting

The term “leakage” is often used to refer to unintended increases in GHG emissions that may result from a GHG reduction project. Generally, leakage occurs at SSRs that are physically distant from the project itself or otherwise outside the project’s physical boundaries. Because the Reserve requires the definition of a comprehensive GHG Assessment Boundary – which must include any and all SSRs associated with significant GHG emissions, regardless of their physical location – Reserve protocols generally do not require an explicit and separate accounting for “leakage” effects. Instead, all effects of a GHG reduction project – both positive and negative – are accounted for without distinguishing one kind of effect from another. This does not mean that Reserve protocols neglect or ignore what other methodologies or protocols identify as “leakage.”

Where helpful for conceptual understanding, Reserve protocols may organize SSRs according to whether they are associated with a project’s “primary” or “secondary” effects. A project’s primary effect is its intended effect on GHG emissions (i.e., intended GHG reductions). Secondary effects are unintended effects on GHG emissions, often associated with leakage.¹²

2.6 Quantifying GHG Reductions

GHG emission reductions are quantified by comparing actual project GHG emissions to baseline GHG emissions. Baseline emissions are an estimate of the GHG emissions from sources within the GHG Assessment Boundary that would have occurred in the absence of the project (assuming the project is additional and would not have happened anyway). Project emissions are actual GHG emissions that occur at sources within the GHG Assessment Boundary. Project emissions must be subtracted from the baseline emissions to quantify the project’s total net GHG emission reductions. For sequestration projects, the formula is reversed: the baseline carbon sequestration rate is subtracted from the project carbon sequestration rate.

For most protocols, GHG emission reductions must be quantified and verified on at least an annual basis. Project developers may choose to quantify and verify GHG emission reductions on a more frequent basis if they desire and if the protocol allows it. The length of time over which GHG emission reductions are quantified is called a “reporting period.” The length of time over which GHG emission reductions are verified is called a “verification period.” Under some protocols, a verification period may cover multiple reporting periods (see Section 3.4.2).

2.6.1 Global Warming Potentials for Quantifying GHG Reductions

Under the Climate Action Reserve’s offset project protocols, projects convert quantities of non-CO₂ greenhouse gases (GHGs) into a quantity of CO₂-equivalent (CO₂e) using the 100-year global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC).¹³ Reserve project protocols currently reference the Fourth Assessment Report (AR4) of the IPCC, released in 2007. At the time that the Reserve was launched, the AR2 was the most

¹² The terms “primary effect” and “secondary effect” are from the World Resources Institute and World Business Council for Sustainable Development, 2005. *The GHG Protocol for Project Accounting*, World Resources Institute, Washington, DC.

¹³ Assessment Reports of the IPCC may be accessed at: <https://www.ipcc.ch/reports/>

widely-used source for GWP values, underpinning activities under the Kyoto Protocol, as well as the U.S. EPA's GHG reporting and inventory efforts. At this time, the IPCC AR4 has become the industry standard for most applications relevant to the Reserve's voluntary offset protocols. All projects using Reserve protocols – regardless of version – shall use AR4 GWP values. While it is the Reserve's policy for protocols to take precedence over the Reserve Offset Program Manual in instances where the standards conflict, this policy is an exception to that rule. In future protocol updates, the Reserve will make clear that GWP values are not fixed and may be updated at a later date. Note that this policy may be superseded by a future policy memo as GHG accounting practices progress. It is anticipated that the program will move to application of the GWP values from the Fifth Assessment Report (AR5) in the near future, in accordance with industry best practice.

2.6.2 Estimating Baseline Emissions

Baseline emissions are always subject to uncertainty because they are counterfactual, i.e., they are an estimate of GHG emissions or removals that would have occurred in the absence of the project. Depending on the project type and SSRs involved, many methods can be used to try to estimate baseline emissions. The Reserve uses standardized baselines in its protocols to the extent possible, meaning that the same conservative assumptions, emission factors, and calculation methods are applied to all projects. Standardized baseline approaches seek to avoid case-by-case analysis of individual projects while maintaining overall levels of quantification accuracy and environmental integrity. Within Reserve protocols, however, project-specific calculations and emission factors may be used wherever necessary to ensure accuracy, or where standardized methods would result in estimates that are overly conservative in a large number of cases.

Standardized baselines are developed by considering broad trends (economic, technological, regulatory, and policy) in the industry or sector relevant to a project type and determining what future "business as usual" alternative activities are likely to be. To develop standardized baselines, the Reserve works with stakeholders to determine the most likely alternative technologies or practices. In many cases, a single practice, activity or technology is assumed to be the common baseline alternative for a class of project activities. In some cases, the performance threshold developed for additionality may also be used as an emissions baseline. After establishing a standard baseline alternative, the Reserve develops specific quantification steps, calculation methods, and formulas to estimate baseline emissions, incorporating site-specific data where appropriate. Depending on the project type, baseline emission estimates may either be fixed at the outset of a project, or they may be regularly updated using actual data collected during the project's operation (used to infer baseline conditions).

2.6.3 Quantifying Project Emissions

Project GHG emissions are quantified based as much as possible on actual measurements of project activity performance. GHG emissions for each SSR may be measured directly, or calculated from measurements of parameters from which GHG emissions can be derived. For SSRs where direct or indirect measurements are too costly or infeasible, project GHG emissions may be estimated using standard assumptions or models.

2.6.4 Quantification Methods

The Reserve develops methods to calculate baseline and project emissions that meet an acceptable level of accuracy. As a general rule, methods should ensure 95% confidence that actual emissions are within +/- 5% of measured or calculated values, although required levels of

accuracy will often depend on the specific magnitudes involved and their materiality. Methods may employ one or more of the following approaches:

- **Emission factor** approaches use input data multiplied by specific emission factors that approximate emissions per unit of the input. The factors are derived from research or model simulations and they are typically categorized by variables such as geographic location, local climate data, tree species, equipment standards, etc.
- **Dynamic models** estimate processes that cause GHG emissions (or biological carbon sequestration). Model users input specific parameters and the model generates emission or removal estimates. Research studies identify the parameters as important drivers of emissions or removals. Sometimes the parameter may be chosen from data provided by the Reserve or they may need to be measured at the project location.
- **Direct emission measurement** uses special instruments that monitor the flow of GHGs from the source into the atmosphere. This involves instrumentation and monitoring of GHG emission sources onsite.

2.6.4.1 Quantification Uncertainty and Conservativeness

Where cost-effective methods for quantifying GHG emissions or carbon storage yield uncertain estimates (e.g., greater than a five percent range), it may not be possible to accurately quantify baseline or project emissions. In these cases, Reserve protocols must use conservative assumptions and/or parameter values that will tend to underestimate, rather than overestimate, total GHG reductions and removals.

2.6.5 Calculating GHG Reductions or Removals

GHG reductions are calculated by periodically comparing the baseline to the project over a certain time period, usually one year.

The general formula for calculating GHG reductions is:

$$GHG\ Reductions = Baseline\ Emissions - Project\ Emissions$$

Positive GHG reductions are achieved when the project results in lower GHG emissions to the atmosphere over a certain time period compared to what would have happened absent the project activity.

For biological carbon sequestration projects, the general formula for calculating GHG removals is:

$$GHG\ Removals = (Incremental\ Project\ Sequestration - Incremental\ Baseline\ Sequestration) + (Baseline\ Emissions - Project\ Emissions)$$

Positive GHG removals are achieved when the project results in more carbon sequestered in biological carbon stocks over a certain time period than would have been in the absence of the project activity.

2.6.6 Immediate Crediting for Future Avoided Emissions

In accordance with recognized principles for carbon offset quality, the Reserve has upheld a general policy against “forward crediting” of GHG emission reductions. Forward crediting occurs when credits are issued for GHG reductions before such reductions have occurred and before the activities that caused such reductions have been verified.¹⁴ Subject to certain conditions, however, the Reserve does credit reductions upfront when a verified action results in the immediate avoidance of a future stream of GHG emissions. Please see the Reserve’s policy memo on this subject, available at <http://www.climateactionreserve.org/how/program/program-manual/>.

Separate from its *ex post* offset crediting program, the Reserve has developed a program, Climate Forward, for the purpose of recognizing and crediting anticipated future streams of emission reductions. This program specifically issues GHG emission reduction credits (not offsets) on an *ex ante* basis. Climate Forward provides a practical solution to companies and organizations seeking cost-effective mitigation of anticipated (i.e., future) operational and/or project-related GHG emissions. Climate Forward facilitates investments in GHG reduction activities that are practical, scientifically-sound, transparent, and aligned with forward-looking mitigation needs. For more information, please visit the Climate Forward website at <https://climateforward.org/>.

2.7 Project Monitoring

Monitoring of GHG projects is required in order to determine project performance, quantify actual GHG emissions, and in some cases, calibrate baseline emissions estimates. Under all Reserve protocols, GHG reductions are quantified only based on actual project monitoring data. Monitoring requirements are specified in each protocol and include provisions for:

- Monitoring GHG emissions or removals associated with SSRs within the GHG Assessment Boundary
- Monitoring other data related to assumptions underlying GHG emissions and/or carbon stock estimates
- Documenting data storage and quality assurance/quality control (QA/QC) measures
- Ensuring all project components are operated in a manner consistent with the manufacturer’s recommendations
- Ensuring all monitoring instruments are calibrated and maintained as specified by the manufacturer

The Reserve requires a monitoring plan to be established for all monitoring and reporting activities associated with a project. The monitoring plan serves as the basis for verification bodies to confirm that the monitoring and reporting requirements in each protocol have been met and that consistent, rigorous monitoring and record-keeping is ongoing at the project site. Monitoring plans must cover all aspects of monitoring and reporting contained in a protocol and must specify how data for all relevant parameters will be collected and recorded. Each protocol specifies in a table the parameters that must be monitored and how data for each parameter must be acquired (e.g., from measurement, calculation, approved references or operating records).

¹⁴ Offset Quality Initiative, 2008. *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy*, p. 10. Available at: <http://www.offsetqualityinitiative.org/>.

At a minimum, a monitoring plan must stipulate the frequency of data acquisition; a record keeping plan; the frequency of instrument field check and calibration activities; and the role of individuals performing each specific monitoring activity. Monitoring plans should include QA/QC provisions to ensure that data acquisition and meter calibration are carried out consistently and with precision.

Finally, monitoring plans for most protocols must include procedures that project developers will follow to ascertain and demonstrate that the project passes the legal requirement test for additionality.

2.8 Ensuring Permanence of GHG Reductions

Because CO₂ and other GHG emissions remain in the atmosphere for very long periods of time, offsetting reductions in GHG emissions must effectively be permanent. The Reserve defines “permanence” as being equivalent to the radiative forcing benefits of removing CO₂ from the atmosphere for 100 years. Some types of offset projects, however, cause GHG reductions by removing CO₂ from the atmosphere and storing it in a reservoir (e.g., in trees or other organic materials, or in geologic formations). In these cases, there is a risk that CO₂ may be re-emitted to the atmosphere, leading to a “reversal” of GHG reductions. A reversal occurs when the total amount of CO₂ stored by a project becomes less than the total number of CRTs issued to the project. This can happen, for example, if some or all of the trees associated with a forest project are destroyed by fire, disease or intentional harvesting.

The Reserve requires that reversals be compensated for in order to ensure the integrity of CRTs and to maintain their effectiveness at offsetting GHG emissions. Specific rules and conditions for reversal compensation are detailed in individual protocols. Generally, the Reserve requires that CRTs be retired in proportion to any reversals, such that the total number of issued CRTs does not exceed the total quantity of CO₂ stored by a project over a sufficiently long period of time.

In some individual protocols, the Reserve may offer the option of “Tonne-Year Accounting” as an alternative mechanism to ensure the permanence of CRTs related to reversible emission reductions. In those cases, the protocol will specify when a project is subject to reversal risk, and how any reversal is to be quantified and compensated.

2.8.1 Maintenance and Disposition of the Buffer Pool

The Reserve maintains a buffer pool composed of credits from project types with identified risk of unavoidable reversal. Credits within the buffer pool from different project types are functionally distinct, despite the buffer pool being administered in one comprehensive account in the Reserve registry. For example, grassland credits in the buffer pool will be used to compensate for reversals of grassland projects, while forest credits in the buffer pool will be used to compensate for reversals of forest projects. Similarly, credits that have been granted eligible status for use in programs outside of the Reserve, but for which the Reserve follows a formal eligibility or qualification process, will be used to compensate for reversals of credits with the same status. The Reserve will retire credits out of the buffer pool to compensate for reversals on a First In First Out (FIFO) basis, after identifying which credits meet the aforementioned criteria for reversal compensation.

Buffer pool contributions are established by each protocol, in accordance with the best available literature. In the highly unlikely event that the buffer pool does not contain sufficient supply of

credits for a certain project type or program eligibility qualification to compensate for identified, unavoidable reversals for that same project type or program eligibility qualification, the Reserve may opt to retire buffer pool credits of another type. If the aggregate buffer pool still is not sufficient for addressing any identified unavoidable reversals, a situation the Reserve believes to be close to impossible (or indicative of an environmental catastrophe hard to imagine), the Reserve will assess the situation and pursue one or more of the following options depending on what is most suitable:

- Require an increased buffer pool contribution from existing projects
- Revise reversal risk ratings within relevant protocols upwards for future reporting to compensate for the unavoidable reversals
- Purchase and retire an adequate amount of similar credits through the Reserve's Blind Trust
- Consult with affected project developers to determine an appropriate course of action

2.9 Avoiding Double Counting of Emission Reductions

Double counting is “a situation in which a single greenhouse gas emission reduction or removal is counted more than once towards achieving climate change mitigation. Double counting can occur through double issuance, double use, and double claiming.”¹⁵ The Reserve program guards against each form of possible double counting in different ways. The combination of these safeguards should mitigate the risk of double counting in all its forms.

The first layer of safeguards to avoid double counting is applied at the level of project protocols. The initial safeguard is through the process for screening project protocols for development and adoption by the Reserve. Section 4.1 provides details regarding the selection of project types with low risk of double counting. The next safeguard to avoid double counting is via the act of protocol development. During this process, decisions are made regarding the determination of additionality and the defining of the GHG Assessment Boundary. Both of these processes can reduce the risk of double counting where project activities or GHG sources are covered by other programs.

The next layer of safeguards is implemented at the program level. When a project is submitted for listing with the Reserve, staff conduct a review of other carbon project registries to ensure that the project is not seeking GHG credits for a concurrent period of time. There are specific circumstances under which a project may be listed in multiple registries at the same time without risk of double counting. For example, a project may have transferred to the Reserve from another registry without any temporal overlap in crediting. When a project is submitted for registration, following review of the verification report, Reserve staff will once again conduct a review of other carbon project registries. Project developers also sign a legal Attestation of Title prior to each registration. Through this form they attest, and thus accept liability, that the relevant emission reductions are not registered in any other program, or in the Reserve under another project.

The registry itself is designed to mitigate the risk of double counting through transparency. Each CRT has a unique serial number, identifying, among other things, the location of the project, the relevant protocol, and the vintage year of the GHG reductions. All issuances and retirements

¹⁵ *Guidelines on Avoiding Double Counting for the Carbon Offsetting and Reduction Scheme for International Aviation*. June 2019. Available online at: <https://www.adc-wg.org/>.

are immediately public. Cancellations for other programs are made public. Any user may review all CRT retirements and view the serial numbers, as well as the reason for retirement. In addition, verification reports are made public, providing an additional source of detailed information regarding the generation of the GHG reductions.

Additional guidance will be added to this document at a later date to address the risk of double claiming between international reporting mechanisms under the Paris Agreement and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), once the international community provides more details on how these commitments will be implemented.

3 Program Rules and Procedures

3.1 Reserve Offset Program Manual

This manual contains details on the Reserve's program, policies, and requirements. Users of the Reserve program, including verification bodies, are subject to the requirements and guidance specified in the most recent version of the Reserve Offset Program Manual. The Reserve Offset Program Manual is considered effective as of the date it is posted on the Reserve website. All account holders and verification bodies are notified when an update to the Reserve Offset Program Manual is released, and the manual is available on the Reserve's Program Manuals and Policies webpage at

<http://www.climateactionreserve.org/how/program/program-manual/>.

3.1.1 Revisions to the Reserve Offset Program Manual

Between updates, the Reserve may release policy memos that update or replace guidance in the Reserve Offset Program Manual or protocols. These memos are considered effective on the date they are posted on the Reserve website; users of the Reserve program and verification bodies must follow the guidance specified in the memo from that date forward. All account holders and verification bodies are notified when a policy memo is released, and memos are posted on the Reserve's Program Manuals and Policies webpage at

<http://www.climateactionreserve.org/how/program/program-manual/>.

In most cases, the contents of the memos are incorporated into the next update of the Reserve Offset Program Manual.

3.2 Start Date

In general, the start date for a project corresponds to the start of activity that generates GHG reductions or removals. Specific requirements for determining the start date of a project are contained in each protocol. Project start date is used in determining project eligibility and initiates a project's crediting period.

Although the project start date is defined by each protocol, the date that begins the project's initial verification period is not. A project must begin its initial verification period on the project start date. This ensures that all project emissions within the GHG Assessment Boundary are accounted for from the project start date until the end of its crediting period.

It is possible that a project developer may not have implemented the appropriate monitoring or QA/QC procedures per the protocol on the project start date. Regardless, the project developer must still begin the initial verification period on the project start date. The project developer shall claim no emission reductions for any time period that the project cannot meet the data, monitoring or QA/QC requirements of the protocol. The verification body must confirm with reasonable assurance that project emissions were not greater than baseline emissions during a verification period, including the time period from the project start date until the protocol requirements were met. Verification bodies shall perform a review of project documentation and calculations for such a time period and may use professional judgment when assessing available project documentation.

If the verifier cannot confirm with reasonable assurance that project emissions were less than or equal to baseline emissions for the verification period, the Reserve will make a determination of action on a case-by-case basis.

3.3 Project Registration

This section summarizes the administrative steps a project developer must follow to register a project with the Climate Action Reserve. The timing of project registration may be independent of its start date. In other words, projects may be submitted after they begin operation (subject to the eligibility restrictions on the project start date described above) or before they begin operation. However, the steps outlined in this section must be followed in order for the Reserve to issue CRTs to a project.

Detailed information on the Reserve's software operating procedures, including step-by-step instructions for creating accounts, entering information, receiving CRTs, and transferring CRTs among accounts can be found in the Reserve's User Guide:

<http://www.climateactionreserve.org/how/program/documents/>.

3.3.1 Fee Structure Summary

The Reserve imposes required fees that are charged to account holders during the project registration process (Sections 3.3.2 to 3.3.13). A summary of those fees is below:

Reserve Account Fees (Effective July 1, 2017) ¹⁶	
Account Setup Fee	\$500
Account Maintenance Fee (annual per project)	\$500
Account Re-activation Fee	\$500
Project Owner Account Setup Fee (for aggregated projects/cooperatives only)	\$200
Project Owner Account Maintenance Fee (annual, for aggregated projects/cooperatives only)	\$80
Project Submittal Fee under a Reserve Project Protocol (per project)	\$500
Project Variance Review Fee (per request)	\$1350
Project Transfer Fee (per project transferred between account holders, paid by the transferee)	\$500
Project Registration Extension (per request)	\$200
CRT Issuance Fee (per CRT issued)	\$0.19
CRT Transfer Fee (per CRT transferred between account holders, paid by the transferor)	\$0.03
Retirement (per CRT retired)	no charge

3.3.2 Account Registration

As a first step, an account must be set up with the Reserve. Account registration only needs to occur once; any number of projects can be registered under the same account.

¹⁶ All fees in this table are limited to the Reserve's voluntary offset program. Fees related to the Reserve's work as an Offset Project Registry (OPR) under the California Cap-and-Trade system can be found at <http://www.climateactionreserve.org/how/program/program-fees/>

Any person or organization may apply for a Reserve account regardless of location or affiliation. Account applications are completed through the Reserve software. Along with completing an online application, each user must also agree to the legal Terms of Use for the Reserve. The Terms of Use binds users of both the Reserve software and the program itself to the terms laid out in the protocols, the Reserve Offset Program and Verification Manuals, and the Operating Procedures as modified from time to time. The Terms of Use document can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

When a new account is approved by the Reserve, the account holder will receive an invoice for the account maintenance fee. Payment is due within 30 days of approval to avoid cancellation of the new account.

Account management can be shared between the account owner and another party provided a Designation of Authority form has been completed (see Section 3.3.2.2).

3.3.2.1 Types of Accounts

There are six types of accounts in the Reserve:

1. **Project Developer.** An account type for organizations that wish to register projects that generate GHG reductions or removals. This account type can also be used to transfer and manage CRTs. Users of this account type are also able to function as project aggregators or cooperative developers, enabling the management of CRTs on behalf of multiple projects formally registered as part of an aggregation or cooperative, as allowed under certain protocols.
2. **Trader/Broker/Retailer.** This type of account allows the transfer and management of CRTs, but not registration of projects.
3. **Verifier.** An account type for verification bodies that have been trained and authorized by the Reserve to verify projects. There is no annual account fee for verification bodies.
4. **Reviewer.** This account type is only for those who have been asked by the Reserve to serve as a project reviewer. There is no annual account fee for reviewers.
5. **Client.** This type of account is for any individual or entity that wishes to retire CRTs but not develop its own projects.
6. **Project Owner (limited).** This account type is designated for use by project participants participating in a cooperative or aggregate according to protocol-specific rules and procedures. This account type allows the registration of projects that are formally part of a cooperative or an aggregation. It is intended for use when the owner of the GHG reduction rights (the Project Owner) is not the entity carrying out project development activities in the registry system. This account type may also be used for limited transfers of CRTs under the terms and restrictions imposed by the relevant project protocol and/or aggregation guidance and does not include privileges for retiring CRTs.

The public also has the ability to view information on the Reserve, but an account is not needed to view publicly available information.

3.3.2.2 Designation of Authority

A project developer and trader/broker/retailer account holder may designate an agent to access the Reserve software on their behalf.

Account holders must complete the Designation of Authority form to specify agents besides themselves who will have access to all information contained in their account. An example of an account holder agent would be a technical consultant hired by the project developer to manage a project on their behalf.

An account holder agent will have all the rights and responsibilities of the account holder and will also be bound by the Reserve Terms of Use. The Designation of Authority form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.3 Project Submittal

Project developers must complete and upload the appropriate project submittal forms for the project type and pay a project submittal fee to the Reserve. Submittal forms are specific to the project type and include project descriptions and preliminary information used to assess eligibility. The submittal forms for each type of project are available for download at <http://www.climateactionreserve.org/how/program/documents/>. A project is considered “submitted” when all of the appropriate forms have been completed, uploaded and submitted through the Reserve software.

3.3.4 Requests for Variances from Protocol Requirements

The Reserve will allow variances from protocol requirements only where Reserve staff determines that such variances are acceptable. Variances are only granted for deviations from requirements related to monitoring or measuring of GHG reductions or removals. The Reserve will not consider variances related to project eligibility criteria, or to the general methodological approaches for quantifying GHG reductions or removals specified in a protocol.

Reserve protocols are standardized documents developed through a transparent, stakeholder-driven process during which public input is solicited and considered thoroughly. Through this process, a single set of requirements and methodologies is established for all projects. If a requested variance diverges significantly from the approved methodology in a protocol, in that it requires extensive analysis of site-specific features and/or employs concepts not fully vetted through public consultation, the variance will be denied.

Variance requests that affect eligibility rules or methodological approaches cannot be granted, but if a request appears to have merit and may have application beyond a single project, it may be a candidate for future work and inclusion in future protocol revisions. Therefore, while a variance may not be approved at the time of submittal, the Reserve may elect to initiate work to explore the issue further if the resolution may be extrapolated, standardized, and used to inform future protocol revisions. If a future version of a protocol addresses the request for variance in such a way that the project would meet the requirements of the revised protocol, the project may be re-submitted and will not be deemed ineligible because of start date requirements (i.e., that the project must be submitted within six months of the project start date – see Section 2.4.3).

To submit a variance request, the project developer must complete and submit a Request for Project Variance form and pay the associated fee. No variance request will be considered until the project in question has been formally submitted to the Reserve. Each variance request is only applicable to a single project. A project developer seeking a similar variance on multiple projects must still submit a variance request for each project.

Upon receipt of the appropriate documentation and payment of the invoice, the Reserve will review the variance and will provide explicit, written acceptance to the project developer if the variance is approved. Decisions on variances are considered *sui generis* and are not precedent-setting. The Reserve retains the right to reject a variance, request further documentation or impose additional constraints and/or discount factors on the proposed monitoring or measuring methods. There is no process to appeal the denial of a variance; the decision to approve or deny a variance request lies solely with the Reserve. If the Reserve approves a variance request, a letter describing the variance granted will be sent to the project developer and will be made publicly available.

The Reserve also maintains a publicly-accessible Variance Tracking Log, which provides a summary list of all variance requests approved by the Reserve. The variance log can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

The Request for Project Variance form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.5 Project Listing

Once the project submittal fee has been received, the Reserve reviews the forms to determine whether they are complete and conducts a preliminary assessment of the project's eligibility according to the eligibility criteria set forth within the appropriate project protocol. Once this review is satisfactorily completed, the project is "listed" and made publicly available on the Reserve. Project verification activities cannot begin until a project is listed. Review of submitted forms will generally take no more than 10 business days.

Note that a project may be verified against the protocol version in place at the time of project submittal as long as the project is verified by its verification deadline (see Section 3.4.2). As long as a project meets its verification deadline, a project developer is not required to verify against a new protocol version, even if one becomes effective in between the time a project is submitted and registered. Project developers always have the option, however, of voluntarily choosing to verify against the most recent version of a protocol at any time.

Listing a project does not constitute a validation or verification of the project or its eligibility; it is a preliminary review of project information provided to the Reserve by the project developer. It is not a final determination of the eligibility of the project, nor does it guarantee CRT issuance or CRT ownership. Project registration and CRT issuance is contingent upon the submission and approval of all required forms and documents for a particular project type, including, but not limited to:

- Attestation of Title (see Section 3.3.6)
- Attestation of Voluntary Implementation (see Section 3.3.7)
- Attestation of Regulatory Compliance (see Section 3.3.8)
- NOVA/COI form (see Section 3.3.9)
- Verification Report, Verification Statement, and List of Findings

The required forms and documents for registration under each project type can be found at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.6 Attestation of Title

All project developers must submit a signed Attestation of Title form indicating that they have exclusive ownership rights to the GHG reductions or removals associated with the project and for which the Reserve will issue CRTs. In addition, the project developer agrees that ownership of the GHG reductions or removals will not be sold or transferred except through the transfer of CRTs in accordance with the Reserve Terms of Use policies.

This form shall be signed and submitted after the conclusion of each verification period for a project, as specified in each protocol. Note that the entity/individual signing the Attestation of Title (and the other attestation forms) must be the account holder who submitted the project. Projects will not be registered unless the account holder and signatory to the attestation forms match.

The Attestation of Title form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.7 Attestation of Voluntary Implementation

All project developers must submit a signed Attestation of Voluntary Implementation form that confirms the project was implemented and established voluntarily and continues to operate as such. The project developer attests that at no time was the project required to be enacted by any law, statute, rule, regulation or other legally binding mandate by any federal, state, local or foreign governmental or regulatory agency having jurisdiction over the project.

This form is signed and submitted after the conclusion of each verification period (unless otherwise exempted by the protocol under which the project is registered). The Attestation of Voluntary Implementation, along with activities detailed in the project's monitoring plan, are the primary mechanisms by which the project passes the legal requirement test, as specified in each protocol.

The Attestation of Voluntary Implementation form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.8 Attestation of Regulatory Compliance

All project developers must sign and submit an Attestation of Regulatory Compliance form after the conclusion of each verification period, as specified in each protocol. By signing this form, the project developer attests to the project's compliance status throughout the project verification period. The form identifies specific dates during the verification period over which the project was in material compliance with all laws. In addition, the form confirms that the project developer has disclosed to its verification body in writing any and all instances of non-compliance of the project with any law. The Attestation of Regulatory Compliance form and the accompanying disclosure to the verification body of non-compliance events are the primary mechanisms by which the project passes the regulatory compliance eligibility criterion, as specified in each protocol.

The Attestation of Regulatory Compliance form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.3.9 Conflict of Interest Evaluation and Initiation of Project Verification

As described in Section 3.4, the Reserve requires third-party verification of all GHG reductions by an ISO-accredited and Reserve-approved verification body. Once the project developer has

selected a verification body, the verification body must submit a Notice of Verification Activities and Conflict of Interest (NOVA/COI) evaluation form to the Reserve at least 10 business days prior to the commencement of verification activities. This form includes the scope of proposed verification activities and other required information used to assess the potential for conflict of interest between the verification body and the project developer. In order for verification activities to begin, the Reserve must determine that the potential for conflict of interest between the project developer and the verification body is low or can be mitigated. The conflict of interest evaluation must be completed before verification activities can begin. The NOVA/COI form is available for download at <http://www.climateactionreserve.org/how/program/documents/>.

Once the conflict of interest evaluation is complete, the project developer must upload the required attestations and enter project data into the Reserve software, and then submit the project for verification. Required data is described in each protocol, and can include project information, monitored GHG emissions data, estimated GHG emission reductions, and other data required by the project monitoring guidelines. Once the project has been submitted by the project developer, the Reserve software automatically notifies the verification body that the project is ready for verification.

The verification body then reviews the project data in the Reserve software, performs verification activities, conducts site visits as needed, and verifies that the listed project has fully complied with the appropriate project protocol and that the GHG reductions or removals have been appropriately quantified. The verification body then submits a Verification Report, Verification Statement, and List of Findings through the Reserve software.

3.3.10 Approval of Verification and Project Registration

Once the verification body completes the Verification Statement, Verification Report, and List of Findings, the project developer reviews the verification body's documents and then formally submits the project to the Reserve for final approval of the verification. The Reserve reviews the submission for completeness, reviews the Verification Statement, Verification Report, and List of Findings, and either approves the verification or requests a re-submittal of one or more components. Upon approval, the project developer receives an invoice for the issuance of CRTs generated by the project.

A project becomes "registered" the first time it is verified and accepted by the Reserve. The status of the project then changes from listed to registered in the Reserve software. See Section 3.4 below and the Reserve Verification Program Manual for further information about the project verification cycle.

3.3.11 Project Completion

A project is considered "completed" when it is no longer reporting to the Reserve. A project may be considered completed because it reaches the end of its crediting period(s), becomes ineligible or the project developer voluntarily chooses not to continue reporting. The reason for the completed status is noted in the Reserve system. Once a project is completed, project information remains publicly available indefinitely.

3.3.12 Record Keeping

According to the Terms of Use, the Reserve has the right to examine, audit, and obtain copies of users' records from the most recent 12-month period. The Reserve does not anticipate this being a routine need, but rather a rare event to verify the accuracy of any attestation, transfer or

statement, or to review account holders' performance of obligations under the protocols, the Terms of Use or the Reserve's Operating Procedures.

Project developer account holders on the Reserve must also maintain copies of all relevant records related to their projects and associated account usage for the time period specified in each protocol.

3.3.13 Publicly Available Information

The Reserve is intended to serve both account holders and the interested public. To this end, information about each project registered with the Reserve is accessible to the public. This openness and transparency provides interested parties with valuable information and helps instill confidence in the Reserve and enhance the credibility of the offset credits it certifies.

The public and all account holders can access the following information online:

- **Participating companies.** Organizations that have an active Reserve account (address or contact information is not disclosed).
- **Projects.** Projects that are listed or registered with the Reserve. Rejected project submittals and projects that are de-listed prior to registration and/or CRT issuance are not displayed; however, information will be made publicly available indefinitely for any project to which CRTs have been issued, regardless of whether the project is completed, terminated or transferred to another program.
- **Project CRTs issued.** Projects for which CRTs have been issued along with the quantity of CRTs issued to each project. Current CRT balances in individual accounts are not automatically displayed.
- **Search of CRT serial numbers.** The Reserve software allows searching for a CRT serial number by batch number or block start or end numbers. This search feature is designed for someone who wants to see details about a given CRT batch (for example, a CRT buyer). It cannot be used to search every CRT issued for a company or project. Search results include whether the CRTs are active or retired and, if retired, the time and date of retirement.
- **Accounts disclosed to public.** Active or retired CRT balances that account holders have chosen to be shown to the general public.
- **Retired CRTs.** Displays the CRTs that have been retired by account holders.

Information that is never shared with the public includes:

- Company street addresses
- Company phone, fax or email addresses
- Internal company information, like billing addresses
- Any person's contact information

Account holders' contact information is not used by the Reserve except to notify users of important system occurrences and policy updates and is not shared with other parties.

3.4 Project Verification

The Reserve requires periodic third-party verification of all GHG projects, as specified in each project protocol. This provides an independent review of data and information used to register CRTs. For every project, a third-party verification body reviews documentation, monitoring data,

and procedures used to estimate GHG reductions or removals. The verification body submits a Verification Statement and Verification Report that provide the basis for determining the quantity of CRTs that can be issued to the project. The Reserve makes these documents publicly available. Verifiers conducting verification activities for projects listed or registered on the Reserve must be trained by the Reserve or its approved designees and employed by or subcontracted to an accredited verification body. A list of accredited verification bodies is available at <http://www.climateactionreserve.org/how/verification/connect-with-a-verification-body/>.

Verification bodies follow guidelines set forth in the Reserve Offset Program Manual and Verification Program Manual, as well as rules and procedures described in the specific verification guidance that is included in each project protocol.

3.4.1 Validation

Validation involves determining the project methodology and a project's eligibility to generate GHG reductions or removals. Unlike some other offset programs, the Reserve does not require that validation be conducted. Eligibility criteria and methodologies for emission reduction calculations are built into the Reserve protocols. Because the Reserve's eligibility criteria are mostly standardized, determination of eligibility is usually straightforward and requires minimal interpretative judgment by verification bodies. The first time a project is verified, verification bodies are required to affirm the project's eligibility according to the rules defined in the relevant project protocol. Project developers may choose to have a project verified without verifying CRTs for issuance in order to establish its eligibility for registration and provide more certainty to potential CRT buyers or sellers. However, when a project developer is seeking to register CRTs, a full verification must be conducted. See the Verification Program Manual for more information.

3.4.2 Reporting Period and Verification Period

GHG emission reductions are generally quantified and verified on an annual basis. Some protocols allow project developers to verify GHG emission reductions on a more frequent or less frequent basis if they desire. The length of time over which GHG emission reductions are quantified and reported to the Reserve is called a "reporting period." The length of time over which GHG reductions are verified is called a "verification period." Under some protocols, the reporting period and the verification period are identical, and no distinction is made between these terms (the protocol may refer only to a "reporting period"). Other protocols distinguish between the two and the maximum period for each is specified. Note that some protocols may allow the verification period to cover multiple reporting periods. However, the end date of a verification period must always correspond to the end date of a reporting period.

CRTs are issued according to the quantity of verified reductions achieved during a verification period, regardless of the period's length.

Reporting periods must be contiguous; there can be no time gaps in reporting during the crediting period of a project once the initial reporting period has commenced.¹⁷ Gaps in monitoring data or activity must be included in reporting periods and verified accordingly. The verification body must confirm that no reductions are claimed for any period for which a gap in monitoring data exists or for which a project was non-operational.

¹⁷ There is an exception to this requirement for projects under the U.S., Article 5, and Mexico Ozone Depleting Substances Project Protocols. Under those protocols, reporting periods need not be contiguous.

3.4.3 Initial Verification and Registration

A project must complete verification within 12 months of the end of its initial reporting period. To satisfy this verification deadline, the project developer must submit a completed Verification Report and signed Verification Statement to the Reserve.

For project types that require annual verification at a minimum, the Verification Statement and Report may cover a maximum of 12 months of project activity, with the following exceptions. A pre-existing project (see Section 2.4.3) undergoing its initial verification and registration with the Reserve may submit a Verification Statement and Report that cover multiple years, back to the project's start date. This data is considered "historic data." Historic data may only be registered during a pre-existing project's initial verification with the Reserve. The Reserve also allows project developers to register more than 12 months of data during a project's initial verification period while still meeting the 12-month verification deadline (based on the maximum initial reporting period specified by each protocol), or register a project's initial verification period as a zero-credit reporting period (see Section 3.4.5).¹⁸

A project is considered "registered" when the project has been successfully verified by an approved third-party verification body, submitted by the project developer to the Reserve for final approval, and accepted by the Reserve.

A project that fails to meet its initial verification deadline must re-submit under the latest version of the applicable protocol. Projects that do so are not subject to the start date requirements in Section 2.4.3, provided that the project met all applicable requirements at the time of initial submittal.

If a project misses its initial verification deadline, the project is "de-listed"¹⁹ in the Reserve software and is no longer viewable by the public. The Reserve will contact the project developer to inform them they must re-submit under the latest version of the protocol within 60 calendar days of notification.

If the project developer re-submits the project within 60 calendar days, the project is "re-listed"²⁰ under the same project ID and the project maintains its original start date. The project is given a new listing date.

If the project developer fails to re-submit within 60 calendar days, the project is cancelled. The project developer could still re-submit the same project at a later date, but it would be assigned a new project ID and would have to meet all the requirements of the applicable protocol, including start date requirements.

Projects that successfully re-list must submit either 1) a Verification Statement and Verification Report or 2) a Zero-Credit Reporting Period Acknowledgment and Election form within 12 months of re-submittal, with the following exceptions. Forest, urban forest, and nitrogen

¹⁸ Forest and urban forest projects are not eligible for zero-credit reporting periods.

¹⁹ "De-list" is not a phase in the Reserve software. De-listed projects will no longer appear to the public in the software.

²⁰ "Re-list" is not a phase in the Reserve software. Projects will be identified as "listed" in the software with the same project ID.

management projects are not eligible for zero-credit reporting periods and therefore must complete initial verification within 12 months of re-submittal.

If a re-listed project misses the deadline above, the project is cancelled. Again, the project developer could still re-submit the same project at a later date, but it would be assigned a new project ID and would have to meet all the requirements of the applicable protocol, including start date requirements.

3.4.4 Subsequent Verification

After a project is registered, a Verification Statement and Verification Report must be submitted within 12 months of the end of each subsequent verification period. The maximum allowed length of a verification period is specified in each protocol. For example, a Verification Statement and Report for GHG reductions achieved between January 1, 2015 and December 31, 2015 would have to be submitted by December 31, 2016. The only exception to the verification deadline is if the project developer has successfully applied for an extension or is taking a zero-credit reporting period (see Section 3.4.5 below).

The Reserve makes account holders aware of upcoming verification deadlines for projects in their account. Project developers that miss this verification deadline are notified and given the choice to:

- A) cancel the project; or
- B) continue the project by initiating verification using the latest version of the relevant protocol.

Once notified that the verification deadline has passed, a project developer has six months to choose one of the options above. If no choice is communicated to the Reserve within six months, the project is cancelled.

If a project developer chooses Option B, they are required to submit a Zero-Credit Reporting Period Acknowledgment and Election form and a monitoring report to retroactively cover the time period since the end date of the last successful verification period (see Section 3.4.5). Thus, the project developer acknowledges that CRTs will not be issued for any GHG reductions or removals achieved by the project since its last successful verification. They are also required to verify the project to the latest version of the relevant protocol.

A project utilizing Option B maintains its original project start date, and thus maintains the crediting period defined by that start date. This option may be used across two crediting periods should the project protocol allow for that.

If a verification period spans two crediting periods and there is a more recent version of the protocol that must be used for the renewed crediting period (see Section 2.4.4), the project developer can either be issued CRTs for two verification periods by completing separate verifications for each crediting period, or can be issued CRTs for one verification period that spans two crediting periods if they choose to verify the entire verification period to the more current protocol version.

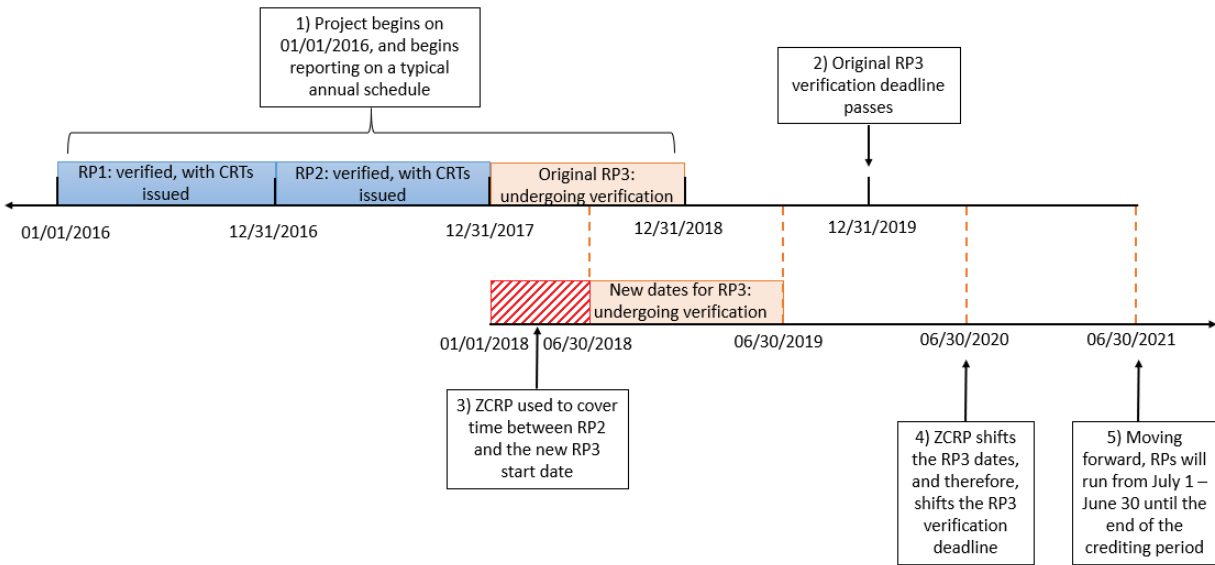
3.4.4.1 Subsequent Verification for Forest, Urban Forest, and Nitrogen Management Projects

The only exceptions to the options regarding a missed verification deadline detailed above are for forest, urban forest, and nitrogen management projects, as these project types are not eligible for a zero-credit reporting period. If a registered forest, urban forest, or nitrogen management project misses a subsequent verification deadline, project account activities will be suspended until the verification is complete. The project developer has 36 months from the end of the reporting period(s) being verified to complete verification. Otherwise, the project will be terminated.

3.4.5 Zero-Credit Reporting Period (ZCRP)

To provide flexibility for project developers in instances where verification is not practical or economical for a specific reporting period/verification period, developers of projects *other than forest, urban forest, and nitrogen management projects* may choose to delay verification on the condition that they acknowledge no CRTs will be issued for any period of time that falls outside the standard window for completing verification of project information and monitoring data. Such a period is referred to as a “zero-credit reporting period.” In such cases, zero-credit reporting periods can be used to cover any time that falls between reporting periods that undergo verification. For most eligible project types, the maximum length of a verification period is 12 months, allowing CRTs to be issued only for GHG reductions achieved up to 24 months prior to submission of a Verification Report. See Figure 1 below for an example of a project using a ZCRP to cover time that falls between reporting periods, in order to extend the deadline for submission of a Verification Report.

Figure 1: Zero-Credit Reporting Period for a Project with a 12 Month Maximum Verification Period



For any zero-credit reporting period, the project developer must sign a Zero-Credit Reporting Period Acknowledgment and Election form (Acknowledgment and Election form) acknowledging that CRTs will not be issued for any GHG emission reductions or removals achieved by the project during the zero-credit reporting period. Along with the Acknowledgment and Election

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form, the project developer must also submit a monitoring report to the Reserve that covers data for the zero-credit reporting period.

The Acknowledgment and Election form and monitoring documents shall be submitted via the Reserve software within 12 months of the end date allowed for a verification period (i.e., by the verification deadline). The monitoring report is not a publicly available document. The Acknowledgment and Election form is made public. The Acknowledgment and Election form and monitoring report are required in order to meet the regular documentation requirements of the Reserve program and ensure the continuation of a project's crediting period. CRTs for subsequent verification periods will not be issued until these documentation requirements are met. The submission of the monitoring report for a zero-credit reporting period will satisfy the requirement for contiguous reporting in Section 3.4.2.

If neither a Verification Report nor an Acknowledgment and Election form is submitted within 12 months of the end date allowed for a verification period, the project is either de-listed or cancelled (see Section 3.4.3, 3.4.2, and 3.4.4). Under certain circumstances, after a project has been de-listed or cancelled, it may re-enter the program, using zero-credit reporting periods to cover the time period when the project was not actively reporting. This is also possible in cases where the failure to maintain contiguous reporting has extended through the end of the crediting period if allowed by the relevant project protocol. In these cases, the zero-credit reporting period may cover a period of time spanning two crediting periods, and the second crediting period will be considered to have begun on the day following the end date of the initial crediting period. There is no limit to the amount of time a zero-credit reporting period may cover, and a project may have contiguous zero-credit reporting periods. Project developers may also declare a project's initial verification period as a zero-credit reporting period.

The Acknowledgment and Election form and project-specific monitoring report templates can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.4.6 Zero-Credit Reporting Period Verification

To ensure that project emissions were not greater than baseline emissions during a zero-credit reporting period, monitoring data collected during the zero-credit reporting period must be verified the next time the project undergoes verification. While the project is not required to conform to the protocol's monitoring and QA/QC procedures during a zero-credit reporting period, the verification body must be able to confirm with reasonable assurance that project emissions were less than baseline emissions during the zero-credit reporting period. Project developers shall provide project documentation and calculations for zero-credit reporting period emissions to the verifiers.

More information on the verification of zero-credit reporting periods can be found in the Verification Program Manual and the relevant project protocols. If the verifier cannot confirm with reasonable assurance that project emissions were less than or equal to baseline emissions, the Reserve will make a determination of action on a case-by-case basis.

The Reserve views a zero-credit reporting period as a separate reporting period from the one undergoing verification for CRT issuance; to that end, the zero-credit reporting period should not be represented as part of the verification period that will be issued CRTs. For example, the dates of the verification period being issued CRTs shall not include the dates of the zero-credit reporting period. Similarly, for attestations that specify a beginning and end date, the time period

should not include the zero-credit reporting period (i.e., Attestation of Regulatory Compliance, Attestation of Voluntary Implementation).

3.4.7 Verification Deadline Extension Request

The Reserve allows project developers to request a project verification deadline extension. No extension requests are granted unless the project has commenced verification and has undergone the site visit for the current verification period (if applicable)²¹ and all outstanding invoices for the project and account holder have been paid. The following extensions may be granted:

- Forest (U.S. and Mexico), grassland (U.S. and Canada), and urban forest projects may be granted a 12-month extension.
- Livestock (U.S. and Mexico), landfill (U.S. and Mexico), and nitrogen management projects may be granted a six-month extension.
- All other project types may be granted a 30-day extension if the account holder can demonstrate to the Reserve's satisfaction that they will miss the deadline due to extraordinary circumstances. The Reserve holds the right to determine what rises to the level of an extraordinary circumstance.

To submit a request, account holders must submit a completed Request for Verification Deadline Extension form and requested documentation to the Reserve and pay a \$200 review fee. The form must be received by the verification deadline.

The Request for Verification Deadline Extension form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.5 Stakeholder Input for Individual Projects

Direct and indirect stakeholder interaction is an integral part of the process for developing offset project protocols (see Sections 4.2 and 4.4). This includes comment periods that are open to the general public. At the project level, interactions generally involve those stakeholders with a commercial interest in the projects (e.g., facility owners, project developers, verifiers, consultants, CRT buyers, regulators, etc.). This section details avenues for non-commercial stakeholders to interact with the Reserve in relation to individual projects (rather than project protocols).

3.5.1 Local Stakeholder Consultations

Every Reserve protocol includes requirements to ensure that credits are only issued for emission reductions at projects that are in compliance with applicable regulations, and do no net environmental harm. In some cases, offset projects may have the potential to create social impacts on the local community, either positive or negative, which may not be appropriately handled by other, existing government structures. In those cases, the individual protocol may include additional requirements for local stakeholder consultations. In addition, every protocol development process, as well as every major protocol update, involves at least one public

²¹ If the registration extension is being requested for a non-site visit year, evidence must be provided to show that the project developer has provided requested documentation to the verification team to allow them to commence the desk review.

comment period, with a public webinar. Local stakeholders are welcome to participate in any of these public events.

For example, the Mexico Forest Protocol provides social safeguards through prescriptive guidance about obtaining free, prior, and informed consent; meeting notification, participation, and documentation; and project governance. This ensures that the local community is able to participate in the offset project.

3.5.2 Feedback and Grievance Process

For any project type, it is possible that a stakeholder may want to contact the Reserve to provide feedback, either positive or negative. For general feedback or inquiries, stakeholders may contact the Reserve at reserve@climateactionreserve.org, or call the Reserve office at (213) 891-1444. For questions or comments related to a specific protocol, current points of contact are listed on our website at <http://www.climateactionreserve.org/contact-us/>.

The Reserve strives to avoid adopting protocols for activities that present a risk of negative environmental or social impacts. However, if a stakeholder has a grievance about a specific project, the initial point of contact would be the same as described above. The staff member receiving this initial contact will collect as much information as possible from the stakeholder about the specific project and grievance. This will then be communicated to the senior management at the Reserve, including the President. The specific action taken will depend on the nature of the grievance.

- For cases of a potential over-issuance, Reserve staff will conduct a thorough review and analysis, then ensure that the system is “made whole,” according to the process detailed in Section 3.6.2 below.
- For disputes related to ownership of the GHG emission reductions, the Reserve senior management and legal counsel will review the positions and documentation of the parties involved and determine the appropriate owner (based on existing Reserve guidance related to ownership of GHG emission reductions), as well as whether any additional action against the project or the project developer is warranted. The Reserve will not be party to any disputes where the involved parties pursue actions beyond the Reserve issuing a determination as previously described.
- For grievances related to potential negative social or environmental impacts related to a Reserve project, which are not in violation of existing regulations (and thus handled by the relevant government agency), the Reserve senior management will conduct a finding of facts and consider the stakeholder’s position. Such instances may be referred to the Board of Directors for a decision on project eligibility.

3.6 Climate Reserve Tonnes (CRTs)

In the Reserve, GHG reductions and removals are recognized as Climate Reserve Tonnes or CRTs, which are equal to one metric ton of carbon dioxide equivalent (CO₂e) reduced or sequestered. After projects are registered, CRTs are issued based on the GHG reduction or removal amount reported by the project developer and confirmed by an approved verification body. CRTs are issued only on an *ex post* basis (i.e., after verification that reduction activities have actually occurred) and only for GHG reductions or removals that occur within the project crediting period. For transparency, each CRT has a unique serial number with embedded information that identifies the project type, location, developer, and vintage. The unique serial number persists as CRTs are transferred between accounts or are retired and become offsets.

3.6.1 Issuance of CRTs

CRTs are issued by the Reserve for actual GHG reductions or removals achieved by a project, as determined in approved Verification Reports. Once a project is registered and the project's account holder pays the appropriate CRT Issuance Fee, CRTs for verified GHG reductions or removals are released into the account holder's primary CRT account. CRTs will not be issued until the CRT Issuance Fee is received by the Reserve. CRTs can then be transferred to another Reserve account holder's account, moved into one of the project account holder's other accounts or retired.

An account holder can only hold or retire CRTs in its account for which it is the sole holder of legal title and Beneficial Ownership Rights, except as permitted under Section 9 of the Terms of Use.

3.6.2 Over-Issuance of CRTs

In the event that the Reserve determines that GHG reductions or removals for a project were incorrectly quantified or reported, such that the number of CRTs issued to the project account holder was in excess of the correct number according to the requirements of the applicable protocol, it is primarily the project account holder's responsibility to compensate for the over-issuance of CRTs.

The Reserve will notify the project account holder of the over-issuance, including the basis for its determination, and the number of CRTs to be surrendered for cancellation or authorized to be withheld from issuance as further described below. The Reserve shall determine, at its sole discretion, which option or combination of options a project account holder may use; this will be determined on a case-by-case basis and detailed in the over-issuance notification.

Within 30 days, the project account holder must:

1. Surrender CRTs for cancellation; and/or
2. Provide written authorization to the Reserve to withhold CRTs from future issuances to the project.

If the project account holder fails to satisfy its obligations within 30 days, the Reserve may:

1. Cancel CRTs held by the project account holder;
2. Withhold from issuance CRTs otherwise issuable to the project account holder; and/or
3. Purchase CRTs from third parties at the project account holder's expense and cancel them.

The project account holder may dispute the over-issuance determination using the dispute resolution provisions set forth in Section 11(c) of the Climate Action Reserve Terms of Use.

3.6.3 Transfer of CRTs

In order to transfer CRTs to another party, that party must have an approved account with the Reserve. There is a transfer fee to transfer CRTs from one account holder to another (\$0.03 per CRT charged to the transferor). The transfer is conducted via the software between the two account holders; the Reserve does not play a role in the transfer.

Note that the Reserve does not function as a trading system or commodity exchange. The sale or purchase of CRTs takes place outside of the Reserve. Account holders may record sales by

using the Reserve to move CRTs from one account to another. However, the Reserve makes no warranties concerning, and has no control over, the legal ownership of CRTs that may be held in individual accounts.

3.6.4 Retirement of CRTs

CRTs may be “retired” to indicate that the emission reductions or removals they represent have been used to satisfy a voluntary GHG emission reduction claim or to offset other emissions. To support such claims, CRTs are taken out of circulation so that they cannot be used to support any further claims. The Reserve retires CRTs by transferring them to a locked retirement account where they remain permanently and in perpetuity, precluding further use or transfer to other parties. Each account holder has its own associated retirement account. Information about retired CRTs is publicly available and includes details like project type, location, serial number, date issued, reason for retirement, etc. to support the transparency of the offsets within the Reserve. There is no charge to retire CRTs.

For the greatest level of transparency, Account Holders are encouraged to provide complete details of the purpose of the CRT retirement in the “Retirement Reason Details” field.

3.6.5 Holding and Retirement of CRTs on Behalf of Other Parties

In some circumstances, an account holder may hold and retire CRTs on behalf of one or more third parties. See Section 9 of the Reserve Terms of Use for related requirements.

3.6.6 Transferring Credits from the Reserve

Offset credits may be transferred to other GHG registries and offset programs under processes that are specific to the receiving registry/program.

3.6.6.1 VCS

CRTs may be exported to a Verified Carbon Standard (VCS) registry and converted into Verified Carbon Units (VCUs). Transfers may be initiated by any account holder with active CRTs. The account holder initiates this process as they would a CRT transfer. Once the transfer is accepted by the VCS registry administrator, the Reserve processes the transfer and VCUs are issued on the VCS registry. The exported CRTs have “converted to VCUs” noted as the cancellation reason in the Reserve software and public reports.

3.6.6.2 The California Compliance Offset Program

The Reserve is an approved Offset Project Registry (OPR) under the California Compliance Offset Program. Projects wishing to receive credits under one of the ARB’s approved Compliance Offset Protocols (COPs) may do so through the Reserve’s project registry. Registry Offset Credits (ROCs) are issued to projects in the Reserve’s registry that have been listed under a COP. Following the issuance of ROCs, project proponents may request issuance of ARB Offset Credits (ARBOCs) from the California Air Resources Board. Upon approval, the Reserve is notified, and ROCs are cancelled and then re-issued as ARBOCs in the Compliance Instrument Tracking System Service (CITSS). The exported ROCs have “ARB” noted as the cancellation reason in the Reserve software and public reports.

3.7 Transferring Projects into the Climate Action Reserve

Existing projects that have been registered with other carbon offset programs may be transferred to the Reserve if they meet, and are successfully verified against, the Reserve’s protocol requirements, and if they meet the project start date requirements detailed in Section

2.4.3. Such projects must submit a Registry Project Transfer Form, available for download at <http://www.climateactionreserve.org/how/program/documents/>. The Registry Project Transfer Form requires additional information and documentation to determine the status of the project and any offset credits issued for it under other programs.

The project developer must also provide the Reserve with a signed Project Transfer Letter before CRTs for that project are issued by the Reserve. The letter must be sent to the administrator of the other program where the project was registered, confirming that no further emission reductions or removals for the project will be verified or registered under the other program.

Transferred projects are considered pre-existing projects and thus are able to register more than 12 months of data during their initial verification with the Reserve (see Section 3.4.2). Transfer projects are also subject to contiguous reporting, which means that a project's initial verification period with the Reserve must be contiguous with the end of the last verification period under the program from which the project is transferred.

The crediting period for a transferred project will be reduced by the length of time that has elapsed since the project start date, as defined by each protocol.

Note that while projects can be transferred from another program to the Reserve, previously issued credits from another program cannot be transferred to the Reserve. Furthermore, projects that generated offset credits in the past but were never registered on a carbon offset registry cannot be registered with the Reserve.

3.8 Transferring Projects from the Climate Action Reserve

Projects may be transferred from the Reserve to other GHG registries and offset programs. To transfer a project, the developer shall provide a signed Project Transfer Letter to the Reserve specifying the effective date of transfer and confirming that no further emission reductions or removals for the project will be verified or registered with the Reserve.

Once a project is transferred, no future reductions or removals from that project will be registered as CRTs. Project information and previously issued CRTs will remain in the Reserve system under their given serial numbers. Previously issued CRTs may be transferred to other accounts on the Reserve system and retired on the Reserve system, as long as the project developer maintains an account with the Reserve. Section 3.6.3 of this manual describes how to transfer CRTs to other Reserve accounts.

3.9 Transferring Projects between Account Holders in the Reserve

Projects may be transferred between project developer account holders within the Reserve program. The project developer transferee (the project developer who is acquiring the project) must submit an Account Holder Project Transfer form and pay \$500 per project transfer. The Reserve will review this form and the project will then be transferred to the new account holder. The original account holder will no longer have access to restricted (non-public) project information.

The Account Holder Project Transfer form can be downloaded at <http://www.climateactionreserve.org/how/program/documents/>.

3.10 Relationships to Other GHG Programs

The Climate Action Reserve operates as a stand-alone voluntary offset registry. However, the Reserve program does interact with other GHG programs in various ways. Relationships with several, major programs are detailed in this section.

3.10.1 Voluntary Carbon Offset Programs

Registration of projects using project protocols developed by the Reserve is limited to the Reserve's voluntary offset program and other carbon offset programs that have pre-existing agreements in place with the Reserve. If a project developer is seeking crediting under a project protocol developed by the Reserve under a different program, it is the project developer's responsibility to notify the Reserve and to ensure that there is such a pre-existing agreement in place.

It may be possible for a voluntary Reserve offset project to be simultaneously listed under another voluntary offset program, provided that there is no overlap in the GHG Assessment Boundaries of the relevant protocol(s) or methodology. All project developers wishing to take advantage of any such opportunity should seek guidance from the Reserve, and staff of the other voluntary offset program, as early as possible in that process, to ensure best chances for approval and avoidance of any double counting. Reserve staff will work directly with the project developer, and likely also staff from the other voluntary program in question, to ensure there is no double counting in such circumstances. Generally speaking, where GHG accounting boundaries do not overlap, it may be possible for a project to enroll in multiple offset programs, undertake one set of activities, and receive crediting from those multiple programs. However, such a determination shall be made on a case-by-case basis for each combination of Reserve protocol and external protocol or methodology.

3.10.1.1 The Verified Carbon Standard

The Reserve is the first recognized independent GHG offset program under the Verified Carbon Standard, a global standard and program for approval of credible voluntary offsets. As an approved VCS program, offset projects that meet the Reserve's protocols can generate VCS credits, known as VCUs. CRTs issued by the Reserve can also be converted to VCUs and transferred to a VCS registry (see Section 3.6.6). However, VCUs cannot be converted to CRTs; only projects registered with the Reserve using Reserve protocols are able to generate CRTs.

For more information on Verra's VCS Program, visit <https://verra.org/project/vcs-program/>.

3.10.2 The California Compliance Offset Program

The California Air Resources Board (ARB) administers a Compliance Offset Program for use under the state's economywide cap and trade program for GHG emissions. The project registry functions for this program are administered by approved Offset Project Registries (OPRs). The Reserve is an approved OPR. Projects wishing to receive credits under one of the ARB's approved Compliance Offset Protocols (COPs) may do so through the Reserve's project registry. Reserve staff are experts in the OPR procedures, as well as the application of the COPs, most of which are adapted from the Reserve's voluntary offset protocols. The Reserve issues Registry Offset Credits (ROCs), which are ultimately canceled and then reissued by the ARB as ARB Offset Credits (ARBOCs). The Reserve does not issue ARBOCs and does not have a connection with the Compliance Instrument Tracking System Service (CITSS) (the registry used by the Western Climate Initiative for tracking compliance instruments). In

instances where a project does not seek the issuance of ARBOCs for a given reporting period, the project may retire the ROCs for voluntary purposes (see Section 3.6.4) or seek the conversion of ROCs into CRTs.

For information on the Reserve's role as an Early Action Offset Program and Offset Project Registry for the California Compliance Offset Program, please see the following resources:

- Climate Action Reserve California Compliance Offset Program website
<http://www.climateactionreserve.org/how/california-compliance-projects/>
- California Air Resources Board Compliance Offset Program website
<http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

3.10.3 The California Low Carbon Fuel Standard Program

The California Air Resources Board (ARB) administers a Low Carbon Fuel Standard (LCFS) Program for use under the state's plan for reducing GHG emissions. Certain project types that are eligible for CRTs and ROCs under the Reserve's voluntary and compliance offset project registry programs are also potentially eligible to receive LCFS credits for the generation and delivery of transport fuels (such as biogas) into California. This includes livestock anaerobic digestion projects and landfill gas capture and destruction projects. The Reserve does not issue or verify LCFS credits. Nor can CRTs or ROCs be directly converted into LCFS credits. However, in some cases the process of verifying and registering offsets through the Reserve may be a component of the project's process toward receiving and verifying LCFS credits. In cases where a Reserve offset project is also seeking LCFS credits, Reserve staff will work with ARB staff and the project developer to ensure that CRTs or ROCs are appropriately cancelled to reflect overlapping issuance in the LCFS program. In instances where a project cancels some, but not all ROCs from a given reporting period, in order to receive benefit in the LCFS program, the project may be able to retire the remaining ROCs or seek the conversion of those ROCs into CRTs.

In all cases, project developers must disclose to their verifiers the existence of any additional crediting or payment programs in which the project is participating concurrently with its registration through the Reserve.

3.10.4 The Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)

The International Civil Aviation Organization, a special body of the United Nations, has resolved to mitigate the growth in GHG emissions from international aviation beyond 2020 through the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA). The offsets portion of this program is designed to be decentralized, allowing for airlines to comply with their offsets obligations via retirement of eligible emission units issued by approved GHG programs.

As of this writing, no GHG programs have been approved by ICAO, and details around qualification of eligible emission units are not settled. The Reserve has applied for its offsets program to be approved for use by airlines to comply with CORSA. At a later date, this document will be updated to reflect the process by which CRTs may be qualified and retired for use in CORSA, including procedures to avoid double claiming of emission reductions.

For more information on CORSA, please visit <https://www.icao.int/environmental-protection/CORSA/Pages/default.aspx>.

3.10.5 Green-e Climate

Green-e Climate is a “global third-party certification program for carbon offsets,” operated by the Center for Resource Solutions (CRS). This program could be viewed as a “meta” certification, applying its label to offsets issued by specific GHG programs it has decided to endorse. The Climate Action Reserve’s voluntary offsets program is one such endorsed program. Thus, CRTs may be certified as Green-e Climate carbon offsets. Regardless of this additional certification, CRTs remain within the Reserve’s registry, with the original serial numbers and no additional requirements from the Reserve program.

For more information on the CRS’s Green-e Climate program, visit <https://www.green-e.org/programs/climate>.

4 Project Protocol Development Process

The Reserve is committed to producing high quality GHG project accounting protocols, and to this end uses an intensive multi-stakeholder process to develop its project protocols. This approach integrates extensive data collection and analysis with review and input from a diverse range of experts and stakeholders. Reserve staff guides this process to ensure that final protocols adhere to the principles outlined in Section 1.2. This process produces high quality, well-vetted, and credible protocols based on best practices from national and international standards. This section details the Reserve's unique and rigorous project protocol development process.

4.1 Screening Process

The Reserve uses an internal screening process to identify candidate project types with good potential for offset protocol development. The Reserve takes into consideration a number of issues when assessing a project type for further development, including:

- Does the project type create direct or indirect emission reductions? All else equal, the Reserve will focus on project types that result in direct reductions. Direct emission reductions are generally easier to verify because the sites where they occur can be directly monitored. When emission reductions occur at sites or sources owned by the project developer, there is also less risk that an entity other than the project developer will claim ownership of the reductions. Thus, these projects are unlikely to be at risk for double counting or ownership issues.
- How amenable is the project type to standardized additionality and baseline determinations? For some types of projects, it is difficult to credibly and accurately determine additionality and estimate baseline emissions on a standardized basis. In general, the Reserve will avoid developing protocols for these project types. Alternatively, the Reserve may incorporate project-specific methods or variables into standardized protocols as appropriate, or limit the scope of protocols to address only activities and conditions for which standardized approaches are feasible.
- What is the likelihood that the sector where the project activity occurs will be covered under a future cap-and-trade system? Since issuing offset credits for reductions that occur at capped emission sources would result in double counting, the Reserve prefers to focus on projects affecting GHG emissions that are unlikely to be capped.
- What are the total potential GHG reductions that could result from this type of project? As it takes significant effort and resources to produce a standardized project protocol, there should be large and geographically diverse potential reduction opportunities.
- Are there potential positive or negative environmental or social impacts from this type of project activity or the operations, facilities or sectors with which this type of project may be associated? Negative effects should be avoided. All else equal, the Reserve will prioritize sectors and project types that can create significant co-benefits for the habitats and communities where projects take place. Where necessary, the Reserve will also consider developing additional criteria for ensuring environmental and social safeguards.

- Are there existing methodologies or protocols that could serve as a starting point? Standardized protocols are more easily developed where sound scientific methods already exist to determine baselines and quantify emission reductions.
- Are there high quality datasets to evaluate “business as usual” activities for the sector in which the project activity occurs? Setting performance thresholds and other standardized tests for additionality requires defensible data on the current state of the sector.

Once the internal screening process is complete, project types with good potential are either explored more fully through the development of an issue paper or the Reserve holds a scoping meeting to engage stakeholders in further evaluating what types of activities should be targets for protocol development.

4.1.1 Issue Paper

An issue paper evaluates the feasibility and desirability of developing a protocol (or set of protocols) for a particular project type. It assesses possible issues with developing a standardized protocol for the project type, including an evaluation of potential approaches to GHG emission quantification; exploration of options for defining eligible project activities; evaluation of approaches to setting project boundaries; and assessment of the availability of datasets and other pertinent information. It also assesses the environmental and social impacts associated with prospective project activities, as well as potential impacts from the operations, facilities or sectors with which project activities may be associated. Issue papers are prepared by researching existing sector methodologies and datasets and consulting sector experts. After completion, the issue paper may be sent to interested parties (industry experts, environmental groups, state agencies, academics) for review and comment.

4.1.2 Scoping Meeting

Interested parties may be invited to a scoping meeting to discuss protocol development options and challenges for the project type in question. At the scoping meeting stage, the Reserve will generally propose a series of activities within the project type category for which specific accounting and verification standards could be developed. Feedback from the scoping meeting is used to determine whether the Reserve will move forward in developing a protocol, and which activities the protocol should encompass.

4.2 Development Process

After a project type is identified, the Reserve follows a rigorous multi-stakeholder consultation process to develop an appropriate protocol.

4.2.1 Workgroup Assembly

To initiate the project protocol development process, the Reserve assembles a balanced multi-stakeholder voluntary workgroup, drawing from industry experts, state and federal agencies, environmental organizations, and other various stakeholders. Workgroups are assembled by invitation, but all parties are encouraged to express their interest in participating in the workgroup process. Throughout the protocol development process, the workgroup provides expert review and direct input into the development of the project protocol.

Interested stakeholders that are not on the workgroup can still participate in the workgroup process as “observers.” Any individual is welcome to be an observer to a protocol development

process. Observers can listen to workgroup meetings via conference call, but are not solicited for comments or feedback until the public review period.

4.2.2 Options Paper

Where appropriate, the Reserve may develop an options paper to further address and lay out different approaches for key elements of the protocol. A draft is shared with the workgroup and comments are incorporated into a final options paper that forms the basis of the draft protocol.

4.2.3 Draft Protocol for Workgroup Review

The Reserve develops a draft protocol based on expert input and insights from an issue paper or the final options paper. The draft protocol is released to the workgroup for review and revision and is also posted on the Reserve's website for review by observers and other interested members of the public. The draft protocol review process usually includes at least one or more in-person workgroup meetings in which members are invited to discuss issues at length. At this point in the process, the Reserve explicitly requests input on possible environmental and social harms associated with project activities and associated operations or facilities, and requests discussion of whether existing legal and regulatory safeguards are appropriate and adequate to mitigate any harms.

Written comments from the workgroup are incorporated into the draft protocol, which may go through multiple iterations of workgroup review before it is ready for public review. Note that observers and the public do not comment on the draft protocol at this stage.

4.2.4 Public Review Period and Public Workshop

The revised draft protocol is posted on the Reserve's website for a 30-day public comment period. The public is notified via the Reserve's listserv database and other venues, and reviewers are asked to submit written comments. During the 30-day public review period, the Reserve also hosts a public workshop to solicit feedback and address concerns regarding the draft protocol in an open forum. After receiving written feedback, all comments are recorded and addressed. A final protocol is produced, taking into account public comments and any further workgroup feedback.

4.2.5 Board Approval

The Reserve's Board of Directors must vote to adopt each project protocol. Protocols are presented at quarterly board meetings, which are open to the public, and issues raised throughout the development process are reviewed, giving workgroup members and interested stakeholders a chance to raise any last concerns or questions. After the Board adopts the protocol, it becomes an official Reserve protocol and is immediately available for use.

4.2.6 Ongoing Public Feedback and Comments

After Board approval, the Reserve continues to solicit, document, and respond to public feedback and comments on the current version of the project protocol. Comments and feedback on adopted protocols can be submitted to the Reserve at policy@climateactionreserve.org. The public is also welcome to contact Reserve staff directly to discuss their comments and concerns.

Public feedback and comments are assessed on an ongoing basis and may initiate a revision to a project protocol.

4.3 Revisions to Project Protocols

After Board approval, the protocols are periodically revised in light of public comments, on-the-ground experience, and technological, scientific, and regulatory developments. In addition, the Reserve may review and update performance standards and standardized baselines to ensure they continue to effectively screen projects for additionality and accurately represent “business as usual” emissions. There are two types of revisions to project protocols: policy revisions and program revisions.

4.3.1 Policy Revisions

Policy revisions are those that affect project definition or eligibility, or that involve significant changes or adjustments to baseline estimation and/or the quantification of emission reductions or removals. A policy revision is generally focused on specific elements of the protocol and is not necessarily an opportunity to revisit all decisions made in the initial protocol development process.

Depending on the extent of the revision, the Reserve may convene an expert stakeholder group or reach out to stakeholders involved in the initial protocol development process. This group may be asked to comment on a revised draft protocol or be convened to discuss key issues prior to changes being circulated for comment. All policy revisions require a 30-day public comment period and adoption by the Reserve’s Board. Policy revisions are brought for adoption at the quarterly board meetings or are brought to the executive committee of the Board for adoption if expedited action is required. When adopted, a policy revision creates a new version of the project protocol (e.g., Version 1.0 undergoes a policy revision to become Version 2.0).

4.3.2 Program Revisions

Program revisions are editorial or technical in nature and do not require a public comment period, nor do they require adoption by the Reserve’s Board. These revisions do not significantly change the policies or eligibility in the project protocol, but can change or revise quantification methodologies or monitoring requirements. Program revisions create a new sub-version of the protocol (e.g., Version 1.0 undergoes a program revision to become Version 1.1). Program revisions are considered adopted on the date they are posted on the Reserve website. A protocol revision notification is sent to the Reserve’s listserv and to Reserve account holders at that time.

4.3.3 Grace Period for Registration under Prior Protocol Versions

Project developers have 90 days from the date on which a revised protocol is adopted to submit a project to the Reserve using the previous version of the protocol. The project must still complete verification within 12 months of the end of its initial reporting period. Otherwise, the project must be resubmitted for registration under the most current version of the protocol.

Projects that have been registered using a previous version of the protocol are not required to have their projects verified under any updated versions. Instead, projects may continue being verified against the original protocol version for the duration of their crediting period. Project developers always have the option, however, of voluntarily choosing to verify against the most current version. Applying the most current protocol to a project does not change the project’s crediting period.

4.3.4 Errata and Clarifications

If typographical errors are found in a protocol after it is released, the Reserve may issue an “Errata” document indicating required corrections. Errata are issued to correct typographical errors in text, equations or figures. Similarly, if the Reserve discovers that certain protocol requirements are ambiguous or in need of further guidance, the Reserve may issue a “Clarifications” document. Clarifications are issued to ensure consistent interpretation and application of the protocol.

Errata and Clarifications documents become effective immediately for the version(s) of the protocol to which they apply (applicable versions are identified in each document). Project developers and verification bodies must refer to and follow the corrections and guidance presented in Errata and Clarifications documents once they are issued. Errata and clarifications are considered effective on the date they are first posted on the Reserve website. All listed and registered projects must follow the guidance specified in the Errata and Clarifications document. On a case-by-case basis, in order to ensure that the protocol is consistently applied and that the purpose of the protocol is achieved, the Reserve has sole discretion to apply current errata retroactively to a project for which CRTs have been issued prior to the release of the errata that may affect quantification of its GHG reductions and/or CRTs issued.

All account holders and verification bodies will be notified if an Errata and Clarifications document is released or updated. Errata and Clarifications documents will be appended to all applicable versions of the protocol and will also be available as stand-alone documents on the relevant protocol’s webpage. The errata and clarifications identified in these documents will be incorporated into subsequent versions of the relevant protocol.

4.4 Communication with the Public

Current versions of each project protocol and information about protocols in development are available at <http://www.climateactionreserve.org/how/protocols/>. Each project protocol also has its own dedicated webpage that can be accessed from here.

Interested members of the public can receive protocol development announcements and program updates by joining the Reserve’s mailing list at <http://www.climateactionreserve.org/news-and-events/newsletter/>.

5 Glossary

Business day	Any day except Saturday, Sunday or a Federal Reserve Bank holiday. A business day shall open at 8:00 a.m. and close at 5:00 p.m. Pacific Prevailing Time.
Client	In the Reserve software system, a “client” is an organization or individual who wishes to retire CRTs but does not develop its own projects.
Climate Action Reserve	The national offsets program that establishes standards for quantifying and verifying GHG emission reduction projects, issues carbon credits generated from such projects, and tracks the transfer and retirement of credits in a publicly-accessible online system.
Climate Reserve Tonne or CRT	The unit of offset credits used by the Climate Action Reserve. One Climate Reserve Tonne is equal to one metric ton of CO ₂ e reduced or sequestered.
Completed	A project is considered “completed” when it is no longer reporting to the Reserve. A project is completed if it reaches the end of its crediting period(s), becomes ineligible, or if the project developer chooses not to continue reporting. The “completed” designation is also used for certain early action projects to indicate that the monitoring, reporting, and verification (MRV) requirements under the Reserve’s Early Action Offset Program have been satisfied, and that the project will continue MRV requirements under the Compliance Offset Program. The reason for the completed status is noted in the Reserve’s public reports. Once a project is completed, project information remains publicly available indefinitely.
Group Retirement Subaccount	The subaccount for the retirement of CRTs that are held by an account holder on an omnibus basis on behalf of one or more third parties that hold legal title and/or beneficial ownership rights in those CRTs.
Listed	A project is considered “listed” once the Reserve has satisfactorily reviewed all project submittal forms. The project will then appear in the public interface of the Reserve system.
Offset	A reduction or removal of GHG emissions from the atmosphere that is used to compensate for an equivalent amount of emissions from another GHG emitting activity occurring elsewhere. For the purposes of the Reserve program, a CRT becomes an offset when it is retired.
Project developer	An organization or individual that registers projects for the purpose of generating emission reductions or removals. In the Reserve software system, project developers may be issued CRTs for the verified emission reductions or removals that their projects achieve. They can also transfer and manage CRTs.
Project owner (limited)	An organization or individual representing a landowner participating in a cooperative or aggregate according to protocol-specific rules and procedures. In the Reserve software system, project owners may register projects that are formally part of a cooperative or an

	aggregation. This account type may also be used for limited transfers of CRTs under the terms and restrictions imposed by the relevant project protocol and/or aggregation guidance and does not include privileges for retiring CRTs.
Project protocol	A Reserve-developed document that contains the eligibility rules, GHG Assessment Boundary, quantification methodologies, monitoring and reporting parameters, etc. for a specific project type. Project protocols are akin to “methodologies” in other offset programs.
Reduction	A verified decrease in GHG emissions caused by a project, as measured against an appropriate forward-looking estimate of baseline emissions for the project.
Registered	A project is considered “registered” when the project has been verified by an approved third-party verification body, submitted by the project developer to the Reserve for approval, and accepted by the Reserve.
Removal	A verified increase in carbon stocks caused by a forest project, as measured against an appropriate forward-looking estimate of baseline carbon stocks for the project.
Reporting period	A discrete period of time over which a project developer quantifies and reports GHG reductions to the Reserve.
Retired	When CRTs are transferred to a retirement account in the Reserve system, they are considered retired. Retirement accounts are permanent and locked, so that a retired CRT cannot be transferred again. CRTs are retired when they have been used to offset an equivalent tonne of emissions or have been removed from further transactions on behalf of the environment.
Submitted	A project is considered “submitted” when all of the appropriate forms have been completed, uploaded, and submitted to the Reserve software.
Trader/Broker/Retailer	An organization or individual that transfers and manages CRTs in the Reserve system, but does not develop its own projects.
Transitioned	An early action project is considered “transitioned” when the project has been listed and successfully completed a verification under the Compliance Offset Program, but has any number of early action-eligible CRTs remaining active or retired in the Reserve program. The project is no longer reporting or seeking credits under the requirements of the relevant Reserve protocol, but is required to meet the MRV requirements of the California Cap-and-Trade Regulation.
User	An individual or entity that holds an account with the Reserve and has agreed to the Terms of Use and shall include such representative as the entity shall appoint and designate by completing the Designation of Authority form.
Verified	A project is considered “verified” when the project verification body has submitted the project’s Verification Statement and the Verification Report in the Reserve system.
Verification body	An organization or company that has been ISO-accredited and

	approved by the Reserve to perform GHG verification activities for specific project protocols.
Verification period	A discrete period of time over which a project's GHG reductions are verified. Under some protocols, a verification period may cover multiple reporting periods. The end date of a verification period must correspond to the end date of a reporting period.
Verifier	An individual that is employed by or subcontracted to an ISO-accredited and Reserve-approved verification body and is qualified to provide verification services for specific project protocols.

Attachment M

Climate Action Reserve, Terms of Use

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)



CLIMATE ACTION RESERVE
TERMS OF USE

JANUARY
2014

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Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

**CLIMATE ACTION RESERVE
TERMS OF USE**

These Terms of Use set out the terms by which the Climate Action Reserve (the “Reserve”), a non-profit public benefit corporation having its principal place of business at 601 West Fifth Street, Suite 650, Los Angeles, California 90071, has agreed to provide the User with access to use the Climate Action Reserve program of the Reserve (the “Program”). The Reserve serves as (1) a voluntary greenhouse gas (“GHG”) registry to protect, encourage, and promote early actions to reduce GHG emissions; and (2) as a California Air Resources Board (ARB) approved Offset Project Registry that meets the requirements of California Code of Regulations section 95986 and lists offset projects, collects Offset Project Data Reports, facilitates verification of Offset Project Data Reports, and issues Registry Offset Credits (or “ROCs”) for offset projects being implemented using a Compliance Offset Protocol as well as early action offset credits (recorded as CRTs on the Reserve’s system) for offset projects being implemented using an Early Action Offset Protocol.

1. Service

- (a) User’s use of the Program, any corresponding software, and the Reserve website, located online at www.climateactionreserve.org, is subject to these Terms of Use, which constitute a binding contract between User and the Reserve. BY USING OR ACCESSING THE PROGRAM, USER ACCEPTS AND AGREES TO BE BOUND BY THESE TERMS OF USE AS MODIFIED FROM TIME TO TIME IN ACCORDANCE WITH THE TERMS HEREOF. User can review the current version of the Terms of Use at any time at <http://www.climateactionreserve.org/how/program/documents/> In addition to these Terms of Use, when using the Program User shall be subject to any general, industry-specific and project-specific guidelines, protocols, and/or operating procedures, including but not limited to the Reserve’s General Reporting Protocols and the Program’s Operating Procedures, applicable to such use (collectively, the “Reserve Protocols”), but only to the extent that the Reserve Protocols do not conflict with the Terms of Use. Certain of the Reserve Protocols may be posted at <http://www.climateactionreserve.org/how/protocols/> from time to time. The Reserve Protocols are incorporated by reference into these Terms of Use. In addition, User agrees to comply with any and all applicable ARB Offset Program Rules and Requirements, as ARB may impose and update from time to time. If User does not agree to these Terms of Use, User may not access or otherwise use the Reserve.
- (b) User recognizes that the Program, and all software, hardware, and data comprising the Program, are either owned by the Reserve or licensed to the Reserve by APX, Inc. (the “Service Provider”). User further recognizes that the compilation of data on the Program is owned entirely by the Reserve.
- (c) User is responsible for providing and maintaining all communications lines, telephone/transmission services, and all equipment and technology, necessary for

User to access and use the Program, and all costs and expenses associated with its accessing and using the Program. User shall take all appropriate steps and precautions to safeguard and protect the access, use, and security of the Program and User's access information from unauthorized users.

- (d) As between the Reserve and User, the Reserve reserves the right, in its sole discretion, to alter, augment, segment, reformat, reconfigure, or otherwise modify at any time the content or methods of transmission of the Program or these Terms of Use and create new versions of the Program or these Terms of Use. If the Reserve creates any such modification of these Terms of Use or any new version of these Terms of Use, the Reserve shall provide notice thereof to User. Following provision of such notice, User shall be entitled to indicate, through a website maintained by the Reserve or the Service Provider, User's agreement to be bound by such modification or new version. If User does not indicate such agreement within fourteen (14) days following the date on which such notice is provided, User shall thereafter cease to have access to the Program until such time as User indicates such agreement.
- (e) The Reserve, through the Program, provides an electronic system to serialize, transfer, track, and report carbon dioxide-equivalent emission reductions, Climate Reserve Tonnes ("CRTs") as defined in the Climate Action Reserve Program Manual available at <http://www.climateactionreserve.org/how/program/program-manual/> and ROCs as defined by ARB in its Cap and Trade Regulation. One CRT and/or ROC shall be created for each metric ton of carbon dioxide-equivalent reduction and each CRT shall be assigned a unique serial number indicating: (i) the CRT or ROC type; (ii) the Project country; (iii) the Project ID; (iv) the Project type; (v) the Project Developer ID; (vi) the State; (vii) the CRT or ROC Vintage; (viii) the CRT or ROC Batch; (ix) the Block Start; and (x) the Block End (each as described in the Reserve Protocols and or the Cap and Trade Regulation).
- (f) The Program is a venue for exchanging information pertaining to business transactions. The Reserve shall post information provided to it by Users in an effort to enable its Users, if they so choose, to undertake transactions or arrangements with other Users; neither the Reserve nor the Service Provider acts as a buyer or seller, or holds title to any product listed on the Program. User acknowledges and agrees that once project information has been uploaded or posted to the Program, such project information cannot and shall not be deleted, removed, expunged or altered, except in accordance with the Reserve's normal operating procedures or as required by ARB. Any subsequent changes or additions to information previously posted shall be posted as an update/amendment, but shall not replace the original posting.
- (g) User acknowledges and agrees that the Reserve, the Program and the Service Provider do not and will not provide any matching services whereby User will be matched with any potential buyer or seller of CRTs or ROCs or services related to the aggregation, verification or certification of emissions data. In the event that

User does enter into a CRT or ROC transaction or an aggregation, verification or certification arrangement with any third party using the Program, the Reserve does not guarantee and shall not be responsible for any obligation arising out of such transaction or arrangement or provide any assurance or guaranty that any such transaction or arrangement ultimately will be consummated.

- (h) Any issues or disagreements that may arise between User and any third party in connection with the use of the Program or any CRT or ROC, or other data in the Program, including, without limitation, relating to whether an ownership or security interest is created in any transferred CRT or ROC, whether any transferred CRT or ROC is considered a “forward contract” under the United States Bankruptcy Code, whether the transferor and/or the transferee of any CRT or ROC are “forward contract merchants” within the meaning of the United States Bankruptcy Code, whether the transferor and/or the transferee of any CRT ROC are “Eligible Contract Participants” as defined in Section 1a(12) of the Commodity Exchange Act, as amended, 7 U.S.C. § 1a(12), or any other issues or disagreements related to such matters, shall be addressed solely between the User and such third party. The Reserve will have no responsibility to address any of the foregoing issues and disagreements, and shall have no liability to User or any third party with respect thereto. The Reserve reserves the right to dispose of any disputed CRTs or ROCs by interpleader or other suitable action in the event of controversy and to deposit any CRTs, ROCs or other items subject to the interpleader action with the relevant court or arbitral panel.
- (i) In order for User to add to the Program any CRTs or ROCs created by any project developed by User, User must provide to the Reserve with respect to each such project, (i) prior to the initial addition of CRTs created by such project, a signed Project Developer’s Attestation of Title, available at <http://www.climateactionreserve.org/how/program/documents/> and (ii) prior to such initial addition of CRTs or ROCs and on an annual basis thereafter, a signed Project Developer's Attestation of Regulatory Compliance, available <http://www.climateactionreserve.org/how/program/documents/> (each attestation referenced in the foregoing clauses (i) and (ii), a "Project Developer's Attestation").

2. Fees

- (a) Fees. User agrees to pay when due the fees and costs for the use of the services provided under these Terms of Use as set forth in the Fee Structure Schedule available at <http://www.climateactionreserve.org/how/program/program-fees/> which may be amended from time to time. All payment of fees and costs shall be made within thirty (30) days after the invoice date.
- (b) Payment. Invoices for Fees will be posted on a secure page within the Program. User will be notified that payment is due upon an invoice being created. User shall pay any Fees charged hereunder by check or wire transfer of immediately available funds in United States dollars on the date and to the account identified

by Administrator from time-to-time on the invoice, or if no date is indicated, no later than thirty (30) days from the date of the invoice (the “Due Date”), without offset or reduction of any kind. Offset Credit Issuance Fees will be automatically invoiced within five (5) months of approval of the reporting period for offset credit issuance if an invoice has not yet been generated by the User within these five (5) months. Late Payment. If User fails to pay when due any fees, costs or other amounts which User is obligated to pay under these Terms of Use, such amounts will be deemed delinquent and will accrue interest at the Interest Rate, such interest to be calculated from and including the due date to, but excluding, the date on which the delinquent amount is paid in full. Acceptance of late payment of any such amounts or of any interest accrued thereon shall not constitute a waiver by the Reserve of User’s default with respect to such late payment, nor prevent the Reserve from exercising any other rights or remedies available to it under the Reserve Protocols, these Terms of Use or any applicable law. If delinquent fees are not paid by User within thirty (30) days of the Due Date, the Reserve maintains the right to freeze User’s access to its account until such time as User pays all outstanding fees, inclusive of interest. Reserve shall bear no liability to User or any third party in connection with Reserve’s exercise of its rights and remedies hereunder.

- (c) Billing Information. User shall provide User’s billing information prior to any Program activity. Invoices will be sent to User by email and will be posted on a secure page accessible by User on the Reserve website. All payments made to the Reserve should be made by wire transfer in immediately available funds in United States dollars to the Reserve account set forth in the Fee Structure Schedule. All payments made to the Reserve will be non-refundable.
- (d) Changes in Fees and Costs. The Reserve may, upon thirty (30) days’ notice to User and in its sole discretion, increase or decrease any or all of the fees and costs payable hereunder at any time. In no event shall any portion of such fees and costs be prorated or refunded to User upon termination of these Terms of Use or termination or suspension of User’s access to the Program. Any use of the Program or the Reserve website by User after the effective date set forth in the notice shall be deemed to constitute acceptance of such changes to the fees and costs payable hereunder.
- (e) Taxes and Other Charges. User shall be responsible for all taxes and charges imposed by a governmental authority related to the use of the Program and all related hardware, software, and services, and any other costs User incurs in connection with the purchase, sale, posting, or transfer of CRTs or ROCs or any other use of the Program. As used herein “taxes” includes, but is not limited to, any or all ad valorem, property, occupation, severance, first use, conservation, gross receipts, privilege, sales, use, consumption, excise, lease, and transaction taxes, and any other taxes and governmental charges, fees, and assessments, or increases therein, other than taxes based on the Reserve’s net income or net worth.

3. Representations, Warranties and Covenants

- (a) Representations and Warranties of User. On the Effective Date and throughout the term of these Terms of Use, User represents and warrants to the Reserve that:
- (i) it is duly organized, validly existing, and in good standing under the laws of the jurisdiction of its formation;
 - (ii) it has all corporate and other authority and all regulatory and other consents, approvals and authorizations necessary for it to legally (A) enter into and perform its obligations under these Terms of Use and the Reserve Protocols and (B) engage in all of its activity (including the creation, receipt and transfer of CRTs and/or ROCs) on or relating to the Program;
 - (iii) the person indicating User's acceptance of these Terms of Use through a website maintained by the Reserve or the Service Provider has the authority to enter into these Terms of Use on behalf of User, and these Terms of Use are binding on User and enforceable against User in accordance with their terms;
 - (iv) it has examined and is familiar with the statements and other data and information submitted by it or on its behalf to the Reserve, and, to the best of its knowledge and belief, such statements and information are true, accurate, and complete;
 - (v) any CRTs added to the Program by it have been created and Verified in accordance with the Reserve Protocols, and any ROCs added to the Program by it have been created and Verified in accordance with the Compliance Offset Protocols;
 - (vi) all legal title to and all Beneficial Ownership Rights in (A) each CRT or ROC held or retired in any account held by User (except for any CRT or ROC retired in a Group Retirement Subaccount) are held by User and (B) each CRT or ROC retired in any Group Retirement Subaccount held by User are held in accordance with the requirements set forth in Section 9(b)(i);
 - (vii) all rights, title and interest in all data and other information provided to the Reserve or input into the Program by User are held by User or, with respect to any data or other information relating to any CRT or ROC retired in a Group Retirement Subaccount held by User, the applicable CRT or ROC Owner (as defined in Section 9(b)(i)), and all such data and other information are true and correct in all material respects;
 - (viii) it has made, and will make, its own review of any potential CRT or ROC brokers, sellers, or buyers, and it has not relied on any representation of the Reserve, express or otherwise, with respect to any CRT or ROC brokers, sellers, or buyers, nor has the Reserve made any such representation to User; and

- (ix) any other representation, warranty, attestation or certification made to the Reserve by or on behalf of User, whether prior to, on or following the Effective Date (including without limitation any of the foregoing contained in any Project Developer's Attestation, any Regulated Person Attestation provided pursuant to Section 9(c)(i), or any certification provided pursuant to clause (C) of Section 9(b)(iii), each of which is incorporated herein by reference, is true and correct in all respects.
- (b) Covenants of User. On the Effective Date and throughout the term of these Terms of Use, User covenants to the Reserve that:
 - (i) it will maintain its user ID and password in strict confidence, will allow only its employees and other representatives access to its account(s) and will promptly notify the Reserve of any suspected unauthorized use of the Program or other breach of security; and
 - (ii) it will comply at all times with the Reserve Protocols and/or Compliance Offset Protocols as applicable, these Terms of Use, the Reserve's program rules, and all laws applicable to its use of the Reserve.
- (c) Representations and Warranties of the Reserve. On the Effective Date and throughout the term of these Terms of Use, the Reserve represents and warrants to User that:
 - (i) to the Reserve's knowledge, (A) the Program, the Reserve Protocols and these Terms of Use comply in all material respects with any applicable laws, regulations and orders to which they may be subject, and (B) the Reserve possess any applicable licenses, authorizations, permits, consents and approvals of any governmental entity or other governmental authority that may be required to be possessed by the Reserve in connection with the operation of the Reserve and the Program; and
 - (ii) to the Reserve's knowledge, use of the Program by User in accordance with the provisions of this Agreement does not and will not infringe the intellectual property rights of any third party in the United States.

4. Certain Acknowledgements and Agreements

- (a) Relationship of the Parties. User acknowledges and agrees that the Reserve is merely providing a service and, accordingly, that: (i) neither the Reserve nor the Service Provider has any special or fiduciary relationship to User or any other user of the Reserve; (ii) neither the Reserve nor the Service Provider is User's agent or advisor; and (iii) these Terms of Use create no relationship of partnership, joint venture, employment, franchise, or agency between the Reserve or the Service Provider and User.
- (b) Program Transfers. User acknowledges and agrees that all CRT and/or ROC transactions shall be performed or settled by it and any third party in accordance

with such separate agreements as may exist between User and the relevant third party. User acknowledges and agrees that neither the Reserve nor the Service Provider assumes any responsibility for the performance or settlement of any transactions. Moreover, User acknowledges and agrees that the Reserve is not in any way involved with ARB's CITSS process and has no control over the disbursement of ARBOCs on the CITSS system. User acknowledges and agrees that it shall perform or settle any ARBOC transactions in accordance with such separate agreements as may exist between User and any third party(ies).

- (c) Overissuance. User acknowledges and agrees that in the event that the Reserve or ARB determines that GHG reductions or removals for a project were incorrectly quantified or reported, such that the number of CRTs or ROCs issued to the User was in excess of the correct number according to the requirements of the applicable protocol, it is the User's responsibility to compensate for the over-issuance of CRTs or ROCs, irrespective of whether the CRTs or ROCs are still held by the User. Additional details relating to CRT or ROC overissuance are included in the Reserve's Program Manual. The obligation to compensate for any over-issuance of CRTs or ROCs survives the end of the term of these Terms of Use.
- (d) Issuance of ROCs. User acknowledges and understands that the Reserve's issuance of ROCs or CRTs is no guarantee of ARB's issuance of ARBOCs, and that ARB may determine, pursuant to the ARB Offset Program Rules and Requirements, that fewer or no ARBOCs will be issued relative to the quantity of CRTs or ROCs issued by the Reserve. In such instances, the Reserve maintains the right to cancel the quantity of CRTs or ROCs that it issued in excess of the number of ARBOCs issued by ARB or take other action that it deems appropriate, in light of the circumstances and facts available to the Reserve.

5. Limitation of Liability and Indemnification

- (a) LIMITATION OF LIABILITY. USER ASSUMES FULL RESPONSIBILITY AND RISK OF LOSS RESULTING FROM ITS USE OF THE PROGRAM. OTHER THAN WHERE LIABILITIES ARE DETERMINED BY FINAL ADJUDICATION TO HAVE BEEN CAUSED BY THE RESERVE'S WILLFUL MISCONDUCT, THE RESERVE'S SOLE LIABILITY RELATING IN ANY WAY, WHETHER DIRECTLY OR INDIRECTLY, TO THE PROGRAM (INCLUDING WITHOUT LIMITATION ANY SERVICE DISRUPTION) OR TO THESE TERMS OF USE (INCLUDING WITHOUT LIMITATION THE PERFORMANCE OR NONPERFORMANCE BY THE RESERVE OF ITS OBLIGATIONS HEREUNDER), WHETHER CAUSED BY THE NEGLIGENCE OF THE RESERVE OR OTHERWISE, AND REGARDLESS OF WHETHER ANY CLAIM FOR DAMAGES IS BASED IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE, IS LIMITED TO AN AGGREGATE AMOUNT EQUAL TO THE FEES PAID BY USER TO THE RESERVE DURING THE ONE-YEAR PERIOD IMMEDIATELY PRECEDING THE EARLIEST DATE ON WHICH ANY SUCH CLAIM IS OR

CLAIMS ARE MADE BY USER. IN NO EVENT SHALL THE RESERVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, PUNITIVE OR INDIRECT DAMAGES, FOR ANY ECONOMIC OR COMMERCIAL LOSSES, OR FOR ANY LOSS OF USE, LOSS OF DATA, LOSS OF BUSINESS, PERSONAL INJURIES, OR PROPERTY DAMAGES SUSTAINED BY USER OR ANY THIRD PARTIES, EVEN IF THE RESERVE HAS BEEN ADVISED BY USER OR ANY THIRD PARTY OF THE POSSIBILITY OF SUCH DAMAGES. USER HEREBY RELEASES AND DISCHARGES THE RESERVE, ANY WHOLLY OWNED SUBSIDIARIES OF THE RESERVE, ANY OTHER CORPORATE AFFILIATES OF THE RESERVE, THEIR SUCCESSORS AND ASSIGNS, AGENTS, DIRECTORS, OFFICERS, EMPLOYEES, CONTRACTORS, SERVICE PROVIDERS (INCLUDING, WITHOUT LIMITATION, THE SERVICE PROVIDER), AND VENDORS FROM ANY AND ALL LIABILITY WITH RESPECT TO ANY DAMAGES OR INJURIES INCURRED BY USER AS RELATES TO THE PROGRAM.

- (b) No Counterparty Liability. The Reserve shall not be liable (i) for the acceptability of or for any action or omission of any counterparty to or other third party involved in any transaction or arrangement that relates to CRTs and/or ROCs or that is entered into or consummated with the use of the Program (including without limitation any CRT or ROC provider or buyer and any verification or certification provider) or (ii) for the enforceability of or for any loss, expense or other liability arising from any such transaction or arrangement.
- (c) Indemnification. User agrees to indemnify, defend, and hold harmless the Reserve and its independent contractors (including, without limitation, the Service Provider) and their respective officers, directors, owners, employees, agents, affiliates, successors and assigns (collectively, the “Indemnified Party”) against and from any losses, liabilities, damages, judgments, awards, fines, penalties, actions, claims, costs, and expenses, including, without limitation, any amounts paid in settlement or compromise and any fees and costs of counsel and experts, (collectively, "Losses") incurred, directly or indirectly, in connection with or by reason of, or in any way relating to or arising out of:
- (i) User’s use of the Program or the Reserve’s website and/or any violation of any law, rule, or regulation arising from such use;
 - (ii) any breach of any representation or warranty set forth in, and any failure to perform any covenant, obligation or agreement under, these Terms of Use by User, or any violation by User of these Terms of Use or the Reserve Protocols;
 - (iii) any claim, action or proceeding asserted or brought by a third party arising out of any actual or alleged act or omission of User;

- (iv) any failure of any CRTs or ROCs posted or transferred by User on the Program to conform with the Reserve's or ARB's requirements;
- (v) any information supplied by or through User, any transaction or arrangement entered into by User with any third party, or any misuse or improper disclosure of any information by User;
- (vi) any dispute between User and any third party with respect to any CRTs or ROCs (including, without limitation, any such dispute arising from or relating to any transaction between User and a third party with respect to the purchase, sale, or exchange of CRTs or ROCs, or to the aggregation, verification or certification of emissions data);
- (vii) any loss suffered by or other harm to any person or property (including, without limitation, any personal injuries or death of any third person) in any way relating to or caused in whole or in part by the posting, purchase, sale or exchange of CRTs or ROCs by User or any other activity of User conducted using the Program;
- (viii) any action (including, without limitation, any message, request to buy, offer to sell, bid to buy, and request for new suppliers) taken by any third person through User's account or using User's password on the Program, whether or not such third person gains access to such account or password as the result of any negligence or lack of vigilance by User; and
- (ix) the enforcement of the release, indemnity and other obligations referred to in this Section 5.

in any case, except to the extent any such Losses result from the Indemnified Party's fraudulent conduct or willful misconduct.

With respect to any claim or action for which indemnification will be sought by the Indemnified Party, such Indemnified Party will promptly, after it becomes aware of such claim or action, notify User in writing in as much detail as reasonably practicable as to the existence and nature of such claim or action. Provided that User has acknowledged in a written notice delivered to the Reserve that it is obligated under this Section 5(c) to indemnify, defend and hold harmless such Indemnified Party against and from all Losses incurred, directly or indirectly, in connection with or by reason of, or in any way relating to or arising out of such claim or action, User shall have the right to conduct, at its own expense, with counsel of its own selection (provided such counsel is reasonably acceptable to the Reserve), the defense and any settlement negotiations with respect to such claim or action. The Indemnified Party, at User's expense, shall render all reasonable assistance requested by User in the defense of such claim or action.

6. **Limited Warranty; Disclaimer of Warranty**

- (a) The data contained in the Program has been gathered by the Reserve from sources believed by the Reserve to be reliable. However, neither the Reserve nor the Service Provider warrants that the information in the Program is correct, complete, current, or accurate, or that the software programs in the Program will be error or bug-free, secure or free from service disruption.
- (b) USER ACKNOWLEDGES, UNDERSTANDS AND ACCEPTS THAT THE PROGRAM IS PROVIDED ON AN “AS IS” BASIS AT USER’S SOLE RISK. NEITHER THE RESERVE NOR THE SERVICE PROVIDER MAKES ANY REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THESE TERMS OF USE, THE RESERVE PROTOCOLS OR COMPLIANCE OFFSET PROTOCOLS, OR THE ADEQUACY OR PERFORMANCE OF THE PROGRAM, AND THE RESERVE AND THE SERVICE PROVIDER HEREBY DISCLAIM ANY SUCH WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES ARISING FROM ANY COURSE OF DEALING, USAGE, OR TRADE PRACTICE. USER ACKNOWLEDGES THAT SERVICE OR MAINTENANCE DISRUPTIONS MAY OCCUR FROM TIME TO TIME. THE RESERVE AND THE SERVICE PROVIDER FURTHER DISCLAIM ANY LIABILITY FOR (1) ERRORS, OMISSIONS, OR OTHER INACCURACIES IN ANY PART OF THE PROGRAM, OR THE REPORTS, CRTS, ROCS, OR OTHER INFORMATION COMPILED OR PRODUCED BY OR FROM OR INPUT INTO THE PROGRAM, (2) ANY DELAYS, OMISSIONS OR INTERRUPTIONS THEREIN, AND (3) FOR THE ACTS OR OMISSIONS OF ANY BROKER OR AGENT AUTHORIZED WITHIN THE PROGRAM BY USER TO UTILIZE THE PROGRAM SERVICES ON BEHALF OF USER.
- (c) The Reserve and the Service Provider are not responsible for the acts or omissions of parties who aggregate, input, verify or certify data for the Program or from whom data is obtained for inclusion in the Program, nor is the Reserve or the Service Provider responsible for any obligation of any User to provide or deliver a product or service or to pay any User for a product or service.
- (d) Neither the Reserve nor the Service Provider assumes any responsibility for, and neither shall be liable for, any damages to, or viruses that may infect, User's equipment or other property on account of User’s access to and use of the Program.
- (e) User is solely responsible for the protection, security, and management of its computer network and of all usage thereof. Neither the Reserve nor the Service Provider will compensate User for damages incurred due to violations of the security of User’s computer network, nor shall User make deductions or set offs of any kind from or against fees due to the Reserve in respect of any such damages.

7. **Term; Termination and Suspension**

- (a) The term of these Terms of Use shall commence on the Effective Date and shall continue until User's access to the Program is terminated pursuant to Section 7(b) or (c) hereof. The following, however, shall survive any termination of such term: (i) the provisions of Section 5 (Limitation of Liability and Indemnification), Section 6 (Limited Warranty; Disclaimer of Warranty), this Section 7, Section 8 (Confidentiality and Intellectual Property Rights), Section 9(b)(v) (Ownership of CRTs and/or ROCs) and Section 10 (Miscellaneous); (ii) any provision of these Terms of Use that by its terms survives such termination, such as, but not limited to Section 4(c) (Certain Acknowledgments and Agreements); and (iii) any obligation to pay any fees, costs or other amounts incurred by User prior to or concurrently with such termination.
- (b) User may terminate its access to the Program, for any reason, by providing at least thirty (30) days prior written notice to the Reserve.
- (c) The Reserve may terminate or suspend User's access to the Program at any time with or without cause and without prior notice to User. Without limiting any other remedies or limiting the foregoing, the Reserve may terminate or suspend User's access to the Program if User is found to have engaged in fraudulent, unethical, or illegal activity in connection with the Program, the Reserve or its website, tampered with, damaged or destroyed the Program or any portion thereof or any data therein, failed to pay any fees, costs or other amounts required to be paid under these Terms of Use within five (5) Business Days of the applicable due date, breached any representation, warranty, covenant or agreement contained herein, or otherwise failed to abide by these Terms of Use, the Reserve Protocols, or the Compliance Offset Protocols. In the event that the Reserve terminates or suspends User's access to the Program pursuant to the preceding sentence or otherwise for cause, User shall be liable for all attorneys' fees and other amounts incurred by the Reserve and/or the Service Provider in connection with such termination or suspension and the events and conditions leading to such termination or suspension. The Reserve shall provide User with written notice via email of any termination or suspension effected pursuant to this subsection (c) within fifteen (15) Business Days following such termination or suspension.
- (d) The Reserve, in its sole discretion, may reinstate User's access to the Program after termination for cause upon the Reserve's determination that User has resolved the issue(s) that prompted the termination and upon receipt of User's full payment of all fees and other amounts due prior to the termination. Any such reinstatement, however, shall be conditioned upon User's payment to the Reserve in advance thereof of a reinstatement fee equal to the fees which would have been due during the period in which User's access to the Program was terminated. In addition, the Reserve shall reinstate User's access to the Program after termination for cause if directed to do so as a result of the outcome of a dispute resolution proceeding under these Terms of Use. Whether payment of the reinstatement fee described above is required in such an instance shall be determined as part of such dispute resolution proceeding. The term of these Terms of Use shall be reinstated

concurrently with any reinstatement of User's access to the Program pursuant to this subsection (d).

- (e) User acknowledges that the Reserve may, in its sole discretion, with or without cause or prior notice to the User, temporarily or permanently cease to operate the Program, temporarily or permanently cease to make CRTs or ROCs or other services described hereunder available, or terminate or suspend User's access to the Program.

8. Confidentiality and Intellectual Property Rights

(a) Confidentiality.

- (i) The Reserve agrees to use and maintain Confidential Information provided by User in accordance with the Reserve Protocols and Compliance Offset Protocols, except as may be otherwise required or permitted under this Section 8(a), under Section 9(b)(v), or as requested by ARB pursuant to its Offset Program Rules and Requirements. User acknowledges that the Reserve will relay Confidential Information to the Service Provider for the purpose of maintaining the Program and consents to and authorizes data sharing between the Reserve and the Service Provider. The Reserve and User shall each use commercially reasonable efforts to protect any Confidential Information of the other party from unauthorized disclosure or use, using at least the same level of care as it uses to protect its own Confidential Information. The Reserve and User each agree not to use or disclose Confidential Information of the other party except to the extent that such use or disclosure is (A) reasonably necessary to perform under the Reserve Protocols, the Compliance Offset Protocols, or these Terms of Use (including, without limitation, in connection with the production of reports or information requested by ARB); or (B) authorized in writing by the other party. Neither the Reserve nor User shall be deemed to have breached these Terms of Use on account of the use or disclosure of any Confidential Information of the other party if (i) such use or disclosure is reasonably necessary to comply with any applicable law, regulation, order or other legally enforceable requirement, or any request by any governmental authority having jurisdiction over the Reserve (including ARB), User CRTs or ROCs and (ii) the party using or disclosing such Confidential Information provides to the other party, as soon as reasonably practicable and, in any event, in advance of such use or disclosure, written notice of such use or disclosure so that the other party may seek a protective order or other appropriate remedy. With respect to requests from ARB for Confidential Information relating to a particular offset project in connection with ARB's review or crediting of that project, the Reserve may disclose User information to ARB without providing written disclosure to User.

- (ii) If a User retires one or more CRTs and/or ROCs, notwithstanding anything to the contrary in these Terms of Use, the following information related to such retirement shall be subject to public disclosure by or at the direction of the Reserve, in such manner (including, without limitation, by inclusion in one or more reports posted on the Reserve's website) and at such times as the Reserve may determine in its sole discretion: (A) the name of User, (B) the number of retired CRTs or ROCs, (C) the vintage and serial numbers of the retired CRTs or ROCs, (D) the date of such retirement, (E) the name, type and identification number of the project and the location of the project site associated with the retired CRTs or ROCs, (F) if applicable, a statement to the effect that the retirement was effected on behalf of another person or organization, and (G) any information not covered by the preceding clause (F) voluntarily disclosed by User to the Reserve regarding the reason for such retirement; *provided, however*, that nothing in this paragraph (ii) shall be construed to permit the public disclosure of any name, email address or reason for the retirement of any CRT or ROC that is deemed to be Confidential Information pursuant to Section 9(b)(v) or to limit any provision of Section 9(b)(v).
 - (iii) If User obtains access to data in the Program that: (A) is not data provided or owned by User; (B) is not part of a publicly available Program report; and (C) User is not otherwise authorized to use, then, regardless of whether such data is otherwise considered information subject to the provisions of this Section 8(a), User shall: (X) immediately notify the Reserve that User has obtained such access; and (Y) not disclose, disseminate, copy, or use any such information.
 - (iv) The Reserve and User will each be entitled to all remedies available at law or in equity to enforce, or seek relief in connection with, the obligations of the other party under this Section 8(a).
- (b) Intellectual Property.
- (i) User hereby grants to the Reserve and the Service Provider, subject to Section 8(a), a perpetual, royalty-free license to (A) use, reproduce, distribute, display and prepare derivative works from data provided by User (“User Data”) and Confidential Information provided by User, and (B) grant sublicenses to such User Data and Confidential Information to subcontractors and other third parties, in each case to the extent reasonably necessary to perform any obligations of the Reserve under these Terms of Use, the Reserve Protocols, and the Compliance Offset Protocols, and to fulfill the purposes of the Program.
 - (ii) The rights and obligations of these Terms of Use shall run to the named parties and their successors in interest and permitted assigns. User shall ensure that any of its owners, trustees, members, officers, directors,

employees and agents to whom it has provided access to the Program agree to be bound by these Terms of Use.

- (iii) User acknowledges and agrees that the rights and licenses provided to User under these Terms of Use and the Program's Operating Procedures are solely for the benefit of User and are to be exercised only in connection with User's use of the Program. User may not transfer, assign or sublicense its rights, licenses or account, or any portion thereof, to any third party without the prior written consent of the Reserve, which consent the Reserve may withhold in its sole discretion.
- (iv) User acknowledges that (A) the Reserve is and shall remain the sole owner of all aggregated data embodied in the Program, and of the selection, arrangement and compilation of such aggregated data, (B) the Service Provider has granted the Reserve a limited license to the Program operating system, including any components, modifications, adaptations and copies thereof (the "System"), and the software used in providing, accessing (other than commercially available third party internet browsers) or using the Program ("Software"), and (C) the Service Provider is the sole owner of the System and the Software. Except as provided herein, User shall not obtain, have or retain any right, title or interest in or to the Program, the System or the Software or any part thereof, and without limiting the generality of the foregoing, no person or organization on whose behalf User is authorized to act shall acquire any rights or license under these Terms of Use. The rights granted to User are solely defined by these Terms of Use and the Reserve Protocols and include, but are not limited to, permission to use the Program as set forth herein. User's rights under these Terms of Use do not include a transfer of title or any other ownership interest in the Program, its content or any part thereof, to User. User agrees not to contest or challenge the Reserve's or the Service Provider's ownership of the Program, the System, the Software and associated intellectual property rights and not to take any action that would infringe, misappropriate, constitute unfair competition with respect to, or otherwise violate the Reserve's or the Service Provider's ownership of or rights in the Program, the System or the Software.
- (v) User shall prevent the use or copying of the Program and any other supporting materials by User's employees and agents except as permitted by the terms and conditions of the Reserve Protocols and these Terms of Use.
- (vi) The Reserve grants User non-exclusive, non-transferable permission to access, retrieve and download data from the Program subject to these Terms of Use and the Reserve Protocols, which grant shall not be effective until User has: (A) indicated User's acceptance of these Terms of Use through the Reserve website, (B) paid all applicable fees due under these Terms of Use and the Reserve Protocols, and (C) completed and submitted

to the Reserve the online registration available on the Reserve website. User will take all appropriate steps and precautions to safeguard and protect the access, use and security of the Program and User's user access information from unauthorized users.

- (vii) User shall be subject to the following limitations:
- (1) User shall not loan, share, publish, republish, copy, reproduce, disclose, transmit, display, sell, license, lease or distribute any portion of the Program or any data thereon to any third party, or use the Program as a basis for a directory or database prepared for commercial sale or distribution; provided, however, nothing shall prohibit internal business use or reporting to governmental agencies or User's end use customers;
 - (2) User shall not remove any copyright, trademark, or other proprietary notices contained in the Program;
 - (3) User shall not disassemble, decode, decompile or otherwise reverse engineer any interfaces or software programs comprising the Program;
 - (4) User shall not access, download, transfer or manipulate data and databases comprising the Program using protocols or interfaces other than those provided by the Reserve as part of the Program;
 - (5) User shall not have access to or make any use of the source code for the Program; and
 - (6) User shall not infringe or misappropriate the Program or take any action inconsistent with the Reserve's and the Service Provider's ownership of and rights in the Program and the Software.
- (viii) The Reserve and the Service Provider reserve all rights in the Program (to the extent of their interests therein) not expressly granted to User in these Terms of Use.
- (ix) To the extent any bulletin board, chat room or any other similar forum on the Program (together, the "Boards") exists, neither the Reserve nor the Service Provider is responsible for the content or accuracy of any material posted on the Boards, including without limitation any information regarding any CRT or ROC provided by any user of the Program or any other third party. If any Boards are established, the Reserve would merely be providing access to the material posted thereon as a service to User. The Boards shall be used only in a non-commercial manner. In using any Boards, User agrees not to upload, transmit, distribute or otherwise publish thereon any material that is, to the best of User's knowledge after reasonable investigation: libelous, defamatory, obscene, abusive,

pornographic, threatening, inaccurate, or an invasion of privacy; an infringement of the intellectual property rights, including, but not limited to, copyrights and trademarks, of any individual or organization; material that is illegal in any way or that advocates illegal activity under any applicable local, state, national, or international law, statute, regulation, ordinance or other means of establishing legal rights and obligations; an advertisement or solicitation of funds, goods or services; a message posted by a user impersonating any other person; personal information such as messages which identify personal phone numbers, account numbers, personal addresses, or employer references; or chain letters or serial communications of any kind. User also agrees to indemnify the Reserve and the Service Provider for any claims or suits arising from User's posting of such material on any such Boards. The Reserve and the Service Provider reserve the right to monitor and delete any postings deemed inconsistent with the Reserve Protocols, their policies or these Terms of Use. Neither the Reserve nor the Service Provider assumes any obligation to monitor material in the Boards or any liability for failing to either monitor the Boards or remove specific material.

- (x) In using the Program, User agrees:
- (1) not to disrupt or interfere with the security of, or otherwise abuse, the Program, or any services, system resources, accounts, servers, or networks connected to or accessible through the Program or affiliated or linked websites;
 - (2) not to disrupt or interfere with any other user's permitted enjoyment of the Program or affiliated or linked websites in accordance with the Terms of Use, the Reserve Protocols, and ARB Offset Program Rules and Requirements, as applicable;
 - (3) not to upload, post, or otherwise transmit through or on the Program any viruses or other harmful, disruptive, or destructive files;
 - (4) not to use, frame, or utilize framing techniques to enclose any Reserve or Service Provider trademark, logo, or other proprietary information (including the images found at the Program website, the content of any text, or the layout/design of any page or form contained on a page) without the express written consent of the owner of such information;
 - (5) not to use meta tags or any other "hidden text" utilizing the Service Provider's or Reserve's name, trademark, or product name except in accordance with the Reserve Protocols and these Terms of Use;
 - (6) not to "deeplink" to the Program website without the Reserve's express written consent;
 - (7) not to create or use a false identity on the Program;

- (8) not to collect or store personal data about others obtained through the Program;
- (9) not to attempt to obtain unauthorized access to the Program or portions of the Program website that are restricted from general access;
- (10) not to post any material that is false and/or defamatory, inaccurate, abusive, vulgar, hateful, harassing, obscene, profane, sexually oriented, threatening, invasive of a person's privacy, or otherwise in violation of any applicable law; and
- (11) not to post any copyrighted material unless the copyright is owned by User, which posting shall be deemed consent by User of the publication of such copyrighted material on the Program website.

9. **Ownership of CRTs and/or ROCs; Action with Respect to CRTs and/or ROCs on Behalf of Third Parties**

- (a) Except as otherwise permitted under Sections 9(b) or 9(c), (A) User will only hold or retire in its account(s) CRTs and/or ROCs for which it is the sole holder of all legal title and all Beneficial Ownership Rights, and (B) User may not hold any account(s), or hold or retire in its account(s) any CRTs and/or ROCs on behalf of one or more third parties.
- (b) User may retire CRTs and/or ROCs on behalf of one or more third parties, provided that any such retirement may be effected only in a specialized type of subaccount, referred to herein as a "Group Retirement Subaccount," and that User shall comply with the following requirements applicable to such subaccounts:
 - (i) All legal title to and all Beneficial Ownership Rights in any CRT or ROC retired in a Group Retirement Subaccount must be held by one or more individuals or organizations (collectively, a "CRT Owner" or "ROC Owner") that have authorized User in writing to retire such CRT or ROC on their behalves and to provide any data or other information relating to such CRT or ROC to the Reserve (except to the extent that User may be deemed to hold or share with the applicable CRT Owner or ROC Owner any legal title to or Beneficial Ownership Rights in such CRT or ROC).
 - (ii) Any retirement of any CRT or ROC in a Group Retirement Subaccount shall be effected solely on behalf of the applicable CRT Owner or ROC Owner.
 - (iii) If User retires more than an aggregate of 99 CRTs or ROCs in one or more Group Retirement Subaccounts during a calendar year on behalf of any individual or organization, in effecting each retirement in excess of 99 CRTs or ROCs , (A) User shall concurrently report to the Reserve through an electronic interface comprising part of the Program the name and email address of such individual or organization (and, if applicable, of each

other individual or organization comprising the CRT Owner or ROC Owner on whose behalf such retirement is effected), (B) User shall concurrently report to the Reserve through an electronic interface comprising part of the Program the reason for such retirement of CRTs or ROCs, which information shall not be disclosed by the Reserve unless User chooses to have it made public, and (C) User shall concurrently provide to the Reserve through an electronic interface comprising part of the Program a certification, having content reasonably satisfactory to the Reserve, that User has received from such individual or organization (and, if applicable, from each other individual or organization comprising the CRT Owner or ROC Owner on whose behalf such retirement is effected) an authorization of the variety contemplated by the above paragraph (i) with respect to the CRT(s) or ROC(s) so retired.

- (iv) If User effects any retirement of one or more CRTs or ROCs in one or more Group Retirement Subaccounts on behalf of any individual or organization and, including the CRTs or ROCs so retired, the aggregate number of CRTs or ROCs retired by User in one or more Group Retirement Subaccounts on behalf of such individual or organization during the applicable calendar year does not then exceed 99 CRTs or ROCs, User may voluntarily concurrently report to the Reserve through an electronic interface comprising part of the Program the types of information specified in the above clauses (A) and/or (B) with respect to such retirement.
- (v) All information reported pursuant to clause (A) or (B) of the above paragraph (iii) or pursuant to the above paragraph (iv) shall be deemed to be Confidential Information for all purposes of these Terms of Use (including, without limitation, Section 8(a)); *provided, however*, that if User retires more than an aggregate of 99,999 CRTs and/or ROCs in one or more Group Retirement Subaccounts during a calendar year on behalf of any individual or organization, notwithstanding anything to the contrary in these Terms of Use, all information that has been reported or that is subsequently reported pursuant to clause (A) or (B) of the above paragraph (iii) or pursuant to the above paragraph (iv) (except for any email addresses so reported) with respect to any CRTs and/or ROCs retired by User on behalf of such individual or organization during such calendar year, (X) shall thereafter be deemed not to be Confidential Information for any purpose of these Terms of Use (including, without limitation, Section 8(a)) and (Y) shall be subject to public disclosure by or at the direction of the Reserve, in such manner (including, without limitation, by inclusion in one or more reports posted on the Reserve's website) and at such times as the Reserve may determine in its sole discretion.

Solely for purposes of applying the 99 and 99,999 CRT and/or ROC thresholds set forth in the above paragraphs (iii), (iv) and (v), respectively,

if a CRT or ROC is retired on behalf of a CRT Owner or ROC Owner comprised of multiple individuals and/or organizations, it shall be deemed to have been retired on behalf of each such individual and/or organization.

- (c) User may hold CRTs or ROCs in its account(s) on behalf of one or more third parties, provided that:
- (i) User is a Regulated Person and has provided to the Reserve a signed Regulated Person Attestation, available at <http://www.climateactionreserve.org/how/program/documents/>; *provided, however*, that the Reserve may, in its sole discretion, waive the requirements set forth in this paragraph (i) with respect to User by providing User with written notice of such waiver;
 - (ii) All legal title to and all Beneficial Ownership Rights in any CRT or ROC so held by User is held by one or more CRT Owners or ROC Owners that have authorized User in writing to hold CRTs or ROCs on their behalves and to provide any data or other information relating to such CRT or ROC to the Program and the Reserve (except to the extent that User may be deemed to hold or share with the applicable CRT Owner or ROC Owner any legal title to or Beneficial Ownership Rights in such CRT or ROC);
 - (iii) All legal title to and all Beneficial Ownership Rights of any CRT Owners or ROC Owners are limited to: (1) holding CRTs or ROCs in User's account for the purpose of voluntary retirement per the requirements of Section 9(b); and/or (2) holding CRTs or ROCs (owned by CRT Owners or ROC Owners only) for the purpose of future transfer to other Users of the Reserve Program per the requirements of Section 4(b).
 - (iv) Under no circumstances may any CRT Owners or ROC Owners that are not Users meeting the requirements of Section 9(c)i maintain any Beneficial Ownership Rights, or provide any CRT or ROC custodial services to any third party or organization.
 - (v) User complies with all applicable laws, regulations or other legally enforceable requirements, including without limitation applicable provisions of the USA PATRIOT Act and the regulations of the Office of Foreign Assets Control of the U.S. Department of the Treasury;
 - (vi) User maintains a customer identification program that contains reasonable procedures to verify the identity of any individual or organization on whose behalf User is holding CRTs or ROCs and maintains records of the information used to verify such identity, which records will be made available to the Reserve upon request; and
 - (vii) User complies with the requirements of Section 9(b) in connection with any retirement of CRTs or ROCs it holds on behalf of one or more third parties.

- (d) User acknowledges that neither the Reserve nor the Service Provider shall have any liability in connection with any misrepresentation by User relating to the ownership of any ROC or CRT in any account or subaccount held by User (including without limitation the identity of the person(s) holding any legal title thereto or Beneficial Ownership Rights or other proprietary rights therein).

10. Miscellaneous

- (a) Assignment. User shall not assign these Terms of Use or any of its rights, benefits, duties, and obligations hereunder without the prior written consent of the Reserve, which consent the Reserve may withhold in its sole discretion. These Terms of Use shall be binding upon and inure to the benefit of the respective parties and their respective successors and permitted assigns.
- (b) Entire Agreement. These Terms of Use and the Reserve Protocols or, as applicable, the Compliance Offset Protocols, constitute the entire agreement of the parties relating to the matters herein provided or contemplated and supersede any prior agreement between the parties in that regard.
- (c) Governing Law and Dispute Resolution.
- (i) These Terms of Use shall be governed by the laws of the State of California without regard to its rules on conflicts of laws.
- (ii) In the event of any claim or controversy arising out of or relating to these Terms of Use, or the breach thereof, or any other claim or controversy between the parties (any such claim or controversy, a “Dispute”), the parties first shall attempt in good faith to settle such claim or controversy by mediation administered by J·A·M·S under its International Mediation Rules then in effect, which mediation shall take place in Los Angeles, California. At least fifteen (15) days prior to the commencement of such mediation, the party seeking to mediate (the “Demanding Party”) shall give the other party written notice describing the Dispute and the amount as to which it intends to initiate the action, as well as providing all supporting documentation available to the Demanding Party.
- (iii) Any Dispute that has not been resolved by mediation as provided herein within thirty (30) days after commencement of the mediation shall be finally resolved by arbitration administered by J·A·M·S and all proceedings shall be held in Los Angeles, California. The arbitration will be conducted in accordance with the provisions of J·A·M·S's Comprehensive Arbitration Rules and Procedures in effect at the time of filing of the demand for arbitration. The parties will cooperate with J·A·M·S and with one another in selecting an arbitrator from J·A·M·S panel of neutrals, and in scheduling the arbitration proceedings. The parties shall participate in the arbitration in good faith and shall share equally in its costs.

- (iv) The provisions of this Section 10 may be enforced by any court of competent jurisdiction, and the party seeking enforcement shall be entitled to an award of all costs, fees, and expenses, including attorneys fees, to be paid by the party against whom enforcement is ordered. The parties shall continue to perform their respective obligations under these Terms of Use during the pendency of dispute resolution proceedings, including mediation and arbitration. Each party waives, to the fullest extent permitted by applicable law, any right it may have to a trial by jury in respect of any Dispute.
- (v) Excepts as otherwise provided herein, each party shall be responsible for the payment of all of its costs associated with the resolution of any Dispute, whether in mediation, arbitration or before a court of law, including but not limited to any filing fees, mediator or arbitrator fees, its reasonable attorneys fees, and other costs incurred in such proceeding, provided that if a Dispute is initiated in bad faith, as determined by the mediator, arbitrator or court, the party initiating the Dispute shall be responsible for all of the other party's defense costs.
- (vi) The parties agree that neither may bring a claim nor assert a cause of action against the other, in any forum or manner, more than one (1) year after the later of (A) the date on which the claim or cause of action accrued and (B) the earliest date on which the aggrieved party could have reasonably discovered the wrong giving rise to the claim or cause of action.
- (d) No Third Party Beneficiaries. Except as set forth elsewhere in these Terms of Use, these Terms of Use confer no rights whatsoever upon any person other than the parties and shall not impose, or be interpreted as imposing, any standard of care, duty, or liability upon any person other than a party.
- (e) Severability. If any term or provision of these Terms of Use is held to be invalid or unenforceable in any respect, the validity and enforceability of the remaining terms and provisions of this Agreement shall not in any way be affected or impaired thereby.
- (f) Force Majeure. To the extent the Reserve is prevented by Force Majeure from fully performing any of its obligations under the Reserve Protocols or these Terms of Use, then the Reserve shall be excused from the performance of such obligations for as long as the Force Majeure event is continuing. The Reserve shall seek to remedy the Force Majeure using commercially reasonable efforts. The User shall not be required to perform or resume performance of its obligations under the Reserve Protocols or these Terms of Use corresponding to the obligations of the Reserve excused by Force Majeure.
- (g) Audit. The Reserve has the right, at its sole expense, upon reasonable notice and during normal working hours, to examine, audit, and obtain copies of the records

of User to the extent reasonably necessary to verify (i) the accuracy of any representation, warranty or attestation made by User to the Reserve and (ii) User's performance during the prior (12) month period of its obligations under the Reserve Protocols or, as applicable, the Compliance Offset Protocols, and these Terms of Use. This right to examine, audit, and obtain copies shall not be available with respect to any information that is not directly relevant to the subject matter of the Reserve Protocols or, as applicable, the Compliance Offset Protocols, or these Terms of Use.

- (h) Injunctive Relief. User acknowledges that money damages would not adequately compensate the Reserve and the Service Provider in the event of a breach by User of its obligations hereunder and that injunctive relief may be essential for the Reserve and the Service Provider to adequately protect themselves hereunder. Accordingly, User agrees that, in addition to any other remedies available to the Reserve and the Service Provider at law or in equity, including but not limited to any monetary damages, the Reserve and the Service Provider shall be entitled to seek injunctive relief in the event of any breach by User of any covenant, agreement, representation or warranty contained herein or in the Reserve Protocols.
- (i) Notices. Except as otherwise provided in Section 2(c) with respect to invoices, all notices and other communications under these Terms of Use must be in writing and will be duly given hereunder (i) upon delivery, if personally delivered, delivered by email or facsimile, or delivered by overnight courier with confirmation of delivery, and (ii) on the fourth business day after the postmark date, if mailed by certified or registered mail with postage prepaid. Street and email addresses and facsimile numbers of each party are as indicated below or as subsequently modified by written notice to the other party.

If to the Reserve: Climate Action Reserve
 Attn: Reserve Administrator
 601 W. Fifth Street, Suite 650
 Los Angeles, CA 90071
 Email: reserve@climateactionreserve.org
 Facsimile: 213-623-6716

If to User: The street address, email address and facsimile number provided in User's account application.

- (j) Hyperlinks. The Reserve and the Service Provider make no claim or representation regarding, and accept no responsibility for, the quality, content, nature, or reliability of sites accessible by hyperlink from the Program, the Program website, the Reserve website, or sites linking to such websites. The linked sites are not under the control of the Reserve or the Service Provider and the Reserve and the Service Provider are not responsible for the content of any linked site or any link contained in a linked site, or any review, changes, or updates to such sites. The inclusion of any link does not imply affiliation,

endorsement, or adoption by the Reserve or the Service Provider to such website or any information contained therein. When leaving the Reserve website or the Program website, User should be aware that the Reserve’s terms and policies no longer govern, and therefore User should review the applicable terms and policies, including privacy and data-gathering practices, of that site.

- (k) Headings. The headings used herein are for convenience and reference purposes only.

11. Definitions

- (a) “ARB Offset Credit or ARBOC” means a credit issued by the Air Resources Board for a GHG reduction or GHG removal enhancement of one metric ton of carbon dioxide equivalent, pursuant to a Compliance Offset Protocol or an Early Action Offset Protocol.
- (b) “ARB Offset Program Rules and Requirements” means those rules and requirements adopted by the California ARB, and set forth in the Cap and Trade Regulation, ARB’s formal guidance documents, and any additional direction provided by ARB as part of its implementation of the Cap and Trade Program.
- (c) “Bank” means any of the following:
- (i) any banking institution chartered by the Office of the Comptroller of the Currency;
 - (ii) any banking institution organized under the laws of any State, territory, or the District of Columbia, the business of which is substantially confined to banking and is supervised by the State or territorial banking commission or similar official; or
 - (iii) any savings and loan association, building and loan association, cooperative bank, homestead association, or similar institution, which is supervised and examined by State or federal authority having supervision over any such institution.
- (d) “Beneficial Ownership Rights,” with respect to any CRT or ROC, means any contractual or other right to direct or control the sale or other disposition of, or the retirement of, such CRT or ROC.
- (e) “Business Day” means any day except a Saturday, Sunday, or a Federal Reserve Bank holiday. A Business Day shall open at 8:00 a.m. and close at 5:00 p.m. Pacific Prevailing Time.
- (f) “Cap and Trade Regulation” means Sections 95800 to 96023 of the California Code of Regulations adopted by the California Air Resources Board, and which may be amended from time to time.

- (g) “Compliance Offset Protocols” means those standardized methodologies adopted by ARB.
- (h) “Confidential Information” shall mean (i) all information (A) to which User, the Reserve or the Service Provider, or any third party (to the extent such third party owes a duty of confidence to User, the Reserve or the Service Provider) has rights, and (B) which is marked to expressly indicate its confidential, restricted, or proprietary nature by the party having rights in the same, or which, under all of the circumstances, a reasonable business person should know to treat as confidential, restricted, and/or proprietary; and (ii) all information that, at the applicable time, is deemed to be Confidential Information pursuant to Section 9(b)(v). Notwithstanding the foregoing and any provision of Section 9(b)(v), Confidential Information does not include information: (i) that is, as of the time of its disclosure, or thereafter becomes, part of the public domain through a source other than the receiving party; (ii) that was known to the receiving party as of the time of its disclosure; (iii) that is independently developed by the receiving party without reference to the Confidential Information of the disclosing party; (iv) that subsequent to its disclosure, is received by the receiving party from a third party not subject to an obligation of confidentiality with respect to the information disclosed; or (v) with respect to which the disclosing party provides to the receiving party in accordance with Section 10(i) or through an electronic interface comprising part of the Program an express waiver of any confidentiality protection under these Terms of Use.
- (i) “Early Action Offset Protocol” means one of those protocols listed in Section 95990(c)(5) of the Cap and Trade Regulation.
- (j) “Effective Date” means the date on which User indicated User's acceptance of these Terms of Use through a website maintained by the Reserve or the Service Provider.
- (k) “Force Majeure” means an event or circumstance which prevents the Reserve from performing its obligations under these Terms of Use, which event or circumstance was not anticipated as of the date these Terms of Use were agreed to, which is not within the reasonable control of, or the result of the negligence of, the Reserve, and which, by the exercise of reasonable commercial efforts, the Reserve is unable to overcome or avoid or cause to be avoided.
- (l) “Interest Rate” means, for any date, the per annum rate of interest equal to the prime lending rate published in *The Wall Street Journal* on such day (or if not published on such day, on the most recent preceding day on which published), plus two percent (2%).
- (m) “Registry Offset Credit or ROC” means a credit issued by the Climate Action Reserve as an Offset Project Registry for a GHG reduction or GHG removal enhancement of one metric ton of carbon dioxide equivalent, pursuant to a Compliance Offset Protocol.

- (n) “Regulated Person” means any of the following:
- (i) A banking institution or similar entity, as specified below:
 - a. A banking institution chartered by the Office of the Comptroller of the Currency;
 - b. A banking institution organized under the laws of any State, territory, or the District of Columbia, the business of which is substantially confined to banking and is supervised by the State or territorial banking commission or similar official; or
 - c. A savings and loan association, building and loan association, cooperative bank, homestead association, or similar institution, which is supervised and examined by State or federal authority having supervision over any such institution.
 - (ii) A broker or dealer that is registered pursuant to Section 15 of the Securities Exchange Act of 1934, as amended; and is a member of all requisite self-regulatory organizations.
 - (iii) A futures commission merchant, introducing broker, commodity pool operator, commodity trading advisor, floor broker or floor trader as specified below:
 - a. A member of the National Futures Association that is registered, pursuant to the Commodity Exchange Act and the Commodity Futures Trading Commission’s regulations, as a futures commission merchant, introducing broker, commodity pool operator, commodity trading advisor floor broker or floor trader; or
 - b. A commodity pool operator or commodity trading advisor that is exempt from registration pursuant to Part 4 of the Commodity Futures Trading Commission’s regulations and has filed a notice of such exemption from registration with the National Futures Association pursuant to the Commodity Futures Trading Commission’s regulations.
 - (iv) A registered investment company or adviser, as specified below:
 - a. An investment company registered under the Investment Company Act of 1940, as amended; or
 - b. An investment adviser registered under the Investment Advisers Act of 1940, as amended.
 - (v) A fund that has assets under management with an aggregate market value of no less than \$100 million and that is advised or managed by an investment adviser registered under the Investment Advisers Act of 1940, as amended.

- (vi) A "business development company" as defined in (A) Section 2(a)(13) of the Investment Company Act of 1940, as amended, or (B) Section 202(a)(22) of the Investment Advisers Act of 1940, as amended.
- (vii) An employee benefit plan or trust fund, as specified below:
 - a. A plan established and maintained by a State, its political subdivisions, or any agency or instrumentality of a State or its political subdivisions, for the benefit of its employees; or
 - b. An employee benefit plan within the meaning of title I of the Employee Retirement Income Security Act of 1974, as amended.
 - c. A trust fund whose trustee is a Bank and whose participants are exclusively plans of the types identified in this item G above, except trust funds that include as participants individual retirement accounts or H.R. 10 plans.
- (viii) A seller that has been granted authorization to engage in sales for resale of electric energy, capacity or ancillary services from the Federal Energy Regulatory Commission pursuant to Section 205 of the Federal Power Act, as amended, and the requirements of 18 C.F.R. § 35.
- (ix) A broker, trader or similar person explicitly approved by the Reserve for an account that trades only in environmental commodity transactions that are intended to be physically settled and are:
 - a. Excluded from the definition of "swap," as defined in section 1a(47) of the Commodity Exchange Act, pursuant to section 1a(47)(B)(ii) of the Commodity Exchange Act and related Commodity Futures Trading Commission and/or Securities and Exchange Commission regulations; and/or
 - b. Transacted in the spot (cash) market (i.e., shipment or delivery is not deferred).
- (x) A non-U.S. entity which is engaged in an "Investment-Related" (e.g., pertaining to securities, commodities, banking, insurance or real estate) business and which is regulated by a Foreign Financial Regulatory Authority (e.g., a foreign securities authority; other governmental body or foreign equivalent of a self-regulatory organization empowered by a foreign government to administer or enforce its laws relating to the regulation of Investment-Related activities).
- (xi) A non-U.S. entity acting in the capacity of a futures commission merchant, introducing broker, commodity pool operator, commodity trading advisor, floor broker or floor trader which is engaged in a "Derivatives-Related" (e.g., pertaining to commodities for future delivery, security futures products, swaps, commodity options, options on futures or swaps, etc.) business and which is regulated by a "Foreign Derivatives Regulatory Authority" (e.g., a foreign securities authority; other governmental body or foreign equivalent of a self-regulatory organization empowered by a foreign government to

administer or enforce its laws relating to the regulation of Derivatives-Related activities.

- (o) “State” means any state of the United States of America.
- (p) “User” means the entity agreeing to these Terms of Use and shall include such representative as the entity shall appoint and designate by completing the Project Developer’s Designation of Authority Form, which is available at <http://www.climateactionreserve.org/how-it-works/projects/register-a-project/documents-and-forms/>
- (q) “Verify” means the activity of verifying that GHG emissions reductions data submitted to the Reserve has been collected and quantified in accordance with the guidelines put forth in the Reserve Protocols.

Attachment N

Climate Action Reserve, Verification Program Manual

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)





CLIMATE
ACTION
RESERVE

Verification Program Manual

February 8, 2017

NOTE TO USERS:

From time to time, the Climate Action Reserve may update this manual. Please make sure you are using the latest version, available at www.climateactionreserve.org.

For information, comments, or questions, please email reserve@climateactionreserve.org.

Climate Action Reserve
601 West 5th Street, Suite 650
Los Angeles, CA 90071
www.climateactionreserve.org

Released February 8, 2017

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1 Introduction

Verification plays a vital role in upholding the integrity and quality of the data reported to both mandatory and voluntary GHG programs across the world. The Climate Action Reserve (Reserve) created this Verification Program Manual to detail the requirements of its verification program and provide approved verification bodies with a standardized approach to the independent and rigorous verification of GHG emissions reductions and removals reported by project developers into its offset program. Project developers should also use this document to help prepare them for the reporting and verification process.

This standardized approach to verification promotes the relevance, completeness, consistency, accuracy, transparency and conservativeness of emissions reductions data reported in the Reserve. This is an accompanying document to the Program Manual, which presents the Reserve's policies, processes and procedures for registering projects and generating offset credits with the Reserve.

Detailed information on the Reserve's general operating procedures and offset program can be found in the following documents:

- Climate Action Reserve Program Manual
<http://www.climateactionreserve.org/how/program/program-manual/>
- Climate Action Reserve User Guide
<http://www.climateactionreserve.org/open-an-account/>
- Climate Action Reserve Terms of Use
<http://www.climateactionreserve.org/open-an-account/>

Verification is an integral part of the Reserve's voluntary offset program. The key objectives of the verification program and guidelines found in this manual are to:

- Ensure projects are real, additional, permanent, verifiable and enforceable
- Minimize the risk of erroneously crediting or double counting of Climate Reserve Tonnes (CRTs)
- Ensure projects meet minimum eligibility requirements
- Support the transparency and integrity of the data contained within Reserve
- Maintain that verifications are conducted in a consistent and comparable manner across projects
- Ensure projects' on-going compliance with the Reserve's protocols and program rules

The Reserve requires third-party verification of all GHG projects as specified in each project protocol. CRTs are issued only after a Verification Report and a Verification Statement attesting to the accuracy of reported emission reductions have been submitted by the verification body and accepted by the Reserve. The Reserve relies upon these documents to attest to the legitimacy of the CRTs issued. The verification body is held accountable to the Reserve for the quality and independence of the report and statement submitted to the Reserve.

Guidance in this Verification Program Manual is limited to the Reserve's program serving the voluntary carbon market. For information on the Reserve's role as an Offset Project Registry for the California Compliance Offset Program, please see the following resources:

- Climate Action Reserve California Compliance Offset Program website
<http://www.climateactionreserve.org/how/california-compliance-projects/>

- California Air Resources Board Compliance Offset Program website <http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

1.1 The Climate Action Reserve

The Climate Action Reserve is a pioneer in carbon accounting and the most experienced, trusted and efficient offset registry to serve the carbon markets. With deep roots in California and a reach across North America, the Reserve encourages actions to reduce greenhouse gas emissions and works to ensure environmental benefit, integrity and transparency in market-based solutions to address global climate change. For the voluntary market, the Reserve establishes high quality standards for carbon offset projects, oversees independent third-party verification bodies and issues and tracks the transaction of carbon credits (CRTs) generated from such projects.

At the heart of the Reserve is a publicly accessible web-based system where owners and developers of carbon offset projects can register project information along with verification reports demonstrating GHG emission reductions. Emission reductions are certified as CRTs (equal to one metric ton of GHG reduced/sequestered), which provide title assurance and unique serial number identifiers to ensure that each metric ton is counted and retired only once.

1.2 Disclaimer

This manual has been prepared for informational and procedural purposes only. Its contents are not intended to constitute legal advice and any person who requires legal advice should obtain it elsewhere. The Reserve maintains the right to amend or depart from any procedure or practice referred to in this guideline as deemed necessary. Where a departure is necessary, the Reserve will provide public notification of significant changes on its website and will notify verification bodies in writing. This guidance is subject to revisions as new information and industry best practices are identified.

This document is intended to be used in combination with project verification guidance that accompany each Reserve project protocol and the International Organization for Standardization (ISO) 14064 series on GHG emission reductions and removals. In the instance that the applicable protocol differs from guidance given in this document, the Reserve project protocols prevail. ISO standards are intended to be program neutral, ensuring that key rules and decisions are made and enforced by the GHG program itself. If differing procedures are noted, contact the Reserve staff for further clarification and interpretation.

1.3 Organization of Verification Program Manual

This manual is divided into six parts that outline the necessary steps for verification bodies to perform verification activities under the Climate Action Reserve.

Part 1, Introduction provides a brief overview of the Reserve, its principles and requirements of the verification process.

Part 2, Standard of Verification focuses on the Reserve's standards; describes the levels of assurance and materiality threshold required under the Reserve; and highlights important definitions.

Part 3, Requirements to Perform Verification focuses on how a verification body becomes accredited to perform verification under ISO 14065, outlines obligations and requirements of

verification bodies under the Reserve, provides specific and detailed training requirements, and details required administrative activities prior to beginning verification activities, which include: roles and responsibilities, conflict of interest, providing required notifications, and designing appropriate verification activities.

Part 4, Project Verification Activities provides guidance on conducting verification activities, such as: assessing eligibility criteria, identifying sources, reviewing management systems and methodologies, and verifying emission reductions and removals.

Part 5, Documenting and Reporting Verification Activities covers procedures for successfully completing the verification process including: preparing the Verification Report, List of Findings and the Verification Statement, and submitting documentation.

Part 6, Administration and Reserve Intervention provides information on the Reserve's verification oversight and auditing process, its dispute resolution process and its record keeping requirements.

1.4 Reserve GHG Accounting Principles

Verification provides an independent third party review of project data and information being submitted to the Reserve. This process ensures project eligibility per the relevant project protocol and that reported emission reductions or removals meet the materiality threshold.

To fulfill this purpose, the independent verification process maintains the minimum criteria of relevance, completeness, consistency, accuracy, transparency and conservativeness. These underlying principles are laid out in ISO 14064-2:2006 and are interpreted below as Reserve accounting principles.

Relevance. Project eligibility and compliance status shall be measured in accordance with applicable reporting boundaries and performance standards.

Completeness. Verification shall identify and account for all emissions, reductions or removals within the GHG assessment boundary that may have occurred in the baseline and project scenarios.

Consistency. Methodologies shall be consistent and uniform. Measurements, source data, data sampling, and tests shall be applied equally so that performance can be compared over time and across similar projects.

Accuracy. Projects shall meet a minimum materiality threshold to ensure accuracy. See Section 2.3 from more information.

Transparency. Verification shall be conducted in a transparent manner. The data used for verification and the verification activities shall be clearly and thoroughly documented to allow replication and outside review by the Reserve or other oversight bodies.

Conservativeness. GHG reductions or removals should not be overstated. Calculations, values and procedures should always be applied in a conservative manner, particularly when there are limitations to certainty.

Implementing these standards in the verification process will help to ensure comparable and consistent reporting to the Reserve. These standards will also help verifiers make the reliable, dependable decisions discussed further in the core verification process (see Section 4.6).

1.5 Overview of Verification Process

The following steps must be taken to ensure that the obligations and responsibilities of both the verification body and the project developer are met.

1. **Verification body receives accreditation:** Verification body meets all accreditation requirements and two Lead Verifiers successfully complete required project verification training (see Section 3.4.2).
2. **Project developer selects approved verification body:** Project developer contacts one or more approved verification bodies listed on the Reserve to discuss verification activities. Project developer selects an organization to verify its GHG emissions reductions or removals and begins to negotiate contract terms. (The contract may not be finalized until a determination has been issued by the Reserve.)
3. **Verification body submits project-specific Notification of Verification Activities and Conflict of Interest (NOVA/COI) Form:** After a project developer chooses a verification body, the verification body must submit a NOVA/COI Form to the Reserve outlining the proposed scope of the planned verification. This document provides insight into the likelihood of a conflict of interest between parties (see Section 3.6).
4. **Reserve sends approval to proceed to verification body:** The Reserve reviews the NOVA/COI Form and supporting information to determine the level of risk associated with the proposed project developer/verifier relationship, then notifies the Lead Verifier of its determination.
5. **Verification body conducts verification activities:** Verification body develops a risk-based verification plan and conducts verification following the guidance in the Verification Program Manual and the applicable project verification guidance. The verification must evaluate a project's ongoing eligibility and the GHG emissions reductions or removals reported to the Reserve (see Section 4.6).
6. **Verification body shares List of Findings with the project developer:** A confidential list of material and immaterial findings is sent to the project developer. This gives the project developer the opportunity to correct any errors found (see Section 5.1).
7. **Verification body prepares the verification documentation for project developer:** Verification body prepares the final List of Findings Verification Report, and the Verification Statement for project developer's review prior to uploading electronically to the Reserve software (see Section 5).
8. **Project developer uploads documents to the Reserve:** Project developer then submits all final documentation to the Reserve - the List of Findings, the Verification Report and Verification Statement (see Section 5.6).

2 Standard of Verification

The Reserve requires that verification bodies use the following standards when conducting verification:

- The applicable Reserve project protocol and any relevant errata and clarifications
- The Reserve Program Manual and any relevant policy memos
- This Verification Program Manual
- ISO 14064-3:2006

Verification must adhere to each of these standards, but in instances where standards conflict, the Reserve protocols shall take precedence, followed by the Reserve Program Manual, the Verification Program Manual, and then ISO 14064-3:2006.

ISO 14064-1:2006 and ISO 14064-2:2006 cover both conformance with the standard and the criteria for establishing that the GHG assertion is reliable and correctly stated based on the agreed level of assurance, materiality, criteria, objectives and scope. The applicable verification standards must be stated in each Verification Report.

2.1 Principles of Verification

An essential element of project verification is to ensure that all verification bodies and verifiers conducting work under the Reserve uphold the basic verification principles laid out in ISO 14064-3:2006. Namely, verification bodies and verifiers shall demonstrate independence from the activity being verified (interpreted in Section 3.6 under Conflict of Interest). Verification bodies must also demonstrate ethical conduct and fair presentation of findings, conclusions and reports throughout the verification process. All projects undergoing verification must be treated equally, with all appropriate procedures followed. Finally, verification bodies must conduct verifications with due professional care, demonstrating the skill, diligence and competence necessary to perform the verification (see Section 3).

2.2 Level of Assurance

The concept of level of assurance is derived from financial auditing and corresponds to the likelihood that a material misstatement has gone undetected. With reasonable or “positive” assurance, the verification body provides a direct factual statement expressing the outcome of the verification. Providing a reasonable level of assurance confirms the accuracy of the GHG assertion. Absolute assurance is the highest form of assurance, but does not allow for professional judgment, sampling and inherent limitations. For reasonable assurance, the verification body must confirm the accuracy of reported data to a reasonable level. The Reserve requires reasonable assurance to uphold the integrity and high quality of verifications conducted under its program.

Under the ISO 14064 standards, the level of assurance determines the depth of detail and rigor that a verifier designs into the verification plan used to identify any material errors, omissions or misstatements. The level of assurance refers to the degree of confidence a verification body is able to provide regarding the accuracy of the asserted GHG removals or reductions. The Reserve requires that reasonable, but not absolute, assurance be obtained by the verification body prior to the execution of a positive Verification Statement, which ensures that the verification body is able to “verify without qualification” and attest to the accuracy of the number of CRTs being issued to the project developer.

2.3 Materiality Threshold

The concept of materiality is fundamental in executing GHG verification. Information is considered material if its omission or misstatement could be seen to influence any resulting decisions or actions. In order to reach a conclusion on the veracity of data used to support assertions, a verification body must form a view on the materiality of all identified errors or uncertainties.

Issues identified during verification must be classified by verification bodies as either material (significant) or immaterial (insignificant). To be verified successfully, all reported emissions reductions or removals submitted to the Reserve must be free of material misstatements or discrepancies.

A materiality threshold is used to assess any error, omission or misstatement that may impact the GHG assertion made by a project developer. This threshold is also known as the “minimum quality standard” and differentiates those errors, omissions or misstatements that are considered by the Reserve to be significant from those that are insignificant.

Materiality has both a quantitative and a qualitative aspect in relation to a project reporting to the Reserve.

2.3.1 Quantitative Materiality Threshold

The quantitative materiality threshold sets a numeric cap on the magnitude of cumulative error in stated reductions permissible under the Reserve as a percent of the verifier’s recalculated emission reductions. Error leading to misstatement may be introduced through incorrect application of protocol calculations, transcription errors, or the use of incorrect default values. Immaterial misstatements identified during verification may go uncorrected and the project may receive a positive Verification Statement from the verification body. All material errors must be corrected prior to a project receiving a positive Verification Statement.

A verification body must recalculate the total quantity of GHG emission reductions reported to the Reserve for any given reporting period in order to determine if the project meets the Reserve’s designated materiality threshold.¹

In determining whether a material misstatement has occurred, the verification body must compare the aggregate total of misstatements against the materiality threshold for the total GHG emission reductions reported to the Reserve. Finding several small reporting errors, each of which might be immaterial on their own, may lead to a material misstatement when totaled against the final number of reported emission reductions. The materiality threshold shall be used to inform the design of a verification body’s sampling plan.

If errors are discovered, the verification body must determine if these errors result in a material misstatement using its risk-based review of materiality and a rigorous data sampling process.

In an effort to maintain a balance of diligence, accuracy and conservativeness, the Reserve defines the quantitative materiality threshold for all projects as follows:

¹ In GHG inventory reporting, the notion of *de minimis* threshold is in relation to a section of a reporter’s inventory that is allowed to be excluded from their reported total. The *de minimis* threshold does not apply to Reserve projects unless explicitly stated in the project protocol.

- Projects registering ≤25,000 CRTs over a 12-month period shall achieve a >95% level of accuracy (<5% error) relative to the verification body's calculated emission reductions
- Projects registering >25,000 CRTs but ≤100,000 CRTs over a 12-month period shall achieve a >97% level of accuracy (<3% error) relative to the verification body's calculated emission reductions
- Projects registering >100,000 CRTs over a 12-month period shall achieve a >99% level of accuracy (<1% error) relative to the verification body's calculated emission reductions

This materiality threshold is set on a 12-month basis to ensure that projects verifying sub-annually do not receive any advantage over those verifying annually. For sub-annual reporting, the quantity of CRTs must be pro-rated based on the verification period length in order to determine the appropriate materiality threshold. For example, if a project registers 20,000 CRTs for a 3-month verification period, then the materiality threshold is <3% error: (20,000 CRTs / 3 months) x 12 months = 80,000 CRTs; >97% accuracy required).

To determine the materiality threshold for projects with verification periods longer than 12 months, the quantity of reported CRTs must be pro-rated in the same fashion. For example, if a project reports 30,000 CRTs for an 18-month verification period, then the materiality threshold is <5% error relative to the verification body's calculated emission reductions: (30,000 CRTs / 18 months) x 12 months = 20,000 CRTs; >95% accuracy required.

The percent error is defined by the following:

$$\%Error = abs\left(\frac{Stated\ reductions - Verified\ reductions}{Verified\ reductions}\right) \times 100$$

The accuracy level is defined by the following:

$$Accuracy = 100\% - \% Error$$

The Reserve allows for under-reporting of total CRTs as that is considered conservative and in line with the Reserve's key principles. Under-reporting errors are not required to be corrected. The quantitative materiality threshold only applies to mistakes that result in over-reporting.

Example 1: A verification body, Verification Pro, recalculates a project's total emission reductions over a 12-month period and notes a quantitative error made by the project developer, LFG Unlimited.

- LFG Unlimited's reported emission reductions = 9,900 metric tons CO₂e
- Verification Pro's recalculated emission reductions = 10,000 metric tons CO₂e
- Percent Error = 1.00%

Given the above information, LFG Unlimited is not required to fix the error. The project is under-reporting its emission reductions and it meets the quantitative materiality threshold of >95% accuracy.

Example 2: Verification Pro recalculates a project's the total emission reductions over a 12-month period and notes two quantitative errors made by the project developer, Worldwide Dairy.

- Worldwide Dairy's reported emission reductions = 55,000 metric tons CO₂e
- Verification Pro's identified errors = -1,000 metric tons CO₂e due to monitoring, +2,000 metric tons CO₂e due to data processing
- Percent Error = 1.79%

Correction is not required as the errors result in a total discrepancy of 1,000 metric tons CO₂e. The project meets the quantitative materiality threshold of >97% accuracy.

Example 3: Verification Pro recalculates a project's total emission reductions over a 3-month period and identifies a quantitative error made by the project developer, ODS Destroyers.

- ODS Destroyers' reported emission reductions = 1,000,000 metric tons CO₂e
- Verification Pro's recalculated emission reductions = 980,000 metric tons CO₂e
- Percent Error = 2.04%

This error requires correction, as it does not meet the >99% materiality threshold and is therefore considered material.

2.3.2 Qualitative Materiality Threshold

A qualitative non-conformance occurs when a prescriptive protocol requirement (e.g., metering, monitoring, management systems, record-keeping, etc.) is not met. Every qualitative non-conformance identified by the verification body is considered material and must be corrected by the project developer before a positive Verification Statement can be issued. A prescriptive requirement is defined as any specific guidance mandated by the protocol that does not allow for deviation, variance or verifier professional judgment.

Take for instance a project developer who neglects to quantify a small source of project emissions. Leaving out that source does not result in a quantitative material misstatement, but the protocol states that all emission sources related to project activities must be accounted for in the emissions calculations. The omission of this source would be considered a qualitative non-conformance because of the protocol requirements and the emission reductions would therefore need to be recalculated.

Another example is the application of an incorrect emission factor – again, this would be considered material even if the difference in emission reductions does not exceed the quantitative materiality threshold. If a Reserve protocol prescribes that a specific emission factor be used and that emission factor is not correctly applied by the project developer, the result is a qualitative misstatement because the non-conformance directly defies a protocol requirement.

Any identified qualitative non-conformances must be documented by the verification body and presented to the project developer in the List of Findings prior to issuance of the Verification Statement and Report (see Section 5.1). All qualitative non-conformances must be corrected in order for the verification body to be able to issue a positive Verification Statement.

3 Requirements to Perform Verification Activities

3.1 Verification Body and Lead Verifier Requirements Overview

In order to conduct verification for the Reserve program, there are requirements for both verification bodies and individual verifiers that must be met. Table 3.1 summarizes the necessary criteria for both entities acting as verification bodies and individuals acting as lead verifiers. Additional information on these requirements can be found below.

Table 3.1: Verification Body and Lead Verifier Requirements

VERIFICATION BODY REQUIREMENTS
Accreditation under International Organization for Standardization (ISO) 14065: 2013 with conformance to all accreditation requirements under ISO 14065, ISO 14064-3: 2006, IAF MD 6: 2014 and all other accreditation requirements, or
Acceptance in the American National Standards Institute (ANSI) accreditation program, having filed a full application for ISO 14065: 2013
Demonstration of a thorough understanding and competency with the Climate Action Reserve program manuals and project protocols
Employment of a minimum of two staff members (or contracted personnel) designated as Lead Verifiers who have successfully completed the training required by the Reserve
LEAD VERIFIER REQUIREMENTS
Employment or a contract with a verification body that is accredited under ISO 14065: 2013, ISO 14064-3: 2006, and IAF MD 6: 2014
Successful completion of Climate Action Reserve training(s) pertaining to each project type for which they wish to perform verifications
Successful completion of the General Project Verification training course
Fulfillment of internal training requirements, following proper processes and procedures under the ISO 14065: 2013, ISO 14064-3: 2006, and IAF MD 6: 2014 accredited verification body
Identification as a Lead Verifier in the Verification Staff Reporting Form submitted by the verification body to the Reserve

Trainings are scheduled as demand or need arises based on feedback from bi-annual surveys by the Reserve. When a new protocol is developed, an inaugural verification training will be provided after the adoption date in order to accommodate verification bodies seeking to practice in that sector.

A verifier can complete Reserve trainings prior to its verification body achieving ISO accreditation or during the accreditation process itself. However, priority for available spaces at the trainings will be given to individuals representing accredited companies, followed by individuals representing companies already enrolled in the accreditation process.

Once a verification body has achieved its ISO 14065 accreditation in accordance with the appropriate scoping policy and has personnel that have completed the training requirements, it may advertise that it is recognized and qualified as a verification body for the Climate Action Reserve and may use the Reserve logo to promote its services in accordance with the Reserve's style guide. All recognized verification bodies are listed on the Reserve's website along with all applicant entities currently undergoing the accreditation process.

Two of the steps in the ISO 14065 accreditation process are an on-site assessment at the verification body's main offices and a witness assessment performed by the accreditation body. The accreditation body must witness the verification activities in order to assess the competency of the verification team as well as the procedures and systems in place at the organizational level. The on-site assessment is designed to ensure that the verification body conforms to ISO 14065 and ISO 14064-3, displays the competency to act in the specific sector, and has the capacity to perform the activities related to the scopes of accreditation for which it has applied.

Over the course of the witness assessment, the accreditation body will observe the verification body performing the tasks related to the verification process for the scope (or group of sectoral scopes) of accreditation for which it has applied. The purpose of the witness assessment is to assess whether verification activities are in line with its documented quality procedures and to assess the capability to conform to the applicable sectoral scope(s).

Verification body applicants that are currently undergoing but have not yet completed the accreditation process are allowed to perform verification activities for Reserve projects if they have met the Reserve training and personnel requirements. A list of the applicant verification bodies that have successfully met the Reserve's training requirements and submitted the Verification Policies Acknowledgement and Agreement form are posted on the Reserve's website. However, CRTs generated by a project verified by a verification body applicant will not be issued to the project developer until the verification body receives its formal accreditation. The verification body should inform the project developer of the circumstances surrounding its expected accreditation, and the issue should be addressed in the verification contract.

Verification bodies that have met Reserve training requirements may conduct one additional verification in each appropriate sector for the purpose of accreditation renewal. There is no deadline for this requirement and CRTs will not be withheld for that verification. The additional verification shall be used for the purpose of obtaining the required witness assessment and finalizing a sector-specific group accreditation. If a verification body fails to obtain its sector-specific accreditation using this additional verification, no future CRTs can be verified in that sector until the verification body has obtained its sector-specific accreditation.

3.2 Obligations and Requirements to the Reserve

Verification bodies and verifiers must follow all applicable Reserve program rules and adhere to the guidance laid out in the Reserve project protocols and program manuals when performing verification activities. In addition, a verification body and its verifiers must always demonstrate ethical conduct and competence, exercise due professional care, and adhere to the remaining verification principles throughout the verification process.

In addition to Reserve rules, the verification bodies under the Reserve have certain duties and obligations. The Reserve also has the discretion to exercise certain powers.

Verification body obligations include (but are not limited to) the following:

- Compliance with any guidelines or policies notified to them by the Reserve in writing.
- A minimum of two Lead Verifiers on staff to enable the appropriate management of the verification program and the separation of powers and responsibilities between the role of Lead Verifier and the role of independent Senior Internal Reviewer. These roles may be filled by either employees or contracted personnel (see Section 3.8).
- Ensuring that all Lead Verifiers are competent and have successfully completed internal, general and protocol-specific training required by the Reserve.
- Ensuring that a Lead Verifier directs, supervises and leads the undertaking of the verification services, including signing all written reports and statements.
- Ensuring that the Senior Internal Reviewer is an active Lead Verifier as defined by the Reserve, has been trained on the relevant protocol and is able to demonstrate continued competence.
- Ensuring that all verification body personnel working on project verification activities have agreed to be bound by confidentiality obligations and understand that the verification body accepts liability for any breach of confidentiality by its employees, agents or contracted personnel.
- Submitting a signed and duly executed Verification Policies Acknowledgment and Agreement to the Reserve on an annual basis. As staff and roles fluctuate over time, the verification body must ensure that up-to-date information is provided to the Reserve.
- Submitting a Notification of Verification Activities and Conflict of Interest (NOVA/COI) Form a minimum of **10 business days** before the commencement of work so that the Reserve has an opportunity to review and address any potential conflicts and observe any part of the verification activities it chooses.
- Not entering into any agreement or participating in any activity that could create a conflict of interest with a verification client without first notifying the Reserve in writing in order to allow the Reserve to evaluate and mitigate any potential risks.
- Maintaining professional liability insurance with a reputable insurer to the level of at least \$4 million for each claim and \$4 million annual aggregate. This professional liability insurance must be held separately from general or umbrella liability policies. The policy must provide coverage of damages and defense costs for any actual or alleged error, omission, neglect, misstatement or misleading statement, or breach of duty relating to verification activities undertaken by the verification body and have the Reserve named as an additional insured. The coverage territory for the insurance must include all geographic regions where the verification body operates and does business under the Reserve's program. This insurance must be maintained for three years following the completion of verification services. Proof of insurance shall be provided to the Reserve within one month of the verification body's usual insurance renewal date.
- Retaining records in line with protocol requirements or for **at least seven years** from the date the Verification Report is accepted following the end of the verification period, whichever is longer. Records to be retained shall include all relevant evidence to support said Report.
- Providing full and free access to the Reserve to obtain all records, documents, accounting and other information maintained by the verification body that relate to Reserve projects.

The Reserve has certain powers that at any time and at its sole discretion it may employ, including (but not limited to):

- Directing the verification body and the project developer to refrain from entering into any agreement that may amount to a conflict of interest in relation to Reserve projects. The verification body must comply with any such direction.
- Determining that a verification of a Reserve project should not proceed or that a person should be removed and/or suspended as a Lead Verifier or key personnel.
- Conducting audit or oversight activities and sending its staff, partners or consultants to attend and oversee verification activities.
- Determining that a verification body should be suspended and/or requiring said verification body to purchase and retire CRTs.
- Compelling the project developer or the verification body to submit all project documents in relation to the GHG assertions made to the Reserve.
- Amending these rules as it deems necessary.

3.3 ISO 14065 Accreditation

The International Organization for Standardization is a recognized institution that developed GHG standards as various schemes emerging in international, national and voluntary sectors began using different sets of guidance or rules for GHG accounting. ISO created a series of standards intended to incorporate best practices and provide consistency and confidence in GHG assertions or claims.

ISO 14065 is the international standard that specifies processes and requirements for accrediting verification bodies to perform GHG validation and verification services. The accreditation process provides criteria for assessing and recognizing the competence of verification bodies, thereby allowing for a consistent and comparable scheme across GHG programs. Accreditation reduces the risk to GHG programs like the Reserve by providing assurance that verification bodies are competent, and it helps establish trust within the voluntary carbon market by ensuring impartiality in the verification process.

The objectives of the ISO 14064 series and ISO 14065 standards are to:

- Develop flexible, regime-neutral tools for use in voluntary or regulatory GHG schemes
- Promote and harmonize best practice
- Support the environmental integrity of GHG assertions
- Assist organizations to manage GHG-related opportunities and risks
- Support the development of GHG programs and markets²

The Reserve has partnered with the American National Standards Institute (ANSI) to accredit independent third party verification bodies to ISO 14065:2013 and the International Accreditation Forum, Inc. (IAF) guidance as well as their accompanying protocols. Verification bodies accredited by ANSI or those undergoing the ANSI accreditation process may provide verification services to Reserve project developers. The Reserve is also working with Entidad Mexicana de Acreditación, A.C. (EMA) in Mexico to accredit verification bodies to support the Mexico Forest Project Protocol. The Reserve may partner with other IAF national standards organizations to provide accreditation services in the future.

² ISO Press Release on 14065:2007 (4/17/2007) Ref 1054: New Tool for International Efforts to Address Greenhouse Gas.

The accreditation process is very rigorous, and verification bodies should undertake it only after understanding and implementing all procedures required under the ISO standards. Verification bodies approved under IAF national standards organizations are granted accreditations that are recognized worldwide.

The following resources provide further information on the principles and standards governing GHG verification and accreditation.³ Verification bodies should cross reference these documents with the rules detailed in each project protocol and accompanying verification guidance in order to ensure the GHG project meets all applicable rules for a specific project type.

Table 3.2: ISO Documents and References

REFERENCE	APPLICABLE TO
ISO 14064-3:2006 – Greenhouse Gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions	Verification body
ISO 14065:2013 – Greenhouse Gases – Requirements for greenhouse gas validation and Verification Bodies for use in accreditation or other forms of recognition	Verification body
ISO 17011:2004 – Conformity Assessment – General requirements for Accreditation Bodies accrediting conformity assessment bodies	Accreditation body
IAF MD 6: 2014 – IAF Mandatory Document on the Application of ISO14065:2013	Accreditation body
ISO 14064-2:2006 - Greenhouse Gases – Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emissions reductions or removals	Project developer, verification body

3.3.1 Obtaining Accreditation

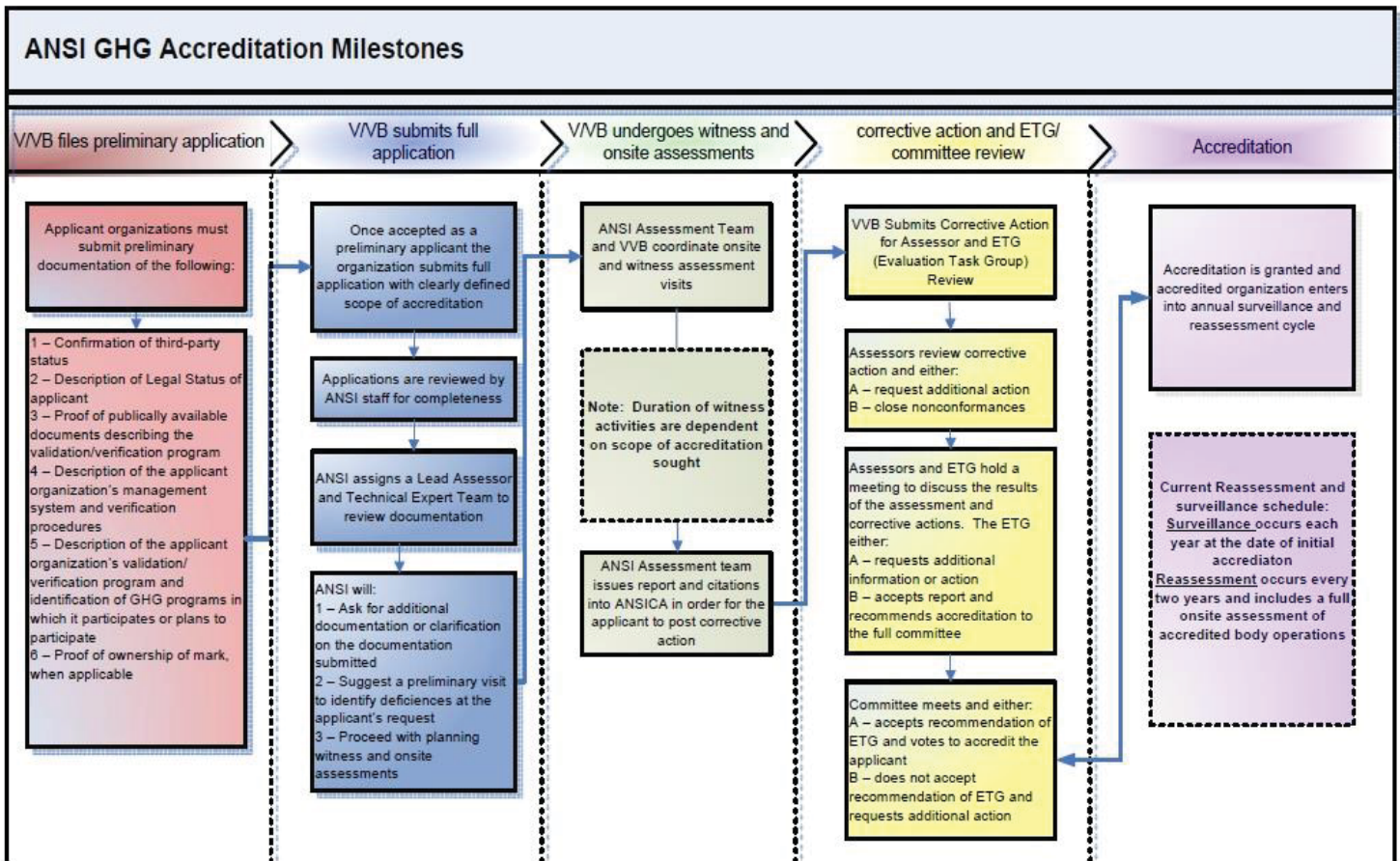
The full accreditation process under ISO 14065 entails:

- Submitting the preliminary application to an approved accreditation body (e.g., ANSI or EMA)
- Submitting the full application
- Preparing for assessment
- Undergoing initial onsite and witness assessments
- Addressing corrective actions identified
- Undergoing committee review
- Receiving accreditation
- Participating in annual surveillance
- Participating in the three-year cycle of reassessment (onsite and witness assessment)

The following diagram of GHG accreditation milestones courtesy of ANSI shows what the accreditation process might look like:

³ Available at www.iso.org.

Figure 3.1: ANSI GHG Accreditation Milestones



Please ensure that you are using the latest version of the Verification Program Manual

3.3.2 Costs of Accreditation

The cost of accreditation is determined by the accreditation body and generally includes an initial non-refundable application fee, an assessment fee for the surveillance performed by the assessors, and an annual accreditation fee. There is also an additional fee to extend the scope of accreditation, which is collected when verification bodies seek eligibility to perform verifications for new sectors.

More information on the ANSI accreditation program is available here:

<https://www.ansi.org/Accreditation/environmental/greenhouse-gas-validation-verification/Default>

More information on EMA accreditation is available here:

ema.org.mx/portal/index.php/Acreditacion/conozca-el-proceso-de-acreditacion.html

3.3.3 ISO Conformance

The Reserve project protocols are generally consistent with international standards and best practice within the GHG offset industry.

Due to ISO copyrights, the text of the relevant sections of ISO standards cannot be reproduced in this document. Therefore, the Reserve has summarized its interpretation of key elements that verification bodies must address to comply with ISO standards and adhere to Reserve protocols, processes and procedures throughout this manual. This manual should not be used as a substitute for any of the ISO standards during accreditation or when planning for project verification activities.

There are some minor differences between the Reserve and ISO 14064 series that are program specific. In areas where other GHG program protocols or ISO standards differ from guidance provided in the Reserve project protocols or program manuals, the Reserve project protocols take precedence, followed by the program manuals.

The language in Reserve protocols is ISO conformant when possible. Where the Reserve protocols presently use non-ISO terminology, the Reserve will attempt to identify and detail its meaning in relation to both Reserve and ISO standards. The Reserve expects that verification bodies will comply with both ISO standards and Reserve requirements when undertaking verifications.

3.3.4 Validation

Under ISO 14065:2013 and IAF Mandatory Document guidance, validation is the process by which an independent validation body assesses a project plan for GHG reductions or removals and deals with the assessment of potential future outcomes. Validation is typically conducted on projects that do not follow standardized protocols. The validation process occurs prior to project implementation in order to establish the project developer's methodology, scope and eligibility to create GHG reductions or removals.

The Reserve does not require that validation be conducted as a separate step in project development. Instead, when a project is first verified, the verifier must affirm the project's eligibility according to the rules defined in the relevant project protocol. Under the Reserve, the project's eligibility criteria are developed through a transparent, stakeholder-driven process that lays out the design and scope for each project type prior to project implementation through the application of performance-based standards and other standardized criteria. The project

protocols provide eligibility rules, methods to calculate reductions, performance-monitoring instructions, and procedures for reporting project information to the Reserve. Further, the project developer completes a standard project submittal form and is reviewed by Reserve staff for compliance with the eligibility criteria prior to the project being publicly listed on the Reserve.

By reviewing project submittal forms, Reserve staff conduct an initial screening to check whether, on the basis of the information provided, the project meets the eligibility rules established in the project protocol. However, the Reserve performs no substantiation of claims made in the submittal forms; that task is left to the verifier. Because the Reserve's eligibility criteria are mostly standardized, determination of eligibility is usually straightforward and requires minimal interpretative judgment by verifiers. Verifiers must ensure that the project developer has provided sufficient evidence to prove that the project meets the eligibility criteria.

Project developers may choose to have a project verified during its initial reporting period without verifying total emission reductions in order to establish the project's eligibility for registration and provide more certainty to potential CRT buyers or sellers. This de-facto validation process is permitted. In addition, the Reserve does not consider validation services conducted under other GHG registries or programs to be a conflict of interest, as validations and verifications are both independent third-party assessments.

3.4 Training Requirements and Qualifications for Lead Verifiers

The Reserve recognizes the verification body as the responsible party under its program, rather than an individual verifier. Verification bodies are obligated to ensure that individual verifiers are qualified with the proper training and skills to conduct verification activities. For individual verifiers to be recognized as Lead Verifiers by the Reserve, they must have completed the training requirements as detailed below.

A Lead Verifier is any verifier from the accredited verification body who directs, supervises and leads verification services and has the authorization from the verification body to sign written reports or statements. A Lead Verifier is someone who has completed the verification body's internal training processes and procedures to achieve this designation, and passed the Reserve training course(s) on the appropriate project protocol(s) as well as the general project verification training.

Each verification body must employ a minimum of two Lead Verifiers for every approved sector accreditation. This policy ensures that the verification team for every project includes at least two Lead Verifiers, one to serve as the Lead Verifier and one to serve as the Senior Internal Reviewer. These Lead Verifiers may be employees of the verification body or contracted personnel.

A Senior Internal Reviewer is any Lead Verifier from the accredited verification body selected to perform a final quality assurance and quality control (QA/QC) review on the project data and verification documentation. The Senior Internal Reviewer must also sign the Verification Statement attesting to the accuracy of reported data. The Senior Internal Reviewer shall remain independent of all verification activities and shall not participate in site visits, as this could compromise his or her objectivity and independence in the final review. The Senior Internal Reviewer must be designated as such on the NOVA/COI Form and also be designated as a Lead Verifier on the annually submitted Verification Staff Reporting form, which is an exhibit to the Verification Policies Acknowledgement and Agreement form.

3.4.1 Internal Training

Qualification as a Lead Verifier begins with the verification body's internal training procedures and programs that instruct staff on how to conduct verifications and lead verification activities. Verification bodies must have a formal process in place for the initial qualification, training, and ongoing monitoring of all personnel verifying a Reserve project. The verification body is responsible for ensuring the verification team has the proper skills, competency and collective capability to conduct verification activities under the Reserve.

In order to be eligible to take the Reserve's Lead Verifier trainings, a verifier must have a basic understanding of GHG accounting and have completed either internal training or taken a recommended external course on GHG accounting and basic verification methods.

3.4.2 Reserve Training

In addition to internal training, Lead Verifiers must successfully complete a Reserve-administered General Project Verification Training course and one or more project protocol verification trainings. This requirement ensures that the individuals leading verification activities under the program have a high level of sector-specific knowledge and training.

At the completion of a Reserve training, verifiers must take a Reserve-administered exam that consists of multiple choice and short essay questions. To prepare for the test, the verifier should study the protocols and the ISO 14064 series, complete the homework assignment, and undertake the practical exercises provided within the training. After passing the general project verification exam and a protocol-specific exam (and meeting the criteria above), the individual becomes a Reserve-recognized Lead Verifier. Following the training, the Reserve provides the recognized verifiers with a notification and a certificate that allows them to act as Lead Verifiers under the Reserve.

Verifiers who do not pass the exam, choose not to take the exam, or are unable to complete the exam on the date it is given receive a certificate of training attendance but will not have met the Reserve's Lead Verifier training requirements. These verifiers have one year from the original date of the course to re-take the exam. There is an administrative fee to retake the exam. If more than one year has passed or a verifier does not pass the exam on the second attempt, the verifier must retake both the training and the exam. The Reserve encourages verifiers who fail the exam to assist on additional verifications in order to gain practical experience before retaking the exam. Please note that for confidentiality purposes, the Reserve does not distribute copies of the verification exam.

An individual's recognition as a Lead Verifier under a specific protocol is generally valid for three years after the date that the training certificate is issued, at which point the Lead Verifier must retake and pass the appropriate exam to demonstrate that he or she has sufficiently maintained knowledge of the protocol and is well-versed in any relevant protocol or programmatic updates made in the interim.

The certification(s) of Lead Verifiers can be extended beyond the three-year period indefinitely if the following requirements are met:

- The Lead Verifier has successfully passed the relevant exam at least twice
- For the general verification certification, the Lead Verifier serves as a Lead Verifier or Senior Internal Reviewer on at least two verifications per calendar year

- For protocol-specific certifications, the Lead Verifier serves as a Lead Verifier or Senior Internal Reviewer on at least two verifications under the relevant protocol per calendar year
- The relevant protocol has not undergone a policy revision since the Lead Verifier last passed the exam

A Lead Verifier is not required to re-take a training course in its entirety unless significant changes to the Reserve program or relevant protocol dictate that a full training is necessary. Verification Statements signed by Lead Verifiers or Senior Internal Reviewers with expired certifications will not be accepted by the Reserve. If a Lead Verifier's general or protocol-specific certification expires during verification services, he or she must pass the exam before the project can be registered.

The Reserve offers public certification exam dates throughout the year. Lead Verifiers seeking to renew their certification(s) are free to take any exams on these dates. Lead Verifiers may also schedule private certification exams through the Reserve Events webpage, but a 10 business day notification period is required. Note that the Lead Verifier certification is tied to the individual and will therefore be recognized regardless of which verification body provides employment.

Unlike the Lead Verifier and the Senior Internal Reviewer, other team members (verifiers, technical experts, administrative staff, etc.) are not required to complete Reserve training or exams.

3.4.3 ARB Training

For the purpose of verifying voluntary Reserve projects, the Reserve will accept the California Air Resources Board (ARB) verification trainings for the Coal Mine Methane, Forest, Livestock, Ozone Depleting Substances, and Urban Forest compliance protocols in lieu of the Reserve's project protocol verification trainings. However, the successful completion of the Reserve's General Project Verification Training is required for all Lead Verifiers, regardless of project type.

It is the responsibility of the Lead Verifier to demonstrate to the Reserve the successful completion of the ARB compliance offset protocol training.

3.5 Verification Policies Acknowledgment and Agreement Form

Verification bodies must have a duly authorized representative of its organization sign and submit the legally binding [Verification Policies Acknowledgment and Agreement form](#) to the Reserve on an annual basis. This required agreement between the Reserve and verification bodies ensures that personnel performing verification activities are aware of their roles, responsibilities and obligations under the program. It asserts that the verification body will follow proper processes and procedures as laid out in the project protocols, the Program Manual and Verification Program Manual. The agreement outlines requirements in relation to confidentiality provisions, insurance requirements, record-keeping requirements, liability, and conflict of interest. It also includes an authorization of potential oversight of verification activities.

The verification body must acknowledge that its duty of care is first and foremost to the Reserve. When a verification body is acting under the auspices of the Reserve's program, it is bound by this agreement to abide and adhere to the rules and procedures of the program itself. If, during the course of verification activities, a verification body suspects the occurrence of fraud, double-counting, or any other significant issue that could impact the quantity or quality of CRTs to be issued, the verification body agrees to immediately report the issue to the Reserve.

The agreement states that personnel conducting verification activities shall be trained and knowledgeable on Reserve procedures. It also asserts that the verification body will remain neutral and impartial. The verification body must acknowledge that potentially market-sensitive information may be encountered while conducting project verification activities and agree to strict confidentiality in its findings prior to the release of the Verification Report.

Further, the agreement asserts that the verification body will not engage in any business activities that would amount to a conflict of interest in relation to its Reserve clients. Specifically, the purchasing, selling, trading or retiring of any offset credits between a verification body and a project developer client in question is considered a high risk for conflict of interest and is strictly prohibited. Conflicting services of this type are addressed further in Section 3.6.3.

The agreement also requires that, in the instance where the Reserve determines an error made by the verification body resulted in the issuance of CRTs not in compliance with Reserve protocols or Reserve policy, the verification body deemed responsible will replace or replenish an equal value of CRTs up to the \$4 million required amount of annual professional liability insurance. The same is true if gross negligence, willful misconduct or fraudulent activity on the part of the verification body has occurred.

Failure to submit the Verification Policies Acknowledgment and Agreement form could result in suspension from the Reserve program.

3.5.1 Verification Staff Reporting Form

Verification bodies must identify to the Reserve all staff members who are designated as verifiers and serve as key personnel in Exhibit A of the Verification Policies Acknowledgment and Agreement form, i.e., the Verification Staff Reporting form.⁴ This form must to be updated and electronically submitted to reserve@climateactionreserve.org whenever new staff members are designated as verifiers on a NOVA/COI form or once per year, whichever is more frequent.

A verification body may add or delete staff to its roster at any time. To add or delete designated staff, the verification body should resubmit the form with the names and contact information for any personnel changing from the roster and note if said personnel are to be removed, added, or their status updated. For each individual identified on the form, the firm shall describe his or her job classifications, relevant experience, education, academic degrees, professional licenses (for technical staff), and role for the Reserve's records. Failure to submit the Verification Staff Reporting form could result in suspension from the Reserve program.

3.6 Conflict of Interest

When conducting verification activities for Reserve project developers, verification bodies must work in a credible, independent, nondiscriminatory and transparent manner that is in compliance with applicable legislation and relevant ISO standards. A conflict of interest (COI) is defined as any situation that compromises a verification body's ability to perform a wholly independent verification. In order to ensure the credibility of the emissions data reported to the Reserve, it is crucial that the verification process be completely independent from the influence of the project developer. The verification team must act objectively and exercise professional skepticism while conducting verification activities. Conflict of interest is a difficult and dynamic issue and is therefore assessed by Reserve staff on a case-by-case basis.

⁴ Available at <http://www.climateactionreserve.org/how/verification/verification-documents/>.

The COI review process gives the verification body the ability to demonstrate that its organization is capable of identifying and mitigating situations that would impair its ability to render an impartial Verification Statement. Any pre-existing relationship between the verification body/verification team and project developer must be disclosed to the Reserve. The Reserve will then evaluate the potential for a real or perceived conflict of interest between the two entities.

3.6.1 Reserve COI Review

Each verification body must provide information to its accreditation body about its organizational relationships, internal structures, and management systems for identifying potential conflicts of interest (organizational COI). Then, on a case-by-case basis, the Reserve will review any pre-existing relationship between a verification body and project developer and assess the potential for conflict of interest in light of the individuals involved. The Reserve staff base the review on the verification body's self-reported information submitted against the criteria laid out below. The verification body must assess all potentially conflicting services it has provided to the project developer, specifying the nature, timing, location, financial value, etc. This information is evaluated and cross-checked against the Reserve's internal records.

If the Reserve finds that there is low risk of COI, a determination is made in writing and sent to the verification body allowing verification services to proceed. After that point, the project developer and verification body may finalize negotiations of their contract and begin verification activities. Following completion of the verification, the verification body must monitor for COI through the next 12 months, as any new business relationship could increase the potential for COI (known as emerging COI).

If the Reserve finds that there is a medium or high risk of COI, it may request further information or the development of a mitigation plan before a final determination is made. For these cases, the Reserve will convene a COI Committee comprised of three or more staff members (with a minimum of one management-level staff member) in order to discuss the issue. The determination will be communicated to the verification body, the project developer, and any relevant body performing oversight. If the verification body disagrees with the determination, it may appeal (the appeals process is detailed in Section 6.4).

In the event that a verification body violates COI procedures, the Reserve, in consultation with the accreditation body and at its discretion, may disqualify an approved verification body from providing services under the Reserve.

Note that this conflict of interest clause does not preclude a verification body from engaging in consulting services for other clients that participate in the Reserve for whom the verification body does not provide any verification activities.

3.6.2 Notification of Verification Activities and COI Form

To obtain an approval for verification activities to proceed, the verification body must submit a Notification of Verification Activities and Request for Evaluation of Potential for Conflict of Interest (NOVA/COI) form⁵ detailing the specifics of its relationship with the project developer and the scope and plan for verification activities. The Reserve will determine the risk for COI

⁵ Available at <http://www.climateactionreserve.org/how/verification/verification-documents/>.

and can seek further information from the verification body to satisfy itself that no conflict exists or will arise and the proposed services are appropriate.

The verification body must conduct an internal review of previous relationships and services provided to the proposed project developer in order to determine the potential for COI before submitting the NOVA/COI form. The form must be submitted to the Reserve a minimum of 10 business days prior to the beginning of verification activities and the finalization of the contract. This notification period is necessary to provide the Reserve time to assess the risk of COI, resolve or mitigate issues, and allow itself, its partners or its consultants the opportunity to conduct verification oversight. More information on the verification oversight process can be found in Section 6.1. If the Reserve approves verification activities to proceed without oversight, project verification may begin on the date that approval is received by the verification body. The verification body may need to revise and resubmit the NOVA/COI form to include a mitigation plan, correct errors, or include any additional information per the Reserve's request. No verification activities may occur prior to NOVA/COI approval.

A verification body that does not provide proper notification to the Reserve could be denied the right to conduct verification services for the proposed verification and may be disqualified or suspended as a recognized verification body. Note that a NOVA/COI form must be submitted for each verification period, even if a verification body has verified a previous vintage for the project and is within the allowed verification cycle timeline.

3.6.3 Potentially Conflicting Services

A verification body will have a high risk of COI if it or one of its contracted personnel shares any management with the potential client or if any of the potential client's staff working on GHG-related activities were previously employed by the verification body within the last three years, or vice versa. A verification body will have a high risk of COI if it or its related companies (e.g., parent company, subsidiaries of a parent company, affiliates) has provided any GHG management, consulting or advocacy services (as identified on the list below) to the potential client within the last three years. Such services would indicate the verification body could be: 1) verifying their own work, 2) performing management functions for the client, and/or 3) acting as an advocate for the client.

Verification bodies may not conduct both GHG consultancy services and verification services for the same project. A verification body may offer both types of services in general, but for any particular project it must choose which of the two services it wishes to offer. A verification body is strictly prohibited from consulting on any project it wishes to verify and can never verify a project that it has designed, developed, implemented or consulted on, regardless of when it provided that service.

Validation of a project prior to verification is considered an independent third party assessment service, not consulting. All instances of work in relation to validation and consulting should be disclosed on the NOVA/COI form.

Where a high risk of COI is determined to exist and mitigation is not possible, the verification body will not be approved to conduct the verification.

The following lists contain services that are considered potentially conflicting and therefore incompatible with the provision of GHG verification activities. Services of this nature must be

declared on the NOVA/COI form. Please note that this list is not exhaustive, as there are other services and conditions that could constitute a COI.

High risks for COI:

- Sharing senior management staff or Board of Director membership between the project developer and the verification body, or previous employment of the senior management staff by the verification body or vice versa within the previous three years.
- Designing, developing, implementing, internal auditing, consulting or maintaining a GHG emissions reduction or removal project
- Designing or developing GHG information systems for the project developer in the same sector
- Owning, buying, selling, trading or retiring shares, stocks or offset credits from the project in question
- Brokering in, advising on, or assisting in carbon or GHG-related markets
- Dealing in or being a promoter of credits on behalf of the project developer

Medium risks for COI:

- Developing GHG emissions factors or other related engineering analyses for the project developer
- Designing energy efficiency, renewable energy, or other projects for the project developer that explicitly identify GHG reductions as a benefit
- Providing appraisal services of carbon or GHG liabilities or assets
- Preparing or producing GHG-related manuals, handbooks, or procedures for the project developer
- Providing legal services
- Providing expert services for a legal purpose or advocating for the project developer
- Providing other GHG-related fee-paying services to the project developer during the course of project verification services
- Members of proposed verification team have a close personal or familial relationship with the project developer
- Any regulatory enforcement action, including citations and fines
- Other services as determined by the Reserve

Depending on the nature of the services provided, it is possible that a COI could be alleviated with a proper mitigation plan. If the verification body identifies a potential high or medium COI risk on the NOVA/COI form, the verification body must submit a plan to avoid, neutralize, or mitigate the COI. The Reserve will review the submitted documents to determine if sufficient information has been provided. If not, the Reserve will request additional information. Once the information is found to be sufficient, the Reserve will review the case and issue a written determination within 10 business days.

Potentially conflicting services could be mitigated by the following circumstances, including, but not limited to:

- **Time of service:** Any services delivered between the project developer and the verification body (past employee/employer or other relationships) that occurred more than three years before the date of the COI determination are viewed as a lower risk. However, any services rendered related to the design, development, implementation or

maintenance of a GHG emissions project must be fully disclosed and are always considered conflicting, regardless of the time of delivery.

- **Location:** Services provided to a business unit, facility or office of the project developer located outside of North America are considered a lower risk for a conflict of interest.
- **Type of service:** Services that do not appear on the above lists of potentially conflicting services may be considered a lower risk.
- **Financial value of service:** The verification body's provision of other services with a small monetary value relative to the value of verification is viewed as a lower risk by the Reserve. Cases where the total value of services provided to the project developer is a very small percentage of the verification body's revenue over the same period may be less cause for concern as well. The size of the verification team is also a factor into the determination of financial value of services. The percentage of annual revenue of verification services conducted by the company's North American Greenhouse Gas Business Management Unit (GHG Business Unit)⁶ for the project developer in question must be provided on the NOVA/COI form. This information will be treated confidentially by the Reserve.

3.7 Organizational COI and the Verification Cycle

There is no limit on the number of projects that a verification body may work on for a project developer. However, if the verification body has performed verification activities for more than 10 projects over a 12-month period for a single project developer, the Reserve may require further information to inform its COI determination.

A verification body may verify any number of reporting periods for a project for a maximum of six consecutive years. After the six-year period, the project developer must engage a different verification body to verify the project. The original verification body may continue to provide verification services for other projects developed by the same project developer, but it cannot provide verification services for the project in question for at least three years.

The cycling and rotation of verification bodies helps avoid COI situations that could arise from lengthy and ongoing business relationships. In addition, this process guarantees that another firm reviews previously verified reporting periods, thus providing another check on the consistency and appropriateness of protocol interpretation and professional judgment. The new verification body must re-check eligibility criteria per the protocol requirements, but it is not required to perform an additional verification of data that was verified in previous reporting periods (see Section 4.6.1).

The original verification body may again provide verification services to the project after a lapse of at least three years. This three-year suspension may be triggered earlier if the verification body has conducted a substantial amount of other services for the project, depending on their nature. These services must be disclosed in the NOVA/COI form and will be assessed by the Reserve on a case-by-case basis. The three-year suspension period begins the day after the project's most recent registration date.

The potential for COI between a project developer and a verifier who works for multiple verification bodies is reviewed on a case-by-case basis. Individual verifier relationships, non-project related consulting services or employment by the project developer or another verification body (also non-project related) may trigger the requirement for a verifier to wait at

⁶ The term "GHG Business Unit" refers to the verification body's staff and offices within the corporate structure that offer climate change and greenhouse gas services (validation, verification, consulting, etc.) in North America.

least three years before performing verification for a particular project in order to mitigate the potential for COI. All personal and business relationships must be disclosed on the NOVA/COI. These cases proceed directly to a Reserve COI Committee for review.

The verification cycle applies to verification services performed during the entire life of the project, which includes verifications performed under another GHG registry or program.

If for any reason the Reserve determines that a relationship constitutes a conflict of interest that cannot be mitigated, the Reserve will require the project developer to select a new verification body. The Reserve may also require re-verification of any verification results from the time at which the conflict of interest arose and could not be mitigated.

Example 1: Verification Pro provided GHG inventory verification services for a Climate Registry member, MacDonald Dairy, from 2012-2015. MacDonald Dairy now has a Reserve livestock project in 2016 and would like to hire Verification Pro.

While Verification Pro has provided verification services for MacDonald Dairy in the recent past, it has never verified this specific project. Verification Pro may verify this project for up to six consecutive years.

Example 2: Verification Pro provided validation services for a LFG Unlimited landfill project under the Verified Carbon Standard from 2012 through 2015 (4 years). The project transferred to the Reserve in 2016.

LFG Unlimited may contract with Verification Pro for verification services for 2016 through 2018 (2 additional years), at which point LFG Unlimited must select a different verification body.

3.8 Technical Consultants and Contracted Verifiers

Technical consultants that are hired by the project developer to provide technical assistance in any capacity, including helping the project developer compile data or manage a project, are not required to complete training or become accredited under ISO 14065. However, a technical consultant that participated in the development of a project cannot provide verification services for that same project, as this is a clear COI. Development services include designing, implementing, or maintaining a GHG emissions reductions or removals project as well as setting up GHG management or information systems for the project. The history and relationships between the technical consultant(s) and the verification body must also be disclosed on the NOVA/COI form.

A verification body is allowed to use contracted verifiers to fill any role on the verification team. Contracted verifiers acting as the Lead Verifier or Senior Internal Reviewer are subject to all training requirements described in Section 3.4. Any contracted verifiers performing verification activities must be included on both the NOVA/COI form and the Verification Staff Reporting form, and per the requirements of ISO 14065, verification bodies must take full responsibility for verification activities performed by contracted verifiers.

Under ISO 14065, contracting is distinct from outsourcing⁷; outsourcing is described as the practice of an organization setting a contract arrangement with another organization to provide services tasked to the original organization. While verification bodies may not outsource the Lead Verifier or Senior Internal Reviewer roles to another organization, verification bodies are allowed to outsource other roles on the verification team, provided no COI exists between the

⁷ ISO 14065:2013, Note under 6.4.

outsourced party and the project developer. Like contracted verifiers, individuals in outsourced positions must be included on both the NOVA/COI form and the Verification Staff Reporting form.

3.9 Confidentiality

Verification bodies must keep sensitive information encountered while conducting verification activities confidential in order to uphold the integrity of data reported within the Reserve. Verification bodies must not make use or take advantage of any confidential information and must take reasonable steps to protect the information from any unauthorized access. Due to the fact that market-sensitive information may be encountered while conducting project verification activities, the verification body must agree to maintain strict confidentiality in its findings prior to the public availability of the Verification Report. Confidentiality arrangements and requirements should be addressed in the contract between the project developer and the verification body.

The Reserve enters into confidentiality agreements with verification bodies and project developers as necessary. The Reserve may also, on occasion, request supporting information to supplement reported data. The Reserve follows standardized security and confidentiality procedures in order to protect all confidential business information. Any organization that must provide confidential information to support the NOVA/COI assessment should clearly mark which information is considered confidential in order for it to be treated as such.

Once a verification body is selected by a project developer, the two parties should negotiate contract terms. This contract should be between the project developer and the verification body exclusively, with the particulars of the contract at the discretion of the two parties. While the commercial arrangements surrounding the timing of the verification and the payment of fees are negotiated between the two parties, these details must be disclosed in the NOVA/COI form. As previously stated, the NOVA/COI form is not made public and no verification activities can take place until it has been approved.

4 Project Verification Activities and Expectations

4.1 Overview

The ultimate objective of verification is to provide assurance that GHG reductions or removals are real, additional, verifiable, permanent, and owned unambiguously. To do this, verification bodies must develop a risk-based verification plan that takes into account the size and complexity of the GHG project, the verification team's knowledge of the project, and the relevant sector, technology and processes. The verification plan must identify areas of key reporting risks to support to a reasonable level of assurance that the claimed GHG reductions or removals are materially correct.

Verification bodies must verify a project's GHG reductions or removals by:

- Implementing a risk-based approach to verification
- Ensuring verifications are conducted in a systematic and comparable way
- Ensuring Verification Reports, List of Findings and Verification Statements are independent and robust

Verification activities necessarily differ based on the complexity of a project's GHG emissions reductions or removals and the underlying data supporting them. However, the verification process must include, at a minimum, the following steps:

- Notification of verification activities and case-by-case evaluation of conflict of interest
- Scoping and planning of project verification activities
- Desk review and initial site visit to conduct project verification activities:
 - Confirmation of eligibility criteria
 - Identifying emissions sources, sinks and reservoirs and assessing risk of material misstatements
 - Reviewing methodologies and management systems
 - Verifying emission reduction calculations
- Preparing a Verification Report, List of Findings and Verification Statement and submitting them to the Reserve

Upon completion of the above steps, Reserve staff reviews the relevant documents and reported data before registering the project and issuing CRTs. The Reserve relies upon the Verification Report to attest to the accuracy and legitimacy of the CRTs issued and the verification body is held accountable to the Reserve for the quality and independence of the Verification Report and Statement. See Section 5 for further guidance on the materials Reserve staff reviews prior to CRT issuance.

4.2 Risk-Based Verification

Project verification is an iterative, risk-based activity in which the complexity of all project components are balanced and assessed in relation to one another using verifier professional judgment. Areas that display low complexity or have minimal bearing on the eligibility or quantification of project emission reductions should receive lower priority and attention relative to areas with high complexity and significant implications for project eligibility or emission reductions.

During the scoping and planning phases (Section 4.3), the verification team shall conduct a preliminary risk assessment in order to establish a verification approach based on areas of highest perceived risk. This assessment should include the project type, size, complexity, and length of verification period, and should not be considered final. Rather, an iterative approach must be used to re-assess risk and complexity in the context of the knowledge gained and information gathered during the verification process.

Identified areas of risk may include any aspect of the project. Where the verification team identifies significant risk, it shall review those project components with increased care exceeding the minimum requirements provided in this document and the appropriate project protocol.

Potential areas of risk may include, but are not limited to:

- Ownership of GHG rights
- Project conformance with the Legal Requirement Test
- Project conformance with the Performance Standard Test
- Project compliance with relevant regulations
- Maintenance and appropriate operation of project hardware
- Adequacy and QA/QC of data collection processes
- Training of project personnel
- Data transcription and handling
- Data calculations

4.3 Scoping and Planning Project Verification Activities

Prior to entering into an engagement to provide verification services for a Reserve project developer, the Reserve must review the composition of the verification team and the scope of verification activities. This information is submitted to the Reserve for its approval in the NOVA/COI form (see Section 3.6).

4.3.1 Verification Team

The verification body is responsible for assembling a competent and qualified verification team to undertake verification activities before beginning any verification work. It must consider the capabilities and capacities of its staff when building the team. The verification team must have sector-specific competency in relation to the type of project being verified, and all team members and their respective roles must be disclosed on the NOVA/COI form. The verification team shall consist of a minimum of two individuals with Lead Verifier qualifications: one to serve as the Lead Verifier and one to serve as the Senior Internal Reviewer.

The role of a Lead Verifier is to coordinate and lead the verification team and all underlying verification activities. The Senior Internal Reviewer's role is to perform a final quality control on the data checks, the List of Findings, the Verification Statement and Verification Report prior to its completion.

In order to perform an impartial evaluation of the verification process and results, the Senior Internal Reviewer must remain independent from decisions made by the rest of the verification team during verification activities. To that end, the Senior Internal Reviewer shall not participate in meetings, phone calls or site visits between the verification team and the project developer.

See Section 3.4 for more detailed information on individual verifier training requirements.

4.3.2 Developing a Verification Plan

Prior to the kick-off meeting, the verification team shall develop an initial verification plan outlining the scope and nature of verification activities to be conducted for the specific project. In developing this plan, it shall consider the key requirements and objectives of the project developer, compliance with the relevant Reserve project protocol, the information to be reported to the Reserve, and the verification team members' capabilities and sector competencies.

The verification plan must include a review of any previously reported information to the Reserve, a preliminary assessment of areas of high risk, identification of potential systemic weaknesses, a draft sampling plan to recalculate the emission reductions or removals data reported to the Reserve, and a site visit itinerary (if necessary). The data sampling plan should be created in line with the requirements of Section 4.3.3 of ISO 14064-3, which stipulates the different types of sampling and the typical conditions that apply to each sampling type. The verification plan should evolve as the verification progresses and the verification team obtains more information on potential areas of risk and supporting evidence to substantiate the GHG emission reductions assertion. The Reserve may request a copy of the verification plan at any time.

After the Reserve has been notified of planned verification activities and issued approval for verification to proceed, contract terms may be finalized. At that point, the verification team shall conduct a kick-off meeting with the project developer. This meeting can be held either in person or remotely. The agenda for the meeting should include:

- Introduction of the verification team, overview of roles and responsibilities
- Review of verification activities, plan and scope
- Transfer of background information and underlying activity data
- Review and confirmation of the verification process schedule

Based on the information provided during the kick off call, the verification team should determine the most effective, efficient, and credible verification approach tailored to the particular characteristics of the project. If a project has been selected by the Reserve for verification oversight, Reserve staff may participate in all or some of the verification activities.

4.4 Verification Cycle

A reporting period is a period of time over which a project developer quantifies and reports GHG reductions/removals for the project. The verification period is the period of time over which GHG reductions/removals from said reporting period(s) are verified. Reporting periods must be contiguous in the Reserve program; there can be no time gaps in reporting during the crediting period of a project once the initial reporting period has commenced. Gaps in recorded data or activity within the crediting period must be included within the reporting period and verified accordingly. The verification body must confirm that no reductions are claimed for any period that is missing data or is designated as a zero-credit reporting period by the project developer. See Section 3.4.6 of the Program Manual for details related to a zero-credit reporting period.

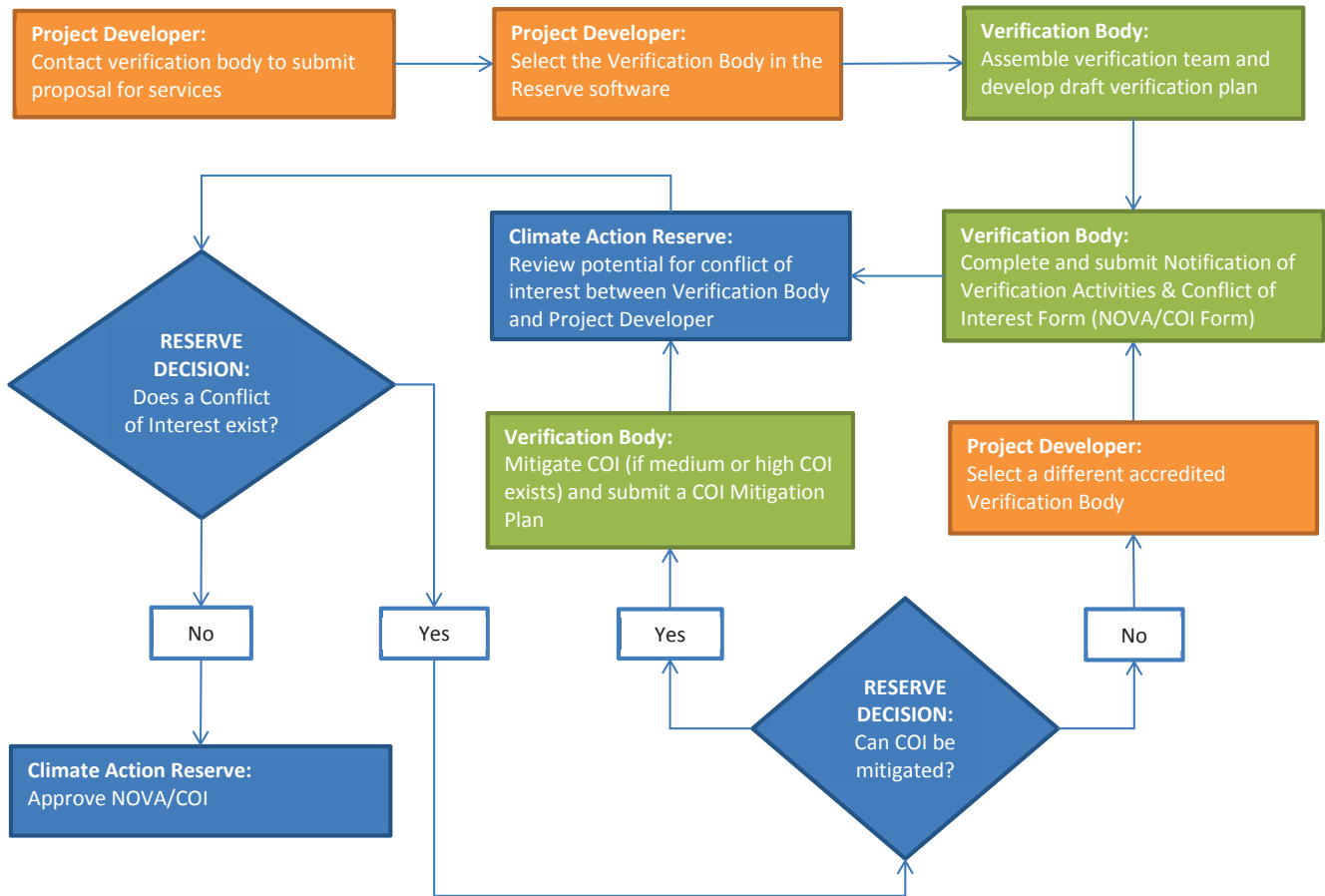
All projects must complete their initial verification within 12 months of the end of the initial reporting period. To satisfy this verification deadline, a completed Verification Report and signed Verification Statement must be submitted to the Reserve.

After a project is registered, a Verification Statement and Verification Report must be submitted within 12 months of the end of each subsequent verification period. The maximum allowed

length of the verification period is specified in each protocol, but project developers may choose to verify more frequently than required. For example, a Verification Statement and Report for GHG reductions achieved between January 1, 2016 and December 31, 2016 would have to be submitted by December 31, 2017 if a project was required to verify annually. The only exception to the verification deadline is if the project developer is taking a zero-credit reporting period (see Section 3.4.6 of the Program Manual).

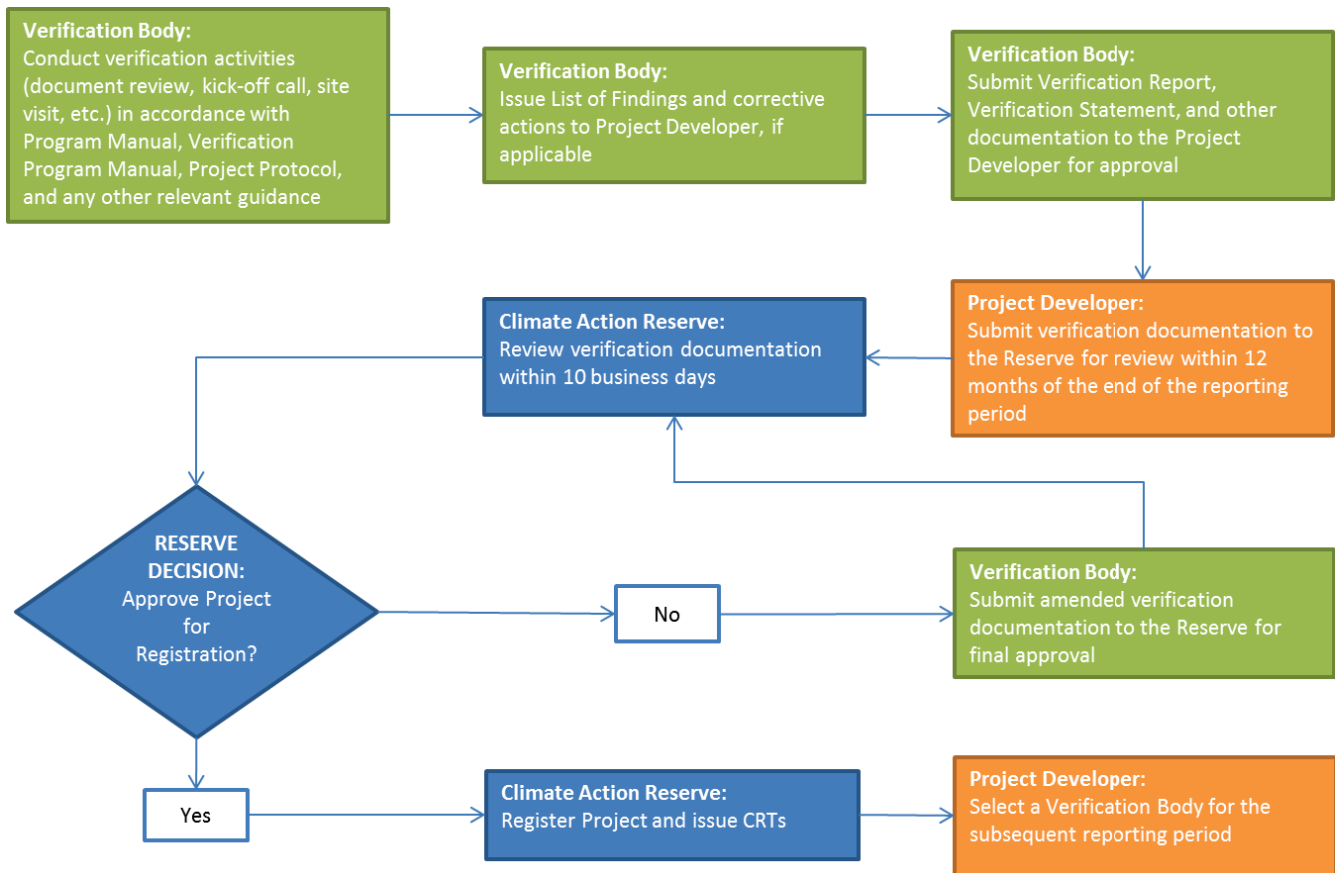
The following flow charts provide an overview of the NOVA/COI approval and verification processes.

Figure 4.1: NOVA/COI Approval



Please ensure that you are using the latest version of the Verification Program Manual

Figure 4.2: Project Verification and Registration



Please ensure that you are using the latest version of the Verification Program Manual

4.5 Desktop Verification vs. Full Verification

The following activities are expected to occur during a desktop verification and a full verification (desktop verification and a site visit), respectively. Please note that these lists are not comprehensive. Requirements differ by project type, and the project protocols note the exact requirements. The depth and breadth of verification activities shall also be guided by the project-specific risk assessment (see Section 4.2).

A desktop verification must, at minimum, consist of:

- Assessment of project eligibility criteria
- Review of required attestations
- Re-calculation and review of the data calculations and information presented in order to verify completeness
- Review of the monitoring plan and monitoring methodology for conformance with protocol requirements
- Evaluation of data management, QA/QC systems, and general procedures in the context of their influence on the generation and reporting of reductions or removals

A full verification must, at minimum, consist of the above-listed desktop verification activities as well as:

- Site visit(s) as required by the relevant protocol
- Assessment of the implementation and operation of the project activity
- Review of information flows for generating, aggregating and reporting the monitoring parameters
- Interviews with relevant personnel to confirm that they are properly trained and qualified for the duties they perform
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the project monitoring plan and the protocol requirements
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the applicable protocol requirements
- Identification of QA/QC procedures in place to prevent or identify the possibility of misstatements

4.5.1 Site Visits

A significant portion of the verification activities are conducted during the desktop review of calculations made by the project developer, GHG emissions data, and supporting documentation. However, a site visit can be critical to properly assess project operations, functionality, and data control systems; confirm the project boundaries and assessment area; and review measurement/monitoring techniques and onsite record-keeping practices.

Unless otherwise specified in a protocol, the verification body must conduct a site visit at least once for every 12 months of data verified. It is recommended, but not required, that the site visit occur after the conclusion of the reporting period under verification and that the Lead Verifier is present.

For sub-annual reporting and verification periods for which the same verification body has been on site within the last 12 months, site visits are not required unless significant changes to the project are identified during the desk review. The verification body may use professional judgment to determine if there have been significant changes to the project.

4.6 Core Verification Activities

The core verification activities of the Reserve program encompass a risk assessment and data sampling effort used to determine that the project is eligible, no relevant sources, sinks or reservoirs (SSRs) identified in the project protocol are excluded, data was properly collected and calculated, and the risk of error is low. Each of these areas must be assessed and addressed through appropriate sampling, testing and review.

All verification activities shall include the following core steps:

1. Confirm eligibility criteria
2. Review data and identify SSRs
3. Review management systems
4. Verify emissions estimates

4.6.1 Step 1: Confirm Eligibility Criteria

Every project must meet the eligibility criteria established in the Reserve Program Manual and relevant project protocol in order to qualify for project registration. There can be no deviation from these rules. The Reserve conducts a preliminary review of project information provided in the project submittal form to assess eligibility. This review is not a final determination of the eligibility of the project, nor does it guarantee CRT issuance or CRT ownership.

Upon initiation of verification activities, it is the responsibility of the verification body to assess these claims and confirm that a project meets the eligibility criteria in the initial verification period. For subsequent verification periods, the verification body must confirm that the project continues to meet eligibility requirements. The eligibility check includes, but is not limited to, reviewing the required attestations described in the following sections.

While the structure of the project eligibility criteria is shared amongst the Reserve protocols, the specific requirements can vary. Please refer to the relevant protocols and accompanying verification guidance for more information on the eligibility criteria and required frequency of verification for each criterion. Whenever a verification body verifies a registered project for the first time, it must review all applicable eligibility criteria rather than relying on the determination of the previous verification body.

The verification body must explicitly state in the Verification Report whether each eligibility requirement has been met and summarize the evidence that was reviewed to reach its determination. Please note that areas of high risk may necessitate investigation beyond the steps described below.

4.6.1.1 Location

Each project protocol limits project activities to an explicitly defined geographic boundary. Verification of project location shall be conducted through site visits, corroboration and review of appropriate documentation, and/or geographic searches confirming location and the project area.

4.6.1.2 Project Start Date

As defined in the Reserve Program Manual and project protocols, the project start date initiates the project crediting period. Verification bodies must verify that:

- The project start date reported in the Reserve software is correct
- The project start date is eligible per the applicable protocol and the policy laid out in the Reserve Program Manual

Verification bodies shall review supporting documentation to ensure the start date established by the project developer is correct (e.g., design plans, installation dates, operational dates, commissioning reports, service invoices, log books, staff interviews, etc.) and may use their discretion as to the adequacy and sufficiency of evidence provided. Supporting documentation should always be clear, traceable and directly correspond to the reported timeline. The exact start date must be explicitly stated in every Verification Report for the project.

4.6.1.3 Crediting Period

Verification bodies shall verify that the reporting period falls within the project's crediting period as defined in the applicable protocol. Verification bodies shall also confirm that the crediting period and the reporting period entered in the Reserve software are accurate and the underlying activity or source data supplied by the project developer directly corresponds to these dates.

It should be noted that all data must be contiguously reported and verified, even if no credits are being claimed for a given time within a particular reporting period (see Section 4.4).

Project transfers are allowed in accordance with the guidelines outlined in Sections 3.6, 3.7, and 3.8 of the Reserve Program Manual. Transfers from another GHG registry shall be reviewed by the verification team, and the verification body must ensure that no double-counting has occurred by cross-checking the previous registry's records with the Reserve software.

4.6.1.4 Additionality

The Reserve incorporates standardized additionality tests in all of its protocols. These tests generally have two components that must be confirmed by the verification body: a legal requirement test and a performance standard test.

The Legal Requirement Test

Projects are very likely to be non-additional if their implementation is required by law. The legal requirement test ensures that eligible projects (and/or the GHG reductions/removals they achieve) would not have occurred anyway in order to comply with federal, state or local regulations, or other legally binding mandates. A project passes the legal requirement test when there are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions or other legally binding mandates requiring its implementation, or requiring the implementation of similar measures that would achieve equivalent levels of GHG emission reductions/removals.

Verification of the legal requirement test requires:

1. **Review of the Attestation of Voluntary Implementation form:** The Attestation of Voluntary Implementation states that the project was implemented, established, operated, and conducted voluntarily and for the carbon benefit. Verifiers must confirm

that this form has been properly executed by a qualified representative of the project developer.

2. **Risk-based review of relevant legal requirements:** The verification body must conduct a review of applicable local, state or federal regulations in order to reach reasonable assurance that there are no specific mandates for the project's implementation.

In addition, most protocols specify that the project's Monitoring Plan must include the procedures that the project developer must follow to ascertain and demonstrate that the project passes the legal requirement test at all times. If the verification risk assessment determines that there is a low risk of the project failing the legal requirement test, then the reviews of the Attestation of Voluntary Implementation and the evidence that the project's Monitoring Plan has been properly implemented may be sufficient.

However, if significant risk of failure is present, verification bodies shall use their professional judgment to determine the depth and scope of the review required to confirm that the project passes the legal requirement test. Project developers are expected to provide evidence if requested by the verifier.

The Performance Standard Test

Projects that are not legally required may still be non-additional if they would have been implemented for reasons other than generating revenue from the sale of carbon offsets or simply to reduce GHG emissions. Performance standards are designed to screen out this potential set of projects. In developing performance standards, the Reserve considers financial, economic, social, and technological drivers that may affect decisions to undertake a particular project activity. These standards are tailored such that the large majority of projects that meet them are unlikely to have been implemented due to other drivers. In other words, incentives created by the carbon market are likely to have played a critical role in decisions to implement each project in the Reserve program.

Verification bodies must verify that the project meets or exceeds the protocol-specific performance standard. This determination is not subjective.

The applicable performance standard is applied by the project developer at the time the project commences. In most protocols, projects that have been registered do not need to be evaluated against the performance standard in future verifications for the duration of the first crediting period.

4.6.1.5 Regulatory Compliance

The verification body shall confirm that the project being verified was in material compliance with all applicable laws, including environmental regulations, during the verification period; no CRTs may be issued for periods when a project was not in material compliance with all applicable laws. The protocol-specific regulatory compliance requirement is generally limited to project activities at the host site, but it may extend to the entire facility or additional holdings. This requirement is verified through a review of the Attestation of Regulatory Compliance, as well as a risk-based review of project documentation.

Project developers are required to disclose to the verifier all instances of non-compliance of the project with any law. To confirm regulatory compliance, the verifier must assess 1) whether a violation is related to the project or project activities, and 2) whether the violation is material.

Before assessing materiality, the verifier must first assess whether a violation is related to the project or project activities. A violation should be considered to be “caused” by project activities if it can be reasonably argued that the violation would not have occurred in the absence of the project activities. It is important to note that the scope of regulatory compliance may be different for different project types. For example, there are many activities and pieces of equipment at a dairy operation, in a forest or at a coal mine that are completely unrelated to project activities occurring at the same site. However, activities at a composting facility, nitric acid facility or ODS destruction facility are inherently more connected to the project.

It is also important to review the timing of the violation. Many facilities do not receive documentation of a violation until well after the violation has actually occurred. If a violation was to affect CRT crediting, it would be for the time period when the violation occurred, which is not necessarily when notice of the violation is received.

Once the verifier has determined that the violation is related to the project or project activities and the reporting period being verified, he/she shall then assess the materiality of the violation.

The concept of materiality is found throughout the Reserve’s program. Generally, the term is used to indicate something significant (material) as opposed to insignificant (immaterial). This manual discusses materiality with respect to verifying an emissions report in terms of a materiality threshold (Section 2.3), a quantitative materiality threshold (Section 2.3.1), and a qualitative materiality threshold (Section 2.3.2).

The materiality thresholds to assess an emissions report described in previous sections are not appropriate to use when assessing the materiality of regulatory violations. The Reserve introduced the concept of materiality to regulatory compliance in order to differentiate between violations that could bring into question the integrity of the project and violations that are strictly administrative or due to acts of nature. Violations that are administrative (such as an expired permit without any other associated violations or tardiness in filing documentation) are not considered material and do not affect CRT crediting. Any other type of violation that is project-related is generally considered material.

Any violation that is found by the verifier to be caused by the project or project activities shall be brought to the Reserve as soon as possible for assessment on a case-by-case basis. Verifiers should continue to use professional judgment to assess the violation and gather the necessary information and documentation they feel is required to make a determination of materiality. The Reserve shall utilize this information and the recommendation of the verifier to make such a determination.

4.6.1.6 Ownership

One of the fundamental principles of the Reserve program is the unambiguous ownership of GHG reductions/removals. Project developers must have exclusive ownership rights to the GHG reductions or removals associated with the project and for which the Reserve will issue CRTs. In addition, the project developer must agree that ownership of the GHG reductions or removals will not be sold or transferred except through the transfer of CRTs in accordance with the Reserve Terms of Use policies.

It is essential that the verification body determines the project developer is the proper owner of a project’s potential CRTs early in the verification process. The ownership requirement is verified

through review of the Attestation of Title and an accompanying review of available ownership documentation. The owner of the CRTs must be the account holder in the Reserve software; the owner must also be the signatory to the Attestation of Title.

The verification body must confirm that the project developer has signed the Attestation of Title and is the owner of full, legal and beneficial title to the GHG reductions or removals generated within the Reserve. Although several parties may be involved in a single project, the party that signs the Attestation of Title must be the party that has beneficial ownership rights in relation to the CRTs registered in the Reserve.

If the verification body determines a different organization has ownership of the CRTs, the verification body may proceed with verification activities as long as the rightful owner is clearly identified in the verification documentation, all involved organizations are informed, and a COI evaluation between that party and the verification body has been approved by the Reserve. The project could also be moved to a different account within the Reserve software.

In addition to the Attestation of Title, verification bodies should review relevant contracts, agreements, and/or supporting documentation between project developers, facility owners, utilities, and other parties that may have a claim to the CRTs generated by the project. Verification bodies must review these contracts in a risk-based context and use professional judgment to determine the depth and breadth of the review. In order to issue a positive Verification Statement, the verification body must conclude with reasonable assurance that the project developer has title of the GHG reductions/removals.

In some instances, ownership will be straightforward and easy to identify (see Example 1). In other instances, particularly those involving multiple parties, a more careful analysis will be required (see Example 2).

Example 1: A forest owner with complete title and beneficial rights in certain real property and its timber designs and implements an Improved Forest Management project to sequester carbon without any outside assistance. In this situation, the future owner of the CRTs is clear, absent any further documentation or assertions to the contrary.

Discussion: In this case, the verifier should be able to establish ownership through a site visit, geographic search mapping of the project boundary, and a thorough review of the deed and/or title to the land.

Example 2: A private company, X Co, pays for the installation of GHG emissions-capturing equipment at a landfill owned by the local county waste authority in exchange for rights to any GHG offset credits derived from such activities.

Discussion: In this case, the proper owner and appropriate Reserve account holder is not immediately clear without reviewing the underlying contractual arrangements between the two parties, since both are involved in the activities leading to the emission reductions.

Upon review of the underlying documents, the verification body should be able to reasonably conclude that X Co is the proper project developer and account holder to which any CRTs would be issued. Even though the waste authority could have potentially laid claim to the emission reductions, it most likely conceded such rights, often noted as "environmental attributes," to X Co via a contract prior to the implementation of the project.

Although the above examples require some review of contractual terms, the parties with potential interest in the project are still fairly straightforward. However, in some cases, a project

developer may try to open an account for an affiliated entity or under a different name and have the CRTs issued directly into that account. In the Reserve program, CRTs can only be issued to the account of the legal entity that owns the rights to those CRTs. Thus, the account holder must be the same legal entity as the project developer in order to be issued the CRTs.

Separate legal entities may include limited liability companies (LLCs), corporations, and other business organizations, regardless of whether these entities are 100% related to the project developer (e.g., parent, subsidiary, affiliate, etc.). Even if a project developer is 100% owned by its parent company, its parent or any other related company cannot be considered the project developer or be designated as the account holder unless they are the same legal entity, e.g., the project developer is a division within the parent LLC or corporation. This is true regardless of the reasoning behind the creation of the organizational structure of the larger corporate family, whether it be for tax purposes, administrative convenience, efficiency, or any other purpose.

If there is any question as to whether the project developer is the same legal entity as the rightful owner of CRTs, then the verifier may ask for the formation documents of each entity, e.g., LLC operating agreement, certificate of incorporation, etc., and/or request each entity's tax identification number (TIN) issued by government authorities. If the entities have separate formation documents but the TIN is the same number for both, they are likely the same legal entity. If they both have separate formation documents and/or different TINs, then they are not the same legal entity.

Table 4.1 contains some examples of different corporate structures that can be considered when assessing legal entities:

Table 4.1: Corporate Structure of Legal Entities

Scenario	Likely Outcome
Names of X Co and Other Named Entity each end in "LLC", "Inc.", "Corp." or other legal entity designation	Separate legal entities
X Co is doing business as (DBA) Other Named Entity	Unclear → check formation docs and TINs
No clear relationship between X Co and Other Named Entity	Unclear → check formation docs and TINs
X Co is a division of Other Named Entity, not a separate LLC, corporation, or other legally formed entity and same TIN	Same legal entity

The Reserve recognizes that verification teams generally do not contain a legal expert. If any high-risk contractual and/or title issues remain unresolved following an exhaustive review, the verification body should contact the Reserve for further assistance. In these circumstances, the Reserve will help make an ownership determination.

4.6.2 Step 2: Review Reported Data and Identify Sources, Sinks and Reservoirs

Verification bodies shall review a project's reported SSRs to ensure that all are properly identified within the GHG Assessment Boundary as defined by the applicable protocol. The review must also include the reporting and monitoring parameters for the project.

The site visit shall be used to confirm the GHG Assessment Boundary, examine project equipment, identify any associated SSRs resulting from the project, and assess the operation of the project activity.

As part of this process, verification bodies shall review the project's Monitoring Plan to verify that all required SSRs and project activities are measured, modeled or calculated appropriately and with the correct frequency. Verification bodies must also review the project's GHG reduction assertions, data collection and storage methods, and QA/QC measures.

Once all reporting parameters and SSRs have been identified and any issues addressed, the verification body may proceed to Step 3 to review the project's calculation methodologies and management systems.

4.6.3 Step 3: Reviewing Management Systems and Methodologies

After the project SSRs have been confirmed, verification bodies shall review the methodologies and management systems used to generate, compile, transcribe, and store project data. This is principally a risk assessment exercise in which the verification body must weigh the relative complexity of the scope of the project's emissions operations and activities, the project developer's methodologies and management systems used to report GHG reductions, and the likelihood of calculation error as a result of reporting uncertainty or misstatement. The verification body must determine the presence and level of inherent and management type risks and focus its verification effort on the highest risk areas. This is an area which requires professional judgment, and it is likely that qualitative material non-conformances with the protocol could be identified.

Through this review, the verification body shall determine the appropriateness of the management systems, IT systems, staff competency, internal audits, record keeping arrangements, and documentation processes to understand the risk of systemic errors as a result of reporting uncertainty or misstatement. A review of records and management systems onsite helps to ascertain the adequacy of the management system relative to protocol requirements.

A verification body's general review of a project's GHG management systems should document whether methodologies/procedures are appropriate given the inherent uncertainty/risk; the likelihood that the data is correctly aggregated, monitored, and measured; and whether a qualified individual is responsible for managing and reporting GHG reductions or removals. The verification body shall also check that the correct metering equipment is used, inspected, cleaned and calibrated in accordance with the applicable project protocol. The verification body is responsible for ensuring that all metered and modeled (if applicable) data are accurate.

4.6.4 Step 4: Verify Emissions Estimates

Based on a project's SSRs, management systems, and corresponding risk profile, verification bodies must ensure that the calculations of GHG reductions or removals are accurate within the appropriate quantitative materiality threshold. This is achieved by re-calculating all emission estimates based on project activity data. All emission or efficiency factors used in the applicable protocol equations must also be checked. Cross-checking calculated emissions reductions and performing data reconciliation in line with the methodologies outlined in the applicable protocol is vital to ensure quantitative material misstatements are identified and resolved.

Verification bodies shall also trace activity and/or monitoring data compiled by the project developer back to the original source and perform re-calculations in accordance with a sampling plan that focuses on high-risk data. Verification bodies shall review all relevant physical and documentary evidence.

In order for verification bodies to verify the reductions or removals entered in the Reserve software, the sample of recalculated project data must be free of material misstatement. It is possible that the overall GHG reductions or removals calculated by the project developer will differ from those estimated by the verification body. A discrepancy is considered material if the difference between the reported GHG reductions and the verifier's estimate surpasses the materiality threshold defined in Section 2.3.1. Immaterial discrepancies are those that fall within the materiality threshold and are not required to be corrected.

Note that, per Section 2.3.1, the Reserve allows for under-reporting of emission reductions/removals as that is considered conservative. Under-reporting errors are not required to be corrected. The quantitative materiality threshold only applies to mistakes that result in over-reporting.

If the reported data is not free of material misstatement, the verification body shall include this information in the List of Findings and complete the sampling effort of other sources. Once the verification body has confirmed that the data sample is free of material misstatements, it is ready to complete verification activities.

Examples of directly monitored and measured data or supporting evidence that should be reviewed during verification include (but are not limited to):

- Flow meter, electricity meter, and continuous emissions monitoring system (CEMS) data
- Outputs from gas collection, destruction or abatement systems
- Electricity use or fossil fuel combustion records, invoices, purchases and sales orders
- Onsite fuel stocks
- Data recording devices and portable monitoring equipment
- Maintenance and calibration records, log books, and system operations manuals
- Laboratory test results or third party reports
- Manufacturer specifications and reports
- Raw material inputs, production output, and hours of operation
- Field check reports, sampling exercises, and analysis reports
- Emission factors (if not default), combustion efficiency, and oxidation factors
- Certificates of destruction, weight tickets, and customs documents
- Calculation spreadsheets and electronic files

It is a verification body's duty to identify errors during the verification process. Common errors include, but are not limited to:

- Calculation errors: equations used by project developer do not match those specified by the protocol
- Incompleteness: incorrect inclusion or exclusion of SSRs within the GHG Assessment Boundary, exclusion of significant sources and/or leakage effects
- Inaccuracy: manual data transfer and transcription errors, double counting, and use of incorrect emission or destruction efficiency factors

Any of the above errors could result in the project developer materially over-estimating GHG reductions or removals.

4.7 Professional Judgment

By design, Reserve protocols are not entirely prescriptive, which necessitates that verification bodies use their best professional judgment when executing certain verification activities. Verification bodies must demonstrate, through their staff's professional qualifications and relevant GHG experience, their ability to render sound professional judgment in relation to Reserve projects.

Application of professional judgment is expected in the following areas:

- Implementation of verification activities with appropriate rigor for the size and complexity of the project and the uncertainty of calculations associated with the project's SSRs
- Review of the capability of a project developer's GHG emissions tracking, monitoring, and management systems to provide accurate information
- Determination of the amount of data that constitutes a representative sample
- Assessment of methods used for calculations where the protocol does not provide prescriptive guidance
- Appraisal of assumptions, estimation methods and emission factors that are selected as alternatives to protocol guidance, where allowed

In areas where the Reserve project protocols are prescriptive, as with monitoring or calibration frequency, verification bodies are not permitted to use professional judgment. Projects must follow the prescriptive requirements of the protocols, where available. The verification section of each protocol provides guidance on areas where professional judgment is allowed/expected and areas where it is not.

The Reserve maintains the right to question any and all decisions made by the verification body. However, in areas where the project protocols explicitly state that professional judgment can be used, the Reserve expects that the verification body has the competency and knowledge to make these decisions, will err on the side of conservativeness, and will follow industry best practice.

4.8 Variances

The Reserve may, at its discretion, grant variances with regard to the manner in which specific projects meter, measure or monitor GHG reductions or removals where Reserve staff determines that such variances are acceptable. Only with explicit, written acceptance of the variance may a project developer apply alternate methods not contained in the applicable protocol. In most cases, a variance will be granted only for a specified time period or portion of the project data. Verification bodies must ensure that the project developer has met the Reserve's requirements and correctly applied the variance determination. Once a variance is granted, the variance determination is available publicly in the Reserve software.

4.8.1 Verification Body Application of Variance Determinations

Verification bodies must adhere to any instructions laid out within the variance determination and ensure that all other relevant criteria in the protocol have been met. Like the listing process, receiving a positive variance determination does not guarantee that a project will be successfully verified, nor that a project complies with other aspects of a given project protocol;

variance determinations do not qualify projects for registration prior to completing the verification process.

Projects continue to be subject to verification body review after a variance has been granted. The burden remains on the project developer to provide supporting evidence to the verification body that all aspects of its project are in compliance with the variance determination and the project protocol. Variance determinations allow for minor alterations to the protocol and are based on the initial information provided in the Variance Request Form. Verification bodies must confirm the underlying facts that were presented to the Reserve. Variances do not exempt the project from protocol requirements that are not specifically referenced in the variance determination.

A verification body shall not make specific recommendations to the project developer in relation to what could qualify for a variance. This would be considered consulting and is explicitly prohibited. Verification bodies shall not recommend that project developers seek variances from the Reserve, but can note sections or guidance of the protocol with which the project is not in conformance. The verification body can refer the project developer to seek assistance from the Reserve in determining how best to proceed with the project.

4.9 Errata and Clarifications

The Reserve utilizes Errata and Clarifications documents to correct and/or clarify issues in previously issued protocols. Errata are issued to correct typographical errors in text, equations or figures. Clarifications are issued to ensure consistent interpretation and application of the protocol.

Errata and Clarifications documents become effective on the date they are first posted on the Reserve website. Listed and registered projects must adhere to all errata and clarifications issued for the applicable protocol version when they undergo verification. Thus, verification bodies must refer to and follow the corrections and guidance presented in Errata and Clarifications documents as soon as they are effective, even if they are issued during an ongoing verification.

The Reserve does not require verification bodies to attend trainings specific to errata and clarifications. Rather, the Reserve expects that verification bodies refer to these documents immediately prior to uploading any Verification Statement to ensure all relevant guidance is properly addressed and incorporated into verification activities.

4.10 Joint Verification

Certain project protocols allow for “joint verification” when a project developer has multiple projects operating on a single site. In these instances, project developers have the option to hire a single verification body to assess the projects concurrently. This is intended to provide economies of scale for the project verifications and improve the efficiency of the verification process.

Under the joint project verification process, each project, as defined by the protocol and the project developer, must be submitted and registered separately in the Reserve software. However, the verification body may submit a single NOVA/COI form that details and applies to all of the projects at a site that it intends to verify.

Additionally, a verification body may conduct a single site visit and prepare a single Verification Report summarizing the verification results from multiple projects. However, the verification body must develop a separate verification plan, sampling plan, and Verification Statement for each project, i.e., each project is assessed by the verification body separately as if it were the only project at the site. In addition, a copy of the Verification Report must be uploaded to each project's Project Documents page in the Reserve software.

If, during joint project verification, the verification activities of one project are delaying the registration of other projects, the project developer may choose to forego joint project verification. There are no additional administrative requirements of the project developer or the verification body if a joint project verification is terminated.

At the time of publication, the following protocols have provisions allowing for joint project verification:

- Coal Mine Methane Project Protocol
- Mexico Boiler Efficiency Project Protocol
- Nitric Acid Production Project Protocol
- U.S. and Article 5 Ozone Depleting Substances Project Protocols

Please refer to the individual protocols for more information on specific processes and procedures for joint verification.

4.11 Aggregation and Cooperatives

Certain Reserve protocols allow projects to aggregate or form cooperatives for reporting and registration purposes. This can help reduce transaction costs for individual project developers. The requirements in relation to verification periods, desktop reviews and site-visit verifications may vary. See specific protocols for reporting and verification guidelines.

At the time of publication, the following protocols have provisions allowing for project aggregation:

- U.S. and Mexico Forest Project Protocol
- Grassland Project Protocol
- Livestock Project Protocol
- Nitrogen Management Project Protocol
- Rice Cultivation Project Protocol

5 Documenting and Reporting Verification Activities

After a verification body has completed its review of a project developer's estimated GHG reductions or removals, it must take the following steps to document the verification process:

1. Complete a detailed List of Findings containing both immaterial and material findings (if any) and deliver it to the project developer, allowing the opportunity for corrective actions (private document).
2. Complete a detailed Verification Report and deliver it to the project developer (public document).
3. Complete a Verification Statement detailing the vintage and the quantity of verified GHG reductions or removals and deliver it to the project developer (public document, standard form).
4. Conduct an exit meeting with the project developer to discuss the Verification Report, List of Findings, and Verification Statement and determine if material misstatements (if any) can be corrected. If so, the verification body must continue the verification after the project developer has made the necessary revisions.
5. If a reasonable level of assurance is successfully obtained, upload electronic copies of the Verification Report, List of Findings, and Verification Statement in the Reserve software.
6. Return important records and documents to the project developer for retention.

The List of Findings, Verification Report and Verification Statement shall be submitted at the conclusion of verification activities. If a project is deemed ineligible or non-compliant with a protocol to the extent that the verification body cannot reach reasonable assurance, the verification body shall submit only the adverse Verification Statement and List of Findings.

5.1 List of Findings

The List of Findings is a private document that details all material and immaterial findings identified by the verification team throughout the verification. These findings shall be distinguished by materiality and whether they were qualitative non-conformances or quantitative misstatements. The List of Findings shall be delivered first to the project developer in order to provide an opportunity to correct the issues that might impact CRT issuance. The List of Findings submitted to the Reserve should provide a summary of all findings and resolutions that arose during the verification process.

The List of Findings shall accompany the Verification Report and must include a record of all corrections or corrective actions made by the project developer to address the identified issues. A correction made by the project developer resolves an error and fixes the identified problem, while a corrective action fixes the cause of the problem in order to prevent its reoccurrence in future verifications. Each finding shall detail and list the identified issue and refer to the relevant section of the protocol, but shall not provide any solutions or potential remedies for resolution. Resolutions constitute consulting advice and thus create a conflict of interest.

The List of Findings should also include opportunities for improvement (OFIs) to help the project developer streamline future verifications. OFIs can consist of recommend improvements that cite sections of the protocol or reference public documents, but they may not provide advice on how to resolve the issues noted. A verification body may enumerate any shortcomings in a project developer's GHG tracking and management systems as related to the specific protocol requirements.

If no findings are issued for a reporting period, the List of Findings does not need to be submitted, but the lack of findings should be noted in the Verification Report. A standardized format for the List of Findings is not currently required - Table 5.1 contains a sample List of Findings. Detailed findings shall not be included in the Verification Report as that document is made public.

Table 5.1: Sample List of Findings

Category	Verification Findings	Correction/Corrective Action
Material Non-Conformance	The landfill protocol states the monitoring plan must include a mechanism to demonstrate that the project passes the Legal Requirement Test. The project's monitoring plan has no reference or application of this requirement.	Corrective action required. Project Developer (PD) updated its monitoring plan to include the current procedures used to demonstrate that the project is not required by federal, state, or local regulations or other legally binding mandates. PD will contact regulatory agencies, keep records and information surrounding its LFG system, and engage a consultant to perform a bi-annual review of applicable statutes.
Material Misstatement and Non-Conformance	GHG reduction calculations submitted to the Reserve do not apply the correct methane destruction efficiency. As prescribed by the landfill protocol, the default destruction efficiency for a lean-burn internal combustion engine is 0.936. An official source-tested destruction efficiency was not available, but PD used a factor of 0.995. This destruction efficiency increases the total reported CRTs to the Reserve by 4%, which is above the allowable materiality threshold (3%) for total reported CRTs.	Correction required. The protocol clearly states that the default factor must be applied if source data is not available. PD has now applied the appropriate factor.
Immaterial Misstatement	Indirect project emissions were calculated using electricity consumption billing history from the utility. Minor differences found in the total kWh purchased as listed in the billing history result in a slight discrepancy of 3%. This decreases the overall reported reductions by less than 0.01%.	Correction not required. PD chose not to fix the error for this reporting period as it has a minor impact on the reported CRTs. PD will ensure correct calculation of kWh consumed in future reporting periods.
Opportunity for Improvement	PD could strengthen its management and record keeping systems by automating the weekly logs and maintenance plans in order to reduce the risk of transcription error.	No corrective action required. Current system acceptable but could be improved for future verifications.

5.2 Verification Report

The Verification Report is a transparent, overarching document that is produced by the verification body for the project developer and is also made available to the Reserve and the general public. The Verification Report must contain a detailed summary and scope of verification activities undertaken. It is made public in order to uphold the integrity of the Reserve

program and to establish the veracity of the CRTs issued. As such, the Verification Report must provide positive assertion that the project met all eligibility requirements, followed all monitoring requirements, applied the appropriate calculation methodologies, and is free of material errors for the reporting period in question. In addition, the Verification Report must include a discussion of how the perceived areas of risk were incorporated into verification activities and project data review.

Verification bodies have the ability to construct the Verification Report in a manner that they feel best communicates the activities undertaken and the results of the verification. However, all Verification Reports must incorporate the elements discussed below; otherwise, the Reserve will request revision and resubmittal. It is important to note that persistent spelling and grammatical errors may also trigger resubmittal. Verification Reports are public documents and should be treated as such.

The Reserve expects all Verification Reports to make explicit, positive assertions of the conclusions drawn. For example, it is insufficient for a Verification Report to simply indicate that no regulatory non-compliances were identified. The report must explicitly state that the verification body has concluded to a reasonable level of assurance that the project met regulatory compliance requirements and identify the evidence examined to reach that determination.

The following sections are not intended as an outline for Verification Reports. These elements may be presented in any fashion deemed appropriate by the verification body, but the report must include, at a minimum, the items indicated.

5.2.1 Verification Report Content

The Verification Report must clearly specify a detailed scope of the verification process and procedures undertaken. The scope includes the physical and temporal boundaries of the verification as well as the GHGs considered. The verification process must be fully documented, with particular focus on the risk-assessment and development of the verification plan. This documentation shall include a description of the verification activities based on the size and complexity of the project developer's operations. This section is expected to provide context for the remainder of the report.

In addition, the standard used to verify GHG emissions reductions or removals must be specified in the Verification Report. For all projects, the standard must include, at a minimum, this document, the Reserve Program Manual, the applicable version of the project protocol, the latest version of Errata and Clarifications, any approved variances, and ISO 14064-3. The quantitative materiality threshold for verification must also be included. Verification bodies are required to adhere to all rules and guidelines relevant to the protocol version under which the project is being verified.

5.2.2 Eligibility

For the majority of project types, the Verification Report must include a description of the eligibility criteria, i.e., start date, location, the legal requirement test, the performance standard test, and regulatory compliance. The report must make an explicit and positive assertion as to whether each eligibility criterion has been met and explain the basis of this determination. The supporting documentation should not be attached to the verification report, but the basis of the successful verification of the eligibility criteria must be explicitly stated.

The Verification Report must describe the project definition and scenario as well as indicate any review conducted to verify the project's asserted baseline status, as this impacts eligibility.

The report must indicate how the verifier's risk assessment was used to inform the project's conformance with eligibility criteria. While some criteria, such as project location, are relatively straightforward, others may require varying levels of review in order to positively verify. In particular, verifiers must indicate whether the risk assessment indicated that reliance on the Attestation of Voluntary Implementation, Attestation of Regulatory Compliance, and a risk-based regulatory review was sufficient or whether additional work was conducted. A simple narrative of work performed on the project is insufficient; verification body conclusions must be explicitly stated, e.g., "Based on the aforementioned review, we conclude that the project satisfies the legal requirement test".

5.2.3 Conformance with the Protocol

As prescribed by the applicable project protocol, all projects must adhere to certain operational, record-keeping, and methodological requirements. The Verification Report must explicitly and positively assert whether the project meets these requirements and provide the basis for the determination reached. Again, narratives of project activities must be accompanied by verification body conclusions.

In particular, the following areas must be reviewed (if applicable) and the project's conformance or non-conformance explicitly stated in the Verification Report:

- Existence of an appropriate monitoring plan
- Data was collected in accordance with monitoring plan (frequency, whether collection was continuous, any discounts applied, etc.)
- Equipment operation and QA/QC meets protocol requirements
- Meter and analyzer cleaning, maintenance, and calibration meets protocol requirements
- Data transcription, management, and QA/QC meets protocol requirements
- Calculations and equations applied in accordance with protocol requirements
- All individuals properly trained for the functions performed
- Accuracy of calculated GHG reductions

The Verification Report must contain explicit, conclusive, and unequivocal statements as to the project's conformance with relevant requirements.

5.2.4 Calculation Review and Sampling

The Verification Report must identify the SSRs contained within the project's GHG Assessment Boundary and make an explicit determination as to whether all necessary and appropriate SSRs have been included. The verification team must note the recalculation and verification of the total number of GHG reductions generated and reported to the Reserve within the given reporting period. It may utilize appropriate risk-based sampling techniques for underlying source data that factor into the final GHG reduction calculation.

The Verification Report must summarize the sampling techniques used, the verification plan, and the risk assessment methodologies employed for project calculations. The report must contain a discussion of the risk assessment and the manner in which this assessment informed the project data and calculation sampling techniques. Relevant input parameters such as destruction efficiency must also be disclosed, and the appropriateness of the chosen parameters must be asserted.

The Verification Report shall summarize the GHG reductions estimation in the following format:

Vintage	Baseline Emissions	Project Emissions	GHG Reductions/Removals (CRTs)
20XX	A	B	Result of A - B

The report shall provide information regarding the comparison of the project's reported GHG reductions or removals with the verifier's recalculation.

5.2.5 Findings and Basis of Opinion

The Verification Report should support the Verification Statement by summarizing the results of the verification in a general conclusion. A positive Verification Report must contain, at a minimum, the following assertions:

- The project meets all eligibility requirements
- The project was conducted in accordance with all monitoring and record-keeping requirements
- There are no existing material non-conformances or misstatements in the reported data

5.3 Verification Statement

The Verification Statement presents the official results of the verification process. It details the amount of CRTs issued, their vintage(s), and the verification standard. The Verification Statement confirms the verification activities and outcomes for all stakeholders: project developers, verification bodies, the Reserve, and the public.

The Reserve relies on the Verification Statement provided by the verification body as the basis for issuing CRTs. A positive Verification Statement indicates that the project and its reported emission reductions meet the Reserve standards, including the verification standards contained in this manual.

Unlike other verification documentation, the Verification Statement is a standardized, mandatory form that is available on the Reserve website.⁸

5.3.1 Preparing a Verification Statement

The Verification Statement must be signed by the Lead Verifier and Senior Internal Reviewer designated in the NOVA/COI form on file with the Reserve. No deviations are allowed. Verification Statements may be positive or negative. Positive statements provide the required reasonable assurance to the Reserve that the amount of CRTs to be issued is materially correct and the project is in compliance with the appropriate protocol. A positive Verification Statement may only be issued if the verification body determines with a reasonable level of assurance that the stated emission reductions are materially accurate.

5.3.2 Negative Verification Statement

If a project cannot be successfully verified, a negative Verification Statement shall be issued. The verification body shall grant the project developer a reasonable amount of time to implement corrective actions prior to issuing a negative statement. If, after issuing the List of

⁸ Available at <http://www.climateactionreserve.org/how/verification/verification-documents/>.

Findings and allowing a sufficient amount of time for corrective actions, a project remains unverifiable due to material misstatements or inability to meet the eligibility criteria, the verification body shall issue a negative Verification Statement to the Reserve. The issuance of a negative Verification Statement does not mean that the project is not eligible or that it cannot be successfully verified. A negative Verification Statement signifies that the engagement between verification body and the project developer has concluded without the issuance of a positive statement.

Different types of unresolvable issues may arise between the verification body and the project developer during the verification process. Any time an issue of this nature arises, the verification body shall notify the Reserve and follow the process outlined below:

- If a verification body is unable to confirm that the project meets the required eligibility criteria or if there are material non-conformances with the protocol that the project developer cannot or will not correct, then the verification body must submit a negative Verification Statement and List of Findings to the Reserve electronically. The verification body must state that it is unable to verify the project and therefore cannot meet the required level of reasonable assurance. It shall detail the issues noted in the List of Findings. Reserve staff will then conduct a review in order to make a determination. Both the verification body and project developer will be notified of the Reserve's determination.
 - If the Reserve determines that the project is ineligible, the project will be de-listed. The verification documents and supporting information will be archived but not made public.
 - If the Reserve determines that the project is eligible and that further actions could be taken to resolve the issues, then the project may remain listed on the Reserve and the project developer may proceed with further verification activities and corrective actions if it chooses. The project remains subject to all deadlines and must be registered within 12 months of the end of the reporting period. If that deadline is not met, the project will be de-listed per the Reserve Program Manual, Section 3.4.3.
- If a verification body has found that a project has not remedied material issues identified and communicated to the project developer in the List of Findings after a reasonable amount of time, it must notify the Reserve of the inaction and submit the List of Findings. The Reserve staff will then contact the project developer and attempt to address the issues noted.

Some verification activities are halted due to lack of knowledge on how to resolve non-conformances, insufficient funding, or inactivity on identified corrective actions. If issues cannot be resolved with Reserve assistance, the verification body may be given permission by the Reserve to cease verification activities rather than issuing a negative Verification Statement. The project remains subject to all Reserve deadlines and must be registered within 12 months of the end of the reporting period.

5.4 Senior Internal Review

The Verification Report, Verification Statement and the List of Findings must be reviewed by an independent Senior Internal Reviewer for a quality assurance check. As stated in previous sections, the Senior Internal Reviewer must conduct an objective and impartial review of the verification team's work, which should include a risk-based analysis of the project documentation and data. No Verification Report shall be forwarded to a project developer until it

has undergone this internal review. The Senior Internal Reviewer is also a signatory to the Verification Statement.

5.5 Exit Meeting

Project developers should be allowed at least 30 days to review and comment on the Verification Report. At the end of that review, the Lead Verifier and the appropriate project developer representative should hold an exit meeting to discuss the nature of any material or immaterial misstatements and review any required corrective actions.

Verification bodies should prepare a brief summary presentation of the verification findings for the project developer's key personnel. At the exit meeting, verifiers and project developers are encouraged to exchange lessons learned about the verification process and share thoughts for improving the process with the Reserve.

The goals of this meeting should be:

- Acceptance of the Verification Report, List of Findings, and Verification Statement (unless material misstatements still exist but can be remediated, in which case the verification contract may need to be revised and additional verification services scheduled)
 - If the project developer does not wish to retain the verification body for the additional verification services, the verification body should return all relevant project documentation to the project developer within 30 days and submit a negative Verification Statement to the Reserve
- Authorization for the verification body to complete the verification and upload the necessary documents to the Reserve

If the verification body is under contract for verification activities in the future, the verification body and project developer may wish to establish a schedule for the upcoming verification activities.

5.6 Submitting the Verification Documentation to the Reserve

Once the Verification Statement, the List of Findings and the Verification Report are complete, the verification body must electronically submit these documents into the Reserve software. The project developer will then submit the project for final approval and Reserve staff will receive an email notification that triggers a review of the documents by the Reserve.

Reserve staff will also review the data entered in the Reserve software and compare it to the uploaded Verification Report, Verification Statement and List of Findings to ensure that all proper procedures were undertaken by both the project developer and the verification body.

In this review process, Reserve staff will ensure consistency between projects and verification bodies as well as compliance with Reserve protocols, processes and procedures. Reserve staff may request corrections or clarifications from either the verification body or the project developer. The Reserve staff aim to be as timely as possible with their requests and responses to verifiers and project developers.

If all outstanding issues can successfully be resolved, the project will be registered, CRTs will be issued to the project developer, and the Verification Report and Verification Statement will be made public.

6 Administration and Reserve Intervention

6.1 Verification Oversight and Audits

Oversight is conducted by the Reserve to provide quality assurance and control on verification activities performed by accredited verification bodies. Oversight consists of a comprehensive examination and evaluation of project verification activities in order to assess verification body performance. It also serves as an opportunity for the Reserve to identify potential improvements to the program's processes and guidance. Oversight is not intended to hold a project or project developer to a different level of scrutiny or subject it to additional requirements. Oversight is an important element of the Reserve program and provides an extra level of assurance and transparency to bolster the validity of the credits issued.

The Reserve staff member or representative conducting oversight must be provided access to all project documentation and data reviewed by the verification body as well as participate in certain stages of the verification. The verification body will be notified that it has been selected for oversight upon the approval of the NOVA/COI form. Reserve attendance in the following activities must be accommodated:

- Kick-off meeting between the verification team and the project developer – in-person or conference call
- Project site visit
- Closing meeting between the verification team and the project developer – in-person or conference call

In addition, the Reserve must review or observe all issues and findings-related discussions between the verification body and project developer during the verification. This can be achieved through conference calls, copying the Reserve staff member or representative on emails, or, if necessary, forwarding all correspondence at the conclusion of verification activities. Including the Reserve in calls and emails allows for real-time review and will decrease the duration of the oversight process.

Oversight can be triggered at random; however, a verification body can expect oversight to occur in the following instances:

- The first verification of a newly released project type
- A verification body's first verification under a specific protocol
- The first verification managed by a newly-approved Lead Verifier
- When issues, warnings or complaints regarding the verification body or project developer arise

Audits are also conducted by the Reserve and may be initiated under similar circumstances. They are limited to a desktop review and are performed upon the completion of verification activities. While oversight covers the entirety of a verification body's processes and qualifications, an audit consists solely of an investigative review of the project data and documentation, as well as the verification body's analysis. The Reserve auditor must be granted the same degree of access that would be afforded to staff conducting an oversight, but participation in verification milestones will not occur.

The Reserve maintains the right to conduct oversight or audits at any time, and such activities will be conducted by a Reserve staff member, partner or Reserve consultant. Entities that may perform or participate in oversight activities or audits on behalf of the Reserve include regulatory agencies, accreditation bodies, third-party observers (for learning or educational purposes), or contractors hired by the Reserve. The Reserve staff or representative will make every effort to not impede the verification process.

Proprietary information will be handled confidentially. The Reserve, as well as any partners or consultants, are willing to enter into a Non-Disclosure Agreement (NDA) should the verification body or project developer require.

Travel and time costs for Reserve staff conducting oversight are covered by the Reserve. To minimize costs associated with reproduction or shipping, records should be shared electronically when possible. If electronic document sharing is not possible, the project developer may incur costs associated with providing requested documentation.

A staff member, partner or consultant performing oversight for the Reserve will observe and evaluate:

- The overall performance of the verification body by reviewing its processes and procedures while conducting verification activities
- Whether the project activities meet the protocol requirements
- Whether the GHG reductions data reported to the Reserve can be verified to a reasonable level of assurance

The Reserve representative performing oversight or conducting an audit may discuss preliminary observations with the verification body and project developer before reporting the findings to the Reserve. Information requests should be addressed promptly. The oversight or audit process shall close with the issuance of a letter detailing the findings and overall evaluation to the verification body, usually upon conclusion of verification activities.

The Reserve will make an effort to clearly coordinate and communicate planned oversight activities to verification bodies and project developers, but it reserves the right to adjust verification activity dates in order to accommodate the schedules of all relevant parties.

6.2 Warnings, Suspensions, Notices to Correct

If the Reserve finds that a verification body has failed to meet the Reserve's standards, it may require the verification body to undertake specified corrective actions. The Reserve may, at its own discretion, issue warnings, temporary suspensions, and notices to correct. It may also disqualify verification bodies or individual verifiers from future verification activities.

In instances where a verification body and a project developer find themselves in disagreement, the two parties should attempt to reach a resolution, relying first on the verification body's internal dispute resolution process (as required by ISO 14065). Either party may contact the Reserve for assistance in resolving issues that require guidance on the project protocols, COI determinations, or verification findings.

If a resolution cannot be reached in a disagreement related to project activities, the verification must be completed prior to the initiation of any dispute resolution process detailed in Section 6.4. The verification body must issue the List of Findings, Verification Statement and Verification

Report to the project developer and upload the documents in the Reserve software. The Reserve staff will conduct an internal review of the verification documentation as well as any additional supporting documentation, claims and information related to the disagreement that substantiate the opinions of the verification body or the assertions of the project developer. The Reserve will interview both parties and make a final determination in a committee comprised of no less than three staff members, two of which will be manager level or higher. The Reserve's determination will be issued in writing to all relevant parties.

6.3 Rescission of Verifier or Verification Body Approval

The Reserve maintains the right to rescind or suspend its recognition of an individual verifier or verification body for any period of time deemed appropriate. The Reserve will make every effort to accommodate the implementation of corrective actions prior to rescinding approval.

Suspensions could occur if the Reserve determines that a verification body or individual verifier intentionally violated the COI policies, committed willful misconduct, displayed negligence, proved unable to uphold obligations to the Reserve, or was responsible for any other significant non-conformance with Reserve rules, protocols or procedures.

The Reserve will make public any suspensions of verification bodies on its website. However, suspensions of individual verifiers, including Lead Verifiers, will not be publicly noticed.

Verification bodies could also be subject to suspension of their ISO 14065 accreditation issued by the accrediting body and must adhere to the rules and procedures surrounding that process.

6.4 Dispute Resolution Process

Verification bodies and project developers have a right to appeal Reserve determinations, including COI determinations, through the Reserve's formal dispute resolution process. An appeal to a specific determination, including a detailed explanation of the issue and any supporting evidence, must be electronically submitted to the Reserve. The Reserve will then convene a Dispute Resolution Committee to review the appeal.

The Dispute Resolution Committee will consist of an odd number of individuals, including at least one Reserve staff member not directly involved in the case, and one Reserve Board member, all of whom are knowledgeable of Reserve policies and procedures. The committee will be convened either in person or via conference call.

The Dispute Resolution Committee may consult outside experts for assistance, but these experts will not have a vote in the committee's final decision. All information reviewed will be kept confidential and should be uploaded to the Reserve software as restricted, private documents by either the project developer or the verification body. Each committee member must declare his or her freedom from any conflict of interest and will have an equal vote. The Dispute Resolution Committee will consider the original finding, the detailed explanation, and any supporting documents. The final determination will be based on a majority vote. The decision will be binding and will be notified to all parties in writing. The Dispute Resolution Committee has the power to suspend a verification body from conducting verification activities under the Reserve Program.

6.5 Record Keeping and Retention

The verification body must retain sufficient records to enable an ex-post verification of the project's emissions. The Reserve requires that the following Reserve project-related records be retained by the verification body in line with the time period specified in the relevant protocol or for a minimum of seven years after the end of the reporting period, whichever is longer. It should be noted that some records may be subject to fiscal or other legal requirements that are longer than the Reserve's mandated period.

Verification bodies shall retain electronic copies, as applicable, of:

- The project developer's Monitoring Plan
- The project developer's SSR and/or project activity data as well as evidence cited
- The verification plan
- The sampling plan
- The Verification Report
- The List of Findings
- The Verification Statement

Each verification body must have an easily accessible record-keeping system, preferably electronic, that provides readily available access to project information. Copies of the original activity and source data records shall be maintained within said record-keeping system, as these records are necessary to perform an ex-post verification or audit. The Reserve may at any time request access to the record-keeping system or any supporting documentation for oversight, monitoring, and auditing purposes.

Glossary

Accreditation body	Under ISO 14065, this is the authoritative body that assesses a verification body's competence to perform GHG verification activities.
Aggregation	Where smaller projects can register jointly as a group. Does not apply to all project types.
Climate Action Reserve	A North American offsets program that establishes standards for quantifying and verifying GHG emission reduction projects, issues carbon credits generated by said projects, and tracks the transfer and retirement of credits in a publicly-accessible online system.
Climate Reserve Tonne (CRT)	The unit of offset credits used by the Climate Action Reserve. One Climate Reserve Tonne is equal to one metric ton of CO ₂ e reduced or sequestered.
Conflict of interest (COI)	A situation in which, due to other activities or relationships with other persons or organizations, a person or firm is unable to render an impartial Verification Statement of a potential client's GHG reductions or the person or firm's objectivity in performing verification activities is otherwise compromised.
Continuous Emissions Monitoring System (CEMS)	The monitoring system required for all projects under the Nitric Acid Project Protocol for the direct measurement of the N ₂ O concentration and flow rate of the stack gas.
Contracted verifier	Under ISO 14065, this is a verifier who is independently contracted to operate as part of a verification team under the supervision of a verification body on specific verification activities. The contracted verifier is not a full-time employee of said verification body, but acts as the verification body's agent and representative while under contract. The use of contracted verifiers under such agreements does not constitute outsourcing.
Inherent uncertainty	Scientific uncertainty associated with measuring GHG emissions due to limitations on monitoring equipment or methodologies.
Joint verification	In cases where a project developer has multiple projects operating on a single site, the project developer has the option to hire a single verification body to assess the projects concurrently. Does not apply to all project types.
Lead Verifier	Employee or contracted verifier to a verification body who is primarily responsible for directing, supervising and the quality of verification activities undertaken on behalf of the Reserve. Each Lead Verifier must be designated as such on the COI Form and the Verification Policies Acknowledgment and Agreement form, and he or she must successfully

	complete sector-specific project verifier training. Each verification body operating within the Reserve program must employ or have under contract a minimum of two Lead Verifiers for each project type in which it conducts verification services.
Listed	A project moves from “new” status to “listed” status once the Reserve has satisfactorily reviewed the project submittal form and any other required documentation. Listed projects appear in the public interface of the Reserve software.
Material misstatement	An error that results in a significant difference between the reported and the true quantity or quality of project information to an extent that will influence performance or decisions.
Onsite assessment	A two- to three- day assessment at the site of the verification body’s main office(s) that is conducted by the accreditation body (ANSI). The purpose of the onsite assessment is to confirm whether the operational capability of the verification body conforms to ISO 14065, ISO 14064-3, IAF MD 6, and other accreditation requirements, including those for specific GHG programs/registries and/or activities in specific sectors. This assessment provides assurance that the verification body has the capacity to perform the activities related to the scopes of accreditation for which it has applied.
Outsourcing	Under ISO 14065, this is the practice of an organization setting a contract arrangement with another organization to provide services tasked to the original organization. The Reserve allows verification bodies to outsource verification services with the exception of the Lead Verifier and Senior Internal Reviewer roles.
Project	A specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon, or enhance GHG removals from the atmosphere. Each project and its accompanying project boundary are defined in the relevant Reserve project protocol.
Project developer	An organization or individual that registers projects for the purpose of generating GHG emission reductions or removals. Under the Reserve program, project developers may be issued CRTs for the verified emission reductions/removals achieved through project activities. They can also transfer and manage CRTs in the Reserve software.
Project protocol	Document developed by the Reserve that contains the eligibility rules, GHG Assessment Boundary, quantification methodologies, monitoring and reporting parameters, and other guidelines for a specific project type. Project protocols are akin to the “methodologies” developed by other offset programs.

Reduction	A verified decrease in GHG emissions caused by project activity, as measured against an appropriate forward-looking estimate of baseline emissions for the project.
Reporting uncertainty	Errors made in the identification of emission sources and the management and calculation of GHG emissions. This arises due to incomplete understanding of climate science or a lack of ability to measure greenhouse gas emissions.
Registered	A project is “registered” once the project has been verified by an approved third-party verification body, submitted by the project developer to the Reserve for final approval, and accepted by the Reserve.
Removal	A verified increase in carbon stocks caused by a forest or urban forest project, as measured against an appropriate forward-looking estimate of baseline carbon stocks for the project.
Retired	CRTs transferred to a retirement account in the Reserve software are considered retired. Retirement accounts are permanent and locked in order to prevent the transfer of a retired CRT. Each retired CRT represents the offset of an equivalent tonne of CO ₂ emissions, and is removed from further transactions on behalf of the environment.
Senior Internal Reviewer (SIR)	The Senior Internal Reviewer must be an active Lead Verifier who is designated on the NOVA/COI Form, is listed in the Verifier Acknowledgement and Agreement form, and has successfully completed project-specific verifier training. The Senior Internal Reviewer must remain independent of all verification activities; perform a final quality assurance review on the project data, the Verification Report, and the List of Findings; and sign the Verification Statement attesting to the accuracy of reported data.
Submitted	A project has been “submitted” once the submittal form and any other required documentation have been completed and uploaded to the Reserve software.
Tax Identification Number (TIN)	Number used to assess ownership and the corporate structure of any legal entities involved in a given project.
Trader/Broker/Retailer	Organization or individual that transfers and manages CRTs in the Reserve software but does not develop its own projects. The trader/broker/retailer holds legal title and all beneficial ownership rights to the CRTs in its account or, with respect to CRTs that will be retired in a Group Retirement Subaccount, the trader/broker/retailer must be granted the authority to act on behalf of the holder of the legal title and/or the beneficial ownership rights of the CRTs.
Validation	The process by which an independent validation body assesses a project plan for GHG reductions or removals as well as potential future outcomes. Validation is typically required for projects that do not follow established protocols,

	and occurs prior to project implementation in order to establish the project's methodologies, scope and eligibility to create GHG reductions or removals.
Verification	The process used to ensure that a given project developer's reported GHG emissions reductions or removals have met a minimum quality standard and complied with the Reserve's procedures and protocols.
Verification body	An ISO-accredited organization that has been approved by the Reserve to perform GHG verification activities for specific project protocols.
Verified	A project is considered "verified" once the project verifier has submitted the project's Verification Statement and the Verification Report in the Reserve software.
Verifier	An individual that is employed by or under contract to an ISO-accredited and Reserve-approved verification body and is qualified to provide verification services for specific project protocols.
Witness assessment	Observation of the verification body by the accrediting body in the performance of tasks related to the verification process for the scope (or group of sectoral scopes) of accreditation for which the verification body has applied. The purpose of the witness assessment is to determine whether verification activities are in line with the verification body's documented quality procedures and to assess its capability to conform to the applicable sectoral scope(s).

Attachment O

Inglewood Basketball and Entertainment Center EIR

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)



3.7 Greenhouse Gas Emissions

This section addresses the potential impacts of greenhouse gas (GHG) emissions from the proposed Inglewood Basketball and Entertainment Center (IBEC, or Proposed Project). The section contains: (1) a description of the local setting of the Project Site and surrounding areas to establish baseline conditions; (2) a summary of the relationship between GHG emissions and global climate change; (3) an overview of applicable plans, policies, and regulations related to GHG emissions; (4) an assessment of current GHG emissions at the City, State, national, and global levels; (5) a quantitative analysis of future GHG emissions associated with construction and operation of the Proposed Project; and (6) an analysis of the consistency of the Proposed Project with applicable regulations, plans, and policies to reduce GHGs as set forth by the State of California, South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG) and the City of Inglewood (City).

Comments received in response to the NOP for the EIR regarding GHG emissions can be found in Appendix B. Any applicable issues and concerns regarding potential impacts related to GHG emissions that were raised in comments on the NOP are analyzed within this section.

The analysis included in this section was developed based on Project-specific construction and operational features described in Chapter 2, Project Description.

3.7.1 Environmental Setting

GHG Fundamentals

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however, current data increasingly indicate that the current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important and widely debated scientific, economic and political issues in the United States and the world. The extent to which increased concentrations of GHGs have caused or will cause climate change and the appropriate actions to limit and/or respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

GHGs are compounds in the Earth's atmosphere that play a critical role in determining temperature near the Earth's surface. More specifically, these gases allow high-frequency shortwave solar radiation to enter the Earth's atmosphere, but retain some of the low frequency infrared energy that otherwise is radiated back from the Earth towards space, resulting in a warming of the atmosphere.

Not all GHGs possess the same capacity to induce atmospheric warming; as a result, the warming contribution of a GHG is commonly quantified in the common unit of carbon dioxide equivalent

(CO₂e) over a 100-year period, by applying the appropriate global warming potential (GWP) value.¹ By using the applicable GWP for each GHG, Project-related emissions can be tabulated in the common unit of metric tons per year CO₂e. GWP ratios are provided by the Intergovernmental Panel on Climate Change (IPCC). Historically, GHG emission inventories were calculated using the GWPs from the IPCC's Second Assessment Report (SAR), published in 1996. The IPCC has since updated the GWP values based on the latest science in its Fourth Assessment Report (AR4)² and Fifth Assessment Report (AR5),³ published in 2007 and 2014, respectively. California Air Resources Board (CARB) uses the AR4 GWPs in the statewide GHG emissions inventory,⁴ in the current Climate Change Scoping Plan,⁵ and in the current version of the California Emissions Estimator Model (CalEEMod®)⁶ that is used to calculate CO₂e values for construction as well as operations for existing and Proposed Project build-out conditions. Compounds that are regulated as GHGs are discussed below.

Carbon Dioxide (CO₂): CO₂ is the most abundant anthropogenic GHG in the atmosphere and is primarily generated from fossil fuel combustion from stationary and mobile sources. CO₂ is the reference gas (GWP of 1) for determining the GWPs of other GHGs. CO₂ accounted for approximately 83 percent of anthropogenic GHG emissions (CO₂e) in California in 2016.

Methane (CH₄): CH₄ is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, anaerobic decomposition of organic matter in landfills, manure management, and leaks in natural gas pipelines. The GWP of CH₄ is 25 in the IPCC AR4. CH₄ accounted for approximately 9 percent of anthropogenic GHG emissions (CO₂e) in California in 2016.

Nitrous Oxide (N₂O): N₂O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N₂O is 298 in the IPCC AR4. N₂O emissions accounted for approximately 3 percent of anthropogenic GHG emissions (CO₂e) in California in 2016.

Hydrofluorocarbons (HFCs): HFCs are fluorinated compounds consisting of hydrogen, carbon, and fluorine. They are typically used as refrigerants in both stationary refrigeration and mobile air

- ¹ GWPs and associated CO₂e values were developed by the IPCC, and published in its Second Assessment Report (SAR) in 1996. Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's SAR. The IPCC updated the GWP values based on the latest science in its AR4. The CARB reports GHG emission inventories for California using the GWP values from the IPCC AR4.
- ² Intergovernmental Panel on Climate Change, 2007. *Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: <https://www.ipcc.ch/assessment-report/ar4/>. Accessed March 10, 2019.
- ³ Intergovernmental Panel on Climate Change, 2014. *Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: www.ipcc.ch/report/ar5/syrhttps://. Accessed March 10, 2019.
- ⁴ California Air Resources Board, 2018. California Greenhouse Gas Emission Inventory – 2018 Edition. 2016 Inventory Documentation. Available: <https://www.arb.ca.gov/cc/inventory/data/data.htm>. Accessed February 8, 2019.
- ⁵ California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed March 9, 2019. November, 2017.
- ⁶ Version 2016.3.1, Available: www.caleemod.com.

conditioning systems. The GWPs of HFCs range from 124 for HFC-152a to 14,800 for HFC-23 in the IPCC AR4. HFCs and PFCs (see below) combined accounted for approximately 5 percent of anthropogenic GHG emissions (CO₂e) in California in 2016.

Perfluorocarbons (PFCs): PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 7,390 to 17,700 in the IPCC AR4.

Sulfur Hexafluoride (SF₆): SF₆ is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF₆ has a GWP of 22,800 in the IPCC AR4. SF₆ emissions accounted for less than 1 percent of anthropogenic GHG emissions (CO₂e) in California in 2016.

Effects of Global Climate Change

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of and inability to accurately model Earth's climate system, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the IPCC's AR5 states that it is extremely likely that the dominant cause of the observed warming since the mid-20th century is the anthropogenic increase in GHG concentrations.⁷ A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.⁸

The Fourth California Climate Change Assessment (Fourth Assessment), published in 2018, found that the potential impacts in California due to global climate change include: loss in snow pack; sea-level rise; more extreme heat days per year; more high ozone days; more extreme forest fires; more severe droughts punctuated by extreme precipitation events; increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation.⁹ The Fourth Assessment's findings are consistent with climate change studies published by the California Natural Resources Agency

⁷ Intergovernmental Panel on Climate Change, 2014. *Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: www.ipcc.ch/report/ar5/syrhttps/. Accessed March 10, 2019.

⁸ Anderegg, William R. L., J.W. Prall, J. Harold, S.H., Schneider, 2010. Expert Credibility in Climate Change, *Proceedings of the National Academy of Sciences of the United States of America*. 2010; 107:12107-12109.

⁹ California Governor's Office of Planning and Research, Scripps Institution of Oceanography, CEC, California Public Utilities Commission. 2018. *Statewide Summary Report. California's Fourth Climate Change Assessment*. Publication number: SUMCCCA4-2018-013. Available: <http://www.climateassessment.ca.gov/state/docs/20190116-StatewideSummary.pdf>. Accessed March 11, 2019.

(CNRA) since 2009, starting with the *California Climate Adaptation Strategy*¹⁰ as a response to the Governor's Executive Order S-13-2008. In 2014, the CNRA rebranded the first update of the 2009 adaptation strategy as the *Safeguarding California Plan*.¹¹ The 2018 update to *Safeguarding California Plan* identifies hundreds of ongoing actions and next steps state agencies are taking to safeguard Californians from climate impacts within a framework of 81 policy principles and recommendations.¹²

In 2016, the CNRA released *Safeguarding California: Implementation Action Plans* in accordance with Executive Order B-30-15, identifying a lead agency to lead adaptation efforts in each sector. In accordance with the 2009 *California Climate Adaptation Strategy*, the California Energy Commission (CEC) was directed to develop a website on climate change scenarios and impacts that would be beneficial for local decision makers. The website, known as Cal-Adapt, became operational in 2011.¹³ The information provided on the Cal-Adapt website represents a projection of potential future climate scenarios comprised of local average values for temperature, sea-level rise, snowpack and other data representative of a variety of models and scenarios, including potential social and economic factors.

Below is a summary of some of the potential effects that could be experienced in California as a result of global warming and climate change.

Temperature Increase

The primary effect of adding GHGs to the atmosphere has been a rise in the average global temperature. The impact of human activities on global temperature is readily apparent in the observational record. Since 1895, the contiguous US has observed an average temperature increase of 1.5°F per century. The last 5-year period (2014–2018) is the warmest on record for the contiguous US,¹⁴ while the 20 warmest years have occurred over the past 22-year period.¹⁵

The Fourth Assessment indicates that average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions.¹⁶ According to the Cal-Adapt website, the portion of the state in which the Project Site is located could result in an average increase in temperature of approximately 4.2° to 6.9°F by 2070–2090, compared to the baseline period of 1961–1990.

¹⁰ California Natural Resources Agency, 2009. *2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding>. Accessed March 10, 2019.

¹¹ California Natural Resources Agency, 2014. *Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. July 2014.

¹² California Natural Resources Agency, 2018. *Safeguarding California Plan: 2018 Update*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. January 2018.

¹³ Cal-Adapt. Available: <http://cal-adapt.org>. Accessed March 10, 2019.

¹⁴ National Oceanic and Atmospheric Association, Assessing the US Climate in 2018. <https://www.ncei.noaa.gov/news/national-climate-201812>. Accessed April 25, 2019. Published February 6, 2019.

¹⁵ Climate Central, 2019. Available: <https://www.climatecentral.org/gallery/maps/2018-global-temp-review-land-ocean>. Accessed April 25, 2019. Published February 6, 2019.

¹⁶ Governor's Office of Planning and Research, 2018. *California's Fourth Climate Change Assessment: Statewide Summary Report*. August 2018.

With climate change, extreme heat conditions and heat waves are predicted to impact larger areas, last longer, and have higher temperatures. Heat waves, defined as three or more days with temperatures above 90°F, are projected to occur more frequently by the end of the century. Extreme heat days and heat waves can negatively impact human health. Heat-related illness includes a spectrum of illnesses ranging from heat cramps to severe heat exhaustion and life-threatening heat stroke.¹⁷

Wildfires

The hotter and dryer conditions expected with climate change will make forests more susceptible to extreme wildfires. One study found that, if GHG emissions continue to rise, the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and the average area burned statewide each year would increase by 77 percent, by the year 2100. In the areas that have the highest fire risk, wildfire insurance is estimated to see costs rise by 18 percent by 2055 and the fraction of property insured would decrease.¹⁸

Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California and make it more difficult for the state to achieve air quality standards. Climate change may increase the concentration of ground-level ozone in particular, which can cause breathing problems, aggravate lung diseases such as asthma, emphysema, chronic bronchitis, and cause chronic obstructive pulmonary disease (COPD) but the magnitude of the effect, and therefore, its indirect effects, are uncertain. Emissions from wildfires can lead to excessive levels of particulate matter, ozone, and volatile organic compounds.¹⁹ Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state.²⁰

Precipitation and Water Supply

There is a high degree of uncertainty with respect to the overall impact of global climate change on future water supplies in California. Studies indicate considerable variability in predicting precise impacts of climate change on California hydrology and water resources. Increasing uncertainty in the timing and intensity of precipitation will challenge the operational flexibility of California's water management systems. Warmer, wetter winters would increase the amount of runoff available for groundwater recharge; however, this additional runoff would occur at a time

¹⁷ California Environmental Protection Agency, 2013. *Preparing California for Extreme Heat: Guidance and Recommendations*. Available: <https://toolkit.climate.gov/reports/preparing-california-extreme-heat-guidance-and-recommendations>. Accessed March 10, 2019. October 2013.

¹⁸ Westerling, Anthony LeRoy. (2018). *Wildfire Simulations for the Fourth California Climate Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate*. California's Fourth Climate Change Assessment, California Energy Commission. Publication number: CCCA4-CEC-2018-014.

¹⁹ Kenward, A, et al. (2013). *Wildfires and Air Pollution: The Hidden Health Hazards of Climate Change*. Climate Central. Available: <http://assets.climatecentral.org/pdfs/WildfiresAndAirPollution.pdf>. Accessed April 11, 2019.

²⁰ California Environmental Protection Agency, 2013. *Preparing California for Extreme Heat: Guidance and Recommendations*. Available: <https://toolkit.climate.gov/reports/preparing-california-extreme-heat-guidance-and-recommendations>. Accessed March 10, 2019. October 2013.

when some basins are either being recharged at their maximum capacity or are already full. Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.²¹

Hydrology and Sea-Level Rise

As discussed above, climate changes could potentially affect: the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea-level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea-level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Sea level could rise as much as 2 feet along most of the US coastline. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.²²

Agriculture

California has a massive agricultural industry that represents 11.3 percent of total US agricultural revenue. Higher CO₂ levels can stimulate plant production and increase plant water-use efficiency. However, a changing climate presents significant risks to agriculture due to “potential changes to water quality and availability; changing precipitation patterns; extreme weather events including drought, severe storms, and floods; heat stress; decreased chill hours; shifts in pollinator lifecycles; increased risks from weeds, pest and disease; and disruptions to the transportation and energy infrastructure supporting agricultural production.”²³

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increased concentrations of GHGs are likely to accelerate the rate of climate change. Scientists expect that the average global surface temperature could rise by 2–11.5°F (1.1–6.4°C) by 2100, with significant regional variation.²⁴ Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. With climate change, ecosystems and wildlife will be challenged by the spread of invasive species, barriers to species migration or movement in response to changing climatic

²¹ California Natural Resources Agency, 2014. *Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. July 2014.

²² California Natural Resources Agency, 2014. *Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. July 2014.

²³ California Natural Resources Agency, 2014. *Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. July 2014.

²⁴ National Research Council, 2010. *Advancing the Science of Climate Change*. Available: <http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/Science-Report-Brief-final.pdf>. Accessed March 11, 2019.

conditions, direct impacts to species health, and mismatches in timing between seasonal life-cycle events such as species migration and food availability.²⁵

Existing Conditions

Global Emissions

Global estimates are based on country inventories developed as part of programs of the United Nations Framework Convention on Climate Change (UNFCCC). Worldwide man-made emissions of GHGs were approximately 49 billion metric tons CO₂e in 2010, including ongoing emissions from industrial and agricultural sources and emissions from land use changes (e.g., deforestation). Emissions of CO₂, primarily from fossil fuel use and industrial processes, account for 76 percent of total GHG (CO₂e) emissions. Methane emissions account for 16 percent and N₂O emissions for 6.2 percent. Worldwide emissions of GHGs in 1970 were 27 billion metric tons of CO₂e per year.²⁶

US Emissions

In 2017, the United States emitted about 6,457 million metric tons (MMT) of CO₂e, with 76.1 percent of those emissions coming from fossil fuel combustion. Of the major sectors nationwide, transportation accounts for the highest amount of GHG emissions (approximately 29 percent), followed by electricity (28 percent), industry (22 percent), agriculture (9 percent), commercial buildings (6 percent), and residential buildings (5 percent). Between 1990 and 2017, total US GHG emissions rose by 1.3 percent, but emissions have generally decreased since peaking in 2005. Since 1990, US emissions have increased at an average annual rate of 0.4 percent.²⁷

California Greenhouse Gas Emissions Inventory

CARB compiles GHG inventories for the state. Based on the 2016 GHG inventory data (i.e., the latest year for which data are available from CARB) prepared by CARB in 2018, California emitted 429.4 MMTCO₂e including emissions resulting from imported electrical power.²⁸ Between 1990 and 2016, the population of California grew by approximately 9.4 million (from 29.8 to 39.2 million).²⁹ This represents an increase of approximately 31 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from \$773 billion in 1990 to \$2.26 trillion in 2016 representing an increase of approximately

²⁵ California Natural Resources Agency, 2014. *Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy*. Available: <http://resources.ca.gov/climate/safeguarding/>. Accessed March 10, 2019. July 2014.

²⁶ Intergovernmental Panel on Climate Change, 2014. *Climate Change 2014 Synthesis Report*. Available: <http://ipcc.ch/report/ar5/syr/>. Accessed March 10, 2019.

²⁷ U.S. Environmental Protection Agency (U.S. EPA), 2019. *Inventory of U.S. Greenhouse Gas Emissions and Sinks Fast Facts*. Available: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-fast-facts>. Accessed April 25, 2019.

²⁸ California Air Resources Board, 2018. *California Greenhouse Gas 2000-2016 Inventory by Scoping Plan Category – Summary*. Available: https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf. Accessed March 10, 2019. June 22, 2018.

²⁹ California Department of Finance, 2019. *E-5 Population and Housing Estimates for Cities, Counties and the State*. Available: <http://www.dof.ca.gov/Forecasting/Demographics/Estimates/>. Accessed February 8, 2019.

292 percent (almost three times the 1990 gross state product) in today's dollars.³⁰ Despite the population and economic growth, CARB's 2016 statewide inventory indicated that California's net GHG emissions in 2016 were just below 1990 levels, which is the 2020 GHG reduction target codified in California Health and Safety Code (HSC), Division 25.5, also known as The Global Warming Solutions Act of 2006 (AB 32). **Table 3.7-1** identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2016. As shown in the table, the transportation sector is the largest contributor to statewide GHG emissions at approximately 39 percent in 2016.

**TABLE 3.7-1
STATE OF CALIFORNIA GREENHOUSE GAS EMISSIONS**

Category	Total 1990 Emissions Using IPCC SAR (MMTCO ₂ e)	Percent of Total 1990 Emissions	Total 2016 Emissions Using IPCC AR4 (MMTCO ₂ e)	Percent of Total 2016 Emissions
Transportation	150.7	35%	169.4	39%
Electric Power	110.6	26%	68.6	16%
Commercial Fuel Use	14.4	3%	15.2	4%
Residential	29.7	7%	24.2	6%
Industrial	103.0	24%	89.6	21%
Recycling and Waste ^a	—	—	8.8	2%
High GWP/Non-Specified ^b	1.3	<1%	19.8	5%
Agriculture/Forestry	23.6	6%	33.8	8%
Forestry Sinks	-6.7	-2%	— ^c	—
Net Total (IPCC SAR)	426.6	100%^e	—	—
Net Total (IPCC AR4)^d	431	100%^e	429.4	100%^e

NOTES:

^a Included in other categories for the 1990 emissions inventory.

^b High GWP gases are not specifically called out in the 1990 emissions inventory.

^c Revised methodology under development (not reported for 2012).

^d CARB revised the state's 1990 level GHG emissions using GWPs from the IPCC AR4.

^e Total of individual percentages may not add up to 100% due to rounding

SOURCES:

CARB, 2017. 1990 to 2004 Inventory Data and Documentation. Available: <https://www.arb.ca.gov/cc/inventory/1990level/1990data.htm>. Accessed March 11, 2019;

CARB, 2018. California Greenhouse Gas 2000-2016 Inventory by Scoping Plan Category – Summary. Available: https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf. Accessed March 10, 2019.

City of Inglewood Greenhouse Gas Emissions Inventory

The South Bay Cities Council of Governments (SBCCOG) received funding from Southern California Edison's 2013-2014 Local Government Partnership Strategic Plan Pilots program to assist local governments within the South Bay sub-region perform inventories of local GHG

³⁰ California Department of Finance, 2018. Gross State Product. Available: http://www.dof.ca.gov/Forecasting/Economics/Indicators/Gross_State_Product/. Accessed February 8, 2019. Amounts are based on current dollars as of the date of the report (May 2018).

emissions and develop GHG reduction programs and policies. As a member of the SBCCOG, the City collaborated with the SBCCOG to develop inventories of community-wide GHG emissions for the years 2005 and 2007.³¹ Additionally, the City developed a community-wide inventory for 2010 as reported in the 2013 Inglewood Energy and Climate Action Plan.³² **Table 3.7-2, *City of Inglewood GHG Emissions by Sector: 2005 to 2010***, is a summary of the City's emissions from each sector for the years 2005, 2007 and 2010 and the percent change from 2005 to 2010. As shown in Table 3.7-2, the City's community and municipal GHG emissions decreased approximately 2.7 percent from 2005 to 2010, falling from 610,910 MTCO₂e in 2005 to 594,273 MTCO₂e in 2010.

TABLE 3.7-2
CITY OF INGLEWOOD GHG EMISSIONS BY SECTOR: 2005 TO 2010 (MTCO₂e)

Sector	2005	2007	2010	2010 % of total	Percent Change (2005–2010)
Transportation	320,254	311,853	322,042	54.2%	+0.6%
Residential Energy	124,872	123,062	122,429	20.6%	-2.0%
Commercial/Municipal Energy	97,176	99,458	95,261	16.0%	-2.0%
Industrial Energy	34,940	31,272	26,100	4.4%	-25.3%
Solid Waste	19,855	16,841	16,448	2.8%	-17.2%
Water	13,813	13,272	11,993	2.0%	-13.2%
Total	610,910	595,758	594,273	100%	-2.7%

SOURCE: City of Inglewood, *Inglewood Energy and Climate Action Plan* (2013).

The City's Community-wide emissions were categorized in six sectors: Transportation, Residential Energy, Commercial/Municipal Energy, Industrial Energy, Solid Waste, and Water.

- **Transportation** includes emissions from vehicles traveling (wholly or partially) within the City, and emissions from operating off-road vehicles and equipment (e.g., lawn and garden equipment, construction equipment, industrial equipment, and light commercial equipment).
- **Residential Energy** includes emissions from electricity and natural gas consumption in residential buildings.
- **Commercial/Municipal Energy** includes emissions from electricity and the on-site combustion of natural gas and fuel use in nonresidential buildings and city facilities (including outdoor lighting).
- **Industrial Energy** includes emissions from electricity and the on-site combustion of natural gas and fuel use in industrial buildings and facilities.
- **Solid Waste** includes emissions from solid waste that is generated in the community and sent to landfills.

³¹ South Bay Cities Council of Governments, 2011. *City of Inglewood Community Greenhouse Gas Emissions Inventory Report*. Available: http://www.southbaycities.org/sites/default/files/documents/inventories/Inglewood_Community_Inventory.pdf. Accessed March 10, 2019.

³² City of Inglewood, 2013, *Inglewood Energy and Climate Action Plan*. Available: <https://www.cityofinglewood.org/225/Sustainability>. Accessed Feb 15, 2019. March 2013.

- **Water** includes emissions from the electricity used to source, treat, and deliver imported water in the community that is not accounted for in the community utility data.

As shown in Table 3.7-2, the transportation sector was the largest contributor to the most recent inventory (2010) at over 54 percent of the total. Residential Energy consumption is the second-largest contributor to emissions at 20.6 percent of the total, followed by Commercial/Municipal Energy (16 percent), Industrial Energy (4.4 percent), Solid Waste (2.8 percent), and Water (2 percent).

Existing Project Site

The entire Project Site is comprised of approximately 28 acres of land. All but six of the parcels that make up the Project Site are currently vacant. The vacant parcels within the Project Site total approximately 23 acres, or more than 85 percent of the Project Site. The six developed parcels include a fast food restaurant (on a privately owned parcel), a motel (on a privately owned parcel), a warehouse and light manufacturing facility (on two privately owned parcels), a commercial catering business (on a privately owned parcel), and a groundwater well and related facilities (on a City-owned parcel) that would be relocated on site during Proposed Project operations.

GHG emissions are currently associated with vehicle trips to and from the existing land uses at the Project Site (on-road mobile sources), on-site combustion of natural gas for heating and cooking, on-site combustion emissions from landscaping equipment (area source), off-site combustion of fossil fuels for electricity, and off-site emissions from solid waste decomposition, water conveyance, and wastewater treatment. The existing GHG emissions at the Project Site are estimated to be approximately 1,119 MTCO_{2e} per year, as shown in **Table 3.7-6**, below, generated primarily from transportation sources.

Existing Uses Relocating to Project Site

The existing off-site LA Clippers Team Offices, which are currently located at 1212 South Flower Street, Los Angeles, California, and the existing off-site LA Clippers practice and athletic training facility, which is located in the Playa Vista neighborhood within Los Angeles, at 6854 South Centinela Avenue, would be relocated to the Project Site upon completion of construction. The existing GHG emissions from off-site uses are estimated to be 1,333 MTCO_{2e} per year, as shown in Table 3.7-6, generated primarily from transportation sources.

3.7.2 Adjusted Baseline Environmental Setting

Section 3.7, Greenhouse Gas Emissions, assumes the Adjusted Baseline as described in Section 3.0, Introduction to the Analysis. Analysis of GHG emissions is cumulative in nature because global climate change effects are caused by cumulative global emissions. Although the Hollywood Park Specific Plan project will be constructed and in operation prior to opening of the Proposed Project, its potential impact on global emissions would not affect the threshold of significance or the impact analysis regarding GHG emissions from the Proposed Project. For this reason, the Adjusted Baseline is not relevant to the GHG impact analysis for the Proposed

Project. No other changes to the existing environmental setting related to GHG emissions would occur under the Adjusted Baseline.

3.7.3 Regulatory Setting

This section provides a summary of pertinent federal, State, and local GHG laws, executive orders, regulations, and policies.

Federal

US Environmental Protection Agency “Endangerment” and “Cause or Contribute” Findings

In *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007), twelve states and cities, including California, together with several environmental organizations, sued to require the US EPA to regulate GHGs as pollutants under the Federal Clean Air Act (CAA). The US Supreme Court ruled that GHGs fit within the CAA’s definition of a pollutant and the US Environmental Protection Agency (EPA) had the authority to regulate GHGs.

On December 7, 2009, the US EPA Administrator signed two distinct findings regarding GHGs under CAA section 202(a):

- **Endangerment Finding:** The current and projected concentrations of the six key GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings did not, by themselves, impose any requirements on industry or other entities. However, these actions were a prerequisite for implementing GHG emissions standards for motor vehicles.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the US EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule was a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the US EPA to develop “... mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy ...” The Reporting Rule applied to most entities that emit 25,000 MTCO₂e or more per year at their facility from stationary sources. Starting in 2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandated recordkeeping and administrative requirements in order for the US EPA to verify annual GHG emissions reports.

Vehicle Emissions Standards

In 1975, Congress enacted the Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the US. Pursuant to the act, the US EPA and National Highway Traffic Safety Administration (NHTSA) are responsible for establishing additional vehicle standards. In August 2012, standards were adopted for model year 2017 through 2025 for passenger cars and light-duty trucks. Under the standards, by 2025 vehicles are required to achieve 54.5 miles per gallon (mpg) (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO₂ per mile. According to the US EPA, a model year 2025 vehicle would emit one-half of the GHG emissions as compared to emissions from a model year 2010 vehicle.³³ California harmonized its vehicle efficiency standards through 2025 with the federal standards (see Advanced Clean Cars Program below).

In January 2017, the US EPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that it would be practical and feasible for automakers to meet the model year 2022-2025 standards through a number of existing technologies. In August 2018, the US EPA revised its 2017 determination, and issued a proposed rule that maintains the 2020 Corporate Average Fuel Economy (CAFE) and CO₂ standards for model years 2021 through 2026.³⁴ The estimated CAFE and CO₂ standards for model year 2020 are 43.7 mpg and 204 grams of CO₂ per mile for passenger cars and 31.3 mpg and 284 grams of CO₂ per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. On February 7, 2019, the state of California, joined by 16 other states and the District of Columbia, filed a petition challenging the US EPA's proposed rule to revise the vehicle emissions standards, arguing that the US EPA had reached erroneous conclusions about the feasibility of meeting the existing standards.³⁵ As of December 2019, the US EPA's proposed rule remains subject to multiple lawsuits that have been filed in federal court regarding the US EPA's GHG emissions standards. Because the outcome of pending litigation is speculative, this analysis assumes that the US EPA's existing CAFE standards will remain unchanged, and applies those standards as opposed to relying on speculative future standards.

State

California has promulgated a series of executive orders, laws, and regulations aimed at reducing both the level of GHGs in the atmosphere and emissions of GHGs from commercial and private activities within the state. The major components of California's climate protection initiative are reviewed below.

³³ United States Environmental Protection Agency, 2012. 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. Available: (August 2012). Available: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle>. Accessed March 11, 2019.

³⁴ Federal Register. Vol. 83, No. 165. August 24, 2018. Proposed Rules.

³⁵ Amicus brief, 2019. USCA Case #18-1114, Doc#1772455 filed February 14, 2019. Available: <http://climatecasechart.com/case/california-v-epa-4/>. Accessed April 17, 2019.

Executive Orders Establishing California Greenhouse Gas Reduction Targets

Through executive order, California governors have established long-term GHG reduction goals for the state.

Executive Order S-3-05

On June 1, 2005, Governor Schwarzenegger announced Executive Order S-3-05,³⁶ which established the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

Executive Order B-30-15

On April 29, 2015, Governor Brown issued Executive Order B-30-15,³⁷ in which, the Governor:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030;
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets; and
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006 (AB 32)

Following the issuance of Executive Order S-3-05, in 2006, the California State Legislature adopted the California Global Warming Solutions Act of 2006 (passed as Assembly Bill [AB] 32 and codified in the California Health and Safety Code [HSC], Division 25.5), which focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines GHGs as CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost effective.

Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

³⁶ California Office of the Governor, 2005. Executive Order S-3-05. Available: https://www.climatechange.ca.gov/state/executive_orders.html. Accessed March 4, 2019.

³⁷ California Office of the Governor, 2005. Executive Order B-30-15. Available: https://www.climatechange.ca.gov/state/executive_orders.html. Accessed March 4, 2019.

CARB 2008 and 2014 Scoping Plans

A specific requirement of AB 32 was the preparation of a Climate Change Scoping Plan for achieving the maximum technologically feasible and cost-effective GHG emission reduction by 2020. CARB developed and approved the initial Scoping Plan in 2008, outlining the regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs that would be needed to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives.³⁸

The First Update to the Scoping Plan was approved by CARB in May 2014 and built upon the initial Scoping Plan with new strategies and recommendations. In 2014, CARB revised the target using the GWP values from the IPCC AR4 and determined that the 1990 GHG emissions inventory and 2020 GHG emissions limit is 431 MMTCO_{2e}. CARB also updated the state's 2020 NAT emissions estimate to account for the effect of the 2007–2009 economic recession, new estimates for future fuel and energy demand, and the reductions required by regulation that were adopted for motor vehicles and renewable energy.³⁹

SB 32/AB 197

In 2016, Senate Bill (SB) 32 and its companion bill AB 197, augmented AB 32 and amended HSC Division 25.5, establishing a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and including provisions to ensure the benefits of state climate policies reach into disadvantaged communities.

2017 Climate Change Scoping Plan Update

In response to SB 32 and the 2030 GHG reduction target, CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in December 2017.⁴⁰ The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels.⁴¹ The 2017 Scoping Plan Update identifies key sectors of the state's implementation strategy, which includes improvements in low-carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water. Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 MMTCO_{2e}, and that further commitments will need to be made to achieve an additional reduction of 50 MMTCO_{2e} beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the Cap-and-Trade Program (discussed further below) to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by E.O. B-30-15.

³⁸ California Air Resources Board, 2008. *Climate Change Scoping Plan*. Available: <https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>. Accessed March 4, 2019. December 2008.

³⁹ California Air Resources Board, 2014. *First Update to the Climate Change Scoping Plan*. Available: <https://www.arb.ca.gov/cc/scopingplan/document/updatescopingplan2013.htm>. Accessed March 4, 2019. May 2014.

⁴⁰ California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan*. Available: <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>. Accessed March 4, 2019. November 2017.

⁴¹ California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan*. Available: <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>. Accessed March 4, 2019. November 2017.

The 2017 Scoping Plan Update’s strategy for meeting the state’s 2030 GHG target incorporates the full range of legislative actions and state-developed plans that have relevance to the year 2030, including the following, described elsewhere in this section:

- Extending the low-carbon fuel standard (LCFS) beyond 2020 and increasing the carbon intensity reduction requirement to 18 percent by 2030;
- SB 350, which increases the Renewables Portfolio Standard (RPS) to 50 percent by 2030 and requires the CEC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030. These targets may be achieved through energy efficiency savings and demand reductions from a variety of programs, including but not limited to appliance and building energy efficiency standards and a comprehensive program to achieve greater energy efficiency standards in existing buildings;
- The 2016 Mobile Source Strategy is estimated to reduce emissions from mobile sources including an 80 percent reduction in smog-forming emissions and a 45 percent reduction in diesel particulate matter from 2016 levels in the South Coast Air Basin, a 45 percent reduction in statewide GHG emissions (from both on-road and off-road mobile sources) and a 50 percent reduction in statewide consumption of petroleum-based fuels;
- The Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission freight handling technologies (described in more detail below);
- SB 1383, which requires a 50 percent reduction in anthropogenic black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030; and
- AB 398, which extends the state Cap-and-Trade Program through 2030.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than six MT CO₂e per capita by 2030 and no more than two metric tons CO₂e per capita by 2050. CARB acknowledges that because the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state (including large industrial sources covered under the state’s cap and trade program), they are not applicable for use at the local level. Rather, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

To demonstrate how a local jurisdiction can achieve their long-term GHG goals at the community plan level, CARB recommends developing a geographically specific GHG reduction plan (i.e., climate action plan) consistent with the requirements of CEQA Guidelines section 15183.5(b). A so-called “CEQA-qualified” GHG reduction plan, once adopted, can provide local governments with a streamlining tool for project-level environmental review of GHG emissions, provided there are adequate performance metrics for determining project consistency with the plan. Absent conformity with such a plan, CARB recommends “that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development.”⁴²

⁴² California Air Resources Board, 2017. *California’s 2017 Climate Change Scoping Plan*. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed March 9, 2019. November 2017. pp. 100–101.

Cap-and-Trade Program

Initially authorized by the California Global Warming Solutions Act of 2006 (AB 32), and extended through the year 2030 with the passage of AB 398 (2017), the California Cap-and-Trade Program is a core strategy that the state is using to meet its GHG reduction targets for 2020 and 2030, and ultimately achieve an 80 percent reduction from 1990 levels by 2050. CARB designed and adopted the California Cap-and-Trade Program to reduce GHG emissions from “covered entities”⁴³ (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 metric tons CO₂e per year), setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve reductions.⁴⁴ Under the Cap-and-Trade Program, an overall limit is established for GHG emissions from capped sectors. The statewide cap for GHG emissions from the capped sectors commenced in 2013. The cap declines over time. Facilities subject to the cap can trade permits to emit GHGs.⁴⁵

If California’s direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California’s direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will require relatively more emission reductions. In other words, the Cap-and-Trade Program can be adaptively managed by the state to ensure achievement of California’s 2020 and 2030 GHG emissions reduction mandates, depending on whether other regulatory measures are more or less effective than anticipated.

California Environmental Quality Act and Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledged that climate change is an environmental issue requiring analysis under CEQA. This bill directed the Governor’s Office of Planning and Research (OPR) to prepare, develop, and transmit to the CNRA guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009. SB 97 required the CNRA to certify or adopt those guidelines by January 1, 2010. On December 30, 2009, the Natural Resources Agency adopted amendments to the CEQA Guidelines, as required by SB 97. The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

CEQA Guidelines

The current CEQA Guidelines section 15064.4 specifically addresses the significance of GHG emissions, directing that a lead agency shall make a “good-faith effort” to “describe, calculate or estimate” GHG emissions in CEQA environmental documents.⁴⁶ Section 15064.4 further states that

⁴³ “Covered Entity” means an entity within California that has one or more of the processes or operations and has a compliance obligation as specified in subarticle 7 of the Cap-and-Trade Regulation; and that has emitted, produced, imported, manufactured, or delivered in 2008 or any subsequent year more than the applicable threshold level specified in section 95812 (a) of the regulation.

⁴⁴ 17 CCR §§ 95800 to 96023.

⁴⁵ See generally 17 CCR §§ 95811, 95812.

⁴⁶ California Natural Resources Agency, 2018. CEQA Guidelines Amendments, Sections 15064.4, 15183.5, 15364.5. Available: http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf. Accessed March 18, 2019.

the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions, (2) whether the project GHG emissions would exceed a threshold of significance that the lead agency determines applies to the project, and (3) the extent to which the project would comply with “regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.”

The CEQA Guidelines focus on the effects of GHG emissions as cumulative impacts, and direct that they should be analyzed in the context of CEQA’s requirements for cumulative impact analysis.⁴⁷ CEQA Guidelines section 15064.4 states that “the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. A project’s incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.” The CEQA Guidelines also establish that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of GHG emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (CEQA Guidelines section 15064(h)(3)).

The CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions, nor do they set a numerical threshold of significance for GHG emissions. Guideline 15064.7(c) clarifies that in adopting or using thresholds of significance, a lead agency may appropriately consider thresholds developed by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

When GHG emissions are found to be significant, CEQA Guidelines section 15126.4(c) includes the following direction on measures to mitigate GHG emissions:

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

- (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency’s decision;
- (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
- (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions;

⁴⁷ California Natural Resources Agency, 2009. Final Statement of Reasons for Regulatory Action, December 2009, pp. 20-26. Available: http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf. Accessed March 15, 2019.

- (4) Measures that sequester greenhouse gases; and
- (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

In late 2018, the CNRA finalized amendments to the CEQA Guidelines, including changes to CEQA Guidelines section 15064.4, which addresses the analysis of GHG emissions. The amendments were approved by the Office of Administrative Law and filed with the Secretary of State. The amendments became effective on December 28, 2018. The revision of CEQA Guidelines section 15064.4 clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects.
- The focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions.
- The impacts analysis of GHG emissions is global in nature and thus should be considered in a broader context. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions.
- Lead agencies should consider a timeframe for the analysis that is appropriate for the project.
- A lead agency's analysis must reasonably reflect evolving scientific knowledge and state regulatory schemes.
- Lead agencies may rely on plans prepared pursuant to section 15183.5 (Plans for the Reduction of Greenhouse Gases) in evaluating a project's greenhouse gas emissions.
- In determining the significance of a project's impacts, the lead agency may consider a project's consistency with the state's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is consistent with those plans, goals, or strategies.
- The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Transportation Sector

AB 1493

In 2002, Governor Davis signed AB 1493 (Pavley), which required CARB to set GHG emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is non-commercial personal transportation manufactured in and after 2009.

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004, requiring automobile manufacturers to meet fleet-average GHG

emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and that is designed primarily for the transportation of persons), beginning with model year 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for model year 2016 are approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24 percent between 2009 and 2016.

Because the Pavley standards (named for the bill's author, state Senator Fran Pavley) would impose stricter standards than those under the CAA, California applied to the US EPA for a waiver under the CAA. In 2008, the US EPA denied the application. In 2009, however, the US EPA granted the waiver. The waiver has been extended consistently since 2009; however, in 2018 the US EPA and NHTSA indicated their intent to revoke California's waiver, and prohibit future state emissions standards enacted under the CAA. As of April 2019, the waiver was still in place and the status of the federal government's revocation of the waiver was uncertain.

As discussed previously, the federal government adopted standards for model year 2012 through 2016 light-duty vehicles. In addition, the US EPA and US Department of Transportation (DOT) have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the state's standards (described below in the Advanced Clean Cars Program), but the state of California has agreed not to contest them, in part due to the fact that while the national standard would achieve slightly less reductions in California, the national standard would achieve greater reductions nationally and is stringent enough to meet state GHG emission reduction goals.

Advanced Clean Cars Program

In 2012, CARB approved the Pavley II (LEV III) Advanced Clean Cars Program, an emissions-control scheme for model years 2015 through 2025 that allows manufacturers to comply with the 2017 through 2025 national standards while meeting state law. The program includes components to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. The zero-emissions vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles (PHEV) in the 2018 to 2025 model years.⁴⁸

Executive Order B-16-12 – 2025 Goal for Zero Emission Vehicles

In March 2012, Governor Brown issued Executive Order B-16-12 establishing a goal of 1.5 million ZEVs on California roads by 2025. In addition to the ZEV goal, EO B-16-12 stipulated that by 2015 all major cities in California will have adequate infrastructure and be

⁴⁸ California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan*. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed March 10, 2019. November 2017.

‘zero-emission vehicle ready’; that by 2020 the state will have established adequate infrastructure to support 1 million ZEVs; that by 2050, virtually all personal transportation in the state will be based on ZEVs; and that GHG emissions from the transportation sector will be reduced by 80 percent below 1990 levels.

Mobile Source Strategy

In May 2016, CARB released the updated Mobile Source Strategy that demonstrates how the state can simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease health risk from transportation emissions, and reduce petroleum consumption over the next 15 years. The strategy promotes a transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled (VMT). The Mobile Source Strategy calls for 1.5 million ZEVs (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) by 2025 and 4.2 million ZEVs by 2030. The strategy also calls for more-stringent GHG requirements for light-duty vehicles beyond 2025 as well as GHG reductions from medium-duty and heavy-duty vehicles and increased deployment of zero-emission trucks primarily for class 3–7 “last mile” delivery trucks in California. Statewide, the Mobile Source Strategy would result in a 45 percent reduction in GHG emissions from mobile sources and a 50 percent reduction in the consumption of petroleum-based fuels.⁴⁹

Executive Order B-48-18 – 2030 Goal for Zero Emission Vehicles

On January 26, 2018, Governor Brown issued Executive Order B-48-18 establishing a goal of 5 million ZEVs on California roads by 2030, in recognition of the critical need to reduce emissions from the transportation sector in order to meet the GHG emissions target of SB 32.

Low Carbon Fuel Standard

In January 2007, Governor Schwarzenegger enacted Executive Order S-01-07, which mandates that the state: (1) establish a statewide goal to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020; and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. The overall goal of the LCFS is to lower the carbon intensity of California transportation fuel. The 2017 Scoping Plan Update calls for the LCFS to reduce fuel carbon intensity by at least 18 percent by 2030. In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction to 20 percent by 2030.

Land Use Transportation Planning

On September 30, 2008, Governor Schwarzenegger signed SB 375 (Chapter 728, Statutes of 2008), which establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Under SB 375, CARB is required, in consultation with the

⁴⁹ California Air Resources Board, 2016. *Mobile Source Strategy*. Available: <https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.htm>. Accessed March 10, 2019. May 2016.

state’s Metropolitan Planning Organizations (MPOs), to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035.⁵⁰

Under SB 375, the regional reduction target must be incorporated within the applicable MPO’s Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities need to be consistent with the SCS, and consistency with the SCS can provide certain CEQA streamlining for proposed projects; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

In 2011, CARB adopted GHG emissions reduction targets for SCAG, the MPO for the region in which the City is located. In March 2018, the CARB updated the SB 375 targets to require an 8 percent reduction by 2020 and a 19 percent reduction by 2035 in per capita passenger vehicle GHG emissions.^{51,52} As these reduction targets were updated after SCAG adopted the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS), it is expected that a future iteration of the RTP/SCS will be updated to reflect these targets. The proposed reduction targets explicitly exclude emission reductions expected from the AB 1493 and the LCFS regulations.⁵³

Energy Sector

Appendix F of the CEQA Guidelines states that, in order to ensure that energy implications are considered in project decisions, the potential energy implications of a project shall be considered in an EIR, to the extent relevant and applicable to the project. Appendix F further states that a project’s energy consumption and proposed conservation measures may be addressed, as relevant and applicable, in Chapter 2, Project Description, and in technical sections found in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, as well as through mitigation measures and alternatives. In accordance with Appendix F, the energy effects of the Proposed Project are addressed in Section 3.5, Energy Demand and Conservation, of this EIR.

Title 24 Building Energy Efficiency Standards

CCR Title 24 establishes California’s Building Energy Efficiency Standards; Part 11 is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to “improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories:

⁵⁰ California Air Resources Board, Sustainable Communities. Available: <https://www.arb.ca.gov/cc/sb375/sb375-rd.htm>. Accessed April 25, 2019.

⁵¹ California Air Resources Board, 2017. *California’s 2017 Climate Change Scoping Plan*. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed March 10, 2019. November 2017.

⁵² California Air Resources Board, 2018. *SB 375 Regional Greenhouse Gas Emissions Reduction Targets*. Available: <https://www.arb.ca.gov/cc/sb375/finaltargets2018.pdf>. Accessed March 11, 2019.

⁵³ California Government Code section 65080(b)(2)(A)(iii).

(1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental air quality.”⁵⁴ Since 2011, the CALGreen Code is mandatory for all new residential and non-residential buildings constructed in the state. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design and overall environmental quality. The CALGreen Code was most recently updated in 2016 to include new mandatory measures for residential and nonresidential uses; the new measures took effect on January 1, 2017.⁵⁵

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods.

The current Title 24, Part 6 standards (2016 standards) were made effective on January 1, 2017. The next update to the Title 24 energy efficiency standards (2019 standards) go into effect on January 1, 2020.

Renewables Portfolio Standard

In 2002, the passage of SB 1078 established the Renewables Portfolio Standard (RPS), which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from eligible renewable sources by 2017. SB 107, adopted in 2006, changed the target date to 2010.

In November 2008, Executive Order S-14-08 expanded the state’s RPS goal to 33 percent renewable power by 2020. In September 2009, Executive Order S-21-09 directed CARB (under its AB 32 authority) to enact regulations to help the state meet the 2020 goal of 33 percent renewable energy. The 33 percent by 2020 RPS goal was codified in April 2011 with the passage of Senate Bill X1-2. This new RPS applied to all electricity retailers in the state, including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators.

Senate Bill 350

The Clean Energy and Pollution Reduction Act of 2015, SB 350 (Chapter 547, Statutes of 2015), was approved by Governor Brown on October 7, 2015. SB 350 increased the RPS by requiring an increase in the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources from 33 percent to 50 percent by December 31, 2030. The Act also

⁵⁴ California Building Standards Commission, 2010. *California 2010 Green Building Standards Code (CALGreen)*. Available: http://www.hcd.ca.gov/building-standards/docs/2010_CA_Green_Bldg.pdf. Accessed March 11, 2019.

⁵⁵ California Building Standards Commission, 2016. 2016 California Green Building Standards Code (Part 11 of Title 24). Available: <https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen>. Accessed April 25, 2019.

requires the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in existing electricity and natural gas final end uses of retail customers by January 1, 2030.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the RPS, increasing required energy from renewable sources for both investor-owned utilities and publicly owned utilities from 50 percent to 60 percent by December 31, 2030. Incrementally, these energy providers must also have a renewable energy supply of 44 percent by December 31, 2024, and 52 percent by December 31, 2027. The updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

SB 1383 (Short-lived Climate Pollutants)

Senate Bill 1383, passed in 2016, requires statewide reductions in short-lived climate pollutants (SLCPs) across various industry sectors. The SLCPs covered under AB 1383 include methane, fluorinated gases, and black carbon—all GHGs with a much higher warming impact than carbon dioxide and with the potential to have detrimental effects on human health. SB 1383 requires the CARB to adopt a strategy to reduce methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The methane emission reduction goals include a 75 percent reduction in the level of statewide disposal of organic waste from 2014 levels by 2025.

AB 987

AB 987 was signed by Governor Jerry Brown on September 30, 2018. The bill added section 21168.6.8 to the California Public Resources Code (PRC). AB 987 does not change the substantive content of this EIR, or the public review requirements for the EIR. AB 987 does, however, establish specific timelines for judicial review in the event that the adequacy of this EIR is challenged, so long as certain requirements are met. The discussion of AB 987 below is focused on the provisions of PRC 21168.6.8 that address GHG emissions; a full description of AB 987 is provided in Chapter 1, Introduction.

AB 987 is described in this chapter under Regulatory Setting because the statute potentially applies to the Proposed Project and addresses issues related to GHG emissions. However, AB 987 is not a regulatory statute, per se, in that the Proposed Project is not required to comply with the provisions of PRC section 21168.6.8. Instead, AB 987 established provisions by which the project applicant for the Proposed Project may voluntarily decide to attempt to qualify under the provisions of the statute. If certified as qualified by the Governor's Office, then specific timelines for judicial review identified in AB 987 would apply to any action brought to challenge the certification of this EIR or the approval of the Proposed Project. In the event that the Proposed Project does not qualify under the provisions of AB 987, then the Proposed Project could still be

reviewed and approved by the City, but judicial review would occur under the standard provisions of CEQA.

The provisions of PRC section 21168.6.8 are similar to the provisions of the Jobs and Economic Improvement through Environmental Leadership Act of 2011 (AB 900; PRC sections 21178 through 21189.3), as subsequently amended, which established expedited judicial review of certified Environmental Leadership Development Projects. In order to qualify for expedited judicial review under AB 987, the Proposed Project would have to achieve certain vehicle trip reduction goals, and, most relevantly for this section, would have to achieve a “no net new” GHG emissions standard.⁵⁶ Further, as a condition of approval of the Proposed Project, the lead agency must require the project applicant, in consultation with SCAQMD, to implement measures that will achieve certain reductions in criteria air pollutant and toxic air contaminant emissions, over and above any reductions required by other laws or regulations in communities surrounding the Project Site.

Regional

SCAQMD

The Project Site is located in the South Coast Air Basin (Air Basin), which consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside Counties, in addition to the San Geronio Pass area in Riverside County. SCAQMD is responsible for air quality planning in the Air Basin and developing rules and regulations to bring the area into attainment with the ambient air quality standards. This is accomplished through air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and supporting and implementing measures to reduce emissions from motor vehicles.

SCAQMD adopted a “Policy on Global Warming and Stratospheric Ozone Depletion” on April 6, 1990. The policy commits SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of chlorofluorocarbons, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons by the year 2000;
- Develop recycling regulations for hydrochlorofluorocarbons (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

⁵⁶ Office of the Governor, 2018. Assembly Bill 987 Signing Message. September 30.

In 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds.⁵⁷ Within its October 2008 document, SCAQMD proposed the use of a percent emission reduction target to determine significance for commercial/residential projects that emit greater than 3,000 MTCO₂e per year. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where SCAQMD is the lead agency. However, SCAQMD did not adopt a GHG significance threshold for land use development projects (e.g., mixed-use/commercial projects) and formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds. This Working Group has been inactive since 2011 and SCAQMD has not formally adopted any GHG significance threshold guidance for land use development projects.

SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

As described in Section 3.10, Land Use and Planning, the 2016–2040 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals, with a specific goal of achieving an 8 percent reduction in passenger vehicle GHG emissions on a per capita basis by 2020, 18 percent reduction by 2035, and 21 percent reduction by 2040 compared to the 2005 level. Consistency of the Proposed Project with the 2016–2040 RTP/SCS, including Goals 6 and 7, is discussed under Impact 3.7-2, below, as well as in Section 3.10, Land Use and Planning, Impact 3.10-2.

Local

City of Inglewood General Plan

The City of Inglewood General Plan sets forth goals, objectives, and policies for the future development of the City and designates the location of desired future land uses within the City.

The following goals from the Land Use Element⁵⁸ of the City of Inglewood General Plan are relevant to GHG emissions.

Circulation Goal: Promote and support adequate public transportation within the City and the region.

Circulation Goal: Develop a safe and adequate pedestrian circulation system which is barrier free for the handicapped.

The use of public transportation reduces the GHG emissions that would otherwise occur through the use of private vehicles. Safe and adequate pedestrian networks promote walking and the use of assisted mobility devices (e.g., wheelchairs) instead of driving. The Proposed Project would include provisions that would promote the use of public transportation as a means of travel to and from the proposed Arena, including a transportation hub at the East Transportation and Hotel

⁵⁷ South Coast Air Quality Management District, 2008. Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008. Available: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf). Accessed April 17, 2019.

⁵⁸ City of Inglewood, Department of Community Development and Housing, 1980. Land Use Element of the Inglewood General Plan. January 1980. Amended September 14, 2016.

Site, shuttle stops on South Prairie Avenue, and a shuttle system for large events that would connect the Proposed Project to nearby Metro stations. In addition, improvements to the sidewalks fronting the Project Site and a pedestrian bridge crossing South Prairie Avenue would promote a safe pedestrian circulation system that would meet ADA requirements. For these reasons, the Proposed Project would not be inconsistent with the General Plan Land Use Element circulation goals listed above. Ultimately, it is within the authority of the City Council to determine whether the Proposed Project is consistent with the City of Inglewood General Plan.

The Proposed Project's consistency with the City of Inglewood General Plan is discussed under Impact 3.7-2.

City of Inglewood Energy and Climate Action Plan

The Inglewood Energy and Climate Action Plan (ECAP) presents the City's community and municipal inventories, emissions forecasts, and recommended reduction targets for emissions to mitigate the City's impacts on climate change.⁵⁹ The ECAP includes a business-as-usual (BAU) forecast that estimates future emissions in 2020 and 2035 from six sectors: Transportation, Residential Energy, Commercial/Municipal Energy, Industrial Energy, Solid Waste, and Water. The BAU forecast assumes GHG emissions that would occur in the future under regulatory conditions as they existed in 2010; the BAU forecast does not include the effects of updates to Title 24, the Renewables Portfolio Standard, and the Pavley Clean Car Standards on future GHG emissions. Under the ECAP's BAU forecast, Inglewood's total GHG emissions are expected to increase approximately 14 percent from 2010 (594,273 MTCO₂e) to 2035 (678,283 MTCO₂e). On a per-service population (SP)⁶⁰ basis, the increase is shown to be just 4.5 percent, from 4.22 MTCO₂e/SP in 2010 to 4.41 MTCO₂e/SP in 2035.

The City's GHG inventories and forecasts are summarized in **Table 3.7-3**.

⁵⁹ City of Inglewood, 2013, *Inglewood Energy and Climate Action Plan*. Available: <https://www.cityofinglewood.org/225/Sustainability>. Accessed Feb 15, 2019. March 2013.

⁶⁰ Service population = residents plus employees working within the City limits.

TABLE 3.7-3
CITY OF INGLEWOOD COMMUNITY GHG EMISSIONS BY SECTOR: EXISTING AND FORECASTED (MTCO₂e)

Sector	2005	2007	2010	2020	2035
Transportation	320,254	311,853	322,042	327,998	337,552
Residential Energy	124,872	123,062	122,429	134,843	156,574
Commercial/Municipal Energy	97,176	99,458	95,261	106,041	124,749
Industrial Energy	34,940	31,272	26,100	26,376	26,830
Solid Waste	19,855	16,841	16,448	16,782	17,555
Water	13,813	13,272	11,993	14,707	15,044
Total	610,910	595,758	594,273	626,748	678,284
Target/goal (change from 2005)				519,273 (-15%)	412,364 (-32.5%)
Reductions from state-level actions				-121,139	-160,002
Forecasts with implementation of state-level actions				505,609	518,282
Reductions from local actions				-9,803	-10,994
Forecasts with CAP Implementation				495,806	499,208
Resulting change from 2005				-18.8%	-18.3%
Meet target/goal?				Yes	No

SOURCE: City of Inglewood, 2013. *Inglewood Energy and Climate Action Plan*.

The ECAP establishes an emissions reduction target of 15 percent below 2005 levels by 2020 and an emissions reduction goal of 32.5 percent below 2005 levels by 2035. As shown in Table 3.7-3, state-level actions, such as the Pavley Clean Cars legislation, the Low Carbon Fuel Standard, the Renewables Portfolio Standard, and Title 24 upgrades are expected to reduce community emissions by 121,139 MTCO₂e per year by 2020, and 160,002 MTCO₂e by year 2035. Local measures in the CAP are expected to reduce community emissions an additional 9,803 MTCO₂e per year by 2020, and 10,994 MTCO₂e per year by year 2035. The ECAP quantifies GHG reductions from the following five implementing strategies and actions:

Strategy 1 – Lead by Example with Municipal Government Actions

- Continue Building and Facility Energy Upgrades to reduce energy use
- Replace all City-owned street, park, and traffic lights with light-emitting diode (LED) lights
- Accelerate city vehicle fleet replacement
- Continue commute trip reduction program
- Planning for electric vehicle infrastructure

Strategy 2: Increase Energy Efficiency

- Make commercial buildings more efficient
- Increase the energy efficiency of residential buildings

- Increase the energy efficiency of street and traffic lights.

Strategy 3: Support Renewable Energy Generation

- Remove barriers to renewable energy generation
- Make renewable energy generation more affordable
- Educate potential customers

Strategy 4: Improve Transportation Options and Manage Transportation Demand

- Make roadways more efficient
- Improve transit
- Improve bicycle facilities
- Make parking more efficient
- Reduce commute trips
- Encourage land use intensification and diversity

Strategy 5: Reduce Consumption and Waste

- Use less water
- Produce less waste
- Promote local food production

The Proposed Project's consistency with the ECAP is discussed under Impact 3.7-2.

3.7.4 Analysis, Impacts and Mitigation

Approach to Analysis

GHG emissions and global climate change represent cumulative impacts from human activities and development projects locally, regionally, statewide, nationally, and worldwide. GHG emissions from all of these sources cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from past, present, and future projects around the world have contributed and will continue to contribute to global climate change and its associated environmental impacts.

The following analysis of the Proposed Project's impact on climate change focuses on the Proposed Project's contribution to cumulatively significant GHG emissions. Given that the analysis of GHG emissions is only relevant in a cumulative context, this section does not include an individual project-specific impact assessment.

Significance Criteria

The City has not adopted thresholds of significance for analysis of impacts related to GHG emissions. As described above, in 2009 the CNRA adopted amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. As a result of the amendments, Appendix G of the CEQA Guidelines was amended to provide screening questions to assist lead agencies when assessing a project's potential impacts with regard to GHG emissions, and additional amendments were made in 2018. The following thresholds of significance are consistent with CEQA Guidelines section 15064.4 and CEQA Guidelines Appendix G.

A significant impact would occur if the Proposed Project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

CEQA Guidelines section 15064.4 gives lead agencies the discretion to determine whether to assess the significance of GHG emissions quantitatively or qualitatively. Section 15064.4 recommends considering certain factors, among others, when determining the significance of a project's GHG emissions, including the extent to which the Proposed Project may increase or reduce GHG emissions as compared to the existing environment; whether the Proposed Project exceeds an applicable significance threshold; and extent to which the Proposed Project complies with regulations or requirements adopted to implement a reduction or mitigation of GHGs. None of the amendments establishes a threshold of significance; rather, so long as any threshold selected is supported by substantial evidence (see section 15064.7(c)), lead agencies are granted discretion to establish significance thresholds for their respective jurisdictions, including by looking to thresholds developed by other public agencies, such as air districts, or suggested by experts, such as the California Air Pollution Control Officers Association (CAPCOA).

The CNRA's *Final Statement of Reasons for Regulatory Action* from December 2009 similarly provides that project-level quantification of emissions should be conducted where it would assist in determining the significance of emissions, even where no numeric threshold applies. In such cases, CNRA's guidance provides that qualitative thresholds can be utilized to determine the ultimate significance of project-level impacts based on a project's consistency with plans, which can include applicable regional transportation plans. Even when using a qualitative threshold, quantification can inform "the qualitative factors" and indicate "whether emissions reductions are possible, and, if so, from which sources."⁶¹

Neither CARB, SCAQMD, nor the City has adopted quantitative significance thresholds for assessing project-level impacts related to GHG emissions. CEQA Guidelines section 15183.5 states that a lead agency may determine that a project's incremental contribution to a cumulative

⁶¹ California Natural Resources Agency, 2009. *Final Statement of Reasons for Regulatory Action*, December 2009, pp. 20–26. Available: http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf. Accessed March 15, 2019.

effect is not cumulatively considerable if the project complies with the requirements in a previously adopted mitigation program, or plan for the reduction of GHG emissions that includes the following elements:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan’s progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review.

The City’s ECAP, adopted in 2013, provides a set of strategies and supporting actions for achieving the City’s 2020 GHG reduction targets, but it does not demonstrate how the City plans to reduce GHG emissions consistent with the State’s post-2020 targets as represented by SB 32 and EO S-3-05.

CARB’s 2017 Scoping Plan Update advises that absent conformity with a qualified GHG reduction plan, projects should incorporate all feasible GHG reduction measures and that achieving “no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development.”⁶² Accordingly, for the purposes of this EIR, the City used a quantitative threshold for the Proposed Project of no net additional GHG emissions, including emissions from employee transportation.

The “no net new” emissions threshold means that if the Proposed Project would not emit any additional GHG emissions beyond the baseline over its estimated 30-year life, the impact would be less than significant. Further, the “no net new” emissions threshold for the Proposed Project is consistent with the project applicant’s commitment to abide by the requirements of AB 987, which stipulates that the Proposed Project would not result in any net additional emissions of GHGs compared to the baseline, including GHG emissions from employee transportation. This threshold serves as a *project-specific* GHG threshold and does not set precedent for future City projects.⁶³

⁶² California Air Resources Board, 2017. *California’s 2017 Climate Change Scoping Plan*. pp. 100-101. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed March 10, 2019. November 2017.

⁶³ Project-specific thresholds are not required to be formally adopted because the requirement for formal adoption of thresholds under 14 CCR §15064.7(b) applies only to thresholds of general application.

Consistent with CEQA Guidelines Appendix G, the City is also assessing whether the Proposed Project would be inconsistent with applicable plans, policies, regulations or requirements adopted to implement a statewide, regional or local plan for the reduction of GHG emissions.

Determining Net New Emissions of Greenhouse Gases

The net new GHG emissions associated with the Proposed Project is defined as the difference in emissions between baseline conditions and the Proposed Project buildout. Baseline operational emissions are the annual operational GHG emissions produced by existing emissions sources and activities against which the Proposed Project's GHG emissions will be compared. The Proposed Project's operational emissions would occur starting in 2024 and for analytical purposes are assumed to continue through the 30-year life of the Proposed Project to 2054.

For the purpose of this analysis, the Proposed Project's annual operational emissions include total construction emissions amortized over the 30-year life of the Proposed Project, consistent with regulatory guidance from SCAQMD and with the typical average lifespan of past NBA arenas.⁶⁴ SCAQMD recognizes that construction-related GHG emissions from projects "occur over a relatively short-term period of time" and that "they contribute a relatively small portion of the overall lifetime project GHG emissions." SCAQMD recommends that construction project GHG emissions be "amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies."⁶⁵

Project Consistency with Existing Plans, Policies and Regulations

A significant impact would occur if the Proposed Project would conflict with applicable regulations, plans and policies that were adopted to reduce GHG emissions that contribute to global climate change. For the Proposed Project, as a land use development project, this analysis considers the Proposed Project's consistency with the following applicable plans, policies and regulations to reduce GHG emissions:

- The 2017 Climate Change Scoping Plan Update, CARB's plan for achieving a 40 percent reduction on GHG emissions from 1990 levels by 2030, statewide, as mandated by SB 32;
- SCAG's 2016-2040 RTP/SCS, the regional plan for achieving sustainable land use patterns that reduce passenger vehicle GHG emissions, as mandated by SB 375;
- Executive Order S-3-05, which established a goal of reducing the state's GHG emissions to 80 percent below the 1990 level by the year 2050;
- CARB's Mobile Source Strategy and Executive Order B-48-18, which are designed to achieve GHG reductions from the state's largest contributing sector (transportation), consistent with the goals of SB 32 and the 2017 Scoping Plan Update; and
- The City's ECAP.

⁶⁴ Wikipedia, List of National Basketball Association arenas, accessed July 7, 2019, https://en.wikipedia.org/wiki/List_of_National_Basketball_Association_arenas.

⁶⁵ South Coast Air Quality Management District, 2008. Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold. Available: [www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf). Accessed March 11, 2019. October 2008, pp. 3-8.

Methodology and Assumptions

As described in Chapter 2, Project Description (see Table 2-3), the Proposed Project includes an annual average of 5 pre-season, 41 regular season, and 3 post-season LA Clippers home games that would be hosted at the Project Arena, for an average of 49 games per year. The Project Arena would also host concerts, family shows, conventions and corporate or civic events, and non-LA Clippers sporting events, which would take place throughout the year and have maximum attendance ranging from 2,000 attendees to full Arena capacity of 18,500. It is estimated that the new Arena could host approximately 178 non-LA Clippers events annually, with an additional 16 smaller outdoor events in the plaza.

The baseline for determining the Proposed Project's net new annual emissions includes GHGs from:

- a. mobile sources and energy usage associated with the existing on-site structures that would be removed and replaced with construction of the Proposed Project;
- b. the existing LA Clippers team offices and practice and athletic training facility uses that would be relocated to the Project Site, and;
- c. LA Clippers games that would be relocated from the Staples Center,
- d. non-NBA events that would be market-shifted to the proposed Arena, as described below.

Existing Operations

Baseline annual emissions include GHGs from mobile sources and energy usage associated with the existing on-site structures that would be removed and replaced with construction of the Proposed Project. Existing buildings within the Project Site include a 16,806-square-foot (sf) motel, an 1,118 sf fast food restaurant, a 28,809 sf light manufacturing/warehouse building, an 1,134 sf commercial building, and a 6,231 sf warehouse and a groundwater well and related facilities that would be relocated on site. GHG emissions from the demolition and construction of the existing groundwater well and related facilities on site were calculated and included as Project emissions; however, the operational GHG emissions of the relocated groundwater well and related facilities "net out" since their operations would not change once relocated.

The Proposed Project would also include relocation of the existing off-site LA Clippers team offices, which are currently located approximately 11 miles northeast of the Project Site at 1212 South Flower Street in downtown Los Angeles, and the existing off-site LA Clippers practice and athletic training facility, which is located approximately 6 miles northwest of the Project Site at 6854 South Centinela Avenue in the Playa Vista neighborhood within Los Angeles. GHG emissions associated with the use of the existing team offices and the practice and athletic training facility (including travel to and from) are currently occurring, and are therefore part of the existing environmental setting.

GHG emissions associated with the use of the existing team offices and the practice and athletic training facility would be relocated to the Project site and are thus included in "baseline" GHG

emissions. However, it is likely that the facilities would be backfilled with new tenants once they are vacated by the LA Clippers. This is particularly true of the current LA Clippers team offices in downtown Los Angeles, located in a multi-tenant office building where demand for commercial real estate is relatively high. For the LA Clippers' practice and athletic training facility, it would be speculative to assume the type of use that could reoccupy it in the future given its unique design and space allocation, but for the purposes of this analysis it was assumed that a new tenant would backfill it with the same emissions profile. To account for the backfilling of these existing facilities, the future emissions of new tenants were added to the Project's operational emissions.

Relocated LA Clippers Games and Market Shifted Events

Starting in the first NBA season following completion of the Proposed Project, all LA Clippers games currently hosted at the Staples Center would relocate to the new Arena. Although these games would not be replaced by home games for another professional sports team, it is reasonable to assume that the operator of the Staples Center would attempt to replace those LA Clippers games with other events. It is difficult to estimate the extent to which these vacant dates at Staples Center will backfill with other events. An expert consultant retained by the applicant has prepared an estimate of the extent to which Staples Center would backfill with events.⁶⁶ Based on an evaluation of the past several years of Staples Center schedules, the consultant estimated that seven events would be backfilled at the Staples Center.

In addition, a total of 178 non-NBA game events (e.g., concerts, family shows, non-NBA sports games, etc.) are expected to occur at the Project Arena. Some of these events will be events that would otherwise occur at other venues in the region absent construction of the Proposed Project and some of these events will be new to the region. The City retained an expert to estimate, out of this total, the number of market-shifted events. Of the 178 non-NBA events, 89 would be market-shifted to the Project Arena, and the balance would be new events.⁶⁷ For these 89 market-shifted events, a backfill event may or may not occur at the vacated venue. As is the case for relocated LA Clippers games, it is difficult to estimate the extent to which these market-shifted events will result in backfilled events at the venues from whence they came. For the market-shifted events, there may be no backfilled events at the vacated venues; backfill may occur for all such events; or the outcome could be something in between.

The estimate of GHG emissions is dependent in part on the number of relocated, market-shifted, and backfilled events. The applicant has also engaged with CARB, as part of the AB 987 application process. At CARB's request, the applicant has prepared an analysis that presumes that

⁶⁶ See Conventions, Sports and Leisure (CSL), 2019. *Staples Center Vacated Event Days Analysis*. May 14, 2019. The majority of LA Clippers games at the Staples Center occur on weekday evenings from Monday through Thursday or on days that are double-booked with a home game for one of the other professional sports teams that play at Staples Center.

⁶⁷ Based on information included in Appendix R, a total of 80 percent of concerts and family shows, and 41 percent of other events would be market-shifted. For this analysis 41 percent of civic and community events are also assumed to be market-shifted, resulting in a total of 89 market-shifted events.

all relocated LA Clippers games, and all non-NBA game market-shifted events, would be backfilled by other events at Staples Center or other venues.

In light of this uncertainty, this EIR presents two analyses. These analyses present a range of potential outcomes for these dates representing what could occur once the LA Clippers have vacated Staples Center and approximately 89 non-NBA events shift to the Project Arena. Under either scenario, the emissions from these backfilled events could be attributable to the Proposed Project. Because of the unavoidable uncertainty regarding the extent to which vacated venues will backfill with other events, the EIR describes and analyzes two potential scenarios: a Full Backfill Scenario and a Partial Backfill Scenario. Each is described and analyzed below.

Full Backfill Scenario

The Full Backfill Scenario accounts for the possibility that all relocated LA Clippers games and market-shifted non-NBA events at the Project Arena would be backfilled with other events at Staples Center and other existing venues in the Los Angeles region. Under this Full Backfill Scenario, all 47 LA Clippers games being relocated from Staples Center to the Project Arena would be backfilled with other events at Staples Center. In addition, all of the non-NBA game events being market shifted to the Project Arena would be backfilled with comparable events at the vacated venue. The emissions from these backfilled events are considered to be attributable to the Proposed Project under the Full Backfill Scenario.

Partial Backfill Scenario

The Partial Backfill Scenario assumes that seven of the vacated LA Clippers games would be backfilled by new events at Staples Center. Under the Partial Backfill Scenario, the emissions from these seven backfill events are considered to be attributable to the Proposed Project. This scenario assumes none of the vacated market-shifted non-NBA events would be backfilled with new events at the other existing venues.

Summary of Event Characteristics under Backfill Scenarios

Table 3.7-4 provides a summary of annual events anticipated at the Project Arena, including the number of events that would be relocated or market-shifted from existing venues within the region, and the number of events that would be backfilled under the Full Backfill and Partial Backfill Scenarios discussed above. Under both scenarios, 47 LA Clippers games currently being played at Staples Center are relocated to the Project Arena,⁶⁸ and 89 non-NBA events are market-shifted from existing venues in the region. Under the Full Backfill Scenario, backfill would occur at Staples Center for all 47 of the vacated LA Clippers games, and at the existing venues that would have vacated event times for all 89 of the non-NBA game market-shifted events. Under the Partial Backfill Scenario, backfill would occur at Staples Center for seven of the vacated LA Clippers games, and for none of the 89 market-shifted events.

⁶⁸ It is anticipated that the proposed Arena would host up to five pre-season LA Clippers games per year, which is two more than is typically hosted by the Staples Center. The annual average number of post-season games at the Arena was based on the average number of post-season home games per NBA team per year.

**TABLE 3.7-4
INGLEWOOD BASKETBALL & ENTERTAINMENT CENTER ANTICIPATED ANNUAL EVENT CHARACTERISTICS**

Event Type	Anticipated Annual Frequency	Maximum Attendance	Event-Day Employees ^a	Relocated or Market-Shifted ^b	Backfilled: Full Backfill Scenario	Backfilled: Partial Backfill Scenario
LA Clippers Home Basketball Games	Up to 5 Pre-season Games	18,000	1,320 ^c	3	3	0
	41 Regular Season Games	18,000	1,320 ^c	41	41	7
	3 Post-season Games ^d	18,000	1,320 ^c	3	3	0
Concerts^e	Up to 5 per year (large)	18,500	1,120 ^f	4	4	0
	Up to 8 per year (medium)	14,500	795 ^f	6	6	0
	Up to 10 per year (small)	9,500	530 ^f	8	8	0
Family Shows^g	Up to 20	8,500	530 ^f	16	16	0
Other Events^h	Up to 35	7,500	480 ^f	14	14	0
Corporate/Community Eventsⁱ	Up to 100	2,000	25 ^f	41	41	0
Plaza Events^j	Up to 16	4,000	25	0	0	0
Total	Up to 243	na	na	136	136	7

NOTES:

- ^a Estimates do not include full-time arena management and operations employees, LA Clippers basketball operations employees including players and coaches, LA Clippers employees that work in the management offices or related facilities during the day, or visiting event performers and their support staff at the arena.
- ^b Number of relocated LA Clippers Games and market shift events as provided in Appendix R.
- ^c Provided by Venue Solutions Group based on a blended analysis of the Amway Center, American Airlines Arena, Madison Square Garden, and Staples Center operations; includes 1,200 non-LA Clippers employees and 120 LA Clippers employees to provide game-day operations support.
- ^d The current NBA playoff format, implemented in the 2002–03 season, involves four rounds of best-of-seven series and allows for a potential maximum of 16 home games in one season. Based on an analysis of the past playoff appearances of all current NBA teams, the anticipated average annual number of home playoff games is 3 games.
- ^e Annual number and size of concerts may vary according to market conditions and availability of the arena; these estimates represent the anticipated annual average occurrences of each concert type.
- ^f Provided by Venue Solutions Group based on a blended analysis of the Amway Center, American Airlines Arena, Madison Square Garden, and Staples Center operations.
- ^g Examples of family shows include Disney Live, Harlem Globetrotters and Marvel Universe Live.
- ^h Examples of other sporting events include college basketball, boxing, lacrosse, arena football, or non-recurring events such as professional wrestling shows. Events could be professional, collegiate or amateur competitions. Other events could include speaking events or civic events such as local graduation ceremonies.
- ⁱ Examples of corporate or community events include small conventions, conferences, cultural events, civic events and private events. Events could be hosted on the arena floor or in club, locker room and concourse space throughout the arena, or in the plaza.
- ^j Examples of plaza events include outdoor exhibitions or festivals for arts, food, technology, or similar activities, fan appreciation days, holiday celebrations, and similar outdoor events.

For purposes of this analysis, the HPSP Adjusted Baseline projects would not affect GHG emissions associated with the Proposed Project and, as such, were not relevant to the impacts and thresholds related to GHG emissions associated with the Proposed Project.

GHG Calculation Methodology

The evaluation of potential impacts to GHG emissions that may result from the construction and long-term operations of the Proposed Project is consistent with CEQA Guidelines section

15064.4(a) and recent related guidance from OPR.⁶⁹ This analysis considered GHG emissions resulting from Project-related incremental (net) increases in the use of on road vehicles, electricity, and natural gas compared to existing conditions. This included construction activities associated with the Proposed Project such as demolition, site preparation, excavation/grading, building construction, paving, hauling, and construction worker trips. This analysis also considered indirect GHG emissions from water conveyance, wastewater generation, and solid waste handling. Because potential impacts resulting from GHG emissions would be long-term rather than acute, GHG emissions were calculated on an annual basis. In accordance with SCAQMD guidance, GHG emissions from construction have been amortized (i.e., averaged annually) over the lifetime of the Project. SCAQMD defines the lifetime of a project as 30 years.⁷⁰ As stated above, a 30-year lifetime is consistent with the average lifespan of past NBA arenas. Therefore, the Project's total construction GHG emissions were divided by 30 to determine an annual construction emissions estimate comparable to operational emissions.

GHG quantification methods rely on guidance from State and regional agencies with scientific expertise in quantifying GHG emissions, including CARB and SCAQMD. GHG emissions were estimated using CalEEMod Version 2016.3.2, which is a California based land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria air pollutant and GHG emissions from land use projects of various types and in various air basins. CalEEMod was developed in collaboration with the air districts of California and is recommended by SCAQMD for evaluating GHG emissions for projects under CEQA.⁷¹ Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions. According to the California Air Pollution Control Officers Association, the model is an established, accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.⁷²

CalEEMod uses CARB's approved on-road and off-road equipment emission models including the Emission FACTor model (EMFAC) and ARB In-Use Off-Road Equipment model (OFFROAD2011), and studies commissioned by California agencies such as the California Energy Commission and CalRecycle. OFFROAD is an emission factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment). The off-road diesel emission factors used in CalEEMod are based on the CARB

⁶⁹ The GHG operational analysis is consistent with the OPR's *CEQA and Climate Change Advisory Discussion Draft*. As stated therein, "when possible, lead agencies should quantify the project's construction and operational greenhouse gas emissions, using available data and tools, to determine the amount, types, and sources of greenhouse gas emissions resulting from the project." Governor's Office of Planning and Research, *CEQA and Climate Change Advisory Discussion Draft*, December 2018, p. 8. Accessed March 2019.

⁷⁰ South Coast Air Quality Management District, 2008. Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold. Available: [www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf). Accessed March 11, 2019. October 2008, pp. 3–8.

⁷¹ South Coast Air Quality Management District, Air Quality Modeling for CEQA, www.aqmd.gov/home/rules-compliance/ceqa/air-quality-modeling. Accessed April 25, 2019.

⁷² California Air Pollution Control Officers Association, California Emissions Estimator Model, 2017. <http://www.aqmd.gov/caleemod/>, Accessed April 25, 2019.

OFFROAD2011 program. EMFAC is an emission factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles). The emission factors used in CalEEMod are based on the CARB EMFAC2014 program. CARB has released an updated EMFAC2017 version that includes various updates, notably the incorporation of USEPA and CARB regulations and standards (e.g., Advanced Clean Cars and the Truck and Bus Rule), and was recently approved by USEPA for use in California.⁷³ To more accurately assess the mobile GHG emissions, EMFAC2017 emission factors were used in the analysis.

Emissions from Existing Operations

Existing operations at the Project Site and at the LA Clippers' current off-site team offices and practice and athletic training facility generate GHG emissions from energy (electricity and natural gas), on-road motor vehicles (mobile), solid waste, water and wastewater, and area sources, as described further below.

Energy

The existing operations consume energy (electricity and natural gas) for multiple purposes including, but not limited to, building heating and cooling, lighting, and electronics. The existing buildings on the Project Site and the off-site team offices and the practice and athletic training facility were built before 2005. Thus, building energy consumption for these facilities was based on CalEEMod historical (pre-2005) electricity and natural gas usage rates per CalEEMod instructions.⁷⁴ For pre-2005 buildings, CalEEMod bases its energy usage estimates on the CEC's California Commercial End-Use Survey (CEUS), which lists energy demand by building type based on data from 2002.⁷⁵

For on-site existing land uses, electricity is supplied by Southern California Edison (SCE) and natural gas is supplied by Southern California Gas Company. CalEEMod provided default CO_{2e} intensity factors for natural gas and for SCE-supplied electricity. The CalEEMod default CO_{2e} intensity factor for SCE-provided electricity, 705 pounds CO_{2e}/MWh (0.320 MTCO_{2e}/MWh), is based on the SCE portfolio in 2012.⁷⁶ However, as described in Section 3.7.3, California's Renewables Portfolio Standard, mandates that publicly owned electric utilities procure an increasing percentage of their total sales from renewable power sources, with a 2020 goal of 33 percent qualifying renewables. SCE's average power mix in 2017 included 32 percent qualified

⁷³ United States Environmental Protection Agency, Official Release of EMFAC2017 Motor Vehicle Emission Factor Model for Use in the State of California, 2019, <https://www.federalregister.gov/documents/2019/08/15/2019-17476/official-release-of-emfac2017-motor-vehicle-emission-factor-model-for-use-in-the-state-of-california>.

⁷⁴ California Air Pollution Control Officers Association, California Emissions Estimator Model User's Guide, 2017, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, Accessed April 25, 2019.

⁷⁵ California Energy Commission, California Commercial End-Use Survey, <http://capabilities.itron.com/CeusWeb/ChartsSF/Default2.aspx>. Accessed April 25, 2019.

⁷⁶ Southern California Edison, 2012 Corporate Responsibility and Sustainability Report. Available: https://www1.sce.com/wps/wcm/connect/68145014-2eba-40c2-8587-6482ce056977/CRR_08202013.pdf?MOD=AJPERES&ContentCache=NONE. Accessed April 5, 2019.

as renewable under the RPS.⁷⁷ SCE's progress in meeting its 2020 RPS obligation is reflected in its decreasing average CO₂e intensity factor since 2012. For 2016 and 2017, SCE reports average CO₂e intensity factors for its total electricity mix as 0.259 and 0.232 MTCO₂e/MWh, respectively.⁷⁸ Thus, the analysis of on-site existing operations emissions used SCE's 2017 CO₂e intensity factor for electricity rather than the CalEEMod default, because that was the most recent SCE emission factor available.

For the off-site team offices and practice and athletic training facility, electricity is supplied by Los Angeles Department of Water and Power (LADWP) and natural gas is supplied by Southern California Gas Company. For quantifying energy emissions from the off-site team offices and practice and athletic training facility, a 2017 intensity factor for LADWP-supplied electricity (0.334 MTCO₂e/MWh) was provided through direct correspondence with LADWP.⁷⁹

For estimating electricity emissions for the Proposed Project through the expected life of the project, CO₂e intensity factors were projected for each operational year through 2054, based on RPS compliance, as shown in **Table 3.7-5**. Annual operational emissions account for the anticipated change over time in CO₂e intensity factors for electricity (due to the RPS) and mobile sources (due to state regulations for vehicle efficiency). Consistent with estimates of operational emissions over the life of the Project, estimates of electricity emissions associated with the existing on-site and off-site uses were adjusted through the year 2054, as shown in Table 3.7-9, below, using projected CO₂e intensity factors for each operational year, based on RPS compliance (see Table 3.7-5).

For quantifying emissions from natural gas usage, CalEEMod calculated operational GHGs emissions using CalEEMod's default CO₂e intensity factor for natural gas combustion.

⁷⁷ California Energy Commission, 2017. 2017 Power Content Label. Available: <https://www.energy.ca.gov/pcl/>. Accessed April 5, 2019.

⁷⁸ Southern California Edison, 2018. ESG/Sustainability Template. Report date: September 27, 2018. Available: <https://www.edison.com/content/dam/eix/documents/sustainability/eix-esg-pilot-quantitative-section-sce.pdf>. Accessed April 5, 2019.

⁷⁹ Edgar Mercado, LADWP, Email correspondence with ESA, April 5, 2019.

**TABLE 3.7-5
EMISSION FACTORS OVER TIME**

Year	RPS Mandate	SCE Electricity Emission Factor (MTCO ₂ e/MWh) ^a	LADWP Electricity Emission Factor (MTCO ₂ e/MWh) ^a	Mobile Source Running Exhaust Emissions Factor: Aggregate (g CO ₂ e/mile) ^b
2020	33%	0.229	0.334	392
2021		0.219	0.321	382
2022		0.210	0.307	371
2023		0.200	0.293	359
2024	44%	0.191	0.279	350
2025		0.182	0.266	340
2026		0.173	0.253	331
2027	52%	0.164	0.239	323
2028		0.155	0.226	315
2029		0.146	0.213	308
2030	60%	0.136	0.200	302
2031		0.127	0.186	297
2032		0.118	0.173	292
2033		0.109	0.160	288
2034		0.100	0.146	284
2035		0.091	0.133	281
2036		0.082	0.120	279
2037		0.073	0.106	276
2038		0.064	0.093	274
2039		0.055	0.080	273
2040		0.045	0.067	271
2041		0.036	0.053	270
2042		0.027	0.040	270
2043		0.018	0.027	269
2044		0.009	0.013	268
2045	100%	0.000	0.000	268
2046		0.000	0.000	268
2047		0.000	0.000	268
2048		0.000	0.000	268
2049		0.000	0.000	268
2050		0.000	0.000	268
2051		0.000	0.000	268
2052		0.000	0.000	268
2053		0.000	0.000	268
2054		0.000	0.000	268

NOTES:

^a See Appendix G for derivation of electricity emission factors for RPS milestone years; emission factors for other years are derived using linear interpolation.

^b Based on EMFAC 2017; Aggregate emission factors are provided to illustrate the expected decreasing emissions intensity of vehicles over time. See Appendix G for derivation of mobile source emission factors used in the analysis, which accounted for emission factors specific to vehicle classes and vehicle speeds.

SOURCE: ESA, 2019.

Mobile Sources

Mobile source GHG emissions associated with existing operations were calculated using EMFAC2017 emission factors and the estimated VMT for existing uses as presented in Section 3.14, Transportation and Circulation. Emissions modeling was conducted using the vehicle fleet mix for the South Coast Air Basin as provided in the EMFAC models, and South Coast Air Basin-specific vehicle fleet emission factors for 2018 in units of grams or metric tons per mile.

Consistent with estimates of operational emissions over the life of the Project, estimates of mobile emissions associated with the existing on-site and off-site uses were adjusted through the year 2054, as shown in Table 3.7-9, using EMFAC 2017's projected mobile CO₂e intensity factors for each operational year (see Table 3.7-5).

Solid Waste

Existing operations generate solid waste from day-to-day activities, which generally consists of product packaging, grass clippings, bottles, food scraps, newspapers, plastic, and other items routinely disposed of in trash bins. A portion of the waste is diverted to waste recycling and reclamation facilities. Waste that is not diverted is typically sent to local landfills for disposal, where it results in GHG emissions of CO₂ and CH₄ from the decomposition of the waste that occurs over the span of many years.

Emissions of GHGs associated with solid waste disposal from existing on-site operations were calculated using the CalEEMod model, using waste generation values by land use as provided in Section 3.15, Utilities and Service Systems, and the CalEEMod GHG emission factors for solid waste decomposition. Solid waste generation rates for existing off-site team offices and practice and athletic training facility were also estimated based on generation rates by land use as provided in Section 3.15, and the CalEEMod GHG emission factors for solid waste decomposition. A waste diversion rate of 50 percent was used, consistent with State regulations.

The CalEEMod model allows the input of several variables to quantify solid waste emissions. The GHG emission factors, particularly for CH₄, depend on characteristics of the landfill, such as the presence of a landfill gas capture system and subsequent flaring or energy recovery. In CalEEMod the default values for landfill gas capture (e.g., no capture, no flaring, no energy recovery) are statewide averages and were used in this assessment to provide a conservative analysis.

Water and Wastewater

GHG emissions from water and wastewater are a result of the required energy for supply, distribution, and treatment. Wastewater generation also results in emissions of GHGs from wastewater treatment systems (e.g., septic, aerobic, or lagoons) as well as from solids that are digested either through an anaerobic digester or with co-generation from combustion of digester gas.

GHG emissions from water use associated with existing operations at the Project Site were calculated using CalEEMod and the Water Supply Assessment prepared for the Proposed Project (see Appendix M), the electrical intensity factors for water supply and distribution, and the GHG emission factors for the electricity utility provider. Water usage rates for existing off-site team

offices and practice and athletic training facility were also estimated based on usage rates by land use as described in the Water Supply Assessment prepared for the Proposed Project (see Appendix M). GHG emissions from water use were calculated using CalEEMod's electrical intensity factors for water supply and distribution and the appropriate GHG emission factor for the electricity utility provider.⁸⁰ For more detail on Water Supply impacts of the Proposed Project, see Section 3.15, Utilities and Service Systems, and Appendix M.

Area Sources

Area source emissions associated with existing operations include landscaping equipment. The emissions for landscaping equipment were estimated using CalEEMod, based on the size of the existing land uses, the GHG emission factors for fuel combustion, and the GWP values for the GHGs emitted. CalEEMod uses landscaping equipment GHG emission factors from the CARB OFFROAD model and CARB's *Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment (6/13/2003)*.⁸¹ In the South Coast Air Basin CalEEMod estimates that landscaping equipment operates for 250 days per year.

Stationary Sources

As a conservative approach, it was assumed that the existing operations do not include emergency generators as a source of GHG emissions. Thus, the GHG emissions from generators in the Proposed Project were treated as net new GHG emissions.

Project Construction Emissions

Construction of the Proposed Project would result in GHG emissions of CO₂ and smaller amounts of CH₄ and N₂O from construction equipment and mobile sources such as haul trucks and worker vehicles. Construction emissions were calculated for each year of construction activity using CalEEMod and applying emission factors from EMFAC2017 to calculate mobile source emissions. Construction emissions were forecasted based on an expectation that construction of the Proposed Project would occur in several overlapping phases over approximately 40 months, from July 2021 through October 2024. This is a conservative approach that assumes all construction occurs at the earliest feasible date.

The CalEEMod software provides options for specifying equipment, horsepower ratings, load factors, and operational hours per day. Project-specific information about equipment types and the current anticipated construction schedule, including construction equipment lists for each phase of construction activity, was provided by the project applicant. Equipment operational hours were increased for the majority of the heavy-duty off-road equipment from CalEEMod default values, which are typically 8 hours or less, but ranged from 4 hours to 21 hours per day to

⁸⁰ Water-related energy intensities in CalEEMod are based on the California Energy Commission report, *Refining Estimates of Water-Related Energy Use in California*, PIER Final Project Report, CEC-500-2006-118, 2006. Available: <https://ww2.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>. Accessed April 5, 2019.

⁸¹ California Air Resources Board, OFFROAD Modeling Change Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment, June 13, 2003. Available: https://ww3.arb.ca.gov/msei/2001_residential_lawn_and_garden_changes_in_eqpt_pop_and_act.pdf. Accessed April 5, 2019.

conservatively estimate the Proposed Project's maximum emissions. These values were applied to the same construction equipment and phasing assumptions used in the criteria air pollutant analysis (see Section 3.2, Air Quality, of this EIR) to generate GHG emissions values for each construction year.

The indirect emissions from electricity used by two 2,500 sf temporary construction trailers/offices were estimated using CalEEMod default energy consumption factors and an estimated SCE CO₂e intensity factor for year 2021 (start of construction).

The electricity needed to convey water for dust control was estimated based on each site's acreage, estimated days of water use, US Department of Energy irrigation rates and CalEEMod default electricity intensity factors for water supply, treatment, and distribution.⁸²⁻⁸³ Water conveyance for dust control was assumed to occur prior to building construction at each site. GHG emissions associated with dust control were estimated based on the total electricity use multiplied by the SCE emissions intensity factor for year 2021 (start of construction).

As explained above in "Approach to Analysis," GHG emissions from construction were amortized over the 30-year lifetime of the Proposed Project.

Project Operational Emissions

Operational emissions associated with the Proposed Project would include emissions from energy use (electricity and natural gas), on-road motor vehicles (mobile), electric off-road motor vehicles (e.g., forklifts and aerial lifts), solid waste, water and wastewater, area sources (landscaping), and on-site stationary sources (emergency generators and a cooling tower). Detailed methodology for each emission source is presented below.

The operational life of the Proposed Project was assumed to be 30 years, consistent with the average lifespan of past NBA arenas and SCAQMD guidance.⁸⁴ Accordingly, operational emissions were estimated from the anticipated start of operations at the Proposed Project during the 3rd quarter of 2024 through 2054, using the CalEEMod software and on-road vehicle emissions factors from the EMFAC2017 model. CalEEMod was used to estimate GHG emissions from electricity, natural gas, solid waste, water and wastewater, and landscaping equipment. Emissions estimates for on-road mobile sources were based on VMT data provided in Appendix K.

⁸² Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%. Factor is therefore $(20.94 \text{ GAL/SF/year}) \times (43,560 \text{ SF/acre}) / (365 \text{ days/year}) / (0.85) = 2,940 \text{ gallons/acre/day}$, rounded up to 3,000 gallons/acre/day. U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. "Guidelines for Estimating Unmetered Landscaping Water Use." July 2010. p. 12, Table 4 – Annual Irrigation Factor – Landscaped Areas with High Water Requirements.

⁸³ CAPCOA, CalEEMod User's Guide for CalEEMod Version 2016.3.2, Appendix D, Default Data Tables, Table 9.2. <http://www.aqmd.gov/calceemod/user's-guide>. Accessed July 31, 2019.

⁸⁴ South Coast Air Quality Management District, 2008. Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold. Available: [www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf). Accessed March 11, 2019. October 2008, pp. 3–8.

Energy

The Proposed Project would consume energy (electricity and natural gas) for multiple purposes including, but not limited to, building heating and cooling, lighting, and electronics. For all land uses, building electricity and natural gas usage rates were based on CalEEMod defaults for building types (e.g., arena, office, hotel, retail/restaurant and parking), adjusted to account for the Proposed Project's expected compliance with 2019 Title 24 building energy efficiency standards. The Proposed Project's electricity would be supplied by SCE and natural gas is supplied by Southern California Gas Company.

As shown in Table 3.7-4, annual non-NBA market-shifted events at the new Arena would include 10 large events, 38 medium events, and 41 small events. Because lighting and air handling would be controlled by zone within the proposed Arena, it was estimated that large events (12,000 or more attendees) require full arena energy demand, medium events (between 5,000 and 10,000 attendees) require 80 percent of the full arena energy demand and small events (less than 5,000 attendees) required 25 percent of the full arena energy demand. It was assumed that the 16 plaza events require 0 percent of arena energy demand because the Arena would not be in use.

For electricity usage, CalEEMod calculated GHG emissions based on the estimated electricity usage, the GHG emission factors for the electricity utility provider (SCE), and the GWP values for the GHGs emitted. CalEEMod provides default CO₂e intensity factors for natural gas and for SCE-supplied electricity. However, as described in Section 3.7.3, SB 100 increased California's Renewables Portfolio Standard and requires retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 60 percent of retail sales by December 31, 2030, and that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by December 31, 2045. SB 100 also mandated interim RPS milestones of 44 percent of retail sales by December 31, 2024, and 52 percent by December 31, 2027. To achieve the RPS mandate, utilities such as SCE are expected to steadily increase their renewable resources for energy production. This assumption is appropriate because utilities have steadily increased the percentage of energy obtained from renewable resources in response to existing mandates. Therefore, all electricity consumption from SCE sources would decrease in GHG intensity (i.e., emissions generated per kilowatt-hour) as the RPS milestones are met.

For estimating electricity emissions for the Proposed Project through the expected life of the project, CO₂e intensity factors were projected for each operational year through 2054, based on RPS compliance, as shown in Table 3.7-5.

In addition to electricity used for regular building operations, the electricity used by media vans parked at the proposed Arena was also calculated. Media vans would use a direct line hookup to draw electricity for use to power parked vehicles. The analysis assumed a maximum of 18 media vans (equal to the total number of media van parking spaces) operating four hours per day for each basketball game taking place at the proposed Arena (49 games total per year). Electricity generation was calculated by assuming media vans would require the equivalent of a 50

horsepower generator to operate, converting the horsepower to kilowatts, and then multiplying by the hours per day and days per year to estimate the total kilowatt-hours per year.

The GHG emissions associated with the Proposed Project's operational off-road equipment were calculated using default equipment data for horsepower and load factor. The operational equipment would include aerial lifts and forklifts operating twice a week for five hours per day for deliveries at the Arena Site loading zone. All operational equipment would be electric-powered and associated emissions were calculated by converting the total horsepower-hours to kilowatt-hours and calculating annual emissions using SCE energy intensity factors from 2024 through 2054.

Electric vehicle charging stations would generate emissions related to electricity generation. A total of 330 electric vehicle charging stations would be installed at the South, East, and West Parking Garages. Emissions estimates from the charging stations were calculated by multiplying the number of spaces, days of operation, charge hours per day, and charging station capacity resulting in the total annual electricity. The GHG emissions were then calculated using the total annual electricity and SCE energy intensity factors from 2024 through 2054.

For natural gas usage, CalEEMod was used to calculate operational GHGs emissions using the estimated natural gas demand of the various land uses, the GHG emission factors for natural gas combustion, and the GWP values for the GHGs emitted. Natural gas demand was based on data from the CEUS, which lists energy demand by building type.⁸⁵ However, since the data from the CEUS is from 2002, correction factors were applied to account for compliance with the updated 2019 Title 24 Building Standards Code. CalEEMod's default statewide emission factor for natural gas combustion was used in the analysis.

Mobile Sources

As described in Section 3.14, Transportation and Circulation, the Proposed Project operations would include vehicle trips related to LA Clippers games and other events at the Arena, commute trips by employees of the Arena and all trips associated with the ancillary development land uses (including retail, restaurant, office, training facilities, and sports medicine clinic employee trips and delivery truck trips).

Mobile source emissions were calculated using VMT data, which takes into account mode (vehicle trip types including private attendee vehicles, transportation network company (TNC) vehicles, employee vehicles, shuttles, and miscellaneous vehicles), ridership (occupancy per vehicle), and trip lengths, as provided in Appendix K.

As discussed in Section 3.2, Air Quality, vehicles traveling at lower speeds have higher emission rates. For the Proposed Project arena land use and associated events-related VMT, trips lengths were separated into three trip length segments with different vehicle speeds to account for travel on residential and business district roadways, freeways and the local study area (for additional details

⁸⁵ California Energy Commission, California Commercial End-Use Survey, <http://capabilities.itron.com/CeusWeb/ChartsSF/Default2.aspx>. Accessed April 25, 2019.

regarding trip length segments and speed derivations see Section 3.2 and Appendix D). For the Proposed Project ancillary uses-related VMT, as provided in Appendix K, vehicles emissions were modeled using the average speed for all vehicle travel in the SCAQMD region as determined through EMFAC2017 (for additional information on trip length and speed derivation to select mobile emissions factors, refer to Section 3.2's Regional Operational Emissions Methodology).

Mobile source emissions are the product of the estimated VMT and the emission factors representative of the vehicle fleet as shown in Appendix K. Emission factors for CO₂, CH₄, and N₂O were obtained from EMFAC2017 for SCAQMD.⁸⁶ For vehicle trips associated with the arena land use, the on-road vehicle trips associated with spectators, event-day staff, and employees would be primarily passenger vehicles, so the default SCAQMD fleet mix was adjusted for a passenger fleet mix of light-duty autos, motorcycles, light duty trucks, and medium-duty vehicles to estimate passenger fleet-average emission factors. For on-road trips associated with TNC vehicles, the default SCAQMD fleet mix was adjusted for a TNC vehicle fleet mix of light-duty autos, light duty trucks, and medium-duty vehicles to estimate TNC fleet-average emission factors. For on-road vehicle trips associated with shuttles used to transport attendees and employees, the default SCAQMD fleet mix was adjusted for a shuttle fleet mix of light-heavy duty trucks to estimate shuttle fleet-average emission factors. For on-road vehicle trips associated with miscellaneous vehicles, the default SCAQMD fleet mix was adjusted for a miscellaneous vehicle fleet mix of medium-heavy duty and heavy-heavy duty trucks to estimate miscellaneous vehicle fleet-average emission factors. For ancillary land uses, including the hotel and restaurant/retail land uses, the default SCAQMD fleet mix was used to estimate fleet-average emission factors.

Delivery truck emissions generated by traveling to and from the Project Site, as well as on-site idling, were based on the proposed loading dock capacity at the proposed Arena and emission factors from EMFAC2017. As a conservative assumption, the maximum number of delivery trucks was assumed to be six at one time based on the proposed Arena's loading dock capacity and with half of the delivery trucks using diesel powered Transport Refrigeration Units (TRUs). TRU emission factors were provided from CARB.⁸⁷⁻⁸⁸ Delivery trucks emissions were based on twenty-two truck deliveries per day with half containing TRUs.

Emission factors for mobile source emissions are assumed to decrease in future years due to fleet turnover and regulations such as Advanced Clean Cars Program. Therefore, emission factors were derived from EMFAC2017 for each year after 2024 (first operational year) through 2050. To illustrate this change over time, the annual aggregate emission factor for all vehicle classes through 2054 is shown in Table 3.7-5. EMFAC2017 does not provide emission factors beyond

⁸⁶ CalEEMod incorporates on-road vehicle emission factors from the prior release of the model, EMFAC2014. ESA incorporated updated EMFAC2017 emission factors as it is the best available data.

⁸⁷ California Air Resources Board, 2011. Staff Report: 2011 Amendments for the Airborne Toxic Control Measure for In-USE Diesel Fueled TRUs and TRU Generator Sets, and Facilities where TRUs Operate, August 2011. CARB does not provide emission factors beyond 2050 for TRUs; thus, emissions associated with TRUs were conservatively assumed to remain constant from 2050 through 2054.

⁸⁸ California Air Resources Board, 2012, Final Regulation Order, Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities where TRUs Operate, October 2012.

2050; thus, emissions associated with mobile sources were conservatively assumed to remain constant through 2050 and 2054.

Solid Waste

The Proposed Project would generate solid waste from day-to-day operational activities, which generally consists of product packaging, grass clippings, bottles, food scraps, newspapers, plastic, and other items routinely disposed of in trash bins. A portion of the waste is diverted to waste recycling and reclamation facilities. Waste that is not diverted is typically sent to local landfills for disposal, where it results in GHG emissions of CO₂ and CH₄ from the decomposition of the waste that occurs over the span of many years.

Solid waste generated by the Proposed Project was estimated using waste generation values by land use as provided in Section 3.15, Utilities and Service Systems. Emissions of GHGs associated with solid waste disposal under the Proposed Project were calculated using the CalEEMod software, using the waste generation data, the waste diversion rate, the GHG emission factors for solid waste decomposition, and the GWP values for the GHGs emitted.

CalEEMod allows the input of several variables to quantify solid waste emissions. The GHG emission factors, particularly for CH₄, depend on characteristics of the landfill, such as the presence of a landfill gas capture system and subsequent flaring or energy recovery. CalEEMod's default values for landfill gas capture (e.g., no capture, flaring, energy recovery), based on statewide averages, were used in the assessment. A waste diversion rate of 50 percent was used, consistent with State regulations.

Water and Wastewater

GHG emissions from water use and wastewater associated with the Proposed Project operations were calculated using CalEEMod and the Water Supply Assessment prepared for the Proposed Project, the electrical intensity factors for water supply and distribution, and the GHG emission factors for the electricity utility provider. For more detail on the Water Supply Assessment, see Section 3.15, Utilities and Service Systems, and Appendix M.

Area Sources

The GHG emissions associated with the Proposed Project's area sources were calculated using the CalEEMod model. The emissions for landscaping equipment were based on the Proposed Project's land uses, the GHG emission factors for fuel combustion, and the GWP values for the GHGs emitted. CalEEMod uses landscaping equipment GHG emission factors from CARB's OFFROAD model and CARB's *Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment (6/13/2003)* where commercial landscape equipment emission factors are multiplied by the project's non-residential building square footage and residential landscape equipment emission factors are multiplied by the project's residential square footage.⁸⁹

⁸⁹ California Air Resources Board, 2003. OFFROAD Modeling Change Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment, June 13, 2003. Available: https://ww3.arb.ca.gov/msei/2001_residential_lawn_and_garden_changes_in_eqpt_pop_and_act.pdf. Accessed April 5, 2019.

Stationary Sources

Stationary sources would include two on-site emergency generators and two emergency fire pumps. Emissions associated with periodic maintenance and testing of the emergency generators were estimated separately from the CalEEMod model. The emergency generator emissions were calculated based on compliance with the applicable federal emissions standards and compliance with SCAQMD Rule 1470 (Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines) mandated emission limits and operating hour constraints. Rule 1470 applies to stationary compression ignition engine greater than 50 brake horsepower and sets limits on emissions and operating hours. In general, new stationary emergency standby diesel-fueled engines greater than 50 brake horsepower are not permitted to operate more than 50 hours per year for maintenance and testing.

Stationary sources would also include an on-site cooling tower to assist in dissipating heat from commercial processes, such as heating, ventilation and air conditioning (HVAC) systems, of the Proposed Project. The cooling tower would utilize a flow rate of 4,800,000 gallons per year (refer to the Water Supply Assessment prepared for the Proposed Project and Appendix M). The cooling tower would require energy to supply, distribute, and treat the water. The emissions associated with this energy use were estimated based on the default energy demand factors in the CalEEMod software.

Emissions from Relocated LA Clippers Games and Market-Shift Events

Mobile Sources

Mobile source GHG emissions associated with relocated LA Clippers games and market-shifted events from the region were calculated using EMFAC2017 emission factors and the VMT data presented in Appendix K, using the same mix of vehicles that were used for the air quality analysis in Section 3.2, Air Quality.⁹⁰

As with operational emissions, emission factors for mobile source emissions associated with relocated LA Clippers games and market-shifted events were assumed to decrease in future years due to fleet turnover and regulations such as Advanced Clean Cars Program. Therefore, emission estimates for future years were based on factors derived from EMFAC2017 for each year after 2024 (first operational year) through 2050. EMFAC2017 does not provide emission factors beyond 2050; thus, emissions associated with mobile sources were assumed to remain constant through 2050 and 2054.

Energy

For relocated LA Clippers games and market-shifted events (see Table 3.7-4), electricity and natural gas use were based on CalEEMod defaults for land use type and facility square footage, which are based on the 2016 Title 24 energy efficiency standards. The 2016 standards are assumed to be

⁹⁰ For backfilled events at Staples Center, the third length segment was assumed to be the average distance each vehicle would travel from the two nearest freeways to the nearest parking structure associated with the Staples Center. Accordingly, the third length segment at Staples Center is 0.3 miles, rather than the 1.3 miles used for the third length segment at the Proposed Project site.

appropriate for the Staples Center operations for the 47 relocated LA Clippers games because of the \$20 Million energy upgrade project that was completed for the arena in 2016. To match assumptions in Appendix K, the Staples Center also served as a proxy for a regional event venue, which serves as the arena use modeled for the non-NBA shifted events. As shown in Table 3.7-4, non-NBA shifted events include 10 large events, 38 medium-size events, and 41 small events. It was assumed that the relocated LA Clippers games and other large (12,000 or more attendees) market-shifted events, would require full arena energy demand; medium events (between 5,000 and 10,000 attendees) would require 80 percent of the arena energy demand; and small events (less than 5,000 attendees) would require 25 percent arena energy demand.

CalEEMod calculated GHG emissions based on the estimated electricity usage, the GHG emission factors for the electricity utility provider (LADWP), and the GWP values for the GHGs emitted. As with existing off-site emissions, estimates for future electricity emissions were based on the forecasted emission factor for LADWP-supplied electricity.

Solid Waste

Solid waste generated by the relocated LA Clippers games from the Staples Center and the market-shifted events shifted at the regional event venue was estimated using waste generation factors from the analysis done for the Sacramento Entertainment and Sports Center EIR, 2014 (see Section 3.15, Utilities and Service Systems, for more information). A diversion rate of 50 percent was assumed for the relocated LA Clippers games and market-shifted events, consistent with state regulations. Emissions were calculated using CalEEMod default factors for solid waste decomposition, and the GWP values for the GHGs emitted. Similar to energy use, it was assumed that large events (12,000 or more attendees) would generate 100 percent of the solid waste generated by a full arena; medium events (between 5,000 and 10,000 attendees) would generate 80 percent of the waste generated by a full arena; small events (less than 5,000 attendees) would generate 25 percent of the solid waste generated by a full arena.

Water and Wastewater

Water usage rates for relocated LA Clippers games and market-shifted events were estimated based on event employee and visitor water usage rates from the Water Supply Assessment prepared for the Proposed Project (see Appendix M). GHG emissions from water use were calculated using CalEEMod's electrical intensity factors for water supply and distribution, and the GHG emission factors for the electricity utility provider. For more detail on the Water Supply Assessment, see Section 3.15, Utilities and Service Systems and Appendix M.

Area Sources

The GHG emissions associated with area sources for relocated LA Clippers games and market-shifted events were calculated using CalEEMod defaults for the arena land use type and facility square footage.

Stationary Sources

It is assumed that emissions from emergency generators are not associated with the relocated Clippers games and market-shifted events because they are accounted for in the Proposed Project's emissions and would occur regardless of how many events are relocated or market-shifted to the proposed Arena.

Emissions from Backfilled Uses and Events

For the uses that will backfill the current off-site LA Clippers' off-site team offices and practice and athletic training facility, emissions estimates were based on the same methodology used to estimate existing emissions at those locations, where the electricity emission factor was also adjusted for the operational year (i.e., 2024 through 2054).

For the backfilled events at Staples Center, emissions were calculated based on the same methodology used to estimate emissions from relocated LA Clippers games, using an event size of 10,500 attendees (conservatively considered as a large event), based on the 2019 market analysis by Conventions, Sports and Leisure (CSL) that averaged attendance at Staples Center third-party events over a 3-year period report.⁹¹ As shown in Table 3.7-4, the analysis assumed 47 backfilled Staples Center events under the Full Backfill Scenario and 7 backfilled Staples Center events under the Partial Backfill Scenario. In addition, the mobile source and electricity emission factors were adjusted for the operational year (i.e., 2024 through 2054).

As shown in Table 3.7-4, the analysis assumed 89 backfilled market-shifted events under the Full Backfill Scenario and no backfilled non-NBA market-shifted events under the Partial Backfill Scenario. Under the Full Backfill Scenario, for backfilled events at other regional venues vacated by market-shifted events, emissions were calculated based on the same methodology used to estimate emissions from the existing market-shifted events.

LEED Gold Certification Requirements

The Proposed Project would be designed and constructed to meet the US Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification requirements under the Building Design + Construction (BD+C) category. LEED provides a level of flexibility for projects to choose the exact credits and project features that reduce energy and water use, promote resource conservation through redevelopment and the sourcing of local construction materials, and create healthier indoor environments. LEED certification for the Arena Structure would be sought under LEED BD+C New Construction and Major Renovation, and certification for the other buildings surrounding the proposed plaza would be sought under LEED BD+C Core + Shell. The hotel would be LEED Gold certified under LEED BD+C Hospitality. Measures would be incorporated into the final design of each component to achieve sufficient points for LEED Gold certification. Based on prior experience with sports facilities and other major venues, the design team for the Proposed Project has identified a menu of project features that are within control of the project applicant and that could be feasibly implemented to

⁹¹ Conventions, Sports and Leisure (CSL), 2019. *Staples Center Vacated Event Days Analysis*. May 14, 2019.

achieve the necessary points to achieve a LEED Gold certification, consistent with the requirements of AB 987. Based on the project applicant's AB 987 application, the Proposed Project's design features related to LEED certification could include the following:⁹²

Location and Transportation. The Proposed Project would be eligible for credits in the location and transportation category in the following areas: (1) the Project Site would have access to high quality transit, (2) the Proposed Project would include bicycle and electric vehicle charging facilities, and (3) the Proposed Project would minimize its parking footprint.

The Proposed Project would be eligible to achieve the Access to Quality Transit credit because local transit service to the Project Site would be provided by the Los Angeles Metropolitan Transportation Authority (Metro) in the form of future below- and at-grade light rail on the Metro Crenshaw/LAX Line, which is currently under construction and expected to be complete in 2019. The Proposed Project would provide shuttle pick-up and drop-off service at the following two Metro rail stations: the existing Metro Green Line – Hawthorne/Lennox Station and the future Metro Crenshaw/LAX Line – Downtown Inglewood Station. In addition, the Project Site is adjacent to two LA Metro bus routes (lines 117 and 212/312 stop at the intersection of West Century Boulevard and South Prairie Avenue) and is also within 0.5 miles of a third Metro bus route (the combined 740/40 line stops at the intersection of West Century Boulevard and La Brea/Hawthorne Boulevard).

The Proposed Project would also provide electric vehicle charging stations for 8 percent of parking spaces, which would exceed the requirements for the Proposed Project to be eligible for the Green Vehicles credit.

Sustainable Sites. The Proposed Project would be eligible for credits for rainwater management, open space, heat island reduction, and light pollution reduction. Credits for open space are based on the percentage of permeable surfaces, including roof-top gardens.

Water Efficiency. The Proposed Project would be eligible for credits for the use of ultra-low flow fixtures in restrooms such as low flow faucets with aerators, dual flush toilets, and waterless urinals. These features would reduce indoor water use by a minimum of 40 percent and would be required to meet Universal Plumbing Code standards. The Proposed Project would also be eligible for credits for using 100 percent recycled water to service project landscaping designed for low water usage.

Energy and Atmosphere. The Proposed Project would be eligible for credits for optimized energy performance and renewable energy production. The Proposed Project would include a 700-kilowatt (kW) photovoltaic (PV) system, generating approximately 1,085,000 kilowatt-hours (kW-hrs) of carbon-free energy annually. The Proposed Project would also implement the following energy efficiency measures: Title 24 compliance; use of 100 percent LED lighting

⁹² Murphy's Bowl LLC, 2018. *AB 987 Application for the Inglewood Basketball and Event Center, Attachment G: Greenhouse Gas Analysis*. November 2018.

indoors and outdoors throughout the site; and implementation of high efficiency HVAC systems. In addition, the Proposed Project's design would include compliance with CALGreen Code Voluntary Tier 1, which is estimated to achieve a reduction in energy consumption greater than Title 24 2019 standards based on the preliminary design of the Proposed Project.

Materials and Resources. The Proposed Project would be eligible for credits for Construction and Demolition Waste Management and sourcing of raw materials. To achieve this credit, the Proposed Project would recycle at least 75 percent of demolition materials, which would exceed the City's target of 50 percent demolition waste recycling and is in accordance with State diversion targets that aim to divert a minimum of 75 percent of construction and demolition materials from landfill disposal.

Indoor Environmental Quality. The Proposed Project would be eligible for credits for enhanced indoor and outdoor air quality, and would meet American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 62.1:2010 indoor air quality requirements and ASHRAE 55 thermal comfort requirements.

Innovation. The Proposed Project would be eligible for innovation credits. Innovative strategies include the following: implementation of the FanFirst/Occupant Comfort Survey,⁹³ green education program, LEED Operations + Management (O+M) Starter Kit (Pest Management and Green Cleaning Program), and the purchasing of 100 percent LED lamps.

Impacts and Mitigation Measures

Impact 3.7-1: Construction and operation of the Proposed Project could generate "net new" GHG emissions, either directly or indirectly, that could have a significant impact on the environment. (Less Than Significant with Mitigation)

As noted above the Proposed Project's baseline emissions are the annual operational GHG emissions produced by existing conditions and activities against which the Proposed Project's GHG emissions are compared, which include existing on-site structures that would be removed and replaced with construction of the Proposed Project, the existing LA Clippers team offices and practice and athletic training facility uses, as well as the operational emissions associated with relocated LA Clippers games and non-NBA events that would be market-shifted from existing venues in the region.

Existing Emissions

Table 3.7-6 presents total annual GHG emissions by source representing the existing conditions (2018).

⁹³ FanFirst Connected Comfort utilizes real time crowdsourced feedback during an event to adjust temperature in the arena bowl to increase fan comfort and reduce over cooling/wasted energy.

**TABLE 3.7-6
EXISTING CONDITIONS (2018) – TOTAL ANNUAL GHG EMISSIONS BY SOURCE AND CATEGORY (MTCO₂E)**

Category	Existing On-Site ^a	Existing Off-Site ^b	Total Existing
Mobile	835	962	1,797
Electricity	127	293	420
Natural Gas	85	59	144
Water and Wastewater	9	3	12
Solid Waste	62	17	79
Area Sources (Landscaping)	<1	<1	<1
Total^c	1,119	1,333	2,452

NOTES:

^a Emissions from existing on-site operations that would be removed.^b Emissions from existing off-site operations associated with the LA Clippers' team business operations and the LA Clippers' practice and athletic training facility.^c Due to rounding, emissions from individual sectors may not add up to exact total.

SOURCE: ESA, 2019. See Appendix G.

Construction Emissions

Table 3.7-7 presents the total annual GHG emissions from construction of the Proposed Project by calendar year over the duration of the construction schedule.

**TABLE 3.7-7
ANNUAL CONSTRUCTION GHG EMISSIONS**

Year	CO ₂ e Emissions (MT/year)
2021 – Off-Road Equipment	1,128
2022 – Off-Road Equipment	1,968
2023 – Off-Road Equipment	889
2024 – Off-Road Equipment	488
Construction Mobile – On-Road ^a	12,794
Off-Road Electric Equipment ^b	711
Construction Office ^b	14
Construction Electricity (Water) ^b	34
Off-Road CNG Equipment ^b	52
Total^c	18,078
<i>Amortized over 30 years^d</i>	603

NOTES:

^a Represents the total GHG emissions from on-road mobile sources over the entire construction duration. This category includes workers, vendor and haul trucks.^b Represents the total GHG emissions over the entire construction duration.^c Due to rounding, emissions from individual years may not add up to total.^d Construction emissions amortized over a period of 30 years per SCAQMD guidance.

SOURCE: ESA, 2019. See Appendix G.

Operational Emissions

Operational emissions associated with the Proposed Project would include emissions from energy use (electricity and natural gas), on-road motor vehicles (mobile), off-road motor vehicles, solid waste, water and wastewater, area sources (landscaping), and on-site stationary sources (emergency generators). Emissions reductions would result from the IBEC Transportation Demand Management (TDM) Plan and the physical design features incorporated in the Project that stem from LEED Gold certification and Title 24 compliance. As discussed above under Methodology, the operational emissions associated with the Proposed Project were calculated using methods consistent with the CalEEMod model.

Section 3.14, Transportation and Circulation, presents estimates that the Proposed Project would result in approximately 48,899,432 net new total annual VMT under the Full Backfill Scenario and approximately 31,781,542 net new total annual VMT for the Partial Backfill Scenario after accounting for use of alternative modes of transportation, internal trip capture, and transportation demand management features of the Proposed Project.

Table 3.7-8 presents total annual GHG emissions by source for the first full year of operations (2025). Pursuant to SCAQMD guidance, construction emissions were amortized over a period of 30 years and then added to annual operational emissions. As indicated in Table 3.7-8, the Proposed Project's first full year of operational GHG emissions at full buildout, including amortized construction emissions, would be approximately 23,729 MTCO₂e per year.

TABLE 3.7-8
ANNUAL OPERATIONAL GHG EMISSIONS AT FIRST FULL YEAR OF OPERATIONS (2025)

Category	CO ₂ e Emissions (MT/year)
Mobile	18,233
Electricity	2,811
Natural Gas	1,270
Water and Wastewater	55
Solid Waste	432
Area Sources (Landscaping)	<1
Emergency Generators	71
Cooling Tower	11
EV Charging Stations	113
Media Van Generators	24
Electric Off-Road Equipment	8
Delivery Trucks (TRU Exhaust and Idling)	13
Construction Emissions ^a	603
Total^b	23,643

NOTES:
^a Construction emissions amortized over a period of 30 years per SCAQMD guidance.
^b Due to rounding, emissions from individual sectors may not exactly add up to total.

SOURCE: ESA, Appendix G.

Net New Emissions

Full Backfill Scenario

Table 3.7-9a presents annual net new annual GHG emissions by source over the 30-year lifetime of the Proposed Project (2024 through 2054) under the Full Backfill Scenario. The baseline for determining net new emissions includes existing emissions (as summarized in Table 3.7-6), as well as events that would be relocated or market-shifted to the Project Arena. As summarized in Table 3.7-4, under the Full Backfill Scenario all of the 47 LA Clippers games that currently occur at Staples Center and all of the 89 annual non-NBA market-shifted events that currently occur at other existing venues in the region would be backfilled. Thus, the GHG emissions from the backfilled Staples Center events and backfilled market shifted events are considered attributable to the Proposed Project under the Full Backfill Scenario. As indicated in Table 3.7-9a, the Proposed Project’s net new GHG emissions for the first full year of operation in 2025 would be approximately 20,991 MTCO_{2e} under the Full Backfill Scenario. By the year 2054, annual net new emissions would be reduced to approximately 14,354 MTCO_{2e}, due to anticipated improvements in vehicle fuel efficiency and lower GHG intensity of the electricity supply.

TABLE 3.7-9a
FULL BACKFILL SCENARIO: PROPOSED PROJECT TOTAL NET NEW GHG EMISSIONS (MT CO_{2e}/YEAR)

Year	Operational ^a	Existing On-Site ^b	Existing Off-Site ^b	Relocated LA Clippers Games ^c	Market Shifted Regional Event Venue ^d	Backfilled Off-Site ^e	Backfilled Staples Center (LA Clippers) Event ^f	Backfilled Market Shifted Regional Event Venues ^g	“Net New” ^h
2024 ⁱ	12,209	(485)	(565)	(2,397)	(1,767)	565	1,512	1,767	10,839
2025	23,643	(943)	(1,094)	(4,632)	(3,414)	1,094	2,923	3,414	20,991
2026	22,947	(920)	(1,062)	(4,487)	(3,307)	1,062	2,833	3,307	20,373
2027	22,307	(898)	(1,032)	(4,356)	(3,210)	1,032	2,750	3,210	19,803
2028	21,719	(877)	(1,003)	(4,238)	(3,121)	1,003	2,674	3,121	19,279
2029	21,179	(858)	(976)	(4,130)	(3,040)	976	2,605	3,040	18,795
2030	20,681	(841)	(950)	(4,033)	(2,966)	950	2,541	2,966	18,349
2031	20,224	(825)	(927)	(3,944)	(2,898)	927	2,482	2,898	17,938
2032	19,802	(810)	(904)	(3,864)	(2,836)	904	2,428	2,836	17,556
2033	19,412	(796)	(883)	(3,791)	(2,779)	883	2,379	2,779	17,204
2034	19,052	(783)	(864)	(3,725)	(2,727)	864	2,333	2,727	16,876
2035	18,719	(772)	(845)	(3,665)	(2,678)	845	2,290	2,678	16,572
2036	18,413	(761)	(827)	(3,611)	(2,634)	827	2,251	2,634	16,292
2037	18,129	(751)	(811)	(3,562)	(2,593)	811	2,215	2,593	16,031
2038	17,865	(742)	(795)	(3,518)	(2,556)	795	2,182	2,556	15,788
2039	17,619	(733)	(780)	(3,477)	(2,521)	780	2,151	2,521	15,560
2040	17,389	(725)	(766)	(3,440)	(2,488)	766	2,122	2,488	15,345
2041	17,173	(718)	(752)	(3,406)	(2,458)	752	2,094	2,458	15,143
2042	16,969	(711)	(739)	(3,375)	(2,430)	739	2,069	2,430	14,951
2043	16,775	(704)	(726)	(3,346)	(2,403)	726	2,044	2,403	14,768

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TABLE 3.7-9a
FULL BACKFILL SCENARIO: PROPOSED PROJECT TOTAL NET NEW GHG EMISSIONS (MT CO₂e/YEAR)

Year	Operational ^a	Existing On-Site ^b	Existing Off-Site ^b	Relocated LA Clippers Games ^c	Market Shifted Regional Event Venue ^d	Backfilled Off-Site ^e	Backfilled Staples Center (LA Clippers) Event ^f	Backfilled Market Shifted Regional Event Venues ^g	"Net New" ^h
2044	16,588	(698)	(714)	(3,319)	(2,377)	714	2,020	2,377	14,592
2045	16,408	(692)	(701)	(3,293)	(2,352)	701	1,998	2,352	14,421
2046	16,384	(692)	(701)	(3,286)	(2,347)	701	1,994	2,347	14,400
2047	16,364	(691)	(701)	(3,280)	(2,344)	701	1,991	2,344	14,383
2048	16,348	(691)	(700)	(3,276)	(2,340)	700	1,988	2,340	14,369
2049	16,336	(691)	(700)	(3,272)	(2,338)	700	1,985	2,338	14,358
2050	16,331	(692)	(701)	(3,269)	(2,336)	701	1,984	2,336	14,354
2051	16,331	(692)	(701)	(3,269)	(2,336)	701	1,984	2,338	14,354
2052	16,331	(692)	(701)	(3,269)	(2,336)	701	1,984	2,336	14,354
2053	16,331	(692)	(701)	(3,269)	(2,336)	701	1,984	2,338	14,354
2054	16,331	(692)	(701)	(3,269)	(2,336)	701	1,984	2,336	14,354
Total over 30-year life of Proposed Project	562,310	(23,269)	(25,023)	(111,068)	(80,603)	25,023	68,772	80,603	496,745

NOTES:

- ^a Includes construction emissions amortized over 30 years. For details, see Appendix G. Annual operational emissions account for the anticipated change over time in CO₂e intensity factors for electricity (due to the RPS) and mobile sources (due to state regulations for vehicle efficiency).
- ^b Existing emissions from Table 3.7-6. Includes emissions from existing on-site structures that would be removed and replaced with construction of the Proposed Project, as well as the existing off-site uses such as the LA Clippers' team business operations, and the existing LA Clippers' practice and athletic training facility. Annual existing emissions account for the anticipated change over time in CO₂e intensity factors for electricity (due to the RPS) and mobile sources (due to state regulations for vehicle efficiency).
- ^c Includes operational emissions from the relocated LA Clippers games at the Staples Center, See Appendix G.
- ^d Includes 89 non-NBA market shifted events transferred to the Proposed Project from elsewhere in the region.
- ^e Includes the backfilled LA Clippers' team business offices and the backfilled LA Clippers' practice and athletic training facility.
- ^f Includes the backfilling of Staples Center vacated LA Clippers game dates with 47 non-NBA events.
- ^g Includes 89 non-NBA market shifted events backfilled elsewhere in the region.
- ^h Net new emissions subtracts existing emissions, relocated LA Clippers game and market-shifted event emissions from operational emissions, and adds emissions from back-filled events.
- ⁱ Represents emissions from 6 months of operation.

SOURCE: ESA, 2019.

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

TABLE 3.7-9b
PARTIAL BACKFILL SCENARIO: PROPOSED PROJECT TOTAL NET NEW GHG EMISSIONS (MT CO_{2e}/YEAR)

Year	Operational ^a	Existing On-Site ^b	Existing Off-Site ^b	Relocated LA Clippers Games ^c	Market Shifted Regional Event Venue ^d	Backfilled Off-Site ^e	Backfilled Staples Center (LA Clippers) Event ^f	"Net New" ^g
2024 ^h	12,209	(485)	(565)	(2,397)	(1,767)	565	226	7,786
2025	23,643	(943)	(1,094)	(4,632)	(3,414)	1,094	436	15,090
2026	22,947	(920)	(1,062)	(4,487)	(3,307)	1,062	423	14,655
2027	22,307	(898)	(1,032)	(4,356)	(3,210)	1,032	410	14,254
2028	21,719	(877)	(1,003)	(4,238)	(3,121)	1,003	399	13,882
2029	21,179	(858)	(976)	(4,130)	(3,040)	976	389	13,539
2030	20,681	(841)	(950)	(4,033)	(2,966)	950	379	13,221
2031	20,224	(825)	(927)	(3,944)	(2,898)	927	370	12,928
2032	19,802	(810)	(904)	(3,864)	(2,836)	904	362	12,654
2033	19,412	(796)	(883)	(3,791)	(2,779)	883	355	12,401
2034	19,052	(783)	(864)	(3,725)	(2,727)	864	348	12,165
2035	18,719	(772)	(845)	(3,665)	(2,678)	845	342	11,946
2036	18,413	(761)	(827)	(3,611)	(2,634)	827	336	11,742
2037	18,129	(751)	(811)	(3,562)	(2,593)	811	331	11,553
2038	17,865	(742)	(795)	(3,518)	(2,556)	795	326	11,376
2039	17,619	(733)	(780)	(3,477)	(2,521)	780	321	11,209
2040	17,389	(725)	(766)	(3,440)	(2,488)	766	317	11,052
2041	17,173	(718)	(752)	(3,406)	(2,458)	752	313	10,903
2042	16,969	(711)	(739)	(3,375)	(2,430)	739	309	10,762
2043	16,775	(704)	(726)	(3,346)	(2,403)	726	305	10,627
2044	16,588	(698)	(714)	(3,319)	(2,377)	714	302	10,496
2045	16,408	(692)	(701)	(3,293)	(2,352)	701	298	10,370
2046	16,384	(692)	(701)	(3,286)	(2,347)	701	298	10,357
2047	16,364	(691)	(701)	(3,280)	(2,344)	701	297	10,346
2048	16,348	(691)	(700)	(3,276)	(2,340)	700	297	10,338
2049	16,336	(691)	(700)	(3,272)	(2,338)	700	296	10,332
2050	16,331	(692)	(701)	(3,269)	(2,336)	701	296	10,331
2051	16,331	(692)	(701)	(3,269)	(2,336)	701	296	10,331
2052	16,331	(692)	(701)	(3,269)	(2,336)	701	296	10,331
2053	16,331	(692)	(701)	(3,269)	(2,336)	701	296	10,331
2054	16,331	(692)	(701)	(3,269)	(2,336)	701	296	10,331
Total over 30-year life of Proposed Project	562,310	(23,269)	(25,023)	(111,068)	(80,603)	25,023	10,265	357,635

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TABLE 3.7-9b
PARTIAL BACKFILL SCENARIO: PROPOSED PROJECT TOTAL NET NEW GHG EMISSIONS (MT CO₂e/YEAR)

Year	Operational ^a	Existing On-Site ^b	Existing Off-Site ^b	Relocated LA Clippers Games ^c	Market Shifted Regional Event Venue ^d	Backfilled Off-Site ^e	Backfilled Staples Center (LA Clippers) Event ^f	"Net New" ^g
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NOTES:

- a Includes construction emissions amortized over 30 years. For details, see Appendix G. Annual operational emissions account for the anticipated change over time in CO₂e intensity factors for electricity (due to the RPS) and mobile sources (due to state regulations for vehicle efficiency).
- b Existing emissions from Table 3.7-6. Includes emissions from existing on-site structures that would be removed and replaced with construction of the Proposed Project, as well as the existing off-site uses such as the LA Clippers' team business operations, and the existing LA Clippers' practice and athletic training facility. Annual existing emissions account for the anticipated change over time in CO₂e intensity factors for electricity (due to the RPS) and mobile sources (due to state regulations for vehicle efficiency).
- c Includes operational emissions from the relocated LA Clippers games at the Staples Center, See Appendix G.
- d Includes 89 non-NBA market shifted events transferred to the Proposed Project from elsewhere in the region.
- e Includes the backfilled LA Clippers' team business offices and the backfilled LA Clippers' practice and athletic training facility.
- f Includes the backfilling of Staples Center vacated LA Clippers game dates with 7 non-NBA events.
- g Net new emissions subtracts existing emissions, relocated LA Clippers Games and market-shift emissions from operational emissions, and adds emissions from back-filled events due to vacated LA Clippers game dates.
- h Represents emissions from 6 months of operation.

SOURCE: ESA, 2019.

Partial Backfill Scenario

Table 3.7-9b presents annual net new annual GHG emissions by source over the 30-year lifetime of the Proposed Project (2024 through 2054) under the Partial Backfill Scenario. The baseline for determining net new emissions includes existing emissions (as summarized in Table 3.7-6), as well as events that would be relocated or market-shifted to the Project Arena. As summarized in Table 3.7-4, under the Partial Backfill Scenario, 7 of the 47 annual LA Clippers games at Staples Center would be backfilled, and none of the 89 non-NBA market-shifted events would be backfilled. The GHG emissions from the 7 backfilled Staples Center events are considered to be attributable to the Proposed Project. As indicated in Table 3.7-9b, the Proposed Project's net new GHG emissions for the first full year of operation in 2025 would be approximately 15,090 MTCO₂e under the Partial Backfill Scenario. By the year 2054, annual net new emissions would be reduced to approximately 10,331 MTCO₂e, due to anticipated improvements in vehicle fuel efficiency and lower GHG intensity of the electricity supply.

Based on the analyses presented above, over the 30-year operational life of the Proposed Project, a net increase of 496,745 MTCO₂e of GHG would occur under the Full Backfill Scenario, and a net increase of 357,635 MTCO₂e of GHG would occur under the Partial Backfill Scenario. Between now and the year 2054, there is considerable uncertainty about changes in the regulatory or technological environment that could affect the actual total GHG emissions of the Proposed Project. Nevertheless, based on the analysis presented above, this impact is considered **significant**.

The following mitigation measures have been designed to achieve no net increase in GHG emissions and thereby reduce the impact to a less-than-significant level. AB 987 imposes additional requirements that will be addressed through project conditions of approval.

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Mitigation Measure 3.7-1(a)

- 1) **Project GHG Emissions.** *Estimate the Project's net new GHG emissions over the 30-year operational life of the Project. The estimate shall be based on final design, project-specific traffic generation, actual energy use estimates, equipment to be used on site, and other emission factors appropriate for the Project, using the best available emissions factors for electricity, transportation engines, and other GHG emission sources commonly used at the time the GHG Reduction Plan is completed, reflecting existing vehicle emission standards and building energy standards. Net operational (incremental) emissions shall be derived by adding the annual operational emissions and backfill emissions and then subtracting from that total existing emissions and emissions from relocated LA Clippers games and market shifted non-NBA events, as illustrated in Table 3.7-9a and Table 3.7-9b. The estimate shall include the Project's construction GHG emissions, which shall be amortized over the 30-year operational life of the Project, shown in Table 3.7-7 to be 603 metric tons of carbon dioxide equivalent (MTCO_{2e})/year.*
- 2) **GHG Mitigation.** *Include reduction measures that are sufficient to reduce or offset incremental emissions over the net neutral threshold, are verifiable, and are feasible to implement over project life. At a minimum, the GHG Reduction Plan shall include:
(i) implementation of all measures set forth under Section A. below; and
(ii) emissions reductions associated with implementation of Project Design Features 3.2-1 and 3.2-2 and Mitigation Measures 3.2-2(b) and 3.14-2(b) regarding the reduction of NO_x and PM_{2.5} emissions, to the extent these features and measures have co-benefits in the form of quantifiable GHG emissions reductions. The project applicant shall be required to implement a combination of measures identified in Section B below, or co-benefits of NO_x and PM_{2.5} emissions reduction measures required under AB 987, to achieve any remaining GHG emission reductions beyond those identified in (i) and (ii) above necessary to meet the no net new GHG emissions threshold over the 30-year operational life of the Project.*

A. Required GHG Reduction Measures.

- a. *Minimize energy demand, including electricity and natural gas demand, through implementation of LEED Gold certification design features.*
- b. *Implement a transportation demand management (TDM) program that includes the following, subject to further refinement and revision through coordination between the City and the project applicant at the time of project approval:*
 - i. *TDM 1 – Encourage Alternative Modes of Transportation (Rail, Public Bus, and Vanpool).*

The IBEC Project shall encourage alternative modes of transportation use by providing monetary incentives and bus stop improvements near the Project Site such as, but not limited to:

- *Integrated event and transit ticketing to enable seamless connections and provide event-day travel updates.*

- *Discounted event tickets with the purchase of a transit pass or providing proof of a registered TAP card (the regional fare payment method).*
 - *Giveaways for transit users (goods for attendees, free tickets for employees, etc.).*
 - *Rewards/gamification opportunities for fans to compete for prizes or points based on their transportation choices.*
 - *Bus stop facilities improvements: the IBEC Project shall provide on-site and/or off-site improvements such as lighting, new benches and overhead canopies, added bench capacity if needed, and real-time arrival information for an improved user experience for bus stops that are relocated as a result of the IBEC Project.*
 - *Transit and/or Multi-Modal Subsidy: the IBEC Project shall provide pre-tax commuter benefits for employees.*
 - *Vanpool Subsidy: This shall provide pre-tax commuter benefits for employees.*
 - *Marketing and outreach campaign to event attendees and employees for transit usage.*
- ii. *TDM 2 – Event-day Dedicated Shuttle Services*

The following shall be provided to ensure sufficient connectivity to existing and planned Metro Rail Stations:

- *The IBEC Project shall provide dedicated shuttle service from the Green Line at Hawthorne Station, Crenshaw/LAX Line at AMC/96th Street Station, and Crenshaw/LAX Line at La Brea/Florence (Downtown Inglewood) Stations for Arena events. This shuttle service shall be a dedicated event-day shuttle service from the venue for employees and attendees.*
- *The IBEC Project shall provide no less than 27 shuttles with a capacity of no less than 45 persons per shuttle to accommodate employees and attendees traveling to and from the Project Site. Due to the arrival and departure of employees prior to and after the attendees, respectively, the same shuttles shall be utilized for the employees. Shuttle service shall begin no less than two hours before the event and extend to at least 30 minutes after the start of the event. After the event, shuttle service shall begin no less than 30 minutes before the end of the event and shall continue for at least one hour after the end of the event.*
- *The IBEC Project shall implement Mitigation Measure 3.14-2(b), requiring the IBEC operator to provide enough shuttles to ensure that there is successful and convenient connectivity with short wait times to these light rail stations. To this end, the IBEC operator will monitor the number of people using shuttles to travel between the*

above light rail stations and the IBEC. If the monitoring shows that peak wait times before or after major events exceeds 15 minutes, then the IBEC operator must add enough additional shuttle runs to reduce wait times to meet this target. The aim is to require increased shuttle runs as necessary to make sure that demand is accommodated within a reasonable amount of time and to encourage use of transit.

- *The IBEC Project shall provide a convenient and safe location on site for shuttle pick-up and drop-off on the east side of South Prairie Avenue, approximately 250 feet south of West Century Boulevard. The drop-off location shall be adjacent to the Arena so that shuttle users would not need to cross South Prairie Avenue to arrive at the Arena. The IBEC Project shall implement Mitigation Measure 3.14-3(f), which requires constructing a dedicated northbound right-turn lane that would extend from the bus pull-out on the east side of South Prairie Avenue to West Century Boulevard.*

iii. *TDM 3 – Encourage Carpools and Zero-Emission Vehicles*

The IBEC Project shall provide incentives to encourage carpooling and zero-emission vehicles as a means for sharing access to and from the Project Site. The incentives shall include:

- *Incentives for carpools or zero-emission vehicles, including preferential parking with the number of parking spots in excess of applicable requirements, reduced parking costs, discounted rides (or other, similar benefits) to incentivize sharing/pooling for attendees using transportation network company (TNC) rides to or from an event, or other discounts/benefits.*
- *Variable parking price based on car occupancy, structured to encourage carpooling.*
- *8 percent of parking spaces with electrical vehicle charging stations in excess of the minimum requirement of 6 percent (i.e., a minimum of three hundred and thirty (330) electric vehicle charging stations (EVCS) shall be installed within the three proposed on-site parking garages serving the Project for use by employees, visitors, event attendees, and the public).*

iv. *TDM 4 – Encourage Active Transportation*

The IBEC Project shall include features that would enhance the access for bicyclists and pedestrians, including the following:

- *Bicycle parking in excess of applicable code requirements as follows: 60 employee bike parking spaces and 23 attendee bike parking spaces.*
- *Showers and lockers for employees.*

- *A bike valet service if needed to accommodate bike parking space needs.*
- *A bicycle repair station where bicycle maintenance tools and supplies are readily available on a permanent basis and offered in good condition.*
- *Coordination of bike pools and walk pools.*
- *Sidewalks or other designated pathways following safe routes from the pedestrian circulation to the bicycle parking facilities and throughout the development.*

v. *TDM 5 – Employee Vanpool Program*

The IBEC Project shall provide an employee vanpool program to accommodate up to 66 employees utilizing the vanpool service. Each vanpool shall have a capacity of at least 15 persons per vehicle. The vanpool program shall be in conjunction with a vanpool subsidy providing pre-tax commuter benefits for employees as indicated in TDM 1.

vi. *TDM 6 – Park-n-Ride Program*

The IBEC Project shall provide a regional park-n-ride program that utilizes charter coach buses with a capacity of no less than 45 persons per bus. Parking lot locations shall correspond to zip code ticket purchase data, and the site circulation shall be designed to account for the charter coaches.

vii. *TDM 7 – Information Services*

The IBEC Project shall provide services to inform the public about activities at the IBEC, including the following:

- *Strategic Multi-modal Signage/Wayfinding.*
- *Real-time travel information; Changeable Message Sign (CMS) and social media.*
- *Welcome packets for new employees and ongoing marketing*
- *Commercials/Advertisement – Television, Website, Social Media, Radio, etc.*
- *Information kiosk or bulletin board providing information about public transportation options.*

viii. *TDM 8 – Reduce On-Site Parking Demand*

The IBEC Project shall include features that reduce on-site parking demand. These features shall include:

- *Provide coach bus/minibus/microtransit staging and parking areas: the IBEC Project is designed to accommodate 20 minibus/microtransit/paratransit parking spaces and 23 charter coach bus spaces. The capacity for minibus/microtransit/paratransit shall be no less than 10 persons per vehicle.*
- *Allocate sufficient TNC staging spaces: the IBEC Project shall be designed to accommodate approximately 160 spaces for TNC staging.*

ix. *TDM 9 – Event Day Local Microtransit Service*

The IBEC Project shall provide a local minibus/microtransit⁹⁴ service for all event days with a service range of approximately six (6) miles surrounding the Project Site. Each minibus shall have a capacity of no less than 10 persons per vehicle and shall provide service to employees and event attendees.

x. *Monitoring*

The TDM Program shall include an ongoing program to monitor each of the TDM Program elements listed above. The monitoring program shall collect data on the implementation of each specific TDM strategy and shall assess the extent to which the TDM Program is meeting demand for alternative forms of transportation and reducing vehicle trips and reliance on private automobiles. The information obtained through this monitoring program shall be provided to the City Traffic Engineer on an annual basis.

- c. *A monitoring report shall be prepared not less than once each year. The report shall evaluate the extent to which the TDM Program encourages employees to reduce single-occupancy vehicle trips and to use other modes of transportation besides automobile to travel to basketball games and other events hosted at the Project. The monitoring report shall be provided to the City Traffic Engineer (ongoing) and the State of California Office of Planning and Research (through 2030).*
- d. *The TDM Program shall be a dynamic document that is expected to be revised and refined as monitoring is performed, experience is gained, additional information is obtained regarding the Project transportation characteristics, and advances in technology or infrastructure become available. Any changes to the TDM Program shall be subject to review and approval by the City Traffic Engineer. In reviewing any proposed changes to the TDM Program, the City Traffic Engineer shall ensure that the TDM Program, as revised, is equally or more effective in addressing the issues set forth above.*

⁹⁴ A minibus is a physically smaller bus and/or shuttle (i.e., with capacity for 20 or fewer people). Microtransit refers to short-distance (i.e., approximately 6 miles or less) shuttle service.

- e. *Install “smart parking” systems in the on-site parking garages serving the Project to reduce vehicle circulation and idle time within the structures by more efficiently directing vehicles to available parking spaces.*

B. *Potential Additional GHG Reduction Measures*

The GHG Reduction Plan shall identify and quantify any additional GHG reduction measures proposed by the project applicant to reduce incremental emissions to below the net zero threshold. These additional measures may include one or more of the following:

- a. *Potential on-site measures:*
- i. *Installation of additional photovoltaic systems as carports on the East Parking Garage.*
 - ii. *Purchase of energy for on-site consumption through the Southern California Edison (SCE) Green Rate, which facilitates SCE’s purchase of renewable energy to meet the needs of Green rate participants from solar renewable developers within the SCE service territory or similar opportunities for renewable electricity that may arise in the future.*
 - iii. *If available after approval by applicable regulatory agencies, on-site use of renewable natural gas.⁹⁵*
 - iv. *Implementation of a waste diversion program with a goal of reducing landfill waste to zero.*
- b. *Potential off-site measures:*
- i. *Carbon offset credits. The project applicant may purchase carbon offset credits that meet the requirements of this paragraph. Carbon offset credits must be verified by an approved registry. An approved registry is an entity approved by CARB to act as an “offset project registry” to help administer parts of the Compliance Offset Program under CARB’s Cap and Trade Regulation. Carbon offset credits shall be permanent, additional, quantifiable, and enforceable.*
 - ii. *Transit and City Fleet Vehicles Replacement. The project applicant may enter into an agreement to cover replacement costs of existing City municipal fleet and transit vehicles with Zero Emissions Vehicles (ZEVs) and install related Electric Vehicle Charging Stations (EVCS).*
 - iii. *Local EV Charging Stations. The project applicant may enter into agreements to install EVCS locations in the City for use by the public.*

⁹⁵ Renewable natural gas is a biogas which has been upgraded to a quality similar to fossil natural gas and having a methane concentration of 90% or greater. A biogas is a gaseous form of methane obtained from biomass. By upgrading the quality to that of natural gas, it becomes possible to distribute the gas to customers via the existing gas grid within existing appliances.

- iv. *The project applicant may develop or enter into partnership with other organizations to develop a tree planting program in the City.*
- v. *EV Home Charger Program. The project applicant may implement a program to cover 100 percent of the costs of purchasing and installing EV chargers for residential use in local communities near the Project Site.*

The GHG Reduction Plan may include different, substitute GHG reduction measures that are equally effective or superior to those proposed above, as new technology and/or other feasible measures become available during construction or the operational life of the Project. The GHG Reduction Plan shall identify such different, substitute GHG reduction measures, and shall provide enough information to assess the feasibility of these measures. The Project Applicant may rely on such measures only if they are reviewed by the City Chief Building Official, are quantified, are found to be feasible, and are found to be at least as effective as those measures listed above. The Plan shall identify and quantify any other GHG reduction measures needed to reduce the Project incremental GHG emissions to no net new GHG emissions, or better.

Mitigation Measure 3.7-1(b)

***Annual GHG Verification Report.** The project operator shall prepare an Annual GHG Verification Report, which shall be submitted to the City, with a copy provided to CARB, in the first quarter of each year following the commencement of project operations. The Annual GHG Verification Report shall estimate the Project's emissions for the previous year based on operational data and methods, and using appropriate emissions factors for that year, as set forth in the GHG Reduction Plan, and determine whether additional offset credits, or other measures, are needed for the Project to result in net zero GHG emissions. It shall include a process for verifying the actual number and attendance of net new, market-shifted, and backfill events.*

If an Annual GHG Verification Report determines that the Project's emissions for the previous year were lower than necessary to achieve net zero GHG emissions, credit for any emissions reductions achieved below net zero shall be applied to the next year in the following Annual GHG Verification Report. The Annual GHG Verification Report shall be verified by a qualified, independent expert entity retained at the project applicant's expense. GHG offset credits to achieve net zero GHG emissions for the previous year, if necessary, shall have been purchased by the end of each reporting year.

Following completion and verification of the Annual GHG Verification Report, the GHG Reduction Plan shall be refined as may be needed in order to maintain emissions below net zero over the next reporting year. Any such revisions shall be prepared by the qualified expert retained by the project applicant and shall be subject to review and approval by the City.

In reviewing the GHG Reduction Plan, any revisions to that plan, or other reports related to implementation of the Plan, the City may retain a qualified expert to assist with this review. The selection of such an expert shall be at the City's discretion. Any expenses incurred by the City in retaining this expert shall be borne by the project applicant.

The provisions of this Mitigation Measure 3.7-1(b) may be consolidated with the reporting obligations pursuant to AB 987, as memorialized in the conditions of approval to the Project, into a single GHG reduction monitoring and verification report.

Impact 3.7-2: Construction and operation of the Proposed Project could be inconsistent with applicable plans, policies and regulations adopted for the purpose of reducing the emissions of GHGs. (Less Than Significant)

CARB 2017 Scoping Plan Update

As directed by Executive Order B-30-15, CARB's 2017 Scoping Plan Update describes how the State plans to achieve the 2030 GHG emission reduction goal for California of 40 percent below 1990 levels by 2030, as mandated by SB 32. The 2017 Scoping Plan Update strategy for meeting the 2030 GHG target incorporates the full range of legislative actions and State-developed plans that have relevance to the year 2030, including the LCFS, SB 350, the 2016 Mobile Source Strategy, the Sustainable Freight Action Plan, SB 1383, and the Cap-and-Trade Program (AB 398).

The Proposed Project would be consistent with key state plans and regulatory requirements referenced in the 2017 Scoping Plan Update designed to reduce statewide emissions. According to the 2017 Scoping Plan Update, reductions needed to achieve the 2030 target are expected to be achieved by increasing the RPS to 50 percent of the State's electricity by 2030, greatly increasing the fuel economy of vehicles and the number of zero-emission or hybrid vehicles, reducing the rate of growth in VMT, supporting high-speed rail and other alternative transportation options, and increasing the use of high-efficiency appliances, water heaters, and HVAC systems. The Proposed Project would not impede implementation of these potential reduction strategies identified by CARB, and it would benefit from statewide and utility-provider efforts towards increasing the portion of electricity provided from renewable resources.⁹⁶ The Proposed Project would also benefit from statewide efforts towards increasing the fuel economy standards of vehicles and reducing the carbon content of fuels. The Proposed Project would utilize energy-efficient appliances and equipment, as required by Title 24, and it would provide EV charging stations to support the future use of electric and hybrid-electric vehicles by employees and visitors.

For these reasons described above, the Proposed Project post-2020 emissions trajectory would decline over time, consistent with the 2017 Scoping Plan Update.

⁹⁶ As discussed previously, with the passage of SB 100, California's RPS has been increased over what is prescribed by the 2017 Scoping Plan Update, requiring retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 44 percent of retail sales by the end of 2024, 52 percent by the end of 2027, and 60 percent by the end of 2030; and requires that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by the end of 2045.

SCAG 2016 RTP/SCS

As discussed in Section 3.2, Air Quality, the 2016 RTP/SCS is designed to support development of compact communities in existing urban areas, with more mixed-use and infill development, and reuse of developed land that is also served by high quality transit. The 2016 RTP/SCS describes how the region can attain the GHG emission-reduction targets set by CARB by reducing VMT to achieve an 8 percent reduction in passenger vehicle GHG emissions by 2020, 18 percent reduction by 2035, and 21 percent reduction by 2040 compared to the 2005 level on a per-capita basis.

The 2016 RTP/SCS includes strategies for transportation and land use that are designed to reduce VMT and the GHG emissions associated with on-road vehicle travel. This includes but is not limited to strategies that increase the density and mix of land uses; focus growth around transit; provide transit improvements; expand active transportation networks; expand regional charging infrastructure for electric vehicles, and expand TDM programs.

As discussed in Section 3.10, Land Use and Planning, the 2016 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in infill areas well served by transit. The TDM strategies in the 2016 RTP/SCS are focused on reducing peak period and SOV travel by encouraging behavior shifts to carpooling or vanpooling or reducing peak period travel. SCAG encourages employers to offer telecommuting or alternative work week schedules to help reduce peak period travel.

In June 2016, CARB accepted SCAG's quantification of GHG emission reductions from the 2016 RTP/SCS and the determination that the 2016 RTP/SCS would, if implemented, achieve the 2020 and 2035 GHG emission reduction targets established by CARB.⁹⁷

Goal 6 of the 2016 RTP/SCS aims to improve air quality and encourage active transportation. The Proposed Project would be consistent with Goal 6 through the implementation of a comprehensive TDM Program provides transportation services, monetary incentives and project design features that encourage and support the use by employees, event attendees and customers of alternative modes of transportation and the reduction of vehicle trips, including by increasing average vehicle occupancy. The program is designed to be consistent with the requirements and achieve the reduction in vehicle trips set forth in AB 987 and would be required under Mitigation Measure 3.14-2(b). The Proposed Project TDM Program would include the following components: encourage alternative modes of transportation (rail, public bus, and vanpool); provide event-day dedicated shuttle services; encourage carpools and zero-emission vehicles; encourage active transportation; implement an employee vanpool program and a park-n-ride program; provide alternative transportation information services; reduce on-site parking demand; and provide event-day local microtransit service.

⁹⁷ California Air Resources Board, 2016. *Southern California Association of Governments' (SCAG) 2016 Sustainable Communities Strategy (SCS) ARB Acceptance of GHG Quantification Determination*. June 2016.

The TDM program (including TDM Program elements included in the Proposed Project) would be designed to achieve and maintain a 15 percent reduction in the number of vehicle trips, on an annual basis, by attendees, employees, visitors, and customers as compared to trips generated by Project operations absent the TDM program. Pursuant to AB 987, the measures included in the Proposed Project TDM program must be implemented so that a 7.5 percent reduction in vehicle trips is achieved and maintained by the end of the first NBA season during which an NBA team has played at the Arena, anticipated to occur by June 2025. A 15 percent reduction in vehicle trips must be achieved no later than January 1, 2030. This requirement directly supports SCAG's 2035 target of reducing per-capita VMT 18 percent reduction by 2035. The reduction in trips achieved under the Proposed Project TDM program would reduce GHG emissions from Project-related transportation.

In addition, as described above and in Section 3.14, Transportation and Circulation, the TDM Program would encourage active transportation and alternative modes of travel. For example, the Proposed Project would include 23 spectators and 60 employee on-site bicycle parking spaces, which would exceed the bicycle parking requirements established in Municipal Code Chapter 12, Article 19, section 12-42.1. To promote pedestrian travel, the Proposed Project would include improvements to the sidewalks fronting the Project Site and a pedestrian bridge crossing South Prairie Avenue to promote a safe pedestrian circulation system and would provide high-capacity pedestrian pathways. In addition, the Proposed Project would include provisions that would promote the use of public transportation as a means of travel to and from the Arena, including a transportation hub at the East Transportation and Hotel Site, shuttle stops on South Prairie Avenue, and a shuttle system for large events that would connect the Proposed Project to nearby Metro stations. This would further support Goal 6 of the RTP/SCS.

Goal 7 of the 2016 RTP/SCS aims to actively encourage and create incentives for energy efficiency. The Proposed Project would utilize energy efficiency appliances and equipment, as required by Title 24, and it would provide EV charging stations to support the future use of electric and hybrid-electric vehicles by employees and visitors traveling to and from the Project Site. In addition, the Proposed Project would be designed and constructed to meet LEED Gold certification requirements, which would require the incorporation of energy efficiency measures. The Proposed Project would comply with Title 24 energy efficiency requirements, use of 100 percent LED lighting indoors and outdoors throughout the site, and install high efficiency HVAC systems. In addition, the Proposed Project's design would include compliance with CALGreen Code Voluntary Tier 1, which, based on the preliminary design of the Proposed Project, is estimated to achieve a reduction in energy consumption greater than Title 24 2019 standards. These actions would be consistent with Goal 7 of the 2016 RTP/SCS.

For the reasons described above, the Proposed Project would be consistent with the 2016 RTP/SCS, and would not be inconsistent with its policies that were adopted for the purposes of avoiding or mitigating environmental effects.

Executive Order S-3-05

Executive Order No. S-3-05 established a long-term goal of reducing California’s GHG emissions to 80 percent below the 1990 level by the year 2050. The Proposed Project GHG emissions would decline from its first operational year in 2024 through at least 2050 due to continued regulatory and technological advancements. The extent to which GHG emissions from mobile sources indirectly attributed to the Proposed Project would change in the future depends on the quantity (e.g., number of vehicles, average daily mileage) and quality (i.e., carbon content) of fuel that would be available and required to meet both regulatory standards, and resident and worker needs.

Renewable power requirements, the LCFS, and vehicle emissions standards discussed above will all decrease GHG emissions per unit of energy delivered or per VMT. Due to the uncertainty of technological advancements that could be anticipated over the next 30 years and the unknown parameters of the regulatory framework in 2050, further quantitative analysis of the Proposed Project impacts relative to the 2050 target would be speculative. CEQA Guidelines section 15145 directs that “[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact.”

Even though the State has not provided a clear regulatory and technological roadmap to achieve the 2050 goal, it has demonstrated the potential pace at which emission reductions can be achieved through new regulations, technology deployments, and market developments. In developing the 2017 Scoping Plan Update, CARB, CEC, CPUC, and the California Independent System Operator (CAISO) commissioned a study to evaluate the feasibility and cost of meeting the 2030 target along the way to reaching the State goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. With input from the agencies, the California State Agencies’ PATHWAYS Project explores scenarios for meeting the State long-term GHG emissions targets, encompassing the entirety of California economy with detailed representations of the buildings, industry, transportation, and electricity sectors.⁹⁸ While acknowledging the inherent uncertainty associated with its modeling assumptions, the PATHWAYS study emphasizes the need for significant action and continued policy development by the State to support low-carbon technologies and markets for energy efficiency, building electrification, renewable electricity, zero emission vehicles, and renewable liquid fuels. The study underscores the need for a periodic review of State policies and programs for reducing GHG emissions, as was anticipated by AB 32 in its directive to update the Scoping Plan at least every 5 years.

A 2018 update to the PATHWAYS study advanced the understanding of what is required for technology deployment and other GHG mitigation strategies if California is to meet its long-term climate goals. The 2018 study concludes that to achieve high levels of consumer adoption of zero-carbon technologies, particularly of electric vehicles and energy efficiency and electric heat

⁹⁸ Energy + Environmental Economics (E3), 2015. *Summary of the California State Agencies’ PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios*. Available: https://www.ethree.com/public_proceedings/summary-california-state-agencies-pathways-project-long-term-greenhouse-gas-reduction-scenarios/. Accessed March 19, 2019 and April 4, 2015.

in buildings, market transformation is needed to reduce the capital cost and to increase the range of options available. This market transformation can be facilitated by (1) higher carbon prices (which can be created by the Cap and Trade and LCFS programs); (2) codes and standards, regulations and direct incentives, to reduce the upfront cost to the customer; and (3) business and policy innovations to make zero-carbon technology options the cheaper, preferred solutions compared to fossil fueled alternatives.⁹⁹

Statewide efforts are underway to facilitate the achievement of the EO S-3-05 goals. It is reasonable to expect the Proposed Project GHG emissions to decline over time, as the regulatory initiatives identified by CARB in the 2017 Scoping Plan Update are implemented, and other technological innovations occur. Given the reasonably anticipated decline in Proposed Project emissions, the Proposed Project would not conflict with or frustrate the ability of the State to achieve the 2050 horizon-year goal of EO S-3-05.

Mobile Source Strategy and Executive Order B-48-18

State goals for ZEVs are expressed in the Advanced Clean Cars Initiative (ACC) and the ZEV mandate established by Governor's Executive Order B-16-1, which sets a target of reaching 1.5 million ZEVs (meaning battery electric vehicles and fuel cell electric vehicles) and plug-in hybrid electric vehicles on California's roadways by 2025.

According to EMFAC2017, which incorporates the State ZEV mandate, there will be approximately 31,700,000 passenger cars and light trucks on the road in California by 2030, at which time 1.5 million ZEVs would constitute approximately 4.7 percent of all vehicles.¹⁰⁰ The more aggressive Mobile Source Strategy, included in the 2017 Scoping Plan Update as a component of the overall strategy for achieving the 2030 GHG target, calls for 4.2 million ZEVs on the road by 2030, equivalent to about 13.2 percent of passenger vehicles + light duty trucks (LDTs).

The Proposed Project would be consistent with the State ZEV mandate by providing a minimum of 8 percent of on-site parking spaces with EV charging capability.

City of Inglewood ECAP

As shown in Table 4.7-2, total reductions from ECAP implementation are expected to reduce emissions by 18.8 percent below 2005 levels by 2020, enabling the City to meet its 2005 target. However, the City would need to reduce emissions by an additional 111,702 MTCO₂e per year by 2035 to meet its 2035 emissions reduction goal.

⁹⁹ Energy + Environmental Economics (E3), 2018. *Deep Decarbonization in a High Renewables Future. Updated Results from the California PATHWAYS Model*. Available: https://www.ethree.com/wp-content/uploads/2018/06/Deep_Decarbonization_in_a_High_Renewables_Future_CEC-500-2018-012-1.pdf. Accessed March 18, 2019. June 2018.

¹⁰⁰ EMFAC2017 estimates the future percentage of the state's ZEVs based on compliance with the State's ZEV mandate. EMFAC2017's forecasted ZEV population for 2030 is approximately 3.6 percent of all passenger and light duty vehicles, but the 3.6 percent figure represents the equivalent percentage of all vehicles operating as a pure zero emission vehicle (e.g., 100 percent battery electric), whereas the actual population would include PHEVs that operate partially on fossil fuels.

The ECAP includes the following strategies and actions that are applicable to the Proposed Project:

- **Strategy 2: Increase Energy Efficiency.** Specific actions under this strategy include making commercial buildings more efficient and increasing the energy efficiency of street and traffic lights. The Proposed Project would be designed and constructed to meet LEED Gold certification requirements, which would require the incorporation of energy efficiency measures. Although the specific LEED credits and project features that will allow the Proposed Project to be certified as LEED Gold are currently uncertain, achieving LEED Gold certification would likely require extensive energy efficiency measures including, but not limited to, the use of 100 percent LED lighting indoors and outdoors throughout the Proposed Project; and implementation of high efficiency HVAC systems.
- **Strategy 3: Support Renewable Energy Generation.** This strategy is focused on City actions that promote more renewable energy generation in the community, like permit streamlining and support for funding and financing programs that help make renewable energy affordable. The Proposed Project design is in the conceptual stage, so the specific LEED credits and project features that would be selected to achieve LEED Gold certification are uncertain, but receiving LEED Gold certification would include a 700 kW on-site solar PV system, generating approximately 1,085,000 kW-hrs of carbon free energy annually.
- **Strategy 4: Improve Transportation Options and Manage Transportation Demand.** Specific actions under this strategy include improving the safety and efficiency of existing roadways, improving transit systems, improving bicycle facilities, making parking more efficient, reducing commute trips, and encourage land use intensification and diversity. The Proposed Project TDM Program would be consistent with these goals by encouraging use of transit, active transportation and alternatives to single-occupant vehicle travel.
- **Strategy 5: Reduce Consumption and Waste.** Specific actions under this strategy include using less water, producing less waste, and promote local food production. The Proposed Project design is in the conceptual stage, so the specific LEED credits and project features that would be selected to achieve LEED Gold certification are uncertain, but achieving LEED Gold certification is likely to include credits under the Water Efficiency and Materials and Resources categories. The Proposed Project would likely include use of recycled water for landscaping, ultra-low flow fixtures in restrooms such as low-flow faucets with aerators, dual flush toilets, and waterless urinals, and recycling of at least 75 percent of demolition materials. Achievement of this amount of waste reduction and diversion would exceed the City of Inglewood target of 50 percent demolition waste recycling and would be in accordance with State goals to divert a minimum of 75 percent of construction and demolition materials from landfill disposal.

Based on the concept designs available at this time and the Proposed project's commitment to achieve LEED Gold Certification in part with planned energy efficiency strategies discussed above, the Proposed Project would be consistent with the City's ECAP.

Conclusion

For the reasons described above, the Proposed Project would not be inconsistent with applicable plans, policies and regulations adopted for the purpose of reducing the emissions of GHGs, including the CARB 2017 Scoping Plan Update, SCAG 2016 RTP/SCS, Executive Order S-3-05,

Mobile Source Strategy and Executive Order B-48-18, and the City of Inglewood ECAP. Therefore, the impact is considered **less than significant**.

Mitigation Measures

None required.

Although no mitigation measures are required to achieve consistency of the Proposed Project with applicable plans, policies, and regulations adopted for the purpose of reducing emissions of GHGs, implementation of Mitigation Measure 3.14-2(b) would require the implementation of a comprehensive TDM program that would reduce vehicular trip making and associated GHG emissions, and Mitigation Measures 3.7-1(a) and 3.7-1(b) would require incorporation of physical design features, on-site GHG reduction measures, and any necessary off-site GHG reduction measures, and would result in no net new Proposed Project GHG emissions. The implementation of these measures would further ensure consistency of the Proposed Project with State, regional, and local GHG reduction plans.

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

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Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

Attachment P

International Carbon Reduction & Offset Alliance, The ICROA Code of Best Practice

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)





THE ICROA CODE OF BEST PRACTICE

[Home](#) » [Quality Assurance](#) » The ICROA Code of Best Practice

The ICROA Code aims to define international best practice for offset-inclusive carbon management and represents the minimum requirements that all ICROA members must meet. It is applicable to voluntary carbon management services provided by ICROA members and covers the following four areas; Carbon Footprinting, GHG emission reduction advice, Offsetting and Communication. In summary, ICROA members commit to:

- Perform carbon measurement in accordance with international standards (e.g. WRI/WBCSD GHG Protocols and ISO 14064)
- Encourage clients to set challenging targets to go beyond business-as-usual
- Encourage clients to assess emission reduction opportunities and prioritise cost-effective actions
- Use credible carbon credits in accordance with international standards and programs (refer to next section for list of permitted sources of carbon credits)
- Use third-party registries to retire and remove carbon credits used for offsetting
- Encourage clients to communicate their carbon status and footprints, including emissions associated with the organisation, product, service or event, as well as details about actions to reduce and offset emissions

Sourcing and Use of Carbon Credits for Offsetting

When offsetting greenhouse gas emissions on behalf of a client, ICROA members commit to use carbon credits based on the principles of:

- Real
- Measureable
- Permanent
- Additional
- Independently verified
- Unique

ICROA members are also encouraged to promote sustainable development in the projects that they develop and provide. When offsetting greenhouse gas emissions on behalf of a client, ICROA members commit to use carbon credits that are or will be validated, verified and registered under the following offset standards



American Carbon Registry



Clean Development Mechanism (CDM)



Climate Action Reserve



Gold Standard

VERIFIED CARBON STANDARD



Australian Government

Department of the Environment and Energy

Emissions Reduction Fund (ERF) of the Australian Government

Under special circumstances and in accordance with strict conditions, ICROA members may use carbon credits from government-approved schemes as well as non-carbon accounting standards (e.g. Climate, Community and Biodiversity Alliance; Social Carbon) that are combined with approved offset standards.

ICROA members that are not in good standing with ICROA or are not compliant with the Code of Best Practice and fail to resolve such infractions shall be excluded from ICROA.

Further details of the ICROA Code of Best Practice can be found in the [Executive Summary](#) and the [Technical Specifications](#).

Approved emissions factors:

New Zealand: Ministry for the Environment – [National Emissions Factors](#)

Australia: Department of the Environment and Energy - [National Greenhouse Accounts Factors](#)

Germany: BMU (Federal Ministry for the Environment)

Netherlands: Ministry of Infrastructure and the Environment - [National Emission Factors](#)

UK: Department for Business, Energy & Industrial Strategy (BEIS) - [Current GHG conversion factors](#)

Intergovernmental Panel on Climate Change (IPCC): [Emission Factors Database](#)

POLICY FAQ'S:

What is the Reductions Sold in Advance of Verification (RSIV) mechanism?

The RSIV mechanism in the ICROA Code contains the rules that ICROA has developed so that its members may sell credits prior to verification. The RSIV mechanism meets ICROA's stringent standards for best practice. The RSIV mechanism helps foster innovation in the voluntary carbon market and provides many of the smallest projects, which may have higher risk profiles, with the amounts of carbon finance needed. Where an ICROA permitted standard facilitates ex ante crediting, the ICROA RSIV mechanism will take precedence over the standard's requirements. ICROA member organisations have to guarantee RSIV purchases using a replacement mechanism, which is either a contractual financial guarantee or an 'Appropriate Safeguards' buffer or a combination of these options. This means that, even in the event of project failure, the emission reduction commitments are always honored. ICROA has also developed rules on transparency and communication regarding the RSIV mechanism. The ICROA Audit Process ensures that the member organisations are following the rules within the ICROA Code for RSIV.

What is ICROA's position on RFI?

ICROA is committed to reaching a consensus on Radiative Forcing Index (RFI), a consensus that accurately reflects scientific opinion on this contentious issue. RFI is the factor used to multiply the carbon emissions generated by a flight in order to account for a range of factors that can increase the footprint of a flight. These factors include, accounting for non-CO₂ gases generated by the combustion of aviation fuel (i.e. sulphur and methane), flying through certain types of clouds, and even flying at night. ICROA acknowledges that there are currently different approaches to calculating air travel emissions, particularly regarding the RFI factor. Once sufficient consensus within the scientific community becomes more apparent, ICROA will develop a more numerically specific consensus on RFI, or the most appropriate metric, through an international, collaborative and transparent process. In the interim, ICROA will base its approach to RFI on the principle of transparency. ICROA members must publicly disclose what RFI they apply and their rationale for applying that RFI. ICROA will also play an educational role on RFI.

What is ICROA's position on additionality?

Additionality is a fundamental criterion for any offset project. ICROA members support the offset standards included in the ICROA Code as the best available tools for assessing additionality. ICROA members are committed to interpreting and using these tools in good faith and require that all projects' successful implementation and operation are dependent on the availability of carbon finance. This is reflected in the ICROA Code of Best Practice. For offset credits that use performance based additionality, ICROA reviews how the benchmarks for performance based additionality have been set by the standards to ensure that this process has been completed transparently.

[PRIVACY POLICY](#)

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Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

Attachment Q

Newhall Ranch GHG Reduction Plan, Appendix 1

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)



Appendix 1

Air Resources Board Letter
to Chuck Bonham, November 3, 2016



Air Resources Board



Matthew Rodriguez
Secretary for
Environmental Protection

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Edmund G. Brown Jr.
Governor

November 3, 2016

Chuck Bonham, Director
California Department of Fish and Wildlife
1416 9th Street, 12th Floor
Sacramento, California 95814

Dear Mr. Bonham:

As you requested, California Air Resources Board (ARB) staff reviewed the technical basis for the net zero greenhouse gas (GHG) determination in the Additional Environmental Analysis prepared for the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan.

ARB staff consulted with Department of Fish and Wildlife staff and technical experts at Ascent Environmental, the principal consultant assisting the Department. In doing so, ARB staff reviewed the technical documentation provided for the evaluation of the project's total estimated GHG emissions and the reductions in emissions to be achieved through the mitigation measures. Based on staff's review, ARB finds the documentation provides an adequate technical basis to determine that the project would not result in any net additional GHG emissions after the mitigation measures are fully implemented.

If you have any questions regarding staff's analysis, please contact Mr. Kurt Karperos by email at kurt.karperos@arb.ca.gov or by phone at (916) 322-2739.

Sincerely,

Richard W. Corey
Executive Officer

cc: Kurt Karperos
Deputy Executive Officer

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Attachment R

Newhall Ranch GHG Reduction Plan, Appendix 6

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)



Appendix 6

Newhall Ranch
Greenhouse Gas Reduction Plan,
Revised Appendix F of Draft AEA
Appendix 1, June 1, 2017

GHG Reduction Plan, Revised Appendix F of Draft AEA Appendix 1
June 1, 2017

Newhall Ranch Greenhouse Gas Reduction Plan

I. OVERVIEW AND SUMMARY

The purpose of this Greenhouse Gas (“GHG”) Reduction Plan is to clarify and further specify performance standards governing the implementation of Mitigation Measure (“MM”) 2-10 (Construction and Vegetation Change Emissions) and MM 2-13 (Operational Emissions), as identified in the California Department of Fish and Wildlife Additional Environmental Analysis (“AEA”) and County of Los Angeles Village-Level California Environmental Quality Act (“CEQA”) Documentation.

This GHG Reduction Plan is organized as follows:

- ▲ Section II defines terms used throughout this GHG Reduction Plan.
- ▲ Section III summarizes the process by which the project applicant will seek to undertake or fund Direct Reduction Activities.
- ▲ Section IV describes certain Direct Reduction Activities that the project applicant is evaluating as of the publication date of this GHG Reduction Plan and may undertake in connection with the implementation of this GHG Reduction Plan.¹
- ▲ Section V describes the phases of project development (i.e., construction and vegetation change; operational) for which this GHG Reduction Plan is designed to mitigate emissions.
- ▲ Sections VI and VII outline the Compliance Options available to the project applicant when implementing this GHG Reduction Plan.
- ▲ Section VIII describes the compliance demonstration process for this GHG Reduction Plan.
- ▲ Section IX sets forth performance standards applicable to GHG Mitigation Credits and Carbon Offsets used for the implementation of this GHG Reduction Plan.
- ▲ Section X establishes the locational performance standards applicable to this GHG Reduction Plan.

The mitigation measures (MM 2-1 through MM 2-13) applicable to the project, including those requiring the implementation of this GHG Reduction Plan (MM 2-10 and MM 2-13), shall reduce the Overall Project Emissions to net zero GHG emissions, as identified in the AEA and Village-Level CEQA Documentation. The reduction of Overall Project Emissions will be achieved through the implementation of various project site-specific measures as set forth in MM 2-1 through MM 2-9, as well as the implementation of certain local off-site measures set forth in MM 2-11 and MM 2-12. In addition, the project shall mitigate construction and vegetation change emissions through implementation of MM 2-10 and mitigate the operational emissions not already mitigated by the other Mitigation Measures through the implementation of MM 2-13 at the local/regional level and within the State of California, as well as within the United States and internationally.

¹ At this time, the project applicant has not selected any specific Direct Reduction Activities for implementation pursuant to this GHG Reduction Plan, except for a clean cook stove installation pilot program in Zambia in 2017.

Consistent with the policy of the State of California, the majority of the GHG reductions (MM 2-1 through MM 2-13) and the substantial majority of the investment associated with such GHG reductions will occur within Los Angeles County and the State of California.

Because the project will facilitate the phased development of a planned community to be built over many years, and because the regulatory and technological frameworks for GHG emissions are rapidly evolving and are expected to continue to do so over the ensuing years during the development of the project, minor modifications to this GHG Reduction Plan may be made by the project applicant upon receipt of a written consistency determination from the Los Angeles County Planning Director provided that such modifications are environmentally equivalent to this GHG Reduction Plan and MM 2-10 and MM 2-13.

The Planning Director shall determine the adequacy of any minor modifications by evaluating whether the project applicant's proposed minor modifications result in equivalent or more beneficial GHG reductions and environmental effects, as compared to the original provisions of this GHG Reduction Plan. The minor modifications cannot result in the creation of new or substantially more severe significant environmental effects and must be consistent with the GHG Reduction Plan and MM 2-10 and MM 2-13. The Planning Director shall make a consistency determination that the proposed minor modifications are environmentally equivalent, based on supporting materials submitted by the project applicant.

II. DEFINED TERMS

The following definitions apply to this GHG Reduction Plan.

"ACR" shall mean the American Carbon Registry.

"AEA" shall mean the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan Additional Environmental Analysis (SCH No. 2000011025).

"Approved Registry" shall mean any of the following: (i) the Climate Action Reserve, the American Carbon Registry and the Verified Carbon Standard; (ii) any entity approved at any time by CARB to act as an "offset project registry" under the state's cap-and-trade program; and if no Approved Registry is in existence as identified by the preceding options (i) or (ii), then (iii) any other entity that issues Carbon Offsets satisfying the performance standards set forth in Section IX.B.

"CAR" shall mean the Climate Action Reserve.

"CARB" shall mean the California Air Resources Board.

"Carbon Offset" shall mean an instrument issued by an Approved Registry that shall satisfy the performance standards set forth in Section IX.B and represent the past reduction or sequestration of one metric tonne of carbon dioxide equivalent achieved by a Direct Reduction Activity or any other GHG emission reduction activity that is not otherwise required (CEQA Guidelines § 15126.4(c)(3)).

"Compliance Option" shall mean any of the two compliance options (Compliance Options No. VI-1 and VI-2) defined in Section VI of this GHG Reduction Plan or the three compliance options (Compliance Options No. VII-1 through VII-3) defined in Section VII of this GHG Reduction Plan.

"Direct Reduction Activity" shall mean the direct undertaking or funding by the project applicant of an activity or activities that reduce or sequester GHG emissions at a location other than the project site, in compliance with the performance standards set forth in Section IX.A.

"GHG" shall mean greenhouse gas.

“**GHG Mitigation Credit**” shall mean an instrument issued by an Approved Registry that satisfies the performance standards set forth in Section IX.A and shall represent the estimated reduction or sequestration of one metric tonne of carbon dioxide equivalent that will be achieved by a Direct Reduction Activity that is not otherwise required (CEQA Guidelines § 15126.4(c)(3)).

“**GHG Reduction Plan**” shall mean this GHG Reduction Plan.

“**GHG Residential Ratio**” and “**GHG Commercial Ratio**” shall mean the GHG emissions ratios expressed in MTCO_{2e} established in the applicable Village-Level CEQA Documentation for a specific Village-Level project to ensure that the related GHG emissions are reduced to net zero as identified in the AEA. For example, the GHG Residential Ratio would be 108.89 MTCO_{2e} per residential unit and the GHG Commercial Ratio would be 506.86 MTCO_{2e} per thousand square feet of commercial development if the maximum allowable development facilitated by the project occurs.

“**Incremental Construction GHG Emissions**” shall mean the GHG emissions associated with a specific grading permit application for the Village-Level Project or a portion of the Village-Level Project relating to construction and vegetation change GHG emissions, as calculated in accordance with the applicable Village-Level CEQA Documentation.

“**Incremental Operational GHG Emissions**” shall mean the GHG emissions associated with a specific residential or commercial building permit application for the Village-Level Project or a portion of the Village-Level Project relating to operational emissions (i.e., non-construction and vegetation change emissions), as calculated based on the applicable GHG Residential Ratio or GHG Commercial Ratio set forth in the applicable Village-Level CEQA Documentation.

“**ISO**” shall mean the International Organization for Standardization.

“**MM**” shall mean Mitigation Measure, as identified in the AEA and/or Village-Level CEQA Documentation.

“**MTCO_{2e}**” shall mean a metric tonne of carbon dioxide equivalent.

“**Overall Project Emissions**” shall mean “Total Annual Emissions” that are “Unmitigated” from the project as set forth in Table 2.3-3 of the AEA.

“**project**” shall mean the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan.

“**project applicant**” shall mean The Newhall Land and Farming Company, LLC or its designee.

“**TSF**” shall mean thousand square feet.

“**VCS**” shall mean the Verified Carbon Standard.

“**Village-Level CEQA Documentation**” shall mean the environmental analysis completed for a Village-Level Project within the project area as required by the California Environmental Quality Act.

“**Village-Level Project**” shall mean any village-level project within the project area, including the Mission Village and Landmark Village projects.

“**WRI/WBCSD**” shall mean the World Resources Institute/World Business Council for Sustainable Development.

III. DIRECT REDUCTION ACTIVITIES

A. Description

Under CEQA Guidelines Section 15126.4, subdivisions (c)(3) and (c)(4), respectively, a project's GHG emissions can be reduced by "[o]ff-site measures, including offsets that are not otherwise required" and "[m]easures that sequester greenhouse gases."

Therefore, the project applicant will work directly with third parties, including not-for-profits, non-governmental organizations, and others, to achieve GHG emissions reduction or sequestration through Direct Reduction Activities. All Direct Reduction Activities will be undertaken for the specific purpose of reducing the Overall Project Emissions, and all Direct Reduction Activities will be confirmed or verified by an independent, qualified third-party using methodologies approved by Approved Registries.

While the focus of the GHG Reduction Plan is on Direct Reduction Activities, if it is necessary to fully offset the Overall Project Emissions, the project applicant may obtain and retire Carbon Offsets that have been issued by an Approved Registry, as provided for in Sections VI and VII, below.

B. Performance Standards

All GHG emission reductions used for compliance with this GHG Reduction Plan will comply with performance standards established in this GHG Reduction Plan. The performance standards are set forth in Section IX and are based on established performance standards in established carbon offset programs and climate change regulations, including California's cap-and-trade program for GHG emissions. The performance standards include both environmental integrity criteria and procedural review requirements, and adherence to the performance standards will ensure that the implementation of the GHG Reduction Plan will satisfy CEQA.

C. Approved Registries

The GHG Reduction Plan is tiered off of established carbon offset programs implemented by Approved Registries. Three Approved Registries currently recognized by the State of California are:

Climate Action Reserve: The California Legislature established CAR in 2001 to encourage actions to reduce GHG emissions. CAR began as the California Climate Registry and developed protocols to track GHG emissions and reductions, and have those emissions verified and publicly reported. The California Climate Registry was renamed as CAR and expanded in 2008, and now plays a leading role in the carbon market. CAR has developed over 15 separate protocols for quantification and verification of GHG emissions reductions, and issued over 60 million carbon offset credits, known as "Climate Reserve Tonnes" or "CRTs." CAR is based in Los Angeles and has been approved by CARB as an official offset registry for the state's cap-and-trade program.

American Carbon Registry: ACR was founded in 1996 as a non-profit enterprise of Winrock International, a non-profit organization. ACR is a CARB-approved offset registry for the state's cap-and-trade program and has also developed its own carbon offset methodologies, such as methodologies for degraded wetlands and for avoided conversion of grasslands to crop production.

Verified Carbon Standard: VCS was founded in 2005 by the Climate Group, the International Emissions Trading Association and the World Economic Forum. Project developers are able to list GHG reduction activities on the VCS registry using a variety of protocols, including CAR protocols. VCS is a CARB-approved

offset registry for the state's cap-and-trade program and has also developed its own carbon offset quantification methodologies.

IV. OVERVIEW OF POTENTIAL DIRECT REDUCTION ACTIVITIES

The following Direct Reduction Activities are prototypical of the types of Direct Reduction Activities that the project applicant has identified on a preliminary basis for inclusion in the GHG Reduction Plan. The following Direct Reduction Activities are illustrative only and the exact portfolio composition of the Direct Reduction Activities may differ over time as new types may be added and certain opportunities identified below may not be realized.²

A. Forest Conservation in California and the United States

Working with a leading developer of forest carbon offset, the project applicant is exploring opportunities involving the conservation of forest land and forest stocks for the purpose of sequestering GHG emissions. The developer would identify suitable forest land and then assist the project applicant in its management of this land to maximize the forest and carbon stocks through afforestation, avoided conversion and improved management techniques. Under a typical contractual structure, the project applicant would purchase forest land from a forest owner to conserve or enhance forest stocks, but the project applicant might also pay the developer or another third party to sequester GHG emissions at a forest rather than taking ownership of the forest itself. In both instances, the developer would subsequently assist the project applicant in managing the forest land or assisting the forest owner so as to increase the forest and carbon stocks.

Loss of forests or unsustainable management of forests in California and the rest of the United States releases carbon emissions into the atmosphere that would otherwise have been sequestered in trees, soils and understory plants in forests, which naturally absorb carbon dioxide from the atmosphere and store the gas as carbon.

Through sustainable management and protection, avoided conversion of forests to other uses, and reforestation, forests can increase their carbon storage. The California Forestry Association recognizes that "healthy forests provide the state with clean water and air [and] thriving wildlife habitats."³ The U.S. Forest Service recognizes the importance of forest restoration and protection through its "Integrated Resource Restoration" program, which aims to "re-establish a balance of nature needed for air, water, plants and animals to thrive" in the nation's forests through direct forest land management⁴. As evidenced by Governor Brown's central role in the creation of the Governors' Climate and Forests Task Force, a multi-national collaboration, which synchronizes efforts across jurisdictions to develop policies and programs that provide pathways to forest-maintaining rural development, California is making considerable efforts to broker the international accord to fight deforestation and resulting impacts on climate change.

The project applicant is actively considering Direct Reduction Activities involving the forestry sector where the project applicant could help conserve forest land or forest stocks for the purpose of sequestering GHG emissions⁵. The project applicant may pursue opportunities that involve three types of forestry sequestration activities:

² At this time, the project applicant has not selected any specific Direct Reduction Activities for implementation pursuant to this GHG Reduction Plan except for installing clean cook stoves in Zambia in 2017.

³ California Forestry Association, "About Us," available at <http://calforests.org/about/>, accessed: March 2017.

⁴ U.S. Forest Service, "Forests and Grasslands," available at <http://www.fs.fed.us/managing-land/national-forests-grasslands>, accessed: March 2017.

⁵ See, e.g., CAR, *Forest Project Protocol Version 3.3* (2012) (providing requirements and guidance for quantifying the net climate benefits of activities that sequester carbon on forestland); CARB, *Compliance Offset Protocol: U.S. Forest Projects* (2015) (the purpose of the protocol "is to quantify [GHG] emission reductions and [GHG] removal enhancements associated with the sequestration of carbon achieved by increasing and/or conserving forest carbon stocks").

- ▲ Avoided conversion of forests: this activity involves the avoided deforestation of forest land through a land purchase or, in California or elsewhere, the creation of a conservation easement or other legally binding agreement.
- ▲ Improved forestry management: this activity may include increasing rotation ages to increase the overall age of the forest, increasing the stocking of trees on understocked areas and increasing forest productivity by thinning diseased and suppressed trees.
- ▲ Reforestation: this activity involves the planting of new trees.

The applicable forestry sequestration protocols and methodologies provide strict criteria regulating the type of activities eligible to qualify as avoided conversion, improved forestry management or afforestation activities. For example, the use of non-native tree species in afforestation is restricted.

B. Clean Cook Stoves

The project applicant is installing cook stoves in Zambia by funding clean-burning cook stoves for underprivileged households. The clean cook stoves will reduce GHG emissions, as well as deliver many health-related co-benefits to their users. An expanded cook stove program is being explored by the project applicant.

More than three billion people globally depend on burning woody fuels in archaic, 3-stone fires for cooking⁶. Inefficient cook stoves are a significant contributor to GHG emissions and climate change. A single clean cook stove can save an average of two tonnes of carbon dioxide emissions per year or more.

In addition to saving an average of two tonnes of carbon dioxide emissions per year or more, a single clean cook stove can reduce household air pollution by 50% and reduce the time spent gathering resources by 75%. According to the World Health Organization, this primitive form of cooking results in over 4 million premature deaths worldwide every year⁷. More than 50% of premature deaths due to pneumonia among children under the age of 5 are caused by the particulate matter (soot) inhaled from household air pollution⁸. Other adverse health effects associated with biomass smoke exposure include stroke, chronic obstructive pulmonary disease, cardiovascular disease and lung cancer⁹. In Africa, more people die from exposure to cook stove smoke than from malaria, tuberculosis and HIV/AIDS, combined.

In addition, the need to gather high volumes of firewood also contributes significantly to deforestation and, consequently, climate change. Moreover, women and children must spend hours a day walking long distances for wood gathering or to purchase bundled wood, and are often exposed to assaults and other dangers. The time spent gathering wood deprives young children of time needed for schooling and education.

If this program is ultimately pursued, the project applicant would provide additional funding to build, distribute and maintain cook stoves. An NGO would assist with installing the stoves by providing in-person training on the manufacturing, operation and maintenance of cooking stoves. The owner and the location of each stove would be tracked and recorded in the documentation for the Direct Reduction Activity¹⁰.

⁶ World Health Organization, "Household air pollution and health: Fact sheet N° 292," (February 2016), available at: <http://www.who.int/mediacentre/factsheets/fs292/en/>, accessed: March 2017.

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ See, e.g., ClimateCare, *Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes*, Gold Standard, available at http://www.goldstandard.org/sites/default/files/gs_methodology_cookstove.pdf, accessed: Mar. 2, 2017 ("All sales records should comprise [of] the following data . . . [l]ocation of sale . . . [and] [n]ame and telephone number[.]").

C. Methane Capture

The project applicant is exploring opportunities to reduce methane emissions from livestock in California and the United States. The project applicant would identify opportunities to fund the capture and destruction of methane emissions from livestock manure at suitable dairy farms, including in California.

Methane is the second most prevalent GHG emitted in the United States from human activities, and agriculture is the second largest source of methane emissions in the U.S. (after petroleum and natural gas systems)¹¹. California has the most dairy cows in the country and the highest aggregated dairy methane emissions¹². California also has established a goal of reducing methane emissions from dairy manure management by 40 percent in 2030 relative to 2013 levels¹³.

The project applicant would provide the funding required to build and maintain methane capture and destruction equipment using established methodologies developed by CARB and/or CAR. The project applicant also would explore opportunities for the beneficial use of the captured methane, such as for renewable electricity or biofuel production.

V. PROJECT EMISSIONS

As described in the AEA and Village-Level CEQA Documentation, there are two general sources of GHG emissions that will result from the project: (i) the construction and vegetation change emissions, which include emissions associated with grading and all horizontal (e.g., infrastructure) and vertical (buildings) construction; and (ii) the operational emissions, which include the emissions associated with the use of the project, including emissions from vehicles, electricity use, building operations and other sources, estimated over a 30-year project life.

As described in the AEA and Village-Level CEQA Documentation, in order to reduce the Overall Project Emissions to net zero, the project applicant shall mitigate the operational emissions not already mitigated by the other Mitigation Measures prior to the issuance by Los Angeles County of the (i) grading permit (to cover construction and vegetation change emissions in MM 2-10) and (ii) the building permit (to cover operational emissions in MM 2-13), as follows:

- ▲ **Construction and Vegetation Change GHG Emissions** – Prior to obtaining a grading permit from Los Angeles County for each village or a portion of a village, the project applicant shall mitigate, through the GHG Reduction Plan, the Incremental Construction GHG Emissions, as required by MM 2-10. The project applicant shall provide documentation for the Incremental Construction GHG Emissions, based on the parameters set forth in the applicable Village-Level CEQA Documentation, which will identify the GHG reduction needed to ensure the Incremental Construction GHG Emissions will be reduced to net zero as identified in the AEA.
- ▲ **Operational GHG Emissions** – Prior to obtaining residential and/or commercial building permits from Los Angeles County for each village or a portion of a village, the project applicant shall mitigate, through the GHG Reduction Plan, the Incremental Operational GHG Emissions, as required by MM 2-13. The project applicant shall provide documentation for the Incremental Operational GHG Emissions, based on the parameters (including the GHG Residential Ratio and GHG Operational Ratio) set forth in the applicable Village-Level CEQA Documentation, which will identify the GHG reduction needed to ensure the Incremental Operational GHG Emissions will be reduced to net zero as identified in the AEA.

¹¹ U.S. Environmental Protection Agency, "Overview of Greenhouse Gases: Methane Emissions," available at <https://www.epa.gov/ghgemissions/overview-greenhouse-gases#methane>, accessed: March 2017.

¹² CARB, Revised Proposed Short-Lived Climate Pollutant Reduction Strategy (November 2016) at 63.

¹³ *Id.*

By way of example, and assuming the maximum allowable development facilitated by the project occurs, the Incremental Operational GHG Emissions over the 30-year project life associated with such building permits that shall be reduced will be equal to the sum of: (1) the number of proposed residential units covered by the applicable building permit multiplied by 108.89 MTCO_{2e}; and (2) every TSF of proposed commercial development (including retail, light industrial, office, hotel and mixed-use buildings) covered by the applicable building permit multiplied by 506.86 MTCO_{2e}. As such, to obtain a building permit for 75 residential units and 40,000 square feet of commercial development, the Incremental Operational GHG Emissions requiring reduction would be: (75 units x 108.89 MTCO_{2e}/unit) + (40 TSF x 506.86 MTCO_{2e}/TSF) = 28,441 MTCO_{2e}.

As recognized above, the GHG Residential Ratio and GHG Commercial Ratio may vary for individual village-level development projects, as estimated in the Village-Level CEQA Documentation; in all cases, the Overall Project Emissions shall be reduced fully to net zero as identified in the AEA.

VI. COMPLIANCE OPTIONS – CONSTRUCTION AND VEGETATION CHANGE EMISSIONS

To satisfy MM 2-10 (Construction and Vegetation Change Emissions), prior to obtaining a grading permit from Los Angeles County for each village or a portion of a village, the project applicant shall mitigate the Incremental Construction GHG Emissions by relying upon one of the following two Compliance Options or a combination thereof.

Section VIII describes how the project applicant will verify completion of the Compliance Options. Section IX describes the performance standards that shall be achieved for GHG Mitigation Credits and Carbon Offsets prior to being issued and retired under such Approved Registry requirements.

Compliance Option VI-1 Undertake Direct Reduction Activities and Retire GHG Mitigation Credits

Under Compliance Option VI-1, prior to issuance of a grading permit, the project applicant will undertake or fund certain Direct Reduction Activities that result in the issuance of GHG Mitigation Credits.

Compliance Option VI-2 Purchasing Carbon Offsets Issued by Approved Registries on the Market

Under Compliance Option VI-2, prior to issuance of a grading permit, the project applicant will purchase and retire Carbon Offsets.

VII. COMPLIANCE OPTIONS – OPERATIONAL EMISSIONS

To satisfy MM 2-13 (Operational Emissions), prior to obtaining residential and/or commercial building permits from Los Angeles County, the project applicant shall mitigate the Incremental Operational GHG Emissions by relying upon one of the following three Compliance Options or a combination thereof.

Section VIII, below, describes how the project applicant will verify completion of the Compliance Options. Section IX below describes the performance standards that shall be achieved for GHG Mitigation Credits and Carbon Offsets prior to being issued and retired under such Approved Registry requirements.

Compliance Option No. VII-1**Undertake Direct Reduction Activities and Retire GHG Mitigation Credits**

Under Compliance Option No. VII-1, prior to obtaining a residential and/or commercial building permit, the project applicant will undertake or fund certain Direct Reduction Activities that result in the issuance of GHG Mitigation Credits.

Compliance Option No. VII-2**Undertake Direct Reduction Activities and Retire Carbon Offsets**

Under Compliance Option No. VII-2, prior to issuance of a residential and/or commercial building permit, the project applicant will undertake or fund certain Direct Reduction Activities that result in the issuance of Carbon Offsets.

Compliance Option No. VII-3**Purchasing Carbon Offsets Issued by Approved Registries on the Market**

Under Compliance Option No. VII-3, prior to issuance of a residential and/or commercial building permit, the project applicant will purchase and retire Carbon Offsets.

Consistent with MM 2-13, the project applicant may rely on Compliance Option No. VII-3, if necessary, as determined by the Los Angeles County Planning Director, if Compliance Options No. VII-1 and VII-2 are not reasonably available based on timing, availability, cost constraints or other relevant information, or to achieve compliance with the Locational Performance Standards set forth in Section X. The project applicant shall provide documentation to the Los Angeles County Planning Director that: (i) evidences the timing, availability or cost constraints that necessitate the use of Compliance Option No. VII-3; (ii) demonstrates that the timing issue, unavailability or cost constraints could not have been reasonably avoided; and (iii) demonstrates that the use of Compliance Option No. VII-3 is otherwise consistent with the requirements of this GHG Reduction Plan. Within 30 days of receipt of such documentation, the Planning Director shall make a determination. The Planning Director shall not impose additional conditions or mitigation measures on the project. If the Planning Director does not determine that reliance on Compliance Option No. VII-3 is necessary, the Planning Director shall inform the project applicant in reasonable detail of the basis of the Planning Director's finding. The project applicant may submit revised documentation to the Planning Director following such a determination by the Planning Director.

VIII. DEMONSTRATING COMPLIANCE WITH MM 2-10 AND MM 2-13

The project applicant shall demonstrate compliance with MM 2-10 (Construction and Vegetation Change Emissions) or MM 2-13 (Operational Emissions) in the manner described below.

Confirmation of Compliance Options No. VI-1 and VII-1

To demonstrate compliance with Compliance Options No. VI-1 and VII-1, the project applicant shall provide the following documentary evidence to Los Angeles County:

An attestation from an Approved Registry that the project applicant has retired a sufficient quantity of GHG Mitigation Credits to mitigate the Incremental Construction GHG Emissions or Incremental Operational GHG Emissions, as applicable, and that such GHG Mitigation Credits and the associated Direct Reduction Activities meet the performance standards set forth in Section IX of this GHG Reduction Plan.

Confirmation of Compliance Option No. VII-2 To demonstrate compliance with Compliance Option No. VII-2, the project applicant shall provide the following documentary evidence to Los Angeles County:

An attestation from an Approved Registry that the project applicant has retired a sufficient quantity of Carbon Offsets to mitigate the Incremental Operational GHG Emissions and that such Carbon Offsets and the associated Direct Reduction Activities meet the performance standards set forth in Section IX of this GHG Reduction Plan.

Confirmation of Compliance Options No. VI-2 and VII-3 To demonstrate compliance with Compliance Options No. VI-2 and VII-3, the project applicant shall provide the following documentary evidence to Los Angeles County:

An attestation from an Approved Registry that the project applicant has retired a sufficient quantity of Carbon Offsets to mitigate the Incremental Construction GHG Emissions or Incremental Operational GHG Emissions, as applicable, and that such Carbon Offsets meet the performance standards set forth in Section IX of this GHG Reduction Plan.

IX. PERFORMANCE STANDARDS FOR GHG MITIGATION CREDITS AND CARBON OFFSETS

A. GHG Mitigation Credits

GHG Mitigation Credits will be used to demonstrate compliance with MM 2-10 or MM 2-13 via Compliance Options No. VI-1 or VII-1, respectively. As further described below, each GHG Mitigation Credit shall be issued by an Approved Registry upon confirmation by an independent, accredited third party that the Direct Reduction Activities have been implemented, meet the Approved Registry's rules for issuing GHG Mitigation Credits, and are in accordance with the quantification methodology adopted by that Approved Registry for the applicable Direct Reduction Activity.

All GHG Mitigation Credits used by the project applicant to comply with MM 2-10 or MM 2-13 shall meet the performance standards identified in this Section.

1. ACCOUNTING, QUANTIFICATION AND REPORTING PERFORMANCE STANDARDS

Approved Registries, and the independent third parties acting under the oversight of Approved Registries, shall account for and quantify emission reductions and sequestration achieved by Direct Reduction Activities by drawing upon defined standards and incorporating principles of GHG emissions reduction accounting, including those set forth in the ISO 14064 and the WRI/WBCSD Greenhouse Gas Protocol for Project Accounting.¹⁴

Such standards, consistent with the ISO and WRI/WBCSD, are generally as follows¹⁵:

- ▲ **Transparency and Monitoring.** Approved Registries and independent third parties shall use clear information sufficient for reviewers to assess credibility of GHG emission reductions. Upon request by Los Angeles County, any governmental entity or any stakeholder, the Approved Registry shall provide the following information within a reasonable time period: the Direct Reduction Activities listed by the project applicant, the applicable quantification protocol, all third-party confirmation reports issued in connection

¹⁴ ISO, ISO 14064, Part 2: "Specification with guidance at the project level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements" (2005); WRI/WBCSD, "The GHG Protocol for Project Accounting" (2005).

¹⁵ See, e.g., WRI/WBCSD, "The GHG Protocol for Project Accounting" (2005) at 43-44.

with a Direct Reduction Activity and information about the issuance and retirement of GHG Mitigation Credits. Such information shall be sufficient to monitor compliance by the project applicant with this GHG Reduction Plan¹⁶.

- ▲ **Relevance.** Approved Registries and independent third parties shall use data, methods, criteria and assumptions that are appropriate for the applicable Direct Reduction Activity.
- ▲ **Completeness.** Approved Registries and independent third parties shall consider all relevant information that may affect the accounting and quantification of GHG emission reductions.
- ▲ **Consistency.** Approved Registries and independent third parties shall use data, methods, criteria and assumptions that are applied in the same manner across different Direct Reduction Activities to allow meaningful and valid comparisons.
- ▲ **Accuracy.** Approved Registries and independent third parties shall reduce uncertainty as much as practicable, erring on the side of conservativeness.
- ▲ **Conservativeness.** Approved Registries and independent third parties shall use conservative assumptions, values and procedures to ensure that GHG reductions or sequestration are not over-estimated, especially when uncertainty is high.

The Approved Registries shall comply with these performance standards in connection with the issuance of GHG Mitigation Credits.

2. DIRECT REDUCTION ACTIVITY ELIGIBILITY PERFORMANCE STANDARDS

To ensure environmental integrity, a Direct Reduction Activity resulting in GHG Mitigation Credits shall meet the following eligibility standards:

- ▲ **Additionality.** In compliance with CEQA Guidelines Section 15126.4(c)(3), the Direct Reduction Activities shall not otherwise be required, as provided for in A and B below. For purposes of this GHG Reduction Plan, the Direct Reduction Activities shall meet the following two performance standards¹⁷:
 - A. **Legal Requirement Test** – The Direct Reduction Activity shall not be required for GHG reduction by applicable law (i.e., statute, ordinance or regulation) in effect at the time of the initiation of such Direct Reduction Activity; and
 - B. **Performance Test** – The Direct Reduction Activity shall reduce GHG emissions below the applicable common industry practice for GHG reductions as in effect at the time of the initiation of such Direct Reduction Activity. The performance test for a particular Direct Reduction Activity shall be set in a protocol by an Approved Registry through analysis of standard practices and technology deployment in the applicable industry sector.
- ▲ **No Double Counting.** The Direct Reduction Activity shall not be concurrently listed, registered or earning credits under any other GHG reduction scheme.
- ▲ **Enforceable.** The project applicant shall implement the Direct Reduction Activity and retire associated GHG Mitigation Credits before using the GHG Mitigation Credits to obtain a grading permit or building permit from Los Angeles County in conformance with MM 2-10 and MM 2-13 and the Mitigation

¹⁶ Accreditation for independent third party reviewers will be consistent with existing recognized accreditation standards, as applied by an Approved Registry.

¹⁷ This standard is functionally similar to the “additionality” test applied to Carbon Offsets; CEQA does not directly incorporate the AB 32 cap-and-trade requirements since CEQA otherwise provides standards for ensuring the environmental integrity of mitigation measures. See California Natural Resources Agency, Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009) at 50.

Monitoring and Reporting Program, as applicable, for an incremental level of development covered by the project.

3. PROCEDURAL PERFORMANCE STANDARDS

In order to ensure that GHG Mitigation Credits satisfy the Accounting, Quantification and Reporting Performance Standards and Eligibility Performance Standards set forth in 1 and 2 above, any Approved Registry approving GHG Mitigation Credits shall implement credit processing standards substantially similar or equivalent to those set forth below:

- ▲ **Registration, Submittal and Listing.** The project applicant shall be required to set up an account with the Approved Registry, list the proposed Direct Reduction Activity with the Approved Registry and provide a proposed quantification methodology to be used for quantification of emission reductions from the Direct Reduction Activity. During this step, the Approved Registry shall conduct a technical review of the proposed Direct Reduction Activity and quantification methodology to ensure that it satisfies the requirements of this GHG Reduction Plan.
- ▲ **Approved Registry Accepts Methodology for Quantifying GHG Emissions Reductions from Direct Reduction Activity.** The project applicant's proposed quantification methodology shall contain a detailed quantification methodology for both baseline and Direct Reduction Activity emissions in order to calculate the estimated emission reductions associated with the Direct Reduction Activity. The quantification methodology shall describe how the proposed approach is suitably conservative to estimate emission reductions. As a result, the methodology shall be conservative in terms of estimating total GHG reductions achieved. The Approved Registry shall review the proposed quantification methodology and related documentation. If necessary, the Approved Registry shall engage appropriate third party experts to assist in reviewing the methodology. The Approved Registry will approve the methodology only after it has determined that the methodology is statistically and environmentally sound and in compliance with this GHG Reduction Plan.
- ▲ **Direct Reduction Activity Implementation.** The project applicant shall implement the Direct Reduction Activity.
- ▲ **Independent, Qualified Third-Party Confirmation of Reduction or Sequestration.** Once the Direct Reduction Activity has been implemented, the Approved Registry will require the project applicant to retain an independent, accredited¹⁸, third-party to confirm that the Direct Reduction Activity has been implemented and that the emission reductions have been quantified based on the approved methodology. The confirmation will take the form of a documentation review and a site visit assessment to confirm the implementation of the Direct Reduction Activity.
- ▲ **Issuance of GHG Mitigation Credits.** The Approved Registry shall review the third- party evaluation and data on implementation of the Direct Reduction Activity. If such evaluation and data complies with and confirms that the Direct Reduction Activity complies with this GHG Reduction Plan and the approved methodology, the Approved Registry shall issue a specific quantity of GHG Mitigation Credits into the project applicant's account. Each GHG Mitigation Credit shall be given a unique serial or tracking number to ensure there is no duplication or double-counting.
- ▲ **Retirement of GHG Mitigation Credits.** Upon request by the project applicant, the Approved Registry shall retire a specific quantity of GHG Mitigation Credits from the account of the project applicant. The Approved Registry shall provide documentation of such retirement in a form that can be provided by the project applicant to Los Angeles County so that the GHG Mitigation Credits can be used in connection with MM 2-10 and MM 2-13, including an attestation from the Approved Registry that the subject protocol used to implement the Direct Reduction Activity meets the performance standards identified in this Section IX. Once a GHG Mitigation Credit has been retired, the retirement is permanent and the GHG

¹⁸ Accreditation for independent third party reviewers will rely on existing recognized accreditation standards: ISO 14065 and ISO 14064-3.

Mitigation Credit cannot be further used in any manner. Los Angeles County shall be authorized to confirm the retirement of GHG Mitigation Credits with the applicable Approved Registry.

4. EXAMPLE GHG MITIGATION CREDIT PROGRAM

As an example of how the project applicant would receive GHG Mitigation Credits by installing clean cook stoves (as described in Section IV.B above) as a Direct Reduction Activity, the project applicant has initiated funding a pilot program in Zambia for the installation of clean cook stoves.

The subject pilot program provides for the construction of 5,000 clean cook stoves in Africa. The quantification methodology approved by the Approved Registry will estimate the time period that each stove will remain operational in the field and the annual quantity of GHG emission reductions that will result from the installation of the stove, based on evidence from similarly situated past installations and other factors. An independent third party will confirm the installation of the stoves in villages in Africa. Upon receipt of the technical report from the third party, the Approved Registry will review the documentation and determine its compliance with the approved quantification methodology. If confirmed by the Approved Registry, the Approved Registry will confirm the issuance of the GHG Mitigation Credit. For example, if the quantification methodology estimates that the stoves will remain operational for seven years and will result in 2 MTCO_{2e} per year, then the project applicant will receive 5,000 x 2 x 7 GHG Mitigation Credits (70,000 GHG Mitigation Credits) upon compliance with the Approved Registry requirements for issuance.

B. Carbon Offsets

To the extent that Compliance Options No. VI-2, VII-2, or VII-3 are utilized, to ensure the environmental integrity and transparency of the GHG Reduction Plan, the project applicant will be required to comply with the performance standards identified in this Section.

1. ACCOUNTING, QUANTIFICATION AND MONITORING PERFORMANCE STANDARDS

Carbon Offsets will be subject to the same Accounting, Quantification and Reporting Performance Standards as GHG Mitigation Credits, as set forth above in Section IX.A.1 above.

For the purposes of this GHG Reduction Plan, it has been determined that the existing program-level accounting and quantification standards adopted by the CAR, VCS, and ACR comply with these performance standards. These Approved Registries have incorporated the ISO Standards discussed above and/or the WRI/WBCSD Greenhouse Gas Protocol for Project Accounting into their existing carbon offset issuance programs¹⁹.

2. ELIGIBILITY PERFORMANCE STANDARDS

All Carbon Offsets used by the project applicant to comply with Compliance Options No. VI-2, VII-2, or VII-3 shall represent the past reduction or sequestration of GHG emissions (measured in MTCO_{2e}) achieved by a Direct Reduction Activity or any other GHG emission reduction activity that is not otherwise required (CEQA Guidelines § 15126.4(c)(3)). In addition, Carbon Offsets shall be real, additional, quantifiable, permanent, verifiable and enforceable²⁰.

For the purposes of this GHG Reduction Plan, it has been determined that the existing program-level environmental integrity standards adopted by the CAR, VCS, and ACR comply with these performance standards.

¹⁹ See, e.g., Climate Action Reserve, *Program Manual* (2015) at 4-5; American Carbon Registry, "Carbon Accounting," available at <http://americancarbonregistry.org/carbon-accounting/carbon-accounting>, accessed: Mar. 1, 2017; Verified Carbon Standard, *VCS Program Guide version 3.6* (2016) at 8.

²⁰ Cal. Health & Safety Code Section 38562(d)(1).

3. PROCEDURAL PERFORMANCE STANDARDS

In order to ensure that Carbon Offsets satisfy the Accounting, Quantification and Reporting Performance Standards and Eligibility Performance Standards set forth above, the rules and protocols of an Approved Registry that issues Carbon Offsets shall require that a Carbon Offset program follows procedural steps substantially similar or equivalent to the following to offset GHG emissions in order to generate Carbon Offsets that meet the requirements of this GHG Reduction Plan:

- ▲ **Listing or Registration.** The project proponent shall apply to list or register the proposed GHG emission reduction program with the Approved Registry, and the Approved Registry shall review the application and accept it only if it complies with the applicable Approved Registry requirements.
- ▲ **Independent, Qualified Third-Party Verification of Reduction or Sequestration.** Once a GHG emission reduction program has begun, the Approved Registry shall require the proponent to retain an independent, qualified third party to verify the reduction or sequestration achieved by the program. Each Approved Registry shall adopt stringent requirements applicable to the accreditation of third parties and only such third parties shall be qualified to verify and audit GHG emission reductions under the applicable Approved Registry rules. This process will typically take place on an annual basis, depending on the specific type of program. Approved Registry rules and protocols shall require “boots on the ground” audits, except that in certain instances documentation reviews may be sufficient, depending on the specific type of program.
- ▲ **Issuance of Carbon Offsets.** Approved Registry rules and protocols shall require the proponent to apply for issuance and to provide the verification report prepared by the independent, qualified third-party. The Approved Registry shall review a verification report and, to the extent that the Approved Registry finds that the report complies with the applicable Approved Registry requirements, the Approved Registry shall issue the Carbon Offsets to the account of the recipient.
- ▲ **Carbon Offset Retirement.** Each Approved Registry shall adopt rules and procedures governing the retirement or cancellation of Carbon Offsets. These rules or procedures involve the transfer of the Carbon Offset serial numbers from an Approved Registry account and will ensure that once a Carbon Offset has been retired, the retirement is permanent and the Carbon Offset cannot be further used in any manner.

For the purposes of this GHG Reduction Plan, it has been determined that the existing program- level procedural standards adopted by the CAR, VCS, and ACR comply with these performance standards.

X. LOCATIONAL PERFORMANCE STANDARDS

This Section X discusses the location of the measures, activities, and projects that the project applicant will implement or undertake to reduce the Overall Project Emissions to net zero. Section X.A sets forth the Locational Performance Standards. Section X.B establishes a mechanism that requires the project applicant to demonstrate compliance with the Locational Performance Standards.

A. Locational Performance Standards

The AEA demonstrates that implementation of Mitigation Measures 2-1 through 2-13 will reduce the Overall Project Emissions to net zero. As shown in Table 2.3-3 of the AEA, the project’s Overall Project Emissions are estimated to be 526,103 MTCO_{2e}/year. As shown in Table 2.3-4 of the AEA, Mitigation Measures 2-1 through 2-9, 2-11 and 2-12 (together, the “Local Measures”) reduce the Overall Project Emissions by 53%, or 281,271 MTCO_{2e}/year. The remaining 244,832 MTCO_{2e}/year of GHG reductions (the remaining 47%) are achieved by Mitigation Measures 2-10 and 2-13, which are governed by this GHG Reduction Plan.

The project applicant shall implement this GHG Reduction Plan so that, in the aggregate and taking into account all onsite and offsite reductions of the Overall Project Emissions achieved by Mitigation Measures 2-1 through 2-13, along with the additional electric vehicle charging stations identified in the Final AEA (“Additional EV Charging Stations”), the project shall meet, at full buildout, the Locational Performance Standards set forth below.

The project applicant shall be deemed to achieve 53% of the Overall Project Emissions reduction by implementing the Local Measures²¹ and shall be deemed to achieve the remaining 47% of the Overall Project Emissions reduction by implementing Mitigation Measures 2-10 and 2-13 per this GHG Reduction Plan. As stated above, taking into account the combination of all onsite and offsite reductions of the Overall Project Emissions achieved by Mitigation Measures 2-1 through 2-13, along with the Additional EV Charging Stations, the project, at full buildout, shall meet the following Location Performance Standards:

- ▲ **California Locational Performance Standard** – No less than 68% of the Overall Project Emissions reductions shall be achieved within the State of California through a combination of the Local Measures and implementation of Mitigation Measures 2-10, 2-13 and the Additional EV Charging Stations²².
- ▲ **United States Locational Performance Standard** – No less than 80% of the Overall Project Emissions reductions shall be achieved within the United States through a combination of the Local Measures and implementation of Mitigation Measures 2-10, 2-13 and the Additional EV Charging Stations.
- ▲ **International Locational Performance Standard** – No more than 20% of the Overall Project Emissions reductions shall be achieved outside of the United States.

The Locational Performance Standards will apply at the project level, not to an individual Village-Level Project²³. Compliance with the Locational Performance Standards shall be determined and enforced only as described in Section X.B.

Recognizing the International Locational Performance Standard as a point of emphasis for CDFW as lead agency, the project applicant will identify and implement comparable emissions reduction opportunities in California and the United States to reduce the use of international reductions below the 20% of the Overall Project Emissions reductions allowed by the International Locational Performance Standard, if such opportunities are reasonable after accounting for cost, availability, timing, and other relevant information. This determination shall be made by the project applicant, provided the reduction activities otherwise comply with the requirements of this GHG Reduction Plan.

B. Enforcement

Compliance with the Locational Performance Standards shall be determined and enforced only as described in Sections X.B.1 and X.B.2, below.

The project applicant shall provide GHG Mitigation Credits and/or Carbon Offsets to the Department of Regional Planning as provided by Mitigation Measures 2-10 and 2-13. (See Section VIII of the GHG Reduction Plan). The project applicant is not required to demonstrate compliance with the Locational Performance Standards to obtain grading or building permits, except as specifically stated below.

²¹ Based on the analysis presented in the AEA, implementation of the Local Measures achieves 53% of the Overall Project Emissions reductions for the Project. (See Draft AEA, Table 2-4). Although individual Village-Level projects may achieve greater than or less than a 53% reduction from the Local Measures, the AEA demonstrates that implementing the Local Measures achieves 53% of the Overall Project Emissions reductions for the entire Project at full buildout.

²² For purposes of determining the reduction value assigned to the Additional EV Charging Stations, each parking space that is served by an electric vehicle charging station shall be deemed to achieve 588 MTCO_{2e} reductions over a 30-year period.

²³ Due to variations in land use development patterns, a Village-Level Project may achieve higher or lower percentages of reductions than identified by the Locational Performance Standards. Because compliance with the Locational Performance Standards is required only at the Project level, no demonstration of compliance is required for a Village-Level Project.

1. LOCAL MEASURES

The Department of Regional Planning shall be responsible for enforcing implementation of the Local Measures and the Additional EV Charging Stations, to the extent each measure is applicable to individual Village-Level Projects.

2. LOCATIONAL PERFORMANCE STANDARDS

The Department of Regional Planning shall be responsible for enforcing implementation of Mitigation Measures 2-10 and 2-13 and compliance with the Locational Performance Standards as provided for in this Section X.B.2.

a. Annual Report (Informational Only)

Concurrent with the filing of the annual Mitigation, Monitoring and Reporting Program report to Los Angeles County, the project applicant shall deliver to CDFW and the Department of Regional Planning an informational report with the following information with respect to the previous annual period: (i) rough or bulk grading permits (whichever occurs first in time) for village level grading for the project or a portion thereof, and commercial and residential building permits (excluding tenant improvement, MEP, HVAC and other miscellaneous permits) for the project or a portion thereof, within the annual period, as provided for by Mitigation Measures 2-10 (construction and vegetation change emissions) and 2-13 (operational emissions), respectively; (ii) the GHG emissions reductions required by Mitigation Measures 2-10 and 2-13; and (iii) the GHG Mitigation Credits and/or Carbon Offsets retired by the project applicant, as provided by Mitigation Measures 2-10 and 2-13. No determination as to compliance with the Locational Performance Standards shall be made at the time of submittal of the annual report.

b. Locational Compliance Reports at Major Project Milestones

Within 3 months following the issuance of building permits for every 7,000 residential units or every 3 million square feet of commercial development, the project applicant shall prepare and submit to CDFW and the Department of Regional Planning a "Locational Compliance Report" that shall provide the following information for the project: (i) rough or bulk grading permits (whichever occurs first in time) for village level grading for the project or a portion thereof, and commercial and residential building permits (excluding tenant improvement, MEP, HVAC and other miscellaneous permits) for the project or a portion thereof, as provided for by Mitigation Measures 2-10 (construction and vegetation change emissions) and 2-13 (operational emissions); (ii) the GHG emissions reductions required by Mitigation Measures 2-10 and 2-13; (iii) the GHG Mitigation Credits and/or Carbon Offsets retired by the project applicant, as provided by Mitigation Measures 2-10 and 2-13; and (iv) the locational distribution of retired GHG Mitigation Credits and/or Carbon Offsets for the portion of the project development covered by the Locational Compliance Report, with the distribution showing the total GHG reductions achieved within California, within the United States and internationally.

c. Consistency Determination

If the Department of Regional Planning determines within 90 days following submission of the Locational Compliance Report that the distribution of retired GHG Mitigation Credits and/or Carbon Offsets for the portion of the project development covered by the Locational Compliance Report are not consistent with the Locational Performance Standards identified above in Section X.A, the Department of Regional Planning shall issue a written notice of non-consistency to CDFW and the project applicant that the Locational Performance Standards as required by Section X.A. have not been met. CDFW may request additional information about the basis for any consistency determination. If the Department of Regional Planning does not issue a notice on non-consistency within the 90-day period, the project applicant shall be deemed to be in compliance with the Locational Performance Standards.

The review of the Locational Compliance Report by the Department of Regional Planning shall be limited to this consistency determination. The Department of Regional Planning shall not impose additional conditions or mitigation measures on the project in connection with the consistency review or determination. The notice

of non-consistency shall provide in reasonable written detail the basis of the finding of non-consistency. Upon a finding of non-consistency, the project applicant may submit a revised Locational Compliance Report to the Department of Regional Planning addressing the issues of non-consistency for additional review by the Department of Regional Planning. Upon a finding of non-consistency, no (i) rough or bulk grading permits (whichever occurs first in time) for village level grading for the project or a portion thereof, or (ii) commercial and residential building permits (excluding tenant improvement, MEP, HVAC and other miscellaneous permits) shall be issued until the Department of Regional Planning has issued a notice that the Locational Performance Standards have been met.

Attachment S
SCAQMD, Draft Guidance
Document – Interim CEQA GHG
Significance Threshold



ATTACHMENT E

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold

October 2008

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Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

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APPENDIX B – Summaries of Working Group Meetings

P R E F A C E

This Draft *Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* document contains the proposed interim GHG significance threshold, rationale for developing the threshold, and details of the working group meetings and represents a work-in-progress of staff's efforts to date. This document will be updated as more information becomes available. For the staff recommendation to the Governing Board at the December 5, 2008 public hearing, please refer to Attachment A of Agenda Item Number 31.

Finally, to facilitate identifying changes to this Guidance Document since its release in October 2008, added text is underlined and deleted text is denoted with ~~striketrough~~ text.

LIST OF ACRONYMS AND ABBREVIATIONS

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
AB 32	Assembly Bill 32 Global Warming Solutions Act of 2006
AER	Annual Emission Reporting
AG	Attorney General
ARB	Air Resources Board
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Control Technology
BAU	Business as Usual
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAT	Climate Action Team
CCAR	California Climate Action Registry
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CPUC	California Public Utilities Commission
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FY	Fiscal Year
GHG	Greenhouse Gas
GGRP	Greenhouse Gas Reduction Plan
GP	General Plan
GWP	Global Warming Potential
IGR	Intergovernmental Review
IPCC	International Panel on Climate Change
ITE	Institute of Transportation Engineers
km	Kilometer
LNG	Liquefied Natural Gas
MMBTU	Million British Thermal Units
MND	Mitigated Negative Declaration
MMT CO _{2e}	Million Metric Tons Carbon Dioxide Equivalent
MW	Megawatts
N ₂ O	Nitrous Oxide
ND	Negative Declaration
NO _x	Oxides of Nitrogen
OPR	State Office of Planning and Research
PFC	Perfluorocarbon

List of Acronyms and Abbreviations (Concluded)

Acronym/ Abbreviation	Definition
PM	Particulate Mater
ROG	Reactive Organic Gas
RPS	Renewable Portfolio Standards
S-3-05	Executive Order S-3-05
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO _x	Sulfur Oxides
TAC	Toxic Air Contaminants
URBEMIS	Urban Emissions Model
VMT	Vehicle Miles Traveled

CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

Introduction

Purpose of This Guidance Document

California Environmental Quality Act and GHGs

Legal Authority

Contents of This Guidance Document

INTRODUCTION

The California Environmental Quality Act (CEQA) requires public agencies in California to analyze potential adverse impacts for proposed projects undertaken by a public agency, funded by a public agency, and requiring discretionary approval by a public agency. The fundamental purposes of CEQA are to inform governmental decision-makers and the public about the significant environmental effects of proposed activities, identify ways to avoid or significantly reduce environmental damage, use feasible alternatives or mitigation measures to avoid significant damage, and disclose to the public why a governmental agency approved a project if significant effects are involved (CEQA Guidelines §15002[a]). To disclose potential adverse impacts from a proposed project, pursuant to CEQA lead agencies typically prepare multidisciplinary environmental impact analysis and make decisions based on the analysis regarding the environmental effects of the proposed project (CEQA Guidelines §15002[a]).

In the past, air quality analyses tended to focus on potential adverse impacts from criteria pollutants and toxic air contaminants. Subsequent to the adoption of Assembly Bill (AB) 32 – The California Global Warming Solutions Act of 2006, lead agencies have increasingly faced legal challenges to their CEQA documents for failure to analyze greenhouse gases (GHGs) or making a determination of significance regarding GHG emission impacts.

Greenhouse gases are those gases that have the ability to trap heat in the atmosphere, a process that is analogous to the way a greenhouse traps heat. GHGs may be emitted as a result of human activities as well as through natural processes. As a result of human activities, such as electricity production, vehicle use, etc., GHGs have been accumulating in the earth's atmosphere at a faster rate than has occurred historically, i.e., prior to the Industrial Age starting approximately 150 years ago. Increasing GHG concentrations in the atmosphere are leading to global climate change.

The Intergovernmental Panel on Climate Change (IPCC) provided the first unequivocal evidence that global climate temperatures are increasing (2007a). Further, the primary driver of global climate change is increased emissions of GHGs due to human activities. According to the IPCC, there is very high confidence, based on more evidence from a wider range of species, that recent warming is strongly affecting terrestrial, marine, freshwater biological systems.

Carbon dioxide (CO₂) is the most important anthropogenic GHG because it comprises the majority of total GHG emissions emitted per year and it is very long-lived in the atmosphere. Annual emissions of CO₂ have increased approximately 80 percent between 1970 and 2004. In addition to CO₂, other GHG pollutants emitted directly as a result of human activities include methane (CH₄), nitrous oxide (N₂O) and halocarbons (a group of gases containing fluorine, chlorine or bromine). Without changes in current climate change mitigation policies and related sustainable

development practices, GHG emissions and global climate temperatures will continue to increase.

To prevent or minimize further increases in global temperatures resulting from increases in GHG emissions due to human activities, it is necessary to stabilize the concentration of GHGs in the atmosphere. Stabilizing GHGs in the atmosphere can only occur through reducing GHG emissions. Without further reductions in GHGs, increased global temperatures will surpass humans' and ecosystems' ability to adapt to these changing conditions (IPCC, 2007b).

In response to the increasing body of evidence that GHGs will continue to affect global climate, Governor Schwarzenegger issued executive order (EO S-3-05), which established the following greenhouse gas emission reduction targets for California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Subsequent to the Governor's issuance of EO S-3-05, the California State Legislature adopted Assembly Bill (AB) 32 – The California Global Warming Solutions Act of 2006. With the adoption of AB 32, the California State Legislature recognized the growing concern regarding changes to global climate resulting from increasing emissions of greenhouse gases (GHGs). AB 32 establishes a cap on statewide greenhouse gas emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emissions levels. Specifically, (AB 32) recognizes the serious threat to the “economic wellbeing, public health, natural resources, and the environment of California” that results from global warming. Consequently, AB 32 mandates a significant reduction in GHGs in order to contribute to efforts to stabilize atmospheric concentrations of GHGs. Under AB 32, greenhouse gases are defined as: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

In general, there is currently an absence of regulatory guidance with regard to analyzing GHG emission impacts in CEQA documents. Similarly, no public agency in California has formally adopted GHG significance thresholds. Recognizing the absence of guidance regarding analyzing and determining the significance of GHGs, the California Air Pollution Control Officers Association (CAPCOA) prepared a White Paper reviewing policy choices, analytical tools, and mitigation strategies for GHGs. In particular, the White Paper identifies a number of options for establishing GHG significance thresholds, but makes no formal recommendation of one approach over another.

Air districts typically act in an advisory capacity to local governments in establishing the framework for environmental review of air pollution impacts under CEQA. This may include recommendations regarding significance thresholds, analytical tools to estimate emissions and assess impacts, and mitigations for potentially significant impacts. Although districts will also address some of these issues on a project-specific basis as responsible agencies, they may provide general guidance to local governments on these issues.

Because of its expertise in establishing air quality analysis methodologies and comprehensive efforts to establish regional and localized significance thresholds for criteria pollutants, local public agencies have asked South Coast Air Quality Management District (SCAQMD) for guidance in quantifying GHG impacts and recommending GHG significance thresholds to assist them with determining whether or not GHG impacts in their CEQA documents are significant. As a result, SCAQMD staff has received requests from a number of public agencies and other stakeholders to provide guidance on analyzing GHG impacts and establishing a GHG significance threshold. In response to these requests from the various stakeholders, SCAQMD established a stakeholder working group to receive input on establishing a GHG significance threshold. In the meantime, SCAQMD staff has joined many other stakeholders urging CARB to establish a statewide threshold for GHGs. In the absence of a statewide threshold, SCAQMD staff will recommend its interim approach to the Governing Board for consideration and it will also become the SCAQMD's input to the statewide process.

PURPOSE OF THIS GUIDANCE DOCUMENT

The purpose of this Guidance Document, therefore, is to provide information on GHG legislation relative to CEQA, a brief summary of the Working Group process, development of the resulting staff-recommended interim GHG significance threshold proposal, and how to use it. This Guidance Document also provides information on the SCAQMD's authority to establish a GHG significance threshold pursuant to CEQA and some background information on GHGs and global climate change. This Guidance Document also discusses future efforts to further refine the interim GHG significance threshold as necessary, includes recommendations for analyzing GHG impacts using current modeling tools, and describes measures to mitigate GHG emission impacts.

CALIFORNIA ENVIRONMENTAL QUALITY ACT AND GHGS

- California Attorney General's Office

Subsequent to adopting AB 32, the California Attorney General's Office determined that GHG emissions contributing to global climate change also contribute to potential adverse environmental impacts that should be evaluated pursuant to the California Environmental Quality Act (CEQA). The Attorney General's Office has submitted numerous comment letters to lead agencies on their CEQA documents for failure to analyze GHG emissions, failure to make a significance determination, and failure to implement feasible mitigation measures to reduce GHG emissions to the maximum extent feasible.

For example, the California Attorney General, on behalf of the people of California, filed a legal challenge against the County of San Bernardino for failure to analyze "reasonably foreseeable" GHG emissions in the CEQA document prepared for its

General Plan update. The County reached a settlement with the Attorney General by committing to developing a GHG inventory and a plan for reducing GHGs.

Similarly, the California Attorney General submitted comments on the CEQA document for a refinery in northern California. Although GHG emissions were quantified, the Attorney General cited the failure of the lead agency to make a determination of significance relative to GHG emissions stating, “[E]ven if there is no established threshold in law or regulation, lead agencies are obligated by CEQA to determine significance. Neither CEQA, nor the regulations, authorize reliance on the lack of an agency-adopted standard as the basis for determining that a project’s potential cumulative impact is not significant.” In other words, the absence of a threshold does not in any way relieve lead agencies of their obligations to address GHG emissions from projects under CEQA. By not concluding whether or not a project is significant, the lead agency may be avoiding its responsibility to implement GHG mitigation measures.

- Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions

In August 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, “This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.” Specifically, SB 97 requires OPR, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the State Air Resources Board pursuant to the California Global Warming Solutions Act of 2006. SB 97 also identifies a limited number of types of projects that would be exempt under CEQA from analyzing GHG emissions. Finally, the legislation will be repealed on January 1, 2010.

- Office of Planning and Research Technical Advisory

Consistent with SB 97, on June 19, 2008, OPR released its *Technical Advisory on CEQA and Climate Change*, which was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (Cal/EPA), and the California Air Resources Board (CARB). According to OPR, the *Technical Advisory* offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by

type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project’s effects on climate change are “cumulatively considerable” even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

SB 375 (Steinberg) Transportation, Land Use, and the California Environmental Quality Act (CEQA)

On September 30, 2008, Governor Schwarzenegger signed into law SB 375 (Steinberg). SB 375 focuses on housing and transportation planning decisions to reduce fossil fuel consumption and conserve farmlands and habitat. This legislation is important to achieving AB 32 goals because greenhouse gas emissions associated with land use, which includes transportation, are the single largest sector of emissions in California. Further, SB 375 provides a path for better planning by providing incentives to locate housing developments closer to where people work and go to school, allowing them to reduce vehicle miles traveled (VMT) every year. The following bullet points summarize some of the main provisions of the bill.

- Require the regional governing bodies in each of the state’s major metropolitan areas to adopt, as part of their regional transportation plan, a “sustainable community strategy” that will meet the region’s target for reducing GHG emissions. These strategies would get people out of their cars by promoting smart growth principles such as: development near public transit; projects that include a mix of residential and commercial use; and projects that include affordable housing to help reduce new housing developments in outlying areas with cheaper land and reduce vehicle miles traveled (VMT).
- Create incentives for implementing the sustainable community strategies by allocating federal transportation funds only to projects that are consistent with the emissions reductions.
- Provide various forms of CEQA relief by allowing projects that are shown to conform to the preferred sustainable community strategy through the local general plans (and therefore contribute to GHG reduction) to have a more streamlined environmental review process. Specifically, SB 375 will change CEQA in two ways:
 - If a development is consistent with the sustainable community’s strategy and incorporates any mitigation measures required by a prior EIR, then the environmental review does not have to consider: a) growth-inducing impacts, or b) project-specific or cumulative impacts from cars on global warming or the regional transportation network.

- A narrowly-defined group of “transit priority projects” will be exempt from CEQA review.

LEGAL AUTHORITY

CEQA Guidelines §15022(a) states that a public agency shall adopt objectives, criteria, and specific procedures consistent with CEQA and these [State] Guidelines for administering its responsibilities under CEQA. CEQA Guidelines §15022(d) states further, “In adopting procedures to implement CEQA, a public agency may adopt the State CEQA Guidelines through incorporation by reference. The agency may then adopt only those specific procedures or provisions described in subsection [15022] (a) which are necessary to tailor the general provisions of the guidelines to the specific operations of the agency.” At the December 11, 1998 Public Hearing the SCAQMD’s Governing Board formally incorporated by reference the State CEQA Guidelines as the implementing guidelines for the SCAQMD’s CEQA program. Adopting GHG significance thresholds would be consistent with CEQA Guidelines §15022 provision to tailor a public agency’s implementing guidelines by adopting criteria relative to the specific operations of the SCAQMD.

Specifically with regard to thresholds of significance, CEQA Guidelines §15064.7(a) states, “Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.” Subsection (b) of the same section states further, “Thresholds of significance to be adopted for general use as part of the lead agency’s environmental review process must be adopted by ordinance, resolution, rule or regulation, and developed through a public review process and be supported by substantial evidence.” Staff’s recommended GHG significance threshold has undergone a public review process as part of stakeholder working group meetings that are open to the public. This Guidance Document provides the substantial evidence relative to the methodology for developing the interim GHG significance threshold. After completion of the public process, the proposed interim GHG significance threshold will be brought to the SCAQMD’s Governing Board at a public meeting, where it will be considered for adoption by resolution, consistent with CEQA Guidelines §15064.7(b). Staff’s proposed interim GHG significance threshold is a recommendation only for lead agencies and not a mandatory requirement. The GHG significance threshold may be used at the discretion of the local lead agency. However, if adopted the SCAQMD will use the interim GHG significance threshold for projects where it is the lead agency.

- Considerations When Establishing Significance Thresholds

No significance thresholds for GHG emissions have been developed, adopted, or endorsed statewide or at the local level¹. Air districts have primary authority under

¹ In response to comments submitted by the Attorney General’s Office on a dairy project, the San Joaquin Valley Air Pollution Control District (SJVAPCD) identified a significance threshold of 38,477 metric tons of

state law for "control of air pollution from all sources, other than emissions from motor vehicles" (H&SC §40000). The term air contaminant or "air pollutant" is defined extremely broadly, to mean "any discharge, release, or other propagation into the atmosphere" and includes, but is not limited to, soot, carbon, fumes, gases, particulate matter, etc. Greenhouse gases and other global warming pollutants such as black carbon would certainly be included in this definition. The U.S. Supreme Court held in *Massachusetts v. EPA* 549 U.S. 497 (2009) that greenhouse gases were clearly within the Federal Clean Air Act's broad definition of air pollutants. Therefore, air districts have the authority to regulate global warming pollutants primarily from non-vehicular sources, while pursuant to AB 32 CARB has authority over a wide range of sources, including vehicular sources.

Appendix G of the CEQA Guidelines provides a checklist of suggested environmental topics that should be addressed in a CEQA document. Questions under each environmental topic area are designed to elicit information on whether a project has the potential to generate significant adverse environmental impacts to that environmental topic area. However, neither the CEQA statutes nor the implementing Guidelines discuss or identify thresholds of significance or particular methodologies for performing an impact analysis. These tasks are left to a lead agency's judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable.

The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area (CEQA Guidelines §15064(b)). Further, in evaluating the significance of the environmental effect of a project, the Lead Agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project (§15064(d)). Significance conclusions must be based on substantial evidence, which includes facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines §15064(f)(5)).

Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects. A threshold of significance is essentially a regulatory standard or set of criteria that represent the level at which a lead agency finds a particular environmental effect of a project to be significant. Specifically, a threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant

carbon dioxide equivalent per year (MT CO₂eq./yr). According to SJVAPCD staff, the agency currently has no plans to formally adopt this significance threshold through a public process.

by the agency and compliance with which means the effect normally will be determined to be less than significant (§15064.7(a)).

Even in the absence of clearly defined significance thresholds for GHG emissions, the California Attorney General has advised that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact.

CONTENTS OF THIS GUIDANCE DOCUMENT

The following subsections provide brief summaries of the chapters contained in this guidance document.

- Summaries of Chapter 1

Chapter 1 is the introductory chapter of this document that contains general background information on GHGs and the determination that GHGs must be analyzed in CEQA documents. There is also information on CEQA legislation related to GHGs and global climate change. Finally, the chapter contains information on the legal authority that allows the SCAQMD to adopt significance thresholds for the purpose of determining the severity of impacts analyzed in CEQA documents

- Summaries of Chapter 2

Chapter 2 contains more detailed background information on GHG emissions relative to global climate change, both internationally and nationally. This chapter also provides more detailed information on legislation to reduce GHG house gas emissions, e.g., Assembly Bill 32 – the Global Warming Solutions Act of 2006, etc. Finally, Chapter 2 contains information on early guidance on evaluating GHG emissions in CEQA documents.

- Summaries of Chapter 3

Chapter 3 contains information on the working group established by the SCAQMD to provide feedback to staff on the development of an interim GHG significance threshold. The chapter also includes discussions on considerations in establishing an interim GHG significance threshold and describes the current staff proposal for an interim GHG significance threshold.

- Summaries of Chapter 4

Chapter 4 contains general recommendations for analyzing GHG emissions in CEQA documents.

- Summaries of Chapter 5

In Chapter 5 it is assumed that the SCAQMD Governing Board will adopt staff's proposed interim GHG significance threshold. Therefore, this chapter discusses future action items, including outreach to interested stakeholders, compiling lists of applicable GHG design features and mitigation measures, and periodic review and update, as necessary of the interim GHG significance threshold.

CHAPTER 2

BACKGROUND INFORMATION ON GHGS

General Background Information

Legislative Background – California

Initial Guidance on Evaluating GHGs Pursuant to CEQA

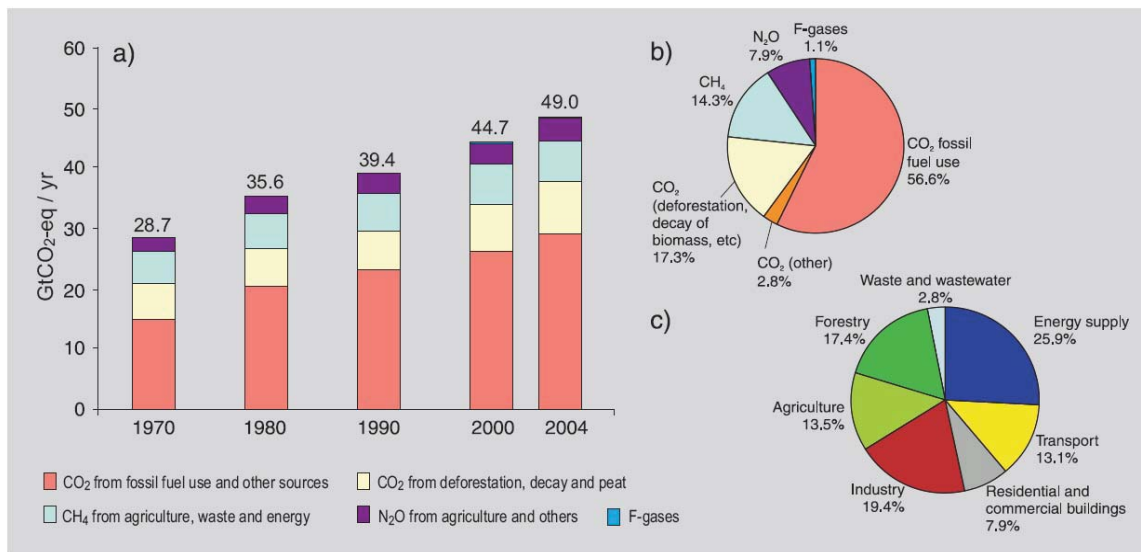
GENERAL BACKGROUND INFORMATION ON GHGS

- Intergovernmental Panel on Climate Change

In the last few years information and data have been compiled that demonstrate unequivocally that increases in average global air and ocean temperatures are occurring (IPCC, 2007a). For example, 11 of the last 12 years (1995-2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850). The temperature increase is widespread over the globe and is greater at higher northern latitudes. Further, increases in sea level are consistent with global warming. For example, global average sea level rose at an average rate of 1.8 [1.3 to 2.3]mm per year over 1961 to 2003 and at an average rate of about 3.1 [2.4 to 3.8]mm per year from 1993 to 2003. According to the IPCC (2007b), there is very high confidence, based on more evidence from a wider range of species, that recent warming is strongly affecting terrestrial, marine, and freshwater biological systems.

One of the major drivers in global climate change has been directly linked to the increase in greenhouse gas (GHG) emissions due to human activities worldwide (Figure 2-1). Carbon dioxide (CO₂) is the most important anthropogenic GHG. Annual CO₂ emissions have increased approximately 80 percent between 1970 and 2004 (IPCC, 2007b)

Figure 2-1
Global Anthropogenic GHG Emissions



Source – IPCC, 2007b: (a) Global annual emissions of anthropogenic GHGs from 1970 to 2004.5 (b) Share of different anthropogenic GHGs in total emissions in 2004 in terms of CO₂-eq. (c) Share of different sectors in total anthropogenic GHG emissions in 2004 in terms of CO₂-eq. (Forestry includes deforestation.) {WGIII Figures TS.1a, TS.1b, TS.2b}

Human activities have been responsible for substantial increases in four long-lived GHGs, including: CO₂, methane (CH₄), nitrous oxide (N₂O) and halocarbons (a group of gases

containing fluorine, chlorine or bromine). Global increases in CO₂ concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. It is very likely that the observed increase in CH₄ concentration is predominantly due to agriculture and fossil fuel use. The increase in N₂O concentration is primarily due to agriculture (IPCC, 2007).

According to the IPCC (2007), for the next couple of decades global temperatures are expected to rise approximately 0.2° C per decade under a variety of scenarios. Further, global temperatures are expected to continue for centuries as a result of human activities due to the time scales associated with climate processes and feedbacks, even if GHG concentrations are stabilized. As a result, based on the current understanding of climate-carbon feedback, model studies show that substantial GHG emission reductions are necessary to avoid substantial increases in global air and ocean temperatures.

LEGISLATIVE BACKGROUND – CALIFORNIA

California has taken a leadership role in not only recognizing the future impacts to global climate change from anthropogenic sources of GHG emissions, but in establishing policies and adopting laws to substantially reduce GHG emissions by 2050. In addition to the GHG legislation related to CEQA described in Chapter 1, California has adopted the following policies and laws that specifically address reducing GHG emissions.

- Governor Schwarzenegger’s Executive Order (June 2005)

In June 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which establishes greenhouse gas emission reduction targets in response to projected increases in global air and ocean temperatures. Specifically, EO S-3-05 establishes the following three GHG emission reduction targets:

- Reduce GHG emissions to 2000 emission levels by 2010;
- Reduce GHG emissions to 1990 emission levels by 2020; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

Further, EO S-3-05 charges the California Environmental Protection Agency (CalEPA) secretary to coordinate with the Secretary of the Business, Transportation and Housing Agency, Secretary of the Department of Food and Agriculture, Secretary of the Resources Agency, Chairperson of the CARB, Chairperson of the Energy Commission and President of the Public Utilities Commission to develop a Climate Action Plan. EO S-3-05 also charges the Secretary of CalEPA with the oversight of efforts to meet the above GHG emission reduction targets and the responsibility to prepare biannual reports on progress in meeting the GHG emission reduction targets.

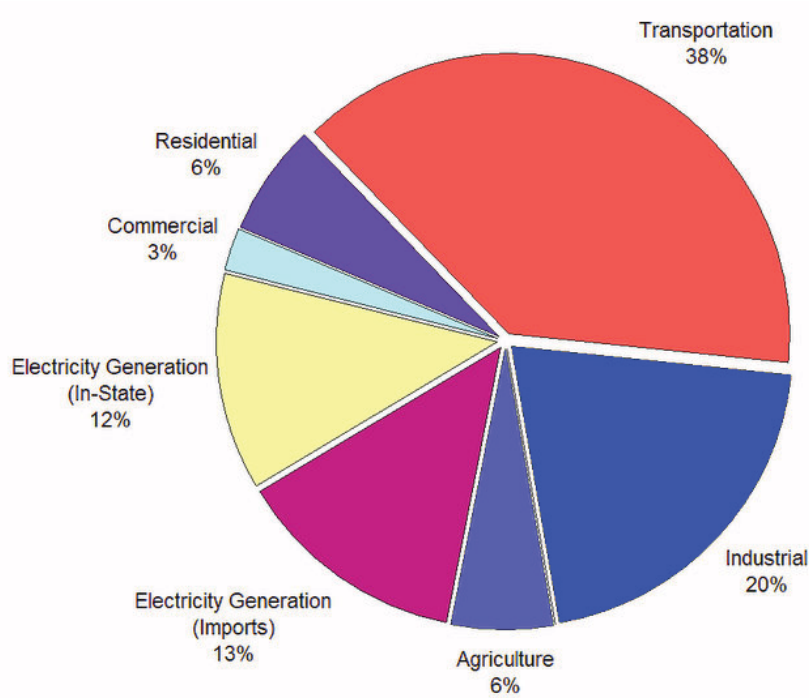
- Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32)

The Global Warming Solutions Act of 2006 (AB 32) was adopted by the California State Legislature in 2006. AB 32 assigns CARB the responsibilities of monitoring and reducing GHG emissions. Specifically, AB 32 requires CARB to:

- Establish a statewide greenhouse gas emissions cap for 2020, based on 1990 emissions, by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of greenhouse gases by January 1, 2009;
- Adopt a plan by January 1, 2009, indicating how emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions;
- Adopt regulations by January 1, 2011, to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas, including provisions for using both market mechanisms and alternative compliance mechanisms;
- Convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee to advise CARB;
- Ensure public notice and opportunity for comment for all CARB actions;
- To adopt rules for “sources” including non-vehicular; and
- Prior to imposing any mandates or authorizing market mechanisms, CARB must evaluate several factors, including but not limited to impacts on California's economy, the environment and public health; equity between regulated entities; electricity reliability; conformance with other environmental laws, and must ensure that the rules do not disproportionately impact low-income communities.

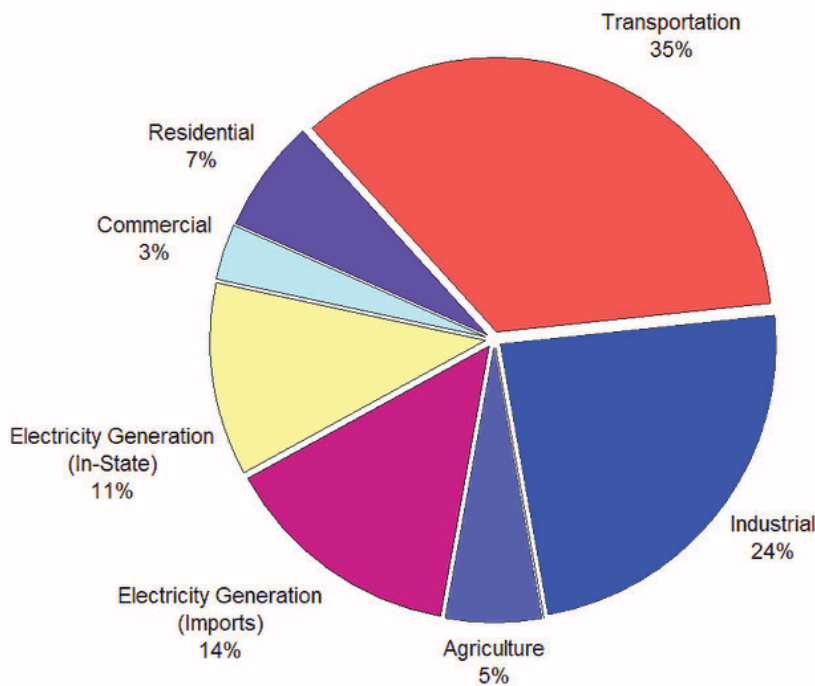
According to the schedule of milestones laid out in AB 32, CARB has made progress in the following areas. Consistent with AB 32's requirement to establish a GHG emission inventory, in December 2007 CARB adopted the California Greenhouse Gas Emission Inventory. The Inventory accounts for all GHG emissions within the state of California and supports the AB 32 Climate Change Program. Figure 2-2 shows CARB's inventory for the year 2004. The Inventory also serves as the basis for developing future year GHG emission forecasts necessary to support measure development and Scoping Plan recommendations. ARB staff has developed a year 2020 “business-as-usual” (BAU) forecast of GHG emissions for use in developing the Draft Scoping Plan. Figure 2-3 shows CARB's inventory for the year 2020, which is AB 32's target inventory.

Figure 2-2
2004 GHG Emissions by Sector (Gross Emissions: 484.4 MMT CO₂eq.)



Source: CARB, 2007

Figure 2-3
1990 GHG Emissions by Sector (Gross Emissions: 433.3 MMT CO₂eq.)



Source: CARB, 2007

On December 6, 2007, the Air Resources Board (ARB) approved a regulation for the mandatory reporting of greenhouse gas emissions from major sources, pursuant to AB 32. The mandatory reporting regulation specifies the types of facilities that must report their GHG emissions, requirements for reporting and estimating the GHG emissions, and requirements for emissions verification. Upon adoption, the CARB Board directed staff to make other conforming modifications, as may be appropriate, based on comments received. Subsequent to adoption, the mandatory reporting regulation has undergone two sets of modifications.

Consistent with the requirement to develop a scoping plan indicating how GHG emission reductions will be achieved through regulations, market mechanisms, and other actions, the Draft Scoping Plan was released for public review and comment on June 26, 2008, followed by workshops in July and August, 2008.

The Draft Scoping Plan calls for achievable GHG emission reduction in California's carbon footprint to 1990 levels. Reducing greenhouse gas emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 10 percent from today's levels. Key elements of CARB's preliminary recommendation for reducing California's greenhouse gas emissions to 1990 levels by 2020 contained in the Draft Scoping Plan include the following:

- Expansion and strengthening of existing energy efficiency programs and building and appliance standards;
- Expansion of the Renewables Portfolio Standard for electricity generation to 33 percent;
- Development of a California cap-and-trade program that links with other WCI Partner programs to create a regional market system;
- Implementation of existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Targeted fees to fund the State's long-term commitment to AB 32 administration.

The Scoping Plan is expected go to the CARB Board for adoption in November, 2008.

INITIAL GUIDANCE ON EVALUATING GHGS PURSUANT TO CEQA

As noted in Chapter 1, both the California Attorney General's Office and the OPR determined that GHG emissions contributing to global climate change have the potential to generate adverse environmental impacts that should be evaluated pursuant to CEQA. Until recently, however, there has been little or no guidance relative to analyzing GHG emissions in CEQA documents or determining significance. The first explicit guidance was provided by the Association of Environmental Professionals (AEP) in its White Paper on Global Climate Change (AEP, 2007) and the White Paper on CEQA and Climate Change prepared by the California Air Pollution Control Officers Association (CAPCOA, 2008). The content of each of these White Papers is summarized in the following subsections.

- Association of Environmental Professionals – White Paper on Global Climate Change

AEP's White Paper (AEP) was one of the first attempts to discuss GHGs in the context of CEQA. The intent of the White Paper was to provide practical, interim information to CEQA practitioners and to help Lead Agencies determine how to address GHGs and global climate change in CEQA documents prior to the development and adoption of guidance by appropriate government agencies. Further, AEP's White Paper provided a summary of the current regulatory environment surrounding GHG emissions, and the various approaches that a Lead Agency may select in a CEQA document to address the potential impacts of global climate change and a project's cumulative contribution to GHG. The White Paper described several approaches for addressing GHGs and global Climate Change in CEQA documents, but did not recommend a single approach or methodology, leaving that decision to local Lead Agencies. The AEP White Paper identified eight approaches for analyzing GHGs and global climate change, which are summarized in the following bullet points.

- **Approach 1 – No Analysis:** under this approach the Lead Agency would not mention or discuss GHGs or global climate change.
- **Approach 2 – Screening Analysis:** under this approach the Lead Agency would establish a process to screen projects and determine that they would not make significant contributions to GHG emissions or GCC and, therefore, would not need to mitigate accordingly.
- **Approach 3 – Qualitative Analysis without Significance Determination:** this approach involves a qualitative discussion of GHGs and global climate change and potential ways the project will contribute to the generation of GHG emissions, but does not provide any significance conclusions.
- **Approach 4 – Qualitative Analysis with Significance Determination:** under this approach the Lead Agency would qualitatively discuss GHGs and climate change impacts and conclude that the project impacts are significant.
- **Approach 5 – Quantitative Analysis without Significance Determination:** under this approach the Lead Agency would quantify GHG emissions from the proposed project, but the results are not compared to a quantitative significance threshold.
- **Approach 6 – Quantitative Analysis with Net Zero Threshold:** this approach involves quantifying GHG emissions and using zero net carbon dioxide equivalent increase as the threshold.
- **Approach 7 – Quantitative Analysis Relative to California GHG Emission Reduction Strategies:** this approach employs both quantitative and qualitative components. The quantitative analysis contains an inventory of project GHG emissions. The qualitative component involves project compliance with the emission reduction strategies contained in the California Climate Action Team's (CAT) Report to the Governor, which contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.
- **Approach 8 – Use of Partial Exemption, “Within the Scope” of a Program EIR, or Tiering:** this option relies on the preparation of a broad EIR on a plan, program, or zoning action that is certified and contains a cumulative GHG and global climate change

impact analysis and mitigation. A later project that is consistent with the actions, goals, and/or policies in that plan, program, or zoning action need not again evaluate the cumulative impact regarding the project's GHG contribution to global climate change. In this situation, the later project may use the "partial exemption" provision of Public Resources Code §21083.3 and CEQA Guidelines §15183.

Since the date that the AEP White Paper was finalized (June, 2007), it has become clear that any of the above eight options that do not include quantification of GHG emissions and a determination of significance would be vulnerable to legal challenge. In addition, with the exception of the net zero approach in option 6, none of the options evaluated identify potential GHG significance thresholds. Approaches to developing GHG significance thresholds were specifically addressed in CAPCOA's White Paper (CAPCOA, 2008).

- California Air Pollution Control Officers Association – White Paper: CEQA and Climate Change

The intent of CAPCOA's White Paper is to serve as a resource for public agencies as they establish procedures for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers three alternative programmatic approaches toward determining whether GHG emissions are significant. Although the White Paper considers an option of not establishing a GHG significance threshold, as already noted this option is not considered to be a viable approach and will not be considered further. Ultimately, the White Paper is intended to provide consistent approaches for public agencies to ensure that GHG emissions are appropriately considered and addressed under CEQA.

The CAPCOA White Paper identifies three programmatic approaches to establishing GHG significance thresholds and also discusses the benefits and problems associated with each approach. Each approach has inherent advantages and disadvantages. The three basic approaches are:

- No significance threshold for GHG emissions (not discussed further);
- GHG emissions threshold set at zero; or
- GHG threshold set at a non-zero level, two approaches.

The following subsections briefly summarize two of the three major programmatic approaches developed by CAPCOA.

- Zero Threshold

An air district or lead agency may determine that any degree of project-related increase in GHG emissions would contribute considerably to climate change which, therefore, would be considered a significant impact. As a result, the air district or lead agency could adopt a zero-emission GHG threshold. If the zero threshold option is chosen, the lead agency would be required to quantify and mitigate GHG emissions for all projects subject to CEQA, regardless of the size of the project or the availability of GHG reduction measures available to reduce the project's emissions. Projects that could not meet the zero-emission threshold would be required to undergo an environmental impact report (EIR) CEQA process to disclose the unmitigable significant impact, and develop the justification for a statement of overriding consideration to be adopted by the lead agency.

CAPCOA notes in the White Paper that if an air district or lead agency elects to adopt a zero threshold approach, it should consider the administrative costs and the environmental review system capacity. Some projects that previously would have qualified for an exemption could require further substantial analysis, including preparation of a Negative Declaration (ND), a Mitigated Negative Declaration (MND) or an EIR. Moreover, the trade-offs between the volume of projects requiring review and the quality of consideration given to reviews should be considered. It may also be useful to consider whether meaningful mitigation can be achieved from smaller projects.

-Approach 1: Non-Zero Threshold – Statute and Executive Order Approach

According to CAPCOA, a non-zero GHG significance threshold could minimize the resources spent reviewing environmental analyses that do not result in real GHG reductions or to prevent the environmental review system from being overwhelmed. The practical advantages of considering non-zero thresholds for GHG significance determinations can fit into the concept regarding whether the project’s GHG emissions represent a “considerable contribution to the cumulative impact” and therefore warrant analysis.

The first non-zero GHG significance threshold approach is based on achieving the objectives of AB 32 or executive order EO S-3-05 and explores four possible options under this scenario. A project would be required to meet the target objectives, or reduce GHG emissions to the target objectives, to be considered less than significant. The options under this approach are variations of ways to achieve the 2020 goals of AB 32 from new development, which is estimated to be about a 30 percent reduction from business-as-usual. Table 2-1 summarizes the four statute and executive order approaches identified by CAPCOA. SCAQMD staff has identified and included in Table 2-1 potential pros and cons identified for each option.

-Approach 2: Non-Zero Threshold – Tiered Threshold Options

The second non-zero GHG significance threshold approach is comprised of a number of tiered GHG significance threshold options. Within this option, the CAPCOA White Paper discusses seven variations. The tiered threshold options offer both quantitative and qualitative approaches to setting a threshold, as well as different metrics for establishing the various tiers. Variations range from setting the first tier at zero to second tiers set at defined emission levels or based on the size of a project. This approach would then prescribe a set of GHG mitigation strategies that would have to be incorporated into the project in order for the project to be considered less than significant. CAPCOA notes that some applications of the tiered threshold approach may require inclusion in a General Plan or adoption of enabling regulations or ordinances to render them fully effective and enforceable. The various tiered threshold options are summarized in Table 2-2. SCAQMD staff has identified and included in Table 2-2 potential pros and cons identified for each option.

Table 2 – 1
Statute and Executive Order Approach

Threshold Number	Description of Threshold	Pros*	Cons*
1.1	<p>Project must reduce emissions compared to business as usual to be less than significant, two approaches:</p> <p>a. Project must reduce GHG emissions 33 percent compared to business-as-usual (BAU) (2020 target), or</p> <p>b. Project must reduce GHG emissions 80 percent compared to business-as-usual (2050 target).</p>	<ul style="list-style-type: none"> • Could reduce resource impacts compared to zero threshold, as not every project would require an EIR • Would achieve GHG reductions consistent with AB 32 • A single threshold is easier to apply and understand 	<ul style="list-style-type: none"> • Could be viewed as setting a de minimis level • Fewer projects would trigger significance, thus, less mitigation • BAU should be defined by CARB • BAU may be difficult to define for all projects
1.2	<p>All new projects must reduce GHG emissions compared to BAU by a uniform percentage to be considered less than significant, e.g., 50 percent.</p>	<ul style="list-style-type: none"> • Same as 1.1 • May produce greater percent reduction of GHGs • Single threshold easier to apply & understand 	<ul style="list-style-type: none"> • Could produce substantially greater GHG reductions than 1.1, but may be difficult to achieve • BAU should be defined by CARB • BAU may be difficult to define for all projects

* Pros and cons reflect only SCAQMD staff's evaluation of the approaches.

Table 2 – 1 (Concluded)
Statute and Executive Order Approach

Threshold Number	Description of Threshold	Pros*	Cons*
1.3	Projects must reduce GHG emissions compared to business-as-usual by a uniform percentage based on economic sector to be less than significant, i.e., different reductions required for different market sectors.	<ul style="list-style-type: none"> • Sector-specific approach may be more appropriate approach • Would take into account costs & available control technologies • Avoids over- or under-regulation of GHGs per sector 	<ul style="list-style-type: none"> • Requires extensive information on emission inventories • Requires extensive information on control technologies • Difficult to determine percent reduction by sector • Because of information requirements, may be more viable in the long term
1.4	Uniform GHG emission reduction by region. Regional GHG reduction plan developed consistent with AB32 emission reductions, e.g., reduce GHG emissions 33% or 80% compared to BAU. A project is not significant if its GHG emissions are consistent with plan.	<ul style="list-style-type: none"> • Could tailor GHG reductions to specific regional needs • GHG reduction strategies could be integrated into regional plans 	<ul style="list-style-type: none"> • Would need to establish GHG regions • Requires extensive information on regional emission inventories • Because of the need to develop a regional plan, may be a more viable interim approach

* Pros and cons reflect only SCAQMD staff's evaluation of the approaches.

Table 2 – 2
Tiered Threshold Options

Threshold Number	Description of Threshold	Pros*	Cons*
2.1	This threshold employs a decision tree approach. Tier 1, no increase in GHG emissions, not significant (zero threshold). If GHG emissions greater than zero, tier two, use one of the following threshold options.	<ul style="list-style-type: none"> • Tiered approach allows flexibility by establishing multiple thresholds to cover a wide range of projects • Tier 2 may minimize administrative burden & costs • Tiers could be set at different levels depending on GHGs, size & other project characteristics • Projects exceeding tier 2 must implement mitigation 	<ul style="list-style-type: none"> • Tier 1 may increase administrative burdens & costs • There may not be meaningful mitigation for small projects • Available mitigation may consist of purchasing offsets • EJ concerns of purchasing offsets because of associated criteria pollutant emissions • Offset markets not well established
2.2	Establish a quantitative threshold based on capturing a percentage, e.g., 90%, of future discretionary projects, CAPCOA's threshold is 900 metric tons CO ₂ eq per year (equivalent to 50 houses or 30,000 square feet of commercial space, i.e., CAPCOA assumes 90% of all projects are this size or greater). Projects less than this would not be significant.	<ul style="list-style-type: none"> • Would capture a larger percentage of projects in the district than is currently the case • Would exclude small projects from further GHG analysis • Single threshold easier to apply & understand 	<ul style="list-style-type: none"> • Would increase administrative & cost burden, especially in developing & moderate growth areas • May not be amenable to industrial projects because of the diversity of these projects • There may not be meaningful mitigation for small projects

* Pros and cons reflect only SCAQMD staff's evaluation of the approaches.

Table 2 – 2 (Continued)
Tiered Threshold Options

Threshold Number	Description of Threshold	Pros*	Cons*
2.3	This threshold is based on CARB’s proposed mandatory reporting threshold of 25,000 metric tons of CO ₂ eq per year. Alternatively, use the Market Advisory Committee of 10,000 metric tons of CO ₂ eq per year. Projects less than either would not be significant.	<ul style="list-style-type: none"> • CARB estimates this threshold would capture 90 % of all industrial projects • Single threshold easier to apply & understand 	<ul style="list-style-type: none"> • May not be amenable to industrial projects because of the diversity of these projects • There may not be meaningful mitigation for small projects
2.4	<p>This approach establishes a GHG threshold based on and analogous to a NO_x/VOC criteria pollutant CEQA significance threshold and is established using the following four steps:</p> <p>a. Define NO_x/VOC CEQA thresholds in tons per year (e.g., 10 t/yr)</p> <p>b. Define the regional NO_x/VOC inventory in tons per year (e.g., annual NO_x inventory for 2005 from 2007AQMP ~ 375,585 t/yr)</p> <p>c. Calculate percentage of NO_x/VOC inventory the significance threshold represents ($10 / 375,585 = 0.00003$) to obtain “minimum percentage of regulated inventory” for NO_x/VOC.</p>	<ul style="list-style-type: none"> • Single threshold easier to apply & understand 	<ul style="list-style-type: none"> • Threshold cumbersome to derive • Threshold would change periodically as inventory goes up or down • Could have widely divergent thresholds by air basin because of varying inventories

* Pros and cons reflect only SCAQMD staff’s evaluation of the approaches.

Table 2 – 2 (Continued)
Tiered Threshold Options

Threshold Number	Description of Threshold	Pros*	Cons*
2.4 (Cont.)	d. Define California GHG emission inventory for 2004 in tons CO ₂ eq per year (499 MMT CO ₂ eq). Apply minimum percentage of regulated inventory to California GHG inventory for 2004 to develop a GHG threshold analogous to the CEQA Threshold (e.g., 0.00003 x 499 MMT = 14,970 metric tons CO ₂ eq per year = significance threshold).	•	•
2.5	Establish quantitative unit-based thresholds based on capturing a percentage, e.g., 90%, of future discretionary projects in specific market sectors (similar to 2.2 above). CAPCOA examples include: <ul style="list-style-type: none"> • 30,000 square-foot (SF) office = 800 metric tons CO₂eq per year; • 30,000 SF retail = 2,500 metric tons CO₂eq per year; • 30,000 SF supermarket = 43,000 metric tons CO₂eq per year. 	<ul style="list-style-type: none"> • Would capture a larger percentage of projects in the district than is currently the case • Would exclude small projects from further GHG analysis • Single threshold easier to apply & understand 	<ul style="list-style-type: none"> • Would increase administrative & cost burden, especially in developing & moderate growth areas • May not be amenable to industrial projects because of the diversity of these projects • There may not be meaningful mitigation for small projects

* Pros and cons reflect only SCAQMD staff's evaluation of the approaches.

Table 2 – 2 (Concluded)
Tiered Threshold Options

Threshold Number	Description of Threshold	Pros*	Cons*
2.6	<p>This threshold would include tiered CEQA thresholds based on CEQA’s definition of “projects with statewide, regional or areawide significance (§15206(b)), which include:</p> <ul style="list-style-type: none"> • Residential development > 500 dwellings • Shopping center or business establishment employing > 1,000 persons or > 500,000 SF • Commercial office building employing >1,000 persons or > 250,000 SF • Hotel/motel > 500 rooms • Industrial, manufacturing or processing plant or industrial park employing > 1,000 persons or > 600,000 SF 	<ul style="list-style-type: none"> • Could capture up to 50% of all future commercial development 	<ul style="list-style-type: none"> • May capture substantially less than 50% if future development, resulting less GHG mitigation • Percentage capture of industrial/manufacturing projects currently unknown
2.7	<p>Efficiency-based thresholds would be based on measurements of efficiency compared to intensity. Must be based on reasonable GHG emissions compared to business-as-usual.</p>	<ul style="list-style-type: none"> • Would benchmark GHG intensity against target levels of efficiency • Thresholds established to provide future foreseeable GHG reductions compared to BAU • Would support AB 32 target objectives 	<ul style="list-style-type: none"> • Would require substantial data & possibly modeling • May be more appropriate as a threshold in the long term

* Pros and cons reflect only SCAQMD staff’s evaluation of the approaches.

CHAPTER 3

INTERIM GHG SIGNIFICANCE THRESHOLD STAFF PROPOSAL

Introduction

GHG Analysis Considerations

Current Staff Interim GHG Significance Threshold Proposals

INTRODUCTION

Because GHG emissions affect global climate, some have argued that it may be more appropriate for national or state agencies to establish significance thresholds or GHG emission reduction target objectives. However, no agency has established GHG significance thresholds that could assist Lead Agencies with determining the significance of GHG emissions in CEQA documents. In the absence of statewide guidance on this issue and in response to requests from a variety of stakeholders, the SCAQMD established a GHG Significance Threshold Stakeholder Working Group (Working Group) to establish an interim GHG significance threshold until such time as the state establishes a GHG significance threshold or provides recommended guidance on establishing a GHG significance threshold. Staff's goal is to reach consensus regarding an interim GHG significance threshold to the extent possible and take the staff proposal to the SCAQMD Governing for consideration and approval.

The Working Group was formed to assist staff's efforts to develop an interim GHG significance threshold and is comprised of a wide variety of stakeholders including: state agencies, OPR, CARB, and the Attorney General's Office; local agencies, city and county planning departments, utilities such as sanitation and power, etc.; regulated stakeholders, industry and industry groups; and organizations, both environmental and professional. Stakeholders were chosen based on their participation in other related stakeholder working groups and their expressed interest in participating in the developing a GHG significance threshold. Working group meetings are open to the public and have been well attended. The members of the Working Group and other interested parties who have requested to be notified of the meetings are listed in Appendix A. Information on the progress of the Working Group, including agendas, overhead presentations, and letters received from the various stakeholders can be found at the following website:

<https://www.aqmd.gov/ceqa/handbook/GHG/GHG.html>.

Part of the purpose of the Working Group is to provide a forum to solicit comments and suggestions from the various stakeholders to assist SCAQMD staff with developing an interim GHG significance threshold that is consistent with CEQA requirements for developing significance thresholds, is supported by substantial evidence, and provides guidance to CEQA practitioners with regard to determining whether GHG emissions from a proposed project are significant.

SCAQMD staff held the first Working Group meeting in April 2008. Except for September, Working Group meetings have been held on a monthly basis since April. Brief summaries of each Working Group meeting and the topics and staff GHG significance threshold proposals discussed to date are provided in Appendix B. Staff's initial proposed has been modified over time based on comments and concerns raised at Working Group meetings or in written comments. The following sections summarize staff's latest recommended interim GHG significance threshold proposal and some of the concepts necessary to understanding the various components of staff's

proposal. The latest staff proposal is considered to be a work-in-progress as staff is continuing to solicit further public input and suggestions.

The following subsections briefly summarize the GHG significance threshold design criteria concepts included as part of staff's proposed interim GHG significance threshold proposal. Following the discussion of design concepts, SCAQMD staff's current interim proposal is described.

GHG ANALYSIS CONSIDERATIONS

Before discussing quantification methodologies, it is necessary to consider design criteria that establish the parameters upon which the actual GHG analysis is based. The following subsections include discussions from the Working Group of some of the most important design criteria to be considered when quantifying GHG emissions. The following topics include some of the most important parameters that should be considered when quantifying GHG emissions and, therefore, should not be considered an exhaustive list of considerations as individual projects may include characteristics that may require additional considerations.

Policy Objective

The overarching policy objective with regard to establishing a GHG significance threshold for the purposes of analyzing GHG impacts pursuant to CEQA is to establish a performance standard or target GHG reduction objective that will ultimately contribute to reducing GHG emissions to stabilize climate change. Full implementation of the Governor's Executive Order S-3-05 would reduce GHG emissions 80 percent below 1990 levels or 90 percent below current levels by 2050. It is anticipated that achieving the Executive Order's objective would contribute to worldwide efforts to cap GHG concentrations at 450 ppm, thus, stabilizing global climate.

As described below, staff's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 3, which is expected to be the primary tier by which the AQMD will determine significance for projects where it is the lead agency, uses the Executive Order S-3-05 goal as the basis for deriving the screening level. Specifically, the Tier 3 screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects. A 90 percent emission capture rate means that 90 percent of total emissions from all new or modified stationary source projects would be subject to some type of CEQA analysis, including a negative declaration, a mitigated negative declaration, or an environmental impact.

Therefore, the policy objective of staff's recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change. Further, a 90 percent emission

capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that staff estimates that these GHG emissions would account for less than one percent of future 2050 statewide GHG emissions target (85 MMTCO₂eq/yr). In addition, these small projects would be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory

- GHG Pollutants

Gases that trap heat in the atmosphere are often called greenhouse gases. The Kyoto Protocol, adopted in December 1997, is an agreement under which industrialized countries will reduce their collective emissions of greenhouse gases by specified percentages, depending on the country, compared to 1990 levels. The goal is to lower overall emissions of six greenhouse gases - carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons, averaged over the period of 2008-2012.

Similarly, AB 32 defines GHGs as including the following: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Health and Safety Code, section 38505(g)). The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide.

Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

- **Carbon Dioxide (CO₂):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH₄):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N₂O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). Fluorinated gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as high global warming potential gases (high GWP gases).
 - Hydrofluorocarbons are manmade chemicals that have historically replaced Chlorofluorocarbons used in refrigeration and semiconductor manufacturing.
 - Perfluorocarbons are manmade chemicals that are by-products of aluminum smelting and uranium enrichment.
 - Sulfur hexafluoride is a manmade chemical that is largely used in heavy industry to insulate high voltage equipment and to assist in the manufacturing of cable cooling systems.

GWP is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale that compares the gas in question to the same mass of carbon dioxide (whose GWP is by definition 1). A GWP is calculated over a specific time interval and the value of this must be stated whenever a GWP is quoted or else the value is meaningless. A substance's GWP depends on the time span over which the potential is calculated. A gas which is quickly removed from the atmosphere may initially have a large effect but for longer time periods as it has been removed becomes less important. For the purposes of a CEQA analysis, especially an analysis of operation emissions, the maximum GWP is typically used, regardless of the actual atmospheric lifetime. This approach simplifies the analysis and provides a very conservative analysis, especially for the fluorinated gases. The GWP of the six Kyoto GHGs is shown in Table 3-1.

The SCAQMD staff recommends that a GHG analysis include the six Kyoto GHGs, to the extent emission factors are available primarily because there is more information on these GHGs than other potential GHGs. Other GHGs would be added to the list as scientific information becomes available and agreed to by national or international protocols and agreements.

Table 3-1
Global Warming Potential of Kyoto GHGs

Gas	Atmospheric Lifetime	GWP
Carbon dioxide (CO ₂)	50 – 200	1
Methane (CH ₄)	12 ± 3	21
Nitrous oxide (N ₂ O)	120	310
HFC-23 (Hydrofluorocarbons)	264	11,700
HFC-32	5.6	650

Table 3-1 (Concluded)
Global Warming Potential of Kyoto GHGs

Gas	Atmospheric Lifetime	GWP
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
CF4 (Perfluorocarbons)	50,000	6,500
C2F6	10,000	9,200
C4F10	2,600	7,000
C6F14	3,200	7,400
Sulfur hexafluoride (SF6)	3,200	23,900

Source: U.S. EPA (<http://www.epa.gov/>)

Carbon black, a form of particulate air pollution most often produced from biomass burning, cooking with solid fuels and diesel exhaust, may also have a warming effect in the atmosphere. It is estimated that carbon black's contribution to climate change is second only to carbon dioxide. Carbon black contributes to global warming by absorbing heat while airborne in the atmosphere. Carbon black is of particular concern in the arctic because it settles on ice and snow, reducing its reflectivity and increasing the rate of melting.

Based on a survey of available information, there are little data available for calculating carbon black effects on global warming. As a result, SCAQMD staff is not recommending analyzing carbon black effects on global warming. As information becomes available, staff will reconsider adding carbon black to the list of GHGs to be analyzed in CEQA documents.

- Business-As-Usual (BAU)

In CARB's Scoping Plan (CARB, 2008) CARB states that the BAU case is a representation of what the state of the California economy will be in the year 2020 assuming that none of the measures recommended in the Scoping Plan are implemented. CARB's projected BAU GHG emissions in 2020 are shown in Table 3-2.

Table 3-2
2002-2004 Average Emissions and 2020 Projected Emissions (Business-as-Usual)
(MMTCO₂E)

Sector	2002-2004 Average Emissions	Projected 2020 Emissions [BAU]
Transportation	179.3	225.4
Electricity	109.0	139.2
Commercial and Residential	41.0	46.7
Industry	95.9	100.5
Recycling and Waste	5.6	7.7
High GWP	14.8	46.9
Agriculture	27.7	29.8
Forest Net Emissions -	4.7	0.0
Emissions Total	469	596

Source: CARB, 2008 – Scoping Plan, Table 1

CARB's Scoping Plan states further that continuing increases in global greenhouse gas emissions at BAU rates would result, by late in the century, in California losing 90 percent of the Sierra snow pack, sea level rising by more than 20 inches, and a three to four times increase in heat wave days, flood damage, etc. To avoid future foreseeable environmental impacts to California, the Scoping plan calls for an ambitious but achievable reduction in California's carbon footprint. Reducing greenhouse gas emissions to 1990 levels means reducing approximately 30 percent from BAU emission levels projected for 2020, or about 15 percent from today's levels. On a per-capita basis, that means reducing our annual emissions of 14 tons of carbon dioxide equivalent for every man, woman and child in California down to about 10 tons per person by 2020.

Although CARB's Scoping Plan calls for reducing GHG emissions 30 percent from BAU levels, it does not explicitly define BAU. There is, however, a brief definition of BAU in CARB's GHG inventory document (CARB, 2007). In that document CARB describes BAU as:

- BAU is based on GHG emissions estimates in the absence of policies and reduction measures, and
- BAU is based on forecasted demographic and economic growth.

In its White Paper, CAPCOA provides a more detailed definition of BAU compared to the above definition in CARB's inventory document. In the White Paper BAU is defined as follows:

- The projection of GHGs into the future based on current technologies and regulations;

- The adoption of new GHG reduction regulations, e.g., CARB’s Scoping Plan measures, in the future establishes new BAU, i.e., the definition of BAU evolves over time; and
- BAU will normally define the CEQA no project alternative, but does not necessarily form the project baseline.

Based on the above definitions and discussions from the Working Group, SCAQMD staff defines BAU as the following

- Is used to project project’s future emissions (consistent with CAPCOA and CARB definitions), i.e., level from which GHG reductions must occur;
- Is based first and foremost on current regulatory requirements (consistent with CAPCOA and CARB definitions);
- Regulatory requirements may determine current technology, e.g., advanced technology may be available, but not required, such as combined cycle gas turbine;
- Will normally define the no project alternative (consistent with CAPCOA and CARB definitions); and
- May be used to establish a project’s CEQA baseline, only if consistent with CEQA Guidelines §15125.

The importance of BAU lies not only in the fact that it is a methodology for calculating a project’s future emissions, is also forms the emission level from which GHG emission reductions must occur. SCAQMD staff’s current GHG significance threshold proposal includes the Tier 4 compliance option 1 that establishes a performance standard of reducing GHG emissions 30 percent below the project’s projected BAU emissions through design features and/or mitigation measures. A 30 percent reduction from BAU is consistent with the target objectives of AB 32 and CARB’s Scoping Plan. The intent of the Tier 4 compliance option 1 is to provide a feasible target objective, that will not only contribute to achieving the AB 32 target objective, but will also contribute to achieving the 2050 target of the Governor’s Executive Order S-3-05, which establishes of target objective of reducing GHG emissions 80 percent below 1990 levels or a 90 percent reduction from current BAU estimates.

As recognized by CAPCOA and SCAQMD, BAU will evolve over time as the current regulatory framework changes to implement GHG reduction strategies, either statewide strategies, e.g., CARB’s Scoping Plan, or any future federal strategies. Evolving BAU creates two issues for the CEQA practitioner. First, staff’s proposed Tier 4 compliance option 1 target objective is unchanged from 30 percent, then over time as BAU changes to incorporate GHG reduction strategies, achieving the target objective will become more difficult. Second, any GHG significance thresholds that rely on BAU will have higher uncertainties because they rely on a constantly changing BAU, which may be difficult to define.

To resolve some of these issues of an evolving definition of BAU, SCAQMD staff recommends that a statewide definition be developed by CARB that is updated periodically. Until such time as a statewide definition of BAU is developed, the SCAQMD staff will rely on the above definition. Because the SCAQMD's staff's GHG significance proposal is considered to be an interim proposal, future updates or revisions to staff's proposal would also include updates to BAU or the target objective as BAU levels decline over time. It may be that a target objective percent reduction from BAU levels is a short-term GHG threshold proposal and may become less important in the future as other concepts are evaluated and more fully developed.

- GHG Source Categories to Analyze

Life Cycle Analysis

CEQA requires that the lead agency analyze direct and indirect impacts from a proposed project, giving due consideration to short-term and long-term effects (CEQA Guidelines 15126.2(a)). In the case of GHG pollutants a systems approach to evaluating the consequences of a particular product, process or activity may be more appropriate because of the long atmospheric lifetimes of the various GHGs (see Table 3-1). One of the most effective ways of evaluating GHGs using a systems approach is through the preparation of a life cycle analysis (LCA).

The goal of a life cycle analysis is to compare the full range of environmental damages assignable to products and services, to be able to choose the least burdensome one. The term 'life cycle' refers to the concept that a fair, holistic assessment requires the assessment of raw material production, manufacture, distribution, use and disposal including all intervening transportation steps necessary or caused by the product's existence. The sum of all those steps - or phases - is the life cycle of the product.

Performing a life cycle analysis may be difficult for a number of projects or processes because life cycle emission factors may not be well established for many activities or projects and the life cycle process itself may not be known or well-defined. SCAQMD staff, however, recommends that life cycle analyses be prepared for all projects undergoing a CEQA analysis, as this will produce a more defensible approach. If, however, any component of the life cycle analysis is unavailable, unknown, or not supported by scientific evidence, the lead agency should note such an analysis would be speculative pursuant to CEQA Guidelines §15145 and terminate discussion of that impact.

Direct/Indirect Impacts

Consistent with CEQA, indirect and direct impacts of the project, typically within California, are required to be analyzed in the CEQA document for a proposed project. The analysis of direct GHG impacts is relatively straightforward as onsite GHG sources or directly related offsite GHG sources, such as worker commute trips, are generally readily identifiable. Indirect GHG emission sources are less obvious, but may include some of the sources identified in the following paragraphs. In general,

for most projects information on direct and indirect emissions may be available, rather than a full life-cycle analysis of emissions. The lead agency has typically been expected to address emissions that are closely related and within the capacity of the project proponent to control and/or influence.

Direct Impacts - are primary effects that are caused by a project and occur at the same time and place, such as emissions from boilers, heaters, or other onsite emissions sources. Direct impacts generated by a project may include offsite sources directly related to the project such as emissions from worker commute trips, haul truck trips to import raw materials and/or export finished products or other goods.

Direct GHG emission impacts will include both construction and operation activities. Because impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions. In addition, GHG emission reduction measures for construction equipment are relatively limited. Therefore, SCAQMD staff is recommending that construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies.

Indirect Impacts - The CEQA Guidelines define indirect impacts as the following: an indirect physical change in the environment...which is not immediately related to the project, but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect change in the environment (CEQA Guidelines §15064 (d)(2)). Indirect or secondary effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems (CEQA Guidelines §15358)(a)(2)).

DRAFT STAFF INTERIM GHG SIGNIFICANCE THRESHOLD PROPOSAL

As indicated by the evolution of the staff proposal over time, SCAQMD has generally recommended a tiered decision tree approach to establishing a GHG significance threshold. In CAPCOA's White Paper, eight of the 12 significance threshold options are based on a tiered threshold approach (see also Table 2-2 in Chapter 2). A tiered GHG significance threshold approach is an appealing approach because it provides flexibility in determining whether or not GHG emissions from a project are significant typically using a single methodology to establish various tiers that can be based on the physical size of the project, land use type, or other characteristics. The tiered approach envisioned by SCAQMD staff would require quantification of GHG emissions for all projects that are subject to CEQA and quantification of the GHG reduction effectiveness of design parameters incorporated into the project and any mitigation measures imposed by the lead agency. It may even be necessary to

quantify GHG emissions, if any, for projects that would otherwise qualify for a categorical exemption to document that no “cumulative impact of successive projects of the same type in the same place, over time is significant” (CEQA Guidelines §15300.2(b), or that there is no “reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.” (CEQA Guidelines §15300.2(c)).

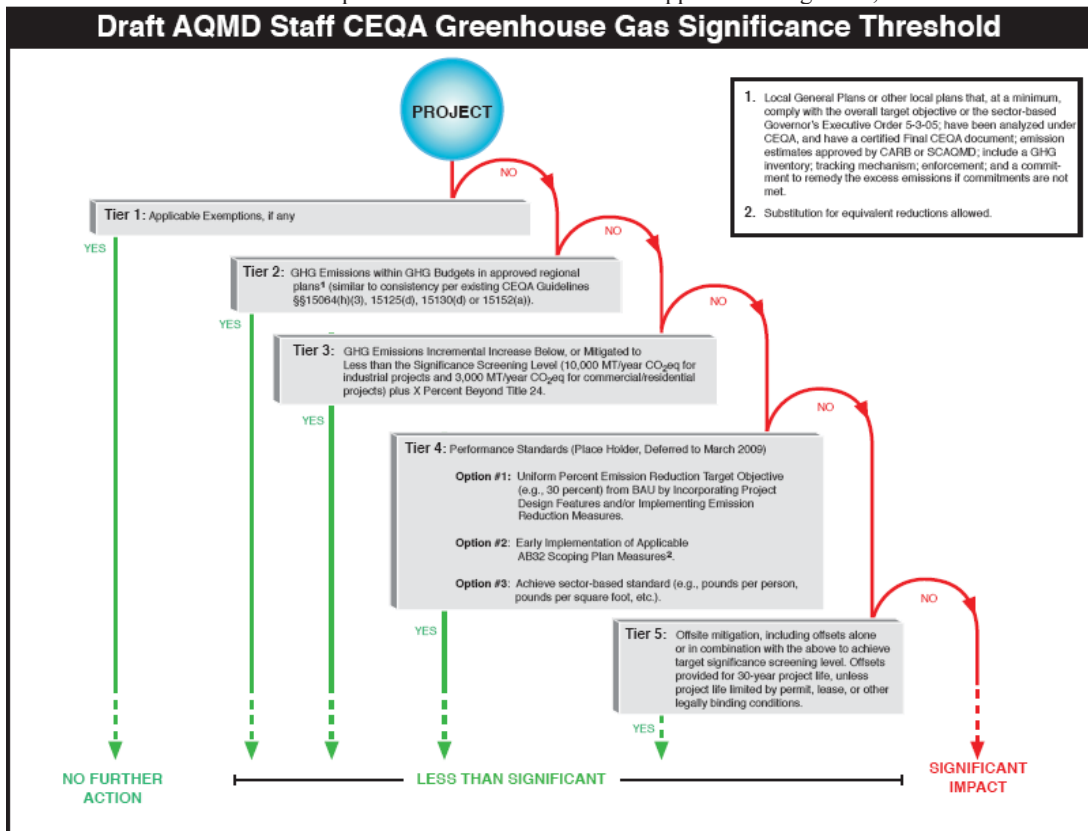
The CAPCOA White Paper also includes a discussion of a decision tree approach to tiering. Instead of using a single methodology to establish tiers, a decision tree approach would use multiple methodologies to demonstrate significance for a broad range of projects/plans that may be difficult to address using a single GHG significance threshold methodology. Using a decision tree approach promotes even greater flexibility in determining significance for a variety of project types.

At the August 27, 2008 Working Group meeting #5, staff presented the revised interim GHG significance proposal #3, which included a tiered decision tree approach. Unlike the decision tree approach discussed in CAPCOA’s White Paper, some tiers include multiple approaches for determining whether a project’s GHG emissions are significant, rather than using a single different methodology for each tier.

For the purposes of determining whether or not GHG emissions from affected projects are significant, project emissions will include direct, indirect, and, to the extent information is available, life cycle emissions during construction and operation. Construction emissions will be amortized over the life of the project, defined as 30 years, added to the operational emissions, and compared to the applicable interim GHG significance threshold tier. The following bullet points describe the basic structure of staff’s tiered GHG significance threshold proposal for stationary sources. The components of revised staff proposal #3 are described in the following paragraphs and shown graphically in Figure 3-1.

- **Tier 1** – consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. For example, SB 97 specifically exempts a limited number of projects until it expires in 2010. If the project qualifies for an exemption, no further action is required. If the project does not qualify for an exemption, then it would move to the next tier.
- **Tier 2** – consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. The concept embodied in this tier is equivalent to the existing concept of consistency in CEQA Guidelines §§15064(h)(3), 15125(d), or 15152(a). The GHG reduction plan must, at a minimum, comply with AB 32 GHG reduction goals; include emissions estimates agreed upon by either CARB or the SCAQMD, have been analyzed under CEQA, and have a certified Final CEQA document. Further, the GHG reduction plan must include a GHG emissions inventory tracking mechanism; process to monitor progress in achieving GHG emission reduction targets, and a commitment to remedy the excess emissions if AB 32 goals are not met (enforcement).

Figure 3-1
 Revised Staff Proposal #3 Tiered Decision Tree Approach – August 27, 2008



If the proposed project is consistent with the local GHG reduction plan, it is not significant for GHG emissions. If the project is not consistent with a local GHG reduction plan or there is no approved plan, the GHG reduction does not include all of the components described above, or there is no adopted GHG reduction plan, the project would move to tier 3.

- **Tier 3** – attempts to identify small projects that would not likely contribute to significant cumulative GHG impacts. However, because of the magnitude of increasing global temperatures from current and future GHG emissions, staff is recommending that all projects must implement some measure or measures to contribute to reducing GHG emissions. Therefore, Tier 3 includes a requirement that ~~all residential/commercial~~ projects with GHG emissions less than the screening level must include efficiency components that ~~reduce a certain~~ **X** percentage beyond the requirements of Title 24 (Part 6, California Code of Regulations), California's energy efficiency standards for residential and nonresidential buildings. Project proponents would also have to reduce by a specified percentage electricity demand from water use, primarily electricity used for water conveyance.

~~The most recently~~ **A past recommended** screening level proposed by staff was 6,500 MTCO₂eq./year. This screening level was derived using the SCAQMD's existing NO_x operational threshold as a basis. The daily NO_x operational significance threshold, 55 pounds per day was annualized, which results in 10 tons of NO_x per year.

Staff initially considered and then rejected a bifurcated screening level, that is one screening level for residential and commercial projects and a different screening level for industrial projects based on the URBEMIS modeling runs used to derive the 6,500 MTCO₃eq/yr screening level because GHG emissions from industrial were of the same magnitude as the GHG emissions from residential and commercial projects. Staff has reconsidered the bifurcated screening level approach as there is a more scientific basis for deriving the different screening levels.

SCAQMD staff is now recommending a bifurcated screening level approach to address two greatly differing project types: industrial projects as opposed to residential and commercial projects (which are largely indirect sources). The former category typically contains stationary source equipment whose emissions are largely permitted or regulated by the SCAQMD; whereas the latter category is mostly residential, commercial (may also include industrial) building structures that attract or generate mobile source emissions. In light of the GHG reductions needed to stabilize the climate while considering implementation resource requirements, the policy objective used to establish the screening thresholds is to capture projects that represent approximately 90 percent of GHG emissions from new sources. The following paragraphs describe the steps taken to derive the screening threshold values.

Industrial Projects: Since the majority of GHG emissions in the district are comprised of CO₂ emissions from burning natural gas rather than other types of fossil fuel, staff compiled reported annual natural gas consumption for 1,297 ~~115~~ permitted facilities for 2006-2007 and rank-ordered the facilities to estimate the 90th percentile of the cumulative natural gas usage for all permitted facilities. Operators of these facilities are required to report their emissions and associated throughput under the SCAQMD's Annual Emission Reporting (AER) Program if any of their criteria pollutant emissions exceed four tons per year (100 tons per year for CO) or if the facility has any reportable air toxics emission. Figure 3-2 shows that approximately 10 percent of facilities evaluated comprise more than 90 percent of the total natural gas consumption, which corresponds to 10,000 metric tons per year (tpy) of CO₂ emissions. This value represents a boiler with a rating of approximately 27 million British thermal units per hour (mmbtu/hour) of heat input, operating at ~~an 25-80~~ percent capacity factor. If the screening threshold of 10,000 MTCO₂eq./yr is implemented, based on the permitting activities for 2006-2007 it will result in at least 31 additional MNDs or EIRs being prepared by the SCAQMD as the lead agency unless another tier option is selected to demonstrate no significant impacts for GHG emissions. It should be noted that this analysis did not include other possible GHG pollutants such as methane, N₂O; a life-cycle analysis; mobile sources; or indirect electricity consumption. Therefore, under a 10,000 MTCO₂eq./yr screening level more projects would be required to go through an MND or EIR environmental analysis than is currently the case. Furthermore, when the SCAQMD acts as a lead agency, the stationary source equipment employed as part of the proposed project typically must comply with BACT or other SCAQMD rules, regulations, programs that require reducing criteria pollutants or air toxics. Therefore, staff is proposing to replace the 6,500 MTCO₂/yr screening level with the 10,000 MTCO₂eq/yr as the screening level in tier III for industrial projects when the SCAQMD is the lead agency for the project.

Residential and Commercial Projects: To achieve the same 90 percent GHG emission capture rate for this segment of projects GHG emissions from residential and commercial sectors were compared to the GHG emissions from the industrial sector including the in-state power plants. The draft AB32 scoping plan indicates that based on statewide 2002-2004 average GHG emissions, the residential and commercial sectors account for approximately nine percent of the total statewide GHG inventory, while the industrial sector (including instate power plants) accounts for approximately 30 percent of the statewide GHG emission inventory. The inventory methodology for both sectors includes only on-site energy use, consistent with the staff approach taken in deriving the 10,000 tpy threshold. Assuming similar emission characteristics also exist for the residential and commercial sector (i.e., large residential or commercial projects, although fewer in numbers, contribute substantially more to the total emissions), it is estimated that at a threshold of approximately 3,000 MTCO₂eq/yr emissions (10,000 x (9 percent / 30 percent)) would capture 90 percent of the GHG emissions from new residential or commercial projects. A series of sensitivity analyses was performed by the staff using URBEMIS to assess the likely project size for 3,000 MTCO₂eq/yr emissions. Table 3-3 illustrates various projects by size and shape.

Figure 3-2

Total Number of AER Facilities and Their Accumulative Reported NG Usage
FY 06-07

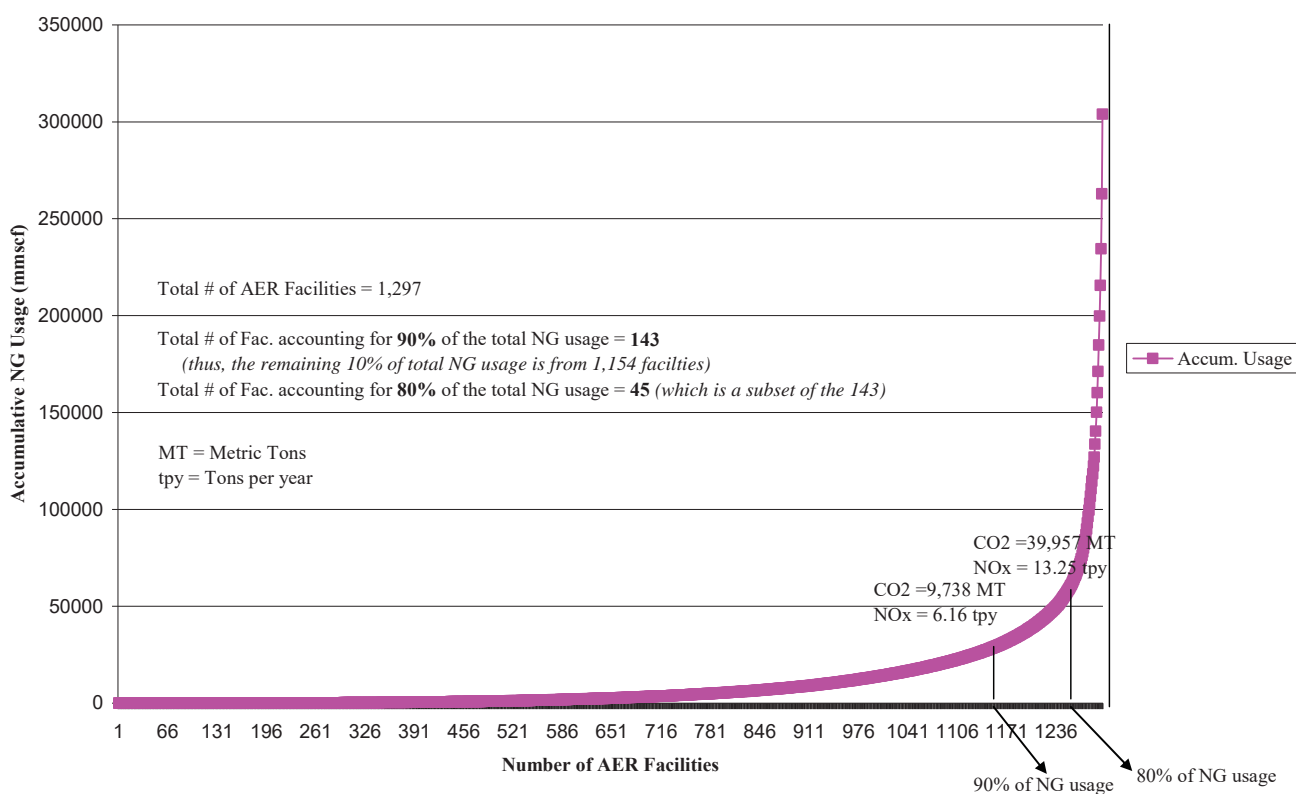


Table 3-3
URBEMIS Run Results for Residential/Commercial Projects Emitting Approximately 3,000 MTCO₂ per Year*

	Weighted Avg Trip Rate	Size	Area Source Emissions		Operational Emissions		TOTAL
			CO ₂ (tons/year)	CO ₂ (MT/year)	CO ₂ (tons/year)	CO ₂ (MT/year)	CO ₂ (MT/year)
Res - Single Unit	19.54	80 units	326.86	297.15	3003.56	2730.51	3027.65
Res - Apt	9.17	175 units	422.70	384.27	2971.95	2701.77	3086.05
Comm - Office	6.02	265,000 ft ²	387.41	352.19	2961.75	2692.50	3044.69
Comm - Bank	206.22	9,500 ft ²	14.38	13.07	3192.90	2902.64	2915.71
Single/Apt	19.54	35 units	379.59	345.08	2964.82	2695.29	3040.37
	9.17	100 units					
Office/Bank	6.02	170,000 ft ²	254.19	231.08	3042.71	2766.10	2997.18
	206.22	3,400 ft ²					
Office/Single	6.02	135,000 ft ²	355.13	322.85	2956.32	2687.56	3010.41
	19.54	40 units					
Office/Apt	6.02	135,000 ft ²	403.19	366.54	2952.34	2683.95	3050.48
	9.17	85 units					
Bank/Single	206.22	3,700 ft ²	202.81	184.37	3052.93	2775.39	2959.76
	19.54	50 units					
Bank/Apt	206.22	4,000 ft ²	248.12	225.56	3042.64	2766.04	2991.60
	9.17	100 units					
Single/Apt/Office	19.54	20 units	382.60	347.82	2945.26	2677.51	3025.33
	9.17	65 units					
	6.02	100,000 ft ²					
Single/Apt/Bank	19.54	20 units	241.78	219.80	3020.76	2746.15	2965.95
	9.17	65 units					
	206.22	3,550 ft ²					
						Avg CO ₂ (MT/year):	3009.60

*Offsite electricity use, water use, or other potential life cycle emissions not included.

As shown in Table 3-3, this threshold would represent a residential development of about 70 single-family dwelling units. It should be noted that the sensitivity analysis did not include GHG emissions from electricity use and water use. As a result, similar to the earlier discussion of industrial projects, this screening level of 3,000 MTCO₂eq/yr could capture development projects less than 70 single-family dwelling units.

In CAPCOA’s White Paper, it is suggested that a thresholds of 900 MTCO₂eq/yr would capture 90 percent of all development projects, which should translate into at least 90 percent of GHG emissions from the residential and commercial sectors². According to CAPCOA 900 MTCO₂eq/yr equates to approximately 50 single-family dwelling units. This information appears to corroborate the SCAQMD staff’s finding that the policy objective of capturing 90 percent of all GHG emissions for this region can be achieved with a screening level of 3000 MTCO₂eq/yr. Therefore, staff is recommending that this value be used by lead agencies for residential and commercial developments, including industrial parks, warehouses, etc.

- **Tier 4 – Decision Tree Options:** consists of three decision tree options to demonstrate that a project is not significant for GHG emissions. The three compliance options are as follows.

Compliance Option 1 – the lead agency would calculate GHG emissions for a project using a BAU methodology. Once GHG emissions are calculated, the project proponent would need to incorporate design features into the project and/or implement GHG mitigation measures to demonstrate a 30 percent reduction from BAU. Although a 30 percent reduction below BAU is consistent with the target objectives of AB 32, it will continue to reduce GHG emissions beyond 2020, thus, contributing to GHG reductions pursuant to the Governor’s Executive Order S-3-05 (a 90 percent reduction compared to current GHG emissions). A 30 percent reduction is also considered to be an achievable GHG reduction target based on current technologies.

Compliance Option 2 – this option consists of early compliance with AB 32 through early implementation of CARB’s Scoping Plan Measures. The intent of this compliance option is to accelerate GHG emission reductions from the various

² Although the CAPCOA White Paper implies that 900 metric tons per year equates to a 90 percent capture rate, there is no explicit information provided in the White Paper that demonstrates this correlation. Indeed, the CAPCOA authors state that 900 metric tons, which represents approximately 50 residential units, corresponds to widely divergent capture rate percentile rankings depending on the project location (see discussion on page 43 of the White Paper). Percentile rankings were based on a survey of four cities in California. A project of 900 metric tons per year representing a 90 percent capture rate appears to be a working assumption for which there appears to be no factual basis. Further, although not explicitly stated, it is assumed that the 900 metric tons were derived using the URBEMIS2007 model. It should be noted that that the URBEMIS2007 model only quantifies CO₂ emissions and direct emissions primarily from on-road mobile sources. It does not capture other GHG pollutants or indirect GHG emissions such as emissions from energy generation, water conveyance, etc. Therefore, it is likely that a 50-unit residential project would actually generate higher GHG emissions than 900 metric tons per year.

sectors subject to CARB’s Scoping Plan to eliminate GHG emission, especially for those GHGs that have a long atmospheric lifetime such as CO₂, sulfur hexafluoride, etc., to minimize future projected impacts to California from global climate change.

Compliance Option 3 – this compliance option consists of establishing sector-based performance standards. For example, it may be possible to use the 1990 inventory required under AB 32 to establish an efficiency standard such as pounds per person, pounds per worker, pounds per square feet, pounds per item manufactured, etc. When calculating GHG emissions from a project, if they are less than the established efficiency standard the project would not be significant relative to GHG emissions, while projects exceeding the efficiency standard would be significant.

If the lead agency or project proponent cannot achieve the performance standards on any of the compliance options in Tier 4, GHG emissions would be considered significant.

- **Tier 5** – under this tier, the lead agency would quantify GHG emissions from the project and the project proponent would implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level. In addition, the project proponent would be required to provide offsets for the life of the project, which is defined as 30 years. If the project proponent is unable to obtain sufficient offsets, incorporate design features, or implement GHG reduction mitigation measures to reduce GHG emission impacts to less than the screening level, then GHG emissions from the project would be considered significant. Since it is currently uncertain how offsite mitigation measures, including purchased offsets, interact with future AB 32 Scoping Plan measures, the AQMD would allow substitution of mitigation measures that include an enforceable commitment to provide mitigation prior to occurrence of emissions and to prevent mitigating the same emissions twice.

Mitigation Preference – If a project generates significant adverse impacts, CEQA Guidelines §15126.4 requires identification of mitigation measures to minimize potentially significant impacts. Because GHG emissions contribute to global change, mitigation measures could be implemented locally, nationally, or internationally and still provide global climate change benefits. Because reducing GHG emissions may provide co-benefits through concurrent reductions in criteria pollutants, when considering mitigation measures when the AQMD is the lead agency under CEQA, staff will implement mitigation measures that are real, quantifiable, verifiable, and surplus in the following order of preference.

- Incorporate GHG reduction features into the project design, e.g., increase a building’s energy efficiency, use materials with a lower global warming potential than conventional materials, purchase building materials locally, etc.
- Implement onsite measures that provide direct GHG emission reductions onsite, e.g., replace onsite combustion equipment (boilers, heaters, steam

generators, etc.) with more efficient combustion equipment, replace existing high global warming potential refrigerants with low global warming refrigerants, eliminate or minimize fugitive emissions, etc.

- Implement neighborhood mitigation measure projects that could include incentives for installing solar power, increasing energy efficiency by exceeding Title 24 building standards through replacing low efficiency water heaters with high efficiency water heaters, increasing building insulation, using fluorescent bulbs, replacing old inefficient refrigerators with efficient refrigerators using low global warming potential refrigerants, etc.
- Implement in-district mitigation measures such as any of the above identified GHG reduction measures; reducing vehicle miles traveled (VMT) through greater rideshare incentives, transit improvements, etc.
- Implement in-state mitigation measures, which could include any of the above measures.
- Implement out of state mitigation measure projects, which may include purchasing offsets if no other options are available.

CARB's Interim GHG Significance Threshold Proposal

In October 2008 CARB released its interim GHG significance threshold proposal and held a public workshop on October 27, 2008. CARB's threshold is considered to be an interim threshold because CARB staff intends to periodically review and change its threshold proposal as necessary. CARB's Preliminary Draft Staff Proposal (Proposal) states that non-zero GHG significance thresholds can be supported by substantial evidence. Further, different GHG significance thresholds may be established for different sectors. Therefore, as part of its initial interim GHG significance threshold proposal CARB is proposing two separate GHG significance thresholds, one for new industrial projects and another for residential/commercial projects subject to CEQA. CARB's proposal uses a tiered approach (see Table 3-4).

Table 3-4
 Comparison of CARB’s and AQMD’s Interim GHG Significance Thresholds Approaches

	<u>Stationary/Industrial Sector Projects</u>		<u>Residential/Commercial Sector Projects</u>	
	<u>CARB</u>	<u>AQMD</u>	<u>CARB</u>	<u>AQMD (Not Recommended at this Time)</u>
<u>Policy Objective</u>	<u>Capture 90% of statewide stationary project emissions</u>	<u>Capture 90% of district wide GHG emissions (industrial)</u>	<u>Capture X% of statewide residential/commercial project emissions</u>	<u>Capture 90% of district wide residential/commercial project GHG emissions</u>
<u>Exemption</u>	<u>Apply applicable exemption</u>	<u>Apply applicable exemption</u>	<u>Apply Applicable Exemption</u>	<u>Apply Applicable Exemption</u>
<u>Regional GHG Reduction Plan</u>	<u>N.A.</u>	<u>Project Consistent with Applicable GHG Reduction Plan with GHG inventorying, monitoring, enforcement, etc.</u>	<u>Project Consistent with Applicable GHG Reduction Plan with GHG inventorying, monitoring, enforcement, etc.</u>	<u>Project Consistent with Applicable GHG Reduction Plan with GHG inventorying, monitoring, enforcement, etc.</u>
<u>Thresholds</u>	<u>Project < 7,000 MTCO₂eq/yr & meets construction & transportation performance standards</u>	<u>GHG emissions from industrial project is < 10,000 MTCO₂eq/yr, includes construction emissions amortized over 30 years & added to operational GHG emissions</u>	<u>Project meets construction & operation performance tandards, e.g., energy, water use, waste & ransportation & < X MTCO₂eq/yr</u>	<u>Project is < 3,000 MTCO₂eq/yr & exceeds Title 24 Energy Efficiency Standards by X%, if applicable – construction emissions amortized over 30 years & added to operational GHG emissions</u>
<u>Performance Standards</u>	<u>See above</u>	<u>NA</u>	<u>See above</u>	<u>3 Compliance Options: 1) Reduce GHG emissions 30% below BAU; 2) Early Implement AB 32 Measure; 3) Comply with Performance Standard</u>
<u>Offsets</u>	<u>Offsite substitution allowed</u>	<u>Implement offsite mitigation for life of project, i.e., 30 years, with mitigation preference</u>	<u>Offsite substitution allowed</u>	<u>Implement offsite mitigation for life of project, i.e., 30 years with mitigation preference</u>
<u>Determination</u>	<u>GHG emissions significant, EIR is prepared, if meeting none of the above</u>	<u>GHG emissions significant, EIR is prepared, if meeting none of the above</u>	<u>GHG emissions significant, EIR is prepared, if meeting none of the above</u>	<u>GHG emissions significant, EIR is prepared, if meeting none of the above</u>

CARB’s interim GHG significance threshold for industrial sources was developed to capture “the vast majority (~90% statewide) of the GHG emissions from new industrial projects being subject to CEQA’s requirement to impose feasible mitigation.” According to CARB’s Proposal, CARB staff used data from a survey of industrial boilers performed by the Oak Ridge National Laboratory in which it was concluded that small boilers with an input capacity of 10 MMBtu/hr corresponded to 93 percent of total industrial boiler input capacity, or 4,660 MTCO₂e/yr. Using this result and accounting for process losses, purchased electricity, and water usage and wastewater discharge, CARB staff is recommending 7,000 MTCO₂eq/yr as a GHG significance threshold for industrial projects. The following bullet points summarize CARB’s proposed interim GHG significance threshold for industrial sources.

- Box 1 – Apply any applicable categorical or statutory exemptions. If the project does not qualify for an exemption, move to Box 2.
- Box 2 – The industrial project must meet both of the following performance standards or equivalent mitigation measures to be deemed insignificant for GHGs:
 - Construction – Project must meet an interim performance standard for construction- related emissions (performance standard not yet defined).
 - Transportation – Project must meet an interim performance standard for transportation (performance standard not yet defined).

AND

- Project with mitigation will emit no more than 7,000 MTCO₂eq/yr. If the project does not qualify for either of the performance standards or exceeds 7,000 MTCO₂eq/yr, move to Box 3.
- Box 3 – Project is deemed significant and an EIR must be prepared.
- CARB’s Preliminary Draft Proposal for Residential and Commercial projects is summarized in the following bullet points.
- Box 1 – Apply any applicable categorical or statutory exemptions. If the project does not qualify for an exemption, move to Box 2.
- Box 2 – Project complies with a previously approved plan that addresses GHG emissions and must: include a GHG reduction target consistent with AB 32; be consistent with transportation-related target adopted by CARB pursuant to SB 375; include a GHG inventory and mechanism for monitoring GHG emissions; include enforceable GHG requirements; include a mechanism for periodic updates to plan; and have a certified CEQA document. If the project is

consistent with a GHG plan that includes all of these elements, it is presumed to be insignificant for GHGs. If the project is not consistent with a GHG plan or there is no adopted GHG plan that includes all of the above elements, move to Box 3.

- Box 3 – The residential/commercial project must meet all of the following performance standards or equivalent mitigation measures to be deemed insignificant for GHGs:
 - Construction – Project must meet an interim performance standard for construction- related emissions (performance standard not yet defined).
 - Operations – Project must meet the following performance standards: energy use performance standard defined in CEC’s Tier II Energy Efficiency goal; an interim performance standard for water use (performance standard not yet defined); an interim performance standard for waste (performance standard not yet defined); and an interim performance standard for transportation (performance standard not yet defined).

AND

The project with performance standards or equivalent mitigation will emit no more than X MTCO₂eq/yr (criterion to be developed). If the project does not qualify for any one of the performance standards or exceeds X MTCO₂eq/yr, move to Box 4.

- Box 4 – Project is deemed significant and an EIR must be prepared.

For a detailed description of CARB’s interim GHG significance threshold proposal, refer to the following URL:
<http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf>.

CARB is currently accepting comments on its Draft Proposal and has scheduled a second public workshop on December 9, 2008. CARB staff currently anticipates taking their proposal to their Board in February 2009.

CHAPTER 4

CONSIDERATIONS WHEN ANALYZING GHG EMISSIONS

Introduction

GHG Analysis Recommendations

INTRODUCTION

As noted in Chapter 1, on June 19, 2008, OPR, in collaboration with the California Resources Agency, the California Environmental Protection Agency and the California Air Resources Board, released a *Technical Advisory* containing informal guidance for public agencies as they address the issue of climate change in their CEQA documents. With regard to analyzing GHG emission impacts OPR states,

“Each public agency that is a lead agency for complying with CEQA needs to develop its own approach to performing a climate change analysis for projects that generate GHG emissions. A consistent approach should be applied for the analysis of all such projects, and the analysis must be based on best available information... Lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source.”

Other than this general advice, the *Technical Advisory* does not provide explicit details for quantifying GHG emissions.

CAPCOA’s White Paper provides a comprehensive discussion of modeling tools that are currently available for analyzing GHG emissions³. As indicated in the White Paper, no one model is currently available that is capable of estimating all of a project’s direct and indirect GHG emissions. It is likely, however, that the Urban Emissions (URBEMIS) Model will be the most commonly used model for calculating GHG emissions because it currently calculates CO₂ emissions (in addition to criteria pollutant emissions) during both construction and operation of proposed projects, it is publicly available, and already widely used in California. Statewide use of the URBEMIS model would provide consistency throughout California with regard to quantifying GHG emissions. For a list of currently available models that calculate GHG emissions and summaries of the capabilities, advantages, and disadvantages of each model refer to Table 10 on pages 75 through 78 in the CAPCOA White Paper.

The purpose of this chapter is to provide more explicit guidance to CEQA practitioners with regard to quantifying GHG emissions than OPR’s *Technical Advisory*, while building on the information provided CAPCOA’s White Paper.

GHG ANALYSIS RECOMMENDATIONS

Direct/Indirect Impacts

As noted in Chapter 3 of this Guidance Document, consistent with CEQA, indirect and direct impacts of the project, typically within California, are required to be analyzed in the CEQA document for a proposed project. The analysis of direct GHG impacts is

³ For maximum transparency with regard to quantifying GHG emissions and disclosure to the public, SCAQMD staff recommends using only publicly available models.

relatively straightforward as onsite GHG sources or directly related offsite GHG sources, such as worker commute trips, are generally readily identifiable. Indirect GHG emission sources are less obvious, but may include some of the sources identified in the following paragraphs. In general, for most projects information on direct and indirect emissions may be available, rather than a full life-cycle analysis of emissions. The lead agency has typically been expected to address emissions that are closely related and within the capacity of the project proponent to control and/or influence.

Direct Impacts - are primary effects that are caused by a project and occur at the same time and place, such as emissions from boilers, heaters, or other onsite emissions sources. Direct impacts generated by a project may include offsite sources directly related to the project such as emissions from worker commute trips, haul truck trips to import raw materials and/or export finished products or other goods. The following paragraphs provide general guidance on quantifying direct GHG emissions.

CAPCOA's White Paper provides a comprehensive discussion of modeling tools that are currently available for analyzing GHG emissions. Further, no one model is currently available that is capable of estimating all of a project's direct and indirect GHG emissions. Although there are a number of modeling tools available to calculate GHG emissions the following discussion focuses on a combination of approaches using the URBEMIS model as the basis for analyzing GHG emission impacts. Other approaches for calculating GHG emissions can be used, as long as they are supported by scientific evidence and include publicly available information.

The URBEMIS model is a publicly available model that is currently used statewide to calculate criteria pollutant emissions from construction and operation activities for a wide variety of land use projects. The model is regularly updated through a collaboration of air pollution control agencies, including the SCAQMD, to reflect the most current data, methodologies, and emission factors for quantifying criteria pollutant emissions. The most current update to the model is URBEMIS2007 version 9.2.4, which quantifies CO₂ emissions in addition to criteria pollutant emissions.

Currently, there are several disadvantages to using the URBEMIS model to calculate GHG emissions from a proposed project and, as a result, it should not be the only tool used to calculate GHG emissions. For example, currently the URBEMIS model only quantifies CO₂ emissions and not other GHG pollutants, with the exception of methane from mobile sources, which is converted to CO₂eq. emissions. Since CO₂ emissions comprise the bulk of GHG emissions from most projects, URBEMIS GHG results are fairly representative of GHG emissions from a project.

To quantify mobile source emissions from on-road mobile sources, the URBEMIS model uses trip rate information from the Institute of Transportation Engineers Trip Generation Handbook (ITE, 2001) as the trip rate default factor for all land uses. ITE trip rate information is widely used and is considered legally defensible as they rely on substantial reports and surveys of trip rates in cities with little or no transit. As a result, the ITE trip rates are also considered to provide a conservative estimate of trip

rates and associated emissions. The model, however, treats each trip as a separate trip and doesn't consider that a single trip may be used for more than one purpose, referred to as "internalization." The model also does not fully account for interaction between land uses in its estimation of mobile source operational emissions. URBEMIS does allow the user to overwrite the default trip rates and characteristics with more project-specific data from a traffic study prepared for a project.

In spite of the disadvantages of the URBEMIS model described above, it can be used as the first step in quantifying GHG emissions for typical land use projects because it establishes default parameters for the most common emission sources from a project including construction equipment types and activity profiles, area of site disturbed during construction, building size, number vehicle trips, etc., if the level of information about the project is low. If more information about the project is available such as a precise profile of construction equipment and activity levels, number of vehicle trips based on a traffic study prepared for the project, etc., this information can be incorporated into the model. The model can then quantify CO₂ emissions from both construction and operation.

The URBEMIS construction analysis quantifies criteria pollutant and CO₂ emissions from both off-road sources (primarily construction equipment) and on-road sources (worker commute trips, haul truck trips, etc.). To further flesh out the construction analysis, the lead agency would have to identify emission factors for other GHG pollutants likely to be emitted during construction, i.e., methane and nitrous oxide⁴, for both off-road and on-road emissions sources and then quantify the GHG emission results using spreadsheets or other available tools.

The off-road CO₂ emission factors in the URBEMIS model are generated from CARB's off-road model (<http://www.arb.ca.gov/msei/offroad/offroad.htm>). Methane emission factors for off-road equipment can also be obtained from CARB's OFFROAD2007 model. CO₂ and methane emission factors for off-road equipment that are based on CARB's OFFROAD2007 model can also be found on the SCAQMD's CEQA webpages at the following URL: <http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html>. Other sources of off-road GHG emissions factors for equipment used in California may be used, as long as they are supported by scientific evidence and are publicly available.

The URBEMIS model is able to quantify mobile source CO₂ emissions during construction from on-road mobile sources such as construction worker commute trips, heavy-duty truck trips to haul away demolition debris, soil hauling to and from the site etc., and during operation, primarily vehicle trips using ITE's Trip Generation Manual (ITE, 2001). The on-road CO₂ emission factors in the URBEMIS model for both construction and operation are generated from CARB's on-road mobile source emissions model, EMFAC2007 (<http://www.arb.ca.gov/msei/onroad/onroad.htm>). Methane emission factors for on-road mobile sources can also be obtained from

⁴ Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are not combustion emissions, so would not normally be emitted during construction.

CARB's EMFAC2007 model. CO₂ and methane emission factors for on-road mobile sources that are based on CARB's EMFAC2007 model can also be found on the SCAQMD's CEQA webpages at the following URL: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>.

The analysis of operation emissions from all types of land uses in the URBEMIS model focuses primarily on mobile source emissions and some area sources. The model does not quantify emissions from stationary sources. For stationary sources that require a permit from the SCAQMD, emission calculation procedures and methodologies are available in the SCAQMD's Best Available Control Technology Guidelines (<http://www.aqmd.gov/bact/partd7-9-2004update.pdf>). Examples of facilities that use stationary sources requiring a permit from the SCAQMD include: fossil fuel power plants⁵, cement plants, landfills, wastewater treatment plants, gas stations, dry cleaners and industrial boilers. The SCAQMD has procedures and methodologies for projects subject to SCAQMD permits to calculate criteria pollutants and air toxics. It is anticipated that these same procedures and methodologies could be extended to estimate a permitted facility's GHG calculations. For any stationary and area sources that do not require SCAQMD permits, the same methodologies used for permitted sources could be used. It will be necessary to contact the SCAQMD to obtain information on GHG emission calculation methodologies applicable to stationary source equipment.

Indirect Impacts - Indirect or secondary effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems (CEQA Guidelines §15358)(a)(2)). The examples of facilities that use stationary sources requiring a permit from the SCAQMD that may contribute to direct environmental impact (fossil fuel power plants, cement plants, landfills, wastewater treatment plants, gas stations, dry cleaners and industrial boilers) may also contribute to indirect impacts and, therefore, should be included, as necessary in the CEQA analysis of GHGs.

Quantification Methodologies and GHG Emission Factors

Methodologies for calculating GHG emissions and GHG emission factors are currently not readily available. Until such time as GHG calculation methodologies and emission factors become well established and more readily available, lead agencies may want to consult the following references to identify acceptable methodologies and emission factors.

1. The first useful reference for GHG emission factors for stationary sources is EPA's Air Pollutant (AP)-42, which is a compilation of air pollutant emission

⁵ According to CEQA Guidelines §15227, CEQA does not apply to projects outside of California. The California Attorney General's Office has rendered an opinion stating that the definition of the environment in CEQA does not stop at the borders of California. Further, California public agencies that take an action outside of California is still bound by the requirements of CEQA to prepare an EIR if the action may cause a significant effect on the environment.

- factors for stationary point and area sources. Each of the first 13 chapters of AP-42 is dedicated to a specific source activity such as solid waste disposal, petroleum industry, and metallurgical industry. Since the publication of the fifth edition (and supplementals) in 2001, there have been a number of updates to the various specific stationary sources such as hot asphalt plants, organic liquid storage tanks, and coke production. In addition to the criteria pollutant emissions, some of the updated AP-42 chapters provide GHG emission factors for a variety of sources. For example, Chapter 15 of AP-42 focuses on GHG emissions from biogenic sources such as soils, termites, lightning, and enteric fermentation (animal digestive fermentation).
2. Second, the California Climate Action Registry (C-CAR) has prepared a General Reporting Protocol (GRP), which is a relatively easy-to-follow user's manual that outlines the principles, concepts, calculation methodologies and procedures required for effective participation in the California Registry. The appendices of the GRP provide GHG emissions factors, specifically CO₂, CH₄ and N₂O, for electricity use, mobile combustion and stationary combustion based on fuel usage type.
 3. Third, a thorough internet search should be conducted to find reliable sources of emissions factors that would assist in accurately determining GHG emissions from a specific source being evaluated. Again, all potential GHGs, such as CO₂, CH₄ and N₂O, should be evaluated to the best of one's ability to locate dependable information.
 4. Finally, a material balance approach also may provide reliable average emission estimates for specific sources. A material balance is when one accounts for (or "balances") all the materials going into and coming out of the process in order to make a credible emissions estimation. For some sources, a material balance may provide a better estimate of emissions especially in situations where a high percentage of material is lost to the atmosphere (e. g., sulfur in fuel, or solvent loss in an uncontrolled coating process.) In other cases, material balances may be inappropriate where material is consumed or chemically combined in the process, or where losses to the atmosphere are a small portion of the total process throughput.

Reporting GHG Emissions – Daily vs. Annual Emissions

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short term exposure effects on human health, e.g., one-hour and eight-hour. Since the half-life of CO₂ is approximately 100 years, the effects of GHGs are longer-term, affecting global climate over a relatively long time frame (see also Table 3-1).

Typical GHG emission inventories (EPA5, ARB6, etc.) represent directly emitted GHGs during a given year. As a result, the current convention is to present GHG emissions as annual emissions. The URBEMIS model can be set to calculate annual emissions for a project. When using the URBEMIS model to calculate annual GHG emissions, it may be useful to modify the trip rate for each land use using a weighted trip rate average to more accurately reflect annualized trip rates. A weighted trip rate average reflects the trip rates during the week, as well as trip rates during Saturdays and Sundays. Trip rate information for weekdays and weekend days can be found in the ITE Trip Rate Handbook.

CHAPTER 5

CONCLUSION

Introduction

Future Action Items

INTRODUCTION

CEQA Guidelines §15064.7(a) encourages lead agencies to establish thresholds of significance to determine the significance of an environmental impact. Further, thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence (CEQA Guidelines §15064.7(b)). Staff's proposed interim GHG significance threshold proposal has been developed through a public process consisting of a series of Stakeholder Working Group meetings. Staff proposals have been modified over time based on written and oral feedback from the Working Group. Staff's intent was to reach consensus to the extent feasible, but for some items staff could not find common ground with some of the stakeholders.

The next immediate step for SCAQMD staff is to present a final interim GHG significance threshold proposal to the SCAQMD Governing Board for consideration. If the Governing Board approves staff's final interim GHG significance threshold proposal, then staff will embark on a number of short-term and intermediate term activities to provide outreach to public agencies that might use staff's interim GHG significance threshold to determine whether or not their projects' GHG emissions are significant, periodically revisit and revise as necessary the interim proposal, and accommodate stakeholders' requests for more information on GHG calculation methodologies and mitigation measures. The following sections provide discussions on future anticipated action items

FUTURE ACTION ITEMS

Interim GHG Significance Threshold Outreach Program

It is currently anticipated that staff's interim GHG significance threshold proposal will be presented to, and considered by the Board at the November 7, 2008 public hearing. Consistent with other significance threshold proposals adopted by the Governing Board, if the draft GHG significance threshold proposal is adopted, staff will meet with local cities, councils of governments, and leagues of cities to discuss the staff proposal and address any questions or concerns.

Once the interim GHG significance threshold is adopted, this Guidance Document will be posted on the SCAQMD's CEQA web pages. Staff will also send notice of the adoption of the staff proposal to all agencies, organizations, and individuals on the SCAQMD's CEQA "Interested Parties" mailing list. In addition, it is expected that staff will prepare and make available an informational brochure that summarizes information about the interim GHG significance proposal in addition to this Guidance Document.

Starting in January 2009, as part of its intergovernmental review (IGR) responsibilities under CEQA, where the SCAQMD reviews and CEQA documents prepared by other public agencies, SCAQMD will begin more thorough evaluations of CEQA documents with regard to their GHG analyses and the basis by which they make a determination of significance. Staff will begin recommending use of the staff's interim GHG significance threshold proposal or other available GHG significance thresholds based on substantial evidence in comment letters on notices of preparation of an EIR. As of March 1, 2009, staff will formally recommend use of staff's interim GHG significance threshold proposal or other available GHG significance thresholds based on substantial evidence in comment letters on NDs and MNDs. As of July 1, 2009, staff will formally recommend use of staff's interim GHG significance threshold proposal or other available GHG significance thresholds based on substantial evidence in comment letters on EIRs.

Compile Lists of GHG Design Features and Mitigation Measures

CEQA Guidelines §15126.4 requires an EIR to “describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy.” Ideally, it is desirable to avoid impacts altogether through incorporating design features into the proposed project. Because staff's recommended interim GHG significance threshold includes performance standards (see tier 4 compliance options 1 and 3) or a project proponent may try to reduce GHG emissions to less than the applicable screening levels, mitigation measures or design features are important components of the overall GHG significance threshold strategy. As a result, a number of GHG Working Group stakeholders has requested that SCAQMD compile lists of design features or mitigation measures to assist with reducing GHG emissions for all land use types.

In response to the request from GHG Working Group stakeholders to develop GHG design features and mitigation measures, over the next year SCAQMD staff will compile lists of GHG reduction strategies, including control efficiencies, by sector and make the lists available online with other recommended mitigation measures. There is already a robust body of mitigation measures available (see in particular the CAPCOA bullet point discussion below), but in most cases, they do not include control efficiencies. SCAQMD staff will use the following mitigation sources as a basis from which to compile mitigation strategies.

- **CEQA Guidelines, Appendix F** – this appendix includes a list of general energy conservation measures that may be used as a basis to identify GHG reduction strategies. The measures do not contain GHG control efficiencies, so they would need further review to determine if control efficiencies are available.
- **CAPCOA White Paper** – this document provides a comprehensive discussion of GHG reduction strategies and specific mitigation measures are listed in Table 16 in Appendix B. The mitigation measures are grouped by emissions source type, such as transportation measures, parking measures, commercial and residential design features, etc. Table 16 also provides other useful information about each

- mitigation measure including source of each measure, comments and descriptions about each control measure, etc. Most importantly, for many of the mitigation measures CAPCOA has included an emission reduction score. In most cases, the emission reduction score is given as a range. As a result, further evaluation would be necessary to provide a single more precise emission reduction score or a defensible average. Otherwise, it is likely that the high end of the emission reduction score would be used.
- **CARB** - is actively working to develop and adopt GHG protocols to support the Climate Change Program. CARB is working in collaboration with other agencies and organizations, including the California Climate Action Registry, to adopt consistent and standardized methods to accurately report GHG emissions. There are two kinds of GHG protocols, a reporting protocol and a project protocol. The project protocol may be useful as it sets standards and provides specific guidance to define GHG reduction projects and quantify and report GHG reductions from project activities. Some example protocols include manure management and urban forestry. It is expected that additional protocols will be developed and adopted by CARB. It is also expected that CARB's Scoping Plan may provide guidance on regulatory guidance that could be used to develop GHG emission reduction measures. GHG reduction strategies that may also serve as GHG mitigation measures to be developed by CARB over the next two years are shown in Table 5-1.

Table 5-1
California Air Resources Board GHG Emission Reduction Strategies

Strategy	Description of Strategy
Other Light Duty Vehicle Technology	New standards would be adopted to phase in beginning in the 2017 model year
Hydrofluorocarbon Reduction	1) Ban retail sale of HFC in small cans; 2) Require that only low global warming potential (GWP) refrigerants be used in new vehicular systems; 3) Adopt specifications for new commercial refrigeration; 4) Add refrigerant leak-tightness to the pass criteria for vehicular Inspection and Maintenance programs; 5) Enforce federal ban on releasing HFCs.
Transportation Refrigeration Units, Off-Road Electrification, Port Electrification	Strategies to reduce emissions from TRUs, increase off-road electrification, and increase use of shore-side/port electrification.
Manure Management	San Joaquin Valley Rule 4570 (adopted 6/15/06) reduces volatile organic compounds from confined animal facilities through implementation of control options.
Alternative Fuels: Biodiesel Blends	CARB would develop regulations to require the use of 1 to 4 percent biodiesel displacement of California diesel fuel.

Table 5-1 (Concluded)
California Air Resources Board GHG Emission Reduction Strategies

Strategy	Description of Strategy
Alternative Fuels: Ethanol	Increased use of ethanol fuel.
Heavy-Duty Vehicle Emission Reduction Measures	Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector.
Reduced Venting and Leaks in Oil and Gas Systems	Rule considered for adoption by the Air Pollution Control Districts for improved management practices.
Hydrogen Highway	The California Hydrogen Highway Network (CA H2 Net) is a State initiative to promote the use of hydrogen as a means of diversifying the sources of transportation energy.
Achieve 50% Statewide Recycling Goal	Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. According to the California Integrated Waste Management Board, in 2005 the statewide waste diversion rate was 52 percent. ⁶
Landfill Methane Capture	Install direct gas use or electricity projects at landfills to capture and use emitted methane.
Zero Waste - High Recycling	Additional recycling beyond the State's 50% recycling goal.

- CEC and CPUC – These agencies are actively developing GHG emission reduction strategies that may also be used to develop GHG mitigation measures for specific energy production sources. Examples of CEC and CPUC GHG emission reduction strategies are shown in Table 5-2.

Other sources of potential GHG emission reduction measures will be evaluated and incorporated, as applicable into any GHG mitigation measure lists developed by the SCAQMD.

⁶ CIWMB, 2007; <http://www.ciwmb.ca.gov/LGCentral/Rates/Diversion/2005/Default.htm>

Table 5-2
GHG Emission Reduction Strategies Implemented by CEC and CPUC

Strategy	Description of Strategy
ENERGY COMMISSION (CEC)	
Building Energy Efficiency Standards in Place and in Progress	Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).
Appliance Energy Efficiency Standards in Place and in Progress	Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).
Cement Manufacturing	Cost-effective reductions to reduce energy consumption and to lower carbon dioxide emissions in the cement industry.
Municipal Utility Strategies	Includes energy efficiency programs, renewable portfolio standard, combined heat and power, and transitioning away from carbon intensive generation.
Alternative Fuels: non-Petroleum Fuels	Increasing the use of non-petroleum fuels in California’s transportation sector, as recommended in the CEC’s 2003 and 2005 Integrated Energy Policy Reports.
PUBLIC UTILITIES COMMISSION (PUC)	
Accelerated Renewable Portfolio Standard (33 percent by 2020)	The Governor has set a goal of achieving 33 percent renewables in the State’s resource mix by 2020. The joint PUC/Energy Commission September 2005 Energy Action Plan II (EAP II) adopts the 33 percent goal.
California Solar Initiative	The solar initiative includes installation of 1 million solar roofs or an equivalent 3,000 MW by 2017 on homes and businesses, increased use of solar thermal systems to offset the increasing demand for natural gas, use of advanced metering in solar applications, and creation of a funding source that can provide rebates over 10 years through a declining incentive schedule.
Investor-Owned Utility	This strategy includes energy efficiency programs, combined heat and power initiative, and electricity sector carbon policy for investor owned utility.

Periodically Review the Interim GHG Significance Threshold

SCAQMD staff will periodically review and revise staff’s GHG proposal to incorporate applicable updated information on GHGs and GHG reduction strategies resulting from regulatory requirements or advances in technology. Some areas of the current proposal that may be reevaluated include the tier 3 screening levels, and the tier 4 compliance option 1 GHG reduction target objective. Further, staff will evaluate whether or not sector based performance standards can be developed for tier 4 compliance option 3.

If a statewide GHG significance threshold is developed by CARB, staff will review that threshold and report to the Governing Board [by March 2009 considering such a](#)

~~threshold for adoption regarding any implementation issues and ways to transition into the recommended GHG significance threshold within six months of formal approval by the CARB Board.~~

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APPENDIX A

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APPENDIX B

SUMMARIES OF WORKING GROUP MEETINGS

WORKING GROUP MEETING #1 (APRIL 30, 2008)

At the first Working Group meeting SCAQMD staff presented the Working Group with a number of policy objectives and design criteria for consideration to establish the framework for developing a GHG significance threshold. Policy objectives include the following concepts. First, the GHG significance threshold should minimize environmental degradation, that is, it should not make impacts worse. To this end, it may be useful to develop a GHG significance threshold that achieves GHG emissions reductions that are consistent with the goals of AB 32 estimated to be approximately 30 percent reduction of GHG emissions from business-as-usual. Although CEQA or a GHG significance threshold established pursuant to CEQA may be useful tools in reducing GHG emissions, they would act in parallel with regulatory requirements, e.g., AB 32, but they do not replace them. As a result, there is no requirement that a GHG significance threshold must reduce GHG emissions consistent with AB 32 or EO S-3-05.

In addition to policy considerations, a number of GHG significance threshold design criteria were also considered. An important consideration in developing a GHG significance threshold is the potential administrative burden it may create on lead agencies through increased resource impacts such as increased costs and staff if the significance threshold is established too low. For example, a zero threshold might result in eliminating or substantially reducing the number of projects that qualify for a categorical exemption, a negative declaration, or a mitigated negative declaration. Other design considerations discussed included establishing a single GHG threshold, such as a “bright line” numerical threshold or multiple thresholds, such as the tiered approaches identified by CAPCOA, etc.

WORKING GROUP MEETING #2 (MAY 28, 2008)

At the second Working Group meeting, staff presented design criteria recommendations based on the discussion at the first Working Group meeting and correspondence received subsequent to the first Working Group meeting. With regard to analyzing life cycle GHG emissions, staff’s initial recommendation was to exclude an analysis of life cycle emissions because life cycle process are not well established. Instead, the GHG emissions analysis should focus on direct and indirect impacts, consistent with current CEQA requirements (CEQA Guidelines §15064(d)). Feedback from the Working Group suggested that a CEQA analysis may be considered deficient without making an effort to conduct a life cycle analysis. Further, if life cycle emissions data are not available, the lead agency should note this consider further analysis speculative and terminate the discussion (CEQA Guidelines §15145).

Another design criteria recommendation made by staff was to take into consideration the administrative burden and resources impacts when establishing a GHG significance threshold. Staff recommended that the GHG significance threshold

should not be set too low, which could result in all projects going through the EIR process. It was pointed out that requiring an EIR for all projects does not necessarily result in more mitigation, no meaningful mitigation may be available for small projects, and it may provide a disincentive for implementing mitigation if the measures are unable to reduce GHG impacts to less than significant.

Other design criteria recommended by staff included analyzing the six Kyoto GHGs, any GHG significance threshold established would be considered interim and would be periodically evaluated and updated as necessary, etc. Staff also introduced the concept of preferred GHG mitigation strategies using a hierarchy from the most to least preferred strategies as shown below.

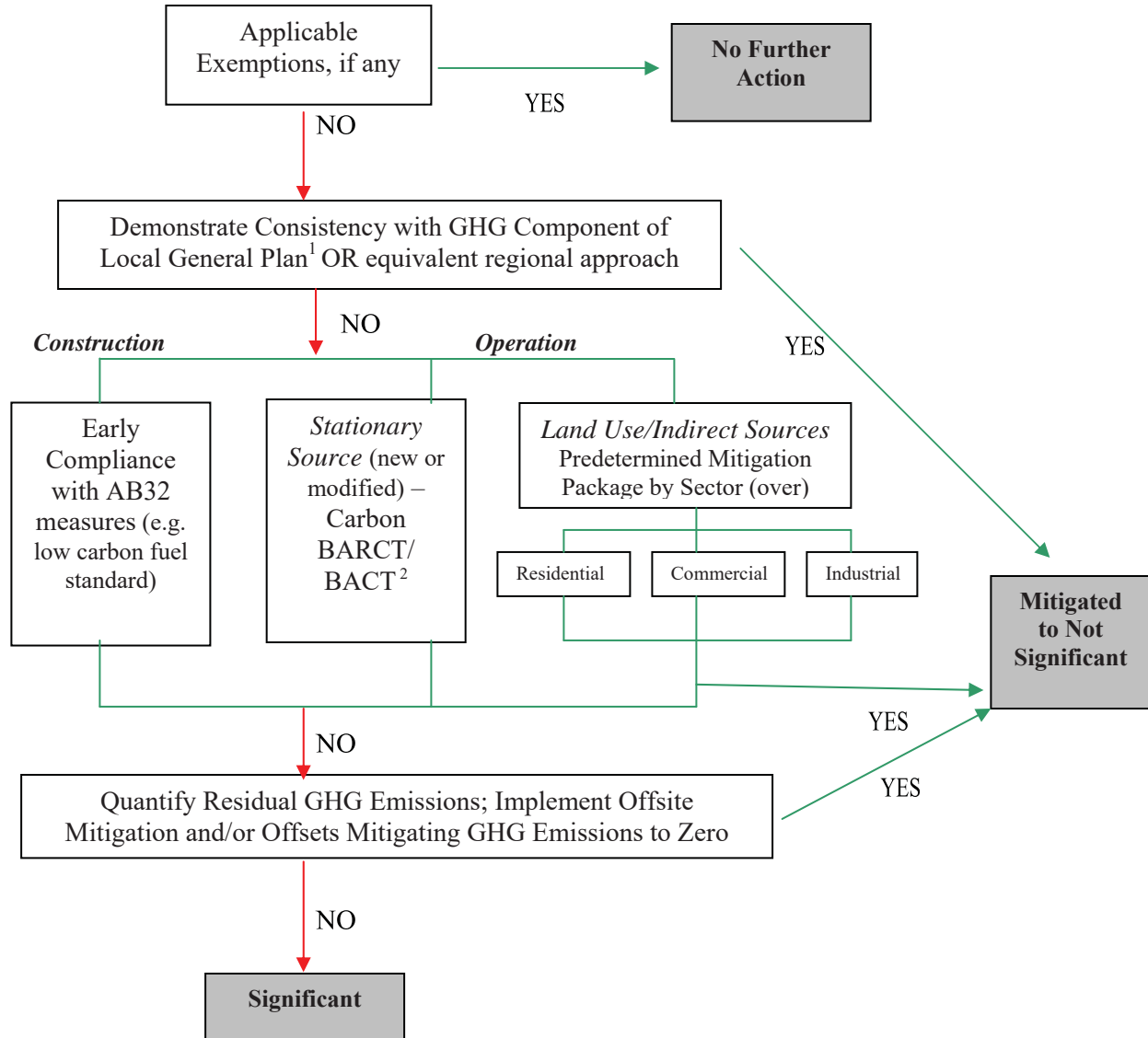
1. Incorporate GHG reduction strategies into project design
2. Mitigate GHGs from other onsite sources for modification projects
3. Mitigate offsite GHG emission reduction projects
4. Mitigate both construction & operational GHG impacts
5. Consider feasible mitigation based on economic factors (cost) pursuant to CEQA Guidelines §15364
6. Purchase acceptable GHG offsets with preference toward GHG reduction projects occurring in-basin or in-state (offset cost a consideration). The following points should be considered:
 - a. Offset market still developing, so it is necessary to ensure offsets are obtained from a credible source
 - b. Offsets should be provided for at least 10 years of project operation (see SJVAPCD indirect source Rule 9510 §6.2 mitigation requirements)

Finally, SCAQMD staff introduced the initial staff proposal. The initial staff proposal consisted of a tiered approach, similar to CAPCOA's Approach 2 with mandatory GHG mitigation measures. Each tier of this proposal is briefly described in the following bullet points and shown graphically in Figure B-1.

- The first tier consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. For example, SB 97 specifically exempts a limited number of projects until it expires in 2010. If the project qualifies for an exemption, no further action is required. If the project does not qualify for an exemption, then move to the next tier.

Figure B-1
Initial Staff Proposal – Proposed Tiered Approach – May 28, 2008

Significance determination of Cumulative Impacts from GHG emissions:



1. Local General Plans, at a minimum, must comply with AB32 reduction goals; have been analyzed under CEQA, and have a certified Final CEQA document; emission estimates approved by CARB or SCAQMD; include a GHG inventory tracking mechanism; and a commitment to remedy the excess emissions if AB32 goals are not met.
2. SCAQMD will work with CAPCOA to develop a list of mitigation measures.

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

- The second tier consists of determining whether or not the project is consistent with a GHG reduction plan that is part of a local general plan for example. The GHG reduction plan must, at a minimum, comply with AB 32 reduction goals; include emission estimates approved by CARB or SCAQMD, have been analyzed under CEQA, and have a certified Final CEQA document. Further, the GHG reduction plan must include a GHG inventory tracking mechanism; process to monitor progress in achieving GHG emission reduction targets, and a commitment to remedy the excess emissions if AB 32 goals are not met (enforcement). If the proposed project is consistent with the local GHG reduction plan, it is not significant for GHG emissions.

The concept of consistency with a GHG reduction plan, is similar to the concept of consistency in CEQA Guidelines §15125(d). If the proposed project does not comply with the local GHG reduction plan or no GHG reduction plan has been adopted, then move to the third tier.

- Under the third tier there are three options that can be used to demonstrate that a project would not have significant emissions. The first significance option is early compliance with AB 32 Scoping Plan measures. The second significance option, primarily for stationary source equipment, would be to install carbon best available retrofit control technology (BARCT) or best available control technology (BACT). Carbon BARCT/BACT would be established by the SCAQMD. The third significance option for industrial, commercial, and residential land use projects would be to implement a menu of prescribed mitigation measures. Mitigation measures would be developed for each land use sector by SCAQMD staff. Implementing one of these three options would result in a determination that GHG emission impacts from the proposed project are not significant. If the proposed project is unable to implement any one of these three options or cannot fully implement any option, then it would move to the fourth tier.
- Under the fourth tier, the lead agency would quantify GHG emissions from the project and implement offsite mitigation (GHG reduction projects) or purchase offsets. Under this tier, GHG emission impacts the lead agency would be required to mitigate or offset GHG emissions to zero. If GHG emissions can be offset to zero, GHG emissions from the project are concluded to be insignificant. If GHG impacts cannot be reduced to zero, the project is concluded to be significant for GHGs.

WORKING GROUP MEETING #3 (JUNE 19, 2008)

Subsequent to Working Group meeting #2, SCAQMD staff received feedback on the initial staff proposal. Issues and concerns raised by the stakeholders on the initial staff proposal were addressed at the third Working Group meeting and are summarized in the following bullet points.

- The staff proposal does not explicitly state any quantitative or qualitative target objectives. If there are no explicit target objectives, how is it possible to determine whether or not a project is insignificant for GHG emissions?

- Concerns were raised regarding the lack of detail relative to the sector-specific mitigation measures and the potentially lengthy lag time between implementing the GHG significance threshold and developing the mitigation measures.
- For most projects, GHG emissions would not need to be calculated as long as the prescribed menu of sector-specific mitigation measures is implemented. Without quantifying GHG emissions and the control efficiencies of the mitigation measures, a project would be vulnerable to a “Fair Argument” that GHG emissions are still significant even after implementing prescribed mitigation measures.
- A CEQA document may be vulnerable in court if control efficiencies of mitigation measures are not identified.
- Is the staff proposal really a zero GHG significance?

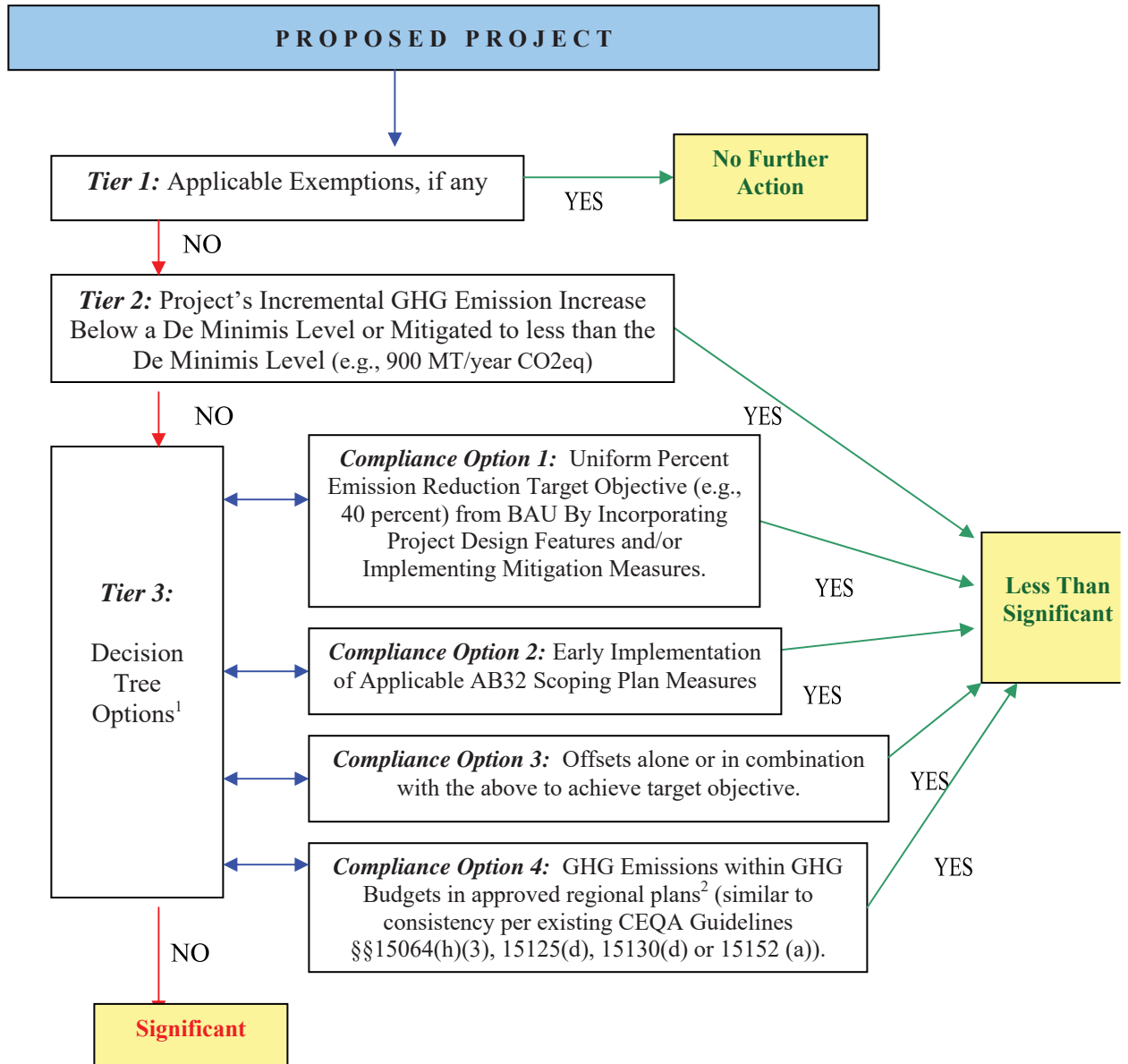
Based on Working Group feedback, staff presented revised staff proposal #1, which consisted of a tiered decision tree approach. The components of revised staff proposal #1 are described in the following bullet points and shown graphically in Figure B-2. As shown in Figure B-2, some of the tier components of the revised staff proposal are similar to those in the initial staff proposal.

- **Tier 1** – no change from the initial proposal.
- **Tier 2** – is a new component of the revised staff proposal. Tier 2 attempts to identify small projects that would not likely contribute to significant cumulative GHG impacts. The de minimis or screening level of 900 metric tons per year is the level that is estimated by CAPCOA to capture 90 percent of the residential units or office space in pending application lists⁷. CAPCOA infers that projects that emit less than 900 metric ton per year would not likely be considered cumulatively considerable. Further, the 900 metric ton per year level would capture 90 percent

⁷ Although the CAPCOA White Paper implies that 900 metric tons per year equates to a 90 percent capture rate, there is no explicit information provided in the White Paper that demonstrates this correlation. Indeed, the CAPCOA authors state that 900 metric tons, which represents approximately 50 residential units, corresponds to widely divergent capture rate percentile rankings depending on the project location (see discussion on page 43 of the White Paper). Percentile rankings were based on a survey of four cities in California. A project of 900 metric tons per year representing a 90 percent capture rate appears to be a working assumption for which there appears to be no factual basis. Further, although not explicitly stated, it is assumed that the 900 metric tons were derived using the URBEMIS2007 model. It should be noted that that the URBEMIS2007 model only quantifies CO₂ emissions and direct emissions primarily from on-road mobile sources. It does not capture other GHG pollutants or indirect GHG emissions such as emissions from energy generation, water conveyance, etc. Therefore, it is likely that a 50-unit residential project would actually generate higher GHG emissions than 900 metric tons per year.

Figure B-2

Revised Staff Proposal #1 Tiered Decision Tree Approach – June 19, 2008

Significance Determination of Cumulative Impacts from GHG Emissions:

1. Substitution for equivalent reductions allowed.
2. Local General Plans or other local plans local plans that, at a minimum, comply with the overall target objective or the sector-based CARB Scoping Plan; have been analyzed under CEQA, and have a certified Final CEQA document; emission estimates approved by CARB or SCAQMD; include a GHG inventory; tracking mechanism; enforcement; and a commitment to remedy the excess emissions if commitments are not met.

of all pending projects, which means that 90 percent of all projects would have to implement GHG reduction measures.

If a project is less than 900 MT/year CO₂eq or can mitigate to less than 900 MT/year CO₂eq, it would be considered insignificant for GHGs. Projects larger than 900 MT/year CO₂eq would move to tier 3.

- Tier 3 Decision Tree Options – consists of four decision tree options to demonstrate that a project is not significant for GHG emissions. The four compliance options are as follows.

Compliance Option 1 – the lead agency would calculate GHG emissions for a project using a business-as-usual (BAU) methodology. Once GHG emissions are calculated, the project proponent would have to incorporate design features into the project and/or implement GHG mitigation measures to demonstrate a 40 percent reduction from BAU. A 40 percent reduction below BAU was selected for the following reason. To comply with the AB 32 requirement of reducing GHG emissions to 1990 levels, an approximately 30 percent reduction from current BAU is necessary.

Since CEQA is not applicable to all GHG emission sources, i.e., existing projects that are not undergoing expansion or modifications, staff chose a 40 percent reduction below BAU requirement, which goes beyond the target GHG reduction objective of AB 32, but is still a potentially feasible GHG reduction for a variety of different projects.

Compliance Option 2 – this option is the same as the early compliance with AB 32 option in the third tier of the initial staff proposal.

Compliance Option 3 – this option is similar to the fourth tier of the initial staff proposal where GHG emissions would be reduced through offsite GHG reduction projects and/or use of offsets. This compliance option, however, would require offsetting GHG emissions by the same target objective as compliance option 1, that is, 40 percent below BAU instead of reducing GHG emissions to less than the de minimis or screening level.

Compliance Option 4 – this option is the same as the consistency with the greenhouse gas reduction plan component in the second tier of the initial staff proposal.

If the lead agency or project proponent cannot implement any of the compliance options in Tier 3, GHG emissions would be considered significant.

WORKING GROUP MEETING #4 (JULY 30, 2008)

Subsequent to Working Group meeting #3, SCAQMD staff received feedback on the revised staff proposal #1. Issues and concerns raised by the stakeholders on the initial

staff proposal were addressed at the third Working Group meeting and are summarized in the following bullet points.

- Compliance with a GHG reduction plan should not be a compliance option in Tier 3, but should be its own tier, earlier in the tiering process.
- There is a large disconnect between screening level and remaining emissions under the Tier 4 compliance options. For example, large projects that can reduce GHG emissions by the target objective of 40 percent would do so, which means GHG emissions would not be significant, could have substantially higher emissions than projects with GHG emissions less than the screening level.
- Compliance with a target objective should not be through offsets alone. Because of the uncertainties regarding the validity of offsets, preferred mitigation should consist of actual GHG emission reductions.
- The Tier 3 compliance option 1, GHG emissions reductions from BAU, is not the proper metric for determining significance. How can a lead agency be sure that the projected BAU emissions for a project are not artificially inflated to make it easier to achieve the required target objective?
- The Tier 3 compliance option 1, reducing GHG emission reductions from BAU, could penalize projects in environmentally progressive areas where BAU may be much lower than in other areas, thus, making it more difficult to achieve the target objectives.

Based on Working Group feedback and internal discussions, staff presented revised staff proposal #2, which further refined the previous tiered decision tree approach. The components of revised staff proposal #2 are described in the following bullet points and shown graphically in Figure B-3. As shown in Figure B-3, some of the tier components of the revised staff proposal are similar to those in the initial staff proposal.

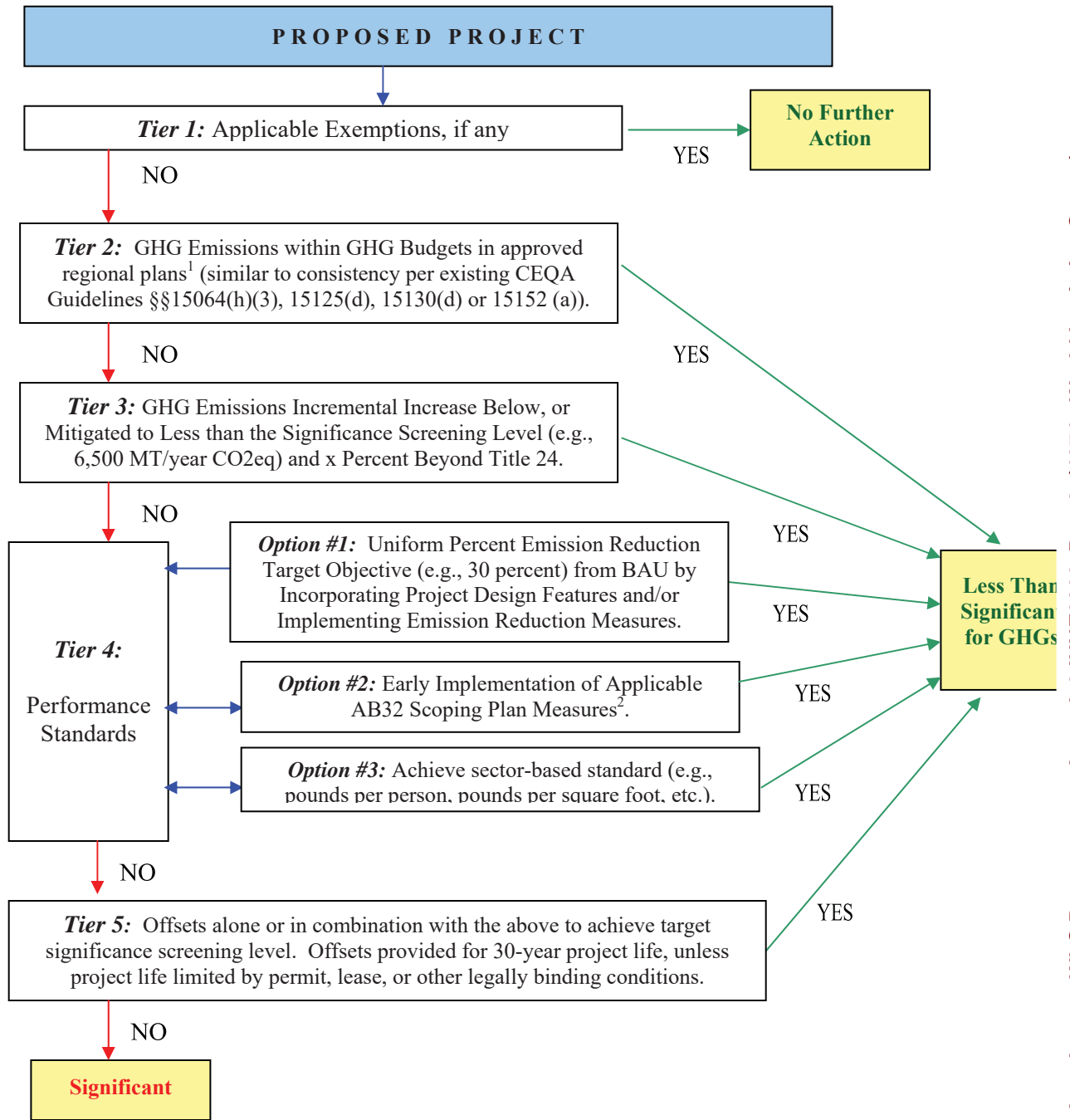
- **Tier 1** – no change from the initial proposal.
- **Tier 2** – compliance option 4 in Tier 3 has been moved back a stand-alone tier.
- **Tier 3** – the screening level that was previously Tier 2 has been moved to Tier 3. In response to feedback from the Working Group, the screening level has been increased to 6,500 MT/year CO₂eq. The new screening level was derived using the SCAQMD's existing NO_x operational threshold as a basis. The daily NO_x operational significance threshold, 55 pounds per day was annualized, which results in 10 tons of NO_x per year. Using the URBEMIS2007 model, staff initially modeled a mixed-use project that emits just under 10 tons per year to determine what the equivalent CO₂ emissions would be. Resulting CO₂ emissions from the mixed use project were approximately 6,500 MT/year CO₂. To further corroborate the 6,500 MT/year CO₂ staff performed 19 modeling runs on a variety of projects including residential, commercial, industrial, and various combinations of land uses. In addition, since the analysis was an annual

analysis, a weighted trip rate was derived for each land use category to obtain a more accurate estimate of trip rates throughout the week. Although the results from the 19 modeling runs were approximately 16 percent higher than staff's original estimate of 6,500 MT/year CO₂, 7,304 to 7,723 MT/year CO₂, staff continued to recommend the 6,500 MT/year CO₂ provides a margin of safety when deriving CO₂ emissions based on the annualized NO_x level of 10 tons per year and when evaluating different types of land use projects.

Projects with GHG emissions less than the screening level are considered to be small projects, that is, they would not likely be considered cumulatively considerable. However, because of the magnitude of increasing global temperatures from current and future GHG emissions, staff recommended that all projects must implement some measure or measures to contribute to reducing GHG emissions. Therefore, Tier 3 includes a requirement that all projects with GHG emissions less than the screening level must include efficiency components that reduce to a certain percentage beyond the requirements of Title 24 (Part 6, California Code of Regulations), California's energy efficiency standards for residential and nonresidential buildings.

- Tier 4 Performance Standards – Tier 3 from the revised staff proposal #1 has been moved to Tier 4 and renamed.

Figure B-3
 Proposed Tiered Decision Tree Approach – July 30, 2008
Significance Determination of Cumulative Impacts from GHG Emissions:



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1. Local General Plans or other local plans local plans that, at a minimum, comply with the overall target objective or the sector-based CARB Scoping Plan; have been analyzed under CEQA, and have a certified Final CEQA document; emission estimates approved by CARB or SCAQMD; include a GHG inventory; tracking mechanism; enforcement; and a commitment to remedy the excess emissions if commitments are not met.
2. Substitution for equivalent reductions allowed.

Compliance Option 1 – is essentially the same as the previously recommended, except that the target objective has been changed from reducing GHG emissions 40 percent below BAU to 30 percent below BAU to be more consistent with AB 32 target objectives.

Compliance Option 2 – no change from the previous proposal.

Compliance Option 3 – this is a new compliance option and consists of establishing sector-based performance standards. For example, it may be possible to use the 1990 inventory required under AB32 to establish an efficiency standard such as pounds per person, pounds per worker, pounds per square feet, pounds per item manufactured, etc. When calculating GHGs from a project, if they are less than the established efficiency standard the project would not be significant relative to GHG emissions, while projects exceeding the efficiency standard would be significant.

Projects that cannot comply with any of the compliance options in Tier 4 would then move on to Tier 5.

- **Tier 5** – consists generally of the Tier 3 compliance option 3 from the previous staff proposal. The only difference is that the project proponent would be required to provide offsets for the life of the project, which is defined as 30 years. If the project proponent is unable to obtain sufficient offsets, incorporate design features, or implement GHG reduction mitigation measures, then GHG emissions from the project would be considered significant.

WORKING GROUP MEETING #5 (AUGUST 27, 2008)

Subsequent to Working Group meeting #3, SCAQMD staff received feedback on the revised staff proposal #2. Issues and concerns raised by the stakeholders on the initial staff proposal were addressed at the third Working Group meeting and are summarized in the following bullet points.

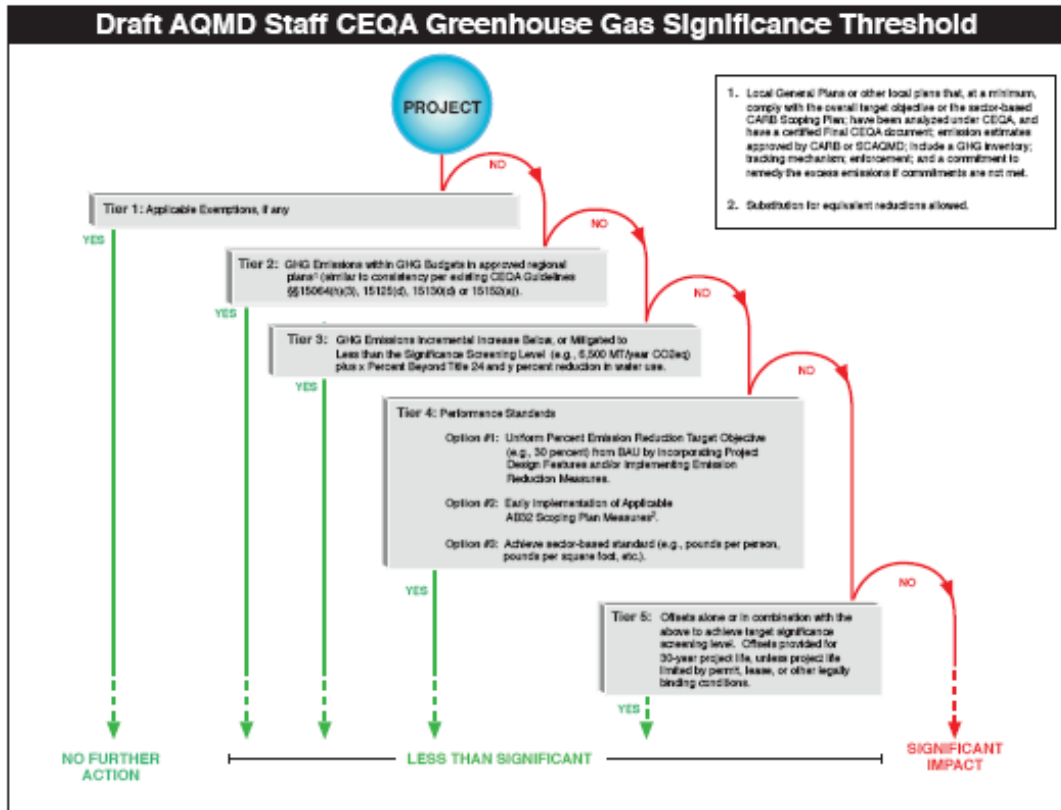
- A recommendation was made to modify the target objective of Tier 5 to be consistent with the target objective of Tier 4 compliance option 1, that is require emissions to be offset 30 percent from BAU rather than offset down to the screening level.
- A Working Group member asked for clarification on the early implementation of applicable AB 32 Scoping Plan measures in Tier 4-Option 2. In addition, a question was asked regarding whether or not this compliance option was applicable after the requirements of AB 32 have become effective.

At Working Group meeting #5, staff presented revised staff proposal #3, which consisted primarily of minor refinements to the previous tiered decision tree approach

in revised staff proposal #2. The components of revised staff proposal #3 are shown graphically in Figure B-4.

Aside from changing the graphic layout of the staff proposal to make it easier to understand, revised staff proposal #3 has only one minor modification. A second energy efficiency requirement has been added to the screening level in Tier 3. In addition to requiring projects to go a certain percentage beyond Title 24, projects would also have to reduce by a specified percentage electricity demand from water use, primarily electricity used for water conveyance.

Figure B-4
 Revised Staff Proposal #3 Tiered Decision Tree Approach – August 27, 2008



Attachment T

SMAQMD, GHG Thresholds for Sacramento County

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DRAFT

Prepared for
Sacramento Metropolitan Air Quality Management District
Sacramento, California

Prepared by
Ramboll US Corporation
San Francisco, California

Project Number
1690006005-013

Date
March 4, 2020

GREENHOUSE GAS THRESHOLDS FOR SACRAMENTO COUNTY SMAQMD SACRAMENTO, CALIFORNIA

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

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1. INTRODUCTION

1.1 History of GHG Thresholds of Significance and Need for Update

The Sacramento Air Quality Management District (SMAQMD) is one of 35 regional air quality districts in California responsible for local air quality planning, monitoring, and stationary source and facility permitting. SMAQMD covers all of Sacramento County, including the cities of Sacramento, Citrus Heights, Folsom, Rancho Cordova, Elk Grove, Galt, Isleton, and unincorporated Sacramento County. Under the California Environmental Quality Act (CEQA) review process for proposed projects, SMAQMD may serve as the lead agency, a responsible agency with limited discretionary authority, or a reviewing agency providing comment on the air quality impacts of a proposed project or plan. CEQA requires that lead agencies identify significant environmental impacts, including impacts from greenhouse gas (GHG) emissions, and to avoid or mitigate those impacts if feasible.

To assist lead agencies in determining significance, in October 2014 SMAQMD adopted the current GHG thresholds of significance which include a construction threshold (1,100 metric tons GHG/year), a land use operational threshold (1,100 metric tons GHG/year), and a stationary source operational threshold (10,000 metric tons GHG/year). Projects whose emissions are expected to meet or exceed the significance criteria will have a potentially significant adverse impact on global climate change. Originally, SMAQMD recommended a 21.7% mitigation from Business as Usual scenario for projects that exceeded the operational thresholds, based on the Business as Usual approach presented in the California Air Resources Board (CARB) 2011 Final Supplement to the 2008 Climate Change Scoping Plan.¹ As a result of the California Supreme Court decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming* in January 2016, SMAQMD recommended suspending the use of Business as Usual analysis and the recommended 21.7% mitigation level for projects exceeding the operational thresholds. This left agencies with the 1,100 metric tons GHG/year screening threshold and the need to demonstrate all feasible mitigation for projects exceeding the threshold. SMAQMD encouraged local agencies in Sacramento County to develop a climate action plan (CAP) or GHG reduction plan that could be used by the local agency to reduce GHG emissions and streamline CEQA review for development projects, which can provide adequate mitigation for GHG impacts by demonstrating consistency with the reduction measures adopted in the CAP. As of August 2019, the following local lead agencies within SMAQMD either have adopted or are in the process of preparing a CAP or GHG reduction plan:

Jurisdiction	CAP or GHG Plan Status	Target Years
County of Sacramento	Government Operations Only, Adopted 2012	2020
City of Sacramento	Adopted 2012	2020, 2035, 2050
City of Elk Grove	Adopted 2019	2020, 2030, 2050

¹ The regulations, court cases, and GHG plans cited in this section are described in further detail in the Regulatory Background Section 1.2 of this report.

City of Folsom	Adopted 2018	2020, 2030, 2040, 2050
City of Citrus Heights	Adopted 2011	2020
City of Rancho Cordova		
City of Galt	In development	2030, 2050
City of Isleton		

As shown in the table above, a limited number of jurisdictions have adopted plans with longer-term targets. Therefore, SMAQMD CEQA thresholds of significance are needed to support jurisdictions which have not yet adopted a qualified CAP or GHG reduction plan with the appropriate horizon year for given projects. Even for jurisdictions with adopted CAP or GHG reduction plans, the jurisdiction may also choose to pursue projects that do not demonstrate consistency with a local agency's CAP, so the ability to instead show compliance with the SMAQMD thresholds would allow flexibility.

Furthermore, changes in State legislation and approval of the 2017 Climate Change Scoping Plan since the adoption of the SMAQMD's 2014 thresholds of significance have established the need for a threshold review and update. In September 2016, Senate Bill 32 (SB 32) established the State target to reduce GHG emissions 40% below 1990 levels by 2030. Additionally, the California Air Resources Board (CARB) adopted its Climate Change Scoping Plan in December 2017, which provided recommended per capita community emission targets that could support the State's efforts to reach climate goals. Those targets include achieving 6 metric tons GHG/year/person by 2030 and 2 metric tons GHG/year/person by 2050. Additionally, CARB recognized that GHG reduction efforts being undertaken by Metropolitan Planning Organizations in compliance with SB 375, through Metropolitan Transportation Plans/Sustainable Community Strategies (MTP/SCS), would not provide sufficient reductions in GHG emissions and vehicle miles traveled to meet the 2050 State climate goals.

For these reasons, SMAQMD is proposing an update to the its CEQA GHG thresholds of significance, to assist lead agencies in determining significance for proposed projects through 2030 and beyond. **Section 1.2** of this report provides additional background on the regulation of GHGs at the federal, state, and local levels, and the recent legislation and court decisions that prompted the need for updates to the SMAQMD significance thresholds. **Section 2** of this report provides an overview of the strategy used to develop the updated significance thresholds. **Section 3** estimates Sacramento County GHG emissions in 2030, and from this, **Section 4** estimates 2030 GHG emissions by sector for new and existing development within Sacramento County. This analysis sets the stage for the establishment of 2030 GHG targets and Best Management Practices (BMPs) by place type (**Section 4**), and GHG targets for project buildouts beyond 2030 (**Section 5**). **Section 6** describes requirements to show consistency with longer-term State targets.

1.2 Regulatory Background: Federal, State, and Local

1.2.1 Federal

1.2.1.1 U.S. Supreme Court Ruling on GHGs

In *Massachusetts et al. v. Environmental Protection Agency*, 549 US 497 (2007), the U.S. Supreme Court held that the United States Environmental Protection Agency (USEPA) was authorized by the Clean Air Act to regulate CO₂ emissions from new motor vehicles. The Court did not mandate that the USEPA enact regulations to reduce GHG emissions, but found that the only instances in which the USEPA could avoid taking action were if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On December 7, 2009, the USEPA issued an "endangerment finding" under Section 202(a) of the Clean Air Act, concluding that GHGs threaten the public health and welfare of current and future generations and that motor vehicles contribute to GHG pollution. These findings provide the basis for adopting new national regulations to mandate GHG emission reductions under the federal Clean Air Act.

1.2.1.2 Stationary Sources

On September 22, 2009, the USEPA issued the Final Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98). The rule requires annual reporting to the USEPA of GHG emissions from certain large industrial and commercial sources that emit 25,000 metric tons or more a year of GHGs. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.

1.2.1.3 Mobile Sources

Also in response to the *Massachusetts et al. v. USEPA* ruling discussed above, an Executive Order was issued on May 14, 2007 directing the USEPA, the Department of Transportation (DOT), and the Department of Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. Subsequently, the USEPA and National Highway Traffic Safety Administration (NHTSA) issued a series of joint rulemakings that regulate fuel efficiency and GHG emissions from cars and light-duty trucks of model year 2011 (March 2009 rule), model years 2012-2016 (May 2010 rule), model years 2017-2021 (October 2012 rule), and model years 2021-2026 (August 2018 proposed rule, currently pending). The USEPA and NHTSA also established fuel efficiency and GHG standards for medium- and heavy-duty trucks of model years 2014-2018 (August 2011 rule) and model years 2018-2027 (August 2016 rule).

1.2.1.4 Other Sources

In addition to the rules and regulations developed with respect to stationary and mobile sources, discussed above, various other federal developments have occurred that aim to reduce GHGs from other sources, including land use activities.

- Created under the Energy Policy Act of 2005, the Renewable Fuel Standards (RFS) program established the first renewable fuel volume mandate in the United States, for blending renewable fuel into gasoline. Under the 2007 Energy Independence and Security Act (EISA), the RFS program was expanded to include diesel, and required the USEPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

- The 2007 EISA also included several other provisions to reduce national GHG emissions: it issued energy efficiency standards and labeling for heating, cooling, consumer electronic, and home appliance products; set requirements for phasing out incandescent light bulbs and improving light bulb efficiency; and promoted green jobs and research in alternative energy and carbon capture.
- The 2009 American Recovery and Reinvestment Act (ARRA) was passed in response to the economic crisis of the late 2000s, with the primary purpose of maintaining existing jobs and creating new jobs. Among the secondary objectives of ARRA was investment in “green” energy programs such as funding private companies developing renewable energy technologies; local and state governments implementing energy efficiency and clean energy programs; research in renewable energy, biofuels, and carbon capture; and the development of high efficiency or electric vehicles.
- The 2015 Clean Power Plan (80 FR 64510-64660) prescribed how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units and established CO₂ emission performance standards. Implementation of the Clean power Plan was stayed by the U.S. Supreme Court pending resolution of several lawsuits. In August 2018 the USEPA issued the proposed Affordable Clean Energy (ACE) Rule to replace the Clean Power Plan; rulemaking proceedings are currently pending.
- The USEPA has also developed a number of voluntary programs to provide opportunities for industry, the USEPA, and other organizations in both the public and private sectors to work together to reduce GHG emissions. These include the Center for Corporate Climate Leadership, the Green Power Partnership, the National Clean Diesel Campaign, and State and Local Climate and Energy Programs.

1.2.2 State

California has adopted various administrative initiatives and also enacted a variety of legislation relating to climate change, much of which sets aggressive goals for GHG emissions reductions within the state. However, none of this legislation provides definitive direction regarding the treatment of climate change in environmental review documents prepared under CEQA. In particular, the amendments to the CEQA Guidelines do not require or suggest specific methodologies for performing an assessment of thresholds of significance, and do not specify GHG reduction mitigation measures. Instead, the CEQA Guidelines amendments continue to rely on lead agencies to choose methodologies and make significance determinations based on substantial evidence, as discussed in further detail below. Consequently, no State agency has promulgated binding regulations for analyzing GHG emissions, determining their significance, or mitigating any significant effects in CEQA documents.

The discussion below provides a brief overview of CARB and Office of Planning and Research (OPR) documents, and of the primary legislation and court cases that relate to climate change and informed the development of the proposed SMAQMD significance thresholds. It begins with an overview of the primary regulatory acts that have driven GHG regulation in California, which underlie many of the GHG rules and regulations that have been developed.

1.2.2.1 Executive Order S-3-05 (Statewide GHG Targets for 2010, 2020, and 2050)

California Executive Order S-03-05 (June 1, 2005) establishes the goal of reducing GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

1.2.2.2 Executive Order B-30-15 (Statewide GHG Targets for 2030)

In April 2015, Governor Brown signed Executive Order B-30-15, which established the following GHG emission reduction goal for California: by 2030, reduce GHG emissions to 40 percent below 1990 levels. This Executive Order also directed all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in Executive Order S-3-05 (see discussion above). Additionally, the Executive Order directed CARB to update its Scoping Plan (see discussion below) to address the 2030 goal.

The Legislature adopted SB 32 to enact the Executive Order's 2030 goal, as described further below.

1.2.2.3 Assembly Bill 32 (Statewide GHG Reductions)

Assembly Bill (AB) 32 (Nunez, 2006), the California Global Warming Solutions Act of 2006, was enacted after considerable study and expert testimony before the Legislature. The heart of AB 32 is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020. In order to achieve this reduction mandate, AB 32 requires CARB to adopt rules and regulations in an open public process that achieve the maximum technologically feasible and cost-effective GHG reductions.

Of relevance to this analysis, in 2007, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline. CARB's adoption of this limit is in accordance with Health & Safety Code Section 38550, as codified through enactment of AB 32.

Per Health & Safety Code Section 38561(b), CARB also is required to prepare, approve and amend a scoping plan that identifies and makes recommendations on "direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that [CARB] finds are necessary or desirable to facilitate the achievement of the maximum feasible and cost-effective reductions of greenhouse gas emissions by 2020."

2008 Scoping Plan

In 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (2008 Scoping Plan) in accordance with Health & Safety Code Section 38561. During the development of the 2008 Scoping Plan, CARB created a planning framework that is comprised of eight emissions sectors: (1) transportation; (2) electricity; (3) commercial and residential; (4) industry; (5) recycling and waste; (6) high global warming potential (GWP) gases; (7) agriculture; and, (8) forest net emissions.

The 2008 Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions from the eight emissions sectors to 1990 levels by 2020. In the Scoping Plan, CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5 percent from the otherwise projected 2020 emissions level; i.e., those emissions that would occur in 2020,

absent GHG-reducing laws and regulations (referred to as “Business-As-Usual” [BAU]).² For example, in further explaining CARB’s BAU methodology, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

To achieve the necessary GHG reductions to meet AB 32’s 2020 target, CARB developed a series of reduction measures in the Scoping Plan covering a range of sectors and activities. Broadly, the reduction measures can be separated into capped sectors (i.e., covered by the Cap-and-Trade Program discussed below) and uncapped sectors.

Multiple Scoping Plan measures broadly cover emissions associated with land use development, including, but not limited to:

- *Energy Efficiency/Green Buildings*. The Scoping Plan highlights the importance of energy efficiency efforts in reducing GHG emissions from residential and commercial development and indicates that zero net energy (ZNE) should be the overarching and unifying concept for energy efficiency.
- *Regional Transportation-Related GHG Targets (SB 375)*. The Scoping Plan relies on Senate Bill (SB) 375, discussed below, as an important mechanism to reduce mobile GHG emissions by integrating land use planning and transportation planning at the regional and local level.
- *Vehicle Emissions*. The Scoping Plan relies on various engine, fuel and other efficiency improvement programs and increasing electrification of the vehicle fleet.
- *Cap-and-Trade Program*. The Scoping Plan identifies the Cap-and-Trade program as a lynchpin, overarching strategy for California to reduce GHG emissions. As explained in the Scoping Plan, the program’s implementing regulations provide assurance that California’s 2020 limit will be met because the regulation sets a firm limit on 85 percent of California’s GHG emissions.

In the 2011 *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (2011 Final Supplement), CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7 percent (down from 28.5 percent) from the BAU conditions. When the 2020 emissions level projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewable Portfolio Standard (12 percent to 20 percent), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16 percent (down from 28.5 percent) from the BAU conditions.

2014 First Update to the Scoping Plan

In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (2014 First Update).³ The stated purpose of the 2014 First Update is to

² CARB. 2008. Climate Change Scoping Plan: A Framework for Change. December. Available at: https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed: March 2020.

³ Health & Safety Code Section 38561(h) requires CARB to update the Scoping Plan every five years.

“highlight[...] California’s success to date in reducing its GHG emissions and lay[...] the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050.”⁴ The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80 percent below 1990 levels by 2050, if the State attains the expected benefits of existing policy goals.

In conjunction with the 2014 First Update, CARB identified “six key focus areas comprising major components of the State’s economy to evaluate and describe the larger transformative actions that will be needed to meet the State’s more expansive emission reduction needs by 2050.”⁵ Those six areas are: (1) energy; (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); (3) agriculture; (4) water; (5) waste management; and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of the 2050 reduction target.

Based on CARB’s research efforts, it has a “strong sense of the mix of technologies needed to reduce emissions through 2050.”⁶ Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the 2014 First Update, CARB recalculated the State’s 1990 emissions level using the GWPs identified by the Intergovernmental Panel on Climate Change’s Fourth Climate Change Assessment (2007). Using the recalculated 1990 emissions level and the revised 2020 emissions level projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15.3 percent (instead of 28.5 percent or 16 percent) from the “BAU” conditions.

The 2014 First Update included a strong recommendation from CARB for setting a mid-term statewide GHG emissions reduction target. CARB specifically recommended that the mid-term target be consistent with: (i) the United States’ pledge to reduce emissions 42 percent below 2005 levels (which translates to a 35-percent reduction from 1990 levels in California); and (ii) the long-term policy goal of reducing emissions to 80 percent below 1990 levels by 2050.

2017 Scoping Plan

In 2017, CARB adopted *California’s 2017 Climate Change Scoping Plan: The Strategy for Achieving California’s 2030 Greenhouse Gas Target* (2017 Scoping Plan).⁷ This 2017 Scoping Plan addresses Executive Order B-30-15 (described earlier) and SB 32 (described in a later

⁴ CARB. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework. May. Available at: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed: March 2020.

⁵ Ibid.

⁶ Ibid.

⁷ CARB. 2017. California’s 2017 Climate Change Scoping Plan: The Strategy for Achieving California’s 2030 Greenhouse Gas Target. November. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: March 2020.

section), which extend the goals of AB 32 and set a 2030 goal of reducing emissions 40 percent below 1990 levels. The 2017 Scoping Plan includes the following major elements for reaching the 2030 Target:

1. SB 350

The objective of this policy element is to enhance existing programs and implement SB 350, with a target of achieving 50 percent Renewables Portfolio Standard (RPS) and a doubling of energy efficiency savings in natural gas and electricity end uses statewide by 2030.

2. Low Carbon Fuel Standard (LCFS)

The objective of this policy element is to transition to cleaner/less-polluting transportation fuels that have a lower carbon intensity, with a goal of a 20 percent reduction in carbon intensity statewide by 2030.

3. Mobile Source Strategy

This strategy will reduce GHGs and other pollutants from the transportation sector through transition to zero- and low-emission vehicles, cleaner transit systems, and reduction of vehicle miles traveled (VMT). Highlights of this strategy include a target of 4.2 million zero-emission vehicles on the road by 2030; reduction in GHGs from medium- and heavy-duty vehicles via the Phase 2 Medium- and Heavy-Duty GHG Standards; a suite of innovative clean transit options including requirements for the deployment of zero-emission buses, and emissions standards for new natural gas and diesel buses; a new "Last Mile Delivery" regulation for certain delivery trucks that would result in the use of cleaner engines and zero-emission vehicles; and reduction in VMT to be achieved in part by the continued implementation of regional Sustainable Community Strategies pursuant to SB 375 (described in a later section) and other statewide strategies.

4. SB 1383

This Short-Lived Climate Pollutant strategy will achieve a 40 percent reduction in methane and hydrofluorocarbon emissions and a 50 percent reduction in anthropogenic black carbon emissions below 2013 levels by 2030.

5. California Sustainable Freight Action Plan

This plan will improve freight system efficiency by 25 percent by 2030, deploy over 100,000 zero emission freight vehicles and equipment, and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030.

6. Post 2020 Cap-and-Trade Program

CARB will continue the existing Cap-and-Trade Program after 2020 with declining caps.

With the exception of the post-2020 Cap-and-Trade Program, the above measures and policies are considered "known commitments" meaning that they were existing programs or required by statute prior to the adoption of the 2017 Scoping Plan. (Since adoption of the 2017 Scoping Plan, legislation was enacted extending the horizon year of the Cap-and-Trade Program to 2030.)

The 2017 Scoping Plan also addressed how CEQA can be used to further statewide GHG reduction goals. The Plan recommends GHG reduction goals that can apply to plan- or

project-level analyses to be incorporated into environmental documentation in support of CEQA. The Plan states that a per capita GHG target is "appropriate for the plan level (city, county, subregional, or regional level), but not for specific individual projects, because [CARB's metric] includes all emissions sectors in the State." Project-level goals may be supported by local governments or lead agencies and include potential strategies such as tiering from a geographically specific GHG reduction plan, comparing to service population emissions targets, implementing all feasible mitigation measures, achieving zero net GHG emissions, or emitting less than bright-line numerical thresholds.

Cap-and-Trade Program

The California Global Warming Solutions Act of 2006 (AB 32) allowed, but did not require, CARB to include among the mechanisms intended to reduce GHG emissions a "system of market-based declining annual aggregate emission limits." In turn, the Scoping Plan, approved by CARB on December 11, 2008, directed CARB staff to develop, among other programs, a cap-and-trade mechanism that would apply a declining aggregate cap on GHG emissions⁸ and provide a flexible compliance system using tradable instruments.

On July 25, 2017, the Governor of California approved AB 398 which extended the cap-and-trade program to 2030. Under AB 398, the statewide GHG emissions goal is 40 percent below 1990 levels by 2030.

Co-Pollutant Benefits

Implementation of the cap-and-trade program will also reduce statewide emissions of criteria and toxic air pollutants. Because GHG emissions are largely the result of fuel combustion, as the cap decreases and combustion decreases, criteria and toxic air pollutants associated with combustion will also decrease. CARB also evaluated the potential for localized impacts from short-term increases in construction and operational emissions at facilities modifying operations in response to cap-and-trade compliance obligations. CARB's analysis indicated that localized impacts are unlikely due to existing local and state air quality regulations; however, where there is potential for significant impact from a proposed project, it would be addressed by local permitting agencies and CEQA lead agencies through the permitting and CEQA processes in which mitigation measures are evaluated.

1.2.2.4 Senate Bill 32 and Assembly Bill 197 (Statewide GHG Targets for 2030)

Enacted in 2016, SB 32 (Pavley, 2016) codifies the 2030 emissions reduction goal of Executive Order B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

SB 32 was coupled with a companion bill: AB 197 (Garcia, 2016). Designed to improve the transparency of CARB's regulatory and policy-oriented processes, AB 197 created the Joint Legislative Committee on Climate Change Policies, a committee with the responsibility to ascertain facts and make recommendations to the Legislature concerning statewide programs, policies and investments related to climate change. AB 197 also requires CARB to make certain GHG emissions inventory data publicly available on its website; consider the social costs of GHG emissions when adopting rules and regulations designed to achieve GHG

⁸ The cap-and-trade regulation applies to the following GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).

emission reductions; and include specified information in all Scoping Plan updates for the emission reduction measures contained therein.

1.2.2.5 Executive Order B-55-18 (Carbon Neutrality)

In September 2018, Governor Brown signed EO B-55-18, which established a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” This EO directs CARB to “work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.”

In January 2019, CARB held a workshop regarding carbon neutrality in California, during which CARB staff explained that the definitional parameters and meaning of the term – carbon neutrality – are still being explored. CARB intends to hold additional workshops to explore specific topics related to the pursuit of carbon neutrality, engage with other experts in the field and stakeholders, and conduct research to ensure that any path to carbon neutrality balances scientific, economic and social justice principles.

1.2.2.6 Regulation of Energy-Related Sources

Renewables Portfolio Standard (SB 100)

As most recently amended by SB 100 (2018), California’s Renewables Portfolio Standard requires retail sellers of electric services and local publicly-owned electric utilities to increase procurement from eligible renewable energy resources to 50 percent of total retail sales by 2026, and 60 percent of total retail sales by 2030. SB 100 also established a state policy goal to achieve 100 percent renewables by 2045.

GHG Emissions Standard for Baseload Generation (SB 1368)

SB 1368 (September 29, 2006) prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out-of-state as well as in the state, and to publicly owned as well as investor-owned electric utilities.

1.2.2.7 Regulation of Mobile Sources

Senate Bill 375 (Land Use Planning)

SB 375 provided for a new planning process to coordinate land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires Metropolitan Planning Organizations (MPOs), including the Sacramento Area Council of Governments (SACOG), to incorporate a “sustainable communities strategy” (SCS) in their regional transportation plans (RTPs) that will achieve GHG emission reduction targets set by CARB, primarily by reducing VMT from light-duty vehicles through development of more compact, complete, and efficient communities.

SB 375 also required CARB to appoint a Regional Targets Advisory Committee (RTAC) to recommend factors and methodologies for CARB to use in setting GHG emission reduction targets (Regional Targets) for each region. On September 29, 2009, the RTAC released its recommendations to CARB, who, on September 23, 2010, adopted Regional Targets for the years 2020 and 2035. The 2010 Regional Targets were 7% for 2020 and 16% for 2035 for

the area under SACOG's jurisdiction, which includes Sacramento County. In 2018, CARB revised these Regional Targets to 7% for 2020 and 19% for 2035.⁹

In February 2016, SACOG issued the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for the Sacramento region. The MTP/SCS supports the 2004 Sacramento Region Blueprint, which implements smart growth principles, including housing choice, compact development, mixed-use development, natural resources conservation, use of existing assets, quality design and transportation choice.¹⁰ The Sacramento Region Blueprint and the MTP/SCS are discussed further in Regional Regulatory Background **Section 1.2.3** below.

Mobile Source Reductions (Pavley) (AB 1493)

AB 1493 required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model years 2009 through 2016. The bill required the California Climate Action Registry to develop and adopt protocols for the reporting and certification of GHG emissions reductions from mobile sources for use by CARB in granting emission reduction credits. The bill authorizes CARB to grant emission reduction credits for reductions of GHG emissions prior to the date of the enforcement of regulations, using model year 2000 as the baseline for reduction.

In 2004, CARB applied to the USEPA for a waiver under the federal Clean Air Act to authorize implementation of these regulations. The waiver request was formally denied by the USEPA in December 2007 after California filed suit to prompt federal action. In January 2008, the State Attorney General filed a new lawsuit against the USEPA for denying California's request for a waiver to regulate and limit GHG emissions from these vehicles. In January 2009, President Obama issued a directive to the USEPA to reconsider California's request for a waiver. On June 30, 2009, the USEPA granted the waiver to California for its GHG emission standards for motor vehicles. As part of this waiver, the USEPA specified the following provision: CARB may not hold a manufacturer liable or responsible for any non-compliance caused by emission debits generated by a manufacturer for the 2009 model year.

Low Carbon Fuel Standard

Executive Order S-1-07, as issued by Governor Schwarzenegger, called for a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California by 2020.¹¹ In response, CARB approved the LCFS regulations in 2009, which became fully effective in April 2010. In September 2015, CARB re-adopted the LCFS regulations following the resolution of a lawsuit.

In January 2019, CARB adopted amendments to the LCFS regulation to support the objectives of the 2017 Scoping Plan in achieving the statewide GHG target of 40 percent below 1990 levels by 2030. The amended regulation targeted a 20 percent reduction in fuel

⁹ CARB. 2019. SB 375 Regional Plan Climate Targets. Available at: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>. Accessed: March 2020. If SACOG is not able to secure the funding and commitments to implement their proposed pilot project, CARB staff would evaluate the SCS performance against an 18 percent target.

¹⁰ SACOG. 2016. Metropolitan Transportation Plan/Sustainable Communities Strategy. February. Available at: <https://www.sacog.org/metropolitan-transportation-plansustainable-communities-strategy>. Accessed: March 2020.

¹¹ Carbon intensity is a measure of the GHG emissions associated with the various production, distribution and use steps in the "lifecycle" of a transportation fuel.

carbon intensity from a 2010 baseline by 2030. Specifically, it strengthened the carbon intensity benchmarks for gasoline, diesel, and jet fuel substitutes from 2019 to 2030, and added new credit generating fuels and vehicle categories to incentivize further reductions, including alternative jet fuels.¹² The LCFS would reduce GHG emissions by reducing the carbon intensity of transportation fuels used in California by at least 10% by 2020 and, as most recently amended in 2018, by at least 20% by 2030.

Clean Cars

In January 2012, CARB approved the Advanced Clean Cars Program, which established an emissions control program for cars and light-duty trucks (such as SUVs, pickup trucks, and minivans) of model years 2017-2025. When the program is fully implemented, new vehicles will emit 75% less smog-forming pollutants than the average new car sold today, and GHG emissions will be reduced by nearly 35%. The program also requires car manufacturers to offer for sale an increasing number of zero-emission vehicles (ZEVs) each year, including battery electric and fuel cell vehicles.

In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017-2025 through compliance with the USEPA GHG requirements for those same model years.¹³

1.2.2.8 CEQA Guidelines Amendments

2009 CEQA Guidelines Amendments (SB 97)

The 2009 CEQA Guidelines amendments adopted pursuant to SB 97 state in Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines amendments note that an agency may identify emissions either by selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards."¹⁴ Section 15064.4(b) provides that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment:

- The extent a project may increase or reduce GHG emissions as compared to the environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a state-wide, regional, or local plan for the reduction or mitigation of GHG emissions.¹⁵

¹² CARB. 2019. Low Carbon Fuel Standard. Available at: <https://www.arb.ca.gov/fuels/lcfs/lcfs.htm>. Accessed: March 2020.

¹³ CARB. 2012. Lev III and ZEV Regulation Amendments For Federal Compliance Option. December. Available at: <http://www.arb.ca.gov/regact/2012/leviiidtc12/leviiidtc12.htm>. Accessed: March 2020.

¹⁴ CNRA. 2009. Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of GHG Emissions Pursuant to SB97. Available at: http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf. Accessed: March 2020.

¹⁵ CNRA. 2009. Revised Text of Proposed Guideline Amendments. Sacramento, CA. Available at: http://resources.ca.gov/ceqa/docs/Adopted_and_Transmitted_Text_of_SB97_CEQA_Guidelines_Amendments.pdf. Accessed: March 2020.

In addition, Section 15064.7(c) of the CEQA Guidelines amendments specifies “[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence”¹⁶. Similarly, the revision to Appendix G, Environmental Checklist Form, which is often used as a basis for lead agencies’ selection of significance thresholds, does not prescribe specific thresholds. Rather, Appendix G asks whether the project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? or
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

This indicates that the determination of what is a significant effect on the environment should be left to the lead agency.

Accordingly, the CEQA Guidelines amendments do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Amendments emphasize the lead agency’s discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA.

The CEQA Guidelines amendments indicate that lead agencies should consider all feasible means, supported by substantial evidence and subject to monitoring and reporting, of mitigating the significant effects of GHG emissions. These potential mitigation measures, set forth in Section 15126.4(c), may include (1) measures in an existing plan or mitigation program for the reduction of GHG emissions that are required as part of the lead agency’s decision; (2) reductions in GHG emissions resulting from a project through implementation of project design features; (3) off-site measures, including offsets, to mitigate a project’s emissions; and (4) carbon sequestration measures.¹⁷

Among other things, the California Natural Resources Agency (CNRA) noted in its Public Notice for these changes that impacts of GHG emissions should focus on the cumulative impact on climate change. The Public Notice states:

While the Proposed Amendments do not foreclose the possibility that a single project may result in GHG emissions with a direct impact on the environment, the evidence before [CNRA] indicates that in most cases, the impact will be cumulative. Therefore, the Proposed Amendments emphasize that the analysis of GHG emissions should center on whether a project’s incremental contribution of GHG emissions is cumulatively considerable.¹⁸

Thus, the CEQA Guidelines amendments continue to make clear that the significance of GHG emissions is most appropriately considered on a cumulative level.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ CNRA. 2009. Notice of Public Hearings and Notice of Proposed Amendment of Regulations Implementing the California Environmental Quality Act. Available at: http://resources.ca.gov/ceqa/docs/Notice_of_Proposed_Action.pdf. Accessed: March 2020.

As described in the Final Statement of Reasoning¹⁹ for the 2009 CEQA Guidelines amendments, the CEQA Guidelines specifically do not address lifecycle emission for two reasons. First, there are different interpretations of the meaning of “lifecycle” amongst lead agencies, which could lead to confusion on how to evaluate the contribution of lifecycle emissions to a project. Furthermore, requiring an analysis of lifecycle emissions may be inconsistent with CEQA, as the emissions may be outside the scope of the “indirect emissions” that are evaluated with a project.

2018 CEQA Guidelines Amendments

In late 2018, the CNRA finalized amendments to the CEQA Guidelines including changes to CEQA Guidelines section 15064.4, which addresses the analysis of GHG emissions. The amendments became effective on December 28, 2018, and clarified several points, including the following:²⁰

- Lead agencies must analyze the GHG emissions of proposed projects. (See CEQA Guidelines, § 15064.4, subd. (a).)
- The focus of the lead agency’s analysis should be on the project’s incremental contribution to climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b).)
- The impacts analysis of GHG emissions is global in nature and thus should be considered in a broader context. A project’s incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies should consider a timeframe for the analysis that is appropriate for the project. (See CEQA Guidelines, § 15064.4, subd. (b).)
- A lead agency’s analysis must reasonably reflect evolving scientific knowledge and state regulatory schemes. (See CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies may rely on plans prepared pursuant to section 15183.5 (Plans for the Reduction of Greenhouse Gases) in evaluating a project’s GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3).)
- In determining the significance of a project’s impacts, the lead agency may consider a project’s consistency with the State’s long-term climate goals or strategies, provided that substantial evidence supports the agency’s analysis of how those goals or strategies address the project’s incremental contribution to climate change and its conclusion that the project’s incremental contribution is consistent with those plans, goals, or strategies. (See CEQA Guidelines, § 15064.4, subd. (b)(3).)
- The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s

¹⁹ CNRA. 2009. Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of GHG Emissions Pursuant to SB97. Available at: http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf. Accessed: March 2020.

²⁰ OPR. 2019. CEQA and Climate Change. Available at: <http://opr.ca.gov/ceqa/climate-change.html>. Accessed: March 2020.

incremental contribution to climate change. (See CEQA Guidelines, § 15064.4, subd. (c).)

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1.2.2.9 Senate Bill 743 (Transit Oriented Infill Projects)

Public Resources Code Section 21099(c)(1), as codified through enactment of SB 743, was enacted with the intent to change the focus of transportation analyses conducted under CEQA. SB 743 reflects a legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. SB 743 requires OPR to establish “alternative metrics to the metrics used for traffic levels of service for transportation impacts outside transit priority areas.”²² Under SB 743, the new metrics or significance criteria must promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. SB 743 dictates that once the CEQA Guidelines are amended to include new thresholds, automobile delay, as described by level of service or similar measures of vehicular capacity or congestion, shall no longer be considered a significant impact under CEQA in all locations in which the new thresholds are applied. The Legislature gave OPR the option of applying the new thresholds only to transit priority areas, or more broadly to areas throughout the State. OPR proposed to apply the new thresholds throughout the State.

In January 2016, OPR issued its *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* (Revised SB 743 Proposal). Included in the Revised SB 743 Proposal were proposed new CEQA Guidelines Section 15064.3 and related revisions to Appendix G. Under the proposed new Guidelines, the analysis of transportation impacts in the CEQA context would shift from a levels of service metric to a vehicle miles traveled (VMT) metric. In proposing the new approach, OPR noted the relationship between VMT and GHG emissions.

A VMT metric was adopted as part of the 2018 CEQA Guidelines Amendments (described above), which became effective on December 28, 2018. As described in the Final Statement of Reasoning²³ for the 2018 CEQA Guidelines amendments: “The current emphasis on traffic congestion in transportation analyses tends to promote increased vehicle use. This new guidance instead focuses on a project’s effect on vehicle miles traveled, which should promote project designs that reduce reliance on automobile travel.”

1.2.2.10 Building Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to incorporate new energy efficiency technologies and methods for

²¹ Ibid.

²² California Legislative Information. 2013. SB-743 Environmental quality: transit oriented infill projects, judicial review streamlining for environmental leadership development projects, and entertainment and sports center in the City of Sacramento. Available at: http://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743. Accessed: March 2020.

²³ CNRA. 2018. Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines. Available at: http://resources.ca.gov/ceqa/docs/2018_CEQA_Final_Statement_of%20Reasons_111218.pdf. Accessed: March 2020.

building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, and 2013 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher-efficiency lighting, heating, ventilation and air conditioning (HVAC), and water heating systems. Additionally, some standards focus on broader concepts such as reducing electricity loads at peak periods and seasons and improving the quality of energy-saving installations. Past updates to the Title 24 standards have proved very effective in reducing building energy use, with the 2013 update estimated to reduce energy consumption in residential buildings by 25% and energy consumption in commercial buildings by 30%, relative to the 2008 standards.²⁴ The California Energy Commission (CEC) recently adopted another update in 2019, which will become effective on January 1, 2020.²⁵ The 2019 updates include a requirement for solar photovoltaic systems for new homes, requirements for newly constructed healthcare facilities, additional high-efficiency lighting requirements, high-performance attic and walls, higher-efficiency water and space heaters, and high-efficiency air filters. Relative to the 2016 standards, the 2019 standards are expected to reduce high-rise residential and non-residential electricity consumption by approximately 10.7% and natural gas consumption by 1%, and require new low-rise residential buildings to achieve zero net electricity consumption using a combination of building efficiency and on-site renewable electricity generation.²⁶

In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CalGreen Building Standard (CalGreen), and establishes voluntary and mandatory standards pertaining to the planning and design of sustainable site development, energy efficiency, water conservation, material conservation, and interior air quality. Like Part 6 of Title 24, the CalGreen standards are periodically updated, with increasing energy savings and efficiencies associated with each code update.

1.2.2.11 Zero Emission Vehicles

Zero emission vehicles (ZEVs) include hydrogen fuel cell electric vehicles and battery-electric vehicles with no tailpipe emissions.

In its 2014 First Update to the Climate Change Scoping Plan, CARB recognized that the light-duty vehicle fleet "will need to become largely electrified by 2050 in order to meet California's emission reduction goals."²⁷ Accordingly, CARB's Advanced Clean Cars (ACC) program requires about 15 percent of new cars sold in California in 2025 to be a plug-in hybrid, battery electric, or fuel cell vehicles.²⁸

²⁴ CEC. 2012. Energy Commission Approves More Efficient Buildings for California's Future. Available online at: https://energyarchive.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html. Accessed: March 2020.

²⁵ CEC. 2019. California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Available online at: <https://www.energy.ca.gov/title24/2019standards/>. Accessed March 2020.

²⁶ CEC. 2018. 2019 Title 24 Impact Analysis. June. Available at: https://ww2.energy.ca.gov/title24/2019standards/post_adoption/documents/2019_Impact_Analysis_Final_Report_2018-06-29.pdf. Accessed: September 2019.

²⁷ CARB. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework. May. p. 48.

²⁸ Id. at p. 47.

Two Executive Orders established milestones to encourage statewide ZEV usage. In 2012, Governor Brown issued EO B-16-12, which calls for the increased penetration of ZEVs into California's vehicle fleet to help California achieve transportation sector GHG emissions reductions of 80 percent below 1990 levels by 2050. In support of this target, the EO also calls upon CARB, the CEC and the California Public Utilities Commission to establish benchmarks that will: (1) allow over 1.5 million ZEVs to be on California roadways by 2025, and (2) provide the State's residents with easy access to ZEV infrastructure.

EO B-16-12 specifically directed California to "encourage the development and success of zero-emission vehicles to protect the environment, stimulate economic growth, and improve the quality of life in the state."²⁹ In January 2018, Governor Brown issued EO B-48-18 to "boost the supply of zero-emission vehicles and charging and refueling stations in California."³⁰ These Executive Orders established several milestones organized into four time periods:

By 2015:

- The State's major metropolitan areas will be able to accommodate zero-emission vehicles, each with infrastructure plans and streamlined permitting;
- The State's manufacturing sector will be expanding zero-emission vehicle and component manufacturing;
- The private sector's investment in zero-emission vehicle infrastructure will be growing; and
- The State's academic and research institutions will be contributing to zero-emission vehicle research, innovation, and education.

By 2020:

- The State's zero-emission vehicle infrastructure will be able to support up to one million vehicles;
- The costs of zero-emission vehicles will be competitive with conventional combustion vehicles;
- Zero-emission vehicles will be accessible to mainstream consumers;
- There will be widespread use of zero-emission vehicles for public transportation and freight transport;
- Transportation sector greenhouse gas emissions will be falling as a result of the switch to zero-emission vehicles;
- Electric vehicle charging will be integrated into the electricity grid; and
- The private sector's role in the supply chain for zero-emission vehicle component development and manufacturing State will be expanding.

By 2025:

²⁹ Executive Order B-16-2012. March 2012. Available at: <https://www.ca.gov/archive/gov39/2012/03/23/news17472/index.html>. Accessed: March 2020.

³⁰ Executive Order B-48-2018. January 2018. Available at: <http://opr.ca.gov/planning/transportation/zev.html>. Accessed: March 2020.

- Over 1.5 million zero-emission vehicles will be on California roads and their market share will be expanding;
- Californians will have easy access to zero-emission vehicle infrastructure; and
- California's clean, efficient vehicles will annually displace at least 1.5 billion gallons of petroleum fuels.

By 2030:

- 5 million zero-emission vehicles will be on California roadways.

In furtherance of those goals, in February 2013, the Governor's Interagency Working Group on Zero-emission Vehicles issued the *2013 ZEV Action Plan: A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025*.³¹ The 2013 ZEV Action Plan identifies four broad goals for state government to advance ZEVs: 1) Complete needed infrastructure and planning; 2) Expand consumer awareness and demand; 3) Transform fleets; and 4) Grow jobs and investment in the private sector. As part of these goals, some highlighted strategies and actions include: i) supporting ZEV infrastructure planning and investment by private entities; ii) enabling universal access to ZEV infrastructure for California drivers; iii) reducing upfront purchase costs for ZEVs; iv) promoting consumer awareness of ZEVs; and v) helping to expand ZEVs in bus fleets. The Action Plan discusses the challenges of ZEV expansion, which include the need to enable electric vehicle chargers in homes, increase consumer awareness, address up-front costs and operational limitations, and address that ZEVs are not commercially available for all categories of vehicles.

In October 2016, the Governor's Interagency Working Group on Zero-emission Vehicles issued the *2016 ZEV Action Plan: A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025*.³² This report provides an update on progress toward achieving the 2013 goals and highlights the following four top priorities for the upcoming years: 1) Raise consumer awareness and education about ZEVs; 2) Ensure ZEVs are accessible to a broad range of Californians; 3) Make ZEV technologies commercially viable in targeted applications in the medium-duty, heavy-duty, and freight sectors; and 4) Aid ZEV market growth beyond California. The broad goals to advance ZEV adoption are: i) Achieve mainstream consumer awareness of ZEV options and benefits; ii) Make ZEVs an affordable and attractive option for drivers; iii) Ensure convenient charging and fueling infrastructure for greatly expanded use of ZEVs; iv) Maximize economic and job opportunities from ZEV technologies; v) Bolster ZEV market growth outside of California; and vi) Lead by example by integrating ZEVs into state government. The goals and strategies proposed in the 2013 Action Plan will continue to be implemented. Additional strategies are proposed to help achieve the new goals, including setting targets to increase home charging stations in multi-unit dwellings and disadvantaged communities and for public transit and school bus electrification. The 2016 Action Plan describes challenges toward achieving the 2025 goal of 1.5 million ZEVs in California, such as that most consumers are still not aware of the benefits of passenger ZEVs and that over 1,000,000 charge points will be needed at homes,

³¹ Governor's Interagency Working Group on Zero-emission Vehicles. 2013. Available at: [http://opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_\(02-13\).pdf](http://opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_(02-13).pdf). Accessed: March 2020.

³² Governor's Interagency Working Group on Zero-emission Vehicles. 2016. 2016 ZEV Action Plan. Available at: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/01/2016_ZEV_Action_Plan-1.pdf. Accessed: March 2020.

workplaces, and public locations but only 11,000 non-home charge points are installed as stated in the 2016 ZEV Action Plan.

In January 2018, Governor Brown signed EO B-48-18 issuing a “Priorities Update”: An update to the 2016 Zero-Emission Vehicle Action Plan to help expand private investment to the zero-emission vehicle infrastructure, particularly in the low income and disadvantaged communities. The initiative is focused on deploying charging and fueling infrastructure through multi-stakeholder efforts, thus increasing both ownership and operations of ZEVs. The 2018 Priorities Update focuses specifically on state agency actions and is designed to serve three fundamental purposes: 1) Provide direction to state agencies on the most important actions to be executed in 2018 to enable the progress toward the 2025 targets and 2030 vision; 2) Give stakeholders transparency into the actions state agencies plan to take (or are taking) this year to further the ZEV market; and 3) Create a platform for stakeholder engagement, feedback, and collaboration.³³

California is incentivizing the purchase of ZEVs through implementation of the Clean Vehicle Rebate Project (CVRP), which is administered by a non-profit organization (The Center for Sustainable Energy) for CARB and currently subsidizes the purchase of passenger near-zero and zero emission vehicles as follows:

- Hydrogen Fuel Cell Electric Vehicles: \$5,000
- Battery Electric Vehicles: \$2,500
- Plug-In Hybrid Electric Vehicles: \$1,500
- Neighborhood Electric Vehicles and Zero Emission Motorcycles: \$900

In July 2017, CARB approved the first of Volkswagen’s (VW) four 30-month ZEV Investment Plans (Plan).³⁴ This Plan is required by California’s partial settlement for \$800 million with VW resulting from the automaker’s use of illegal defeat devices in its 2.0-liter diesel cars sold in the state from model years 2009 to 2015. The Plan describes how VW proposes to spend the first \$200 million in California on ZEV charging infrastructure (including the development and maintenance of ZEV charging stations), public awareness, increasing ZEV access, and a green city demonstration. In December 2018, CARB approved VW-subsiary Electrify America’s Cycle 2 California ZEV Investment Plan, which continues to support the goals established in the first funding cycle but adds in new metropolitan and regional charging corridors. It also expands investments for charging stations to support ZEV bus fleets, ride-hail services, and autonomous vehicle charging.³⁵

Many other statewide and regional initiatives are helping spur ZEV uptake.

³³ Governor’s Interagency Working Group on Zero-emission Vehicles. 2018. 2018 ZEV Action Plan Priorities Update. Available at: <https://static.business.ca.gov/wp-content/uploads/2019/12/2018-ZEV-Action-Plan-Priorities-Update.pdf>. Accessed: March 2020.

³⁴ VOLKSWAGEN, Group of America. 2017. California ZEV Investment Plan: Cycle 1. March. Available at: https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/vwinvestplan1_031317.pdf. Accessed: March 2020.

³⁵ Electrify America. 2018. California ZEV Investment Plan: Cycle 2. October. Available at: https://ww3.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/c2zevplan_100318.pdf?_ga=2.211777173.1496327517.1568135164-893091953.1554304459. Accessed: March 2020.

Senate Bill 391 (California Transportation Plan)

SB 391 requires that Caltrans updates the California Transportation Plan by December 31, 2015, and every five years thereafter, accounting for a wide variety of measures, including the use of alternative fuels, new vehicle technology, tailpipe emissions reductions, and the expansion of public transit, bicycling, and walking. The California Transportation Plan was updated in 2015.³⁶

1.2.2.12 Other State GHG Regulatory Activities***Executive Order S-13-08 (Climate Adaptation Strategy)***

On November 14, 2008, Governor Arnold Schwarzenegger signed Executive Order S-13-08, which called on State agencies to develop a strategy for identification of and preparation for expected climate change impacts in California. The resulting *2009 California Climate Adaptation Strategy* report was developed by the CNRA in coordination with the Climate Action Team (CAT). The report presents the best available science relevant to climate impacts in California and proposes a set of recommendations for decision-makers to assess vulnerability and promote resiliency to reduce California's vulnerability to climate change. Guidance regarding adaptation strategies is general in nature and emphasizes incorporation of strategies into existing planning policies and processes. The report has since been updated in 2014 and 2018 and is now known as the Safeguarding California Plan, which is a roadmap for the state's programmatic and policy actions to achieve an integrated climate change adaptation strategy.³⁷

Other Regulations or Policies**Senate Bill X7 7 (Water Conservation Act of 2009)**

The Water Conservation Act of 2009 sets an overall goal of reducing per-capita urban water use by 20% by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per-capita water use by at least 10% by December 31, 2015. Reduction in water consumption directly reduces the necessary energy and the associated emissions to convey, treat, distribute, and eventually treat the water.

California Integrated Waste Management Act

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 (Public Resources Code Sections 40000 et seq.) to include a provision declaring that it is the policy goal of the state that not less than 75 percent of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter.³⁸ In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the State's policy goal.³⁹ CalRecycle conducted several stakeholder workshops and published a discussion document in May 2012 titled California's New Goal: 75

³⁶ California Department of Transportation. California Transportation Plan 2040. Available at: <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/finalctp2040-report-webready.pdf>. Accessed: March 2020.

³⁷ CNRA. 2019. Safeguarding California and Climate Change Adaptation Policy. Available at: <https://resources.ca.gov/CNRALegacyFiles/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf>. Accessed: March 2020.

³⁸ Cal. Pub. Res. Code § 41780.01(a).

³⁹ Cal. Pub. Res. Code § 41780.02.

Percent Recycling, which identifies concepts that CalRecycle believes would assist the state in reaching the 75 percent goal by 2020.⁴⁰

AB 1826 (2014) further amended the California Integrated Waste Management Act of 1989 to require commercial businesses to recycle organic waste, which includes food waste and green waste, with phased-in requirements based on the volume of waste generated. It also required local jurisdictions to adopt an organic waste recycling program.

In March 2017, CARB released its Short-Lived Climate Pollution Reduction Strategy which included a provision for CalRecycle to develop regulations to reduce statewide organic waste disposal by 50% of 2014 levels by 2020 and 75% of 2014 levels by 2025. These regulations will take effect on or after January 1, 2022.⁴¹

1.2.2.13 Court Rulings

Several recent court rulings affect the derivation and applicability of GHG thresholds for CEQA. These are summarized below.

Newhall Ranch: Center for Biological Diversity v. Department of Fish and Wildlife, 62 Cal. 4th 204 (2016)

In the Newhall Ranch decision, the California Supreme Court recognized that an individual project's emissions alone will most likely not have any appreciable impact on global GHG emissions, but an individual project will contribute to the significant cumulative impact caused by GHG emissions from other sources around the globe. The question therefore becomes whether the project's incremental addition of GHGs is cumulatively considerable in light of the global problem, and thus significant. The Court acknowledged that the fact that emissions are global rather than local gives rise to an argument that a certain amount of GHG emissions "is as inevitable as population growth." The Court stated "Under this view, a significance criterion framed in terms of efficiency is superior to a simple numerical threshold because CEQA is not intended as a population control measure."

Golden Door: Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego, Cal. App. 5th (2018)

In the Golden Door decision, the Court ruled that San Diego County's 2016 Guidance Document for analyzing GHG impacts violated CEQA because it was not adopted by ordinance, resolution, rule, or regulation, or through a public review process. The Court further ruled that the Guidance Document's GHG efficiency metric of 4.9 metric tons of CO₂e per service population per year was not supported by substantial evidence that explained why use of statewide GHG reduction levels was appropriate for all projects in San Diego County.

Together, the Newhall Ranch and Golden Door court decisions suggest that data used to support thresholds should be local, and the applicability of one threshold to all land use types or emission sectors may not be appropriate.

⁴⁰ CalRecycle. 2018. California's 75 Percent Initiative Defining the Future. Available at: <https://www.calrecycle.ca.gov/calendar/75percent>. Accessed: March 2020.

⁴¹ CARB. 2017. Short-Lived Climate Pollutant Reduction Strategy. March. Available online at: https://ww2.arb.ca.gov/sites/default/files/2018-12/final_slcp_report%20Final%202017.pdf. Accessed: March 2020.

1.2.3 Regional

1.2.3.1 Sacramento Region Blueprint

SACOG adopted the Sacramento Blueprint in 2004 as a smart growth vision for the region. The Blueprint integrates land use and transportation planning in an effort to reduce sprawl, vehicle emissions, and traffic congestion by incorporating smart growth principles that encourage housing options closer to centers of employment, shopping, and recreation hubs. The key planning principles of the Blueprint include: transportation choice, compact development, mixed use development, housing choice and diversity, use of existing assets, natural resource conservation, and quality design.⁴² The Blueprint establishes 2050 targets including percent distribution of housing types (rural residential, large-lot single family, small-lot single family, attached homes); percent distribution of new housing vs. new jobs; square miles of new land for urban uses; and square miles of agricultural land to be converted to urban and public-use open space. The Blueprint conceptual map and growth principles are updated regularly to include new information, no less frequently than the update cycle for the MTP/SCS.⁴³

1.2.3.2 Sacramento Metropolitan Transportation Plan/Sustainable Communities Strategy

The Sacramento Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) supports the Sacramento Region Blueprint and links land use, air quality, and transportation needs. As the state and federally-designated MPO for the region, SACOG is responsible for developing the MTP/SCS in coordination with Sacramento, Yolo, Yuba, Sutter, El Dorado, and Placer counties. The MTP/SCS includes a long-range regional transportation plan covering a 20-year planning horizon (the MTP component), as well as policies and strategies to reduce GHG emissions from passenger vehicles based on targets set by CARB (the SCS component) pursuant to SB 375.⁴⁴ In 2018, CARB set SACOG's GHG emissions reduction targets to 7% for 2020 and 19% for 2035.⁴⁵

The most recent version of the MTP/SCS was adopted in November 2019 and covers the period from 2020 to 2040. The 2020 MTP/SCS is a multimodal transportation plan that is required to be financially feasible, achieve health standards for clean air, and address statewide climate goals. It is guided by four priority policy areas: build vibrant places for today's and tomorrow's residents; foster the next generation of mobility solutions; modernize the way we pay for transportation infrastructure; and build and maintain a safe, reliable, and multimodal transportation system. The MTP/SCS includes a regional growth forecast and projected land use pattern (residential and employment) to accommodate estimated increases in population, employment, and housing. It also reports on historical

⁴² SACOG. Sacramento Region Blueprint. Available online at: <https://www.sacog.org/sacramento-region-blueprint>. Accessed: March 2020.

⁴³ SACOG. 2007. Special Report: Preferred Blueprint Alternative, Sacramento Region Blueprint Transportation Land Use Study. June. Available online at: https://www.sacog.org/sites/main/files/file-attachments/special_reportbp_insert_jan_2005.pdf. Accessed: March 2020.

⁴⁴ SACOG. Metropolitan Transportation Plan/Sustainable Communities Strategy. Available online at: <https://www.sacog.org/metropolitan-transportation-plansustainable-communities-strategy>. Accessed: March 2020.

⁴⁵ CARB. 2019. SB 375 Regional Plan Climate Targets. Available at: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>. Accessed: March 2020.

VMT data, observed VMT trends, and forecasted VMT through 2040.⁴⁶ Data from the 2020 MTP/SCS is used to establish Sacramento County's share of future transportation emissions for new developments, as described later in this report.

1.2.4 Local

1.2.4.1 County of Sacramento Climate Action Plan

The County of Sacramento adopted its Government Operations CAP in 2012, which addresses GHG emissions from the County's operations including County-owned facilities, vehicles, equipment, and employee commute. It identified an action plan to reduce County government GHG emissions to a level 15% below baseline 2005 levels by 2020.⁴⁷

The County is currently developing a Communitywide Greenhouse Gas Reduction and Climate Change Adaptation Plan (Communitywide CAP), which will update the government operations GHG inventory and CAP measures, update the unincorporated County's GHG inventory and forecasts, identify GHG reduction targets for 2020, and propose measures to achieve the required GHG reductions for the entire County. It will also conduct a climate change vulnerability assessment and develop an adaptation strategy. So far, a memorandum documenting the existing and projected Business-as-Usual emissions inventories has been released.⁴⁸

1.2.4.2 City Climate Action and GHG Reduction Plans

In 2011, the City of Citrus Heights adopted its Greenhouse Gas Reduction Plan with a GHG reduction target of 10-15% below 2005 baseline emission levels by 2020.⁴⁹

In 2012, the City of Sacramento adopted its Climate Action Plan, and in 2015 it was incorporated into the City's 2035 General Plan. The CAP/2035 General Plan identified how City operations as well as the broader community could reduce GHG emissions to achieve 22% and 15% reductions below 2005 baseline levels by 2020 for municipal and community emissions, respectively. It also set longer-term reduction targets of 49% by 2035 and 83% by 2050.⁵⁰ In 2016, the City of Sacramento updated its Climate Action Plan for Internal Operations. The plan documented the City's attainment of a 24% GHG emissions reduction from municipal operations from 2005 to 2013, thus exceeding the adopted CAP/2035 General Plan target of 22% reduction by 2020. The 2016 update set a new target to achieve

⁴⁶ SACOG. 2019. Metropolitan Transportation Plan/Sustainable Communities Strategy, November 2019. Available online at: <https://www.sacog.org/2020-metropolitan-transportation-plansustainable-communities-strategy-update>. Accessed: March 2020.

⁴⁷ Sacramento County. 2012. Climate Action Plan: County Government Operations. June. Available online at: <https://planning.saccounty.net/PlansandProjectsIn-Progress/Documents/Climate%20Action%20Plan/Government%20Operations%20CAP.pdf>. Accessed: March 2020.

⁴⁸ Sacramento County. 2019. Planning and Environmental Review: Communitywide Greenhouse Gas Reduction and Climate Change Adaptation (Communitywide CAP) Project. Available online at: <https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/CAP.aspx>. Accessed: March 2020.

⁴⁹ City of Citrus Heights. 2011. Greenhouse Gas Reduction Plan. August. Available online at: <https://www.citrusheights.net/203/Greenhouse-Gas-Reduction-Plan>. Accessed: March 2020.

⁵⁰ City of Sacramento. 2015. Sacramento Climate Action Plan and 2035 General Plan. March. Available online at: <https://www.cityofsacramento.org/Community-Development/Resources/Online-Library/Sustainability>. Accessed: March 2020.

33% reduction by 2020.⁵¹ The City is currently developing the 2040 General Plan, which will include an ambitious update to the Climate Action Plan with the goal of establishing Sacramento as a climate leader.⁵²

In 2018, as part of its 2035 General Plan, the City of Folsom set GHG reduction targets of 15%, 40%, 51%, and 80% below 2005 baseline levels by 2020, 2030, 2040, and 2050, respectively.⁵³

In 2019, the City of Elk Grove updated its CAP as part of its General Plan. The updated CAP set per capita emissions targets of 7.6 MTCO₂e per capita by 2020, 4.1 MT CO₂e per capita by 2030, and 1.4 MT CO₂e per capita by 2050.⁵⁴

The City of Galt's CAP is currently under development.⁵⁵ The cities of Rancho Cordova and Isleton have not yet developed CAPs.

The State CEQA Guidelines describe the technical and procedural conditions needed to be a Qualified CAP.

1.2.4.3 The Mayor's Commission on Climate Change

In 2018, Mayor Darrell Steinberg of Sacramento and Mayor Christopher Cabaldon of West Sacramento⁵⁶ established the Mayors' Commission on Climate Change. The Commission aims to develop a common vision and strategies for both cities to achieve net zero greenhouse gas emissions, referred to as Carbon Zero, by 2045. Specifically, the Commission's objectives are to: (1) establish goals and priority areas of action to achieve Carbon Zero by 2045, (2) strengthen local and regional partnerships to address climate change and increase resiliency, (3) engage community members and business leaders to build political support for robust climate action, (4) provide a forum to develop and vet the guiding principles of ambitious strategies within the City of Sacramento and West Sacramento's Climate Action Plans, (5) advance social equity and economic prosperity, and (6) attract additional investments into the region.⁵⁷

Key focus sectors include the built environment, mobility, and community health and resiliency. The Commission will issue a Final Recommendations Report that highlights priority strategies to achieve Carbon Zero to inform future updates to the cities' Climate Action

⁵¹ City of Sacramento. 2016. Climate Action Plan for Internal Operations. June. Available online at: <https://www.cityofsacramento.org/Public-Works/Facilities/Sustainability/Climate-Action-Plan-for-Internal-Operations>. Accessed: March 2020.

⁵² City of Sacramento. 2018. 2040 General Plan Update. Available online at: <http://www.cityofsacramento.org/Community-Development/Planning/Major-Projects/General-Plan>. Accessed: March 2020.

⁵³ City of Folsom. 2018. 2035 General Plan. August. Available online at: https://www.folsom.ca.us/community/planning/general_plan/2035_general_plan.asp. Accessed: March 2020.

⁵⁴ City of Elk Grove. 2019. Climate Action Plan: 2019 Update. February. Available online at: http://www.elkgrovecity.org/UserFiles/Servers/Server_109585/File/Departments/Planning/Projects/General%20Plan/GPU/Adopted_2019-02/ElkGrove_CAP_Adopted_Clean.pdf. Accessed: March 2020.

⁵⁵ City of Galt. 2019. City of Galt Draft Climate Action Plan. June. Available online at: <http://www.ci.galt.ca.us/home/showdocument?id=31207>. Accessed: March 2020.

⁵⁶ The City of West Sacramento is part of Yolo County; however it is part of the Greater Sacramento area and within SACOG's jurisdiction.

⁵⁷ The Mayor's Commission on Climate Change. Available online at: <https://www.lgc.org/climatecommission/>. Accessed: March 2020.

Plans. Current adopted strategies for the built environment include mandating new construction to be all-electric to eliminate fossil fuel use in new buildings by 2023, transitioning 25% of existing residential and small commercial buildings to all-electric by 2030, and supporting infill to ensure that 90% of growth is in the established and center/corridor communities and 90% small-lot and attached homes by 2040, consistent with the regional MTP/SCS.⁵⁸ The Climate Commission's adopted mobility strategies are to expand and enhance accessibility to low-stress connected infrastructure for walking and rolling (e.g., bicycling), prioritizing improvements that address specific community and neighborhood concerns and needs, so that 30% of all trips are by active transportation by 2030 and 40% by 2045; expand and improve transit and shared mobility services to be more accessible, affordable, timely, and attractive than single-occupancy vehicle use, so that 30% of all trips are by transit and pooled share mobility by 2030 and 50% by 2045; and develop a comprehensive package of incentives, disincentives, and policies to encourage the adoption of ZEVs so that they make up 70% of new vehicle registrations by 2030 and achieve 100% electrification of all public, private, and shared fleets by 2045.⁵⁹ Draft strategies for the community health and resiliency sector are still under development as of the writing of this report.

⁵⁸ The Mayor's Commission on Climate Change. 2019. Meeting #5: Built Environment Strategy Recommendations. October. Available online at: <https://www.lgc.org/wordpress/wp-content/uploads/2019/10/2.-Built-Environment-Strategy-Recommendations.pdf>. Accessed: March 2020.

⁵⁹ The Mayor's Commission on Climate Change. 2019. Meeting #5: Mobility Strategy Recommendations. Available online at: <https://www.lgc.org/wordpress/wp-content/uploads/2019/10/3.-Mobility-Strategy-Recommendations.pdf>. Accessed: March 2020.

2. OVERVIEW OF STRATEGY FOR THRESHOLD DEVELOPMENT

As described in Section 1, there is a need for substantiated GHG thresholds for purpose of CEQA that are consistent with achieving the portion of the State's targeted GHG emissions reductions specific to the quantities and sectors of emissions from Sacramento County. The thresholds developed in this document supplement the thresholds and modeling methodologies already available in the SMAQMD CEQA Guide and the SMAQMD Recommended Guidance for Land Use Emissions Reductions.^{60,61} The overall modeling and reporting strategy for CEQA climate change sections will generally follow existing SMAQMD guidance, but with updates to default assumptions and significance thresholds as described in Sections 4 and 5. These thresholds are developed and applied in four steps, described in more detail below:

1. Determine Sacramento County's share of statewide 2030 GHG emissions by sector consistent with the CARB Scoping Plan (See Section 3).
2. Determine share of Sacramento County 2030 emissions from existing development vs new development (See Section 4).
3. Allocate 2030 GHG emissions from new development among land uses and place types to set numeric thresholds (See Section 4).
4. Set Best Management Practices by land use and place types that achieve numeric thresholds (See Section 5).

The land use types to which these thresholds apply include a range of residential and commercial uses. Examples of the land uses types that these thresholds are intended to cover include:⁶²

- Residential
- Commercial
- Retail
- Educational
- Recreational
- Light industrial
- Mixed-Use

These thresholds are not intended to address projects from which the majority of emissions are not related to building energy or mobile vehicle traffic, or that relate to sectors not

⁶⁰ SMAQMD. 2018. Chapter 6 Greenhouse Gas Emissions. Available online at: <http://www.airquality.org/LandUseTransportation/Documents/Ch6GHGFinal5-2018.pdf>.

⁶¹ SMAQMD. 2017. Recommended Guidance for Land Use Reductions. Available online at: <http://www.airquality.org/LandUseTransportation/Documents/SMAQMDLandUseEmissionReductions4.0Final.pdf>.

⁶² Definitions and land use subtypes for these categories are available in the CalEEMod® Users Guide, Table 1. 2017. Available at: http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

captured here. These thresholds are only intended to address GHG emissions and are not intended to address other regulatory considerations. Other sectors analyzed in the 2017 Scoping Plan include agriculture and industrial emissions. Projects in those sectors are relatively unique and should be evaluated on a case-by-case basis. This includes agriculture, industrial, transportation, infrastructure, stadiums, military bases, and hospitals. Projects such as hospitals should consult with SMAQMD to determine whether and how to apply these thresholds.

3. SACRAMENTO COUNTY GHG EMISSIONS IN 2030

The first step in threshold development requires the derivation of the GHG emissions in 2030 by sector in Sacramento County that would be needed to be consistent with the CARB Scoping Plan. First, the Scoping Plan assumptions are reviewed to determine the assumptions that are either geographically-specific or specific to new developments as compared to existing developments. Next, the analysis determines the share and total amount of emissions in the Scoping Plan scenario that can reasonably be attributed to Sacramento County.

3.1 Scoping Plan Assumptions

The 2017 CARB Scoping Plan projects emissions by sector to achieve California's 2030 GHG target of 40 percent below 1990 levels. The Scoping Plan assumptions and assessments are just one potential set of modeling assumptions to achieve the State's targets; the targets could be achieved by other methods, policies, or technologies, but those used in the modeling are considered reasonable, and are used as the basis for these guidelines. The assumptions are detailed by Environment, Economics, and Energy (E3)'s PATHWAYS modeling outputs and described in more detail in the Scoping Plan Appendix D.⁶³ Assumptions by sector and their relationship to geographic locations and new and existing developments are summarized below. The analyzed sectors include building energy, water, mobile sources, waste, entities included under cap-and-trade and other sectors.

3.1.1 Building Energy (natural gas and electricity):

Scoping Plan assumptions: The Scoping Plan assumes that the SB 350 goal of doubling additional achievable energy efficiency by 2030 is met. This includes measures such as a 50% increase in energy efficiency for new appliances (appliances, water heating, space heating, lighting, cooking) compared to 2015, and small reductions in heating (3%), cooling (4.4%), and lighting (2%) loads due to behavior changes and better windows. The assumptions for this sector also assume achievement of 50% RPS by 2030, plus 18 gigawatts of behind-the-meter solar PV. The scenario does not assume any additional electrification or renewable natural gas.

Conclusion: Improvements in energy efficiency and renewables generation are not geographically specific, and the assumed improvements could be met through a variety of pathways. As described in Section 1.2.2, the Title 24 Building Energy Efficiency Standards have improved energy efficiency in new buildings with each triennial update cycle. The standards are required to be cost effective over the lifespan of a building.⁶⁴ The 2019 standards require low-rise residential buildings to generate on-site renewable electricity. Currently, the 2022 Title 24 standards update is underway, with an expected focus on nonresidential and multifamily buildings and decarbonization.⁶⁵ Therefore, new developments

⁶³ CARB. 2017. 2030 Scoping Plan Appendix D: PATHWAYS. Available at: https://www.arb.ca.gov/cc/scopingplan/2030sp_appd_pathways_final.pdf. Accessed: March 2020.

⁶⁴ CEC. 2019 Building Energy Efficiency Standards Frequently Asked Questions. Available at: https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf. Accessed: March 2020.

⁶⁵ California Energy Commission. 2019. April 24 Staff Workshop on Triennial California Energy Code Measure Proposal Template. Available at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=227863>. Accessed: March 2020.

will include more efficient buildings and appliances than existing buildings and an increase in renewables generation due to code compliance and economic considerations.

3.1.2 Water

Scoping Plan assumptions: The Scoping Plan includes a 10% reduction in water heating demand due to urban water efficiency measures.

Conclusion: Reductions in water demand are overall not geographically specific (though total water consumption may vary by climate zone and land use type). Water reductions apply to both new and existing developments.

3.1.3 Mobile

Scoping Plan assumptions: The Scoping Plan scenario uses the CARB's "Clean Technologies and Fuels" VISION model scenario plus incorporates additional ZEVs, biofuels, and a reduction in light-duty VMT. The end result of the assumptions is equivalent to achieving all of the prior SB 375 SCS targets (as adopted prior to the Scoping Plan's analyses in 2016) plus an additional ~15% reduction in VMT per capita, as noted in CARB's January 2019 white paper.⁶⁶

Conclusion: The SCS targets are geographically specific, but the 4 major MPOs all have similar targets (set 19% in 2035 for the SCS targets as adopted in 2018).⁶⁷ Therefore, it is reasonable to assume a similar per-capita reduction percentage is required for each region. Reductions for different place types within each region may be tailored to the region. Note that the SCS target percentages refer to reductions in light-duty vehicle GHG emissions compared to a 2005 baseline, so are not directly comparable to SB 743 targets or CARB's related supporting documentation, which are based on VMT reductions compared to 2015-2018 existing conditions.

The 2019 CARB white paper describes how per capita VMT reductions related to new projects as follows:

"It is reasonable for new development to achieve a fair share of per capita VMT and GHG emissions reductions necessary to achieve statewide climate goals and to continue to work towards additional VMT and GHG emissions reductions through other measures. The remainder of this document presents quantitative information about the rate of per capita VMT reduction needed on a statewide average basis compared to existing conditions to achieve the State's long-term climate goals. This rate of per capita VMT reduction is scalable to a fair share reduction at the project level."

The ~15% VMT per capita reduction target from existing conditions described in CARB's 2019 white paper as consistent with the Scoping Plan is also consistent with SB 743 requirements for new developments' transportation analyses for CEQA purposes. As described further below, the thresholds developed here are based on CARB's analyses and

⁶⁶ CARB. 2019. California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. January. Available at: <https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate>. Accessed: March 2020.

⁶⁷ CARB. 2019. SB 375 Regional Plan Climate Targets. Available at: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>. Accessed: March 2020. If SACOG is not able to secure the funding and commitments to implement their proposed pilot project, CARB staff would evaluate the SCS performance against an 18 percent target.

are meant to show consistency with the mobile emissions reductions needed to achieve the Scoping Plan target.

3.1.4 Waste

Scoping Plan assumptions: The Scoping Plan scenario includes a 14% reduction in waste emissions due to organic diversion of waste.

Conclusion: Reductions in waste emissions are not geographically specific as it applies to municipal solid waste. This reduction applies to both new and existing developments.

3.1.5 High-GWP Gases:

Scoping Plan assumptions: High-GWP gases include methane, hydrofluorocarbons (HFCs) and anthropogenic black carbon. The Scoping Plan scenario is generally consistent with the mitigation scenario in the Short-Lived Climate Pollutant (SLCP) Strategy per SB 1383, which mandates a 40 percent reduction in methane and HFC emissions by 2030 and a 50 percent reduction in anthropogenic emissions of black carbon by 2030.⁶⁸ Several components of non-energy GHGs are not evaluated here because they are associated with industrial or agricultural land uses. Black carbon is not evaluated here because it is not part of the State's GHG inventory that tracks progress toward the State's climate targets.⁶⁹ Emissions categories associated with residential and commercial land use types include solid waste disposal and a portion of refrigerant use (F-gases, HFCs). As described in Section 3.1.4, the Scoping Plan scenario includes a 14% reduction in waste emissions due to organic diversion of waste (on top of the reductions required by SB 1383 by 2020). In addition, the Scoping Plan scenario includes a 63% reduction in F-gases.

As described in the SLCP Strategy, "HFCs are synthetic gases used in refrigeration, air conditioning, insulating foams, solvents, aerosol products, and fire protection...The major concern with respect to HFCs is that their contribution to climate forcing is expected to increase rapidly in the future as they continue to replace ozone depleting substances (ODS), such that they will become very significant contributors." HFCs from transportation are expected to decrease due to the California and USEPA light-duty vehicle GHG emission standards.⁷⁰ Refrigerant HFC emissions are expected to decrease significantly due to State and International HFC phasedown agreements, but not enough to meet the 2030 reduction goal. Additional measures are being considered to further reduce emissions, with a menu of potential actions presented in the SLCP Strategy. The SLCP Strategy states, "Early action...can avoid locking-in the use of high-GWP refrigerants in new or retrofitted systems in the coming years. For example, as effective alternatives become available, ARB will consider developing limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment where lower-GWP alternates are feasible and readily available" (page 90). The safety and feasibility of low-GWP refrigerants (e.g., hydrofluoro-olefin blends, ammonia, CO₂) is not fully established for all uses. Other actions include financial incentive programs for low-GWP refrigeration early adoption and a prohibition on sales of very-high GWP refrigerants. California's Significant New Alternatives Policy (SNAP), comprised of the

⁶⁸ CARB. 2017. Final Short-Lived Climate Pollutant Reduction Strategy. March. Available at: <https://ww2.arb.ca.gov/resources/documents/final-short-lived-climate-pollutant-reduction-strategy-march-2017>. Accessed: March 2020.

⁶⁹ CARB. 2017. California's 2017 Climate Change Scoping Plan. (page 11). Available at: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: March 2020.

⁷⁰ The effects of the recent federal actions to roll back vehicle efficiency standards have not yet been quantified.

CARB HFC Regulation and SB 1013, took effect on January 1, 2019, and will require HFC emissions reductions from non-mobile sources.⁷¹ This includes refrigerant prohibitions for new household refrigerators and freezers, retail food refrigeration, cold storage warehouses, foams, and aerosols, among other substances, with effective dates ranging from January 1, 2019, to January 1, 2021.

Conclusion: As discussed in Section 3.1.4, reductions in waste emissions are not geographically specific as it applies to municipal solid waste, and this reduction applies to both new and existing developments. F-gas emissions may vary geographically based on refrigeration and air conditioning requirements. Per the SLCP Strategy, “[e]xisting equipment using high-GWP HFCs has an average lifetime of 15-20 years, and can be expected to continue operating and emitting high-GWP HFCs well past 2030” (page 97). Emissions reductions will occur during replacement and maintenance of existing refrigeration equipment or purchase or installation of new equipment, so would apply both to existing and new developments. However, due to the length scale for HFC replacement, emissions reductions would be more heavily weighted toward new developments.

3.1.6 Other Sectors:

Scoping Plan assumptions: The Scoping Plan includes emissions and reduction strategies from several other sectors that include agriculture, industrial, and offroad sources such as landscaping equipment. The natural and working lands sector includes forests, rangelands, farms, wetlands, and soils, and California’s climate objective is to maintain these as a net carbon sink. The State continues to develop quantification methodology and implementation scenarios to incorporate into future climate policies that affect natural and working lands. However, the Scoping Plan does not assume any GHG reductions in the natural and working lands sector.⁷²

Conclusion: The Scoping Plan includes emissions and reduction strategies from several other sectors that are not generally controlled by the types of developments covered by this report and are not disclosed in a geographically specific manner. However, project proponents should be generally aware of these sectors and not conflict with reduction strategies therein. Projects should comply with federal permitting requirements for high-value sequestering lands such as wetlands and agricultural land.^{73,74}

3.1.7 Cap-and-Trade:

Scoping Plan assumptions: Any ‘gap’ in reductions to achieve the State’s goals that are not explicitly included in other sectors are assumed to be met through Cap-and-Trade.

Conclusion: Cap-and-Trade assumptions are not geographically specific. This is an overarching emissions reduction strategy in the 2017 Scoping Plan that does not apply

⁷¹ CARB. California Significant New Alternatives Policy (SNAP). 2019. Available at: <https://ww2.arb.ca.gov/our-work/programs/california-significant-new-alternatives-policy-snap/about>. Accessed: March 2020.

⁷² CARB. 2017. California’s 2017 Climate Change Scoping Plan. (page 82-87 and Table 3). Available at: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: March 2020.

⁷³ USEPA. 2019. Section 404 of the Clean Water Act. Available at: <https://www.epa.gov/cwa-404/permit-program-under-cwa-section-404>. Accessed: March 2020.

⁷⁴ USEPA. 2019. Laws and Regulations that Apply to Your Agricultural Operation by Farm Activity. Available at: <https://www.epa.gov/agriculture/laws-and-regulations-apply-your-agricultural-operation-farm-activity>. Accessed: March 2020.

specifically to the residential and commercial land use developments, although it could drive energy efficiency and vehicle efficiency as fuel gets more expensive.

3.2 Sacramento County GHG Share

To determine the Sacramento County GHG emissions as a percentage of statewide totals by sector requires assumptions about historical consumption, growth, and future expected emissions reductions. Sacramento County is expected to grow in population and employment at a faster rate than the State, on average, through 2030 and 2050.⁷⁵ As a conservative approach to set the Sacramento County maximum allowed emissions, for all emissions sectors of interest other than mobile sources, the proportion of statewide emissions from historical data in Sacramento County is assumed to remain constant in 2030 with no adjustment factor to account for its more rapid growth than the rest of the state. This is conservative, because as the population increases, Sacramento County could otherwise feasibly claim it should be allocated a larger share of total state emissions. As described further below, for the mobile sector, data from CARB's EMFAC2017 program and additional reductions to show consistency with the State target are used to project the County's share of future transportation emissions. While most of the emissions reductions are similar across California, the fraction of each sector represented in Sacramento will be different than in other areas of the state. This will result in a location-specific evaluation. **Appendix A** shows the detailed calculations used to inform the summary statistics presented below.

3.2.1 Building Energy:

Building energy emissions include natural gas combustion, indirect emissions from electricity generation required for both electricity consumption and electricity used to supply, treat, and distribute water and wastewater. Natural gas combustion is included in the 2017 Scoping Plan sector "Residential and Commercial", while electricity is separated into the sector "Electric Power". The percent of statewide emissions is based on historical consumption data for electricity and natural gas for Sacramento County residential and commercial sectors out of State totals.^{76,77,78} This data is shown in **Table A-1** for electricity and **Tables A-2** and **A-3** for natural gas.

3.2.2 Mobile

As described in Section 1.2, the currently adopted 2016 MTP/SCS provides a roadmap to achieving the SB 375 targets as included in the Scoping Plan's assumptions. For the SACOG region, this includes a 15% reduction in light-duty vehicle GHG emissions per capita from a 2005 baseline by 2035. However, meeting statewide 2030 and 2050 climate goals would require a 16.8% reduction in per capita light-duty VMT or a 14.3% reduction in total per capita VMT from 2015-2018 conditions, based on CARB's January 2019 white paper; this is not directly comparable to the SB 375 reduction target but rather aligns with the SB 743

⁷⁵ California Department of Finance (CDOF). 2019. P-1: State Population Projections (2010-2060), Total Population by County. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Projections/documents/P1_County_1yr_interim.xlsx. Accessed: March 2020.

⁷⁶ California Energy Commission (CEC). 2016. Electricity Consumption by Entity. Available at: <http://www.ecdms.energy.ca.gov/elecbyutil.aspx>. Accessed: March 2020.

⁷⁷ CEC. 2016. Gas Consumption by County. Available at: <https://ecdms.energy.ca.gov/gasbycounty.aspx>. Accessed: March 2020.

⁷⁸ CEC. 2016 Gas Consumption by Entity. Available at: <http://www.ecdms.energy.ca.gov/gasbyutil.aspx>. Accessed: March 2020.

15% reduction targets recommended by the Office of Planning and Research (OPR) as described further in Section 4.3. The CARB paper states:

“An RTP/SCS that meets the applicable SB 375 targets alone will not produce the GHG emissions reductions necessary to meet state climate goals in 2030 nor in 2050... Certain land use development projects located in areas that would produce rates of total VMT per capita that are approximately 14.3 percent lower than existing conditions, or rates of light-duty VMT per capita that are approximately 16.8 percent lower than existing conditions (either lower than the regional average or other appropriate planning context) could be, by virtue of their location and land use context, interpreted to be consistent with the transportation assumptions embedded in the 2017 Scoping Plan and with 2050 State climate goals.”.⁷⁹

Two steps are followed to determine the share of statewide emissions corresponding to this sector. First, the projected gasoline and diesel fuel use from on-road mobile vehicles for Sacramento County is calculated using CARB’s EMFAC2017 for calendar year 2030. Then, a reduction of 14.3% is taken to show consistency with the State’s 2030 GHG target, as described above. **Table A-4** shows how EMFAC2017 fuel uses are converted to GHG emissions.

3.2.3 Waste:

CalRecycle provides historical waste disposal data for each jurisdiction. Sacramento County’s share of statewide recycling and waste emissions is based on historical waste disposal data for Sacramento County out of State totals, as shown in **Table A-5**.

3.2.4 High-GWP Gases:

As described in Section 3.1.5, HFCs are the primary high-GWP gases of interest for the residential and commercial sectors. HFCs are expected to comprise 21% of the total high-GWP gas emissions if the State achieves its 2030 target. As shown in the SLCP Strategy, California’s 2030 HFC emission sources with existing measures are expected to be comprised of 37% commercial refrigeration, 9% industrial refrigeration, 20% residential refrigeration, 5% residential aerosol use, 17% foam (insulation in products and materials), 10% transportation refrigeration, 1% other aerosols, and 1% solvents and fire suppression. The residential and commercial sectors are assumed to include 78% of HFC emissions based on the categories of commercial, residential and transportation refrigeration; residential aerosols; and a portion of the foam emissions.⁸⁰ The percent of statewide emissions in Sacramento County is estimated based on the projected population of Sacramento County out of State totals in 2030. Air conditioning and cooling needs may be higher in Sacramento County than more temperate areas of the state (e.g., San Francisco Bay Area, northern California, Lake Tahoe region), so this is likely underestimating. This calculation is shown in **Table A-6**.

⁷⁹ CARB. 2019. California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. January. Available at: <https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate>. Accessed: March 2020.

⁸⁰ 35% of foam emissions are assumed to be associated with the residential and commercial portions of emissions, based on Table 8 of CARB. 2015. California’s High Global Warming Potential Gases Emission Inventory: Methodology and Technical Support Document. Available at: https://ww3.arb.ca.gov/cc/inventory/slcp/doc/hfc_inventory_tsd_20160411.pdf. Accessed: March 2020.

3.2.5 Localized Emissions by Sector

Localized emissions by sector consistent with the Scoping Plan using the methodology described above are summarized in Table 1.

Table 1: Localized Greenhouse Gas Emissions by Sector, 2030			
Sector	Statewide (MT CO ₂ e) ^a	Sacramento County 2030 Emissions for Residential & Commercial Development Consistent with Scoping Plan ^b	
	Updated Scoping Plan	% of Statewide	Emissions (MT CO ₂ e)
Agriculture	23,854,810	N/A	N/A
Residential and Commercial Natural Gas Combustion	38,078,729	1.4%	548,714
Electric Power	53,014,776	3.4%	1,817,830
High GWP	10,655,327	0.7%	70,523
Industrial	82,560,459	N/A	N/A
Recycling and Waste	9,167,237	2.1%	195,538
Transportation (Incl. TCU)	103,055,723	3.9%	3,967,853
Total	320,387,064	N/A	6,600,457
% of Total Considered ^c	55%	N/A	N/A
<p>Notes:</p> <p>^a Data from CARB Scoping Plan. Available at: https://www.arb.ca.gov/cc/scopingplan/comparison_graphs_6cases101817.xlsm</p> <p>^b Supporting details are shown in Appendix A, Tables A-1 through A-6.</p> <p>^c Calculated based on the residential and commercial proportion assumed for each sector.</p> <p>Abbreviations: GWP – global warming potential MMT CO₂e – million metric tons of carbon dioxide equivalents N/A – not applicable TBD – to be determined</p>			

4. GHG EMISSIONS BY SECTOR FROM NEW VS EXISTING DEVELOPMENT

The second step in thresholds development uses the Scoping Plan assumptions and emissions by sector derived in Section 3 to determine the GHG targets by sector for new developments in Sacramento County. As detailed below, for the residential and commercial sector, projected emissions from existing development are summarized and subtracted from the sector-specific emissions targets shown in Table 1. Any remaining emissions are allocated to new developments. Consistency between new and existing developments with the electric power and solid waste sector targets are qualitatively achieved through regulatory compliance. Consistency between new and existing development with the mobile targets is achieved through per capita VMT reductions consistent with the directives of SB 743.

4.1 Residential and Commercial

The emissions included in this sector as analyzed in the Scoping Plan are from natural gas combustion for heating, cooking, and other uses within buildings (including natural gas use for fireplaces or hearths). Other emissions sources associated with buildings are included in separate sectors such as Electric Power and Solid Waste. To determine the natural gas target for new developments, projections were used to establish the amount of natural gas emissions from existing commercial and residential buildings. Natural gas-related GHG emissions in new developments would be represented by the difference between projected emissions from natural gas in existing developments and the sector target shown in **Table 1**, as natural gas use in existing development is unlikely to grow as appliances become increasingly efficient.

Data from the Sacramento County Communitywide CAP (SCCCAP) technical memo #1 was used to evaluate the total emissions from residential and commercial buildings and the projected change in emissions from 2015 to 2030 under the business-as-usual scenario.⁸¹ This percent change is assumed to be similar for Unincorporated Sacramento County (as shown in the SCCCAP) and the rest of the County. The percent change is then applied to Countywide historical (2015) natural gas usage data to estimate natural gas use and emissions totals from existing and new developments Countywide in 2030. **Table A-7** shows the methodology and results.

As shown in Table A-7, there is **no** remaining emissions budget for natural gas from new developments; in fact, existing developments will need to reduce their natural gas use to meet the 2030 sector target.⁸² This seems reasonable based on increasing energy efficiency for new appliances as they replace existing appliances in existing uses. Based on this

⁸¹ Available at: http://www.per.saccounty.net/PlansandProjectsIn-Progress/Documents/Climate%20Action%20Plan/2015%20Greenhouse%20Gas%20Emissions%20Inventory%20and%20Forecasts_Rev.pdf. Accessed: March 2020.

⁸² In the CARB Scoping Plan, E3 performed stock-based modeling of space heaters and water heaters for residential and commercial buildings that would result in emissions totals that meet the State's 2030 target. In the Scoping Plan scenario, new heating systems were mainly assumed to be natural gas, with the resulting gap in emissions necessary to meet the State target assumed to be reduced through Cap-and-Trade. In the Alternative 1 (no Cap-and-Trade) scenario, E3 assumed nearly 100% of new water and space heaters would be high-efficiency electric heat pumps by 2030. Available at: https://ww3.arb.ca.gov/cc/scopingplan/pathways_stock_charts_101917.xlsm. Accessed: March 2020.

analysis, new projects will need to either be electrified, reduce emissions beyond requirements from other sectors, or fund off-site GHG emissions reductions. These options are discussed further in Section 5.

4.2 Electric Power

The emissions included in this sector are indirect GHG emissions that occur when electricity is used, typically from generation from offsite power plant locations. Typical electricity uses are for building energy (air conditioning, lighting, electronic appliances and equipment, etc.) and electricity used to convey, treat, and distribute water and wastewater.

New developments must comply with more stringent Building Energy Efficiency Standards (Title 24, Part 6) and Green Building Standards (Title 24, Part 11) than evaluated in the Scoping Plan. Further, SB 100 (De León, 2018) requires utilities to achieve 60% renewables by 2030, a more stringent target than contemplated in the Scoping Plan. In addition, new developments must achieve consistency with the latest State and local water conservation requirements. Water reductions reduce the amount of electricity needed to supply, treat, and transport the water and treat the resulting wastewater and therefore also reduce GHG emissions. Therefore, through regulatory compliance, new developments are assumed to achieve their “fair share” of reductions for the electric power sector.

4.3 Mobile

The emissions included in this sector are direct emissions from the combustion of gasoline, diesel, or compressed natural gas fuel. As described in Section 3.2.2, achievement of the currently adopted SCS targets per SB 375 are insufficient to reach the statewide GHG targets for 2030 in the Scoping Plan or longer-term 2045 or 2050 targets. Therefore, additional reductions in per capita VMT are needed. These reductions include both existing and new developments, where new developments should cover their fair share. The metrics described below are designed to show consistency with the State’s climate goals while reducing the need for extra traffic modeling and reporting beyond that to be required by SB 743.

OPR’s December 2018 Technical Advisory on Evaluating Transportation Impacts in CEQA⁸³ proposes the following thresholds, and references the CARB January 2019 memorandum⁸⁴ that confirms these targets are consistent with the 2017 Scoping Plan’s 2030 and 2050 trajectories. It also states that “meeting the targets described above (for overall climate change) will require substantial reductions in existing VMT per capita...” In other words, the Technical Advisory acknowledges that people in both new and existing developments will need to reduce single-occupancy vehicle use, but still suggests an additional reduction for new development.

4.3.1 Regional VMT Targets

Projects should use consistency with SB 743 to determine required VMT reductions that show consistency with the GHG targets. As described by OPR, these targets are as follows:

⁸³ OPR. December 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. Available at: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: March 2020.

⁸⁴ CARB. 2019. California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. January. Available at: <https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate>. Accessed: March 2020.

- Residential projects: A proposed project below a level of 15 percent below existing VMT per capita may indicate a less than significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita.
- Office projects: A proposed project below a level of 15 percent below existing regional VMT per employee may indicate a less than significant transportation impact.
- Retail projects: A net increase in total VMT may indicate a significant transportation impact.

For jurisdictions with SB 743 targets already established, projects that show consistency with those established targets will show consistency with the SMAQMD GHG targets. For jurisdictions without established SB 743 targets, regional targets have been developed using SACOG data for the 2020 MTP/SCS. This data was used to derive historical average Sacramento County regional VMT per resident and VMT per worker (based on 2016 data, which falls within the 2015-2018 data that represents existing conditions in CARB's January 2019 white paper). This VMT per capita is then reduced by 15% to determine targets consistent with the State targets. For Sacramento County, these values are shown below in **Table 2**.

Table 2: VMT per Capita for Sacramento County GHG Targets			
Type	2016 VMT per Capita	VMT per Capita to Shown Consistency with Target	
	(miles/capita)^a	% Reduction	(miles/capita)
Residential	15.9	15%	13.5
Worker	17.2	15%	14.6
Notes: ^a Data provided by SACOG as used in the 2020 MTP/SCS. <u>Abbreviations:</u> MTP/SCS – Metropolitan Transportation Plan/Sustainable Communities Strategy VMT – vehicle miles traveled N/A – not applicable			

4.3.2 Projects with de Minimis Mobile GHG Impacts

Certain projects may be assumed to have a negligible contribution toward total GHG emissions or be consistent with the targets and will not be required to perform a full VMT evaluation. This methodology adopts slight variations on the *de minimis* significance thresholds from the OPR December 2018 Technical Advisory and exempts the following types of projects, provided that project-specific or location-specific information do not indicate that the project will still generate significant levels of VMT as described by OPR.⁸⁵

- Small projects that generate or attract fewer than 110 trips per day

⁸⁵ See pages 13 to 15 of OPR. 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. Available at: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: March 2020.

- Residential and office projects in areas with low VMT (currently below threshold VMT) that incorporate similar features (i.e., density, mix of uses, transit accessibility), including affordable housing infill development.
- Residential, retail, office, or mixed-use projects within ½ mile walking distance of an existing major transit stop or existing stop along a high quality transit corridor, *unless the primary use of the site is auto-oriented (e.g., car dealership, car wash, gas station)*.

4.4 Solid Waste

The emissions included in this sector as analyzed in the Scoping Plan cover all aspects of solid waste and materials management including reduction/reuse; recycling; remanufacturing of recovered material; composting and in-vessel digestion; biomass management; municipal solid waste transformation; and landfilling. Following legislative and CARB action discussed earlier, CalRecycle is required to adopt regulations to (1) achieve a 75% statewide solid waste recycling rate by 2020; (2) reduce landfilling of organic waste by 50% below 2014 levels by 2020; (3) reduce landfilling of organic waste by 75% below 2014 levels by 2025; and (4) recover at least 20% of edible food destined for organic waste and divert to feed people in need by 2025.^{86,87} Existing and new developments must comply with all applicable CalRecycle or other local requirements including those for diversion, recycling, and composting. Therefore, through regulatory compliance, new developments are assumed to achieve their “fair share” of reductions for the solid waste sector.

4.5 High-GWP Gases

The emissions included in this sector as analyzed in the Scoping Plan include HFCs, anthropogenic black carbon, and methane emissions. As described in Section 3.1.5, California’s SNAP and other regulations will reduce HFC emissions. However, these regulations are not yet determined to be sufficient to achieve the targets. Through regulatory compliance, new developments are expected to achieve their “fair share” of reductions for the high-GWP sector. However, if low-GWP refrigeration substitutes become available prior to their regulatory requirement, new developments would be expected to use these substitutes to ensure their consistency with the State target.

⁸⁶ CARB. 2017. California’s 2017 Climate Change Scoping Plan: The Strategy for Achieving California’s 2030 Greenhouse Gas Target. November. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: March 2020.

⁸⁷ CalRecycle. 2018. Legislation and Regulations. Available online at: <https://www.calrecycle.ca.gov/Laws/>. Accessed: March 2020.

5. GHG TARGETS AND BEST MANAGEMENT PRACTICES BY PLACE TYPE

5.1 Best Management Practices

To demonstrate consistency with the GHG targets by sector for new developments described in Section 4, project proponents shall commit to a menu of best management practices (BMPs). Based on the targets derived above, there are two tiers of BMPs: Tier 1: Required for all projects to avoid conflicting with long-term State goals, and Tier 2: Required for projects that do not screen out of further requirements (e.g., large or inefficient projects). Approximate GHG reductions expected due to the BMPs are described in Section 5.5. These BMPs may be revised over time to incorporate regulatory or technological advances.

Tier 1: BMPs Required for all Projects

- BMP 1: No natural gas: Projects shall be designed and constructed without natural gas infrastructure.
- BMP 2: Electric vehicle ready: Projects shall meet the current CalGreen Tier 2 standards, except all EV Capable spaces shall instead be EV Ready. **Appendix B** provides definitions and estimated costs and notes on current and future regulatory requirements.

Alternatives may be proposed that demonstrate the same level of GHG reductions as BMPs 1 and 2. Example alternative reductions are described in Section 5.3. As described in Section 6, at a minimum, for purposes of evaluating consistency with 2045 statewide carbon neutrality, a project would need to offset any natural gas emissions and require all pre-wiring necessary so that the building is ready for a future retrofit to all-electric (e.g., such that electric space heating, water heating, drying, and cooking appliances could be installed).

Small, efficient projects may screen out of further requirements. This includes projects that screen out due to OPR's *de minimis* VMT criteria as discussed in Section 4.3, and projects that emit less than 1,100 MT CO₂e/year prior to implementation of BMP 1 and 2.⁸⁸ SMAQMD recently reviewed 102 Environmental Impact Reports (EIRs) and Mitigated Negative Declarations (MNDs) in Sacramento County between 2014 and 2018. Of these projects, a screening level of 1,100 MT CO₂e/year would result in 43 projects below the screening level but would still capture over 98% of the total GHG emissions. SMAQMD has prepared an operational screening table of project sizes by land use subtype that are below the 1,100 MT CO₂e/year threshold to assist in these designations.⁸⁹ The 1,100 MT threshold was adopted by the Board with substantial evidence and documented through staff reports.⁹⁰

Tier 2: BMP Required for Large or Inefficient Projects

- BMP 3: As described in more detail in Section 4.3.1, residential projects shall achieve a 15% reduction in VMT per resident, and office projects should achieve a 15% reduction in VMT per worker compared to existing average VMT per capita for the county, or for the

⁸⁸ 1,100 MT CO₂e/year is the current SMAQMD *de minimis* threshold. By complying with BMPs 1, and 2 above (removing natural gas, EV-ready), small projects would reduce emissions to be consistent with State goals.

⁸⁹ SMAQMD. 2018. SMAQMD Operational Screening Levels. Available at: <http://www.airquality.org/LandUseTransportation/Documents/Ch4+Ch6OperationalScreening4-2018.pdf>

⁹⁰ SMAQMD. 2020. CEQA Guidance and Tools. Available at: <http://www.airquality.org/businesses/ceqa-land-use-planning/ceqa-guidance-tools>.

city if a more local SB 743 target has been established. Retail projects should achieve no net increase in total VMT, as required to show consistency with SB 743. These reductions can be achieved by many strategies, such as:

- Locate in an area that already has low VMT due to location, transit service, etc.
- Adopt CAPCOA measures
- Adopt measures noted in Sacramento's CAP checklist
- Join a Transportation Management Association
- Incorporate traffic calming measures
- Incorporate pedestrian facilities and connections to public transportation
- Promote electric bicycle or other micro-mobility options

Quantification methodology for these strategies is described in the SMAQMD Recommended Guidance for Land Use Emission Reductions (AQMP) guidance.⁹¹ Projects that are located in areas with existing VMT per capita above the county or city average VMT per capita shall also provide sufficient electrical capacity (e.g., transmission lines and substation sites) such that 100% of project vehicles have the potential to be zero-emission vehicles in future years.⁹²

If a project cannot incorporate the required BMPs, other reductions or purchasing and retiring GHG/carbon offsets from a registry approved by the SMAQMD may be required. Carbon offsets are instruments that can be bought, sold, and traded. Like a stock or equity that represents a unit of ownership in a company, a carbon offset represents a unit of greenhouse gas emissions reductions. Each offset is essentially a certification that a certain quantity of greenhouse gas emissions has been avoided, prevented, or sequestered. Offset registries that the SMAQMD may approve have developed a broad consensus around the standards that are necessary to ensure that offsets are environmentally sound, namely, that offsets be real, permanent, quantifiable, verifiable, enforceable, and additional. Approved registries may include but are not limited to any of the following: (i) the Climate Action Reserve, the American Carbon Registry and Verra, which are all approved by CARB; (ii) any entity approved at any time by CARB to act as an "offset project registry" under the state's cap-and-trade program; (iii) or voluntary credits with the concurrence of the SMAQMD.

In addition to the BMPs, projects need to show consistency with the 2045 statewide carbon neutrality target, as described further in Section 6.

5.2 Modeling Unmitigated and Mitigated Emissions

Emissions should be quantified for projects that are either required to comply with the Tier 2 BMPs or would not comply with the Tier 1 BMPs (for example, they choose to use natural gas). The California Emissions Estimator Model (CalEEMod[®]) is typically used to model GHG and criteria air pollutants for project operations for CEQA purposes and has been recommended by SMAQMD in its Recommended Guidance for Land Use Emission Reductions.

⁹¹ SMAQMD. 2018. Recommended Guidance for Land Use Emission Reductions. Available at: <http://www.airquality.org/residents/ceqa-land-use-planning/mitigation>

⁹² Projects in areas with below-average VMT per capita tend to be urban or infill locations with limited parking facilities where additional electrical capacity may be infeasible, but also where public or fast charging are likely to be targeted nearby by programs such as the VW fund.

⁹³ The most current version of CalEEMod[®] should be run to calculate operational emissions for the buildout year for the proposed project land use subtypes and climate zone. Most of the inputs and descriptions for modeling emissions will be consistent with the SMAQMD guidance.⁹⁴ Differences are described below.

Building Energy:

Natural Gas and Electricity: The unmitigated natural gas use should assume compliance with the most current version of the Title 24, Part 6 Building Energy Efficiency Standards. The mitigated natural gas use should include assumed compliance with BMP-1 and therefore should include no natural gas use (including in the area source – hearths and fireplaces inputs). This will allow a project proponent to accurately assess the emissions reductions necessary if they do not comply with BMP-1.

The CO₂ intensity factor for electricity should be based on consistency with SB 100. To derive this factor, the historical emissions from delivered electricity and the percent of RPS-eligible renewable electricity for the relevant utility (e.g., Sacramento Metropolitan Utility District, SMUD) should be used to calculate the emissions from non-RPS-eligible renewables per megawatt-hour (MWh) delivered. This factor should be assumed to remain constant, and the percent of renewables required by SB 100 should be incorporated for the project buildout year.⁹⁵ The year-by-year projections that should be used for projects that receive power from SMUD is shown in **Table A-8**. The unmitigated electricity use should assume compliance with the most current version of the Title 24, Part 6 Building Energy Efficiency Standards. The mitigated electricity use should include any additional electricity needed to replace natural gas.

Energy use conversion from major natural gas appliances to their equivalent electric replacements tends not to be straightforward given that most significant gas appliances (e.g. water heaters, space heaters, ovens and cooktops) have varying input-to-output efficiencies and losses from product to product. Equivalent electric appliances also have differing efficiencies, and usage patterns for these equivalent appliances may differ in some way. However, the increase in electricity use as a result of natural gas to electric switchover can be estimated more easily with the aid of average end use consumption data for equivalent gas and electric appliance types.

Table A-9 shows average energy use rates per dwelling unit or area for major natural gas commercial and residential end uses. Any full or partial reduction in natural gas end uses or appliance types can be estimated by multiplying the percentage of natural gas reduction by the percent of total natural gas consumption for a given gas appliance. That reduction percentage can then be subtracted from an existing total gas consumption rate (e.g. CalEEMod default energy use intensities). The additional electricity use can be estimated by multiplying the electric energy use rate by the number of dwelling units or commercial square footage and adding this to the CalEEMod[®] default total electricity consumption rate. For example, a single family residence that complies with BMP 1 would remove all natural

⁹³ SMAQMD. 2018. Recommended Guidance for Land Use Emission Reductions. Available at: <http://www.airquality.org/residents/ceqa-land-use-planning/mitigation>. Accessed: March 2020.

⁹⁴ SMAQMD. 2018. Recommended Guidance for Land Use Emission Reductions. Available at: <http://www.airquality.org/residents/ceqa-land-use-planning/mitigation>. Accessed: March 2020.

⁹⁵ If SMUD fails to achieve its SB 100 targets or shows significant changes in its non-RPS-eligible power generation source types, this table should be updated to reflect more current information.

gas use from the CalEEMod® default (“Title 24” and “Non-Title 24” natural gas categories) and add 4,650 kWh to the electricity total. In contrast, a residence that keeps natural gas cooking would use Table A-9 to show that it should keep 9% of the CalEEMod® default natural gas use and should add (4,650 minus 310 equals 4,340) 4,340 kWh to the electricity total.

For energy consumption estimates not broken down by appliance groups, total natural gas consumption rates per dwelling unit or area are presented for the three most significant gas appliance types, along with total consumption rates for these appliances’ electric equivalents.

Appendix C includes additional supporting documentation used to derive Table A-9.

Water: The unmitigated and mitigated water use rates should use CalEEMod® defaults. As described in Section 3.1.2, projects are assumed to meet a 10% reduction target through regulatory compliance. If a project reduces water use beyond regulatory requirements, this can be included in the mitigated run.

Mobile:

CalEEMod® contains default mobile trip generation rates, lengths, and trip types based on the Institute for Transportation Engineers (ITE) data that generally applies to suburban development nationwide. Adjustments to the defaults can be applied to reduce emissions based on either Project-specific traffic modeling or standard mitigation assumptions related to the land use location, density, mixed-use type, or other metrics that may reduce VMT. In September 2019, SACOG prepared updated default data on trip lengths and trip types based on traffic modeling for each of its counties; if this has not yet been incorporated into CalEEMod® by the time these GHG thresholds are used, users should replace the CalEEMod® defaults with the more current data.

Modeling GHG emissions and VMT to show consistency with the metrics in Section 4.3 likely requires adjustments to typical CalEEMod® emissions modeling. The SB 743 thresholds that will be used for the SMAQMD GHG thresholds apply to trips from light-duty vehicles for residential and office projects only. However, all mobile emissions from all land uses should be disclosed in the GHG section, including those from non-passenger vehicles and for land uses other than residential and office. CalEEMod® defaults should be adjusted to account for Sacramento County-specific VMT and to determine the necessary VMT reduction for the Project. If projects are located in jurisdictions with more local data and methodologies that are SB 743 compliant, that data can be used rather than the Sacramento County-overall data.

A lookup map has been prepared using the SACOG 2020 MTP/SCS data that shows adjustment factors to apply to the CalEEMod® default VMT for relevant land use subtypes in Sacramento County. This map is available at <http://sb743-sacog.opendata.arcgis.com/>. These adjustment factors are based on the 2016 relative VMT per capita based on the location-specific traffic modeling.

Project proponents should use the (new) defaults from CalEEMod multiplied by the relevant adjustment factor for their unmitigated CalEEMod® emissions modeling. To calculate the adjustment factor, the project proponent should zoom into the proposed project location in the map. The map will contain hexagon-shaped areas with data on VMT per capita for each hexagon (“hex-level VMT per capita”). The project proponent should divide the hex-level VMT per capita by the Sacramento County VMT per capita to derive the adjustment factor. For example, a project located in a center or corridor community in downtown Sacramento

might see its VMT reduced by 60% compared to the countywide average; its adjustment factor to the CalEEMod[®] defaults trip generation rate would thus be 60%. The mitigated run then needs to demonstrate a 15% VMT reduction below the Sacramento County average resident per capita and worker per capita VMT as shown in Table 2. The example in downtown Sacramento would already be consistent with this reduction requirement. The 15% reduction could be due to project design features or mitigation measures, as described further in Section 5.1, but should not double-count features that are already incorporated in SACOG's default modeling (e.g., mixed-use features for established communities).

For retail uses, there are several alternative means that might be used to demonstrate no net increase in VMT. For chains, loyalty "club" card data for the nearby stores may be used, where available, to determine the origins and distance traveled for store users of that type (e.g., supermarket, hardware store) and similar locations. Another option is to look at the distance from population centroids as compared to competitor distance. A third option is to evaluate the nexus to public transportation as opposed to competitors.

For other land use types, the defaults can be used and the emissions disclosed.

Note that vehicle emission reductions (e.g., zero emission vehicles) cannot be substituted for VMT reductions; CARB has concluded that VMT reductions are needed in addition to cleaner vehicles and fuels to meet statewide goals.⁹⁶

Waste:

The unmitigated waste disposal rates should use CalEEMod[®] defaults. As described in Section 4.4, projects are assumed to meet the State targets through regulatory compliance. If a project reduces waste disposal beyond regulatory requirements, this can be included in the mitigated run.

Other Sectors:

The other sectors should use CalEEMod[®] defaults and project-specific data, where available. If the project reduces emissions beyond regulatory requirements, this can be included in the mitigated run.

5.3 Alternative Greenhouse Gas Reduction Measures

As described in Section 5.1, if applicants cannot or choose not to incorporate the required BMPs, they may propose alternative GHG reduction strategies that achieve equivalent reductions, provided that they are surplus to the reductions needed to achieve the State's targets. This guidance is intended to allow applicants to pursue innovative and cost-effective measures and is not intended to restrict the reduction measures to those described here. However, example strategies include the following, among many others:

- Use natural refrigerants: Projects can participate in SMUD's pilot program to use lower-GWP or natural alternates for refrigeration and air conditioning. Natural refrigerants include ammonia, CO₂, or hydrocarbons. To quantify the benefits of this measure, the applicant should work with SMUD or CARB tools to calculate high-GWP emissions from traditional refrigerants (as these emissions are not typically included in CEQA emissions

⁹⁶ CARB. 2017 Scoping Plan, page 75. Available at:
https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

- inventories and would not be added to the unmitigated emissions totals) and then calculate the reduction due to the lower-GWP refrigerants.
- Increase vegetation sequestration: Projects can increase carbon sequestration in natural and working lands through planting and management techniques. To quantify the benefits of these commitments, the applicant should use calculational methodology such as CARB's approved offsets protocols, California Climate Initiatives (CCI) tools and calculators, and/or CalEEMod®.
 - Install electric vehicle charging stations: Projects can install EV charging stations in addition to the electrical infrastructure required by BMP 2. To quantify the benefits of this measure, the applicant should use Project-specific or applicable published literature to calculate the projected amount of charging that will be provided by the chargers, then subtract the indirect emissions from electricity used by the chargers from the gasoline- or diesel-combustion tailpipe emissions that would otherwise be produced by internal combustion-powered vehicles. The applicant should take care not to double-count GHG reductions with reductions already assumed by the State in its base EV projections.
 - Solar water heaters and other water heating reductions: Projects can install solar water heaters to replace the need for natural gas or electricity for water heating. Since the unmitigated default to show compliance with BMP 1 is to assume no natural gas, the GHG benefit should be the reduction in electricity that would otherwise be used to heat water.
 - Increase water and waste reductions beyond regulatory compliance: As described in Section 5.2, projects can demonstrate GHG reductions beyond defaults based on project-specific studies and initiatives and can quantify these reductions using CalEEMod® methodology.
 - Reduce gas- or diesel-powered landscaping equipment use: Project proponents design for reduced landscaping equipment (xeriscaping) or contract with a parks district, city, or homeowners association to require the use of electric landscaping equipment. To demonstrate GHG reductions would require enforceable mechanisms. For example, the California Electrical Code requires outdoor receptacle outlet(s) to be installed at an accessible level for all new residences⁹⁷; this can enable the use of electric landscaping equipment but does not ensure its use.

5.4 Other Thresholds

As described in Section 1, this report is not intended to replace SMAQMD's existing thresholds or suggested GHG reduction guidance for stationary source emissions or construction emissions. Those thresholds were adopted by the Board with substantial evidence and documented through staff reports.⁹⁸

5.5 GHG Reductions from BMPs

The BMPs were developed to show consistency with the State's climate goals as applicable to new developments in Sacramento County, as described in Sections 3 and 4. The BMPs are expected to reduce GHG emissions as follows:

⁹⁷ California Building Standards Commission. 2019 Title 24, Part 3 California Electrical Code, Sections 210.52(E)

⁹⁸ SMAQMD. 2020. CEQA Guidance and Tools. Available at: <http://www.airquality.org/businesses/ceqa-land-use-planning/ceqa-guidance-tools>.

BMP 1: The reduction in natural gas emissions is approximately 257,000 MT, based on the difference between the 2015 natural gas emissions and the 2030 business-as-usual natural gas emissions summarized in Table A-7. As described in Table A-7, the business-as-usual increase in emissions between the 2015 and 2030 inventories would be solely due to population and employment growth, and therefore is the amount reduced if the growth excludes natural gas. This does not include any additional reductions that would result if renovations or building retrofits reduce natural gas use from existing buildings.

BMP 2: Additional EV infrastructure is necessary to achieve the State's EV goals. The California Energy Commission and National Renewable Energy Laboratory project that far more chargers are needed than currently on-track to be installed to meet the State's 2025 targets; even more will be needed to meet targets for 2030 and beyond.⁹⁹ In addition, the 2020 SACOG MTP/SCS assumes zero emission vehicle infrastructure higher in the SACOG region than the State's overall projections in order to meet the SCS target reduction.¹⁰⁰ On an operational per-mile basis, EVs will reduce emissions by approximately 89% compared to internal combustion engine vehicles at around 211 grams of CO₂e per mile, based on the electricity grid composition and passenger fleet fuel economy expected in 2030; this is shown in **Table A-10**. In later years, as the grid becomes cleaner, this benefit will increase.

BMP 3: The GHG emissions reduction due to the 15% VMT reduction is projected to be approximately 662,000 MT CO₂e, based on the difference in EMFAC2017 projected fuel use and fuel use to meet the State goals as shown in Table A-4.

⁹⁹ National Renewable Energy Laboratory. 2018. California Plug-in Electric Vehicle Infrastructure Projections: 2017-2025. California Energy Commission Publication CEC-60-2018-001. Available at: <https://www.nrel.gov/docs/fy18osti/70893.pdf>.

¹⁰⁰ SACOG. 2019. Metropolitan Transportation Plan/Sustainable Communities Strategy (page 62). Available online at: <https://www.sacog.org/2020-metropolitan-transportation-plansustainable-communities-strategy-update>. Accessed: March 2020.

6. LONGER-TERM GHG TARGETS

After 2030, SB 100 (De León, 2018) requires statewide 100% carbon-free electricity by 2045. In addition, Governor Brown's Executive Order B-55-18 (2018) targets all other sectors of the economy (including transportation, building heating and cooling, industry, etc.) by setting a policy goal of statewide carbon neutrality by 2045.

Achieving statewide carbon neutrality will require systemic changes in how energy is produced and consumed through all sectors of the economy. Because the mix of technologies, strategies, and policy choices the state will ultimately choose to implement to achieve the 2045 goal is not readily ascertainable at this time, any accounting of future GHG emissions from an individual development project cannot yet reflect the scope and scale of reductions that may occur as the state transitions toward new regulations designed to achieve the new long-term goals. Furthermore, in absence of a state plan to achieve these long-term goals, it is difficult to identify the "fair share" of reductions to be applied at the local or project level. Therefore, in order to evaluate the significance of a project with buildout beyond 2030, the project would be required to show that the SMAQMD 2030 targets and BMPs are met, and also qualitatively describe consistency with statewide carbon neutrality by 2045.

A number of studies have been conducted to identify pathways to achieving the statewide goal of reducing GHG emissions to 80% below 1990 levels by 2050, which was established in Governor Schwarzenegger's 2005 Executive Order S-3-05 and preceded the 2045 statewide carbon neutrality goal.^{101,102,103,104,105,106,107} In general, these studies have similar conclusions: deep cuts in GHG emissions can be achieved with substantial changes in electricity production, transportation fuels, and industrial processes. Meeting the 2050 goal (and by extension, the 2045 goal) would require:

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- ¹⁰¹ Williams et al. 2012. The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity. Available at: <http://www.sciencemag.org/content/335/6064/53.full>. Accessed: March 2020.
- ¹⁰² California Council on Science and Technology. 2012. California's Energy Future – Portraits of Energy Systems for Meeting Greenhouse Gas Reduction Targets. Available at: <https://ccst.us/reports/californias-energy-future-portraits-of-energy-systems-for-meeting-greenhouse-gas-reduction-requirements/>. Accessed: March 2020.
- ¹⁰³ California Department of Transportation. 2016. California Transportation Plan 2040. June. Available at: <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/finalctp2040-report-webready.pdf>. Accessed: March 2020.
- ¹⁰⁴ E3. 2015. Summary of the California State Agencies PATHWAYS Project: Long-Term GHG Reduction Scenarios. Available at: https://ethree.com/public_projects/energy_principals_study.php. Accessed March 2020.
- ¹⁰⁵ E3. 2015. Pathways to Deep Decarbonization in the United States. Available at: <http://www.arb.ca.gov/research/lectures/speakers/williams/williams.pdf>. Accessed: August 2019.
- ¹⁰⁶ EPRI and NRDC. Environmental Assessment of a full Electric Transportation Portfolio. Volume 2, Greenhouse Gas Emissions. Available at: <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=3002006881>. Accessed: March 2020.
- ¹⁰⁷ CARB. 2017. 2017 Scoping Plan Appendix C: Vibrant Communities and Landscapes and Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel. Available at: https://ww3.arb.ca.gov/cc/scopingplan/2030sp_appc_vmt_final.pdf. Accessed: March 2020.

- Electricity production that relies on much more renewable energy, plus other carbon-free sources.
- The reduction in petroleum-based fuels for transportation, including a combination of the electrification of transportation to reduce GHG emissions with increased energy efficiency that comes from electric motors and reduced fossil fuel use due to the decarbonized electricity supply and the use of hydrogen fuels.
- The electrification of industrial process heating that is currently provided by fossil fuels.
- Land use strategies that ensure future growth and development occurs in infill locations or locations with existing infrastructure, minimizes vehicles miles traveled, prioritizes active transportation and transit, and preserves natural and working lands, in addition to landscape-scale forest conservation and soil carbon sequestration.
- Reductions in non-energy, non-CO₂ GHGs including reductions in F-gases; solid waste source reduction, diversion, composting, and recycling; and agricultural policies, such as the reduction of methane emissions from dairy cows and manure.
- The use of technologies that have not yet been established or proven.

Thus at a minimum, for purposes of evaluating consistency with 2045 statewide carbon neutrality, a project would need to eliminate natural gas completely or require all pre-wiring necessary so that the building is ready for a future retrofit to all-electric, and in regions with relatively high VMT per capita (e.g., suburban and greenfield developments) to provide sufficient electrical capacity such that 100% of project vehicles have the potential to be zero-emission vehicles. Additionally, the project would be required to qualitatively show that it is not otherwise impeding the 2045 statewide carbon neutrality goal.

**APPENDIX A
TABLES**

Table A-1
2018 Sacramento Electric Power Usage Compared to State by Sector
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

Utility Type	Utility Name	Commercial Building	Commercial Other	Residential	All Sectors Total	Commercial + Residential Sectors Total
		GWh ¹				
Publicly owned utility	Sacramento Municipal Utility District	4,143	431	4,550	10,315	9,124
Self Generator	Self Generation in the NCNC planning area	160	55	297	580	512
Sacramento County Total		4,303	486	4,847	10,895	9,636
Statewide Total		103,199	15,038	92,640	281,024	210,876
Sacramento Residential and Commercial Percentage of Statewide Total						3.4%

Notes:

¹ 2018 electricity consumption by entity for the State of California. Source: California Energy Commission. Available at: <http://www.ecdms.energy.ca.gov/elecbyutil.aspx>. All sectors total includes all uses, including industry, mining, streetlights, and agriculture.

Abbreviations:

CEQA- California Environmental Quality Act

GWh- Gigawatt hour

NCNC- Northern California Non-California Independent System Operator (ISO)

**Table A-2
2018 PG&E Gas Usage Compared to State by Sector
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

Utility Type	Utility Name	Commercial Building	Commercial Other	Residential	All Sectors Total	Commercial + Residential Sectors Total
		Millions of Therms ¹				
Investor owned utility	PG&E ²	899	59	1,833	4,794	2,791
Statewide Total		2,050	169	4,393	12,638	6,612
PG&E Commercial + Residential Usage Percentage of PG&E Total Usage						58%

Notes:

¹ 2018 gas consumption by utility for the State of California. Source: California Energy Commission. Available at: <https://ecdms.energy.ca.gov/gasbyutil.aspx>. All sectors total includes all uses, including industry, mining, streetlights, and agriculture.

² PG&E services Sacramento County as well as other regions of California. The purpose of this calculation is to calculate the proportion of natural gas use in the PG&E service area that is used for commercial and residential sectors, as this data is not otherwise available at the County level. This percent is then used to calculate the Sacramento County share of residential and commercial natural gas use in Table A-3.

Abbreviations:

CEQA- California Environmental Quality Act
GWh- Gigawatt hour
PG&E - Pacific Gas and Electric

Table A-3
2018 Sacramento Gas Usage Compared to State
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

County	Sector	Total Usage ¹
		Millions of Therms
Sacramento	Non-Residential	111
Sacramento	Residential	194
Statewide	Non-Residential	8,245
Statewide	Residential	4,393
Sacramento Total		305
Statewide Total		12,333
Sacramento Percentage of Statewide		2.5%
Proportion of Total from Residential and Commercial ²		58%
Sacramento Residential and Commercial Percentage of Statewide		1.4%

Notes:

¹ 2018 gas consumption by county for the State of California. Source: California Energy Commission. Available at: <https://ecdms.energy.ca.gov/gasbycounty.aspx>

² As shown in Table A-2.

Abbreviations:

CEQA- California Environmental Quality Act

Table A-4
Sacramento County Mobile Fuel Use to GHG Emissions
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

Variable	Fuel Type	Sacramento County Value	Units
		2030	
EMFAC2017 Projected Fuel Use ¹	GAS	1,179,547	gal/day
	DSL	248,646	
Reduction to Meet State Goals ²	ALL	14.3%	%
Total Fuel Use to Meet State Goals ^{1,2}	GAS	1,010,872	gal/day
	DSL	213,089	
Emission Factors ³	GAS	9.13	kg CO ₂ /gal
	DSL	10.35	
Annual GHG Emissions⁴	Total	3,967,853	MT CO ₂ /year
Statewide Total Emissions ⁵	Total	103,055,723	MT CO ₂ e/year
Sacramento County Percentage of Statewide	Total	3.9%	%
Reduction in GHG Emissions⁶	Total	662,081	MT CO ₂ /year

Notes:

- ¹ Projected fuel use from CARB EMFAC2017 web database for Sacramento County, calendar year 2030, aggregated models and speeds. Available at: <https://www.arb.ca.gov/emfac/2017/>. Does not the very small portion of mobile vehicles fueled by natural gas.
- ² This reduction aligns with CARB's reductions in total VMT per capita to meet statewide targets and assumes fuel use is directly proportional to VMT. Source: CARB. 2019. California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. January. Available at: <https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate>. Accessed: August 2019.
- ³ The conversion factors for gasoline and diesel are 9.13 kg CO₂/gal and 10.35 kg CO₂/gal, respectively. Source: The Climate Registry, 2018 Default Emission Factor Document. Available at: <https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climateregistry-2018-Default-Emission-Factor-Document.pdf>
- ⁴ Consistent with CARB methodology for the quantification of GHG reduction measures, daily VMT was multiplied by 347 days per year to estimate annual VMT to account for lower VMT during weekends, holidays, and summer periods.
- ⁵ Data from CARB Scoping Plan. Available at: https://www.arb.ca.gov/cc/scopingplan/comparison_graphs_6cases101817.xlsm
- ⁶ This is the approximate reduction compared to the EMFAC2017 Sacramento County projected mobile GHG emissions due to a 14.3% reductions in gasoline and diesel fuel use.

Abbreviations:

CARB - California Air Resources Board
 CEQA - California Environmental Quality Act
 EMFAC - Emission FACTors Model
 gal - gallon

GHG - greenhouse gas emissions
 kg - kilogram
 MT - metric tonnes

**Table A-5
2018 Sacramento Waste Landfilled Compared to State
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

County	Waste Landfilled ¹
	Tons
Sacramento Total	833,340
Statewide Total	39,068,723
Sacramento Percentage of Statewide	2.1%

Notes:

¹ 2018 Landfill Tonnage Reports for Sacramento County out of the state.
Source: CalRecycle. Available at:
<https://www2.calrecycle.ca.gov/LandfillTipFees/>

Abbreviations:

CEQA- California Environmental Quality Act

**Table A-6
Sacramento County Portion of High-GWP Gases Emissions
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

Type	Variable	Value
Data from SLCP Strategy	HFC % of Total High-GWP Emissions ¹	21%
	% of HFC Emissions from Residential & Commercial Sector ²	78%
Population in 2030 ³	Sacramento County	1,758,565
	Statewide	43,631,295
	% of Statewide	4.0%
Sacramento Residential & Commercial Percentage of Statewide		0.7%

Notes:

¹ Data from CARB SLCP Strategy, Table 1, 2030 Emissions Reduction Target. Available at: <https://ww2.arb.ca.gov/resources/documents/final-short-lived-climate-pollutant-reduction-strategy-march-2017>. Accessed: September 2019. Assumes residential and commercial sectors are primarily associated with HFC emissions, not methane or anthropogenic black carbon emissions.

² The residential and commercial sectors are assumed to include 78% of HFC emissions based on the categories of commercial refrigeration (37%), residential refrigeration (20%), transportation refrigeration (10%), residential aerosols (5%), and a portion of the foam emissions (6%). 35% of foam emissions are assumed to be associated with the residential and commercial portions of emissions, based on Table 8 of CARB. 2015. California's High Global Warming Potential Gases Emission Inventory: Methodology and Technical Support Document. Available at: https://ww3.arb.ca.gov/cc/inventory/slcp/doc/hfc_inventory_tsd_20160411.pdf. Accessed: September 2019.

³ Data from CA Department of Finance, Total Estimated and Projected Population for California and Counties: July 1, 2010 to July 1, 2060 in 1-year Increments. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Projections/documents/P1_County_1yr_interim.xlsx. Accessed: September 2019.

Abbreviations:

CARB - California Air Resources Board

GWP - Global Warming Potential

HFC - hydrofluorocarbon

SLCP - Short-Lived Climate Pollutants

**Table A-7
Natural Gas Emissions Budget for New Developments
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

Location	Type	Residential & Commercial Natural Gas
Building Energy Emissions from Unincorporated SCCAP BAU	2015 Emissions (MT CO ₂ e) ¹	685,662
	2030 Emissions (MT CO ₂ e) ²	844,454
	Change, 2015-2030	23%
Sacramento County	2015 use (million therms) ³	163
	2015 Emissions (MT CO ₂ e) ⁴	1,109,800
	2030 BAU Emissions (MT CO ₂ e) ⁵	1,366,818
	2030 Sector Target (MT CO ₂ e)	548,714
	2030 Remaining for New Development⁶	0

Notes:

- ¹ 2015 emissions from the Sacramento County Communitywide CAP (SCCCAP) technical memo #1, Table 6, for the residential and commercial sectors. 2015 emissions are 33% of the total 2015 emissions from the "Residential Energy" and "Commercial/Industrial Energy" as presented in the SCCCAP. Available at: http://www.per.saccounty.net/PlansandProjectsIn-Progress/Documents/Climate%20Action%20Plan/2015%20Greenhouse%20Gas%20Emissions%20Inventory%20and%20Forecasts_Rev.pdf
- ² Because the SCCCAP Business-as-Usual projection does not incorporate changes in the electricity intensity factor over time, the increase in emissions between the 2015 and 2030 inventories is solely due to population and employment growth. Therefore the same proportion of total emissions (33%) described in footnote #1 is applied to the 2030 BAU "Residential Energy" and "Commercial/Industrial Energy" emissions from the SCCCAP to derive the 2030 emissions from residential and commercial natural gas combustion.
- ³ Data from the CEC for 2015 for total natural gas use for Sacramento County, multiplied by 58% to represent residential and commercial sector natural gas use (consistent with Table A2). Available at: <https://ecdms.energy.ca.gov/gasbycounty.aspx>.
- ⁴ Emissions based on PG&E and Climate Registry Emission Factors for natural gas provided in SCCAP Table 5 and IPCC Fourth Assessment Report Global Warming Potentials.
- ⁵ The percent change is assumed to be similar for Unincorporated Sacramento County (as shown in the SCCCAP) and the rest of the County.
- ⁶ As shown in Table 1, the sector target for Sacramento County Residential and Commercial GHG emissions is lower than the 2030 BAU projection and lower than the 2015 historical emissions. Therefore, there is no emissions budget available for new developments to produce natural gas emissions.

Abbreviations:

BAU - Business as Usual

CO₂e - carbon dioxide equivalence

SCCAP - Sacramento County Communitywide CAP

CEC - California Energy Commission

IPCC - Intergovernmental Panel on Climate Change

CEQA - California Environmental Quality Act

PG&E - Pacific Gas & Electric

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

**Table A-8
Electricity Intensity Projections for SMUD
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

Historic Electricity Intensity

Annual Electricity Data	2016^{1,2}	2017^{1,2}	2018^{1,2}	Average³	Units
CO ₂ Intensity Factor per Total Energy Delivered	493	384	466	448	lbs CO ₂ /MWh delivered
% of Total Energy From RPS-Eligible Renewables	20%	19%	20%	19.7%	[-]
CO ₂ Intensity Factor per Total Non-RPS-Eligible/Non-Renewable Energy ⁴	616	474	583	557	lbs CO ₂ /MWh delivered

Estimated Intensity Factor for Total Energy Delivered

Model Year	RPS %⁵	Projected Electricity Intensity per MWh delivered⁶	
		lbs CO₂/MWh	lbs CO₂e/MWh
2020	33%	373	375
2021	35.8%	358	360
2022	38.5%	343	344
2023	41.3%	327	329
2024	44%	312	314
2025	47.0%	295	297
2026	50%	279	280
2027	52%	267	269
2028	54.7%	253	254
2029	57.3%	238	239
2030	60%	223	224
2031	62.7%	208	210
2032	65.3%	193	195
2033	68.0%	178	180
2034	70.7%	163	165
2035	73.3%	149	150
2036	76.0%	134	135
2037	78.7%	119	120
2038	81.3%	104	106
2039	84.0%	89	91
2040	86.7%	74	76
2041	89.3%	59	61
2042	92.0%	45	46
2043	94.7%	30	31
2044	97.3%	15	16
2045	100%	0	2

Notes:

- ¹ Total CO₂ intensity factors from The Climate Registry. Available at: <https://www.theclimateregistry.org/our-members/cris-public-reports/>. Accessed: September, 2019. For 2018, data provided by SMUD.
- ² Percent of total energy from eligible renewables is from the SMUD 2016, 2017, and 2018 Power Content Labels.
- ³ This average uses the most recent three years of data.
- ⁴ The emissions metric presented here is calculated based on the total CO₂ intensity factor divided by the percent of energy delivered from non-RPS-eligible or non-renewable sources. The intensity factor for total energy delivered is estimated by multiplying the percentage of energy delivered from non-RPS-eligible or non-renewable energy by the CO₂ emissions per total non-renewable energy metric calculated above. The estimate provided here assumes that renewable energy sources do not result in any CO₂ emissions. If newer information becomes available that results in a substantial change to the long-term assumed CO₂ intensity per non-RPS energy, this table should be updated.
- ⁵ Emission factors presented here are consistent with the requirements of SB 100: 33% RPS by 2020, 44% RPS by 2024, 50% RPS by 2026, 52% RPS by 2027, 60% RPS by 2030, and 100% carbon-free electricity for 2045. Available at: https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=20170180SB100. Factors are interpolated for intervening (non-**bolded**) years.
- ⁶ Global Warming Potentials (GWP) are based on the IPCC Fourth Assessment Report. CH₄ and N₂O emission factors are from the eGRID2016 total output emission rates for California, and are conservatively assumed not to change from these estimates. Available at: https://www.epa.gov/sites/production/files/2018-02/documents/egrid2016_summarytables.pdf, Table 3. As more renewable energy is integrated into the electricity grid, these intensity factors will also decrease.

Abbreviations:

CARB - California Air Resources Board
CO₂ - carbon dioxide
GHG - greenhouse gases
RPS - Renewables Portfolio Standard

lbs - pounds
MWh - megawatt-hour
SB - Senate Bill

RPS - Renewable Portfolio Standards
SMUD - Sacramento Metropolitan Utility District
USEPA - US Environmental Protection Agency

Table A-9
Increases in Electricity Use to Replace Natural Gas
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

Commercial Energy Use Categories¹

	Appliance Group	Percent of Total Annual Energy Use
	Gas	Water Heaters
Space Heaters		44%
Cooking (Oven + Cooktop)		18%
Total (Water Heater, Space Heater, & Cooking)²		93%
	Appliance Group	Energy Use Index (kWh/ksf/year)
	Electric	Water Heaters
Space Heaters		1,037
Cooking (Oven + Cooktop)		666
Total (Water Heater, Space Heater, & Cooking)^{3,8}		2,045

Residential Energy Use Categories⁴

	Appliance Group	Percent of Primary Natural Gas Energy Uses				
		Single Family Units	Town Homes	2-4 Unit Apartments	5+ Unit Apartments	Mobile homes
Gas⁵	Water Heaters	47%	68%	65%	76%	53%
	Conventional Heat	44%	21%	24%	13%	40%
	Cooking (Oven + Cooktop)	9%	11%	11%	12%	6%
	Total (Water Heater, Conventional Heat, & Cooking)	100%	100%	100%	100%	100%
	Appliance Group	Energy Use per Dwelling Unit (kWh/DU/year)				
		Single Family Units	Town Homes	2-4 Unit Apartments	5+ Unit Apartments	Mobile homes
Electric	Water Heaters	3,169	2,190	1,301	1,543	2,575
	Conventional Heat	1,171	501	552	570	739
	Cooking (Oven + Cooktop)	310	234	218	165	224
	Solar Water heater (Electric Backup) ⁶	1,877	2,075	--	--	--
	Heat Pump	994	320	324	522	504
	Total (Water Heater, Conventional Heat, & Cooking)^{7,8}	4,650	2,925	2,071	2,278	3,538

Notes

- Commercial energy consumption by end-use is provided from the California Commercial End Use Survey for Sacramento Metropolitan Utility District (SMUD) for All Commercial Gas and Electric fuel types. For projects that do not fit the generic commercial definition, this same methodology and reference can be used by the project applicant to determine the electricity use for more specific building types.
- This demonstrates that the majority of natural gas use in commercial buildings in the SMUD region (93%) is accounted for by these three appliance groups. Due to differences in efficiency between electric and natural gas appliances, the relative amount of energy used for each appliance group may vary if applied to electricity consumption.
- For commercial projects that comply with BMP 1, the electricity use rates should be increased by this total per ksf. For projects that do not comply with BMP 1 and instead commit to one or two of the appliance groups to be electric, the electricity use can be increased by just the rate shown for the relevant appliance groups, and the CalEEMod default natural gas use rate can be decreased by the percent of natural gas from the appliance groups shown above.
- Residential energy consumption data is provided per appliance type by the California Energy Commission (CEC) 2009 Residential Appliance Saturation Study. The CEC began an updated survey in 2019, but results are not yet available as of March, 2020.

**Table A-9
Increases in Electricity Use to Replace Natural Gas
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California**

5. Natural Gas Energy Consumption estimates are presented only for homes with natural gas billing data. Due to variability in saturation rates of other natural gas appliances (e.g., spa heaters, auxiliary heating, gas dryers), these totals are assumed to sum to 100% for use in this methodology. If the applicants only electrify certain appliances and therefore use these percentages to calculate reductions from CalEEMod defaults, this is assumed to be a reasonable representation because the current Title 24 Building Energy Efficiency Standards are expected to reduce natural gas use more than what is reflected in the CalEEMod defaults.
6. Solar Water Heater data should be interpreted with caution given limited data due to low statewide saturation rates of residential solar water heater appliances.
7. For residential projects that comply with BMP 1, the electricity use rates should be increased by this total per DU. For projects that do not comply with BMP 1 and instead commit to one or two of the appliance groups to be electric, the electricity use can be increased by just the rate shown for the relevant appliance groups and the natural gas use can be reduced by the percent of natural gas from the appliance groups shown above. Heat pumps are more efficient than conventional electric heating, so projects that plan to use heat pumps can use the heat pump values instead of the conventional heat values.
8. Space heating and water heating are included in the Title 24 electricity and Title 24 natural gas energy usage categories of CalEEMod, while cooking and appliances are included in the non-title 24 electricity and natural gas energy usage categories.

Abbreviations

DU - Dwelling Unit
EF - Energy Factor

kBTU - thousand British Thermal Units
ksf - thousand square feet

kWh - kilowatt-hour

References

California Commercial End Use Survey, Annual Summary Statistics. Accessed February 2020. Available online at <http://capabilities.itron.com/CeusWeb/Chart.aspx>

2009. California Energy Commission. California Residential Appliance Saturation Study, Volume 2: Study Results. Accessible online at https://webtools.dnvgl.com/RASS2009/Uploads/2009_RASS_Volume%20FINAL_101310.pdf

Table A-10
GHG Reductions due to Electric Vehicles
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

Estimating GHG Emissions Reduction to Replace Gasoline Vehicle with Electric Vehicle		
SMUD electricity emission factor ¹	0.10	(MT CO ₂ e/MWh)
Fuel Economy of Electric Vehicle ²	0.25	(kWh/mile)
Electric Vehicle GHG Emissions ³	25	(gms/mile)
Gasoline/Diesel CO ₂ e emission while running ⁴	236	(gms/mile)
GHG Emissions Reduction from Additional Electric Vehicles, per mile	211	(gms/mile)
	89%	

Notes:

- ¹ CO₂e intensity factor for SMUD accounts for the 60% projected RPS for 2030 as shown in Table A-8.
- ² National Renewable Energy Laboratory (NREL), 2018. California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025 (Table C.1). Available at: <https://www.nrel.gov/docs/fy18osti/70893.pdf>.
- ³ Electric vehicle GHG emissions per mile are estimated based on the SMUD electricity emission factor (MT CO₂e/MWh) and the fuel economy of electric vehicles (KWh/mile).
- ⁴ CARB, 2015. EMFAC2017, running and starting exhaust emission rate for CO₂ and CH₄ for light duty gasoline- and diesel-powered vehicles in Sacramento County, aggregated for all models and speeds, averaged over all seasons for 2030. Available at: <http://www.arb.ca.gov/emfac/>.

Abbreviations:

CARB - California Air Resources Board	gms - grams
CH ₄ - methane	kWh - kilowatt-hour
CO ₂ - carbon dioxide	MT - metric tonnes
CO ₂ e - carbon dioxide equivalents	MWh - megawatt-hour
EMFAC - California Air Resources Board Emissions Factor Model	SMUD - Sacramento Metropolitan Utility District
EV - electric vehicle	
GHG - greenhouse gases	

**APPENDIX B
EV REGS AND COSTS**

Appendix B Table 1. Electric Vehicle Infrastructure Requirements as of September, 2019.**CalGreen Background**

- The California Building Energy Efficiency Standards Title 24 Part 11 ("CalGreen" Green Building Code) is a statewide building code with mandatory measures that apply to all new construction and additions or alterations of buildings in the state.
- The first CalGreen code was adopted in 2008, and it is updated approximately every 3 years to incorporate additional feasible measures with input from stakeholders including designers, architects, builders, property owners, businesses, the government and its agencies.
- The CalGreen code contains provisions on planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.
- The California Building Standards Commission, Department of Housing and Community Development, Division of the State Architect, all Office of Statewide Health Planning and Development all have specific scopes responsible for code adoption and enforcement.

Electric Vehicle Charging Infrastructure Definitions

*CalGreen does not currently require installation of electric vehicle (EV) chargers but does require **EV Capable spaces** as described in the table below, to avoid costly retrofits.*

EV supply equipment (EVSE, "chargers") require a dedicated circuit for each EVSE unit on the electrical panel; sufficient electrical capacity from the utility connection to the electrical panel; and sufficient electrical capacity at the panel.¹

-EV Capable: "Installation of "raceway" (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of a dedicated branch circuit and charging station(s)."

If 1 space is required:

The raceway shall be capable of accommodating a 208/240-volt dedicated branch circuit, not less than trade size 1", shall originate at a service panel or subpanel serving the area, shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure, or equivalent. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

If multiple spaces are required:

Plan design shall be based upon 40-ampere minimum branch circuits. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

-EV Ready: "Installation of dedicated branch circuit(s), circuit breakers, and other electrical components, including a receptacle or blank cover needed to support future installation of one or more charging stations"²

-Chargers: The physical device that the EV plugs into, e.g., devices from ChargePoint, AeroVironment, Blink, others.

2019 CalGreen Mandatory Measures (Title 24, Part 11), Effective 1/1/2020

Land Use Type	Requirements for New Construction	Ref
1-2 family dwelling units and townhouses with attached garages	EV Capable for every dwelling unit	3
Multifamily dwelling units with residential parking available	EV Capable for 10% of total parking spaces	4
Hotels and motels	EV Capable, # spaces depending on number of parking spaces: 0-9 spaces: 0 EV spaces 10-25: 1 26-50: 2 51-75: 4 76-100: 5 101-150: 7 151-200: 10 201+: 6 percent of total (rounded up)	5
Nonresidential	EV Capable, # spaces depending on number of parking spaces: 0-9 spaces: 0 EV spaces 10-25: 1 26-50: 2 51-75: 4 76-100: 5 101-150: 7 151-200: 10 201+: 6 percent of total (rounded up)	6

References:

- ¹ US Department of Energy. https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf
- ² California Air Resources Board. <https://arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf>
- ³ 2019 CalGreen. Section 4.106.4.1. <https://codes.iccsafe.org/content/chapter/15772>
- ⁴ 2019 CalGreen. Section 4.106.4.2. <https://codes.iccsafe.org/content/chapter/15772>
- ⁵ 2019 CalGreen. Section 4.106.4.3. <https://codes.iccsafe.org/content/chapter/15772>
- ⁶ 2019 CalGreen. Section 5.106.5.3. <https://codes.iccsafe.org/content/chapter/15773>

Appendix B Table 2. Potential Upcoming Requirements

CalGreen Proposed and Voluntary Standards

-CalGreen contains voluntary "Tier 1" and "Tier 2" standards that are not mandatory statewide but could be required by a City or County. These are 'reach' standards that can be adopted by local jurisdictions and may be incorporated as mandatory standards in future code cycles.

- Sacramento County does not currently require compliance with the voluntary standards, but the air district (SMAQMD), utility (SMUD), and Sacramento Area Council of Governments (SACOG) recently recommended that Sacramento County should require compliance with Tier 1 or Tier 2 CalGreen standards (see table below).¹

Electric Vehicle Charging Infrastructure Definitions

CalGreen does not currently require installation of electric vehicle (EV) chargers, but proposed and Tier 1 or Tier 2 measures would require additional EV Capable or EV Ready spaces, as shown below.

EV supply equipment (EVSE, "chargers") require a dedicated circuit for each EVSE unit on the electrical panel; sufficient electrical capacity from the utility connection to the electrical panel; and sufficient electrical capacity at the panel.²

-EV Capable: "Installation of "raceway" (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of a dedicated branch circuit and charging station(s)."

If 1 space is required:

The raceway shall be capable of accommodating a 208/240-volt dedicated branch circuit, not less than trade size 1", shall originate at a service panel or subpanel serving the area, shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure, or equivalent. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

If multiple spaces are required:

Plan design shall be based upon 40-ampere minimum branch circuits. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.¹

-EV Ready: "Installation of dedicated branch circuit(s), circuit breakers, and other electrical components, including a receptacle or blank cover needed to support future installation of one or more charging stations"³

-Chargers: The physical device that the EV plugs into, e.g., devices from ChargePoint, AeroVironment, Blink, others.

Source ^a	Land Use Type	Requirements for New Construction	R
2019 CalGreen Voluntary Measures (Tier 1)	1-2 family dwelling units and townhouses with attached garages	EV Ready for every dwelling unit	1
	Multifamily dwelling units	EV Capable for 15% of total parking spaces	1
	Nonresidential, and New hotels and motels	EV Capable, # spaces depending on number of parking spaces: 0-9 spaces: 0 EV spaces 10-25: 2 26-50: 3 51-75: 5 76-100: 7 101-150: 10 151-200: 14 201+: 8 percent of total (rounded up)	4
2019 CalGreen Voluntary Measures (Tier 2)	Multifamily dwelling units (any number of units)	EV Capable for 20% of total parking spaces	1
	Nonresidential, and New hotels and motels	EV Capable, # spaces depending on number of parking spaces: 0-9 spaces: 1 EV spaces 10-25: 2 26-50: 4 51-75: 6 76-100: 9 101-150: 12 151-200: 17 201+: 10 percent of total (rounded up)	4
City of Sacramento Final EV Strategy (December 2017)	New development projects	"Evaluate options to advance EV charging in new development projects citywide, such as mandatory standards , incentives, and educational programs..."	1

Appendix B Table 2. Potential Upcoming Requirements

Source ^a	Land Use Type	Requirements for New Construction	R
Sacramento County EV Readiness and Infrastructure Plan (June 2017), Prepared by the air district (SMAQMD), utility (SMUD), and Sacramento Area Council of Governments (SACOG), Clean Cities Coalition, and other contributors	Recommendations for County of Sacramento	"-Adopt Tier 1 or Tier 2 voluntary green building codes to increase the number of EV charging ready parking spaces and parking standards for multifamily and non-residential projects. -Research the cost and policy implications of requiring the installation of EV chargers in new multifamily dwelling units and/or commercial centers adjacent to MF complexes. -Require all new Master Plans and Specific Plans to address and incorporate EV charging infrastructure."	
Mayor's Commission on Climate Change	Potential Mobility Implementation Tactics for Sacramento Region, July 2019	"-Adopt Tier 2 of the CA Green Building Code for new parking structures/lots to require installation of EV chargers and dedicated EV parking spaces for new non-residential garages, MUDs, hotels. -Extend EV Infrastructure code with Reach Codes such as specific in the Peninsula Reach Code: -MUDs: One EV Ready circuit per dwelling. 25% of spaces to be Level 2 EV Ready, 75% are either Level 1 EV Ready or Level 2 EV Ready with load management -Non-Res: 10% Level 2 EVSE Installed, 10% Level 1 EV Ready with L2 conduit; on-grade parking: 50% Level 2 EV Capable, Panel Capacity, average 2kW/ EV space; underground or deck parking: 100% Level 2 EV Capable; Panel Capacity, average 1kW/ EV space"	

References:

- ⁰ California Building Standards Commission. <http://www.bsc.ca.gov/Rulemaking/adoptcycle/2018TriennialCodeAdoptionCycle/ComMtg1-2019.asp>
- ¹ Sacramento Area PEV Collective. 2017. Page 26. http://www.cleancitiessacramento.org/uploads/2/7/8/6/27862343/sac_county_ev_inf_planfinal_6-20-17.pdf
- ² US Department of Energy. https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf
- ³ California Air Resources Board. <https://arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf>
- ⁴ 2019 CalGreen. Section A4.106.8. <https://codes.iccsafe.org/content/chapter/15777>
- ⁵ 2016 CalGreen. Section A5.106.5.3. <https://codes.iccsafe.org/content/chapter/15778>
- ⁶ Section 1.2. https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Electric-Vehicles/EVStrategy_171206_FINAL_DRAFT_CityOfSacramento.pdf?la=en
- ⁷ Mayors' Commission on Climate Change. <https://www.lgc.org/wordpress/wp-content/uploads/2019/07/Potential-Mobility-Implementation-Tactic>

Appendix B Table 3. Estimated Costs for EV Ready and EV Supply Equipment

Type	Stage of Infrastructure ^{a,b,c}	
	EV Full Wiring ("EV Ready")	EV Supply Equipment ("Chargers") ^d
Single Family Residential	~\$250/home ¹	\$500-\$2,000 per Level 2 charge point (before rebates)
Commercial/Multifamily, Surface Parking	~\$760-\$830/space ^{2,3}	
Commercial/Multifamily, Enclosed Garage	~\$280/space ² , ~10% of total electrical work cost for large parking lots ³	

Notes:

- ^a -EV Capable: "Installation of "raceway" (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of a dedicated branch circuit and charging station(s)." Required as noted in Table 1, so costs are not shown.
- EV Ready: "Installation of dedicated branch circuit(s), circuit breakers, and other electrical components, including a receptacle or blank cover needed to support future installation of one or more charging stations" ²
- Chargers: The physical device that the EV plugs into, e.g., devices from ChargePoint, AeroVironment, Blink, others.
- ^b EV supply equipment require a dedicated circuit for each EVSE unit on the electrical panel; sufficient electrical capacity from the utility connection to the electrical panel; and sufficient electrical capacity at the panel. ⁴
- ^c 2019 CalGreen mandatory measures include EV capacity, to avoid more costly retrofitting as EV adoption increases. EV full wiring is still voluntary as of September, 2019. ³
- ^d SMUD has rebates to cover most of the cost of charging equipment in single-family homes, multifamily homes, and workplaces. ⁵

References:

- ¹ http://energy-solution.com/wp-content/uploads/2015/01/Reducing-Barriers-to-Electric-Vehicle-Adoption-through-Building-Codes_EnergySolutions_ACEEE-2012.pdf
- ² <https://arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf>
- ³ <https://arb.ca.gov/cc/greenbuildings/pdf/tcac2015.pdf>
- ⁴ https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf
- ⁵ <https://www.smud.org/en/Going-Green/Electric-Vehicles/Business>

APPENDIX C
Building Energy

Appendix C-1
Non-Residential Natural Gas Use from Space Heating & Cooling, Water Heating, Cooking
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

End Use ¹	End Use Floor Stock (KSF)	Annual Natural Gas Use (10,000 therms) ¹	Percent of Total NG Use	Energy Use Index (therms/ksf/yr)	Energy Use Index (kBTU/ksf/yr)
Heating	135,072	2,710	44.3%	201	20,059
Cooling	0	0	0.0%	--	--
Water Heating	105,832	1,883	30.8%	178	17,788
Cooking	67,170	1,088	17.8%	162	16,194
Miscellaneous	15,962	165	2.7%	103	10,335
Process	7,948	275	4.5%	346	34,592
Segment Total	227,831	6,121	100.0%	269	26,860
Percent of Annual Natural Gas Use from Heating, Water Heating, and Cooking		93%			

Notes:

¹. End use data from California Commercial End Use Survey, with SMUD, all commercial buildings, and natural gas settings.

Abbreviations:

kBTU - thousand British Thermal Units
ksf - thousand square feet
NG - natural gas
yr - year

References:

California Commercial End Use Survey, Annual Summary Statistics. Accessed February 2020. Available online at <http://capabilities.itron.com/CeusWeb/Chart.aspx>

Appendix C-2
Non-Residential Electric Use from Space Heating & Cooling, Water Heating, Cooking
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

End Use ¹	End Use Floor Stock (KSF)	Annual Electricity Use (GWh) ¹	Percent of Total Elec Use	Energy Use Index (kWh/ksf/yr)
Heating	116,632	121	3%	1,037
Cooling	184,121	546	15%	2,965
Ventilation	188,858	531	14%	2,812
Water Heating	117,243	40	1%	341
Cooking	198,227	132	4%	666
Miscellaneous	214,149	241	6%	1,125
Process	7,283	12	0%	1,648
Segment Total	227,831	3,759	100%	16,499
Percent of Annual Electricity Use from Heating, Water Heating, and Cooking		8%		

Notes:

¹ End use data from California Commercial End Use Survey, with SMUD, all commercial buildings, and electricity settings.

Abbreviations:

GWh - gigawatt-hour
ksf - thousand square feet
kWh - kilowatt-hour
yr - year

Reference:

California Commercial End Use Survey, Annual Summary Statistics. Accessed February 2020. Available online at <http://capabilities.itron.com/CeusWeb/Chart.aspx>

Appendix C-3
Residential Unit Energy Consumption for Natural Gas and Electric End Uses
Greenhouse Gas CEQA Thresholds Update
Sacramento County, California

Natural Gas Energy Consumption per appliance (therms)^{1,3}

Appliance Group	Housing Type				
	Single Family Units	Town Homes	2-4 Unit Apartments	5+ Unit Apartments	Mobile Homes
All Household	425	247	232	150	352
Water heater	195	189	186	183	193
Primary Heat	184	59	68	31	146
Range/Oven	36	32	33	28	23
Solar Water heater (Gas backup) ²	164	133	143	165	147
Auxillary Heat	118	38	61	49	70

Electricity Energy Consumption per appliance (kWh)¹

Appliance Group	Housing Type				
	Single Family Units	Town Homes	2-4 Unit Apartments	5+ Unit Apartments	Mobile Homes
All Household	7605	4561	3821	3709	5580
Water heater	3,169	2,190	1,301	1,543	2,575
Conventional Heat	1,171	501	552	570	739
Range/Oven	310	234	218	165	224
Solar Water heater (Electric Backup) ²	1,877	2,075	--	--	--
Heat Pump	994	320	324	522	504
Auxillary Heat	382	86	62	99	342

Notes:

- ¹ Energy Consumption estimates are given per dwelling unit, assuming 1 appliance per dwelling unit. Consumption data from California Residential Appliance Saturation Study.
- ² Given the low saturation rate of Solar Water Heaters in residential units, estimates should be interpreted with caution.
- ³ Natural Gas Energy Consumption estimates are presented only for homes with natural gas billing data.

Abbreviations:

kWh - kilowatt-hour

References:

2009. California Energy Commission. California Residential Appliance Saturation Study, Volume 2: Study Results. Accessible online at https://webtools.dnvgl.com/RASS2009/Uploads/2009_RASS_Volume%20_FINAL_101310.pdf

Attachment U
SMAQMD, Guide to Air Quality
Assessment in Sacramento
County, Chapter 6: Greenhouse
Gas Emissions



6 GREENHOUSE GAS EMISSIONS

6.1 INTRODUCTION

The California Environmental Quality Act (CEQA) requires that lead agencies consider the environmental effects of projects they are considering for approval. Greenhouse gas (GHG) emissions adversely affect the environment by contributing, on a cumulative basis, to global climate change. In turn, global climate change will increase sea levels, which can inundate low-lying areas; affect rain and snow fall, leading to changes in water supply; exacerbate the intensity of storms and other extreme weather, endangering human life and infrastructure; and increasing temperatures, leading to adverse effects on public health, agriculture, habitats, and biological and other resources. Thus, GHG emissions require consideration in CEQA documents.

Climate change is a global problem. GHGs are global pollutants, unlike criteria pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for time periods long enough to cause them to be dispersed around the globe, and they cause global effects. The atmospheric concentration of GHGs determines the intensity of global warming, with current levels already leading to dangerous increases in global temperatures, accompanied by sea level rise, severe weather, and other environmental impacts. The continued increase in atmospheric GHG concentrations will only worsen the severity and intensity of climate change, locking in perhaps irrevocable environmental changes. Therefore, from the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Prominent GHGs of primary concern from land use development projects include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Other GHGs such as hydrofluorocarbons (HFC), chlorofluorocarbons, and sulfur hexafluoride are of less concern because construction and operational activities associated with land use development projects are not likely to generate substantial quantities of these GHGs. HFCs are primarily used in air-conditioning and refrigeration systems and are getting increased attention with the passage of [SB 1383](#). SB 1838 requires a 40 percent reduction of HFC emissions from 2013 levels by 2030. A discussion of measures to reduce HFCs is included in the California Air Resources Board's [Short-Lived Climate Pollutant Reduction Strategy](#) (March 2017). Other pollutants being addressed by the *Short-Lived Climate Pollutant Reduction Strategy* include methane and black carbon, which can be reduced by diverting organic material from landfills, reducing residential wood burning, and reducing diesel fuel combustion.

Land use development projects typically include the following sources of GHG emissions:

- Construction activities that result in exhaust emissions of GHGs from fuel combustion for mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, material delivery trucks, and worker commuter trips;
- Motor vehicle trips generated by the particular land use (i.e. vehicles arriving and leaving the project site), including those by residents, shoppers, workers, and vendors;
- Onsite fuel combustion for space and water heating, landscape maintenance equipment, and fireplaces/stoves; and
- Offsite emissions at utility providers associated with the project's demand for electricity, water conveyance, and wastewater processing.

Generally, the District agrees that GHG emissions are best analyzed and mitigated at the program level; however, since not all jurisdictions in Sacramento County have conducted program level GHG analyses, such as a GHG reduction plan or climate action plan, the District offers the guidance contained in this chapter for addressing the GHG emissions associated with individual development projects. Please refer to [Chapter 9, Program Level Analysis of Plans](#), for recommendations for assessing and mitigating GHG emissions-related impacts at the program level.

The guidance presented in this chapter takes into consideration the following bodies of work produced by other agencies and organizations in the state:

- California Air Pollution Control Officers Association's (CAPCOA) white paper titled [CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act](#) (January 2008);
- California Air Resources Board's (ARB) [Climate Change Scoping Plan](#) (December 2008, re-approved August 24, 2011);
- ARB's [First Update to the Climate Change Scoping Plan](#) (May 2014);
- ARB's [California's 2017 Climate Change Scoping Plan, The strategy for achieving California's 2030 greenhouse gas target](#) (November 2017);
- Governor's Office of Planning and Research's (OPR) technical advisory, [CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review](#) (June 2008);
- The California Natural Resources Agency's [CEQA Guidelines](#);
- California Air Pollution Control Officers Association's (CAPCOA) white paper titled [Model Policies for Greenhouse Gases in General Plans](#) (June 2009); and

- California Air Pollution Control Officers Association's (CAPCOA) [Quantifying Greenhouse Gas Mitigation Measures](#) (August 2010).

In November 2008, Governor Arnold Schwarzenegger issued [Executive Order S-13-08](#) to enhance the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. The Executive Order directs the state agencies to request that the National Academy of Sciences convene an independent panel to complete the first California Sea Level Rise Assessment Report. The agencies involved in the project include the California Resources Agency; the Department of Water Resources; the California Coastal Commission; the California Ocean Protection Council; California State Parks; and the California Energy Commission (CEC). The Executive Order directed OPR to provide state land-use planning guidance related to sea level rise and other climate change impacts. In addition, SB 379, approved in 2015, asked that local governments address their vulnerabilities to climate impacts and adaptation strategies in their general plans or their local hazard mitigation plans. Therefore, **the District recommends that lead agencies address the impacts of climate change on a proposed project and its ability to adapt to these changes in CEQA documents.** It is anticipated that guidance on addressing this issue will be provided by the state agencies identified above and not the District. OPR's [website](#) contains resources and links related to adaptation. Additional resources include [Cal-Adapt](#), the [Safeguarding California and Climate Change Adaptation Policy](#), and [California's Fourth Climate Change Assessment](#). The Sacramento Area Council of Governments (SACOG) 2016 update to the [2035 Metropolitan Transportation Plan and Sustainable Communities Strategy](#) (MTP/SCS) included a climate adaptation action plan providing an overview of climate vulnerabilities for the region and establishing strategies to help the region's transportation system adapt to climate change impacts. The [2020 MTP/SCS](#) continues to provide resiliency policies.

The District acknowledges that the warming trends associated with climate change in the Sacramento region are expected to result in more episodes of unhealthy levels of ground-level ozone which will adversely affect residents and workers of proposed projects, among other impacts. Nevertheless, the primary focus of this chapter is to provide guidance about evaluating whether the GHG emissions associated with a proposed project will be responsible for making a cumulatively considerable contribution to global climate change.

REGULATORY SETTING

In September 2006, Governor Arnold Schwarzenegger signed [Assembly Bill \(AB\) 32](#), the California Global Warming Solutions Act of 2006. AB 32 established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also included guidance to institute emission reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the

reductions. AB 32 demonstrated California's commitment to reducing GHG emissions without intent to limit population or economic growth. On April 29, 2015, Governor Edmund Brown Jr. issued [Executive Order B-30-15](#). Executive Order B-30-15 required greenhouse gas emissions in California be reduced by 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050. On September 8, 2016, Governor Brown signed Senate Bill 32 (SB 32) into law which codified the mandate to reduce GHG emissions by 40 percent below 1990 levels by 2030.

CEQA requires lead agencies to identify the potentially significant effects on the environment of projects they intend to carry out or approve, and to mitigate significant effects whenever it is feasible to do so. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming ([Health and Safety Code, Section 38501\(a\)](#)).

[Senate Bill \(SB\) 97](#), enacted in 2007, amended the CEQA statute to establish that GHG emissions and their effects are a prominent environmental issue that require analysis and identification of feasible mitigation under CEQA. GHG emissions were incorporated into the CEQA Guidelines on March 18, 2010.

In June of 2008, OPR published a technical advisory entitled [CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review](#). OPR recommends that the lead agencies under CEQA make a good-faith effort, based on available information, to estimate the quantity of GHG emissions that will be generated by a proposed project, including the emissions associated with vehicular traffic, energy consumption, water usage, and construction activities, to determine whether the emissions have the potential to result in a cumulative impact and to mitigate the impacts where feasible. In that document, OPR acknowledged that "perhaps the most difficult part of the climate change analysis will be the determination of significance," and noted that "OPR has asked the California Air Resources Board (ARB) technical staff to recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." To date, ARB has not adopted thresholds.

In December 2008, ARB adopted its [Climate Change Scoping Plan \(Scoping Plan\)](#), which is the State's plan to achieve GHG reductions in California required by AB 32. The *Scoping Plan* includes ARB-recommended GHG reductions for each emission sector of the state's GHG inventory. The largest proposed GHG reductions recommended are from improving emission standards for light-duty vehicles, implementation of the Low-Carbon Fuel Standard, employing energy efficiency measures in buildings and appliances, the widespread development of combined heat and power systems, and applying a renewable portfolio standard for electricity production. ARB has not determined what statewide reduction in GHG emissions shall be achieved from changes in local government (municipal) operations; however, the *Scoping Plan* does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because

local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The *Scoping Plan* was re-approved by the ARB on August 24, 2011, after ARB updated its Functional Equivalent Document. ARB adopted the [First Update to the Climate Change Scoping Plan](#) on May 22, 2014. The update reports on the progress made towards meeting the 2020 GHG reduction goals; lays groundwork for longer term reduction goals; and discusses opportunities to leverage funds to drive additional GHG reductions. In December 2017, ARB adopted [California's 2017 Climate Change Scoping Plan, the strategy for achieving California's 2030 greenhouse gas target](#), setting the path towards the ultimate reduction goal of 2050.

A comprehensive discussion of regulatory actions taken by federal and state agencies related to GHG is included in the District's [Greenhouse Gas Thresholds in Sacramento County](#) document supporting updated thresholds of significance, released March 4, 2020.

Regional GHG reduction targets are aligned with regional transportation planning efforts and land use and housing allocations through SB 375, signed into law in September 2008. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocations in that MPO's Regional Transportation Plan (RTP). On April 19, 2012, SACOG adopted its 2035 Metropolitan Transportation Plan and associated SCS (MTP/SCS), the first plan to meet the requirements of SB 375. Updated MTP/SCSs were adopted by SACOG on February 18, 2016 and November 18, 2019.

With the passage of Senate Bill 743 in 2013, the Governor's Office of Planning and Research (OPR) amended the State CEQA Guidelines providing alternative criteria to level of service (LOS) for evaluating transportation impacts. The goal of the new criteria is to promote the reduction of GHG, the development of multimodal transportation networks, and a diversity of land uses. OPR provides [documents](#) to evaluate vehicle miles traveled (VMT) as the alternative to LOS. Local jurisdictions must implement SB 743 by July 1, 2020 or do additional transportation analysis on a project by project basis.

The 2017 Climate Change Scoping Plan notes that SB 375 efforts, if fully implemented, do not provide enough light-duty transportation sector reductions for the state to meet the 2050 GHG targets. As such, land use and transportation projects consistent with the MTP/SCS may still need additional GHG reductions to be consistent with state climate change goals. In January 2019, ARB released the [California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals](#), which provides additional information on

what level of statewide VMT reduction would promote achievement of statewide GHG emissions reduction targets.

6.2 ANALYSIS EXPECTATIONS

The District recommends that CEQA analyses addressing the potential impacts of project-generated GHG emissions include the following:

- A summary of the current state of the science with respect to GHGs and climate change. [U.S. Global Change Research Program](#), [NASA](#), [California Climate Change Assessments](#), and [OEHHA's Indicators of Climate Change in California](#) provide good resources;
- A description of the existing environmental conditions or setting, without the project, which constitutes the baseline physical conditions for determining the project's impact;
- A discussion of the existing regulatory environment pertaining to GHGs;
- Identification of the thresholds of significance applicable to the proposed project. The District provides [recommended thresholds](#), including required Best Management Practices for operational emissions, for agencies without adopted GHG reduction plans (climate action plans) or their own adopted thresholds and for projects that are inconsistent with an agency's adopted GHG reduction plan;
- A discussion of the GHG emission sources associated with the project's construction and operational activities;
- Discussion of whether the project's size qualifies it to be analyzed using the District's construction screening level for GHG emissions, discussed in Section 6.3.1;
- If the analysis cannot be completed using the District's construction screening level, a quantification of the annual mass emissions of GHGs that will be generated by project construction, and the input parameters and assumptions used to estimate these values;
- Identification of the earliest year in which operational emissions of GHGs are anticipated to commence;
- Discussion of whether the project's scope and size qualify it to be analyzed using the District's [Operational Screening Levels table](#) (which lists sizes of land uses not expected to exceed 1,100 metric tons of CO₂e per year), including implementation of required tier 1 Best Management Practices;
- If the analysis cannot be completed using the District's operational screening levels table, including implementation of required tier 1 Best

Management Practices, a quantification of the annual mass emissions of GHGs that will be generated by project operations, and the input parameters and assumptions used to estimate these values, including implementation of required tier 2 Best Management Practices;

- A discussion of whether project construction- and operations-related GHG emissions will exceed the established significance thresholds and the resulting determination of whether the construction and operational GHG emissions, without mitigation, will represent a cumulatively considerable contribution to the significant cumulative impact;
- A discussion of feasible construction mitigation necessary to reduce impacts and make a determination whether the mitigation will be sufficient to reduce the project's construction GHG contribution to the significant cumulative impact to a less than considerable level;
- A discussion of operational mitigation, including implementation of required tier 1 and tier 2 operational Best Management Practices (or equivalent on-site or off-site mitigation) necessary to reduce impacts and make a determination whether the mitigation will be sufficient to reduce the project's operational GHG contribution to the significant cumulative impact to a less than considerable level; and
- With state-wide GHG reduction targets established in 2030 and 2050, and carbon free electricity targeted in 2045, analysts are advised to include a discussion of how the project will be consistent with these targets.

6.3 METHODOLOGIES

The evaluation of GHG emissions considers the following questions regarding Greenhouse Gas Emissions from the Environmental Checklist Form, [Appendix G of the State CEQA Guidelines](#):

- VIII.a. Will the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- VIII.b. Will the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

The State CEQA Guidelines [Section 15064.4](#) states that a lead agency must make a good faith effort, based on available information, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. The guidelines give the lead agency the discretion to select the most appropriate tools based on substantial evidence. The District's recommendations on appropriate methodology and tools for analyzing GHG emissions are provided in the following sections. Additionally, the District created an [applicability flow chart](#) to assist lead agencies

and project proponents with properly evaluating operational GHG emissions, thresholds, and best management practices.

6.3.1 ASSESSING MASS EMISSIONS

LAND USE DEVELOPMENT PROJECTS

Screening

The District assumes that projects described in CEQA's categorical and statutory exemption provisions ([Articles 18 and 19 of the California Code of Regulations, Title 14](#)) will not interfere with achieving emission reductions from new projects subject to CEQA. The District also assumes that GHG emissions from residential and commercial projects that are described in the categorical exemption language appear to be relatively small from a GHG perspective and may be considered less-than-cumulatively considerable.

For projects within the District's jurisdiction not described in CEQA's categorical and statutory exemption provisions, the District has developed screening levels to help lead agencies analyze operational and construction GHG emissions. The [GHG Operational Screening Levels table](#) shows the size of development (by land use type) at which 1,100 metric tons of GHG per year would not be exceeded. If a project is less than or equal to 1,100 metric tons of GHG per year and implements the District's tier 1 operational GHG Best Management Practices (noted in Section 6.4.1), the District's operational GHG threshold of significance would not be exceeded. In addition, the District has determined that projects below the GHG Operational Screening Levels would not exceed the District's construction GHG threshold of significance if the project meets the parameters in Chapter 3, Section 3.3.1 for the construction NOx screening level.

Therefore, operational and construction emissions from projects that are smaller than the land use sizes in the Operational Screening Levels table, implement the District's tier 1 operational GHG Best Management Practices, and also meet the parameters outlined in Chapter 3, Section 3.3.1 regarding construction may be considered less-than-cumulatively considerable.

[CEQA Guidelines Section 15183.5](#) includes the provision for tiering and streamlining the analysis of GHG emissions in CEQA documents. Under this provision, lead agencies may analyze and mitigate the effects of GHG emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce GHG emissions such as a Climate Action Plan developed by a local jurisdiction, or a sustainable communities strategy developed by the metropolitan planning organization. Later project-specific CEQA documents may tier and/or incorporate by reference that existing programmatic review if the proposed project is consistent with the applicable regional or local plan that adequately addresses GHG emissions, and that plan has been evaluated pursuant

to CEQA and has a certified or approved environmental document. More guidance on program-level GHG emissions analysis is included in [Chapter 9](#).

Pursuant to CEQA Guidelines Sections [15064\(h\)\(3\)](#) and [15130\(d\)](#), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances. CEQA Guidelines Section [15183.5\(b\)\(2\)](#) provides additional detail regarding use of an adopted GHG emissions reduction plan with later projects.

Quantification of GHG Emissions

CEQA is a public disclosure law that requires lead agencies to make a good-faith, reasoned effort, based upon available information, to identify the potentially significant direct and indirect environmental impacts - including cumulative impacts - of a proposed project. The District recommends the lead agency quantify the GHG emissions anticipated to be generated by a proposed project that does not meet the requirements of a categorical or statutory exemption, that cannot show consistency with the jurisdiction's adopted climate action plan or GHG reduction plan (if applicable), or that exceeds the screening levels in the [GHG Operational Screening Levels table](#) (projects below the screening levels must also implement required tier 1 Best Management Practices to avoid quantification). Direct and indirect emissions of GHGs from the project, which include construction emissions, area- and mobile-source emissions, and indirect emissions from in-state energy production and water consumption (energy for conveyance, treatment, distribution, and wastewater treatment), must be quantified and disclosed in the CEQA document. Operational calculations must also include vehicle miles traveled per resident and per worker. The annual and total amount of a project's construction related GHG emissions and the operational GHG emissions generated per year over the lifetime of the project should be disclosed separately. The most recent version of the [California Emissions Estimator Model \(CalEEMod\)](#) is the recommended analysis tool to quantify project GHG emissions. Lead agencies should discuss the use of other analysis tools with the District prior to use.

Construction Emissions

District-recommended methodologies for quantifying construction GHG emissions include using [CalEEMod](#) for proposed land use development projects and the [Roadway Construction Emissions Model](#) for proposed projects that are linear in nature.

Please note that sources of construction-related GHG emissions only include exhaust, for which the lead agency can follow the same detailed guidance as described in [Chapter 3, Construction-Generated Criteria Air Pollutant and Precursor Emissions](#) for criteria air pollutants and precursors. CalEEMod output for construction related GHG emissions must be disclosed in the CEQA document and treated as a net increase in emissions.

For linear construction projects such as construction of a new roadway, road widening, roadway overpass, levee, or pipeline, the District recommends the use of the most current version of the Roadway Construction Emissions Model. This model is a spreadsheet-based tool that uses basic project information (e.g., total construction months, project type, total project area) to estimate a construction schedule and quantify GHG emissions from heavy-duty construction equipment, haul trucks, and worker commute trips associated with linear construction projects. Lead agencies should refer to Chapter 3 for guidance on using the Roadway Construction Emissions Model.

Operational Emissions

Operational GHG emissions from a project should be calculated and reported for the first full year of operation in annual metric tons of carbon dioxide equivalents (CO₂e). Vehicle miles traveled per resident and per worker should also be calculated for comparison to tier 2 Best Management Practices, if applicable. Direct and indirect emissions from the project must be estimated using the most current version of [CalEEMod](#) in accordance with the CalEEMod User's Guide and the District's [User Tips](#). Section 5 of the District's [Greenhouse Gas Thresholds for Sacramento County](#) describes methods to modify CalEEMod inputs for operational emissions calculations (electricity, natural gas, and trip generation rate adjustments). The District encourages the use of project-specific information whenever possible.

If project emissions exceed the District's GHG operational screening levels table, the project would then apply the District's tier 1 and tier 2 Best Management Practices to reduce GHG emissions from the project. The Best Management Practices are fully described in Section 6.4, Mitigation.

STATIONARY-SOURCE FACILITIES

An emissions unit consists of a single emission source with an identified emission point, such as a stack, at a facility. Facilities can have multiple emission units located on-site and sometimes the facility as a whole is referred to as a "stationary source." Stationary sources are typically associated with industrial processes. Examples include boilers, heaters, flares, cement plants, and other types of combustion equipment.

AB 32 required ARB to adopt regulations that require the monitoring and annual reporting of GHG emissions from the sources that "contribute the most to statewide emissions", and account for the GHG emissions from all electricity consumed in California, including transmission and distribution line losses from electricity generated within the state or "imported from outside the state." Pursuant to AB 32, ARB adopted the [Greenhouse Gas Mandatory Reporting Regulation](#) in December 2007. The regulations require certain stationary sources, including, but not limited to, cement plants, petroleum refineries, and operators, retail providers and marketers involved in electric generation within California or the import or export of electricity across California borders, to comply with

monitoring and reporting guidelines associated with their GHG emissions. The rule also applies to operators of other facilities in California that emit greater than or equal to 25,000 metric tons CO₂/year from stationary combustion sources.

GHG Emissions Reporting Tool

The [California Electronic Greenhouse Gas Reporting Tool](#), or Cal e-GGRT, is a web-based annual reporting tool managed by ARB. The tool facilitates tracking and reporting of annual data required under the ARB Mandatory Reporting Regulation. It provides for the assignment of reporting personnel, set-up of source inventory information, and annual reporting of emissions and other data in a manner that directly addresses the requirements of the regulation. Additional elements of the same tool provide for tracking and certification of emission reports and data verification by third-party verifiers. Reporters subject to California's [Greenhouse Gas Mandatory Reporting Regulation](#) must submit their data to ARB using Cal e-GGRT. The Reporting Tool can be used to disclose a stationary source's GHG emissions in a CEQA document.

Manual Estimation

Stationary source GHG emissions may be estimated manually. District staff should be consulted to ensure the emission factors and calculation methods are appropriate for CEQA and permitting purposes.

6.3.2 DETERMINING LEVEL OF SIGNIFICANCE

LAND USE DEVELOPMENT PROJECTS

AB 32 demonstrated California's commitment to reducing GHG emissions and the state's associated contribution to climate change, without intent to limit population or economic growth within the state. To meet AB 32 goals, California must reduce GHG emissions to 1990 levels by 2020. To meet the goals of [Executive Order B-30-15](#), California must reduce GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050. On September 8, 2016, Governor Brown signed Senate Bill 32 (SB 32) into law which codified the mandate to reduce emissions by 40 percent below 1990 levels by 2030. The District recognizes that although there is no known level of emissions that determines if a single project will substantially impact the environment, a threshold must be set to trigger review and to assess the need for mitigation.

Lead agencies shall compare the project's estimated GHG emissions to the [District's recommended thresholds of significance](#):

- Construction phase of all project types -1,100 metric tons of CO₂e per year.
- Stationary source operational emissions - 10,000 metric tons of CO₂e per year.

- Land development project operational emissions are reviewed in the context of consistency with ARB's 2017 Climate Change Scoping Plan (which pertains to the second GHG-related question from appendix G).

If a project's emissions exceed the thresholds of significance for construction or stationary source emissions, then the project emissions may have a cumulatively considerable contribution to a significant cumulative environmental impact, answering Appendix G's first GHG-related question on whether the project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

For projects that exceed the District's thresholds of significance, lead agencies shall implement all feasible mitigation to reduce GHG emissions, discussed in Section 6.4, Mitigation.

The second GHG-related question in Appendix G asks if the project will conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. In order to answer this question, project emissions should be evaluated with respect to consistency with the following plans and policies, if applicable, that have been adopted to reduce GHG emissions:

- A jurisdiction's qualified climate action plan or GHG reduction plan.
- The Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS).
- ARB's 2017 Climate Change Scoping Plan (including State climate goals beyond 2030).

In April 2020, the District adopted an update to the land development project operational GHG threshold, which requires a project to demonstrate consistency with ARB's 2017 Climate Change Scoping Plan. The District's technical support document, [Greenhouse Gas Thresholds for Sacramento County](#), identified operational measures that should be applied to a project to demonstrate consistency. The measures target GHG emissions inventory areas where State measures did not fully achieve reductions, allowing for local supportive measures. These measures, known as tier 1 and tier 2 Best Management Practices are discussed in Section 6.4, Mitigation. The District's [applicability flow chart](#) is a good reference to ensure the required best management practices are included in the project.

Construction Emissions

Lead agencies shall estimate and report a land use development or stationary source project's construction GHG emissions for each year of construction. Lead agencies shall compare the project's annual construction GHG emissions to the District's 1,100 metric ton per year threshold of significance. If the threshold is exceeded, then the project may have a cumulatively considerable contribution to

a significant cumulative environmental impact, and all feasible mitigation is required.

Operational Emissions

Lead agencies shall estimate and report a project's annual operational GHG emissions in the first year of full operation (or if various phases, for each phase of operation) for projects that cannot screen out by comparing to the District's operational screening levels table (equivalent to 1,100 metric tons of CO₂e per year), including implementation of tier 1 Best Management Practices. If the project emissions exceed the screening level, or the project fails to implement tier 1 Best Management Practices, the project may have a cumulatively considerable contribution to a significant cumulative environmental impact, and all feasible mitigation is required. Projects exceeding the screening level, must implement tier 1 and tier 2 Best Management Practices, or provide equivalent on-site or off-site mitigation measures.

For purposes of evaluating a project's consistency with the 2045 statewide carbon neutrality goal, a project would need to eliminate natural gas completely (BMP 1) or require all pre-wiring necessary so that the buildings are ready for a future retrofit to all-electric. Additionally, for a project located in an area with relatively high vehicle miles traveled per capita (resident and worker) the project would need to provide sufficient electrical capacity that 100% of project vehicles have the potential to be zero emission vehicles. Qualitatively, the project would be required to show that it is not otherwise impeding the 2045 statewide carbon neutrality goal.

STATIONARY SOURCE FACILITIES

Lead agencies shall compare the stationary source project's annual direct operational GHG emissions to the District's 10,000 metric ton per year threshold of significance for stationary sources. If the project's annual direct GHG emissions will exceed the District's threshold of significance, then the project may have a cumulatively considerable contribution to a significant cumulative environmental impact.

Stationary source GHG emissions shall also be evaluated in the context of the applicable regulatory environment that is in place under the mandates of AB 32, SB 32, ARB's Climate Change Scoping Plan and Executive Order B-30-15.

6.4 MITIGATION

The State CEQA Guidelines [Section 15126.4\(c\)](#) requires lead agencies to consider feasible means of mitigating the significant effects of GHG emissions, supported by substantial evidence and subject to monitoring and reporting. Mitigation measures may include, but are not limited to:

1. Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

2. Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in CEQA Guidelines [Appendix F - Energy Conservation](#);
3. Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
4. Measures that sequester greenhouse gases; and
5. In the case of the adoption of a plan, such as a general plan, long range development plan, or GHG reduction plan, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

GHG mitigation measures could also be included in a Climate Action Plan or similar plan-level document adopted by a lead agency.

The lead agency must impose all mitigation measures that are necessary to reduce GHG emissions to a less-than-cumulatively considerable level. CEQA does not require mitigation measures that are infeasible for specific legal, economic, technological, or other reasons. A lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is "less than significant" or, in the case of cumulative impacts, less than cumulatively considerable.

For every GHG emission reduction measure included in a CEQA document, the District recommends that the text shall be as detailed as possible and shall clearly identify who is responsible for implementation, funding, monitoring, enforcement, and any required maintenance activities. The lead agency shall also explain why the measure will be effective in reducing emissions and why each measure is considered to be feasible. In the case that GHG emission reduction measures relate directly or indirectly to policies in the local jurisdiction's General Plan, the District encourages the explanation of these relationships also be included.

If, after the identification of all feasible mitigation measures, a project is still deemed to have a cumulatively considerable contribution to a significant cumulative environmental impact, the lead agency can approve a project, but must adopt a Statement of Overriding Consideration to explain why further mitigation measures are not feasible, and why approval of a project with significant unavoidable impacts is warranted.

6.4.1 REDUCING MASS EMISSIONS FROM LAND USE DEVELOPMENT PROJECTS

When a lead agency does not have a previously approved community-wide GHG Reduction Plan or Climate Action Plan from which it can tier subsequent CEQA analyses for land use development projects, the project GHG emissions exceed the

threshold of significance for construction emissions, and/or the project size exceeds the operational land use screening levels table, which are equivalent to 1,100 metric tons of CO₂e per year, the District recommends the project proponent include all feasible measures to reduce GHG emissions.

Construction Emissions

The District provides [Recommended Measures](#) for Reducing GHG emissions from construction activities. These measures are best management practices, and some do not produce easily quantifiable GHG emission reductions. Other options for reducing GHG emissions from construction activities include obtaining emission reduction offsets or amortizing the construction emissions along with the operational emissions prior to applying mitigation.

Lead agencies may decide to amortize the level of short-term construction emissions over the expected (long-term) operational life of a project. Operational life of a building can be estimated to be 40 years for new residential and 25 years for conventional commercial. These estimates are derived from the State of California Executive Order D-16-00 and the US Green Building Council's October 2003 report on [The Costs and Financial Benefits of Green Buildings](#). The US Green Building Council's report provides longer operational life estimates for LEED certified buildings. Other operational life estimates can be used if justification is provided.

Operational Emissions

All projects must implement tier 1 Best Management Practices to demonstrate consistency with the Climate Change Scoping Plan. After implementation of tier 1 Best Management Practices, project emissions are compared to the operational land use screening levels table (equivalent to 1,100 metric tons of CO₂e per year). If a project's operational emissions are less than or equal to 1,100 metric tons of CO₂e per year after implementation of tier 1 Best Management Practices, the project will result in a less than cumulatively considerable contribution. Tier 1 Best Management Practices (fully described in [Greenhouse Gas Thresholds for Sacramento County](#)) include:

- BMP 1 - no natural gas: projects shall be designed and constructed without natural gas infrastructure.
- BMP 2 - electric vehicle (EV) ready: projects shall meet the current CalGreen Tier 2 standards, except all EV capable spaces shall be instead EV ready.

Project's that do not implement the tier 1 Best Management Practices must conduct additional calculations to determine excess emissions and provide measures either on-site or off-site to provide equivalent mitigation. Failure to implement tier 1 Best Management Practices may also require additional

environmental review, especially if a Statement of Overriding Consideration is needed.

If project emissions exceed the land use screening levels table (equivalent to 1,100 metric tons of CO₂e per year) after implementation of tier 1 Best Management Practices, the project is required to implement tier 2 Best Management Practices (fully described in [Greenhouse Gas Thresholds for Sacramento County](#)). Tier 2 Best Management Practices consists of BMP 3 - reductions in vehicle miles traveled (VMT) that meet the following requirements (or equivalent local agency's adopted SB 743 targets):

- Residential projects must achieve a 15% reduction in VMT per resident compared to existing average VMT per capita in the county.
- Office projects must achieve a 15% reduction in VMT per worker compared to existing average VMT per capita for the county.
- Retail projects must achieve no net increase in total VMT.

If the project meets the de minimis criteria for VMT in the Office of Planning and Research's SB 743 [Technical Advisory on Evaluating Transportation Impacts in CEQA](#), document the qualifying criteria to satisfy the BMP3 requirement.

Projects that do not meet tier 2 Best Management Practices (BMP 3) are required to implement additional measures to further reduce VMT to achieve the target. The District's [Recommended Guidance for Land Use Emissions Reductions](#) (District Guidance) provides a description of the most current feasible mitigation measures to reduce a project's operational GHG emissions. The District Guidance provides detailed information on how to utilize CalEEMod to select the most appropriate mitigation measures for the project and quantify GHG mitigation measures selected. All of the measures in the District Guidance include information about the reductions that might be achieved by each measure. The measures and reductions have been substantiated through research identified by a comprehensive literature review including the California Air Pollution Control Officers Association's [Quantifying Greenhouse Gas Mitigation Measures](#) document. Lead agencies and project proponents can also research and develop additional measures, in consultation with the District, that have reductions that are both quantifiable and substantiated. Potential alternative measures include use of natural refrigerants, sequestration, installation of vehicle charging stations, solar water heaters (to reduce electricity use), or offsite mitigation, including offsets, if on-site reduction measures are not sufficient to meet reduction targets. Offsite mitigation measures are required to demonstrate with substantial evidence that the project, credit, or registry being used provides GHG offsets that are real, permanent, quantifiable, verifiable, enforceable, and additional. Alternative measures are discussed further in Section 5 of the District's [Greenhouse Gas Thresholds for Sacramento County](#).

To assist in documenting, quantifying, and monitoring the mitigation measures selected by the project proponent, the District has prescribed that the selected GHG mitigation measures be explained in the context of a project-specific GHG Reduction Plan. The GHG Reduction Plan can be a standalone document or incorporated into the environmental document. During the environmental review process, and before certification of the CEQA environmental document by the lead agency, the District independently verifies the benefits of the selected measures in the GHG Reduction Plan with a letter. The GHG Reduction Plan shall then be referenced in the CEQA document as a GHG mitigation measure, appended to the document, and referenced as a condition of approval by the lead agency.

6.4.2 REDUCING EMISSIONS FROM STATIONARY SOURCES

Mitigation measures for reducing GHG emissions from stationary-source facilities shall be developed on a case-by-case basis in consultation with the District's permitting staff. Area- and mobile-source emissions shall be mitigated in the same way as land use development projects, as discussed in Section 6.4.1. Additional offsets could be implemented, including, but not limited to, the purchase of verified emission reduction credits, to ensure that a facility's GHG emissions are reduced to a less-than-cumulatively considerable level.

Attachment V
SMAQMD, Resolution No. 2020
– 009, Update to the
Recommended Greenhouse
Gas Emissions Thresholds of
Significance



RESOLUTION NO. 2020 – 009

Adopted by the Sacramento Metropolitan Air Quality Management District

UPDATE TO THE RECOMMENDED GREENHOUSE GAS EMISSIONS THRESHOLDS OF SIGNIFICANCE**BACKGROUND:**

- A. Section 15064.7 of the California Environmental Quality Act (CEQA) Guidelines encourages public agencies to develop and publish thresholds of significance to use in the determination of the significance of environmental effects, and states that thresholds of significance adopted for general use as part of the agency's environmental review process must be adopted by ordinance, resolution, rule or regulation; developed through a public review process; and supported by substantial evidence.
- B. On October 23, 2014, the Sacramento Metropolitan Air Quality Management District Board of Directors adopted Recommended Greenhouse Gas Emissions Thresholds of Significance (Resolution 2014-028) for land development project operational phase emissions, construction phase emissions, and stationary source emissions.
- C. Since the adoption of the Recommended Greenhouse Gas Emissions Thresholds of Significance in 2014, changes in State law and guidance documents along with updated CEQA case law resulted in the need to review the Recommended Greenhouse Gas Emissions Thresholds of Significance and prepare needed updates. Current local data was available to update the land development project operational phase emissions threshold.
- D. The Sacramento Metropolitan Air Quality Management District provides substantial evidence supporting the update to the recommended greenhouse gas emissions thresholds of significance in a document entitled *Greenhouse Gas Thresholds for Sacramento County*, final version dated March 4, 2020.
- E. The Sacramento Metropolitan Air Quality Management District conducted outreach on the thresholds update via public workshops January 9 and December 9, 2019. Staff coordinated with local lead agencies and the North State Building Industry Association in one-on-one meetings. Comments by stakeholders were considered and incorporated as needed into *Greenhouse Gas Thresholds for Sacramento County* document.
- F. The updated recommended greenhouse gas emissions thresholds of significance do not apply to a project that is exempt from CEQA; complies with the lead agency's adopted climate action plan or greenhouse gas emission reduction plan in accordance with CEQA Guidelines Section 15183.5; or utilizes the lead agency's own adopted thresholds of significance based on substantial evidence.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE BOARD OF DIRECTORS RESOLVES AS FOLLOWS:

- Section 1. The development and adoption of the update to the recommended greenhouse gas emissions thresholds of significance meets the requirements of CEQA Guidelines Section 15064.7.
- Section 2. The construction phase and stationary source project thresholds of significance remain in place and are unchanged.
- Section 3. The recommended land development project operational phase greenhouse gas emissions threshold of significance is demonstrating consistency with *California's 2017 Climate Change Scoping Plan*.
- Section 4. A project within the jurisdiction of the Sacramento Metropolitan Air Quality Management District shall demonstrate consistency with *California's 2017 Climate Change Scoping Plan* by implementing the following best management practices (BMP).

Tier 1 required for all projects to avoid conflicting with long-term state goals:

BMP 1: No natural gas. Projects shall be designed and constructed without natural gas infrastructure.

BMP 2: Electric vehicle (EV) ready. Projects shall meet the current CalGreen Tier 2 standards, except all EV capable spaces shall instead be EV ready.

Tier 2 required for large projects or inefficient projects that do not screen out of further requirements:

BMP 3: Residential projects shall achieve a 15% reduction in vehicle miles traveled per resident, and office projects shall achieve a 15% reduction in vehicle miles traveled per worker compared to existing average vehicle miles traveled for the county or for the city if a more local target has been established to implement Public Resources Code Section 21099 regarding vehicle miles traveled and the Governor's Office of Planning and Research's December 2018 *Technical Advisory On Evaluating Transportation Impacts in CEQA*. Retail projects shall achieve a no net increase in total vehicle miles traveled, as required to show consistency with the *Technical Advisory*.

If a project cannot incorporate the required BMPs, other on-site reductions or offsite reduction projects would be required to mitigate the emissions. If offsite mitigation is utilized, the project, credit, or registry must demonstrate with substantial evidence that the offset is real, permanent, quantifiable, verifiable, enforceable, and additional.

Section 5. The recommended thresholds of significance are effective immediately upon adoption.

ON A MOTION by Director Hansen, seconded by Director Harris, the foregoing resolution was passed and adopted by the Board of Directors of the Sacramento Metropolitan Air Quality Management District on March 26, 2020, by the following vote:

Ayes: Carr, Frost, Guerra, Kennedy, Lampson, Ly, Nottoli and Terry.

Noes: Daniels and Gaylord.

Abstain:

Absent: Peters and Serna.

ATTEST:

Salina Martinez

Digitally signed by: Salina Martinez
DN: CN = Salina Martinez email = smartinez@airquality.org C = AD O = Sac Metro Air District
Date: 2020.04.24 10:39:38 -08'00'

Clerk, Board of Directors
Sacramento Metropolitan Air Quality Management District

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

Attachment W

VCS, Program Guide, V4

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)





**Verified Carbon
Standard**

A VERRA STANDARD

Program Guide

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

ABOUT VERRA



Verra supports climate action and sustainable development through the development and management of standards, tools and programs that credibly, transparently and robustly assess environmental and social impacts, and drive funding for sustaining and scaling up these benefits. As a mission-driven, non-profit (NGO) organization, Verra works in any arena where we see a need for clear standards, a role for market-driven mechanisms and an opportunity to achieve environmental and social good.

Verra manages a number of global standards frameworks designed to drive finance towards activities that mitigate climate change and promote sustainable development, including the [Verified Carbon Standard \(VCS\) Program](#) and its [Jurisdictional and Nested REDD+ framework \(JNR\)](#), the [Verra California Offset Project Registry \(OPR\)](#), the [Climate, Community & Biodiversity \(CCB\) Standards](#) and the [Sustainable Development Verified Impact Standard \(SD VISta\)](#). Verra is also developing new standards frameworks, including [LandScale](#), which will promote and measure sustainability outcomes across landscapes. Finally, Verra is one of the implementing partners of the [Initiative for Climate Action Transparency \(ICAT\)](#), which helps countries assess the impacts of their climate actions and supports greater transparency, effectiveness, trust and ambition in climate policies worldwide.

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1 INTRODUCTION

The Verified Carbon Standard (VCS) Program provides a global program and standard for GHG emission reduction and removal projects and programs. It uses as its core the requirements set out in *ISO 14064-2:2006*, *ISO 14064-3:2006* and *ISO 14065:2013*. The *VCS Program Guide* (this document) is the overarching program document and provides the rules and requirements governing the VCS Program, and describes the constituent parts of the program such as the project and program registration process, the Verra registry system, the methodology approval process, and the accreditation requirements for validation/verification bodies.

1.1 Version

VCS Program editions are labeled with a version number and program documents are correspondingly version controlled. *VCS Version 4* is the fourth working version of the VCS, having been preceded by *VCS Version 1* (the initial version), *VCS 2007* and *VCS 2007.1* (which were two releases of the same version, but with the latter version incorporating the agriculture, forestry and other land use (AFOLU) specifications), and *VCS Version 3*.

VCS Version 4 was released on 19 September 2019 and becomes the applicable version with immediate effect, except where grace periods were set out for particular requirements.

VCS Version 4 is comprised of all the program documents labeled v4.x, where x is a running number starting at zero. Individual program documents may be updated from time-to-time, as developments require, and their version numbers will be incremented using the v4.x format. Such updated documents still form part of version 4 and the VCS Program edition should be referred to as *VCS Version 4* regardless of the version numbers of the individual program documents. Where documents are updated, an appendix to the document will clearly state the updates made and their effective date. VCS Program stakeholders will be informed of the updates and the updates will also be catalogued on the Verra website. Readers shall ensure that they are using the most current version of this and all other program documents.

Note that errata documents may also be issued on a periodic basis to correct typographical errors in text, equations or figures in VCS Program documents or methodologies. In addition, clarification documents may be issued to provide additional guidance on the VCS Program rules or methodological requirements. Errata and clarification documents are posted to the Verra website alongside the relevant program document or methodology, and are effective on their issuance date. Project proponents and validation/verification bodies shall apply and interpret the VCS Program rules and methodological requirements consistent with any errata and clarifications. Errata and clarifications will be incorporated into the next issued version of the relevant program document or methodology.

New versions of the VCS Program will be issued on a periodic basis when major edition updates are required. Development of new versions of the program will include public stakeholder consultation and will be announced on the Verra website and to VCS Program stakeholders.

The VCS Program documents for previous versions of the VCS Program are available on the Verra website and these should be referred to for the rules and requirements under such previous versions of the VCS Program.

Note that projects, programs and verified carbon units (VCUs) are not labeled in the Verra registry with a specific version of the VCS Program (i.e., projects are not “Version 3 projects” or “Version 4 projects”, and likewise with VCUs). The VCS Program documentation is merely labeled with a version in order to provide version control over the program documents.

1.2 Language

The operating language of the VCS Program is English. The VCS Program documents may be translated into other languages to facilitate local use. However, the English versions of VCS Program documents, and the interpretation of same, shall take precedence over any other language translations.

1.3 Definitions

Definitions as set out in the VCS Program document *Program Definitions, ISO 14064-2:2006, ISO 14064-3:2006 and ISO 14065:2013* shall apply to all VCS Program documentation. Note that defined terms in the VCS Program documents, in common with ISO convention, are used without capital first letters.

2 OVERVIEW OF THE VCS PROGRAM

2.1 Program Objectives

The VCS Program establishes the rules and requirements that operationalize the *VCS Standard* to enable the validation of GHG projects and programs, and the verification of GHG emission reductions and removals that can be used both in voluntary and compliance markets. The VCS Program aims to:

- 1) Establish clear rules and procedures to enable the successful development of GHG projects and programs, and the creation of high quality GHG credits;
- 2) Create a trusted and fungible GHG credit, the VCU;
- 3) Stimulate innovation in GHG mitigation technologies and measures as well as procedures for validation, verification and registration, all within a context of quality, credibility and transparency;
- 4) Provide a secure registry system for all VCUs that offers assurance against double counting and provides transparency to the public;
- 5) Demonstrate workable frameworks and offer lessons that can be incorporated into other GHG programs and climate change regulation;
- 6) Provide oversight to ensure that investors, buyers and the market recognizes VCUs as being real, additional and permanent; and
- 7) Link carbon markets worldwide through a coherent and robust framework.

2.2 Program History

The Climate Group, the International Emissions Trading Association and the World Business Council for Sustainable Development are the partner organizations that founded the VCS Program. The World Economic Forum also partnered in the development of the VCS Program for part of the process. *VCS Version 1* was released on 28 March 2006 as both a consultation document and a standard for use by the market. *VCS Version 2* was released in October 2006 as a consultation document and did not replace *VCS Version 1* as the applicable version. After two years of work, two rounds of public consultation and the work of the 19-member steering committee¹ and seven technical working groups, *VCS 2007* was released on 19 November 2007. *VCS 2007.1*, which incorporated requirements for agriculture, forestry and other land use projects, was released on 18 November 2008. *VCS Version 3* was issued on 8 March 2011. *VCS Version 4* was released on 19 September 2019.

¹ The members of the steering committee were Jan-Willem Bode, Derik Broekhoff, Mike Burnett, Robert Dornau, Steve Drummond, Mitchell Feierstein, Yoshito Izumi, Mark Kenber, Adam Kirkman, Andrei Marcu, Erin Meezan, Ken Newcombe, Mark Proegler, Robert Routliffe, Richard Samans, Marc Stuart, Einar Telnes, Bill Townsend and Diane Wittenberg.

2.3 Program Scope

The VCS Program provides the standard and framework for independent validation of projects and programs, and verification of GHG emission reductions and removals, based on *ISO 14064-2:2006* and *ISO 14064-3:2006*. The scope of the VCS Program covers all those activities related to the generation of GHG emission reductions and removals, including jurisdictional programs and nested REDD+ projects. The scope does not include carbon footprint assessments or carbon neutrality claims.

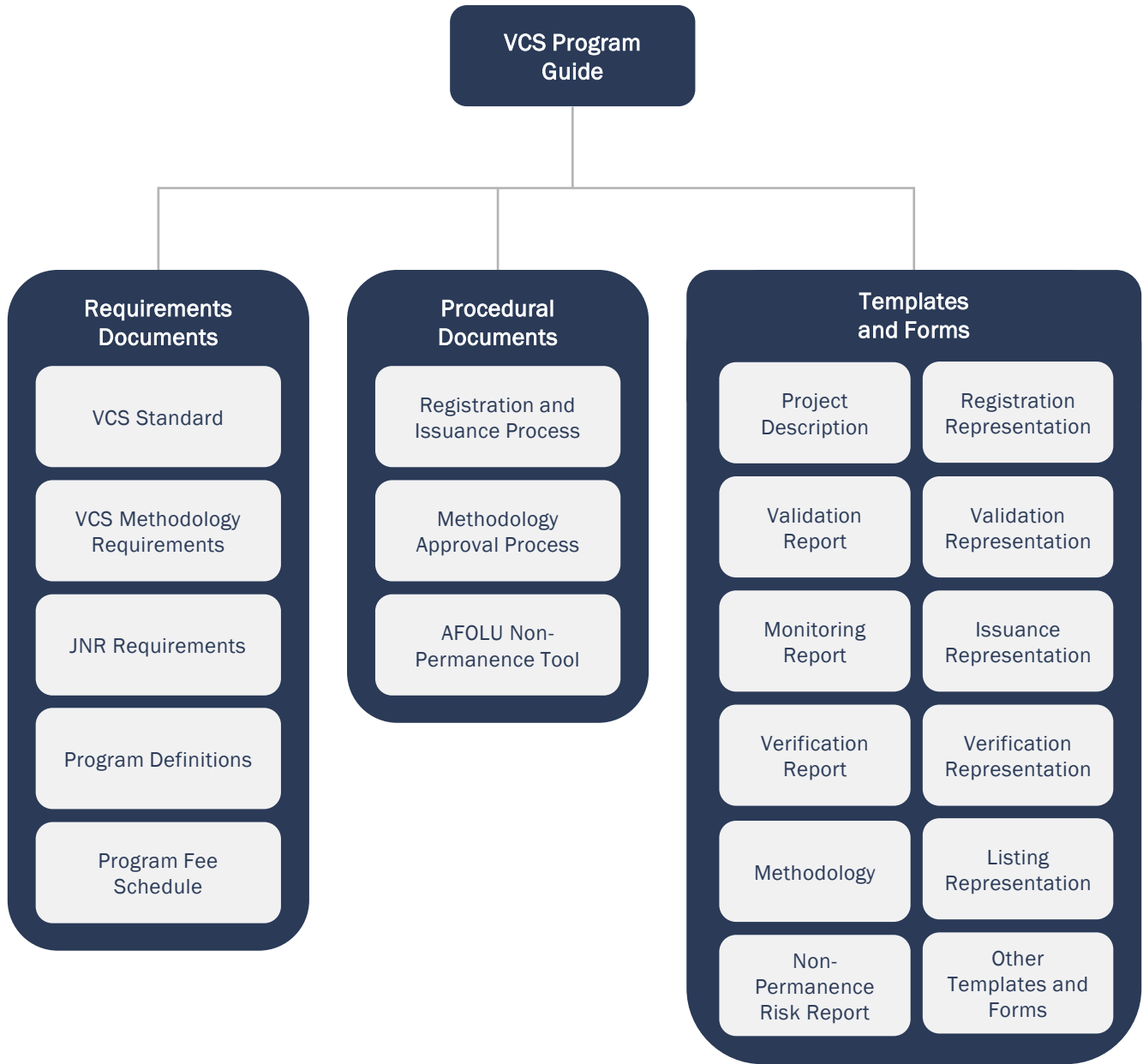
Participation is voluntary and based on objective criteria. The VCS Program is not discriminatory to project proponents, jurisdictional proponents, methodology element developers, validation/verification bodies, or VCU buyers, sellers or brokers.

2.4 Program Documents

The rules and requirements for the VCS Program are set out in the program documents. Projects, programs and methodologies shall meet with all the applicable rules and requirements set out in these documents.

The structure of the program documents is summarized in Diagram 1. The *VCS Program Guide* is the overarching program document, providing the rules and requirements governing the VCS Program and further describing the constituent parts of the program such as the project and program registration process, the Verra registry system, the methodology approval process, and the accreditation requirements for validation/verification bodies. Complementing the *VCS Program Guide* are requirements documents, procedural documents and templates and forms. Verra may issue new documents, as developments in the VCS Program require, and the complete and current list of the program documents is available on the Verra website.

Diagram 1: Program Documents



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In addition to the *VCS Program Guide*, the program documents currently include the following:

- 1) Requirements Documents
 - a) *VCS Standard*. Provides the requirements for developing projects and for the validation and verification process.
 - b) *Methodology Requirements*. Provides the requirements for developing new methodology elements.

- c) *JNR Requirements*. Provides further requirements for developing jurisdictional REDD+ programs and nested REDD+ projects.
- d) *Program Definitions*. Provides the definitions for terms used in the VCS Program documents.
- e) *Program Fee Schedule*. Provides the fees related to the various parts of the VCS Program.

2) Procedural Documents

- a) *Registration and Issuance Process*. Provides the procedures and rules for registering projects and issuing VCUs.
- b) *JNR Registration and Issuance Process*. Provides the procedures and rules for registering jurisdictional baselines and jurisdictional REDD+ programs, as well as projects nested in jurisdictional programs and standalone projects operating under Scenario 1.
- c) *JNR Validation and Verification Process*. Provides the process and requirements for the validation and verification of jurisdictional baselines and jurisdictional REDD+ programs.
- d) *Methodology Approval Process*. Provides the procedures and rules for approval of VCS Program methodology elements.
- e) *AFOLU Non-Permanence Risk Tool*. Provides the procedure for conducting non-permanence risk analysis and buffer determination for AFOLU projects.

3) Templates and Forms

- a) *VCS Program Templates*. Templates for project descriptions, validation reports, monitoring reports, verification reports and methodologies.
- b) *Representations Templates*. Templates for deeds of representation made by project proponents and validation/verification bodies.
- c) *Forms*. Forms such as for submitting methodology elements under the methodology approval process and for applying to be an AFOLU expert.

The following are normative (referenced) documents for the VCS Program:

- 1) *ISO 14064-2:2006*, Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements, ISO, 2006.
- 2) *ISO 14064-3:2006*, Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions, ISO 2006.
- 3) *ISO 14065:2013*, Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition, BSI, 2007.
- 4) *The GHG Protocol for Project Accounting* (Chapter 7, guidance related to additionality and common practice), WRI, 2005.

The four standards above are part of the requirements of the VCS Program and their requirements shall be met either by the project proponent (*ISO 14064-2:2006*) or validation/verification body (*ISO 14064-3:2006* and *ISO 14065:2013*). Where there is any conflict between VCS Program documentation and the above normative references, the VCS Program documentation shall take precedence.

The program documents are also complemented by a number of guidance documents. These guidance documents do not set out VCS Program rules and requirements, but they provide additional information to assist with the interpretation of the rules and requirements. It is strongly encouraged that such guidance is followed.

2.5 Roles and Responsibilities

2.5.1 Project and Jurisdictional Proponents

Project and jurisdictional proponents are the entities with overall control and responsibility for projects or programs. A project may have one project or jurisdictional proponent, or there may be a number of project or jurisdictional proponents who collectively have overall control and responsibility for a project or program. Project and jurisdictional proponents establish and operate projects and programs in accordance with the VCS Program rules. They are responsible for providing the project or program description, monitoring report and supporting documentation (including evidence of project ownership or program ownership) to facilitate validation and verification.

Project and jurisdictional proponents sign unilateral representations with respect to their projects or programs and VCUs, and these are made available on the Verra registry. Project proponents assume limited liability for replacement of excess VCUs, as set out in Section 4.2.

Note – In order to aid the readability of the VCS Program documentation, the documents use project and jurisdictional proponent in the singular. For projects and programs with multiple project or jurisdictional proponents, “project proponents” or “jurisdictional proponents” should be substituted in place of “project proponent” or “jurisdictional proponent”, as appropriate.

2.5.2 Methodology Element Developers

Methodology element developers are entities that develop methodologies, methodology revisions, modules and tools that are subject to the methodology approval process.

2.5.3 Validation/Verification Bodies

Validation/verification bodies are accredited to:

- 1) Validate projects and verify GHG emission reductions and removals.
- 2) Assess methodology elements under the methodology approval process.

Validation/verification bodies are only eligible to carry out work for the sectoral scopes for validation and verification for which they hold accreditation and must sign the required agreement with Verra before they can perform validation or verification in connection with the VCS Program. The list of validation/verification bodies is available on the Verra website.

2.5.4 Verra Registry

The Verra registry is responsible for ensuring that all required project and program documents have been submitted to Verra; issuing and maintaining accounts of VCUs for accountholders; ensuring the seamless flow of VCUs throughout the entire Verra registry system; tracking and reporting the deposit/withdrawal of buffer credits to/from the centrally managed AFOLU pooled buffer account and jurisdictional pooled buffer account; and maintaining custody and records of VCU legal ownership.

2.5.5 VCU Buyers, Sellers and Brokers

Buyers, sellers and brokers are companies, organizations or individuals who transact VCUs or facilitate the transaction of VCUs.

2.5.6 Verra

The VCS Program is managed by Verra, which is an independent, non-profit organization incorporated under the laws of the District of Columbia in the United States. Verra is responsible for managing, overseeing and developing the program. It maintains an impartial position in the market and does not develop projects, programs or methodologies, nor does it provide validation, verification or consulting services.

One of Verra's roles is in respect of overseeing and ensuring the integrity of projects, programs and VCUs in the Verra registry system. Verra conducts reviews of project and program registration and VCU issuance requests. Verra is also responsible for overseeing the validation/verification bodies operating under the VCS Program. Where Verra identifies shortcomings in a validation/verification body's performance, it may provide feedback and require the validation/verification body to address non-conformities.

Verra reserves the right not to register projects and programs, or issue VCUs where it deems that they are not in compliance with the VCS Program rules or may otherwise impact the integrity of the VCS Program or the functioning of the broader carbon market, and to delist projects, programs and VCUs where it deems that they have not been registered or issued in accordance with the VCS Program rules. Verra also reserves the right to take action against validation/verification bodies in accordance with the provisions set out in the agreements signed with Verra. The rights and obligations for validation/verification bodies are set out in such agreements.

Verra is also responsible for managing the methodology approval process, and it reserves the right to not accept methodology elements into the process, not approve methodology elements, or review and update, put on hold or withdraw approved methodology elements where it deems that they are not in compliance with the VCS Program rules, would sanction politically or ethically contentious project activities, or may otherwise impact the integrity of the VCS Program or the functioning of the broader

carbon market.

Verra may convene steering committees, advisory committees or working groups to support its work in specific areas. These groups draw in expertise from outside the organization to develop and support specific elements of the VCS Program. A full list of steering committees and working groups is available on the Verra website.

3 VCS PROGRAM CRITERIA FOR GHG PROJECTS AND PROGRAMS

All projects and programs shall meet the requirements set out in the VCS *Version 4* program documents.

GHG emission reductions and removals verified under the VCS Program and issued as VCUs shall meet the following principles:

Real

All GHG emission reductions and removals and the projects or programs that generate them must be proven to have genuinely taken place.

Measurable

All GHG emission reductions and removals must be quantifiable using recognized measurement tools (including adjustments for uncertainty and leakage) against a credible emissions baseline.

Permanent

Where GHG emission reductions or removals are generated by projects or programs that carry a risk of reversibility, adequate safeguards must be in place to ensure that the risk of reversal is minimized and that, should any reversal occur, a mechanism is in place that guarantees the reductions or removals will be replaced or compensated.

Additional

GHG emission reductions and removals must be additional to what would have happened under a business-as-usual scenario if the project had not been carried out.

Independently Audited

All GHG emission reductions and removals must be verified to a reasonable level of assurance by an accredited validation/verification body with the expertise necessary in both the country and sector in which the project is taking place.

Unique

Each VCU must be unique and must only be associated with a single GHG emission reduction or removal activity. There must be no double counting, or double claiming of the environmental benefit, in respect of the GHG emission reductions or removals.

Transparent

There must be sufficient and appropriate public disclosure of GHG-related information to allow intended users to make decisions with reasonable confidence.

Conservative

Conservative assumptions, values and procedures must be used to ensure that the GHG emission reductions or removals are not over-estimated.

4 VERRA REGISTRY

The Verra registry provides the public interface to all project, program and VCU information. VCU serial numbers are generated by the registry, which ensures uniqueness of projects, programs and VCUs. In addition, the Verra registry provides full transparency on project and program documentation, together with information on project and jurisdictional proponents, VCU issuance and retirement, the AFOLU pooled buffer account and the jurisdictional pooled buffer account.

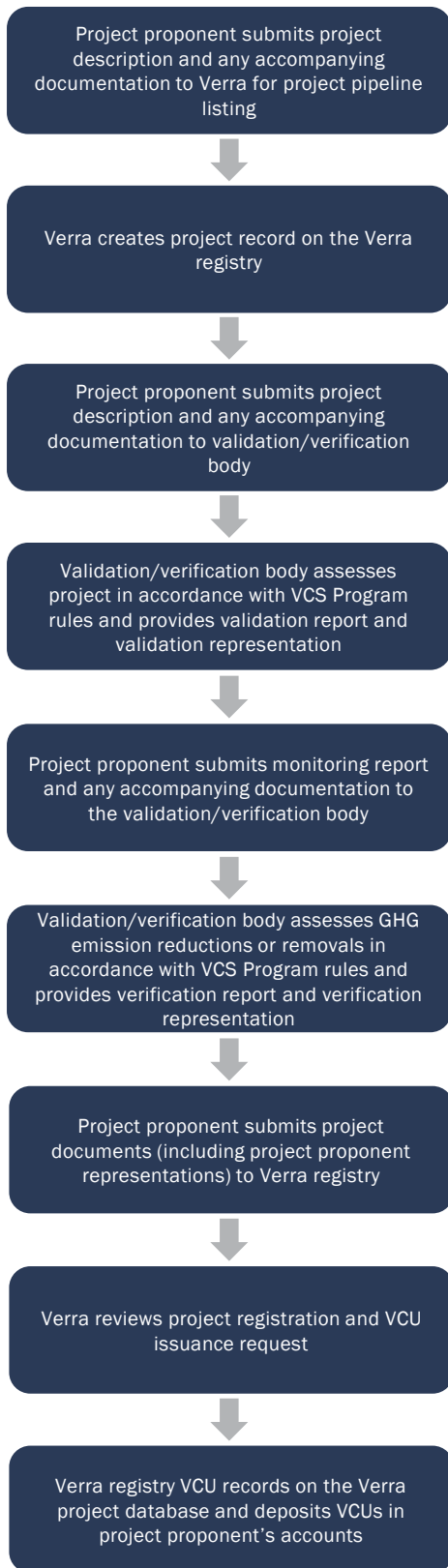
The AFOLU pooled buffer account holds non-tradable buffer credits to cover the non-permanence risk associated with AFOLU projects. It is a single account that holds the buffer credits for all projects. The account is subject to a periodic reconciliation, as set out in the VCS Program document *VCS Standard*. Likewise, the jurisdictional pooled buffer account holds the non-tradable buffer credits to cover the non-permanence risk associated with jurisdictional REDD+ programs and nested projects.

The Verra registry provides accountholder services and is the entry point into the registry system for project and jurisdictional proponents, and VCU buyers and sellers. Such market participants open an account with the Verra registry and project and program registration and VCU issuance is initiated with the Verra registry.

The Verra registry is responsible for ensuring that projects and programs are registered and VCUs are issued in accordance with the VCS Program rules; providing services for holding, transferring and retiring VCUs; managing AFOLU and jurisdictional buffer credits; and providing custodial services for VCUs and maintaining records of VCU legal ownership.

Project and jurisdictional proponents (or other eligible entities, as set out in the VCS Program documents *Registration and Issuance Process* and *JNR Registration and Issuance Process*) request listing and registration of projects and programs, and VCU issuance, with the Verra registry. Diagram 2 outlines the project life cycle and registration process, which is similar to the program life cycle and registration process. Once the project or program has been validated and the GHG emission reductions or removals verified, the project or jurisdictional proponent submits the relevant documents to the Verra registry. Verra conducts a completeness review of the documents, and may conduct a further accuracy review to assess compliance with the VCS Program rules. Where it is determined that the project or program complies with the VCS Program rules, Verra uploads the documents to the public Verra registry and issues VCUs into the project or jurisdictional proponent's account. Note that validation and verification may be undertaken simultaneously, with registration and issuance of the VCUs occurring at the same time, or validation may occur before verification, with registration occurring before any subsequent issuance of VCUs.

Diagram 2: Project Life Cycle and Registration Process



The process and detailed rules and requirements for project pipeline listing, program listing, project and program registration, and VCU issuance are set out in the VCS Program documents *Registration and Issuance Process* and *JNR Registration and Issuance Process*.

4.1 VCS Program Fees

Verra charges fees to cover administration costs, at the rates set out in the VCS Program document *Program Fee Schedule*.

4.2 VCU Liability And Statute Of Limitations

Registered projects and issued VCUs are subject to review by Verra, as set out in the VCS Program document *Registration and Issuance Process*. Project proponents are responsible for compensating for excess VCU issuance where Verra deems, acting reasonably, that there has been a material erroneous issuance of VCUs in respect of a project, as a result of the fraudulent conduct, negligence, intentional act, recklessness, misrepresentation or mistake of the project proponent. A statute of limitations applies, whereby Verra can only require such compensation in relation to any verification completed after 8 April 2014 and up to the later of:

- 1) 6 years after the date of issuance of the relevant VCU; or
- 2) 12 months after the date upon which any second verification report with respect to the relevant VCU is accepted on the Verra registry.²

²The relevant VCU will be issued following acceptance of a verification report for a project. For some types of AFOLU projects in particular, verification cycles may be longer than 6 years. In this regard, if the second verification report shows a VCU has been erroneously issued, Verra will have an additional 12 months to deal with that issue. Note also that where a VCU is erroneously issued from the last verification report of a project, Section 4.2(1) applies.

5 VCS PROGRAM ACCREDITATION

Validation/verification bodies are eligible to provide validation and verification services under the VCS Program if they have signed the required agreement with Verra and are:

- 1) Accredited under a VCS-approved GHG program³; or
- 2) Accredited under *ISO 14065:2013* for scope VCS by an accreditation body that is a member of the International Accreditation Forum;

The validation/verification body shall hold such accreditation or approval for validation or verification (as applicable) for the sectoral scope(s) applicable to the methodology applied to the project. Where the methodology falls under more than one sectoral scope, the validation/verification body shall hold accreditation or approval for validation or verification (as applicable) for all relevant sectoral scopes.

Where the validation/verification body holds accreditation or approval for the verification for the relevant sectoral scope(s) but does not hold accreditation or approval for validation, it may validate project description deviations and inclusion of new project activity instances in grouped projects at the time of verification, under the following circumstances:

- 1) It holds accreditation or approval for validation in at least one other sectoral scope.
- 2) It has completed validation of at least five projects under the VCS Program or an approved GHG program, and such projects have been registered under the relevant program.
- 3) The validation activity does not entail the validation of a project description deviation that impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario (see the *VCS Standard* for further information on such deviations).

Validation/verification bodies are also eligible to conduct assessments (validation) of methodology elements under the methodology approval process. The validation/verification body shall hold accreditation for validation for the sectoral scope(s) applicable to the methodology. Where the methodology falls under more than one sectoral scope, the validation/verification body shall hold accreditation for validation for all relevant sectoral scopes.

To apply to become an approved validation/verification body with the VCS Program, organizations must complete a *Verra Validation/Verification Body Application Form* and submit the signed application, along with any supporting evidence (as required by the application) to secretariat@verra.org.

A list of validation/verification bodies approved to undertake validation and verification services under the VCS Program is available on the Verra website.

³ Note that accreditation under an approved GHG program shall be recognized only until such time as Verra determines that a sufficient number of validation/verification bodies are accredited under other recognized accreditation pathways, or two years from the date of release of VCS Version 4, whichever is earlier. After such date, all validation/verification bodies must be accredited through another approved accreditation pathway.

6 METHODOLOGY APPROVAL PROCESS

The methodology approval process is the process by which methodologies, methodology revisions, modules and tools (including additionality tools, performance benchmarks and technology benchmarks), are approved under the VCS Program. Such methodology elements are subject to review by Verra, a global stakeholder consultation hosted on the Verra website and independent assessment by one validation/verification body, before final approval by Verra.

The full rules and requirements for methodology elements with respect to the methodology approval process are set out in the VCS Program document *Methodology Approval Process*.

6.1 Review of Approved VCS Methodology Elements

Verra may periodically review methodology elements approved under the VCS Program to ensure they continue to reflect best practice and scientific consensus. This includes ensuring that methodology elements approved under the program are consistent with any new requirements issued by Verra and that methodology elements have appropriate criteria and procedures for addressing all VCS Program requirements and are consistent with emerging best practice and scientific consensus. As a result, Verra may need to update, put on hold or withdraw a methodology element. The procedure through which Verra may review approved VCS Program methodology elements and take appropriate action is set out in the VCS Program document *Methodology Approval Process*.

6.2 Compensation for Methodology Developers

Methodology developers are eligible to receive compensation for methodologies approved under the VCS Program.

Compensation will be paid according to the number of VCUs issued to projects using the methodology or a revision of the methodology, at the rate and in accordance with the payment terms set out in the VCS Program document *Program Fee Schedule*. Compensation is payable with respect to VCUs issued on or after 15 June 2010. Methodology developers may elect not to receive compensation by notifying Verra at any time.

Where Verra sanctions the consolidation of a number of methodologies, the compensation due to the developer of the consolidated methodology and the underlying methodologies respectively will be determined on a case-by-case basis by Verra.

Where an eligible methodology is withdrawn or put on hold, compensation remains payable in respect of continuing issuance of VCUs to registered projects that have applied the methodology or a revision of the methodology.

Only methodologies developed under the VCS Program methodology approval process are eligible for the compensation mechanism. Developers of methodology revisions, modules and tools are not compensated under the mechanism.

Note – Project proponents pay the same VCU issuance levy regardless of the methodology applied to the project. Verra pays any compensation to the methodology developer out of the VCU issuance levy it receives.

7 LINKING TO OTHER GHG PROGRAMS

To recognize work that has gone into developing other credible GHG programs, the VCS Program has a process for approving GHG programs that meet VCS Program criteria. A GHG program shall demonstrate compliance with VCS Program principles and requirements through a gap analysis and the Verra Board will make the final decision on whether to approve the GHG program. Approval of a GHG program under the VCS Program has three implications:

- 1) GHG credits under the approved GHG program may be cancelled and issued as VCUs (converted into VCUs).
- 2) Validation/verification bodies under the approved GHG program are approved for validation and verification under the VCS Program (for the corresponding sectoral scopes for validation and verification respectively, and provided they have signed the required agreement with Verra).
- 3) Methodology elements under the approved GHG program may be used for developing projects under the VCS Program.

The list of approved GHG programs is available on the Verra website, together with any specific conditions or further clarifications with respect to the scope of approval.

7.1 Gap Analysis Methodology and Process

The approval of other GHG programs is based on the principle of full compatibility with the VCS Program. A gap analysis process is applied on a case-by-case basis to determine the other GHG program's compliance with VCS Program principles and requirements and to assess whether the GHG emission reductions or removals issued under the GHG Program are fully compatible with VCUs issued under the VCS Program.

Any party may initiate a gap analysis of another GHG program with the VCS Program. All relevant documentation in relation to the GHG program shall be provided to Verra, with appropriate authorization secured.

The onus is on the GHG program to demonstrate that it meets the VCS Program criteria. The costs of the assessment are borne by the GHG program or whoever initiates the gap analysis.

Based on the gap analysis report, the Verra Board will make a decision on whether to approve the full GHG program or elements of the program.

7.2 Review of VCS Program-Approved GHG Programs

Approved GHG programs are reviewed periodically by Verra. Any changes made by an approved GHG program which may affect its compatibility with the VCS Program shall be communicated immediately to Verra. In the event that it is considered that the changes lead to non-conformity with the VCS Program, the Verra Board may decide to suspend or terminate its recognition of the approved GHG program. Any projects approved under the GHG program prior to such Verra Board decision will not be affected by the suspension or termination.

8 COMPLAINTS AND APPEALS PROCEDURE

Project proponents, validation/verification bodies, methodology element developers and other stakeholders (including interested stakeholders) may submit enquiries to Verra at any time. In addition, the VCS Program provides a complaints and appeals procedure as set out in the *Verra Appeals, Complaints and Conduct Policy* available on the Verra website.

APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v4.0	19 Sep 2019	Initial version released under VCS Version 4.



Standards for a Sustainable Future



Attachment X

VCS, Requirements Document

v.3.7





VCS Standard

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1 | Introduction

The *VCS Standard* provides a global standard for GHG emission reduction and removal projects and programs. It uses as its core the requirements set out in *ISO 14064-2:2006*, *ISO 14064-3:2006* and *ISO 14065:2007*. The two principal documents of the program are the *VCS Program Guide* and the *VCS Standard*. The *VCS Program Guide* describes the rules and requirements governing the VCS Program and further describes the constituent parts of the program such as the project and program registration process, the VCS registry system, the methodology approval process and the accreditation requirements for validation/verification bodies. The *VCS Standard* provides the requirements for developing projects, programs and methodologies, as well as the requirements for validation, monitoring and verification of projects, programs and GHG emission reductions and removals. The *VCS Standard* is supported by other documents that provide further requirements specific to agriculture, forestry and other land use (AFOLU), ozone-depleting substances projects and methodologies, and jurisdictional programs and nested REDD+ projects. The *VCS Program Guide* should be read before using the *VCS Standard*.

The VCSA recognizes the kind agreement of the International Organization for Standardization (ISO, www.iso.org) to allow inclusion of critical clauses of *ISO 14064-2:2006* and *ISO 14064-3:2006* in the VCS documentation to facilitate comprehension. In particular, the sections in this document on project and methodology requirements include text drawn from *ISO 14064-2:2006* clause 5 and *ISO 14064-3:2006* clause 4.9, amended where necessary to fit the context of the VCS Program.

1.1 VERSION

All information about version control under the VCS Program is contained in the *VCS Program Guide*.

This document will be updated from time-to-time and readers shall ensure that they are using the most current version of the document. Where external documents are referenced, such as the *IPCC 2006 Guidelines for National GHG Inventories*, and such documents are updated, the most recent version of the document shall be used.

2 | VCS Program Specific Issues

2.1 SCOPE OF VCS PROGRAM

2.1.1 The scope of the VCS Program includes:

- 1) The six Kyoto Protocol greenhouse gases.
- 2) Ozone-depleting substances as set out in VCS document *ODS Requirements*.

- 3) Project activities supported by a methodology approved under the VCS Program through the methodology approval process.
- 4) Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of VCS approval.
- 5) Jurisdictional REDD+ programs and nested REDD+ projects as set out in VCS document *JNR Requirements*.

The scope of the VCS Program excludes:

- 1) Projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction.
- 2) Projects that reduce hydrofluorocarbon-23 (HFC-23) emissions.

2.2 LANGUAGE

- 2.2.1** The operating language of the VCS Program is English. The project and program description, validation report, monitoring report, verification report and all other documentation (including all and any appendices) required under the VCS Program shall be in English.

2.3 TIMING OF CREDITING

- 2.3.1** VCUs shall not be issued under the VCS Program for GHG emission reductions or removals that have not been verified.
- 2.3.2** Project activities are eligible for immediate crediting of future avoided emissions under the conditions set out below, which shall be addressed at the level of the methodology:
- 1) The project immediately avoids future streams of GHG emissions as a result of an upfront intervention that permanently precludes further emissions from the source. VCUs shall be issued only after such an intervention has occurred and the GHG emission reductions have been verified. Examples of such activities include projects that destroy chlorofluorocarbons recovered from refrigeration equipment thereby immediately precluding their future release into the atmosphere, and composting projects that divert organic waste from landfill sites thereby immediately precluding future methane emissions. A REDD project would not qualify for immediate crediting because future streams of GHG emissions are not permanently precluded.
 - 2) The physical processes that would generate GHG emissions in the absence of an intervention are well-understood, stable and quantifiable. Models used to simulate such processes shall meet the requirements set out in Section 4.1.6. Any default factors associated with input parameters shall meet the requirements set out in Section 4.1.7.
 - 3) VCUs may be issued only for GHG emissions avoided over a ten year period, even if such GHG emissions are likely to have continued over a longer period of time under the baseline scenario. For example, a composting project that diverts organic waste from a landfill site

would be eligible for crediting (in relation to a specific amount of composted organic waste) for the GHG emissions that would have occurred at the landfill site over a ten year period, and any emissions that would have occurred beyond the ten year period (in relation to the specific amount of composted organic waste) are not eligible. Note that in this particular example the ten year rule applies to the specific amount of composted organic waste and the usual rules on duration of the project and project crediting period still apply.

2.4 PRINCIPLES

- 2.4.1** The application of principles is fundamental in ensuring that GHG-related information is a true and fair account. The principles below shall provide the basis for, and shall guide the application of, the VCS rules and requirements.

Principles taken from ISO 14064-2:2006, clause 3.

Relevance

Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.

Completeness

Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.

Consistency

Enable meaningful comparisons in GHG-related information.

Accuracy

Reduce bias and uncertainties as far as is practical.

Transparency

Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

Conservativeness

Use conservative assumptions, values and procedures to ensure that net GHG emission reductions or removals are not overestimated.

Note – Accuracy should be pursued as far as possible, but the hypothetical nature of baselines, the high cost of monitoring of some types of GHG emissions and removals, and other limitations make accuracy difficult to attain in many cases. In these cases, conservativeness may serve as a moderator to accuracy in order to maintain the credibility of project and program GHG quantification.

3 | Project Requirements

3.1 GENERAL REQUIREMENTS

- 3.1.1** Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. Projects shall be guided by the principles set out in Section 2.4.1.
- 3.1.2** Agriculture, forestry and other land use projects shall meet the rules and requirements set out in VCS document *AFOLU Requirements*. Ozone-depleting substances projects shall meet the rules and requirements set out in VCS document *ODS Requirements*.
- 3.1.3** Projects shall apply methodologies eligible under the VCS Program. Methodologies shall be applied in full, including the full application of any tools or modules referred to by a methodology, noting the exception set out in Section 3.14.1. The list of methodologies and their validity periods is available on the VCS website.
- 3.1.4** Where projects apply methodologies that permit the project proponent its own choice of model (see VCS document *Program Definitions* for definition of model), such model shall meet with the requirements set out in Section 4.1.6(2)-(6) and it shall be demonstrated at validation that the model is appropriate to the project circumstances (i.e., use of the model will lead to an appropriate quantification of GHG emission reductions or removals).
- 3.1.5** Where projects apply methodologies that permit the project proponent its own choice of third party default factor or standard to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, such default factor or standard shall meet with the requirements set out in Section 4.1.7(1).
- 3.1.6** Projects shall preferentially apply methodologies that use performance methods (see Section 4.1.11 for further information on performance methods) where a methodology is applicable to the project that uses a performance method for determining both additionality and the crediting baseline (i.e., a project shall not apply a methodology that uses a project method where such a performance method is applicable to the project). Methodologies approved under the VCS Program that use performance methods provide a list of similar methodologies that use project methods (that were approved under the VCS Program or an approved GHG program at the time the performance method was developed). Such lists are not necessarily exhaustive but can serve as the starting point for determining whether a performance method is applicable to the project. Following the approval of a methodology that uses a performance method, projects may use any applicable pre-existing methodology that uses a project method for a six-month grace period.
- 3.1.7** Where projects apply methodologies from approved GHG programs, they shall comply with any specified capacity limits (see VCS document *Program Definitions* for definition of capacity limit) and any other relevant requirements set out with respect to the application of the methodology

and/or tools referenced by the methodology under those programs. Where the rules and requirements under an approved GHG program conflict with the rules and requirements of the VCS Program, the rules and requirements of the VCS Program shall take precedence.

- 3.1.8** Where the VCSA issues new requirements relating to projects, registered projects do not need to adhere to the new requirements for the remainder of their project crediting periods (i.e., such projects remain eligible to issue VCUs through to the end of their project crediting period without revalidation against the new requirements). The new requirements shall be adhered to at project crediting period renewal, as set out in Section 3.8.5.

3.2 MULTIPLE PROJECT ACTIVITIES

- 3.2.1** Projects may include multiple project activities where the methodology applied to the project allows more than one project activity and/or where projects apply more than one methodology.
- 3.2.2** Where more than one methodology has been applied to a project with multiple project activities, the following applies:
- 1) Each project activity shall be specified separately in the project description, referencing the relevant methodology.
 - 2) All criteria and procedures set out in the applied methodologies in relation to applicability conditions, demonstration of additionality, determination of baseline scenario and GHG emission reduction and removal quantification shall be applied separately to each project activity, noting the following:
 - a) A single set of criteria and procedures for the demonstration of additionality may be applied where the applied methodologies reference the same additionality tool and/or procedures, and where separate demonstration of additionality for each project activity is not practicable. For example, separate demonstration of additionality may not be practicable in project activities that are implemented at a single facility and therefore represent a single investment. The onus is upon the project proponent to demonstrate to the validation/verification body that separate demonstration of additionality is not practicable, failing which separate demonstration of additionality shall be provided. Where a methodology specifies requirements for demonstrating additionality in addition to those specified in the referenced additionality tool and/or procedures, such requirements shall be adhered to.
 - b) The criteria and procedures for identifying the baseline scenario may be combined where the relevant methodologies or the referenced additionality tool and/or procedures specify criteria and procedures for combining baseline scenarios.
 - 3) The criteria and procedures relating to all other aspects of the methodologies may be combined.
 - 4) Where AFOLU projects are required to undertake non-permanence risk assessment and buffer withholding determination, this shall be done separately for each project activity.

Note – Where a single methodology is applicable to more than one project activity and where the methodology does not provide clear procedures for the application of more than one project activity, the above requirements shall be adhered to.

3.3 MULTIPLE INSTANCES OF PROJECT ACTIVITIES

- 3.3.1 Projects may include more than one project activity instance, such as a wind power project that includes a number of wind turbines. Inclusion of further project activity instances subsequent to initial validation of a non-grouped project is not permitted (see Section 3.4 for information on grouped projects). The baseline determination and additionality demonstration for all project activity instances shall be combined (e.g., multiple wind turbines shall be assessed in combination rather than individually).
- 3.3.2 Where a project includes multiple project activity instances from multiple project activities, the project activity instances from each project activity shall be assessed in accordance with Section 3.2.
- 3.3.3 Non-grouped projects with multiple project activity instances shall not exceed any capacity limits to which a project activity is subject.

3.4 GROUPED PROJECTS

- 3.4.1 Grouped projects are projects structured to allow the expansion of a project activity subsequent to project validation. Validation is based upon the initial project activity instances identified in the project description. The project description sets out the geographic areas within which new project activity instances may be developed and the eligibility criteria for their inclusion. New instances meeting these pre-established criteria may then be added to the project subsequent to project validation, as set out in the sections below. These sections provide the requirements for all grouped projects, which are further expanded upon in VCS document *AFOLU Requirements*. VCS methodologies may also provide additional specifications for grouped projects.

Note – Project activity and project activity instance both have the specific meanings that are set out in VCS document *Program Definitions*.

Baseline Scenario and Additionality

- 3.4.2 Grouped projects shall have one or more clearly defined geographic areas within which project activity instances may be developed. Such geographic areas shall be defined using geodetic polygons as set out in Section 3.10 below.
- 3.4.3 Determination of baseline scenario and demonstration of additionality are based upon the initial project activity instances. The initial project activity instances are those that are included in the project description at validation and shall include all project activity instances currently implemented on the issue date of the project description. The initial project activity instances may also include any planned instances of the project activity that have been planned and developed

to a sufficient level of detail to enable their assessment at validation. Geographic areas with no initial project activity instances shall not be included in the project unless it can be demonstrated that such areas are subject to the same (or at least as conservative) baseline scenario and rationale for the demonstration of additionality as a geographic area that does include initial project activity instances.

- 3.4.4** As with non-grouped projects, grouped projects may incorporate multiple project activities (see Section 3.2 for more information on multiple project activities). Where a grouped project includes multiple project activities, the project description shall designate which project activities may occur in each geographic area.
- 3.4.5** The baseline scenario for a project activity shall be determined for each designated geographic area, in accordance with the methodology applied to the project. Where a single baseline scenario cannot be determined for a project activity over the entirety of a geographic area, the geographic area shall be redefined or divided such that a single baseline scenario can be determined for the revised geographic area or areas.
- 3.4.6** The additionality of the initial project activity instances shall be demonstrated for each designated geographic area, in accordance with the methodology applied to the project. Where the additionality of the initial project activity instances within a particular geographic area cannot be demonstrated for the entirety of that geographic area, the geographic area shall be redefined or divided such that the additionality of the instances occurring in the revised geographic area or areas can be demonstrated.
- 3.4.7** Where factors relevant to the determination of the baseline scenario or demonstration of additionality require assessment across a given area, the area shall be, at a minimum, the grouped project geographic area. Examples of such factors include, inter alia, common practice; laws, statutes, regulatory frameworks or policies relevant to demonstration of regulatory surplus; determination of regional grid emission factors; and historical deforestation and degradation rates.

Capacity Limits

- 3.4.8** Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows:
- 1) Each project activity instance that exceeds one percent of the capacity limit shall be identified.
 - 2) Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters.
 - 3) None of the clusters shall exceed the capacity limit and no further project activity instances

shall be added to the project that would cause any of the clusters to exceed the capacity limit.

Eligibility Criteria

3.4.9 Grouped projects shall include one or more sets of eligibility criteria for the inclusion of new project activity instances. At least one set of eligibility criteria for the inclusion of new project activity instances shall be provided for each combination of project activity and geographic area specified in the project description. A set of eligibility criteria shall ensure that new project activity instances:

- 1) Meet the applicability conditions set out in the methodology applied to the project.
- 2) Use the technologies or measures specified in the project description.
- 3) Apply the technologies or measures in the same manner as specified in the project description.
- 4) Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.
- 5) Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area. For example, the new project activity instances have financial, technical and/or other parameters (such as the size/scale of the instances) consistent with the initial instances, or face the same investment, technological and/or other barriers as the initial instances.

Note – Where grouped projects include multiple baseline scenarios or demonstrations of additionality, such projects will require at least one set of eligibility criteria for each combination of baseline scenario and demonstration of additionality specified in the project description.

Inclusion of New Project Activity Instances

3.4.10 Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project. New project activity instances shall:

- 1) Occur within one of the designated geographic areas specified in the project description.
- 2) Comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.
- 3) Be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.
- 4) Be validated at the time of verification against the applicable set of eligibility criteria.
- 5) Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions).
- 6) Have a start date that is the same as or later than the grouped project start date.

- 7) Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only). Note that where a new project activity instance starts in a previous verification period, no credit may be claimed for GHG emission reductions or removals generated during a previous verification period (as set out in Section 3.16.7) and new instances are eligible for crediting from the start of the next verification period.

Where inclusion of a new project activity instance necessitates the addition of a new project proponent to the project, such instances shall be included in the grouped project within two years of the project activity instance start date or, where the project activity is an AFOLU activity, within five years of the project activity instance start date. The procedure for adding new project proponents is set out in VCS document *Registration and Issuance Process*.

Project Description for Grouped Projects

3.4.11 A grouped project shall be described in a single project description, which shall contain the following (in addition to the content required for non-grouped projects):

- 1) A delineation of the geographic area(s) within which all project activity instances shall occur. Such area(s) shall be defined by geodetic polygons as set out in Section 3.10 below.
- 2) One or more determinations of the baseline for the project activity in accordance with the requirements of the methodology applied to the project.
- 3) One or more demonstrations of additionality for the project activity in accordance with the requirements of the methodology applied to the project.
- 4) One or more sets of eligibility criteria for the inclusion of new project activity instances at subsequent verification events.
- 5) A description of the central GHG information system and controls associated with the project and its monitoring.

Note – Where the project includes more than one project activity, the above requirements shall be addressed separately for each project activity, except for the delineation of geographic areas and the description of the central GHG information system and controls, which shall be addressed for the project as a whole.

3.5 METHODOLOGY DEVIATIONS

3.5.1 Deviations from the applied methodology are permitted where they represent a deviation from the criteria and procedures relating to monitoring or measurement set out in the methodology (i.e., deviations are permitted where they relate to data and parameters available at validation, data and parameters monitored, or the monitoring plan). Methodology deviations shall not negatively impact the conservativeness of the quantification of GHG emission reductions or removals, except where they result in increased accuracy of such quantification. Deviations relating to any other part of the methodology shall not be permitted.

- 3.5.2** Methodology deviations shall be permitted at validation or verification and their consequences shall be reported in the validation or verification report, as applicable, and all subsequent verification reports. Methodology deviations are not considered to be precedent setting.

3.6 PROJECT DESCRIPTION DEVIATIONS

- 3.6.1** Deviations from the project description are permitted at verification. The procedures for documenting the deviation depend on whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Interpretation of whether the deviation impacts any of these shall be determined consistent with the CDM *Guidelines on assessment of different types of changes from the project activity as described in the registered PDD*, mutatis mutandis. The procedures are as follows:

- 1) Where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario, the deviation shall be described and justified in a revised version of the project description. This shall include a description of when the changes occurred, the reasons for the changes and how the changes impact the applicability of the methodology, additionality and/or the appropriateness of the baseline scenario. An example of such a deviation is a change in project capacity where a different baseline scenario would be more plausible, the applied methodology would no longer be applicable, or there would be a significant impact on the investment analysis used by the project to demonstrate additionality. Other examples include changes to the project that might have similar impacts such as the addition of new carbon pools or new types of project activities.
- 2) Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report. This shall include a description of when the changes occurred and the reasons for the changes. The deviation shall also be described in all subsequent monitoring reports. Examples of such deviations include changes in the procedures for measurement and monitoring, or project design changes that do not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

Note that project proponents may apply project description deviations for the purpose of switching to the latest version of the methodology, or switching to a different methodology. For example, a project proponent may want to switch to the latest version of a methodology where such version includes additional types of carbon pools or project activities.

- 3.6.2** The deviation shall be assessed by a validation/verification body and the process, findings and conclusions shall be reported in the verification report. The assessment shall determine whether the deviation is appropriately described and justified, and whether the project remains in compliance with the VCS rules. The deviation shall also be reported on in all subsequent verification reports. Project description deviations are not considered to be precedent setting.

- 3.6.3** The validation/verification body assessing the project description deviation shall be accredited for the validation, recognizing that assessment of project description deviations is a validation activity, as further set out in the *VCS Program Guide*.

3.7 PROJECT START DATE

- 3.7.1** The project start date is the date on which the project began generating GHG emission reductions or removals (see VCS document *AFOLU Requirements* for further specification for AFOLU projects). The rules and requirements on project start date, as well as validation and verification dates, are set out in the sections below. For projects registered under an approved GHG program which are seeking registration with the VCS Program, further specification with respect to the validation deadline is set out in Sections 3.11.10 and 3.11.11.

Note – The rules and requirements in relation to project start date (as well as validation and verification dates) under VCS Version 1 are different from *VCS 2007, 2007.1* and *VCS Version 3*, and are provided in VCS document *Registration and Issuance Process*.

Non-AFOLU

- 3.7.2** Non-AFOLU projects shall complete validation within two years of the project start date. Additional time is granted for non-AFOLU projects to complete validation where they are applying a new VCS methodology. Specifically, projects using a new VCS methodology and completing validation within two years of the approval of the methodology by the VCSA may complete validation within four years of the project start date. Note that *new VCS methodology* in this context refers to both newly issued VCS methodologies and newly issued VCS revisions to approved GHG program methodologies. The grace period does not apply in relation to any subsequent versions of such new methodologies and new methodology revisions that may be issued.

AFOLU

- 3.7.3** AFOLU projects with a project start date on or after 8 March 2008 shall complete validation within five years of the project start date.
- 3.7.4** AFOLU projects with a project start date on or after 1 January 2002 and before 8 March 2008 shall complete validation before 8 March 2013.
- 3.7.5** For AFOLU projects with a project start date before 1 January 2002, the following applies:
- 1) Validation and verification shall be completed by 1 October 2011. However, additional time is granted for AFOLU projects with a project start date before 1 January 2002 to complete validation and verification where they are applying a new VCS methodology. Specifically, projects using a new VCS methodology shall complete validation and verification within one year of the approval of the methodology, and no later than 1 October 2012. *New VCS methodology* in this context has the same meaning as set out in Section 3.7.2.

- 2) It shall be demonstrated that the project was designed and implemented as a GHG project from its inception. Evidence may include minutes and/or notes related to Board decisions to undertake the project as a GHG project, or other evidence of real actions to undertake the project as a GHG project such as relevant contracts with consultants, documentation related to the sale of GHG credits or contracts with validation/verification bodies.
- 3) It shall be demonstrated that the project, prior to 1 January 2002, applied an externally reviewed methodology and engaged independent carbon expert(s) to assess and quantify the project's baseline scenario and net GHG emissions reductions or removals.

Standardized Methods

- 3.7.6** Notwithstanding the requirements set out in Sections 3.7.1 – 3.7.5 above, projects applying a standardized method for determining additionality shall initiate the project pipeline listing process set out in VCS document *Registration and Issuance Process* within the project validation timelines set out above. Validation may be completed any time thereafter. For example, a non-AFOLU project applying a standardized method for determining additionality shall initiate the project pipeline listing process within two years of the project start date, and may complete validation any time thereafter.

3.8 PROJECT CREDITING PERIOD

- 3.8.1** For non-AFOLU projects and ALM projects focusing exclusively on reducing N₂O, CH₄ and/or fossil-derived CO₂ emissions, the project crediting period shall be a maximum of ten years which may be renewed at most twice. For all other AFOLU projects other than such ALM projects, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times with a total project crediting period not to exceed 100 years. Where projects fail to renew the project crediting period, the project crediting period shall end and the project shall be ineligible for further crediting.
- 3.8.2** The earliest project crediting period start date for AFOLU projects shall be 1 January 2002.
- 3.8.3** Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project crediting period under those programs. For example, a CDM project with a seven year twice renewable project crediting period is not eligible for VCU issuance beyond the end of those 21 years. Where projects have been registered under more than one other GHG program, they are not eligible for VCU issuance after the date that is the earliest end date of all applicable project crediting periods.

Note – Since the total project crediting period under the Joint Implementation (JI) program is not defined *ex-ante*, the total project crediting period shall be deemed as 21 years for non-AFOLU JI projects and as 60 years for AFOLU JI projects¹.

¹ Consistent with the UNFCCC's other project-based mechanism, CDM.

3.8.4 Project crediting periods under the VCS Program shall be renewed as set out in Section 3.8.5.

Renewal of Project Crediting Period

3.8.5 The following shall apply with respect to the renewal of the project crediting period under the VCS Program:

- 1) A full reassessment of additionality is not required when renewing the project crediting period. However, regulatory surplus shall be demonstrated in accordance with Section 4.6.3 and the project description shall be updated accordingly.
- 2) The validity of the original baseline scenario shall be demonstrated, or where invalid a new baseline scenario shall be determined, when renewing the project crediting period, as follows:
 - a) The validity of the original baseline scenario shall be assessed. Such assessment shall include an evaluation of the impact of new relevant national and/or sectoral policies and circumstances on the validity of the baseline scenario.
 - b) Where it is determined that the original baseline scenario is still valid, the GHG emissions associated with the original baseline scenario shall be reassessed using the latest version of the *CDM Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period*.
 - c) Where it is determined that the original baseline scenario is no longer valid, the current baseline scenario shall be established in accordance with the VCS rules.
 - d) The project description, containing updated information with respect to the baseline, the estimated GHG emission reductions or removals and the monitoring plan, shall be submitted for validation. Such updates shall be based upon the latest approved version of the methodology or its replacement. Where the project does not meet the requirements of the latest approved version of the methodology or its replacement, the project proponent shall select another applicable approved methodology (which may be a new methodology or methodology revision it has had approved via the methodology approval process), or shall apply a methodology deviation (where a methodology deviation is appropriate). Failing this, the project shall not be eligible for renewal of its project crediting period.
- 3) The updated project description shall be validated in accordance with the VCS rules. In addition, the project shall be validated against the (current) scope of the VCS. Such validation report shall be issued after the end of the (previous) project crediting period but within two years after the end of the (previous) project crediting period.

Additional time is granted for projects to complete such validation where they are switching to a new VCS methodology (*new VCS methodology* in this context has the same meaning as set out in Section 3.7.2) when renewing the project crediting period. Specifically, projects switching to a new VCS methodology and completing such validation within one year of the approval of the methodology by the VCSA may complete such validation within three years of the end of the (previous) project crediting period.

Note – The project crediting period under *VCS Version 1* shall be deemed as 10 years, and

commences at the specific project crediting period start date. Note also, *VCS Version 1* allowed an earlier project start date than subsequent versions and such projects remain eligible for project crediting period renewal under *VCS Version 3*.

3.9 PROJECT SCALE

3.9.1 Projects are categorized by size according to their estimated average annual GHG emission reductions or removals, as set out below, and materiality requirements for validation and verification differ accordingly, as set out in Section 5.3.1:

- 1) Projects: Less than or equal to 300,000 tonnes of CO₂e per year.
- 2) Large projects: Greater than 300,000 tonnes of CO₂e per year.

3.9.2 Where applying a methodology with scale and/or capacity limits, it shall be demonstrated that the project is not a fragmented part of a larger project or activity that would otherwise exceed such limits. The project shall be considered a fragmented part of a larger project if within one kilometer of the project boundary there exists another project where:

- 1) The project proponents for both projects are the same.
- 2) The sectoral scope and project activity for both projects are the same.
- 3) The other project has been registered under the VCS or another GHG program within the previous two years.

3.10 PROJECT LOCATION

3.10.1 Project location shall be specified in the project description as follows:

- 1) Project location for non-AFOLU projects shall be specified by a single geodetic coordinate. Where there are multiple project activity instances (see Section 3.3 for more information on multiple project activities), the following applies:
 - a) Where it is reasonable to do so, a geodetic coordinate shall be provided for each instance and provided in a KML file; or
 - b) Where there are a large number project activity instances (e.g., cookstoves or energy efficient light bulbs), at least one geodetic coordinate shall be provided, together with sufficient additional geographic information (with respect to the location of the instances) to enable sampling by the validation/verification body.
- 2) Project location for grouped projects shall be specified using geodetic polygons to delineate the project's geographic area or areas (see Section 3.4.2 for further information on geographic areas for grouped projects) and provided in a KML file.
- 3) Project location for AFOLU projects shall be specified using geodetic polygons to delineate the geographic area of each AFOLU project activity and provided in a KML file.

3.11 OWNERSHIP AND OTHER PROGRAMS

Project and Program Ownership

3.11.1 The project description shall be accompanied by one or more of the following types of evidence establishing project ownership accorded to the project proponent(s), or program ownership accorded to the jurisdictional proponent(s), as the case may be (see VCS document *Program Definitions* for definitions of project ownership and program ownership). To aid the readability of this section, the term project ownership is used below, but should be substituted by the term program ownership, as appropriate:

- 1) Project ownership arising or granted under statute, regulation or decree by a competent authority.
- 2) Project ownership arising under law.
- 3) Project ownership arising by virtue of a statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals (where the project proponent has not been divested of such project ownership).
- 4) Project ownership arising by virtue of a statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions and/or removals (where the project proponent has not been divested of such project ownership).
- 5) An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals which vests project ownership in the project proponent.
- 6) An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals which vests project ownership in the project proponent.
- 7) Project ownership arising from the implementation² or enforcement of laws, statutes or regulatory frameworks that require activities be undertaken or incentivize activities that generate GHG emission reductions or removals.

Emission Trading Programs and Other Binding Limits

3.11.2 Where projects reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading, evidence shall be provided that the GHG emission reductions or removals generated by the project have not and

² Implemented in the context of this paragraph means enacted or introduced, consistent with use of the term under the CDM rules on so-called Type E+ and Type E- policies.

will not be otherwise counted or used under the program or mechanism. Such evidence may include:

- 1) A letter from the program operator, designated national authority or other relevant regulatory authority that emissions allowances (or other GHG credits used in the program) equivalent to the reductions or removals generated by the project have been cancelled from the program or national cap, as applicable.
- 2) Evidence of the purchase and cancellation of GHG allowances equivalent to the GHG emissions reductions or removals generated by the project related to the program or national cap.
- 3) Evidence from the program operator, designated national authority or other relevant regulatory authority stating that the specific GHG emission reductions or removals generated by the project or type of project are not within the scope of the program or national cap.

Other Forms of Environmental Credit

3.11.3 Projects may generate other forms of GHG-related environmental credits, such as renewable energy certificates (RECs), though GHG emission reductions and removals presented for VCU issuance shall not also be recognized as another form of GHG-related environmental credit. The requirements set out in Sections 3.11.4 and 3.11.5 below assist the VCS registry administrator in confirming that this requirement has been met at the point of the issuance request (i.e., the registry administrator uses the information disclosed in the project documents to perform its checks).

Therefore, project proponents interested in issuing (sequentially) both VCUs and another GHG-related environmental credit should consider which periods of time they wish to issue one credit or the other. Project proponents should also investigate whether such other GHG-related environmental credits can be cancelled from the relevant program, in case such credits have already been issued for periods where the project proponent wishes to issue VCUs. Note that additional requirements regarding evidence that no double issuance has occurred are set out in VCS document *Registration and Issuance Process*.

3.11.4 Where projects have sought or received another form of GHG-related environmental credit, the following information shall be provided to the validation/verification body:

- 1) Name and contact information of the relevant environmental credit program.
- 2) Details of the project as registered under the environmental credit program (e.g., project title and identification number as listed under the program).
- 3) Monitoring periods for which GHG-related environmental credits were sought or received under the environmental credit program.
- 4) Details of all GHG-related environmental credits sought or received under the environmental credit program (e.g., volumes and serial numbers).

3.11.5 Where projects are eligible to participate under one or more programs to create another form of GHG-related environmental credit, but are not currently doing so, a list of such programs shall be provided to the validation/verification body.

Note - The requirements set out in Section 3.11.4 above and this Section 3.11.5 do not apply to non-GHG related environmental credits, such as water or biodiversity credits.

Participation Under Other GHG Programs

3.11.6 Projects may be registered under both the VCS Program and either an approved GHG program or a GHG program that is not an approved GHG program. The rules and requirements set out in the sections below apply.

General Requirements

3.11.7 Project proponents shall not claim credit for the same GHG emission reduction or removal under the VCS Program and another GHG program. Projects issuing GHG credits under both the VCS Program and another GHG program shall also comply with the rules and requirements set out in VCS document *Registration and Issuance Process*.

3.11.8 Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project crediting period under those programs (see Section 3.8.3 for further information).

3.11.9 For projects registered under the CDM as a Program of Activities (PoA), each Component Project Activity (CPA) shall be registered with the VCS Program as a separate project accompanied by its associated Program of Activities Design Document. Each such project shall be validated in accordance with Section 3.11.10(1) below. The project start date for such projects is the date on which the first activity under the Program of Activities began reducing or removing GHG emissions. Where the project start date is before 8 March 2011, validation shall be completed within four years of the project start date; otherwise, validation shall be completed within two years of the project start date (in this case, validation refers to validation of the first CPA under the associated PoA).

Approved GHG Programs

3.11.10 The following applies with respect to projects registered under an approved GHG program which are seeking registration with the VCS Program:

- 1) For projects registered under the CDM, the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4, 1.13 and 2.6 of the *VCS Project Description Template* shall be completed. A validation/verification body shall undertake a validation of same, which shall be accompanied by a validation representation, to provide a gap validation for the project's compliance with the VCS rules.
- 2) For projects registered under the JI program, a new *VCS Project Description Template* shall

- be completed (applying a methodology eligible under the VCS Program). A validation/verification body shall undertake a full validation of same in accordance with the VCS rules. The validation report shall be accompanied by a validation representation.
- 3) For projects registered under the Climate Action Reserve, the cover page and sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4, 1.13, 2.6, 5.1, 5.2, 5.3 and 5.4 of the *VCS Project Description Template* shall be completed. A validation/verification body shall undertake a validation of same, which shall be accompanied by a validation representation, to provide a gap validation for the project's compliance with VCS rules.
 - 4) The approved GHG program validation (or verification, where the approved GHG program does not have a validation step) or VCS validation shall be completed within the relevant validation deadline as set out in Section 3.7. Validation (or verification) is deemed to have been completed when the validation (or verification) report that is submitted to the relevant program to request registration has been issued.
 - 5) AFOLU projects shall comply with the additional requirements set out in VCS document *AFOLU Requirements*.

Other GHG Programs

3.11.11 Non-AFOLU projects registered under a GHG program that is not an approved GHG program may also register with the VCS Program where a validation or verification report has been issued under such program (by an entity approved under the program to issue such reports). For such projects, the following applies:

- 1) The project start date shall be on or after 19 November 2007.
- 2) A new *VCS Project Description Template* shall be completed (using a methodology eligible under the VCS Program) and a validation/verification body shall undertake a full validation of same in accordance with the VCS rules. The validation report shall be accompanied by a validation representation.

The validation or verification that is submitted to request registration under the other GHG program shall be completed within the relevant validation deadline set out in Section 3.7. Validation or verification is deemed to have been completed when the validation or verification report that is submitted to the other GHG program to request registration has been issued.

Projects Rejected by Other GHG Programs

3.11.12 Projects rejected by other GHG programs due to procedural or eligibility requirements can be considered under the VCS Program, but the following conditions shall be met:

- 1) The project description (where the other GHG program has rejected the project before VCS validation) or monitoring report (where the other GHG program has rejected the project after VCS validation) shall clearly state all GHG programs to which the project has applied for registration and the reason(s) for rejection. Such information shall not be deemed as

commercially sensitive information.

- 2) The validation/verification body shall be provided with the rejection document(s), including any additional explanations.
- 3) The project shall be validated against the VCS rules. For projects where the other GHG program has rejected the project after VCS validation, this means a complete revalidation of the project against the VCS rules.

3.12 PROJECT BOUNDARY

- 3.12.1** The project boundary shall be described (using diagrams, as required) and GHG sources, sinks and reservoirs shall be identified and assessed in accordance with the methodology applied to the project. The project shall justify not selecting any relevant GHG source, sink and reservoirs.

3.13 BASELINE SCENARIO

- 3.13.1** The baseline scenario for the project shall be determined in accordance with the requirements set out in the methodology applied to the project, and the choice of baseline scenario shall be justified.
- 3.13.2** Equivalence in type and level of activity of products or services provided by the project and the baseline scenario shall be demonstrated and, where appropriate, any significant differences between the project and the baseline scenario shall be explained.
- 3.13.3** In developing the baseline scenario, assumptions, values and procedures shall be selected that help ensure that net GHG emission reductions and removals are not overestimated.

3.14 ADDITIONALITY

- 3.14.1** Additionality shall be demonstrated and assessed in accordance with the requirements set out in the methodology applied to the project, noting the following exceptions:
- 1) Where a VCS module using an activity method (see Section 4.1.11 for further information on activity methods) is applicable to the project, additionality may be demonstrated using the module in substitution of the additionality requirements set out in the methodology. For example, if a module uses an activity method (i.e., positive list) to deem a project activity additional, the project proponent does not have to follow the additionality requirements in the methodology applied to the project and may instead demonstrate additionality by demonstrating that it meets the applicability conditions and any other criteria of the activity method. Note that only modules may be used in this way. Where a methodology contains an activity method for additionality, the additionality procedures may not be applied in conjunction with a different methodology.
 - 2) Where the applied methodology was developed under an approved GHG program and uses an activity method or other simplified procedure for demonstrating additionality, the project proponent shall demonstrate to the validation/verification body that the simplified procedure is

appropriate to apply to the project considering the project characteristics, including the context in which the project activity takes place. For example, where a project is developed in the United States and applies a CDM methodology which uses a simplified procedure for demonstrating additionality, the project proponent shall demonstrate to the validation/verification body that the simplified procedure is appropriate to apply given that the simplified procedure was originally developed for application in a developing country context. Failing this demonstration, the project proponent shall not use the simplified procedure for demonstrating additionality, and shall instead use an appropriate additionality assessment method in substitution.

3.15 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

- 3.15.1** GHG emissions and/or removals shall be estimated for each GHG source, sink and/or reservoir relevant for the project (including leakage) and the baseline scenario.
- 3.15.2** The net GHG emission reductions and removals generated by the project shall be quantified.
- 3.15.3** Metric tonnes shall be used as the unit of measure and the quantity of each type of GHG shall be converted to tonnes of CO₂e. The six Kyoto Protocol greenhouse gases and ozone-depleting substances shall be converted using 100 year global warming potentials derived from the IPCC's *Fourth Assessment Report*.

3.16 MONITORING

Data and Parameters

- 3.16.1** Data and parameters used for the quantification of GHG emission reductions and/or removals shall be provided in accordance with the methodology.
- 3.16.2** Quality management procedures to manage data and information shall be applied and established. Where applicable, procedures to account for uncertainty in data and parameters shall be applied in accordance with the requirements set out in the methodology.

Monitoring Plan

- 3.16.3** The project proponent shall establish a GHG information system for obtaining, recording, compiling and analyzing data and information important for quantifying and reporting GHG emissions and/or removals relevant for the project (including leakage) and baseline scenario.
- 3.16.4** A monitoring plan for the project that includes roles and responsibilities shall be established.
- 3.16.5** Where measurement and monitoring equipment is used, the project proponent shall ensure the equipment is calibrated according to the equipment's specifications and/or relevant national or international standards.

Monitoring Report

- 3.16.6** The monitoring report describes all the data and information related to the monitoring of GHG emission reductions or removals. The project proponent shall use the *VCS Monitoring Report Template*, *VCS Joint Project Description & Monitoring Report Template*, *VCS & CCB Monitoring Report Template* or *VCS+SOCIALCARBON Monitoring Report Template*, as appropriate, and adhere to all instructional text within the template.
- 3.16.7** The verification period of the monitoring report shall be a distinct time period that does not overlap with previous verification periods. Projects shall not be eligible for crediting of GHG emission reductions generated in previous verification periods. In addition, verification periods shall be contiguous with no time gaps between verification periods.
- 3.16.8** Where a monitoring report and associated verification report divide a verification period into vintages, separate VCU issuance records in accordance with vintage periods may be issued, as set out in VCS document *Registration and Issuance Process*.

3.17 SAFEGUARDS

No Net Harm

- 3.17.1** The project proponent shall identify potential negative environmental and socio-economic impacts, and shall take steps to mitigate them. Additional certification standards may be applied to demonstrate social and environmental benefits beyond GHG emission reductions or removals.

Note that VCUs may be labelled with additional standards and certifications on the VCS project database where both the VCS and another standard are applied. The VCS website provides the list of standards that are accepted as VCU labels and the procedure for attaining such VCU labels.

Local Stakeholder Consultation

- 3.17.2** The project proponent shall conduct a local stakeholder consultation prior to validation as a way to inform the design of the project and maximize participation from stakeholders. Such consultations allow stakeholders to evaluate impacts, raise concerns about potential negative impacts and provide input on the project design.
- 3.17.3** The project proponent shall establish mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation.
- 3.17.4** The project proponent shall take due account of all and any input received during the local stakeholder consultation and through ongoing communications, which means it will need to either update the project design or justify why updates are not appropriate. The project proponent shall

demonstrate to the validation/verification body what action it has taken in respect of the local stakeholder consultation as part of validation, and in respect of ongoing communications as part of each subsequent verification.

Public Comment Period

- 3.17.5** All VCS projects are subject to a 30-day public comment period. The date on which the project is listed on the project pipeline marks the beginning of the project's 30-day public comment period (see VCS document *Registration and Issuance Process* for more information on the VCS project pipeline).
- 3.17.6** Projects shall remain on the project pipeline for the entirety of their 30-day public comment period.
- 3.17.7** Any comments shall be submitted to the VCSA at secretariat@v-c-s.org and respondents shall provide their name, organization, country and email address. At the end of the public comment period, the VCSA provides all and any comments received to the project proponent.
- 3.17.8** The project proponent shall take due account of any and all comments received during the consultation, which means it will need to either update the project design or demonstrate the insignificance or irrelevance of the comment. It shall demonstrate to the validation/verification body what action it has taken.

3.18 RECORDS AND INFORMATION

Records Relating to the Project

- 3.18.1** The project proponent shall ensure that all documents and records are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

Information for the Validation/Verification Body

- 3.18.2** For validation, the project proponent shall make available to the validation/verification body the project description, evidence of project ownership and any requested supporting information and data needed to support statements and data in the project description and evidence of project ownership.
- 3.18.3** For verification, the project proponent shall make available to the validation/verification body the project description, validation report, monitoring report applicable to the monitoring period and any requested supporting information and data needed to evidence statements and data in the monitoring report.

3.19 PROJECT DESCRIPTION

- 3.19.1** The project description describes the project's GHG emission reduction or removal activities. The project proponent shall use the *VCS Project Description Template*, *VCS Joint Project Description & Monitoring Report Template*, *VCS & CCB Project Description Template*, *VCS+SOCIALCARBON Project Description Template* or approved GHG program project description template where the project is registered under an approved GHG program, as appropriate, and adhere to all instructional text within the template.
- 3.19.2** All information in the project documents shall be presumed to be available for public review, though commercially sensitive information may be protected, as set out in VCS document *Registration and Issuance Process*, where it can be demonstrated that such information is commercially sensitive. The validation/verification body shall check that any information designated by the project proponent as commercially sensitive meets the VCS Program definition of commercially sensitive information. Information in the project documents related to the determination of the baseline scenario, demonstration of additionality, and estimation and monitoring of GHG emission reductions and removals shall not be considered to be commercially sensitive and shall be provided in the public versions of the project documents.

4 | Methodology Requirements

4.1 GENERAL REQUIREMENTS

General

- 4.1.1** The list of methodologies approved under the VCS Program, together with their respective validity periods, is available on the VCS website. All new methodologies applying for approval under the VCS Program shall use the *VCS Methodology Template*, comply with the requirements set out in this Section 4 and any other applicable requirements set out in the VCS rules, and be approved via the methodology approval process. AFOLU methodologies shall meet the rules and requirements set out in VCS document *AFOLU Requirements*. Ozone-depleting substances methodologies shall meet the rules and requirements set out in VCS document *ODS Requirements*.
- 4.1.2** Methodologies shall be informed by a comparative assessment of the project and its alternatives in order to identify the baseline scenario. Such an analysis shall include, at a minimum, a comparative assessment of the implementation barriers and net benefits faced by the project and its alternatives.
- 4.1.3** Methodologies may employ a modular approach in which a framework document provides the structure of the methodology and separate modules and/or tools are used to perform specific

methodological tasks. Such methodologies shall use the *VCS Methodology Template* for the framework document and the *VCS Module Template* for the modules and tools. The framework document shall clearly state how the modules and/or tools are to be used within the context of the methodology.

- 4.1.4** Methodology elements shall be guided by the principles set out in Section 2.4.1. They shall clearly state the assumptions, parameters and procedures that have significant uncertainty, and describe how such uncertainty shall be addressed. Where applicable, methodology elements shall provide a means to estimate a 90 or 95 percent confidence interval. Where a methodology applies a 90 percent confidence interval and the width of the confidence interval exceeds 20 percent of the estimated value or where a methodology applies a 95 percent confidence interval and the width of the confidence interval exceeds 30 percent of the estimated value, an appropriate confidence deduction shall be applied. Methods used for estimating uncertainty shall be based on recognized statistical approaches such as those described in the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Confidence deductions shall be applied using conservative factors such as those specified in the CDM Meth Panel guidance on addressing uncertainty in its Thirty Second Meeting Report, Annex 14.
- 4.1.5** New methodologies shall not be developed where an existing methodology could reasonably be revised (i.e., developed as a methodology revision) to meet the objective of the proposed methodology, as set out in VCS document *Methodology Approval Process*.
- 4.1.6** Where methodologies mandate the use of specific models to simulate processes that generate GHG emissions (i.e., the project proponent is not permitted to use other models), the following applies, given the note below:
- 1) Models shall be publicly available, though not necessarily free of charge, from a reputable and recognized source (e.g., the model developer's website, IPCC or government agency).
 - 2) Model parameters shall be determined based upon studies by appropriately qualified experts that identify the parameters as important drivers of the model output variable(s).
 - 3) Models shall have been appropriately reviewed and tested (e.g., ground-truthed using empirical data or results compared against results of similar models) by a recognized, competent organization, or an appropriate peer review group.
 - 4) All plausible sources of model uncertainty, such as structural uncertainty or parameter uncertainty, shall be assessed using recognized statistical approaches such as those described in *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1, Chapter 3*.
 - 5) Models shall have comprehensive and appropriate requirements for estimating uncertainty in keeping with IPCC or other appropriate guidance, and the model shall be calibrated by parameters such as geographic location and local climate data.

- 6) Models shall apply conservative factors to discount for model uncertainty (in accordance with the requirements set out in Section 4.1.4), and shall use conservative assumptions and parameters that are likely to underestimate, rather than overestimate, the GHG emission reductions or removals.

Note – The criteria set out in (2)-(6) above are targeted at more complex models. For simple models, certain of these criteria may not be appropriate, or necessary to the integrity of the methodology. Such criteria may be disregarded, though the onus is upon the methodology developer to demonstrate that they are not appropriate or necessary.

- 4.1.7** Where methodologies use default factors and standards to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, the following applies:

- 1) Where the methodology uses third party default factors and/or standards, such default factors and standards shall meet with the requirements for data set out in Section 4.5.6, *mutatis mutandis*.
- 2) Where the methodology itself establishes a default factor, the following applies:
 - a) The data used to establish the default factor shall comply with the requirements for data set out in Section 4.5.6, *mutatis mutandis*.
 - b) The methodology shall describe in detail the study or other method used to establish the default factor.
 - c) The methodology developer shall identify default factors which may become out of date (i.e., those default factors that do not represent physical constants or otherwise would not be expected to change significantly over time). Such default factors are subject to periodic re-assessment, as set out in VCS document *Methodology Approval Process*.
- 3) Where methodologies allow project proponents to establish a project-specific factor, the methodology shall provide a procedure for establishing such factors.

Note – Methodologies may use deemed savings factors which, as set out in the definition of deemed savings factor, are a specific type of default factor.

- 4.1.8** Where proxies are used, it shall be demonstrated that they are strongly correlated with the value of interest and that they can serve as an equivalent or better method (e.g., in terms of reliability, consistency or practicality) to determine the value of interest than direct measurement of the value itself.

- 4.1.9** Methodologies shall use a standardized method (i.e., performance method or activity method) or a project method to determine additionality and/or the crediting baseline, and shall state which type of method is used for each. A project method is a methodological approach that uses a project-specific approach for the determination of additionality and/or crediting baseline. Standardized methods are further described in Section 4.1.11 and additional guidance is available in VCS document *Guidance for Standardized Methods*. This guidance document

provides additional information to aid the interpretation of the VCS rules on standardized methods and should be read before developing or assessing such methods. Although the guidance document does not form part of the VCS rules, interpretation of the rules shall be consistent with the guidance document.

- 4.1.10** Methodologies may use any combination of project, performance or activity methods for determining additionality and the crediting baseline. However, methodologies shall provide only one method (i.e., a project method or performance method) for determining the crediting baseline (i.e., methodologies shall not provide the option of using either a project method or a performance method for the crediting baseline).

Standardized Methods

- 4.1.11** Standardized methods are methodological approaches that standardize the determination of additionality and/or the crediting baseline for a given class of project activity, with the objective of streamlining the development and assessment process for individual projects. Additionality and/or the crediting baseline are determined for the class of project activity, and qualifying conditions and criteria are set out in the methodology. Individual projects need only meet the conditions and apply the pre-defined criteria set out in the standardized method, obviating the need for each project to determine additionality and/or the crediting baseline via project-specific approaches and analyses.

The VCS defines two types of standardized methods:

- 1) Performance methods: These methods establish performance benchmark metrics for determining additionality and/or the crediting baseline. Projects that meet or exceed a pre-determined level of the metric may be deemed as additional and a pre-determined level of the metric may serve as the crediting baseline.
- 2) Activity methods: These methods pre-determine additionality for given classes of project activities using a positive list. Projects that implement activities on the positive list are automatically deemed as additional and do not otherwise need to demonstrate additionality. One of three options (namely, activity penetration, financial viability or revenue streams) is used to qualify the project activity for the positive list, as set out in Section 4.6.9.

Note – There is some overlap between performance and activity methods with respect to concepts, objectives and outcomes, and methodologies may use any combination of methods (performance, activity, and project) for determining additionality and the crediting baseline as set out in Section 4.1.10. However, both performance and activity methods are sufficiently distinct, and this document sets out the rules and requirements for each method separately.

- 4.1.12** Methodologies shall include sufficient information and evidence to allow the reader to reach the same assessment conclusion on the appropriateness and rigor of the standardized method reached by the two validation/verification bodies in the methodology approval process, noting that the confidentiality of proprietary data may be protected as set out in Section 4.5.6(5). To aid the

readability and clarity of methodologies, such information and evidence may be included in appendices to methodology documents rather than in the body of the documents themselves. Following their initial approval, methodologies are subject to periodic re-assessment, as set out in VCS document *Methodology Approval Process*.

Performance Methods

- 4.1.13** All new performance methods shall be prepared using the *VCS Methodology Template*. A performance method is an integral part of a methodology and therefore it cannot be developed and approved as a separate module that is then applied by projects in conjunction with other methodologies.
- 4.1.14** The methodology may use a performance method for determining additionality only, for determining additionality and the crediting baseline, or for determining the crediting baseline only. The level of the performance benchmark metric for determining additionality and for the crediting baseline may be the same, or each may be different. Where they are different, the level for determining additionality shall be more stringent than the level of the crediting baseline.
- 4.1.15** Where the methodology uses a performance method for determining both additionality and the crediting baseline, the methodology shall list all methodologies that use a project method for determining the crediting baseline that are applicable to similar project activities and are approved under the VCS Program or an approved GHG program. The purpose of this requirement is to facilitate the transition to standardized methods, as further set out in Section 3.1.6.
- 4.1.16** The performance benchmark metric shall be specified in terms of tonnes of CO₂e per unit of output (i.e., GHG emissions per unit of product or service), tonnes of CO₂e per unit of input (e.g., GHG emissions per unit of input per unit of land area) or as a sequestration metric (e.g., carbon stock per unit of land area), as appropriate to the project activity applicable under the methodology. This may represent tonnes of CO₂e reduced or tonnes of CO₂e sequestered. An input metric shall only be used where an output metric is not practicable (e.g., the corresponding output metric is subject to influences outside the control of the project proponent) and leakage shall be addressed. The unit shall be unambiguously defined to allow a consistent comparison of project performance with the performance benchmark. The *GHG Protocol for Project Accounting*, Chapter 7 (WRI-WBCSD) provides some examples of products and services that may serve as candidates for performance benchmark metrics. Note that proxies for the performance benchmark metric may be used for determining additionality, as set out in Section 4.6.7.
- 4.1.17** It is recognized that an overly stringent level for the performance benchmark metric used for additionality may exclude additional projects (false negatives) while an overly lenient level may allow in non-additional projects (false positives). Similarly, an overly stringent level of the performance benchmark metric used for the crediting baseline may result in too little incentive for project proponents while an overly lenient level may allow the crediting of non-additional GHG emission reductions and removals. In order to address these considerations, the following shall apply with respect to setting the level(s) of the performance benchmark metric:

- 1) The methodology shall provide a description and analysis of the current distribution of performance within the sector as such performance relates to the applicability of the methodology or each performance benchmark (see Section 4.3.5 for further information on applicability of methodologies and performance benchmarks). The methodology shall also provide an overview of the technologies and/or measures available for improving performance within the sector, though an exhaustive list is not required recognizing that performance methods may be somewhat agnostic with respect to the technologies and/or measures implemented by projects.
- 2) The methodology shall discuss and evaluate the tradeoff between false negatives and false positives and shall describe objectively and transparently the evidence used (including reference to primary and secondary data sources), experts consulted, assumptions made, and analysis (including numerical analysis) and process undertaken in determining the selected level(s) of the performance benchmark metric (noting that expert consultation is a key part of this process, as set out below). The selected level(s) shall not systematically overestimate GHG emission reductions or removals.
- 3) The process of determining the level(s) of the performance benchmark metric shall include and be informed by an expert consultation process, undertaken by the methodology developer as follows:
 - a) The objective of the expert consultation shall be to engage and solicit input from technical experts on the appropriateness of the proposed level(s) of the performance benchmark metric to ensuring environmental integrity and provision of sufficient financial incentive to potential projects. Technical experts are persons who have specific knowledge or expertise relevant to the methodology and performance benchmark metric.
 - b) The methodology developer shall ensure that a representative group of experts participates in the consultation, including, but not limited to, representation from industry, environmental non-governmental organizations, and government or other regulatory bodies. Where a diverse range of views can be expected with regard to the appropriate level of the performance benchmark metric, experts representing the range of views shall participate in the consultation. Participation by experts shall be pro-actively sought and facilitated. Consultation that does not involve a representative group of experts shall be deemed insufficient.
 - c) Experts shall be provided, under appropriate confidentiality agreements (as necessary), with sufficient background and technical information about the methodology and its context to allow meaningful participation in the consultation. The consultation process shall use meetings, conference calls and other appropriate methods to allow all experts to provide comments and exchange views in an open, fair and transparent manner.
 - d) A report on the expert consultation process and outcome shall be prepared and submitted to the VCSA when the methodology is submitted under the methodology approval process. This may be included as an annex to the methodology, to be removed from any final approved version of the methodology. The report shall provide a summary of expert views, and shall demonstrate how the above requirements have been met and

how expert views were taken due account of (i.e., how expert views have affected the final level(s) of the performance benchmark metric in the draft methodology).

Note that expert consultation only needs to be undertaken by the methodology developer with respect to the level of the performance benchmark metric, since the methodology is also subject to public stakeholder consultation as part of the VCS methodology approval process.

4.1.18 Where there is heterogeneity of performance (measured in terms of the performance benchmark metric) that may be practicably achieved by individual projects, multiple benchmarks or correction factors may be required. Multiple benchmarks or correction factors shall be established under the following circumstances:

- 1) The project activity includes technologies and/or measures which may be implemented at both greenfield and brownfield sites and the performance (measured in terms of the performance benchmark metric) that may be practicably achieved at each is substantially different.
- 2) The methodology encompasses both larger and smaller scale project activities and the performance (measured in terms of the performance benchmark metric) that may be practicably achieved in each case is substantially different.
- 3) Any other circumstances related to the baseline scenario or project activity, such as plant age, raw material quality and climatic circumstances, that lead to heterogeneity of performance (measured in terms of the performance benchmark metric) that may be practicably achieved by individual projects.

Activity Methods

4.1.19 The activity method shall be prepared using the *VCS Module Template*, or, where a new methodology is being developed, may be written directly into the methodology (i.e., a positive list may be prepared and approved as a standalone additionality test that may be used in conjunction with applicable methodologies, or may be prepared as a direct part of a new methodology, in which case it may not be used in conjunction with other methodologies). To aid the readability of this document, it is assumed that the activity method is being written directly into the methodology, so readers should take references to *methodology* to mean *methodology or module*, as appropriate.

4.1.20 The activity method shall set out, using the specification of the project activity under the applicability conditions, a positive list of project activities that are deemed as additional under the activity method (see Section 4.3 for further information on providing specification of project activities). All such project activities are deemed as additional under the activity method.

4.2 METHODOLOGY REVISIONS

General

- 4.2.1** Methodology revisions are appropriate where a project activity is broadly similar to the project activities eligible under an existing methodology and such project activity can be included through reasonable changes to that methodology. Methodology revisions are also appropriate where an existing methodology can be materially improved. Materially improving a methodology involves comparing the existing and proposed methodologies so as to show that the changes will deliver material improvements that will result in greater accuracy of measurement of GHG emissions reductions or removals, improved conservatism and/or reduced transaction costs.
- 4.2.2** Methodology revisions shall be prepared using the *VCS Methodology Template* and shall be managed via the methodology approval process. They may be prepared and submitted to the methodology approval process by the developer of the original methodology or any other entity.
- 4.2.3** The VCS Program distinguishes between revisions to VCS methodologies and revisions to approved GHG program methodologies. The requirements for the development and assessment of each are set out in VCS document *Methodology Approval Process*.

Standardized Methods

- 4.2.4** Standardized methods approved under the VCS Program shall be periodically reviewed and may require revision, as set out in VCS document *Methodology Approval Process*.

Activity Methods

- 4.2.5** Where an activity method uses the activity penetration option and the level of activity penetration has risen (since initial approval) to exceed the five-percent threshold level, the activity method may not be revised to use the financial viability or revenue streams options.

4.3 APPLICABILITY CONDITIONS

General

- 4.3.1** The methodology shall use applicability conditions to specify the project activities to which it applies and shall establish criteria that describe the conditions under which the methodology can (and cannot, if appropriate) be applied. Any applicability conditions set out in tools or modules used by the methodology shall also apply.

Standardized Methods

- 4.3.2** Precise specification of the project activity is required to provide a carefully targeted standardized method with an appropriate level of aggregation with respect to the project activity. The

applicability conditions shall be specified accordingly and shall cause to be excluded from the methodology, to the extent practicable, those classes of project activities that it can be reasonably assumed will be implemented without the intervention created by the carbon market. For example, the methodology may exclude facilities larger than a specific size or capacity, constructed before a given date or that have regular access to lower cost fuels than most facilities. The methodology shall demonstrate how the applicability conditions achieve such objective with respect to free-riders.

Performance Methods

- 4.3.3** The applicability conditions shall limit the applicability of the methodology to project activities whose performance can be described in terms of the performance benchmark metric set out in the methodology.
- 4.3.4** Where the methodology uses a performance method for determining additionality, the applicability conditions shall ensure that the project implements technologies and/or measures that cause substantial performance improvement relative to the crediting baseline and what is achievable within the sector, and the methodology shall explicitly specify such technologies and/or measures (or examples thereof). Note that the implementation date of such technologies and/or measures is the project start date and the VCS rules with respect to project start date apply (i.e., implementation will need to have occurred within timeframes permitted under the VCS rules on project start date). Activities that have not implemented any such technologies and/or measures, or that have implemented them on a date that is earlier than that permitted under the VCS rules on project start date, shall be excluded from the methodology.
- 4.3.5** The applicability conditions shall establish the scope of validity of the methodology, and where multiple benchmarks are established, each performance benchmark, including the geographic scope. In establishing the scope of validity of the methodology or each performance benchmark, the methodology shall clearly demonstrate that there is similarity across the sub-areas of the geographic scope in factors such as socio-economic conditions, climatic conditions, energy prices, raw material availability and electricity grid emission factors, as such factors relate to the baseline scenario and additionality, noting that variation is permitted where correction factors address such variation as set out in Section 4.1.18.
- It may be necessary to stratify and establish multiple performance benchmarks, or to limit the applicability of the methodology, to comply with this requirement.
- 4.3.6** The applicability of the methodology or a performance benchmark shall be limited to the geographic area for which data are available, or it shall be demonstrated that data from one geographic area are representative of another or that it is conservative to apply data from one geographic area to another. Representativeness shall be determined in terms of the similarity of the geographic areas considering such factors as those set out in Section 4.3.5 above. Likewise, it shall be determined that it is conservative to apply data from one geographic area by considering the same factors. In determining whether two areas are sufficiently similar, or that it is

conservative, to allow data to apply from one area to another, only factors related to the baseline scenario and additionality need to be considered.

Activity Methods

- 4.3.7** The applicability conditions specify the project activity and they shall therefore serve as the specification of the positive list (i.e., all project activities that satisfy the applicability conditions are deemed as additional).
- 4.3.8** The methodology shall clearly specify the project activity in terms of a technology or measure and its context of application. A technology or measure encompasses the plant, equipment, process, management and conservation measure or other practice that directly or indirectly generates GHG emission reductions and/or removals. The context of application refers to the conditions or circumstances under which such technology or measure may be implemented.
- 4.3.9** The applicability conditions shall establish the scope of validity of the methodology, including the geographic scope. In establishing the scope of validity of the methodology, the methodology shall clearly demonstrate that there is similarity across the sub-areas of the geographic scope in factors such as socio-economic conditions, climatic conditions, energy prices, raw material availability and electricity grid emission factors, as such factors relate to the baseline scenario and additionality, It may be necessary to limit the applicability of the methodology to comply with this requirement.
- 4.3.10** Where the activity method is set out as a separate module (i.e., is not an integrated part of a methodology), the activity method may be applied to any methodology eligible under the VCS Program that permits the project activity specified in the module (see Section 3.14.1 for further details).

4.4 PROJECT BOUNDARY

General

- 4.4.1** The methodology shall establish criteria and procedures for describing the project boundary and identifying and assessing GHG sources, sinks and reservoirs relevant to the project and baseline scenarios. Justification for GHG sources, sinks and reservoirs included or excluded shall be provided.
- 4.4.2** In identifying GHG sources, sinks and reservoirs relevant to the project, the methodology shall set out criteria and procedures for identifying and assessing GHG sources, sinks and reservoirs that are controlled by the project proponent, related to the project or affected by the project (i.e., leakage).
- 4.4.3** In identifying GHG sources, sinks and reservoirs relevant to the baseline scenario, the methodology shall:

- 1) Set out criteria and procedures used for identifying the GHG sources, sinks and reservoirs relevant for the project.
- 2) Where necessary, explain and apply additional criteria for identifying relevant baseline GHG sources, sinks and reservoirs.
- 3) Compare the GHG sources, sinks and reservoirs identified for the project with those identified in the baseline scenario, to ensure equivalency and consistency.

Standardized Methods

4.4.4 (No specific requirements)

4.5 BASELINE SCENARIO

General

4.5.1 Methodologies using a project method shall establish criteria and procedures for identifying alternative baseline scenarios and determining the most plausible scenario, taking into account the following:

- 1) The identified GHG sources, sinks and reservoirs.
- 2) Existing and alternative project types, activities and technologies providing equivalent type and level of activity of products or services to the project.
- 3) Data availability, reliability and limitations.
- 4) Other relevant information concerning present or future conditions, such as legislative, technical, economic, socio-cultural, environmental, geographic, site-specific and temporal assumptions or projections.

4.5.2 Methodologies using a standardized method for determining the crediting baseline shall describe (taking into account the factors set out Section 4.5.1 above), as far as is possible, the technologies or measures that represent the most plausible baseline scenario or the aggregated baseline scenario (see Section 4.5.4 for further information on aggregate baseline scenarios), though it is recognized that it may not be possible to specify precisely all technologies or measures given that the baseline may represent a variety of different technologies and measures.

Standardized Methods

4.5.3 Standardized methods shall be developed with the objective of predicting, as accurately as is practicable, the most plausible baseline scenario or aggregated baseline scenario. Notwithstanding this principle, it is recognized that standardized methods cannot perfectly capture the precise baseline behavior for all proposed projects eligible under a standardized method.

Performance Methods

- 4.5.4** The methodology shall identify alternative baseline scenarios and determine either the most plausible baseline scenario or an aggregate baseline scenario for the project activity. Aggregate baseline scenarios shall be determined by combining likely scenarios on a probabilistic (i.e., likelihood) basis.
- 4.5.5** The performance benchmark shall be established based upon available technologies and/or current practices, and trends, within the sector. Where the analysis of trends shows a clear trend of improvement in the baseline scenario over time, the performance benchmark shall take account of the trend. This means that where the performance benchmark does not use a dataset that is updated at least annually, an autonomous improvement factor shall be used that provides a performance benchmark that tightens annually. Notwithstanding this requirement, methodologies may allow projects to use the level of the performance benchmark metric available at project validation for the duration of their project crediting periods (see also Section 4.5.7 below). Where the analysis of trends shows a trend of increasing GHG emissions or decreasing GHG removals in the baseline scenario over time, the performance benchmark shall not consider such trend.
- 4.5.6** Appropriate data sources for developing performance methods include economic and engineering analyses and models, peer-reviewed scientific literature, case studies, empirical data, and common practice data. The data and dataset derived from such data sources shall meet the requirements below. The *CDM Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines* also provides useful related guidance.
- 1) Data collected directly from primary sources shall comply with relevant and appropriate standards, where available, for data collection and analysis, and be audited at an appropriate frequency by an appropriately qualified, independent organization.
 - 2) Data collected from secondary sources shall be available from a recognized, credible source and must be reviewed for publication by an appropriately qualified, independent organization or appropriate peer review group, or be published by a government agency.
 - 3) Data shall be from a time period that accurately reflects available technologies and/or current practice, and trends, within the sector. Selection of the appropriate temporal range shall be determined based on the guidance provided in the *GHG Protocol for Project Accounting*, Chapter 7 (WRI-WBCSD).
 - 4) Where sampling is applied in data collection, the requirements set out in Section 4.1.4 shall be adhered to. The methodology developer shall demonstrate that sampling results provide an unbiased and reliable estimate of the true mean value (i.e., the sampling does not systematically underestimate or overestimate the true mean value).
 - 5) Data shall be publicly available or made publicly available. Proprietary data (e.g., data pertaining to individual facilities) may be aggregated, and therefore not made publicly available, where there are demonstrable confidentiality considerations. However, sufficient data shall be publicly available to provide transparency and credibility to the dataset.

- 6) All data shall be made available, under appropriate confidentiality agreements as necessary, to the VCSA and each of the validation/verification bodies assessing the proposed performance benchmark methodology, to allow them to reproduce the determination of the performance benchmark. Data shall be presented in a manner that enables them to independently assess the presented data.
- 7) Data shall be appropriate to the methodology's geographic scope and the project activities applicable under it.
- 8) All reasonable efforts shall be undertaken to collect sufficient data and the use of expert judgment as a substitute for data shall only be permitted where it can be demonstrated that there is a paucity of data. Expert judgment may be applied in interpreting data. Where expert judgment is used, good practice methods for eliciting expert judgment shall be used (e.g., *IPCC 2006 Guidelines for National GHG Inventories*).
- 9) Where data must be maintained in a central repository on an on-going basis (e.g., in a database that holds sector data for use by project proponents in establishing specific performance benchmarks for their projects), there shall be clear and robust custody arrangements for the data and defined roles and responsibilities with respect to the central repository.

Where such data requirements set out above cannot be met, a performance method shall not be applied except as set out in Section 4.3.5.

4.5.7 The dataset may be documented and contained within the methodology, or may be maintained in a separate repository that is referenced by the methodology. Datasets documented and contained within methodologies are static datasets, where all projects use the level of the performance benchmark metric specified in the methodology (noting that autonomous improvement factors may be used, as set out in Section 4.5.5 above). The following applies with respect to datasets maintained in a separate repository:

- 1) The dataset may be static or dynamic (i.e., may or may not be periodically updated).
- 2) The methodology shall establish criteria and procedures for use of the dataset and for establishing specific performance benchmarks for individual projects.
- 3) The methodology may specify that projects use the level of the performance benchmark metric available at project validation for the duration of their project crediting periods, or may specify that projects use an updated level of the performance benchmark metric at each verification event. The frequency that data is updated within the dataset shall be determined by the methodology developer.
- 4) It shall be demonstrated that procedures are in place to maintain the dataset in accordance with the applicable requirements set out for data and datasets in Section 4.5.6 above.

Activity Methods

- 4.5.8** There are no specific requirements for activity methods, noting that methodologies using an activity method may use a project or performance method for determining the crediting baseline, as set out in Section 4.1.10.

4.6 ADDITIONALITY

General

- 4.6.1** The methodology shall establish a procedure for the demonstration and assessment of additionality based upon the requirements set out below. Note that such requirements are for methodology development, and projects shall demonstrate and assess additionality in accordance with the requirements set out in the applied methodology.
- 4.6.2** Methodologies shall use a project method, performance method and/or activity method to determine additionality. The high level specifications and procedural steps for each approach are set out in Sections 4.6.3 to 4.6.9 below. New methodologies developed under the VCS shall meet this requirement by doing one of the following:
- 1) Referencing and requiring the use of an appropriate additionality tool that has been approved under the VCS or an approved GHG program;
 - 2) Developing a full and detailed procedure for demonstrating and assessing additionality directly within the methodology; or
 - 3) Developing a full and detailed procedure for demonstrating and assessing additionality in a separate tool, which shall be approved via the methodology approval process, and referencing and requiring the use of such new tool in the methodology.

Note - Reference in a methodology to the VCS requirements on additionality is insufficient. The VCS requirements are high level requirements and do not represent a full and detailed procedure for the demonstration of additionality. The only exception to this is with respect to regulatory surplus (i.e., methodologies may directly reference the VCS requirements on regulatory surplus and do not need to further develop a procedure for demonstrating and assessing regulatory surplus).

Project Method

4.6.3 Step 1: Regulatory Surplus

The project shall not be mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework. For UNFCCC non-Annex I countries, laws, statutes, regulatory frameworks or policies

implemented³ since 11 November 2001 that give comparative advantage to less emissions-intensive technologies or activities relative to more emissions-intensive technologies or activities need not be taken into account. For all countries, laws, statutes, regulatory frameworks or policies implemented since 11 December 1997 that give comparative advantage to more emissions-intensive technologies or activities relative to less emissions-intensive technologies or activities shall not be taken into account.

4.6.4 Step 2: Implementation Barriers

The project shall face one or more distinct barrier(s) compared with barriers faced by alternatives to the project:

- 1) Investment barrier: Project faces capital or investment return constraints that can be overcome by the additional revenues associated with the sale of GHG credits.
- 2) Technological barriers: Project faces technology-related barriers to its implementation.
- 3) Institutional barriers: Project faces financial (other than identified in investment barrier above), organizational, cultural or social barriers that the VCU revenue stream can help overcome.

4.6.5 Step 3: Common Practice

The project shall not be common practice, determined as follows:

- 1) Project type shall not be common practice in sector/region, compared with projects that have received no carbon finance.
- 2) Where it is common practice, the project proponent shall identify barriers faced compared with existing projects.
- 3) Demonstration that the project is not common practice shall be based on guidance provided in *The GHG Protocol for Project Accounting*, Chapter 7 (WRI-WBCSD).

Performance Method

4.6.6 Step 1: Regulatory Surplus

The project activity shall meet with the requirements on regulatory surplus set out under the project method in Section 4.6.3.

4.6.7 Step 2: Performance Benchmark

The GHG emissions generated (or carbon sequestered) per unit of output, unit of input or sequestration metric by the project shall be below (or above, for sequestration) the prescribed

³ Implemented in the context of this paragraph means enacted or introduced, consistent with use of the term under the CDM rules on so-called Type E+ and Type E- policies.

performance benchmark metric or proxy for such metric (see Section 4.1.16 for specification of the metric). Proxy metrics or conditions may be specified where it can be demonstrated that they are strongly correlated with the performance benchmark metric and that they can serve as an equivalent or better method (e.g., in terms of reliability, consistency or practicality) to determine whether performance is achieved to a level at least equivalent to that of the performance benchmark metric.

GHG emissions generated (or carbon sequestered) may be above (or below, for sequestration) the prescribed performance benchmark metric or proxy for such metric for a given verification period, though the project shall not be granted credit for such verification periods.

Activity Method

4.6.8 Step 1: Regulatory Surplus:

The project activity shall meet with the requirements on regulatory surplus set out under the project method in Section 4.6.3.

4.6.9 Step 2: Positive List:

The methodology shall apply one or more of the following three options:

1) Option A: Activity Penetration

The methodology shall demonstrate that the project activity has achieved a low level of penetration relative to its maximum adoption potential, as follows:

- a) The methodology shall demonstrate that the project activity has achieved a low level of penetration relative to its maximum adoption potential, determined using the following equation:

$$AP_y = OA_y / MAP_y$$

Where:

- AP_y = Activity penetration of the project activity in year y (percentage)
- OA_y = Observed adoption of the project activity in year y (e.g., total number of instances installed at a given date in year y, or amount of energy supplied in year y)
- MAP_y = Maximum adoption potential of the project activity in year y (e.g., total number of instances that potentially could have been installed at a given date in year y, or the amount of energy that potentially could have been supplied in year y)

The maximum adoption potential is the total adoption of a project activity that could currently be achieved given current resource availability, technological capability, level of service, implementation potential, total demand, market access and other relevant factors

within the methodology's applicable geographically defined market. Maximum adoption potential does not consider market price, cost of adoption, consumer education, cultural or behavioral barriers, and laws, statutes, regulatory frameworks or policies.

Maximum adoption potential is constrained by numerous factors each imposing their own limitations on the total adoption of a project activity. The following list provides further specification with respect to factors that do, and do not, need to be considered in determining maximum adoption potential:

- i) Resource availability is the limitation imposed by the supply of raw materials or energy resources to the activity.
- ii) Technological capability is the limitation imposed by the technical efficiency of the project activity.
- iii) Level of service is the limitation imposed by the technical reliability or quality of the service provided by the project activity relative to its alternatives.
- iv) Implementation potential is the limitation imposed by the availability of appropriate locations for implementing the project activity.
- v) Total demand is the limitation imposed by demand for the product or service provided by, or associated with, the project activity and all relevant alternative sources of the product or service.
- vi) Market access is the limitation imposed by current infrastructure and the degree to which the outputs of project activity can be practically supplied to the market.
- vii) Market price is the limitation imposed by the current price achievable for outputs from the project activity. Cost of adoption is the limitation imposed by the cost of switching to the project activity from an alternative activity. Consumer education is the public knowledge or awareness of the activity and its benefits. Behavioral or cultural barriers are limitations resulting from social or cultural inertia with respect to the adoption of the project activity.

Data used in determining the level of activity penetration shall meet the requirements for data set out for performance benchmarks in Section 4.5.6, *mutatis mutandis*.

- b) The level of penetration of the project activity shall be no higher than five percent.
 - c) Where the project activity has been commercially available in any area of the applicable geographic scope for less than three years (i.e., it uses a new technology or measure), it shall be demonstrated that the project activity faces barriers to its uptake. Such barriers shall be demonstrated in accordance with Step 3 (barrier analysis) of the latest version of the CDM *Tool for the demonstration and assessment of additionality*.
- 2) Option B: Financial Viability

The methodology shall demonstrate that the project activity is less financially or economically attractive than the alternatives to the project activity using the procedures for investment analysis set out in the CDM *Tool for the demonstration and assessment of additionality*. This

requires that Steps 1, 2 and 4 of such tool are followed. The analysis shall be conducted for the class of project activities to which the methodology is applicable, and the following also applies:

- a) Sub-step 1a. Other realistic and credible alternative scenarios shall be taken to mean the full range of alternatives to the class of project activity that are found and are operational in the applicable geographic scope.
- b) Sub-step 1b. Where the methodology is applicable to more than one country, the mandatory applicable legal and regulatory requirements of all countries shall be examined.
- c) Sub-step 2b and Sub-step 2c. The following applies:
 - i) The full range of circumstances which can influence the project activity shall be considered, and either average circumstances or the circumstances that lead to the most cost effective outcome shall be assumed (e.g., if the observed wind resource in the geographic scope of the methodology leads to plant load factors for wind turbines of between 25 and 30 percent, an average of these figures can be used, or 30 percent may be assumed).
 - ii) Likewise, the full range of cost and/or revenue estimates for the project activity shall be considered, and either average estimates or the estimates that lead to the most cost effective outcome shall be assumed.
 - iii) The full range of circumstances related to the baseline alternatives shall be considered, and either average circumstances or the circumstances that lead to the most cost effective outcome shall be assumed. Only observed or realistic circumstances shall be included (e.g., in a country where cement plants are all located close to harbors or large rivers with a view to easy access to transport, it would not be realistic to assume cement plants would be located in remote areas without easy access to transport).
 - iv) Likewise, the full range of cost and/or revenue estimates for the baseline alternatives shall be considered, and either average estimates or estimates pertaining to the most likely baseline alternative shall be assumed. Where estimates pertaining to the most likely baseline alternative are used, it shall be substantiated that such baseline alternative is the most likely among the alternatives.
- d) Sub-step 2b, Option III. Company internal benchmarks may not be used.
- e) Sub-step 2d. Where average circumstances or estimates have been used in Sub-step 2b and/or Sub-step 2c (i.e., calculations have been based upon a range of circumstances or estimates, see above), a sensitivity analysis shall be undertaken. The objective of the sensitivity analysis is to test whether the conclusion regarding the financial/economic attractiveness of the class of project activity is robust to reasonable variations in the critical assumptions, and where it does not demonstrate conclusively that the (entire class of) project activity is additional, the project activity shall not qualify for the positive

list under this Option B. Where the most cost effective, and therefore most conservative, circumstances or estimates have been used, a sensitivity analysis is not required.

- f) Step 2 (General). Where there are multiple circumstances and estimates that must be aggregated in order to calculate output figures, the method of aggregation shall account for the correlations between each circumstance and estimate.
 - g) Step 4 (Common practice analysis). It shall be demonstrated that the project activity is not common practice using the full procedures for common practice analysis set out in the CDM *Tool for the demonstration and assessment of additionality*.
- 3) Option C: Revenue Streams

The methodology shall demonstrate that the project activity does not have any significant sources of revenue other than revenue from the sale of GHG credits, as follows:

- a) The project activity's gross annual revenue (including cost savings) excluding from the sale of GHG credits shall not exceed five percent of capital expenditure (see VCS document *Program Definitions* for definition of capital expenditure). All capital expenditures incurred during the project crediting period shall be accounted for and where the project activity involves capital expenditure subsequent to year zero, an appropriate discount rate shall be applied.
- b) It shall be demonstrated that the project activity is not common practice using the full procedures for common practice analysis set out in the CDM *Tool for the demonstration and assessment of additionality*.

4.7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

General

- 4.7.1** The methodology shall establish criteria and procedures for quantifying GHG emissions and/or removals, and/or carbon stocks, for the selected GHG sources, sinks and/or reservoirs, separately for the project (including leakage) and baseline scenarios.
- 4.7.2** The methodology shall establish criteria and procedures for quantifying net GHG emission reductions and removals generated by the project, which shall be quantified as the difference between the GHG emissions and/or removals, and/or as the difference between carbon stocks, from GHG sources, sinks and reservoirs relevant for the project and those relevant for the baseline scenario. Where appropriate, net GHG emission reductions and removals, and net change in carbon stocks, shall be quantified separately for the project and the baseline scenarios for each relevant GHG and its corresponding GHG sources, sinks and/or reservoirs.

Performance Methods

- 4.7.3** In any given verification period, the methodology may result in the project's GHG emission reductions or removals being quantified as negative. This is permitted and the project shall be granted no credit in such periods.

Activity Methods

- 4.7.4** (No specific requirements)

4.8 MONITORING

General

- 4.8.1** The methodology shall describe the data and parameters to be reported, including sources of data and units of measurement.
- 4.8.2** When highly uncertain data and information are relied upon, conservative values shall be selected that ensure that the quantification does not lead to an overestimation of net GHG emission reductions or removals.
- 4.8.3** Metric tonnes shall be used as the unit of measure and the quantity of each type of GHG shall be converted to tonnes of CO₂e consistent with the requirements set out in Section 3.15.3 above.
- 4.8.4** The methodology shall establish criteria and procedures for monitoring, which shall cover the following:
- 1) Purpose of monitoring.
 - 2) Monitoring procedures, including estimation, modeling, measurement or calculation approaches.
 - 3) Procedures for managing data quality.
 - 4) Monitoring frequency and measurement procedures.

Standardized Methods

- 4.8.5** (No specific requirements)

5 | Validation and Verification Requirements

5.1 INTRODUCTION

- 5.1.1** Validation is the independent assessment of the project by a validation/verification body that determines whether the project complies with the VCS rules. Verification is the periodic ex-post independent assessment by a validation/verification body of the GHG emission reductions and removals that have occurred as a result of the project during the monitoring period, conducted in accordance with the VCS rules.
- 5.1.2** Validation and verification is a risk-based process and shall be carried out in conformance with *ISO 14064-3:2006* and *ISO 14065:2007*. Additional requirements with respect to validation and verification are set out in this Section 5 and shall be adhered to.
- 5.1.3** The validation/verification body shall select samples of data and information to be validated or verified to provide a reasonable level of assurance and to meet the materiality requirements of the specific project.

5.2 GENERAL REQUIREMENTS

- 5.2.1** The project shall be validated and GHG emission reductions or removals verified by a validation/verification body that meets with the eligibility requirements set out in the *VCS Program Guide*.
- 5.2.2** Validation and verification of the project may be undertaken by the same validation/verification body, noting the rules on rotation of validation/verification bodies set out in Section 5.3.12 below. Validation may occur before the first verification or at the same time as the first verification.
- 5.2.3** The project shall be listed on the project pipeline before the opening meeting between the validation/verification body and the project proponent (such opening meeting representing the beginning of the validation process). The validation/verification body is responsible for checking that the project is listed on the project pipeline and shall not conduct the opening meeting or otherwise begin validation until such time as the project is listed.
- 5.2.4** Where the project applies a methodology from an approved GHG program that does not have an independent validation step, the VCS rules still require validation of the project.
- 5.2.5** Validation/verification bodies are expected to follow the guidance provided in the *VCS Validation and Verification Manual* when validating or verifying projects and conducting methodology assessments under the VCS Program.

5.3 VALIDATION AND VERIFICATION PROCESS

General Requirements

- 5.3.1** In addition to the requirements set out in *ISO 14064-3:2006*, the following shall apply:
- 1) The level of assurance shall be reasonable, with respect to material errors, omissions and misrepresentations, for both validation and verification.
 - 2) The criteria for validation shall be the *VCS Version 3*, or approved GHG program where the validation is performed under an approved GHG program (as in cases of participation under the VCS Program and an approved GHG program). The criteria for verification shall be the *VCS Version 3* (regardless of the VCS version or GHG program under which the project was validated). This means the validation or verification shall ensure conformance of the project with the VCS rules, or rules and requirements of the approved GHG program, as applicable.
 - 3) The objective of validation or verification shall be in conformance with the VCS rules and the methodology applied to the project.
 - 4) The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals shall be five percent for projects and one percent for large projects.
- 5.3.2** Where the project does not fully comply with the methodology, the validation/verification body shall determine whether this represents a methodology deviation or a methodology revision (in accordance with the specifications for each), and the case shall be handled accordingly.
- 5.3.3** Where the project applies a revision to an approved GHG program methodology and the version of the (underlying) methodology referenced by the methodology revision is no longer current, the validation/verification body shall determine whether material changes have occurred to the underlying methodology that affect the integrity of the methodology revision. Where such material changes have occurred, the project shall not be approved.
- 5.3.4** Where the project does not meet the criteria for validation or verification, the validation/verification body shall produce a negative validation conclusion and provide the validation, or verification, report and project description, or monitoring report to the VCSA. The project shall be ineligible for registration until such time as corrective action is taken and the (same) validation/verification body has provided a positive validation or verification.

Competence

- 5.3.5** The validation/verification body and validation and verification team shall meet the competence requirements set out in *ISO 14065:2007*, *mutatis mutandis*.

Validation and Verification Reporting

- 5.3.6** The validation report describes the validation process, any findings raised during validation and their resolutions, and the conclusions reached by the validation/verification body. The validation/verification body shall use the *VCS Validation Report Template*, *VCS Joint Validation & Verification Report Template*, *VCS & CCB Validation Report Template*, *VCS+SOCIALCARBON Validation Report Template* or approved GHG program validation report template where the project is registered under an approved GHG program, as appropriate, and adhere to all instructional text within the template. The validation report shall be accompanied by a validation representation, which shall be prepared using the *VCS Validation Deed of Representation Template*.
- 5.3.7** The verification report describes the verification process, any findings raised during verification and their resolutions, and the conclusions reached by the validation/verification body. The validation/verification body shall use the *VCS Verification Report Template*, *VCS Joint Validation & Verification Report Template*, *VCS & CCB Verification Report Template* or *VCS+SOCIALCARBON Verification Report Template*, as appropriate, and adhere to all instructional text within the template. The verification report shall be accompanied by a verification representation, which shall be prepared using the *VCS Verification Deed of Representation Template*.

Validation and Verification Statement

- 5.3.8** The validation report and the verification report shall contain a validation statement and a verification statement, respectively.
- 5.3.9** Validation and verification statements shall:
- 1) Describe the level of assurance of the validation or verification.
 - 2) Describe the objectives, scope and criteria of the validation or verification.
 - 3) Describe whether the data and information supporting the GHG assertion were hypothetical, projected and/or historical in nature.
 - 4) Include the validation/verification body's conclusion on the GHG assertion, including any qualifications or limitations.
- 5.3.10** The verification statement shall state the volume of GHG emission reductions or removals generated during the monitoring period that have been verified.

Records of Validation and Verification

- 5.3.11** The validation/verification body shall keep all documents and records in a secure and retrievable manner for at least two years after the end of the project crediting period, even where they do not conduct verification for the whole project crediting period.

Rotation of Validation/Verification Bodies

5.3.12 Rotation of validation/verification bodies is required in respect of validation and verification, as follows:

- 1) Validation (including project crediting period renewal validation) and the first verification of a project (in a given project crediting period) may be undertaken by the same validation/verification body. However, the subsequent verification shall be undertaken by a different validation/verification body. For example, if validation and verification were undertaken at the same time, the subsequent verification would have to be undertaken by a different validation/verification body. If validation were undertaken first (i.e., separately), the first verification could be undertaken by the same validation/verification body, but the subsequent verification would have to be undertaken by a different validation/verification body.

Note – The gap validation of a project registered under an approved GHG program may be disregarded when assessing adherence to these requirements.

- 2) A validation/verification body may not verify more than six consecutive years of a project's GHG emission reductions or removals. The validation/verification body may undertake further verification for the project only when at least three years of the project's GHG emission reductions or removals have been verified by a different validation/verification body. Additionally, where a validation/verification body verifies the final six consecutive years of a project crediting period, the project crediting period renewal validation shall be undertaken by a different validation/verification body. Notwithstanding these rules, where AFOLU projects have verification periods longer than six years, a validation/verification body is permitted to verify more than six consecutive years of a project's GHG emission reductions or removals, and the subsequent verification shall be undertaken by a different validation/verification body.

Note – Validations and verifications performed under other GHG programs shall be counted when assessing adherence to these requirements.

Validation and Verification Requirements for Grouped Projects

5.3.13 Validation and verification of grouped projects shall assess conformance of the project with the requirements for grouped projects set out in the VCS rules.

5.3.14 New project activity instances shall be validated, based on the information reported in the monitoring report, against the applicable set of eligibility criteria. The validation/verification body shall specify which instances meet the eligibility criteria for inclusion in the project. Such validation may be reported in the verification report or a separate validation report.

5.3.15 Where, due to the number of project activity instances, it is unreasonable to undertake an individual assessment of each initial or new instance, the validation/verification body shall document and explain the sampling methods employed for the validation of such instances. Such sampling methods shall be statistically sound. The number of instances included in the project,

eligible for monitoring and generation of VCUs shall be proportional to the percentage of sampled instances found to be in compliance by the validation/verification body.

- 5.3.16** The verification report for grouped projects shall document and explain the sampling methods employed by the validation/verification body for the verification of GHG emission reductions or removals generated by the project. Such methods shall be statistically sound. Any subsequent changes to the sampling method(s) required as a result of the verification findings shall be documented.

APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v3.0	8 Mar 2011	Initial version released under <i>VCS Version 3</i>
v3.1	15 Jul 2011	<p>Main updates (all effective on issue date):</p> <ol style="list-style-type: none"> 1) Clarified the language for the validation deadline of AFOLU projects. 2) Provided an extension of the validation/verification deadline for AFOLU projects with a start date before 1 January 2002. 3) Incorporated requirements for projects registered sequentially under the VCS Program and a GHG program that is not an approved GHG program. 4) Updated requirements for estimating uncertainty in methodologies. 5) Clarified the rules on grace period granted to projects using new methodologies.
v3.2	1 Feb 2012	<p>Main updates (all effective on issue date, unless otherwise stated):</p> <ol style="list-style-type: none"> 1) Included requirements for standardized methods (Sections 3.1.6, 3.14.1 and 4). 2) Updated rules on double counting to focus on double selling and monetizing, and not double claiming (Section 3.11.2). 3) Expanded requirements and procedures for AFOLU projects registering and issuing credits under the VCS Program and an approved GHG program (Section 3.11). 4) Amended additionality rules on regulatory surplus such that the exception for Type E- policies and systematically enforced law is granted to non-Annex I countries only (Section 4.6.3). Effective from 1 August 2012. 5) Clarified that new requirements released by the VCSCA do not impact registered projects (Section 3.1.8). 6) Replaced the term <i>proof of title</i> with <i>evidence of right of use</i> (Sections 3.4.10, 3.11.1, 3.18.2 and 3.19.2).
v3.3	4 Oct 2012	<p>Main updates (all effective on issue date, unless otherwise stated):</p> <ol style="list-style-type: none"> 1) Included reference to jurisdictional programs and nested REDD+ projects (Sections 1 and 2.1). 2) Clarified that the most recent version of external documents shall be used where referenced (Section 1.1). 3) Introduced rules for the use of models, default factors and proxies (Sections 2.3.2, 3.1.4, 3.1.5, 4.1.6, 4.1.7 and 4.1.8). 4) Clarified that the size/scale of project activity instances for grouped projects may need to be considered in establishing eligibility criteria for the inclusion of instances (Section 3.4.9). 5) Added new type of right of use for JNR (Sections 3.4.10 and 3.11.1). 6) Clarified requirements for methodology deviations (Section 3.5.1). 7) Introduced rules on project description deviations, replacing rules on monitoring plan deviations and switching methodologies (Section 3.6). 8) Clarified that the project crediting period under <i>VCS Version 1</i> is deemed as 10 years (Section 3.8.5). 9) Changed the thresholds for project scale so that projects with emission reductions or removals greater than 300,000 tonnes CO₂e per year are considered large and the

		<p>materiality threshold is one percent for large projects. (Sections 3.9 and 5.3.1).</p> <p>10) Clarified that the consultation undertaken on the level of performance benchmark metrics is an expert consultation rather than a general stakeholder consultation (i.e., the purpose is to engage technical experts in the process) (Section 4.1.17).</p> <p>11) Added QA/QC guidance for standardized methods data (Section 4.5.6).</p> <p>12) Clarified that proxy metrics or conditions may serve as an <i>equivalent</i> method to determine whether performance is achieved to a level at least equivalent to that of the performance benchmark metric (Section 4.6.7).</p> <p>13) Clarified that the difference in carbon stock between the baseline and project scenarios may be used to quantify the emission reductions from pools (Sections 4.7.1 and 4.7.2).</p> <p>14) Removed monitoring section requirements for standards and factors (previously Section 4.8.2).</p> <p>15) Specified rules on rotation of VVBs (Sections 5.2.2 and 5.3.12). Effective immediately, unless evidence of contracting for verification prior to 4 October 2012 is provided.</p> <p>16) Added new requirement that listing on the project pipeline is required before validation can begin (Section 5.2.3). Effective from 4 April 2013.</p> <p>17) Included reference to the <i>VCS Validation and Verification Manual</i> (Section 5.2.5).</p> <p>18) Revised language on validation report conclusions (Section 5.3.4).</p>
v3.4	8 Oct 2013	<p>Main updates (all effective on issue date):</p> <p>1) Clarified that readers <i>shall</i> use the most current version of this document (Section 1.1).</p> <p>2) Clarified that verification periods cannot overlap (Sections 3.4.10 and 3.16.7).</p> <p>3) Removed reference to JNR-specific right of use for grouped projects (previously Section 3.4.10(7)).</p> <p>4) Extended validation grace period for projects applying a new VCS methodology, including at project crediting period renewal (Sections 3.7.2 and 3.8.5(3)).</p> <p>5) Added requirements on debundling (Section 3.9.2).</p> <p>6) Added new requirements with respect to other forms of GHG-related environmental credits (Sections 3.11.3 and 3.11.5).</p> <p>7) Removed duplication of reporting requirements between the monitoring report, project description, validation report, and verification report and their respective templates (Sections 3.16.6, 3.19.1, 5.3.6 and 5.3.7).</p> <p>8) Removed language on validation/verification body liability (Section 5.2.5).</p> <p>9) Revised VCSA actions for projects not meeting criteria for validation and verification (Section 5.3.4).</p> <p>10) Clarified validation/verification body rotation requirements in respect of project crediting period renewals (Section 5.3.12).</p> <p>11) Expanded the document to be applicable to JNR, and made other minor edits and clarifications to text and grammar (throughout).</p>
v3.5	25 Mar 2015	<p>Main updates (all effective on issue date, unless otherwise stated):</p> <p>1) Incorporated 9 January 2014 exclusion of HFC-23 from the scope of the VCS Program (Section 2.1.1).</p>

		<ol style="list-style-type: none"> 2) Clarified language with respect to projects registered under other GHG programs which are seeking registration with the VCS Program (Sections 3.7.1, 3.11.9, 3.11.10, 3.11.10(1), 3.11.10(3), 3.11.11, 3.19.1, 5.3.6). 3) Specified the total project crediting period for projects registered under the JI Program which are seeking registration with the VCS Program (Section 3.8.3). 4) Incorporated 30 October 2014 clarification with respect to GHG-related environmental credits (Section 3.11.3). 5) Updated reference to <i>CPA</i> to be consistent with latest version of <i>Glossary of CDM Terms</i> (Section 3.11.9). 6) Added requirements and procedures for projects registered under the Joint Implementation program to also register with the VCS Program (Section 3.11.10(2)).
v3.6	19 Oct 2016	<p>Main updates (all effective on issue date, unless otherwise stated):</p> <ol style="list-style-type: none"> 1) Replaced term <i>right of use</i> with <i>project ownership</i> (Sections 3.4.10(5), 3.11.1, 3.18.2) 2) Incorporated 23 September 2015 standalone update removing validation deadline for projects applying a standardized method for determining additionality into document text (Section 3.7.6) 3) Incorporated 24 February 2016 clarification with respect to introduction of joint templates into document text (Sections 3.16.6, 3.19.1, 5.3.6, 5.3.7) 4) Introduced requirements for assessment of no net harm (Section 3.17.1). Effective immediately, unless evidence of contracting for validation prior to 19 April 2017 is provided. 5) Introduced requirements for conducting local stakeholder consultations (Sections 3.17.2-3.17.4). Effective immediately, unless evidence of contracting for validation prior to 19 April 2017 is provided. 6) Introduced requirements for public comment periods for projects (Sections 3.17.5-3.17.8). Effective from 19 April 2017.
v3.7	21 Jun 2017	<p>Main updates (all effective on issue date, unless otherwise stated):</p> <ol style="list-style-type: none"> 1) Introduced new requirement that new project activity instances added to grouped projects shall have a start date that is equal to or later than the grouped project start date (Section 3.4.10(6)) 2) Clarified that the project crediting period shall not be renewed until the end of the previous crediting period (Section 3.8.5(3)) 3) Updated CDM gap validation process and introduced new Climate Action Reserve gap validation process (Section 3.11.10(1, 3)) 4) Introduced new requirements for projects applying an approved GHG program methodology which uses an activity method or other simplified procedure for demonstrating additionality (Section 3.14.1) 5) Updated required source of global warming potentials from the IPCC's <i>Second Assessment Report</i> to the IPCC's <i>Fourth Assessment Report</i> (Sections 3.15.3 and 4.8.3). Projects may optionally transition to the updated global warming potentials immediately via a project description deviation. Projects shall transition to the updated global warming potentials at their project crediting period renewal. 6) Added reference to joint VCS, VCS & CCB and VCS+SOCIALCARBON templates (Sections 3.16.6, 3.19.1, 5.3.6, 5.3.7)

		<ul style="list-style-type: none">7) Clarified that project verification periods must be contiguous (Section 3.16.7)8) Clarified that any validation and verification activities performed under other GHG programs shall be counted when assessing compliance with VVB rotation requirements (Section 5.3.12)9) Removed requirement that a validation representation must be submitted where verification includes the validation of new project activity instances of a grouped project (formerly Section 5.3.14)
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Attachment Y

VCS, Validation and Verification Manual v3.2





19 October 2016, v3.2

Validation and Verification Manual

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1 | Introduction

1.1 OVERVIEW

Independent third-party validation and verification plays a vital role in upholding the integrity and quality of greenhouse gas (GHG) emission reductions and removals achieved by VCS projects.

Validation/verification bodies (VVBs) have three main roles under the VCS Program: to validate projects, verify GHG emission reductions and removals, and assess methodology elements under the methodology approval process.

VVBs are eligible to provide validation and verification services under the VCS Program if they are accredited under a VCS-approved GHG program, accredited under *ISO 14065* for scope VCS by an accreditation body that is a member of the International Accreditation Forum, or approved under the VCS temporary accreditation program. The detailed accreditation requirements for VVBs are set out in the *VCS Program Guide*. The VVB annual fee is set out in the *Program Fee Schedule*.

The objective of the *Validation and Verification Manual* is to provide guidance to increase the consistency, quality and transparency of validation and verification of projects under the VCS Program and to provide guidance on assessing methodologies under the VCS methodology approval process. The manual is intended to be used in combination with the VCS Program documents that set out the VCS rules and *ISO 14064-3* which sets out program-neutral requirements for validation and verification. The manual was developed with the support of a working group.¹

The manual does not contain VCS requirements but rather provides further clarification on VCS rules and, in some instances, clarifications on the application of *ISO 14064-3* requirements on validation and verification as they relate to the VCS Program. In addition, the manual does not address *ISO 14065* or other VVB accreditation-specific topics, nor does it offer methodology-specific or sectoral scope-specific guidance (although various project types are discussed as examples). VVBs must refer directly to the applied methodology when conducting project validation or verification.

While VVBs are the primary intended users of this manual, the guidance presented in this manual is also considered useful for project proponents and methodology developers.

¹ The working group comprised of representatives from VVBs and the American National Standards Institute (ANSI). Working group members were Ann Bowles, Tod Delaney, Todd Frank, Jared Nunery, Rainer Winter and Siddharth Yadav.



VCS GUIDANCE

This document shall be updated from time-to-time and readers should ensure they are using the most current version of the document.

1.2 KEY REQUIREMENTS AND REFERENCES

The VCS Program provides the standard and framework for independent validation of projects and methodologies as well as verification of GHG emission reductions and removals, based on *ISO 14064-2* and *ISO 14064-3*. The key requirements of the VCS Program are described in the following documents:

- *VCS Program Guide*
- *VCS Standard*
- *AFOLU Requirements*
- *ODS Requirements*
- *Jurisdictional and Nested REDD+ (JNR) Requirements*
- *Program Definitions*

Other procedural requirements are described in the following documents:

- *Registration and Issuance Process*
- *Methodology Approval Process*
- *AFOLU Non-Permanence Risk Tool*

These documents are available on the VCS website and are updated periodically when VCSA releases program updates. New requirements are effective immediately upon release, though, where appropriate, a grace period may be provided to allow stakeholders sufficient time to transition to the new requirements. VVBs must refer directly to the VCS website for full information on program updates. Further information specifically for VVBs will be made available on the VVB Portal (a password-protected informational website for VVBs).

1.3 DEFINITIONS

Definitions and acronyms that apply to the VCS Program are set out in the VCS document *Program Definitions*.

1.4 SEEKING CLARIFICATIONS FROM VCSA

VVBs that need clarification directly from VCSA can access the VVB Portal via the VCS website. The portal lists responses to common VVB questions. If no responses are provided to the particular question, VVBs are encouraged to submit their questions directly to VCSA at secretariat@v-c-s.org.



For responses to proprietary or commercially sensitive questions, VVBs may contact a VCSA program officer directly. Where VVBs use clarifications provided by VCSA staff or clarifications provided in this manual as a basis for interpreting VCS rules, they must also provide a direct reference to the VCS requirement set out in the VCS Program documents to which the clarification applies. Clarifications provided by VCSA staff or in this manual are not decisions and should not be misinterpreted as approvals or consultations of specific project activities.

1.5 OVERARCHING VALIDATION AND VERIFICATION PRINCIPLES

Overarching principles are useful for helping VVBs understand the overall goals of the VCS Program and *ISO 14064* requirements. The principles serve as guidance for VVBs where project- or methodology-specific requirements are not fully prescriptive.

While *ISO 14064-3* principles do not constitute auditable criteria, VCS principles form mandatory criteria that the VVBs must consider when validating or verifying projects, or conducting methodology assessments. For example, where a project does not use data and methods that enable meaningful comparisons of GHG related information, the VVB must note it as a non-conformance with the VCS principle of consistency.

In some cases, VVBs may need to use professional judgment in applying the VCS principles. For instance, the principles of accuracy and conservativeness are interrelated and often the principle of conservativeness serves as a moderator to the principle of accuracy. The accuracy principle implies that VVBs must assess whether uncertainties with respect to GHG measurements, estimates or calculations have been reduced as much as is practical and measurement and estimation methods are used in a manner that avoids bias. The conservativeness principle implies that assumptions, values and procedures used in the project or methodology do not result in an overestimation in the quantification of net GHG emission reductions and removals. Therefore, where the data or procedures associated with the project or methodology have uncertainties, VVBs must apply the conservativeness principle.

Keep in mind

The VCS Program principles are:

- Relevance
- Completeness
- Consistency
- Accuracy
- Transparency
- Conservativeness

Explanations of these principles are set out in the *VCS Standard*.

2 | Elements of Validation and Verification Plans

When a VVB is approached to conduct a validation or verification, the VVB and its client must come to agreement on the objectives, scope, criteria, level of assurance and materiality of the validation or verification assessment. These five elements form the basis for validation or verification plans and associated sampling plans. Such agreements must recognize VCSA as one of the primary intended users of project descriptions, monitoring reports and resulting validation and verification reports.

Prior to finalizing an agreement, a VVB is required to follow the steps included in *ISO 14064-3*. The various steps include determining risks to team member impartiality and determining whether the VVB can assemble a team with competencies and resources appropriate for completing the scope of work.

2.1 OBJECTIVES

Overview

The first step in conducting a validation or verification is to establish the objectives and identify the GHG assertion to be assessed as part of a validation or verification. Assessment of these assertions against the requirements of the VCS Program, the applied methodology and *ISO 14064-2* is the core objective for any project validation or verification. The objectives may vary depending on whether the engagement is a validation or verification. The scope, criteria, level of assurance, and materiality of the validation and verification assessment should also inform the objectives.

Key Elements

2.1.1 Validation Objectives

Validation involves the assessment of a project description wherein VVBs must assess the following:

- Project conformance to VCS rules;
- Project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and
- Likelihood that methods and procedures set out in the project description will generate verifiable GHG data and information when implemented.

VVBs should review the guidance provided in Annex A.2.3.3 of *ISO 14064-3* with respect to establishing validation objectives.

2.1.2 Verification Objectives

Verification is conducted once project implementation has commenced. It is the ex-post assessment of the monitored GHG data and information. During verification, VVBs must evaluate the monitoring report and assess the following:

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- The extent to which GHG emission reductions and removals reported in the monitoring report are materially accurate.

VVBs should review the guidance provided in Annex A.2.3.4 of *ISO 14064-3* with respect to establishing project verification objectives.

2.2 SCOPE AND CRITERIA

Overview

The scope of a validation or verification helps place physical and temporal boundaries on the GHG data and information that must be assessed. Criteria are the set of requirements against which the project is evaluated.

Key Elements

In determining the scope of the assessment, VVBs must take into account the physical boundaries, sites or facilities of the project and the temporal boundaries (ie, the years when GHG emission reductions and removals are quantified). For validation, the temporal boundaries are determined by VCS project crediting period requirements set out in the *VCS Standard*. For verification, the temporal boundaries are determined by the length of the monitoring period.

The mandatory requirements of the VCS Program and *ISO 14064-2* guide the criteria against which the validation or verification is conducted. The methodology applied to the project also informs the criteria for validation and verification; therefore, it is essential that VVBs thoroughly understand a methodology prior to undertaking an assessment. Where projects apply methodologies from other approved GHG program such as the Clean Development Mechanism (CDM) or Climate Action Reserve (CAR), VVBs should refer to any guidance provided by such programs with regard to the application of the methodology. Some of the key validation and verification criteria are discussed further in Section 3.

VVBs are not expected to document every criterion that will apply to the validation or verification engagement. Instead, it is sufficient to indicate the relevant documents containing the criteria such as the *VCS Standard*, *ISO 14064-2* and the applied GHG methodology.

2.3 MATERIALITY

Overview

Materiality, as applied to GHG projects, is the concept that errors, omissions or misrepresentations, individually or in aggregate, can affect the GHG assertion and therefore affect the decisions of the intended users. The materiality threshold is non-negotiable between the project proponent and the VVB and must be informed by the VCS rules on materiality thresholds with respect to project scale.

Key Elements

Materiality has both qualitative and quantitative aspects. When assessing qualitative materiality, VVBs must determine whether the project conforms to VCS rules and methodology requirements. Certain qualitative discrepancies such as a discrepancy with respect to ownership or applicability criteria must always be noted as a material non-conformance. In other cases, qualitative discrepancies will be less definite and may ultimately manifest themselves as quantitative discrepancies. When considering less definite qualitative discrepancies, VVBs should use their professional judgment to determine the issues that immediately need to be identified as material and which require further investigation through sampling and testing.

When assessing quantitative materiality of data errors, omissions or misrepresentations, VVBs must assess materiality with respect to the aggregate estimate of GHG emission reductions and removals set out in the project description or monitoring report. Uncertainties inherent in an approved GHG methodology are not to be considered.

The materiality threshold varies depending on the amount of the project's GHG emission reductions and removals, as set out in the *VCS Standard*. The materiality threshold applies equally to validation and verification. While all material errors, omissions and misrepresentations must be addressed for a project to receive a positive validation or verification opinion, if non-material errors are found in the project documents, VVBs should ensure that such errors are addressed by the project proponent where practicable.

EXAMPLE – Qualitative Material Discrepancy

Qualitative discrepancies that are material:

- An improved forest management (IFM) methodology requires that the evaluation of the baseline scenarios include, at minimum, historical practice baseline scenarios based on the project proponent's previous and current forest management activities, and common practice baseline scenarios based on evidence of comparable forest management for similar property types and situations in the region. While the project description provides a detailed analysis of historical practices, the VVB finds that the identification of common practice baseline scenarios is based on national data that does not differentiate between different kinds of forest management scenarios. The VVB must consider this as a material discrepancy.
- A project applies a meter calibration schedule that differs from what is set out in the validated project description. The VVB must consider this as a material discrepancy.

Qualitative discrepancy that may not be material:

- Gaps in procedures for quality management of data need not be a material discrepancy unless the VVB determines that such weaknesses in the data management procedures could result in quantitative discrepancies.

2.4 LEVEL OF ASSURANCE

Overview

The VCS Program requires a reasonable level of assurance in validation and verification that GHG assertions are free of material errors, omissions and misrepresentations. This is non-negotiable between the project proponent and the VVB.

Key Elements

In a reasonable level of assurance engagement, the VVB must test a sufficient amount of data to ensure with confidence that no material errors are present. The amount of testing to be conducted is determined based on the outcome of a risk assessment (see Section 3.3.1.1).

3 | Project Validation and Verification Process

VCS Program documents provide detailed rules and requirements that VVBs must refer to when conducting project validations or verifications. This section provides further guidance on some of the key areas of validation and verification.

3.1 PRE-VALIDATION ASSESSMENT

VVBs are encouraged to conduct an assessment prior to undertaking project validation to ensure the project is eligible under the VCS Program. The pre-assessment should, at minimum, focus on the following:

- VVBs must confirm that the validation can be completed within the relevant validation deadline, relative to the project start date (ie, the date the project starts generating emission reductions and removals). The project start date is fixed and cannot be adjusted to ensure that validation deadline is met.
- VVBs must confirm that the project applies a methodology eligible under the VCS Program. Eligible methodologies include VCS methodologies and methodologies approved under CDM and CAR. The project must be validated against a valid version of the applied methodology. Note the relevant methodology grace periods on the GHG program website.
- In the case of AFOLU projects, VVBs must confirm that the project is in conformance with the eligibility requirements for AFOLU projects set out in VCS document *AFOLU Requirements*. For example, project activities that convert native ecosystems are not eligible under the VCS Program.

Keep in mind

VVBs conducting a pre-validation assessment must confirm whether the project has applied a valid version of the methodology. VCS, CDM and CAR methodologies are updated periodically. In such cases, projects applying the previous version of the methodology must issue a validation report by the deadline posted on the methodology page of the VCS, CDM or CAR website.



- Where the project has registered and issued credits under the CDM, VVBs must check the issuance date of the validation report used to request CDM registration to determine whether the project complies with VCS rules on validation deadlines.

3.2 KEY VALIDATION AND VERIFICATION REQUIREMENTS

VVBs must assess the project's conformance with all VCS Program requirements as well as the requirements of the applied methodology. This section provides guidance on some of the main requirements that need to be assessed, highlighting common issues and challenges faced by VVBs.

3.2.1 Project ownership

Overview

Under the VCS Program, a project is only eligible where the project proponent can demonstrate project ownership. Project ownership is the legal right to control and operate the project activities.

Key Elements

VVBs are not expected to provide an opinion on the legal ownership of GHG emission reductions and removals, but VVBs must assess project ownership with a reasonable level of assurance. VVBs must assess whether the project proponent can claim project ownership based on the evidence provided by the project proponent. Such evidence may include a contractual right such as legal title to the plant or equipment that generates GHG emission reductions and removals or a legally binding agreement such as a long-term lease for the management of lands. VVBs should refer directly to the *VCS Standard* for a list of acceptable forms of evidence of project ownership.

While the level of due diligence required to evaluate evidence of project ownership varies depending on the project, VVBs must, at minimum, assess whether the project proponent has provided sufficient evidence to demonstrate the authenticity of the documentation presented to demonstrate project ownership. VVBs must also assess the regulatory or jurisdictional framework within which the project is being implemented to determine that there is no conflict with the project proponent's claims at a *prima facie* level.² VVBs are encouraged to solicit external expertise when evaluating a project in a geographic jurisdiction or sector where knowledge or expertise is limited.

² *Prima facie* implies sufficient evidence to establish a fact or raise a presumption unless disproved or rebutted and is generally understood to be a flexible evidentiary standard that may at first appear sufficient.

EXAMPLE – Project ownership

A company develops a REDD project on forest land owned by the state government. The company has a long-term lease for the management of the forest and provides the VVB with the lease as evidence of project ownership.

The VVB reviews the jurisdiction's regulatory framework and finds that state law recognizes customary land rights of indigenous peoples and local communities who reside in state-owned forests. The law transfers rights to the natural resource benefits accruing from the forests to local residents. The VVB notes that the state law raises a conflict with respect to the project proponent's claim to project ownership, and the VVB requires that the project proponent provide further evidence to demonstrate that project ownership is undisputed.

In response, the project proponent submits legal documentation that includes a benefits-sharing agreement established with a community residing in one section of the forest. The documentation has the approval from the appropriate government authorities and the traditional authority customarily recognized by the community. However, the project proponent is unable to provide a similar agreement with a community residing in another section of the forest and therefore redefines the project area to limit it only to the area where a benefits-sharing agreement has been secured.

The VVB concludes that the legal documentation provides *prima facie* evidence that the project proponent has secured project ownership, which now encompasses a smaller area.

3.2.2 Methodology Applicability

Overview

All methodologies include specific conditions that a project applying the methodology must meet in order to be eligible. VVBs must assess whether the project proponent has met these applicability conditions.

Key Elements

Project proponents are expected to detail how their project meets all applicability conditions. VVBs are required to assess the project against each of these applicability conditions to confirm that methodology requirements are satisfied. Applicability conditions may include restrictions with respect to the nature of the technology or measure used in the project, geographic conditions, baseline conditions and eligible carbon pools. Failure to conform to any applicability conditions must be viewed as a material discrepancy.

3.2.3 Baseline Scenario

Overview

The baseline scenario is a hypothetical reference case that most likely represents what would have occurred in the absence of the GHG project. Given its hypothetical nature, baseline scenarios can carry significant uncertainty and are a common source of material error.

Key Elements

VVBs must assess whether the baseline scenario selection procedure complies with the procedure set out in the methodology. Often the procedures for identifying the baseline scenario are combined with the procedures for demonstrating additionality. For example, many CDM methodologies require the use of the baseline assessment procedures set out in the CDM methodological tool *Combined tool to identify the baseline scenario and demonstrate additionality*.

Methodologies may use one of two approaches in the procedures for determining the baseline scenario: a project method or a standardized method.

Keep in mind

VVBs should consider the following when assessing a project method for identifying the baseline scenario:

- Have all methodology requirements been met?
- Has a complete set of baseline alternatives been identified, within a justified geographic and temporal boundary relevant for the project?
- Are all alternative baseline scenarios functionally equivalent to the project? (This may not apply for AFOLU projects)
- Has objective evidence been provided to support the barriers assessment? Has the VVB sampled and tested this evidence?
- Where two or more alternative baseline scenarios seem equally likely, has the conservativeness principle been applied to select the scenario that will result in the fewest GHG emission reductions and removals?

3.2.3.1 Project Method

A project method is a methodological approach that uses a project-specific approach for determining the baseline scenario. Viable alternative baseline scenarios are assessed against one or more barriers to implementation such as investment, technological and institutional barriers. The assessment of baseline scenarios should therefore focus on the identification of the most plausible baseline scenario (ie, a scenario that faces the fewest barriers to implementation). For example, in a retrofit project that involves upgrading equipment, VVBs must consider whether the continued use of existing equipment would have been a plausible baseline scenario if the equipment was reaching the end of its useful life.

3.2.3.2 Standardized Method

A standardized method is a methodological approach that standardizes elements of additionality and/or the crediting baseline for a given class of project activity. Performance methods establish a baseline scenario and baseline emissions that are reflective of all viable alternative scenarios and emissions for a given class of project activity. Performance benchmark metrics are based upon baseline emissions, which can serve as the basis for determining additionality as well as the benchmark for the crediting baseline. For example, a performance method for a cement methodology could establish a performance benchmark metric expressed in terms of a given level of GHG emissions generated per tonne of cement or clinker produced (such level would represent the top performance within the sector).

EXAMPLE – Baseline Scenario

A REDD project in Brazil is seeking to avoid planned conversion of forested land to agricultural land. The project proponent is the owner of the project lands. Prior to project implementation, the project proponent sold portions of the lands for development into sugar cane plantations.

The applied VCS REDD methodology uses a project method (ie, a project-specific approach) for the selection of the baseline and prescribes specific procedures that must be undertaken to select the baseline, beginning with the identification of the agent of planned deforestation.

The specific entity that would undertake future deforestation is unknown, but potential classes of deforestation agents were considered as required by the methodology. The project proponent demonstrated that the only deforestation activities undertaken in the project vicinity were agricultural conversion to sugar cane, citrus or corn plantations. Based on the project proponent's history of selling land to sugar cane plantation owners, this baseline scenario was selected as the most likely.

However, the VVB identified two material discrepancies:

- The project proponent did not consider the impact of different (soil) strata within the project area, as required by the methodology. The VVB determined that soil types differed between the north and south portions of the project area. Sugar cane suitability may vary by soil type.
- The project proponent did not compare the selected baseline scenario against an appropriate geographic area with similar socio-economic economic and ecological conditions, as set out in VT0001 (the applied additionality tool). The process did not consider the prevalence of conversion to each crop type on local lands not formerly owned by the project proponent.

As a result, the project proponent revised the assessment as follows:

- The south portion of the project area, where the soil was determined to be too poor to sustain agriculture, was deemed unlikely to face deforestation and removed from the project area.
- A review of recent conversion activities on local areas of similar soil type found an equal distribution of all crop scenarios. Citrus plantations, (which support high carbon stocks when compared to sugar cane or corn plantations, were considered the most conservative baseline scenario for the remainder of the project area.

Further guidance on how a project method or standardized method is identified and assessed is provided in Section 5.2.4.

3.2.3.3 AFOLU-Specific Guidelines

Assessing the baseline scenario in an AFOLU project can be particularly challenging due to the variety of specific requirements within each methodology.

Some questions VVBs should consider when assessing alternative land use scenarios and whether these scenarios are realistic and credible include:

- Do the land use scenarios include the continuation of pre-project land use, the proposed project activity and an alternative land use within the project boundary?
- Do the land use scenarios include the observed land use activities in surrounding geographical areas with similar socio-economic and ecological conditions?
- Do the land use scenarios include activities that occurred within the proposed project activity boundary in the past 20 years?
- Is the identification of a realistic and credible land use scenario based on analysis of land use records, field surveys and interviews? Project proponents must justify the baseline scenario, and claims of alternative land uses, by providing sufficient evidence such as reports on geospatial planning, legal requirements and economic feasibility studies.

3.2.4 Additionality

Overview

Additionality is the concept that credited GHG emission reductions and removals must exceed (ie, be additional to) what would have been achieved under the business-as-usual scenario, and credited reductions and removals must be attributable to the intervention of the carbon market.

Specific requirements and criteria for demonstrating additionality are specified in methodologies. VVBs must assess project additionality against these criteria in full. Methodologies may reference additionality tools from the VCS or approved GHG programs such as CDM. When a methodology references a tool such as the CDM *Combined tool to identify the baseline scenario and demonstrate additionality*, VVBs need to assess additionality in accordance with the tool. VVBs must take account of relevant guidance issued in respect of the tool except where such guidance conflicts with VCS rules. For example, when projects apply the CDM tools for additionality, VVBs must refer to the decisions and guidelines issued by the CDM Executive Board on assessment of barriers, investment analysis and common practice analysis, though they can disregard the CDM requirement for prior consideration of carbon finance (the latter being addressed by the VCS requirement to have projects validated within fixed times of the project start date).

VVBs should note that VCS requirements on additionality set out in the *Methodology Requirements* section of the *VCS Standard* are high-level requirements not to be used by projects for the demonstration and assessment of additionality. Rather, the requirements provide the basis for methodologies to develop fully elaborated procedures for the demonstration and assessment of additionality.



Key Elements

The *VCS Standard* identifies two main approaches for demonstrating additionality. Both approaches require a regulatory surplus analysis step followed by the option of a project-specific approach or one of two standardized approaches (ie, a project method, or a performance method or activity method).

3.2.4.1 Regulatory Surplus

To be additional, a project must not be mandated by any law, statute or other regulatory framework or, for projects in non-Annex I countries, any *systematically enforced* law, statute or other regulatory framework. *Systematically enforced* means that projects required by law may still be eligible if the project proponent

EXAMPLE – Additionality

An IFM project undertaken in Rwanda has demonstrated additionality through the use of the *VCS Tool for the Demonstration and Assessment of Additionality in VCS AFOLU Project Activities* in accordance with the methodology. In conducting its assessment, the validation team reviewed the following:

Step 1: Identification of alternative land use scenarios to the proposed project activity

All identified alternative land use scenarios were deemed credible and legal.

Step 2: Investment analysis

The project proponent elected to use a simple cost analysis. However, the VVB deemed a simple cost analysis as inappropriate because the project proponent was expecting revenue from ecotourism in the project areas. The project proponent subsequently performed an investment comparison analysis using the IRR as a financial indicator. The results of the analysis indicated a five percent IRR for the project in the absence of carbon finance. Other alternatives suggested IRRs as high as 20 percent. No sensitivity analysis was conducted, which the VVB noted as a clarification request. The sensitivity analysis, which was later conducted, found the conclusions to be robust.

Step 4: Common practice analysis

The project proponent indicated that forest lands in Rwanda are typically over-logged, providing statistics related to the rate of logging as supporting evidence. The VVB indicated that this was insufficient to demonstrate that the project was not common practice, as it did not address the prevalence of sustainable forest management initiatives (relative to other alternatives) found across the country. In response, the project proponent provided statistics regarding the number of sustainably managed forests in the country. This evidence indicated that only 20 percent of forests were sustainably managed and that these forests were government owned. No examples of sustainable forest management on private lands were found by the project proponent. The VVB agreed that the project activities are not common practice.

can demonstrate that applicable laws are not enforced and non-compliance is widespread (provided the methodology does not state otherwise). VCS rules also allow certain laws and regulations to be disregarded that give comparative advantage to more emission intensive technologies or less emission intensive technologies. Known as Type E+ and E- policies, these rules ensure carbon finance does not create perverse incentives that stymie the implementation of local laws and regulations that would seek to contribute towards climate change mitigation.

3.2.4.2 Project Method

The project method requires that each project individually demonstrate that the project would not have been feasible in the absence of the intervention of the carbon market.

The project method involves a barriers analysis step and a common practice analysis step. The barrier analysis and common practice analysis is discussed in greater detail in Section 5.2.4.

Where projects apply an investment analysis as part of the project-based demonstration of additionality, VVBs should consider the following:

- Has an appropriate method for analysis been applied? For example, a wind energy project will generate revenue beyond the sale of VCUs. The use of a simple cost-benefit analysis is not likely to be appropriate to the project context. Rather, a more detailed investment analysis would be required.
- Are the applied financial or economic indicators such as internal rate of return (IRR) or net present value (NPV) suitable for the project type and investment decision, and supported with objective evidence?
- Has uncertainty been adequately addressed in the analysis?
- How sensitive is the final result to changes in key assumptions and data?

In assessing the results of a common practice analysis step, VVBs must pay close attention to the following:

- Are the geographic and temporal boundaries appropriate? Various factors may change and influence alternative choices across geographic areas. The rate that technologies and practices evolve in the region or sector must also be considered.
- Is the justified common practice threshold appropriate? The prevalence of a project depends on the number of project alternatives, among other factors. The *GHG Protocol for Project Accounting* suggests applying a lower common practice threshold where several alternatives exist.

- Does the project activity qualify to be considered as a first-of-its-kind technology? A common practice analysis may not be required for emerging technologies. However, VVBs must assess whether the project activity meets the definition of *first-of-its-kind*. VVBs are encouraged to refer to CDM guidance to determine if the project activity qualifies as *first-of-its-kind*.

3.2.4.3 Standardized Method

Standardized methods allow for more streamlined assessment of additionality than project-specific approaches. Standardized methods pre-determine additionality for a given class of project activity. Qualifying conditions and criteria are set out within the methodology. Rather than each project undertaking project-specific barriers and common practice assessments, projects are compared against clearly specified conditions and parameters pre-defined in the methodology. Further guidance on standardized approaches to additionality is set out in Section 5.2.4.

3.2.5 Ex-ante Quantification of Emission Reductions

Overview

VVBs must include an assessment of whether the GHG emission reductions and removals estimated in the project description will be achieved by implementing the project activity.

Key Elements

Providing assurance on future projections of GHG emission reductions and removals is inherently challenging. Various factors may influence the reductions ultimately achieved. In the assessment of GHG emission reduction and removal quantification, VVBs must, at minimum, review the following:

- Methodology equations: Where methodologies provide different options and procedures for quantifying baseline and project emissions, VVBs must confirm whether proper justification has been provided based on the choice of the baseline scenario, context of the project activity and other evidence provided. VVBs must also confirm whether correct equations have been used, reflecting the relevant methodological choices.

Keep in Mind

Some projects have inherent uncertainty that cannot be resolved prior to project implementation. Examples include scientific uncertainty related to the use of models in the quantification or uncertainty surrounding weather patterns in solar and wind projects. Any such uncertainties must be transparently identified in the project's assertion of ex-ante GHG emission reductions and removals.

- **Data and parameters:** Where data and parameters are determined at validation (ie, not monitored during the project crediting period), VVBs must assess all data sources, assumptions and calculations to verify that they are correct and applicable to the project. Where models are used to estimate GHG emission reductions and removals, VVBs must assess whether the model has been transparently and appropriately parameterized and calibrated for the project context. For example, where a project applies a model to estimate changes in soil carbon, and the model requires the use of a project-specific soil carbon decay rate, the VVB must determine the appropriateness of the data provided and its suitability to the given agro-ecological zone. In some cases, VVBs may need to review relevant peer-reviewed literature to ascertain the validity of the data or parameters provided by the project proponent.

EXAMPLE – Ex-ante quantification of GHG emission reductions

An off-grid, run-of-river hydroelectric project is being developed in Indonesia where the baseline scenario is the use of diesel generators. The methodology allows for determining the baseline based on the energy consumption of the technology in use in the absence of the project activity.

Baseline emissions are calculated, as follows:

$$BE_{CO_2,y} = EBL,y * EF_{CO_2}$$

Where:

$BE_{CO_2,y}$	= Emissions in the baseline in year y; tCO ₂ e
EBL,y	= Annual energy baseline in year y; MWh
EF_{CO_2}	= Fuel emission factor; tCO ₂ e/MWh

A default value of 0.8kg CO₂e/KWh is used for diesel generation units. The annual energy baseline consumption is estimated to be 600KWh. In assessing the ex-ante emission reduction estimates, the VVB focused on the proposed annual energy baseline. Public data indicated that the average household electricity consumption was 350KWh per year. As a result, the project proponent prepared and justified a conservatively low forecast of annual energy consumption in the project description.

- **Uncertainty:** VVBs must account for any uncertainty associated with measurement. VVBs must also consider other sources of uncertainty such as uncertain future project activity or performance levels. For example, where a project uses a model to estimate forest regrowth, local climate variability can influence forest regrowth patterns.
- **Conservativeness:** Where VVBs find uncertainty associated with a project's data and parameters, the conservativeness principle should be applied to adjust estimates of GHG emission reductions and removals and, where appropriate, manage the risk of associated uncertainty.

3.2.6 Leakage

Overview

Many GHG projects, whether related to energy, industrial processes or AFOLU, have the potential to result in leakage (ie, the increase of GHG emissions outside the project boundary as a result of the project). VVBs must include an assessment of leakage emissions within the same country as the project if such emissions are measurable. Each methodology sets out processes to calculate leakage emissions.

Key Elements

Effects from leakage on all carbon sources, sinks and reservoirs need to be assessed, and significant effects must be considered when calculating net GHG emission reductions or removals. Accounting for positive leakage (emission reductions that occur outside the project area as a beneficial spill-over effect from implementing the project activity) is not allowed.

VVBs must approach leakage quantification in the same manner as baseline and project quantification, assessing all data sources, assumptions and calculations to verify accuracy and applicability.

Keep in Mind

When a project includes timber harvesting, as in IFM and some REDD and ARR projects, market leakage can be calculated using a discount factor as set out in the *AFOLU Requirements*. When validating a market leakage discount factor, VVBs need to be aware that project proponents are incentivized to select the lowest discount factor possible to maximize net emission reductions or removals claimed by the project.

EXAMPLE – Leakage

A REDD project is developed in Kenya in accordance with a VCS methodology for avoided mosaic deforestation in dryland forests. The project implements a variety of leakage mitigation activities that intend to provide economic alternatives to slash-and-burn agricultural practices. The methodology quantifies activity-shifting leakage using a cumulative model of combined deforestation or degradation and observations from a leakage area during each monitoring period.

With no historical leakage observations, no data on participation in leakage mitigation activities, and no certainty as to the extent that leakage mitigation activities will be implemented during the life of the project, estimating an ex-ante leakage rate is highly uncertain. At validation, the VVB randomly selected and visited a leakage area used in the model and confirmed that the primary agents of deforestation had access to the leakage area. In addition, the VVB examined the topographic characteristics, ownership structure, soil productivity and access points of selected leakage areas and identified a material discrepancy: five plots in the leakage area did not have landscape configurations comparable to the project area. The project proponent was required to select different plots.



For non-AFOLU projects that reference CDM tools for calculating leakage, such as from fossil fuel combustion, electricity consumption or transportation, VVBs must ensure that the procedures and criteria specified in the tools have been applied appropriately.

For AFOLU projects, VVBs must assess if the project has accounted for any leakage considered to be significant (ie, greater than the *de minimis* threshold of five percent of total GHG emission reductions and removals) for three types of leakage: market leakage, activity-shifting leakage and ecological leakage. Further guidance on the three types of leakage in AFOLU projects is provided in Section 5.2.6.

For REDD and IFM projects, VVBs must carefully examine all assumptions prior to validating the leakage rate. At each verification event, VVBs must visit leakage mitigation zones (eg, the leakage belt in REDD projects) and, where applicable, inspect the management plans and/or land-use designations of all lands owned by the project proponent to ensure affected lands have not materially changed as a result of the project leakage.

3.2.7 Monitoring Plan

Overview

A monitoring plan includes details about monitoring parameters, schedules and process. The plan must describe the entire system employed by a project proponent for obtaining, recording, compiling and analyzing GHG data and information, as well as descriptions of the roles and responsibilities of those involved. Monitoring plans must be assessed by VVBs to ensure that the GHG emission reductions and removals generated by a project will be measurable and verifiable.

Key Elements

VVBs must confirm that a project's monitoring plan conforms to requirements set out in the applied methodology. In addition, VVBs must assess the relevant data quality management procedures for generating verifiable GHG data and avoiding material errors in reported GHG emission reductions and removals.

Keep in mind

For AFOLU projects that require field measurements to monitor changes in carbon stocks, VVBs must assess whether the project's sampling approach is appropriately documented and in accordance with the guidelines established by the methodology. VVBs must consider whether the monitoring plan includes target precision levels, sample site locations, stratification, number of plots per strata, types of plots used, frequency of measurement and appropriate quality control checks such as a field protocol or standard operating procedures for data collection.

VVBs should consider the following:

- Data monitoring, calibration or other similar procedures need to be consistently performed, according to validated methods.
- Recognized areas of data uncertainty and risks for material error need to be adequately managed through data controls and quality assurance checks.
- Record-keeping practices need to result in the generation of sufficient levels of documentary evidence to support assessment against all relevant criteria.
- Controls and procedures need to be in place to avoid intentional or unintentional alteration or destruction of data.
- Controls need to be in place to ensure participating staff are sufficiently qualified.
- The project proponent needs to demonstrate sufficient management oversight and accountability for the conduct of monitoring procedures.

Discrepancies between a project's monitoring plan and the monitoring requirements in the applied methodology must be cited as a material discrepancy.

3.2.8 Methodology deviations

Overview

Methodology requirements may be impracticable in some specific project circumstances. The VCS Program permits deviations from the applied methodology where they pertain to the criteria and procedures relating to monitoring and measurement. Deviations relating to any other part of the methodology are not permitted and require a methodology revision.

Key Elements

The limited scope of permissible methodology deviations implies that VVBs should be cautious when assessing the validity of proposed deviations. VVBs must ensure that methodology deviations do not negatively affect the conservativeness of the quantification of GHG emissions reductions or removals, except where the deviations result in greater accuracy. VVBs must also note that past methodology deviations are not precedent setting (ie, approval of a particular deviation does not grant approval of the similar deviations in the future).

In most cases, VVBs should be able to recognize whether a methodology deviation relates only to the procedures relating to monitoring and measurement. However, given the interconnected nature of many methodologies, VVBs should be aware that such deviations may have implications on other provisions of

the methodology (eg, equations for quantification) and must assess this possibility when evaluating a proposed deviation.

EXAMPLE – Methodology deviation

A methodology requires the use of a default factor to calculate project emissions and no options are provided for developing an alternative factor. At validation, the project proponent proposes the use of an alternative, peer-reviewed, region-specific factor as a methodology deviation. The project proponent also proposes a new quantification approach that alters the equation for calculating baseline emissions. The VVB rejects the proposed deviation to the quantification approach, citing the fact that the proposed deviation is not specific to the “procedures relating to monitoring and measurement”. However, given that the default factor is a parameter available at validation, the VVB determines that the proposed deviation is allowed. The VVB finds that while use of a regional default factor may result in less conservative quantification of GHG emission reductions or removals, it increases accuracy.

The same methodology requires the use of particular measurement equipment to monitor methane emissions in the project scenario. At validation, the project proponent proposes an alternative model of monitoring equipment due to the particular model specified in the methodology no longer being sold in the market. The project proponent demonstrates that the alternative monitoring equipment does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals.

The project proponent documents the use of a regional default factor and more modern measurement equipment in the project description as methodology deviations. The VVB also documents in the validation report that the deviations are appropriately described and justified, and that the project remains in compliance with VCS rules. The VVB issues a positive validation. At the subsequent verification, the VVB will take note of the methodology deviations when reporting on the implementation of the project activity.

3.2.9 Project Description Deviations

Overview

Projects may be implemented differently from the validated project description, or the project may change over time. Further, project proponents may want to switch to use the latest version of a methodology or a different methodology altogether, recognizing the development and evolution of methodologies. In such cases, the VCS Program allows project description deviations at the time of verification.



Key Elements

Where a project description deviation is proposed, VVBs must first ascertain whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Guidance on these three types of impacts is set out in the CDM *Guidelines on assessment of different types of changes from the project activity as described in the registered PDD*. Determination of whether the deviation impacts any of these three elements must be consistent with the CDM guidance and apply the following conditions:

- Where the deviation impacts applicability of the methodology, additionality or appropriateness of the baseline scenario, the project proponent must describe and justify the deviation in a revised version of the project description. The requirement for a revised project description is in recognition of the deviation being a substantial change to the project.
- Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the project proponent must describe and justify the deviation in the monitoring report. The deviation is documented in the monitoring report in recognition of the deviation being a more limited change to the project.

VVBs are required to assess whether the deviation is appropriately described and justified. VVBs are further required to determine whether the project remains in compliance with VCS rules. The findings and conclusions must be reported in the verification report and the deviation must also be reported on in all subsequent verification reports. Where the assessment results in a negative conclusion, the verification report, and either the monitoring report or revised project description, must be provided to the VCSA, as set out in the *VCS Standard*.

VVBs must have experience of project validation, recognizing that assessment of project description deviations is a validation activity. If the VVB is not accredited or approved for validation for the applicable sectoral scope, it may still proceed if the following conditions are met:

- It holds accreditation for validation in at least one (other) sectoral scope.
- It has completed validation of at least five projects under the VCS Program or an approved GHG program, and such projects have been registered under the relevant program.
- The project description deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario (see the *VCS Standard* for further information on such deviations).



Note also that past project description deviations are not precedent setting (ie, each deviation must be assessed upon its merits and approval of similar deviations does not provide a sufficient basis for approval).

EXAMPLE – Project description deviation

A registered REDD project is undergoing inventory field work in preparation for the initial verification. While processing the inventory data, the project proponent realizes their GIS technician committed a processing error that resulted in incorrect mapping of the project area, leading to an omission of five percent of the project area. At verification, the project proponent proposes, through a project description deviation, expanding the project area to include the forests mistakenly excluded from the project area. The project proponent documents that the expansion would not have an impact on the applicability of the methodology, appropriateness of the baseline scenario nor additionality of the project. The VVB, determines that, consistent with the *CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD*, the addition of project activity sites may impact the validity of the investment analysis or barrier analysis as validated in the project description. The VVB requests that the project proponent describe and justify the deviation in a revised version of the project description.

A registered ARR project undergoes a change in management that results in modifications to various silviculture techniques. The project proponent now conducts re-planting, fertilization and other management approaches in a manner unlike how it was reported in the project description. The project proponent describes the new techniques in the monitoring report and justifies that the deviation does not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

When assessing these deviations, the VVBs conclude in each verification report that the deviations are appropriately described and justified, and that the projects remain in compliance with VCS rules. At the subsequent verification, the VVBs will take note of the deviation when reporting on the implementation of the project activity.

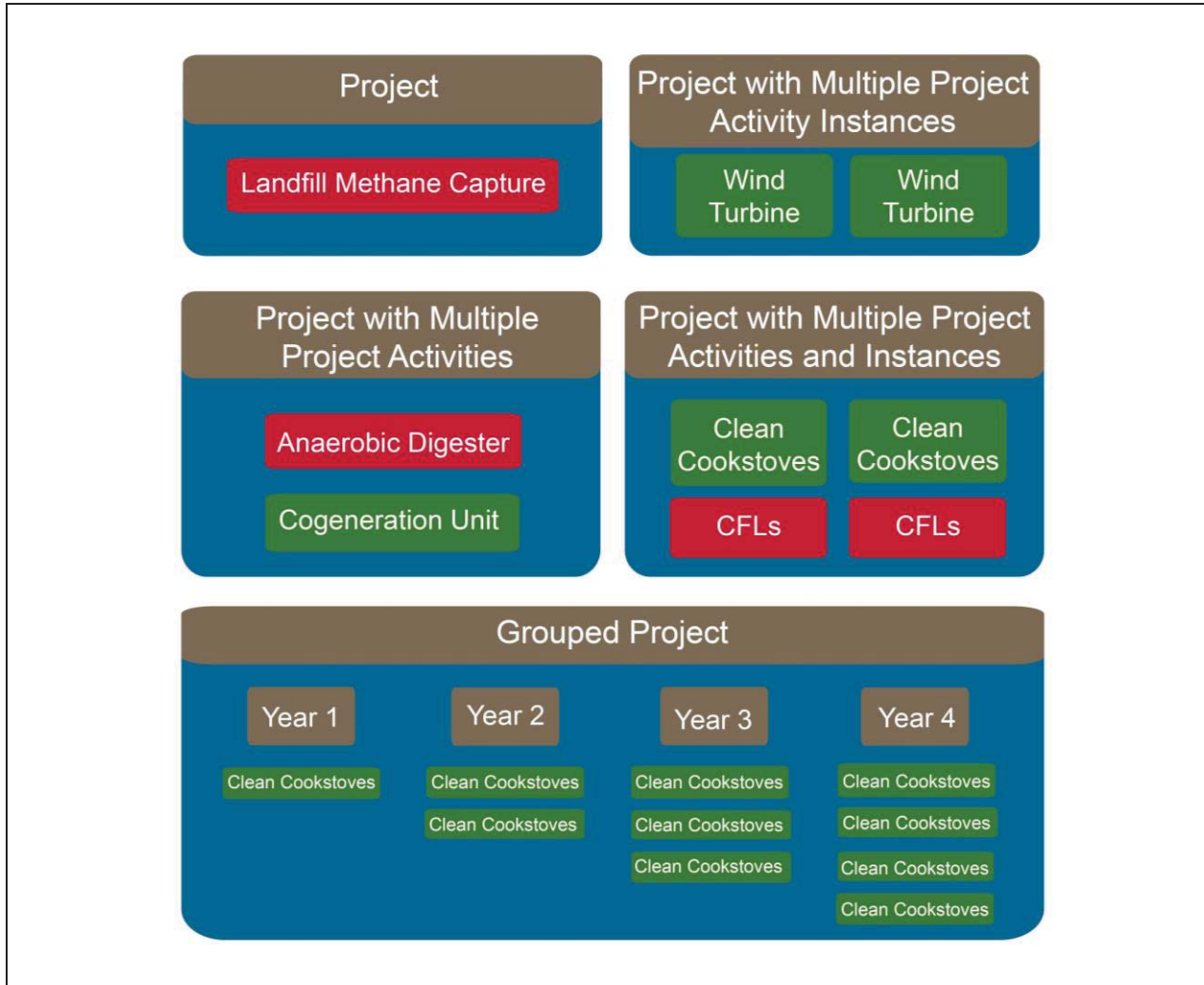
3.2.10 Projects with Multiple Project Activities or Multiple Project Activity Instances

Overview

Under the VCS rules, project proponents can combine multiple project activities or multiple project activity instances within one project. Project activity refers to the set of technologies or measures that generate GHG emission reductions and removals set out in a given methodology. Project activity instance refers to

an individual unit of a project activity. For example, if the project activity is the implementation of efficient cookstoves, each individual cookstove represents a project activity instance. Diagram 1 below provides a schematic overview of the five project configurations that are allowable under the VCS Program.

Diagram 1: Project Configurations Allowable Under VCS Rules



Key Elements

Projects with multiple instances of project activities or multiple project activities need only one project description and a single validation is undertaken.

For projects with multiple instances, the demonstration and assessment of baseline and additionality is combined, because multiple project activity instances are undertaken as part of the same investment decision.

A project with multiple project activities refers to the implementation of different types of project activities and can entail the application of a combination of methodologies. VVBs must perform the assessment of baseline and additionality separately for each project activity, except where these can be integrated by using the same tool and/or procedures for each activity (eg, generation of electricity from methane captured in an anaerobic digester). In addition, VVBs must consider

whether the project proponent has provided sufficient evidence to establish the impracticality of a separate demonstration of additionality. For example, multiple additionality assessments are unnecessary where a project proponent implements different project activities at a single facility such as the installation of an anaerobic manure digester and electricity generation system on a farm. However, where a project

Keep in Mind

VVBs should consider whether multiple project activity instances are simply separate projects.

For example, where instances are geographically distant, baseline and additionality characteristics for these instances may be quite different, given that common practice, local laws and other characteristics may vary. VVBs should assess whether aggregated baseline and additionality assessments would yield the same outcome as an individual assessment of each instance.

EXAMPLE – Projects with multiple instances of project activities

Deciding whether baseline identification and additionality demonstration can be performed jointly or separately depends on the circumstances of the project activity instances. The following two examples require different approaches:

1. A wind energy project with total capacity of 12.5 MW comprises ten wind turbine generators of varying capacities. All the wind turbines are located in the state of Karnataka, India and were commissioned between 2010 and 2012. The electricity generated is sold to the state electricity supply company on the basis of power purchase agreements. Based on the baseline scenario and additionality assessment, the VVB concludes that the project activity conforms to the VCS definition of a project with multiple instances. The baseline identification and additionality demonstration for the ten wind turbines can be performed jointly.
2. A landfill gas project captures methane for electricity production at three different landfill sites, located in the states of Colorado, Virginia and Texas in the United States. Different local regulations apply at each site, and waste management practices also differ. The VVB concludes that the identification of the baseline and demonstration of additionality cannot be done jointly for the three landfills, and each site would need to be considered as a separate project.

includes implementation of energy efficiency retrofits on one site and implementation of fuel switch on another site, the VVB should assess whether both project activities emanate from a single investment decision.

3.2.11 Grouped Projects

Overview

VCS rules for grouped projects allow for the expansion of project activities over time and over a geographically dispersed area. New project activity instances can be added to the project over time (ie, following initial project validation) within predefined geographic areas, provided they meet the set of eligibility criteria set out in the project description. The new instances are validated at the time of verification.

In keeping with the intent of the CDM rules on Program of Activities (PoA), the VCS rules on grouped projects are intended for programmatic initiatives that are typically managed by a central coordinating entity. The rules are designed to facilitate the scaling up of project activities where the GHG emission reductions generated by each project activity instance are small. Examples of activities well suited to the grouped project approach include solar home systems, installation of efficient lighting and installation of clean cookstoves.

Key Elements

VVBs should focus on the following key elements when validating grouped projects:

- Geographic areas: VVBs must ensure that the project description clearly identifies the geographic areas within which new instances may be added. Geographic areas must be defined using geodetic polygons and provided in a KML file. Such geographic areas need not be contiguous and may be large or small, noting the grouped project requirements for additionality and baseline assessments of the geographic area.
- Identification of baseline scenario and demonstration of additionality: The assessment of baseline scenario and additionality is based upon the initial instances included within each geographic area. VVBs must ensure that, for each project activity, a single baseline scenario exists for each geographic area. VVBs must also ensure for each project activity that additionality is demonstrated across the entirety of each geographic area. Failing this, VVBs must require that the geographic areas are redefined such that the requirements are met. As with projects with multiple instances, project activity instances within a grouped project should be part of the same investment decision if they are to be included in a single project.
- Eligibility criteria: VVBs must ensure that an appropriate set of eligibility criteria are established for each combination of project activity and geographic area. The criteria are

used to validate new project activity instances, essentially serving as a checklist to determine whether the instances share the same attributes as the initial set of validated project activities instances. For example, eligibility criteria for grouped projects implementing CFLs may state that new instances must be installed in grid-connected households and the CFLs must be at least 30 percent more expensive compared to conventional incandescent bulbs. In general, VVBs must ensure that the eligibility criteria are developed sufficiently that such determinations could be made when validating new instances. Eligibility criteria must also conform to any restrictions set out in the methodologies applied.

- **Monitoring and GHG information system:** VVBs must ensure that the project has an appropriate monitoring plan that includes a sampling plan to collect data from all project activity instances and information systems, allowing for centralized data collection. VVBs must ensure the sampling plan is able to generate statistically significant results.
- **Methodology:** Grouped projects can apply methodologies other than those designed specifically for grouped projects. When reviewing the methodology and the project's application of it, VVBs must be mindful of any capacity limits applicable to the methodology. VVBs need only ensure that project activity instances and clusters adhere to such capacity limits; the grouped project as a whole may exceed the capacity limit.

3.2.12 Assessing Non-Permanence Risk

Overview

AFOLU project proponents must complete a self-assessment of the potential transient and permanent losses to their project's carbon stocks over a 100-year period. The VCS *AFOLU Non-Permanence Risk Tool* generates risk ratings that are applied to the net change in the project's carbon stocks, thereby determining the number of credits that the project proponent deposits into the reserve of non-tradable credits, the AFOLU pooled buffer account. At verification, VVBs must assess the project's non-permanence risk based upon the project's *Non-Permanence Risk Report*.

Key Elements

The non-permanence risk rating only needs to be assessed for projects with GHG emission sources or sinks that can be reversed. GHG project activities are not subject to buffer withholding if they do not store carbon in biomass or carbon pools, such as projects that reduce N₂O, CH₄ or fossil-derived CO₂.

Risk factors are classified into three categories: internal risks, external risks and natural risks. The risk tool assesses internal risk further by evaluating sub-categories: project management, financial viability, community engagement and project longevity.



VCS GUIDANCE

When assessing the non-permanence risk report for AFOLU projects, VVBs must refer to the most recent version of the risk tool and assess whether the project meets the risk threshold identified for each risk category and the project as a whole.

In assessing risk factors, VVBs should pay particular attention to the following:

- When assessing internal risk, VVBs must evaluate the risk that project activities will not be continued in the future. VVBs should note that the project proponent does not have to provide evidence of project ownership for the entire project longevity. Rather, the project proponent must demonstrate it can obtain and maintain project ownership for the entire project crediting period. For example, evidence of project ownership for a 10-year period is acceptable if project ownership is renewable at the end of 10 years.
- For all AFOLU project types, the entire project longevity must be covered by management and financial plans that demonstrate the intention to continue the management practices. The project longevity risk rating is determined by whether the project proponent has a legal agreement or requirement to continue the management practice. A legal agreement or requirement must be in place to continue the management practice. A legal agreement to protect land, such as national designation as a protected area, is insufficient to demonstrate that a management practice will continue for the

Keep in Mind

If a project proponent is aware that part of the project area has comparatively greater risks, the project area can be stratified for the purpose of the risk analysis. The VVB would assess the non-permanence risk for each stratified project area. The risk rating would then apply to the net change in the project's carbon stocks of the respective stratified area.

EXAMPLE – Assessing Non-Permanence Risk

A wetlands rewetting and conservation (WRC) project in Malaysia began implementing activities to conserve an undrained peatland in 2005. The project was verified in 2011. In preparing a non-permanence risk assessment, the project proponent evaluated the project's financial viability and opportunity cost based on, among various factors, previously secured funding and alternative land uses developed prior to the project start date.

However, a major donor discontinued funding for the project in 2010. Meanwhile, growing oil palm demand led to a significant increase in the land value of the project's surrounding areas, compared to the 2005 land value. The project's opportunity cost increased with respect to its main alternative land use, which the project proponent identified as draining peatland for oil palm production.

Upon verifying the non-permanence risk assessment, the VVB noted a non-conformance that the project proponent did not correctly apply the risk tool. The project proponent improperly estimated the cumulative cash flow breakeven point and the net present value (NPV) based on data and information from the project start date and not information from the date of the current assessment.

The project proponent revised the risk assessment for both financial viability and opportunity cost and estimated risk based on the most recent data available from the date of the assessment.

length of the project.

- Projects with longevities of less than 30 years are not permitted under the VCS, and VVBs in such cases must fail the risk assessment.
- While risk is assessed over a 100-year period from the start of the current monitoring period, the analysis should be based on data and assumptions that accurately reflect current conditions, not past or future circumstances, when determining all risks, including the opportunity costs and financial viability.
- When assessing the cumulative cash flow breakeven point, VVBs must evaluate whether recurring capital expenditures have been accounted for in the breakeven analysis.

3.3 KEY ELEMENTS OF THE VALIDATION AND VERIFICATION PROCESS

3.3.1 Sampling, Validation and Verification Plans

Overview

Sampling plans and associated validation or verification plans describe the planned validation or verification activities and schedules. These plans also address what data and information will be sampled and how it will be tested. A robust sampling plan is critical in ensuring the robustness of the validation or verification.

Key Elements

In developing sampling, plans, VVBs must consider the objectives, scope, criteria, materiality and level of assurance for the proposed validation or verification assessment.

3.3.1.1 Sampling Plans

A sampling plan should describe: risks of material error, types of data and information to be assessed, methods to be used to assess the data and information, and the amount of each type of data or information to be assessed.

To determine each of these, a VVB must first conduct a risk assessment to identify areas that may potentially result in material discrepancy.

Risk assessments must follow the guidelines set out in Annex A.2.4.6 of *ISO 14064-3* and include, at minimum, reviews of the following:

Keep in Mind

Sampling applies to both quantitative and qualitative data and information. Qualitative information (eg, procedures or applicability) is particularly relevant for validation. Quantitative data (eg, monitored results) is a principal focus at verification.

- **Background information:** Contextual information is provided to help readers understand the nature, scale and complexity of the project.
- **Potential sources of material error:** Potential sources of material error will differ for validation and verification, reflecting the different objectives as set out in Section 2.1.
- **GHG information system controls:** Controls are needed to avoid or correct errors (ie, control risk) for each source of potential material error. Consideration should be given to the full data chain of custody for all relevant data types, considering potential risks of error at each step in the chain.
- **Residual risks:** Any areas of risk not adequately addressed by the control systems should be identified for inclusion in the sampling plan. *ISO 14064-3* identifies a range of testing methods that can be employed alone or in combination to assess a particular residual risk.

Keep in Mind

Data and information vary in reliability. *ISO 14064-3* delineates three general types of evidence in order of decreasing reliability:

- **Physical:** directly observable such as witnessing a meter calibration.
- **Documentary:** written or electronic records, logs, data or procedures.
- **Testimonial:** verbal information gathered through interviews.

For less reliable sources of evidence, cross-checking should be used.

Given that physically observed data is considered most reliable, and that VVBs are required to provide a reasonable level of assurance, site visits must be included in validation and verification plans.

3.3.1.2 Data Testing Methods and Determining Representative Samples

VVBs may employ several testing methods, including, *inter alia*: simple random sampling, stratified random sampling, systematic sampling, cluster sampling and multi-stage sampling.

Choice of testing method (or combination of methods) will depend on the data in question and the nature and extent of risks identified. VVBs should apply their professional judgment in determining the most appropriate method. VVBs are encouraged to use the following resources as guidance:

- *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (PoAs);*
- *IPCC 2006 Guidelines for National Greenhouse Gas Inventories;*
- *IPCC 2003 Good Practice Guidelines for Land Use, Land-Use Change and Forestry.*

Multiple cross-checking methods are advisable where data is less reliable. VVBs must also determine the amount of data required for the assessment (eg, how many data points or records) by selected methods. Data samples must be representative of the whole data set and reflect the risk assessment.

3.3.1.3 Validation and Verification Plans

VVBs must prepare validation and verification plans that describe the schedule of validation or verification activities, documents to be reviewed, locations to be visited, validation or verification team duties, and associated logistical details and arrangements.

Design of the validation or verification plan must be informed by the sampling plan.

EXAMPLE – Sampling and Verification Plan

A gas-to-biomass fuel switching project using a methodology for fuel switch from fossil fuels to biomass residues for thermal power is undergoing its first verification. During the risk assessment portion of sampling plan development, the VVB identified baseline emissions from fossil fuel combustion for heat generation ($BE_{HG,y}$) as a key emission source with potential for material error. The equation used to calculate $BE_{HG,y}$ is as follows:

$$BE_{HG,y} = \frac{HG_{PJ,biomass,y} \times EF_{FF,CO_2,y}}{\eta_{heatFF}}$$

Where:

$BE_{HG,y}$	=	Baseline emissions from fossil fuel combustion for heat generation in the heat generation equipment (tCO ₂ e/yr)
$HG_{PJ,biomass,y}$	=	Heat generated with incremental biomass residues used as a result of the project activity during the year y (GH/yr)
$EF_{FF,CO_2,y}$	=	CO ₂ emission factor of the fossil fuel type displaced by biomass residues (tCO ₂ e/GJ)
η_{heatFF}	=	Average net efficiency of the heat generation equipment if fired with fossil fuels in the baseline (ratio)

Below is a simplified summary of related details on the sampling plan. In developing the verification plan, the VVB ensured that the site visit was scheduled to correspond with a scheduled calibration event, sufficient time was allocated to perform the planned data sampling and testing, and appropriate verification team members were assigned to specific tasks.

Potential Discrepancy	Reporting Risk	Control Risk	Planned Sampling and Testing
$HG_{PJ,biomass,y}$	Meter Calibration	Medium (use of non-accredited firm)	Physically observe calibration firm conducting calibration Review all calibration logs Interview calibration technicians
	Data entry and storage in spreadsheet	Very low (automated data acquisition and uploading; validated previously)	Trace back limited sample data to raw data High level review of dataset to ensure continuity of data over reporting period
$EF_{FF,CO_2,y}$	Data entry and storage in spreadsheet	Medium (manual entry to spreadsheet)	Review spreadsheet to confirm that validated values are used
$\eta_{heat,FF}$			
$BE_{HG,y}$	Spreadsheet used for calculations	Low-Medium (good access controls, validated previously)	Recalculate a limited sample of daily results

3.3.1.4 Updating Sampling, Validation and Verification Plans

As data are sampled and tested, VVBs will likely need to change the initial risk assessments. VVBs must update sampling, validation and verification plans in an iterative manner according to increases or decreases in the perceived level of risk. Some situations may necessitate extending the validation or verification schedule or number of sites visited. Adjustments, while potentially inconvenient and involving some cost, are necessary to ensure that a reasonable level of assurance can be provided.

3.3.2 Resolution of Material Discrepancies and Clarification Requests

Overview

Resolution of identified actual or potential material discrepancies is an important part of finalizing a validation or a verification. All identified discrepancies and areas for clarification must be clearly communicated to the project proponent, addressed and transparently documented.

Key Elements

Validation and verification almost always result in the identification of areas requiring further clarification and discrepancies that must be addressed. VVBs must clearly document the following:

- Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.
- Corrective action requests (CARs): The VVB has identified a material discrepancy or non-conformance that the project proponent must address.

When issuing CLs and CARs to project proponents, the following guidelines apply:

- VVBs must be careful not to offer consulting advice when issuing CARs such as how to address noted deficiencies. Otherwise, the independence of the VVB is called into question.
- The VCS validation and verification reporting templates require that VVBs document the process used to resolve material discrepancies (not just the discrepancies themselves).
- VVBs must document all identified CLs and CARs and summarize the CLs and CARs in the validation or verification report.
- All CLs and CARs need to be fully resolved prior to issuance of a positive validation or verification statement. In the case of validation, it is unacceptable for VVBs to leave material discrepancies unresolved (eg, deficiencies in a project's data management system), which a verifier may need to ensure is addressed at a later date.

3.4 COMMON TECHNICALLY CHALLENGING AREAS

During validation and verification, common areas of technical challenge arise across a wide variety of projects and methodologies. This section identifies some common issues and provides related guidance.

3.4.1 Complete Identification of GHG Sources, Sinks and Reservoirs

Overview

A key component of assessing project and baseline emissions is the complete identification of relevant GHG sources, sinks and reservoirs. While the methodology identifies the relevant types of GHG sources, sinks and reservoirs, the project proponent must determine the specific sources, sinks and reservoirs present and ultimately quantified for a given project.

Key Elements

Identification of a complete set of relevant GHG sources, sinks and reservoirs can be challenging, especially for large or complex project sites, or where the project involves multiple sites. For many projects, this can be a potential source of material error.

During validation, VVBs must first assess the project proponent's process for identifying relevant emission sources (eg, how systematic was the process and who was involved in carrying it out?) to identify the associated control risk. The sampling plan could then be developed accordingly. In addition to review of engineering drawings and interviews with key staff, careful attention during site tours (if the facility has already been constructed) can be effective in confirming identified GHG sources, sinks and reservoirs.

During verification, the verification team must not only visit all relevant sites but also sample an adequate number of sites based on a risk assessment.

In both validation and verification, the assessment team will need sufficient technical experience related to the methodology and project technology. Deficiencies in this area have in the past led VVBs to overlook material discrepancies.

3.4.2 Calibration

Overview

Calibration of monitoring equipment is critical in ensuring accurate reporting of results. This is a common problem area for projects. Calibration is frequently conducted incorrectly or at inappropriate times. The result is often a material impact on the reported emission quantifications.



Key Elements

Calibration problems can often be traced to poor calibration procedures, including communication of calibration schedules and associated record keeping. Problems are also common when unqualified or inexperienced technicians are employed.

Calibration is an issue for both validation and verification. During validation, VVBs must focus on ensuring that calibration plans meet the requirements specified in the applied methodology and/or by the equipment manufacturer. Calibration schedules need to be clearly presented and communicated to relevant staff. It should also be clear how verifiable records of calibration will be generated.

During verification, attention must be placed on reviewing objective evidence, demonstrating that calibration was performed according to plan. Depending on assessed risk and project type, the use of cross-referenced data and information is recommended. Best practice examples include timing a site visit to align with a calibration event, reviewing calibration logs and/or interviewing the individual(s) conducting the calibration (which often involves outside service providers).

Determining minimum required experience or qualifications for a calibration technician or organization can be challenging. Ideally, the project uses calibration organizations accredited to relevant standards. Other non-accredited organizations may also perform calibrations if permitted by an equipment manufacturer's specifications and the relevant methodology. Ultimately, VVBs must assess whether calibration practices follow current good practice as required by Clause 5.10 of *ISO 14064-2* and meet any requirements

EXAMPLE – Calibration

A landfill gas destruction project in the United States has developed a VCS project using a consolidated methodology for landfill gas project activities. In order to minimize the risk of calibration drift in gas flow meters, the project proponent established a quarterly field check schedule.

During verification, the VVB discovered that planned quarterly checks were missed, and only single checks at the beginning and end of the annual reporting period were conducted. The final check showed that the calibration had drifted significantly, over-reporting gas flows by 10 percent. The monitoring report was based on unadjusted meter readings.

The VVB cited two material discrepancies:

1. Material error of up to 10%: To resolve this issue, the project proponent conservatively assumed that the meter over-reported flows by 10% for the entire monitoring period.
As a result, the proponent discounted measured flows (and thus reductions) for the entire year by 9.1 percent [$10 \div (100 + 10)$].
2. Non-conformance with the validated monitoring plan: To resolve this issue, the project proponent submitted a project description deviation applicable to the reporting period, justifying the conservativeness of the alternative approach. The project proponent also identified why the scheduled checks were missed and enhanced associated monitoring and quality assurance procedures accordingly.

specified in the methodology. To avoid significant challenges during verification, it is important that these procedures are carefully scrutinized during validation.

3.4.3 Emission Factors, Measurement Abbreviations and Conversion Factors

Overview

Emission factors, conversion factors and measurement abbreviations, while often taken for granted, are all common areas where material errors may be introduced into the quantification of GHG reductions and removals.

Key Elements

Accuracy is contingent on proper use of the factors and assumptions embedded in GHG calculations. Accuracy likewise relies on proper understanding of any abbreviations or industry-specific language. The following are examples of factors and abbreviations:

- Emission factors (eg, tCO₂e per MWh electricity, tonne CO₂e per m³ natural gas);
- Conversion factors (eg, BTU/m³, g/L, kg/tonne, GWPs);
- Measurement abbreviations (eg, MMBTU, SCF, kt, Nm³).

VVBs must ensure that factors and abbreviations are appropriate and meet the requirements of the applied methodology. VVBs must ensure the sampling and testing are appropriate for the assessed risk. Spreadsheets can pose significant risks, especially where associated data quality controls are minimal.

Experience from a range of GHG programs indicates that VVBs tend to devote insufficient time to sampling and testing emission factors, conversion factors and measurement abbreviations. Errors often emerge when spot checks are conducted by program administrators.

3.4.4 Models

Overview

Models are powerful tools used to provide GHG data where direct monitoring or simple estimation is not possible or practical. Models can, however, be complex. Results are sensitive to various inputs and key assumptions, making them a common source of material error.

Key Elements

Models can range from simple (eg, expressed as a single equation) to complex (eg, comprised of many equations incorporated into modeling software). Models can estimate emissions directly (eg, a landfill gas

generation model) or indirectly (eg, a forest growth and yield model that estimates changes in amount of woody biomass). There are two broad uses for models:

- Estimating *ex-ante* GHG data in a project description (eg, use of the CDM *Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site* to estimate *ex-ante* baseline emissions for a landfill gas project).
- Estimating *ex-post* GHG data in a monitoring report (eg, use of a forestry model that meets the requirements of VCS methodology VM0003: *Methodology for Improved Forest Management through Extension of Rotation Age* to estimate *ex-post* carbon stock changes in the baseline).

Given that models are often complex and have inherent uncertainty, VVBs must ensure that applied models apply conservative factors to discount for model uncertainty and use conservative assumptions and parameters that are likely to underestimate, rather than overestimate, the GHG emission reductions or removals. VVBs must also ensure that sufficient empirical testing has been conducted to calibrate the model accurately for the project. For example, where a forest growth and yield model is used to estimate change in carbon stocks, the model may need to be calibrated and/or validated through field measurements and compared against inventory data to ensure the appropriateness of the model for the project. Model results should be subjected to sensitivity analysis, taking into account variation in input parameters. It is also important that the validation or verification team include an expert experienced in the application of the particular model to ensure its correct use.

Keep in Mind

Key questions to consider when reviewing factors and abbreviations include:

- Is the factor appropriate for the project or baseline technology, fuel type, geographic location and time period?
- Are the correct units being used?
- Has there been confusion between CO₂ and CO₂e?
- Has there been confusion between GHGs such as CO₂ and CH₄?
- Have the VVB and project proponent clearly understood the abbreviations?
- Have the abbreviations been used correctly in the calculations?
- Have metric and imperial units been confused?

4 | Project Validation and Verification Reporting

Project validation and verification reporting is central to the transparency of validation and verification processes. Reporting provides a means for VCSA and other stakeholders to better understand VVB findings and supporting rationale. This ultimately increases market confidence in the VCS Program and its projects and VCUs. Reports are also an important tool during subsequent verifications, as they can provide useful inputs to a VVB's risk assessment.

4.1 REPORT TEMPLATES

Overview

The VCS Program ensures consistent VVB reporting by requiring the use of validation and verification report templates. Guidance is contained within each template to assist VVBs in properly documenting processes, findings and conclusions.

Key Elements

When preparing a validation or verification report, VVBs must address, at minimum, the specific items detailed within the VCS templates (*VCS Validation Report Template* and *VCS Verification Report Template*, respectively) and adhere to the structure of the template. However, VVBs can provide additional information. VVBs are encouraged to include additional documentation as annexes to the reports where needed.

The report templates have been developed to ensure both a minimum level of transparency in reporting and consistency in work undertaken by different VVBs. Both templates are structured in a similar manner covering the following key areas:

- **Introduction:** Covers objectives, scope, criteria, level of assurance and project description.
- **Process:** Addresses methods, objectives and criteria, including the sampling plan used to undertake the validation or verification.
- **Findings:** Identifies, discusses and justifies findings in specific areas identified in the templates.



- **Conclusions:** Provides a clear statement of conclusions, addressing specific items identified in the templates.

The verification template also includes a section for reporting on the validation process, findings and conclusions, which VVBs need to complete where a methodology deviation or project description deviation is applied to the project or where new project activity instances are added to a grouped project. In some cases, verification may also include gap validation of a project that is registered sequentially under the VCS and another approved GHG program.

4.2 REPORTING LEVEL OF DETAIL

Overview

A sufficient level of information and detail must be provided in validation and verification reports to allow readers to understand the validation or verification process and draw informed conclusions about the project.

Key Elements

Understanding the appropriate level of detail for reporting is a common challenge for VVBs. Reporting is simplified through various report templates where VVBs are instructed whether to provide more descriptions or more detailed discussion and justification.

All sections of the templates, other than validation or verification findings, require only a description. VVBs must indicate the activities conducted, methods used, criteria applied and other information as appropriate. Descriptions should be succinct, while providing enough detail for the reader to understand what approaches were taken. VVBs are not required to include details on why they pursued a chosen course of action.

In contrast, the validation and verification findings sections of the templates require the identification, discussion and justification of all conclusions. VVBs must not only indicate findings but must also provide details on the following:

- Project proponent assertions;
- Types and amounts of evidence sampled and tested;
- Material and non-material discrepancies identified and how they were addressed; and
- Results of data testing that support the validation or verification conclusions.

VVBs must also ensure that reports contain an itemized breakdown of GHG emission reductions and removals where appropriate. For example, where the net emission reductions and removals is the sum of

emission reductions and removals from changes in soil carbon, changes in both belowground biomass and aboveground biomass, as well as emission reductions and removals from each of the carbon pools must be stated and verified separately.

Where the monitoring report includes vintage breakdowns, the verification report must verify the emission reduction and removal volume for each vintage period specifying the exact start dates and end dates of the vintage period. This is required if VCUs are to be issued according to any vintage period breakdown in the monitoring report.

It is not necessary to provide detailed information such as the results of individual recalculations, notes from interviews and meetings, or detailed observations from site visits. This detailed information should still be retained outside of the validation or verification report in the form of validation and verification records. Such records assist VVBs in demonstrating conformance to *ISO 14064-3* and *ISO 14065* (eg, as part of accreditation assessment and surveillance). VCSA may also request such records as part of program oversight.

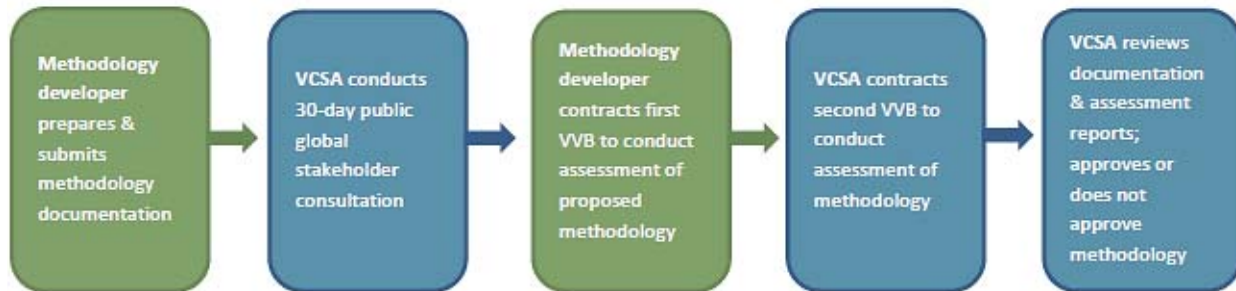
5 | Methodology Assessment

The VCS Program provides a unique, bottom-up approach to methodology development that incentivizes project proponents or other market participants to create new methodological approaches for accounting for GHG emissions reductions or removals in eligible sectoral scopes. Ensuring that VCS methodologies are robust is integral to quality assurance of the VCS Program. This section sets out guidance that VVBs are expected to follow when conducting methodology assessments.

5.1 GUIDANCE ON KEY ELEMENTS OF METHODOLOGY APPROVAL PROCESS

Assessment of new methodologies, methodology revisions, modules and tools are guided by the requirements and procedures set out in VCS document *Methodology Approval Process*. Methodologies submitted to VCS undergo a 30-day public consultation period followed by two independent assessments by qualified VVBs. Where both VVBs approve a methodology, VCSA conducts a final review prior to approving the methodology. Diagram 2 shows the main stages in the methodology approval process.

Diagram 2: Main Stages in the Methodology Approval Process



5.1.1 Key Elements of the Process

The methodology approval process is designed in stages that are sequential. VVBs conducting methodology assessments should bear in mind the following:

- **Initial VCSA review:** VCSA undertakes a review of all methodology elements submitted under the methodology approval process. The purpose of the initial methodology review is to ensure that the methodology documentation has been completed in accordance with VCS rules and is of a sufficient quality to enable its assessment under the VCS methodology approval process. The methodology developer may need to revise the methodology as a result of the preliminary VCSA review. VCSA may not accept methodologies into the process where they are not of the requisite standard or not in compliance with VCS rules. VCSA may also not accept methodologies that sanction politically or ethically contentious project activities or otherwise undermine the integrity of the VCS Program or broader carbon market. VVBs who are contacted to begin first assessment should therefore confirm whether VCSA has already accepted the methodology into the approval process and completed its preliminary review.
- **Public consultation:** Methodologies that have completed the initial VCSA review are posted for a 30-day public comment period. The VCSA will also host a webinar on the methodology during the public comment period.
- **First assessment:** The first assessment report cannot be issued before the public comment period concludes. This allows the methodology developer to take into account any public comments. It also allows the VVB to undertake an assessment of, and to document, how such comments were taken into account.
- **VCSA review:** VCSA reviews the methodology and the associated assessment report once the first assessment has been completed. VCSA may hire external experts as part of this review. Any CLs and CARs emerging from this review will need to be addressed by the developer during second assessment. VCSA may also issue CLs and CARs that the VVB

would need to address if the review indicates that the methodology has not been assessed in accordance with VCS rules. If CLs and CARs issued by VCSA are not satisfactorily addressed by the VVB, VCSA reserves the right to not accept the assessment report.

- Second assessment: The second assessment needs to include a review of the first assessment report and the most recent version of the methodology element. The second assessment report cannot be issued until the first assessment report has been issued. The second assessment must also take account of the findings from VCSA review. Where CARs issued by the first assessor cannot be resolved in a reasonable time frame, second assessment may begin once the draft first assessment report has been issued. The first and second assessors can simultaneously review unresolved CARs. All such CARs must be closed out before the respective VVB can issue the final first and second assessment reports.
- VCSA review: The VCSA review at this stage entails a thorough review of the methodology document and the second assessment report. Any CLs and CARs resulting from the VCSA review need to be addressed in the methodology and the second assessment may also need to be updated as necessary. VCSA may also issue CLs and CARs that the VVB would need to address if the review indicates that the methodology has not been assessed in accordance with VCS rules. If CLs and CARs issued by VCSA are not satisfactorily addressed by the VVB, VCSA reserves the right to not accept the assessment report.
- Reconciliation: Once the second assessment is completed, both VVBs need to approve the same final version of the methodology. The VVB who performed first assessment needs to update the first assessment report statement to take account of changes made to the methodology during second assessment. VVBs conducting a first assessment should therefore consider the time and costs of reviewing the methodology following second assessment.
- Final VCSA review and approval: VCSA undertakes a final review of the methodology when the developer submits the final version of the methodology document along with the final versions of the two assessment reports and a signed methodology approval request form. VCSA may make minor edits and clarifications in the methodology as part of the final review and approval process to ensure that methodologies approved under the VCS are written clearly and apply consistent terminology and formatting.

5.1.2 Role of the VVB

Under the methodology approval process, two VVBs are required to independently assess the methodology. The methodology assessment process is a desk review process that involves a thorough review of all the elements of a methodology as set out under the *Methodology Approval Process*. Methodology assessments typically entail an iterative review where the VVB issues CLs and CARs that must be addressed by the developer until the issues are resolved satisfactorily.

Methodology assessments require background research, document reviews, and interviews with experts and key stakeholders to determine whether criteria and procedures described in the methodology conform with the requirements and principles set out in the *VCS Standard* as well with scientific best practice. VVBs must also carefully evaluate the underlying assumptions and conceptual approaches that are used in methodology and explain whether and how the methodology takes into account relevant scientific and sector specific considerations.

VVBs conducting methodology assessments need to meet the eligibility criteria set out in the *Methodology Approval Process*. VVBs are responsible for assembling competent and qualified teams to undertake methodology assessments. VVBs must consider sector-specific competencies and capabilities of personnel when building assessment teams. VVBs must also ensure teams include an appropriately qualified, independent technical reviewer.

Some VVBs contract external experts as consultants where a methodology requires detailed technical or scientific expertise in a sector for which it does not have in-house expertise. For non-ARR AFOLU methodologies and methodologies that use a standardized methods, at least one of the VVBs must include in its assessment team a VCS-approved expert for the given project type. In many project types, the science or technology within a sector is continually evolving and experts play a key role in ensuring that a methodology reflects scientific best practice.

5.1.3 Role of VCSA

VCSA is responsible for managing the methodology approval process and for providing support and oversight to ensure that approved methodologies are consistent with VCS rules.

Each methodology submitted to the methodology approval process is assigned a program officer who is responsible for facilitating communications across the relevant stakeholders and for conducting a review of the methodology at various stages of the process. VCSA reviews methodologies upon initial submission of the methodology (before the methodology is posted for public consultation), after first assessment and after second assessment.

VCSA is also responsible for overseeing the second assessment. VVBs conducting second assessment sign a contract directly with VCSA (rather than the methodology developer). This agreement clarifies that



the VVBs' client is VCSA and ensures VCSA has the ability to oversee second assessment even while the methodology developer is responsible for financing the assessment. During second assessment, it is important that VVBs inform VCSA of progress related to all relevant milestones. Where milestones are not met in a timely manner, VCSA reserves the right to terminate the agreement and contract an alternative VVB following consultation with the methodology developer.

5.1.4 Effective Communications

Close communications between the methodology developer, the VVBs and VCSA is critical in ensuring that the methodology assessment is completed in a timely, efficient and robust manner. The VCSA program officer managing the methodology can help facilitate communication where appropriate. The program officer can also provide clarifications on VCS procedures and requirements as needed.

5.1.5 Seeking Clarifications from VCSA

If there is a lack of consensus on the methodology element between the methodology developer and VVBs, or between VVBs, either party may request that VCSA provide clarification or facilitate additional discussions between all parties to resolve the issue. While the VVBs are ultimately responsible for assessing the methodology element, the clarifications provided by VCSA may, in certain cases, take precedence over assessment findings of the VVBs.

5.2 KEY ASSESSMENT CRITERIA

Methodologies set out the detailed criteria and procedures that project activities must follow. Detailed requirements for methodologies are set out in the *VCS Standard* and other accompanying program documents such as the *AFOLU Requirements* and *ODS Requirements*.

When conducting a methodology assessment, VVBs need to assess whether the methodology conforms to VCS rules and whether the methodology has appropriate criteria and procedures to ensure conservativeness and scientific integrity.

VVBs must also ensure that methodologies are written in a manner that provides a prescriptive set of criteria and procedures that projects can apply and VVBs can audit against, thereby minimizing the scope for subjective interpretation, or gaming, by project proponents and VVBs using the methodology. This includes the use of precise language and the avoidance of vague terminology. For example, VVBs must ensure the proper use of key words *must*, *should* and *may*. Consistent with best practice, *must* is to be used to indicate a firm requirement, *should* is to be used to indicate a (non-mandatory) recommendation and *may* is to be used to indicate a permissible or allowable option. The term *shall* is reserved for VCS program documents and is generally not appropriate for methodologies.



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Methodology assessments must focus on whether and how the methodology addresses the components set out in the sections below.

Keep in mind

Methodologies must not restate VCS requirements. For example, VCS requirements on project crediting period should not be included in the methodology. Where necessary, methodologies may make reference to the VCS rules directly to prevent methodologies from becoming outdated, should it be necessary to update a specific VCS requirement. References to specific tools or VCS Program documents must not state specific versions but rather refer to *the most recent version* of the tool or document.

Where methodologies include definitions, VVBs must ensure that the definitions are consistent with VCS definitions. If methodologies contain definitions not included in the *Program Definitions*, or the methodology contains more narrowly defined terms than in the *Program Definitions*, such methodology definitions need to be noted within the methodology element. In addition, VVBs must ensure that terms are used consistently across the methodology.

5.2.1 Applicability

Overview

The applicability conditions set out the criteria for determining which projects are eligible under the methodology. These may include conditions with respect to GHG reduction technologies and measures, or geographic areas under which a methodology is applicable.

Key Elements

VVBs must assess whether the methodology provides a clear and defined specification and/or list of project activities eligible under the methodology. This means that applicability conditions cannot be open ended. For example, a methodology cannot state that a methodology can be applied to “a range of energy efficiency measures” but instead needs to specify the energy efficiency activities or measures that are applicable, such as replacement of incandescent light bulbs with CFLs and LEDs. Modules and tools also need to set clear conditions and parameters under which the module or tool is applicable.

VVBs must bear in mind that applicability conditions must not include criteria and procedures that are addressed in other sections of the methodology. For example, the applicability conditions section cannot state that the project will have no leakage, but the methodology must instead provide a procedure for determining leakage within the leakage section. In addition, conditions specified in tools or modules used by the methodology must not contradict any conditions specified in the applicability conditions section.

VVBs must also bear in mind that a methodology should not create limiting conditions that restrict its use to a single project or proprietary technology or approach.

5.2.2 Project Boundary

Overview

The project boundary in a methodology sets out criteria and procedures for identifying and describing the GHG sources, sinks and reservoirs relevant to the project and baseline scenarios.

Key Elements

VVBs must assess whether the methodology has provided adequate justification for the included and excluded GHG sources, sinks and reservoirs. AFOLU methodologies must adhere to the requirements on relevant carbon pools set out in the *AFOLU Requirements*. VVBs must also assess whether the GHG sources, sinks and reservoirs identified for the project and those identified in the baseline scenario are equivalent and consistent. VVBs must assess whether the project boundary includes, at minimum, all GHG sources, sinks and reservoirs controlled by the project proponent and related to the project.

5.2.3 Baseline scenario

Overview

All methodologies need to establish criteria and procedures for identifying alternative baseline scenarios and determining the most plausible scenario.

Key Elements

The baseline scenario is a reference case for the project activity. VVBs must consider whether the procedures for determining the baseline scenario take into account existing and alternative project types, activities and technologies that provide the same type of quality and quantity of product or service as the project activity. Note that functional equivalence between the baseline scenario and the project scenario may not apply or be appropriate for certain AFOLU project types.

VVBs must assess whether the procedure for identifying the baseline scenario allows for identifying the most *plausible* baseline scenario and determine whether the procedure takes into account relevant information concerning present or future conditions such as political, technical, economic and socio-cultural conditions. For methodologies that use a performance method to establish the crediting baseline, VVBs must assess whether the proposed baseline scenario, or aggregate baseline scenario, would be credible for the whole class of project activity.

The procedure for the identification of baseline scenario may be combined with the procedure for demonstrating additionality where appropriate.

5.2.4 Additionality

Overview

The procedures for demonstrating additionality provide a step-wise approach to demonstrate whether a project activity would have occurred in the absence of the intervention of the carbon market.

Key Elements

VVBs must assess whether the procedure set out in the methodology complies the VCS rules on project methods and standardized methods (ie, performance or activity methods) for additionality.

Note that referencing or restating VCS rules is not sufficient. Rather, methodologies need to apply an appropriate additionality tool that is approved under the VCS or an approved GHG program, or methodologies can develop new, detailed procedures for demonstrating additionality within the methodology or as a separate tool. However, methodologies may reference VCS requirements on regulatory surplus without providing further procedures.

Methodologies can apply one of two approaches for the demonstration and assessment of additionality: the project method or the standardized method. Both methods begin with the regulatory surplus analysis step.

5.2.4.1 Project method

As set out in Section 3.2.4, the project method involves a barriers analysis step and a common practice analysis step.

For the barriers analysis, the types of barriers that may be assessed for a VCS project are:

- **Investment Barriers:** The investment barriers analysis step involves determining if the proposed project activity would have been economically feasible or economically the most attractive option in the absence of revenues from sale of VCU.
- **Technological Barriers:** Technological barriers of various kinds may be present for a project, including a lack of key elements necessary to move the project forward (eg, supporting infrastructure, material inputs or skilled labor) and/or project aspects that increase the risk of technology failure (eg, risk inherent in the complex or unproven nature of a technology).
- **Institutional Barriers:** Institutional barriers include other barriers not reflected above such as organizational, cultural, social or educational barriers.

The final additionality step is the common practice analysis. The project method requires a demonstration and assessment of whether the project activity is common practice in an appropriately-defined sector or region when compared against project alternatives that do not receive carbon finance. The common practice analysis step may also be required where methodologies apply standardized methods.

The criteria and procedures established for demonstrating common practice must be based on guidance provided in the *GHG Protocol for Project Accounting*, Chapter 7 (WRI-WBCSD). The *GHG Protocol* requires that market penetration of a project technology or practice will be assessed by collecting data on all alternative baseline scenarios within a relevant geographic area and calculating a relative market share for each different technology or practice.

5.2.4.2 Standardized Method

The VCS Program allows two types of standardized methods:

- **Performance Methods:** A methodology that uses a performance method establishes a performance benchmark for determining additionality and/or the crediting baseline. Projects that meet or exceed a pre-determined level of the metric may be deemed as additional and a pre-determined level of the metric may serve as the crediting baseline.
- **Activity Methods:** A methodology that applies an activity method establishes the bounds of the project activity that is deemed to be additional. These methods pre-determine additionality for given technologies and measures within given contexts of application using a positive list. Projects that implement activities on the positive list are automatically deemed as additional and do not otherwise need to demonstrate additionality. One of three options (activity penetration, financial viability or revenue streams) is used to qualify the project activity for the positive list.

The assessment of standardized methods requires a very careful review given that standardized methods entail the determination of additionality and/or the crediting baseline for whole classes of project activities. When assessing standardized methods, VVBs should refer to the VCS requirements, described in the *VCS Standard*, as well as the guidance provided in the *Guidance for Standardized Methods*. The guidance document provides information to help with the background and interpretation of standardized methods.



5.2.5 Procedure for Quantification of Net GHG Emission Reductions and Removals

Overview

Methodologies need to establish procedures for quantifying GHG emissions and reductions and removals. As set out in the *VCS Standard*, the procedure must determine baseline emissions, project emissions and emissions associated with leakage.

Key Elements

When assessing quantification procedures, VVBs must determine whether appropriate formulae and calculation methods have been used. The methods must provide a logical and consistent approach to determine the net GHG emission reductions and removals. The assessment must also focus on whether appropriate parameters have been applied in the calculation methods or formulae.

Quantification procedures are subject to uncertainty. VVBs must assess whether the methodology relies on assumptions, parameters and/or procedures with significant uncertainty and whether the methodology has appropriate procedures to address such uncertainty. The *VCS Standard* sets out required confidence intervals and, where the uncertainty exceeds the permitted thresholds, methodologies are required to apply a conservative deduction to address the uncertainty. VVBs are encouraged to review the most recent version of the IPCC report *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* when reviewing the uncertainty associated with methodologies.

VVBs must pay particular attention to uncertainty where indirect methods such as models, default factors and proxies are used to estimate GHG emissions reductions and removals, and where direct measurements are not be feasible either due to the nature of the project activity or due to the complexity and cost involved in field-based measurements. While methodologies may pursue a model-based approach to estimate GHG emission reductions and removals, VVBs must assess whether the model is based on publicly available, reputable and recognized sources. Further requirements for the use of models, as well as the use of default factors, standards, and proxies, are provided in the *VCS Standard*.

VVBs may also be required to determine whether a model has been calibrated for use in a given ecological zone. For example, a methodology for reduced deforestation in a semi-arid zone should not use a model that is derived from data from a moist tropical climatic zone. VVBs must assess whether the methodologies that use models include basic requirements for model selection, parameterization, calibration and validation to the local project area. VVBs must also assess whether methodologies include a pathway for calibrating, or refining, the model uncertainty through the use of available data and/or measurements.

5.2.6 Leakage

Overview

Methodologies must specify procedures for estimating leakage in project activities. Specific leakage requirements for various AFOLU project categories are detailed in the *AFOLU Requirements*.

Key Elements

Assessing leakage can be challenging. Complex inter-linkages typically exist between a project activity and the activities outside the project boundary. VVBs must consider whether changes in GHG emissions outside the project boundary are directly attributable to the project.

Where a project results in a change in GHG emissions outside the project boundary, those emissions are considered as leakage. A key question VVBs must consider when assessing leakage is whether the methodology has accounted for potential upstream and downstream emission sources associated with the project activity. For example, in a project activity that uses biomass to generate electricity and the project boundary only includes emission sources within the generation site, upstream emissions that result from the production of biomass should be evaluated. Given that a project activity can have multiple upstream and downstream effects, VVBs should consider the significance of the effect and the extent to which the effects are directly attributable to the project activity. The principle of relevance should be applied in determining what constitutes leakage.

In some methodologies it may be necessary to evaluate and account for lifecycle emissions. Lifecycle emissions are emissions associated with the product life from cradle-to-grave (ie, from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, including disposal or recycling). For example, in fuel switch projects where conventional fossil fuels are replaced with biofuels, the seed to tailpipe emissions associate with biofuels, depending on how the biofuel is produced, can be very significant.

In AFOLU methodologies, VVBs must ensure that the methodology has appropriate criteria and procedures for addressing the following types of leakage, as applicable:

- Market leakage: Projects may significantly reduce the production of a commodity, causing a change in the supply and demand equilibrium, resulting in a shift of production elsewhere.
- Activity-shifting leakage: The agent of deforestation and/or degradation may move to an area outside the project boundary and continues activities elsewhere.
- Ecological leakage: Wetlands restoration and conservation (WRC) projects may cause changes in GHG emissions or fluxes of GHG emissions from ecosystems hydrologically connected to the project area.



Criteria and procedures for determining leakage may either be within the methodology or a separate tool. Where appropriate, the methodology may also reference approved tools for the estimation of leakage.

5.2.7 Monitoring

Overview

The methodology must provide the data and parameters to be reported, including sources of data and units of measurement.

Key Elements

In assessing monitoring data and parameters, VVBs must assess whether the default factors and standards used are from a publicly available, reputable and recognized source (eg, IPCC or published government data), peer reviewed, and appropriate for the given source, sink or reservoir. The standards and factors must also reflect current data.

Where methodologies do not provide data values, VVBs must assess whether the methodology establishes appropriate procedures for the project proponent to determine data values.

VVBs must also consider whether the measurement methods prescribed by the methodology are appropriate. For instance, in some case direct measurements of GHG emissions may be feasible (eg, measuring the methane captured in landfills through flow meters); in other cases, indirect measurements of GHG emissions combined with calculations may be more appropriate (eg, calculating carbon stock changes from models). These choices may involve trade-offs between accuracy and uncertainty. If a methodology uses a less accurate method for monitoring a particular GHG source or sink, the VVB must assess whether appropriate procedures are in place to ensure that the estimates are conservative. As set out in the IPCC *Good Practice Guidance and Uncertainty Management*, higher tier methods that involve direct measurement result in more reliable estimates with reduced uncertainty. This implies that methodologies that rely on low-tier approaches, such as the Tier One method of using default emission factors, must ensure that the default factors are conservative to account for uncertainty.

Keep in Mind

VVBs must assess the appropriateness of monitoring and quality assurance procedures set out in the methodology. For example, in an IFM project, a VVB may need to assess whether sufficient clarity on sampling design is provided (ie, plot location, sampling intensity and stratification). In certain methodologies, the procedures may need to provide prescriptive guidance with regard to measurement procedures as well (eg, the minimum diameter at breast height (DBH) of trees to be measured or minimum depth for soil sampling).



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Where methodologies require the use of remotely sensed data, VVBs must, at minimum, require that internationally-recognized published guidelines are followed for evaluating remotely-sensed data. Guidelines for estimating carbon stock based on forest inventories and remotely sensed data are found in the IPCC *Good Practice Guidelines for LULUCF* and the Global Observation of Forest and Land Cover Dynamics (GOFD-GOLD).

5.3 REPORTING REQUIREMENTS

Methodology assessment reports must clearly describe the process of the assessment as well as the findings from the assessment.

VCSCA provides a template for methodology assessments. The template requires that VVBs provide a description of the assessment, the method and criteria used, and any findings of uncertainties related to the methodology element. For each aspect of the methodology element, VVBs must assess whether and how the criteria and procedures are appropriate, adequate and in compliance with VCS rules. All CLs and CARs as well as the methodology developer's responses need to be documented.

VVBs must ensure that the methodology assessment reports provide a sufficient level of detail to allow VCSCA and other intended readers to understand how the methodology conforms to VCS rules and scientific best practice. For example, where a VVB relies on published peer reviewed studies to evaluate the credibility of a procedure used in a methodology, the methodology assessment report should provide references to the studies.



VCS GUIDANCE

APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v3.0	4 Oct 2012	Initial version released under <i>VCS Version 3</i>
v3.1	8 Oct 2013	Main updates: 1) Updated the methodology deviation and project description deviation examples (Sections 3.2.8, and 3.2.9). 2) Clarified the use of the terms <i>must</i> , <i>should</i> and <i>may</i> in methodologies (Section 5.2).
v3.2	19 Oct 2016	Main updates: 1) Replaced the term <i>right of use</i> with <i>project ownership</i> (throughout)

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Attachment Z

VCS Standard v4.0

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)





**Verified Carbon
Standard**
A VERRA STANDARD

VCS Standard

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

ABOUT VERRA



Verra supports climate action and sustainable development through the development and management of standards, tools and programs that credibly, transparently and robustly assess environmental and social impacts, and drive funding for sustaining and scaling up these benefits. As a mission-driven, non-profit (NGO) organization, Verra works in any arena where we see a need for clear standards, a role for market-driven mechanisms and an opportunity to achieve environmental and social good.

Verra manages a number of global standards frameworks designed to drive finance towards activities that mitigate climate change and promote sustainable development, including the [Verified Carbon Standard \(VCS\) Program](#) and its [Jurisdictional and Nested REDD+ framework \(JNR\)](#), the [Verra California Offset Project Registry \(OPR\)](#), the [Climate, Community & Biodiversity \(CCB\) Standards](#) and the [Sustainable Development Verified Impact Standard \(SD VISTa\)](#). Verra is also developing new standards frameworks, including [LandScale](#), which will promote and measure sustainability outcomes across landscapes. Finally, Verra is one of the implementing partners of the [Initiative for Climate Action Transparency \(ICAT\)](#), which helps countries assess the impacts of their climate actions and supports greater transparency, effectiveness, trust and ambition in climate policies worldwide.

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1 INTRODUCTION

The *VCS Standard* provides a global standard for GHG emission reduction and removal projects and programs. It uses as its core the requirements set out in *ISO 14064-2:2006*, *ISO 14064-3:2006* and *ISO 14065:2013*. The three principal documents of the program are the *VCS Program Guide*, the *VCS Standard*, and the *VCS Methodology Requirements*. The *VCS Program Guide* describes the rules and requirements governing the VCS Program and further describes the constituent parts of the program such as the project and program registration process, the Verra registry system, the methodology approval process and the accreditation requirements for validation/verification bodies. The *VCS Standard* provides the requirements for developing projects and programs, as well as the requirements for validation, monitoring and verification of projects, programs and GHG emission reductions and removals. The *VCS Methodology Requirements* provides the rules and requirements for developing new VCS methodologies. The *VCS Program Guide* should be read before using the *VCS Standard* or the *VCS Methodology Requirements*.

Verra recognizes the kind agreement of the International Organization for Standardization (ISO, www.iso.org) to allow inclusion of critical clauses of *ISO 14064-2:2006* and *ISO 14064-3:2006* in the VCS Program documentation to facilitate comprehension. In particular, the sections in this document on project and methodology requirements include text drawn from *ISO 14064-2:2006* clause 5 and *ISO 14064-3:2006* clause 4.9, amended where necessary to fit the context of the VCS Program.

1.1 Version

All information about version control under the VCS Program is contained in the *VCS Program Guide*.

This document will be updated from time-to-time and readers shall ensure that they are using the most current version of the document. Where external documents are referenced, such as the *IPCC 2006 Guidelines for National GHG Inventories*, and such documents are updated, the most recent version of the document shall be used.

Previous versions of the VCS Program may have included different rules and requirements than those set out in this version. Previous versions of the *VCS Standard* and other VCS Program documents are archived and available on the Verra website.

1.2 Language

The operating language of the VCS Program is English. The project and program description, validation report, monitoring report, verification report and all other documentation (including all and any appendices) required under the VCS Program shall be in English.

2 VCS PROGRAM SPECIFIC ISSUES

2.1 Scope of VCS Program

2.1.1 The scope of the VCS Program includes:

- 1) The six Kyoto Protocol greenhouse gases.
- 2) Ozone-depleting substances.
- 3) Project activities supported by a methodology approved under the VCS Program through the methodology approval process.
- 4) Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval.
- 5) Jurisdictional REDD+ programs and nested REDD+ projects as set out in the VCS Program document *Jurisdictional and Nested REDD+ (JNR) Requirements*.

The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction. The VCS Program also excludes the following project activities under the circumstances indicated in Table 1, below.

Table 1: Excluded Project Activities

Activity	Non-LDC ¹		LDC	
	Large scale ²	Small scale ²	Large scale	Small scale
Activities that reduce hydrofluorocarbon-23 (HFC-23) emissions	Excluded	Excluded	Excluded	Excluded
Grid-connected electricity generation ³	Excluded	Excluded	Excluded	

¹ Least Developed Country, as designated by the United Nations.

² Small-scale and large-scale designations are as per CDM definitions for same.

³ "Grid-connected electricity generation" means the generation of electricity primarily for delivery to a national or regional grid. Generation of electricity primarily for delivery to a micro-grid (i.e., a localized grid that facilitates the delivery of electricity to discrete and often remote sets of infrastructure that do not otherwise have reliable access to electricity) is not included in this definition, and such project activities are eligible under the scope of the VCS Program.

using hydro power plants/units				
Grid-connected electricity generation using wind, geothermal, or solar power plants/units	Excluded	Excluded		
Utilization of recovered waste heat for, <i>inter alia</i> , combined cycle electricity generation and the provision of heat for residential, commercial or industrial use	Excluded	Excluded		
Generation of electricity and/or thermal energy using biomass. This does not include efficiency improvements in thermal applications (e.g., cook stoves).	Excluded	Excluded		
Generation of electricity and/or thermal energy using fossil fuels, including activities that involve switching from a higher carbon content fuel to a lower carbon content fuel	Excluded	Excluded		
Replacement of electric lighting with more energy efficient electric lighting, such as the replacement of incandescent electrical bulbs with CFLs or LEDs	Excluded			
Installation and/or replacement of electricity transmission lines and/or energy efficient transformers	Excluded			

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

For example, and to illustrate the mechanics of this table, large-scale grid-connected hydroelectric projects are excluded in all cases. However, a small-scale grid-connected hydroelectric project would be eligible where located within an LDC.

2.2 Principles

- 2.2.1 The application of principles is fundamental in ensuring that GHG-related information is a true and fair account. The principles below shall provide the basis for, and shall guide the application of, the VCS Program rules and requirements.

Principles taken from ISO 14064-2:2006, clause 3.

Relevance

Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.

Completeness

Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.

Consistency

Enable meaningful comparisons in GHG-related information.

Accuracy

Reduce bias and uncertainties as far as is practical.

Transparency

Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

Conservativeness

Use conservative assumptions, values and procedures to ensure that net GHG emission reductions or removals are not overestimated.

Note – Accuracy should be pursued as far as possible, but the hypothetical nature of baselines, the high cost of monitoring of some types of GHG emissions and removals, and other limitations make accuracy difficult to attain in many cases. In these cases, conservativeness may serve as a moderator to accuracy in order to maintain the credibility of project and program GHG quantification.

2.3 Timing of Crediting

- 2.3.1 VCUs shall not be issued under the VCS Program for GHG emission reductions or removals that have not been verified.
- 2.3.2 Project activities are eligible for immediate crediting of future avoided emissions under the conditions set out below, which shall be addressed at the level of the methodology:

- 1) The project immediately avoids future streams of GHG emissions as a result of an upfront intervention that permanently precludes further emissions from the source. VCUs shall be issued only after such an intervention has occurred and the GHG emission reductions have been verified. Examples of such activities include projects that destroy chlorofluorocarbons recovered from refrigeration equipment thereby immediately precluding their future release into the atmosphere, and composting projects that divert organic waste from landfill sites thereby immediately precluding future methane emissions. A REDD project would not qualify for immediate crediting because future streams of GHG emissions are not permanently precluded.
- 2) The physical processes that would generate GHG emissions in the absence of an intervention are well-understood, stable and quantifiable. Models used to simulate such processes shall meet the requirements for such models set out in the VCS Program document *VCS Methodology Requirements*. Any default factors associated with input parameters shall meet the requirements set out for such default factors in the VCS Program document *VCS Methodology Requirements*.
- 3) VCUs may be issued only for GHG emissions avoided over a ten-year period, even if such GHG emissions are likely to have continued over a longer period of time under the baseline scenario. For example, a composting project that diverts organic waste from a landfill site would be eligible for crediting (in relation to a specific amount of composted organic waste) for the GHG emissions that would have occurred at the landfill site over a ten-year period, and any emissions that would have occurred beyond the ten year period (in relation to the specific amount of composted organic waste) are not eligible. Note that in this particular example the ten-year rule applies to the specific amount of composted organic waste and the usual rules on duration of the project and project crediting period still apply.

2.3.3 ODS projects are eligible for immediate crediting of future avoided emissions and methodology elements may use such a crediting model.

Note – Crediting of ODS projects shall still be in relation to the baseline scenario. In many cases, methodology elements will credit projects for all of the ODS destroyed by the project (minus any project emissions and leakage). However, it is possible that projects could destroy ODS from existing stockpiles and only a portion of the ODS would have been emitted under the baseline scenario. For example, if the baseline scenario includes use of the ODS to service existing equipment and a certain proportion of such ODS would be recovered and destroyed at the end of that equipment’s life (whether voluntarily or due to regulation), then the volume of credits granted to the project shall reflect this.

2.4 AFOLU Non-Permanence Risk and Pooled Buffer Account

2.4.1 Non-permanence risk in Agriculture, Forestry, and Other Land Use (AFOLU) projects is addressed through the use of a project risk analysis, using the *AFOLU Non-Permanence Risk Tool*, which determines a number of credits to be deposited in the AFOLU pooled buffer account. The pooled buffer account holds non-tradable buffer credits to cover the non-permanence risk associated with AFOLU projects. It is a single account that holds the buffer

credits for all projects.

Buffer credits are cancelled to cover carbon known, or believed, to be lost. As such, the VCU already issued to projects that subsequently fail are not cancelled and do not have to be “paid back”. All VCUs issued to AFOLU projects (as with all projects) are permanent. The VCS approach provides atmospheric integrity because the AFOLU pooled buffer account will always maintain an adequate surplus to cover unanticipated losses from individual project failures and the net GHG benefits across the entire pool of AFOLU projects will be greater than the total number of VCUs issued.

The full rules and procedures for AFOLU projects with respect to non-permanence risk are set out in Section 3.2.

- 2.4.2 The AFOLU pooled buffer account is subject to periodic reconciliation. Reconciliation is based on a review of existing AFOLU verification reports and an assessment of project performance. This process will identify the projects that have failed or underperformed and seek to identify their common characteristics. The risk analysis criteria and buffer withholding percentages, set out in the VCS Program document *AFOLU Non-Permanence Risk Tool*, will be adjusted accordingly to ensure that there are always sufficient buffer credits in the AFOLU pooled buffer account to cover project losses. Any changes to the tool will not be retroactive (i.e., they will apply only to future non-permanence risk assessments).
- 2.4.3 Project risk analyses will be subject to periodic review by Verra. This process consists of a review of a sample of AFOLU project risk reports to identify any inconsistencies in the process and application of the *AFOLU Non-Permanence Risk Tool* and assessment of same by validation/verification bodies. The risk analysis criteria and risk ratings set out in the tool may be adjusted, to ensure consistent and accurate application of the tool. Any changes to the tool will not be retroactive (i.e., they will apply only to subsequent non-permanence risk analyses).

2.5 AFOLU Leakage Assessments

- 2.5.1 Project market leakage assessments will be subject to periodic review by Verra. This process consists of a review of a sample of AFOLU projects’ leakage assessments to identify any inconsistencies in the process and application of the leakage requirements in Sections 3.14.7–3.14.9 and the VCS Program document *VCS Methodology Requirements*, and assessment of same by validation/verification bodies. The leakage requirements set out in the *VCS Methodology Requirements* may be adjusted to ensure consistent and accurate application. Any changes to the leakage requirements will not be retroactive (i.e., they will apply only to subsequent leakage assessments).

3 PROJECT REQUIREMENTS

This section sets out the rules and requirements for projects under the VCS Program. Specific requirements for AFOLU and ODS projects are set out throughout this section, as these project types may encounter unique circumstances related to project implementation, monitoring and other matters, which must be addressed.

In order to complete the VCS Program certification process, projects must demonstrate how they meet the rules and requirements set out below. Projects must also demonstrate how they have applied an eligible methodology in full. Projects demonstrate their compliance with the VCS Program rules and the applied methodology through the validation and verification processes, which are defined in Section 4 below. Once projects complete the validation and verification processes, they become eligible to request registration and VCU issuance. Note that the full process for requesting project registration and VCU issuance is set out in the VCS Program document *Registration and Issuance Process*.

3.1 General Requirements

Concept

Establishing a consistent and standardized certification process is critical to ensuring the integrity of VCS projects. Accordingly, certain high-level requirements must be met by all projects, as set out below.

Requirements

- 3.1.1 Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. Projects shall be guided by the principles set out in Section 2.2.1.
- 3.1.2 Projects shall apply methodologies eligible under the VCS Program. Methodologies shall be applied in full, including the full application of any tools or modules referred to by a methodology, noting the exception set out in Section 3.13.1. The list of methodologies and their validity periods is available on the Verra website.
- 3.1.3 Projects and the implementation of project activities shall not lead to the violation of any applicable law, regardless of whether or not the law is enforced.
- 3.1.4 Where projects apply methodologies that permit the project proponent its own choice of model (see the VCS Program document *Program Definitions* for definition of model), such model shall meet with the requirements set out in the VCS Program document *VCS Methodology Requirements* and it shall be demonstrated at validation that the model is appropriate to the project circumstances (i.e., use of the model will lead to an appropriate quantification of GHG emission reductions or removals).

- 3.1.5 Where projects apply methodologies that permit the project proponent its own choice of third party default factor or standard to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, such default factor or standard shall meet with the requirements set out in the VCS Program document *VCS Methodology Requirements*.
- 3.1.6 Projects shall preferentially apply methodologies that use performance methods (see the VCS Program document *VCS Methodology Requirements* for further information on performance methods) where a methodology is applicable to the project that uses a performance method for determining both additionality and the crediting baseline (i.e., a project shall not apply a methodology that uses a project method where such a performance method is applicable to the project). Methodologies approved under the VCS Program that use performance methods provide a list of similar methodologies that use project methods (that were approved under the VCS Program or an approved GHG program at the time the performance method was developed). Such lists are not necessarily exhaustive but can serve as the starting point for determining whether a performance method is applicable to the project. Following the approval of a methodology that uses a performance method, projects may use any applicable pre-existing methodology that uses a project method for a six-month grace period.
- 3.1.7 Where the rules and requirements under an approved GHG program conflict with the rules and requirements of the VCS Program, the rules and requirements of the VCS Program shall take precedence.
- 3.1.8 Where projects apply methodologies from approved GHG programs, they shall comply with any specified capacity limits (see the VCS Program document *Program Definitions* for definition of capacity limit) and any other relevant requirements set out with respect to the application of the methodology and/or tools referenced by the methodology under those programs.
- 3.1.9 Where Verra issues new requirements relating to projects, registered projects do not need to adhere to the new requirements for the remainder of their project crediting periods (i.e., such projects remain eligible to issue VCUs through to the end of their project crediting period without revalidation against the new requirements). The new requirements shall be adhered to at project crediting period renewal, as set out in Section 3.8.9.

3.2 AFOLU-Specific Matters

Concept

AFOLU projects may encounter unique circumstances related to project implementation, monitoring and other matters. This section sets out high-level requirements related to such AFOLU-specific matters. Note that additional AFOLU-specific requirements are also set out throughout this document.

Requirements

General

- 3.2.1 There are currently six AFOLU project categories eligible under the VCS Program, as defined in *Appendix 1 Eligible AFOLU Project Categories* below: afforestation, reforestation and revegetation (ARR), agricultural land management (ALM), improved forest management (IFM), reduced emissions from deforestation and degradation (REDD), avoided conversion of grasslands and shrublands (ACoGS), and wetland restoration and conservation (WRC). Further specification with respect to eligible activities which may be included within methodologies approved under the VCS Program can be found in the VCS Program document *VCS Methodology Requirements*.
- 3.2.2 Where projects are located within a jurisdiction covered by a jurisdictional REDD+ program, project proponents shall follow the requirements in this document and the requirements related to nested projects set out in the VCS Program document *Jurisdictional and Nested REDD+ Requirements*.
- 3.2.3 Where an implementation partner is acting in partnership with the project proponent, the implementation partner shall be identified in the project description. The implementation partner shall identify its roles and responsibilities with respect to the project, including but not limited to, implementation, management and monitoring of the project, over the project crediting period.
- 3.2.4 Activities that convert native ecosystems to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any ARR, ALM, WRC or ACoGS project areas were not cleared of native ecosystems to create GHG credits (e.g., evidence indicating that clearing occurred due to natural disasters such as hurricanes or floods). Such proof is not required where such clearing or conversion took place at least 10 years prior to the proposed project start date. The onus is upon the project proponent to demonstrate this, failing which the project shall not be eligible.
- 3.2.5 Activities that drain native ecosystems or degrade hydrological functions to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any AFOLU project area was not drained or converted to create GHG credits. Such proof is not required where such draining or conversion took place prior to 1 January 2008. The onus is upon the project proponent to demonstrate this, failing which the project shall not be eligible.
- 3.2.6 The project proponent shall demonstrate that project activities that lead to the intended GHG benefit have been implemented during each verification period in accordance with the project design. Where no new project activities have been implemented during a verification period, project proponents shall demonstrate that previously implemented project activities continued to be implemented during the verification period (e.g., forest patrols or improved agricultural practices of community members).

3.2.7 For all IFM, REDD, WRC and ACoGS project types, the project proponent shall, for the duration of the project, reassess the baseline every 10 years and have this validated at the same time as the subsequent verification. Baseline projections for deforestation and/or degradation, land conversion, forest management plans and wetland hydrological changes beyond a 10-year period are not likely to be realistic because rates of change in land-use and/or land or water management practices are subject to many factors that are difficult to predict over the long term, hence the need for periodic reassessment of the baseline. The following shall apply with respect to the baseline reassessment:

- 1) The reassessment will capture changes in the drivers and/or behavior of agents that cause the change in land use, hydrology, sediment supply and/or land or water management practices and changes in carbon stocks, all of which shall then be incorporated into revised estimates of the rates and patterns of land-use change and estimates of baseline emissions.⁴
- 2) The latest approved version of the methodology or its replacement shall be applied at the time of baseline reassessment.
- 3) The project description shall be updated at the time of baseline reassessment following the requirements set out in Section 3.8.9(2)(d).
- 4) Ex-ante baseline projections beyond a 10-year period are not required.

3.2.8 Where ARR, ALM, IFM or REDD project activities occur on wetlands, the project shall adhere to both the respective project category requirements and the WRC requirements, unless the expected emissions from the soil organic carbon pool or change in the soil organic carbon pool in the project scenario is deemed below *de minimis* or can be conservatively excluded as set out in the VCS Program document *VCS Methodology Requirements*, in which case the project shall not be subject to the WRC requirements.

Non-Permanence Risk

3.2.9 Projects shall prepare a non-permanence risk report in accordance with the VCS Program document *AFOLU Non-Permanence Risk Tool* at both validation and verification. In the case of projects that are not validated and verified simultaneously, having their initial risk assessments validated at the time of VCS project validation will assist VCU buyers and sellers by providing a more accurate early indication of the number of VCUs projects are expected to generate. The non-permanence risk report shall be prepared using the *VCS Non-Permanence Risk Report Template*, which may be included as an annex to the project description or monitoring report, as applicable, or provided as a stand-alone document.

⁴ Brown, S., M. Hall, K. Andrasko, F. Ruiz, W. Marzoli, G. Guerrero, O. Masera, A. Dushku, B. DeJong, and J. Cornell, 2007. Baselines for land-use change in the tropics: application to avoided deforestation projects. *Mitigation and Adaptation Strategies for Global Change*, 12 (6):1001-1026.

- 3.2.10 Projects with tree harvesting shall demonstrate that the permanence of their carbon stock is maintained and shall put in place management systems to ensure the carbon against which VCUs are issued is not lost during a final cut with no subsequent replanting or regeneration.
- 3.2.11 WRC projects shall demonstrate that the permanence of their soil carbon stock will be maintained. The maximum quantity of GHG emission reductions that may be claimed by the project is limited to the difference between project and baseline scenario after a 100-year time frame, as further described in the VCS Program document *VCS Methodology Requirements*.
- 3.2.12 Buffer credits shall be deposited in the AFOLU pooled buffer account based upon the non-permanence risk report assessed by the validation/verification body(s). Buffer credits are not VCUs and cannot be traded. The full rules and procedures with respect to the deposit of buffer credits are set out in the VCS Program document *Registration and Issuance Process*.
- 3.2.13 Projects shall perform the non-permanence risk analysis at every verification event because the non-permanence risk rating may change. Projects that demonstrate their longevity, sustainability and ability to mitigate risks are eligible for release of buffer credits from the AFOLU pooled buffer account. The full rules and procedures with respect to the release of buffer credits are set out in the VCS Program document *Registration and Issuance Process*.
- 3.2.14 Assessment of non-permanence risk analyses may be conducted by the same validation/verification body that is conducting validation or verification of the project and at the same time as the validation or verification of the project, as applicable. The rules and requirements for the process of assessment by validation/verification body(s) are set out in Section 4 below.
- 3.2.15 Where an event occurs that is likely to qualify as a loss event (see the VCS Program document *Program Definitions* for definition of loss event), the project proponent shall notify Verra within 30 days of discovering the likely loss event. Where VCUs have been previously issued, a loss event report shall be prepared and submitted to the Verra registry, as follows:
- 1) The loss event report shall be prepared using the *VCS Loss Event Report Template*. It shall include a conservative estimate of the loss of previously verified emission reductions and removals due to losses in carbon stocks from the project, based on monitoring of the full area affected by the loss event.
 - 2) The loss event report shall be accompanied by a loss event representation signed by the project proponent and representing that the loss estimate is true and accurate in all material respects. The template for the loss event representation is available on the Verra website.
 - 3) The loss event report shall be submitted to the Verra registry within two years of the date of discovery of the loss event. Where a loss event report is not submitted within two years of the date of discovery of the loss event, the project shall no longer be eligible to issue VCUs.

- 4) The Verra registry shall put buffer credits from the AFOLU pooled buffer account on hold, in an amount equivalent to the estimated loss stated in the loss event report.

3.2.16 At the verification event subsequent to the loss event, the monitoring report shall restate the loss from the loss event and calculate the net GHG benefit for the monitoring period in accordance with the requirements set out in the methodology applied. In addition, the following applies:

- 1) Where the net GHG benefit of the project, compared to the baseline, for the monitoring period is negative, taking into account project emissions, removals and leakage, a reversal has occurred (see the VCS Program document *Program Definitions* for definition of reversal) and buffer credits equivalent to the reversal shall be cancelled from the AFOLU pooled buffer account, as follows:
 - a) Where the total reversal is less than the number of credits put on hold after the submission of the loss event report, Verra shall cancel buffer credits equivalent to the reversal. Any remaining buffer credits shall be released from their hold status (though remain in the AFOLU pooled buffer account).
 - b) Where the reversal is greater than stated by the loss event report, the full amount of buffer credits put on hold with respect to the submission of the loss event report shall be cancelled, and additional buffer credits from the AFOLU pooled buffer account shall be cancelled to fully account for the reversal.
- 2) Where the net GHG benefit for the monitoring period is positive, taking into account project emissions, removals and leakage (i.e., all losses have been made up over the monitoring period), a reversal has not occurred and buffer credits put on hold after the submission of the loss event report shall be released from their hold status (but shall remain in the AFOLU pooled buffer account).

3.2.17 At a verification event, where a reversal has occurred, the following applies:

- 1) Where the reversal is a catastrophic reversal (see the VCS Program document *Program Definitions* for the definition of catastrophic reversal), the following applies:
 - a) The baseline may be reassessed, including any relevant changes to baseline carbon stocks and, where reassessed, shall be validated at the time of the verification event subsequent to the reversal. Note that allowing baseline revisions after catastrophic reversal supersedes any methodological requirements for a fixed baseline.
 - b) The same geographic boundary shall be maintained. The entire project area, including areas degraded or disturbed by the catastrophic event, shall continue to be a part of project monitoring. GHG credits may not be claimed from any increased rate of sequestration from natural regeneration after a catastrophic reversal until the loss from catastrophic reversals is recovered. At the subsequent VCU issuance, GHG credits from the project equal to the additional number of buffer credits cancelled after the

reversal from the AFOLU pooled buffer account on behalf of the project (i.e., above what has been previously contributed by the project) shall be deposited in the AFOLU pooled buffer account. For example, if the project previously contributed 100 buffer credits and 150 credits were cancelled from the AFOLU pooled buffer account after a reversal, the project would deposit an additional 50 buffer credits (to replenish the pool at large) in addition to the amount required by the risk analysis at the current verification event. Buffer credits deposited to replenish the pool after a reversal (50 in the example above) shall never be eligible for release back to the project, as set out in Section 3.2.12. In addition, buffer credits shall be deposited in the AFOLU pooled buffer account based upon the non-permanence risk analysis determined in accordance with the VCS Program document *AFOLU Non-Permanence Risk Tool*, as assessed by the validation/verification body(s).

- 2) Where the reversal is a non-catastrophic reversal (e.g., due to poor management, removal of a portion of the project area from participation in the project or over-harvesting), the following applies:
 - a) No further VCUs shall be issued to the project until the deficit is remedied. The deficit is equivalent to the full amount of the reversal, including GHG emissions from losses to project and baseline carbon stocks.
 - b) The same geographic boundary shall be maintained. The entire project area, including areas degraded or disturbed by the non-catastrophic event, shall continue to be a part of project monitoring. Projects may not claim GHG credits from any increased rate of sequestration from natural regeneration after a reversal until the loss from catastrophic reversals is recovered.

Note – Notwithstanding the rules set out in (b) above, where a portion of the project area is removed from participation in the project, it is not expected that the project proponent maintain the same geographic boundary of the project, nor is it expected that the area that is removed from the project continue to be monitored.

3.2.18 As set out in the VCS Program document *Registration and Issuance Process*, where projects fail to submit a verification report within five or ten years from the previous verification event, a percentage of buffer credits is put on hold under the conservative assumption that the carbon benefits represented by buffer credits held in the AFOLU pooled buffer account may have been reversed or lost in the field. Where projects fail to submit a verification report within 15 years from the previous verification event, buffer credits are cancelled under the same assumption. The full rules and requirements with respect to the cancellation and holding of buffer credits are set out in the VCS Program document *Registration and Issuance Process*.

3.2.19 The remaining balance of buffer credits is cancelled at the end of the project crediting period.

Long-term Average GHG Benefit

3.2.20 ARR and IFM projects with harvesting activities shall not be issued GHG credits above the long-term average GHG benefit maintained by the project.

3.2.21 Where ARR or IFM projects include harvesting, the loss of carbon due to harvesting shall be included in the quantification of project emissions. The maximum number of GHG credits available to projects shall not exceed the long-term average GHG benefit. The GHG benefit of a project is the difference between the project scenario and the baseline scenario of carbon stocks stored in the selected carbon pools and adjusted for any project emissions of N₂O, CH₄ and fossil-derived CO₂, and leakage emissions. The long-term average GHG benefit shall be calculated using the following procedure:

- 1) Establish the period over which the long-term average GHG benefit shall be calculated, noting the following:
 - a) For ARR or IFM projects undertaking even-aged management, the time period over which the long-term GHG benefit is calculated shall include at minimum one full harvest/cutting cycle, including the last harvest/cut in the cycle. For example, where a project crediting period is 40 years and has a harvest cycle of 12 years, the long-term average GHG benefit will be determined for a period of 48 years.
 - b) For ARR projects under conservation easements with no intention to harvest after the project crediting period, or for selectively-cut IFM projects, the time period over which the long-term average is calculated shall be the length of the project crediting period.
- 2) Determine the expected total GHG benefit of the project for each year of the established time period. For each year, the total GHG benefit is the to-date GHG emission reductions or removals from the project scenario minus baseline scenario.
- 3) Sum the total GHG benefit of each year over the established time period.
- 4) Calculate the average GHG benefit of the project over the established time period.
- 5) Use the following equation to calculate the long-term average GHG benefit:

$$LA = \frac{\sum_{t=0}^n PE_t - BE_t}{n}$$

Where:

- LA = The long-term average GHG benefit
- PE_t = The total to-date GHG emission reductions and removals generated in the project scenario (tCO₂e). Project scenario emission reductions and removals shall also consider project emissions of CO₂, N₂O, CH₄ and leakage.
- BE_t = The total to-date GHG emission reductions and removals projected for the baseline scenario (tCO₂e)

- t = Year
- n = Total number of years in the established time period

6) A project may claim GHG credits during each verification event until the long-term average GHG benefit is reached. Once the total number of GHG credits issued has reached this average, the project can no longer issue further GHG credits. The long-term average GHG benefit shall be calculated at each verification event, meaning the long-term average GHG benefit may change over time based on monitored data. For an example of determining the long-term average GHG benefit, see the Verra website.

Buffer credits are withheld only when GHG credits are issued. the number of buffer credits to withhold is based on the change in carbon stocks only (not the net GHG benefit), as such the buffer credits will be based on the long-term average change in carbon stock. Use the following equation to calculate the long-term average change in carbon stock.

Where:

$$LC = \frac{\sum_{t=0}^n PC_t - BC_t}{n}$$

- LC = The long-term average change in carbon stock
- PC_t = The total to-date carbon stock in the project scenario (tCO_{2e})
- BC_t = The total to-date carbon stock projected for the baseline scenario (tCO_{2e})
- t = Year
- n = Total number of years in the established time period

Note – The VCS Program guidance document AFOLU Guidance: Example for Calculating the Long-Term Average Carbon Stock for ARR Projects with Harvesting, available on the Verra website, provides examples for calculating the long-term average carbon stock for a variety of ARR project scenarios with harvesting. The same examples can be applied to IFM projects with harvesting.

3.3 ODS-Specific Matters

Concept

ODS projects may encounter unique circumstances related to project implementation, avoidance of perverse incentives and other matters. This section sets out high-level requirements related to such ODS-specific matters. Note that additional ODS-specific requirements are also set out throughout this document.

Requirements

Eligible ODS

- 3.3.1 ODS residing in stockpiles or ODS recovered directly from any of the products set out in Section 3.3.2 are eligible. The following ODS controlled by the Montreal Protocol for which the IPCC publishes a global warming potential (100-year time horizon) are eligible:
- 1) Annex A, Group I
 - 2) Annex B, Group I
 - 3) Annex C, Group I
- 3.3.2 The destruction of ODS recovered from the following products are eligible:
- 1) Refrigeration equipment, systems or appliances;
 - 2) Air conditioning equipment, systems or appliances;
 - 3) Fire suppression equipment or systems; and
 - 4) Thermal insulation foams.
- 3.3.3 The destruction of ODS recovered from pre-polymers, aerosol products or other products is not eligible.

ODS Origin

- 3.3.4 Where ODS is recovered from products that have been imported specifically for their disassembly (i.e., the products have not been collected in the host country), the following shall apply:
- 1) The products shall not originate from any country in which any law, statute or other regulatory framework requires the recovery and destruction of the relevant ODS from such products.
 - 2) The project proponent shall provide documentary evidence, such as shipping manifests, bills of lading and evidence of collection of the products in the originating country, to demonstrate the origin of such products.
- 3.3.5 Documentary evidence shall be provided to verify the origin of all ODS destroyed by the project. Evidence may include, inter alia, shipping manifests, bills of lading, other commercial documentation, and addresses of households, commercial premises and other evidence of collection of the products. Such evidence shall be appropriate to the nature and scale of the project.

Destruction Technology

- 3.3.6 The project shall use a destruction technology that meets the screening criteria for destruction technologies set out in the *UNEP April 2002 Report of the Technology and Economic Assessment Panel (TEAP), Volume 3b, Report of the Task Force on Destruction Technologies*⁵, as may be updated from time to time. The report sets out, inter alia, requirements for Destruction and Removal Efficiency (DRE).
- 3.3.7 For concentrated sources (e.g., refrigerants), projects shall use a destruction technology with a minimum verified DRE of 99.99 percent.
- 3.3.8 For dilute sources (i.e., foams), projects shall use a destruction technology with a minimum verified DRE of 95 percent. In addition, a minimum Recovery and Destruction Efficiency (RDE) of 85 percent shall be achieved. RDE describes the proportion of blowing agent (ODS) remaining in the foam immediately prior to decommissioning that is recovered in the overall end-of-life management step, including ultimate destruction. For a full specification of RDE, see the *UNEP May 2005 Report of the Technology and Economic Assessment Panel, Volume 3, Report of the Task Force on Foam End-of-Life Issues*.⁶

Note – The May 2005 TEAP report provides a theoretical model for calculating RDE and methodology elements will need to specify a practical approach for determining RDE, such as those provided in RAL GZ 728 (Quality Assurance and Test Specifications for the Demanufacture of Refrigeration Equipment, 2007), the WEEE Forum standard (Requirements for the Collection, Transportation, Storage, Handling and Treatment of Household Cooling and Freezing Appliances containing CFC, HCFC or HFC, 2007) or another appropriate approach.

3.4 Project Documentation

Concept

In order to complete the project validation process, project proponents shall prepare a project description, which describes the project's GHG emission reduction or removal activities. In order to complete the project verification process, project proponents shall prepare a monitoring report, which describes the data and information related to the monitoring of GHG emission reductions or removals.

⁵ UNEP, 2002, UNEP April 2002 Report of the Technology and Economic Assessment Panel, Volume 3b, Report of the Task Force on Destruction Technologies. (http://ozone.unep.org/teap/Reports/Other_Task_Force/TEAP02V3b.pdf)

⁶ UNEP, 2005, UNEP May 2005 Report of the Technology and Economic Assessment Panel, Volume 3, Report of the Task Force on Foam End-of-Life Issues. (http://ozone.unep.org/teap/Reports/TEAP_Reports/TEAP-May-2005-Vol-2-Forms-End-of-Life.pdf)

Requirements

Project Description

- 3.4.1 The project proponent shall use the *VCS Project Description Template*, an approved combined project description template available on the Verra website or an approved GHG program project description template where the project is registered under an approved GHG program, as appropriate. The project proponent shall adhere to all instructional text within the template.
- 3.4.2 All information in the project description shall be presumed to be available for public review, though commercially sensitive information may be protected, as set out in the VCS Program document *Registration and Issuance Process*, where it can be demonstrated that such information is commercially sensitive. The validation/verification body shall check that any information designated by the project proponent as commercially sensitive meets the VCS Program definition of commercially sensitive information. Information in the project description related to the determination of the baseline scenario, demonstration of additionality, and estimation and monitoring of GHG emission reductions and removals shall not be considered to be commercially sensitive and shall be provided in the public versions of the project description.

Monitoring Report

- 3.4.3 The project proponent shall use the *VCS Monitoring Report Template* or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.
- 3.4.4 The monitoring period of the monitoring report shall be a distinct time period that does not overlap with previous monitoring periods. Projects shall not be eligible for crediting of GHG emission reductions generated in previous monitoring periods. In addition, monitoring periods shall be contiguous with no time gaps between monitoring periods.
- 3.4.5 Where a monitoring report and associated verification report divide a monitoring period into vintages, separate VCU issuance records in accordance with vintage periods may be issued, as set out in the VCS Program document *Registration and Issuance Process*.

3.5 Project Design

Concept

The VCS Program allows for different approaches to project design. Projects may be designed as a single installation of an activity. Projects may also be designed to include more than one project activity, such as an AFOLU project that includes REDD and ALM components. In addition, projects may be designed to include more than one project activity instance, such as a clean cookstove project that distributes cookstoves to a number of different communities. Finally, projects may be designed as

grouped projects, which are projects structured to allow the expansion of a project activity subsequent to project validation.

Note – Project activity and project activity instance both have the specific meanings that are set out in the VCS Program document Program Definitions.

Requirements

Multiple Project Activities

- 3.5.1 Projects may include multiple project activities where the methodology applied to the project allows more than one project activity and/or where projects apply more than one methodology.
- 3.5.2 Where more than one methodology has been applied to a project with multiple project activities, the following applies:
 - 1) Each project activity shall be specified separately in the project description, referencing the relevant methodology.
 - 2) All criteria and procedures set out in the applied methodologies in relation to applicability conditions, demonstration of additionality, determination of baseline scenario and GHG emission reduction and removal quantification shall be applied separately to each project activity, noting the following:
 - a) A single set of criteria and procedures for the demonstration of additionality may be applied where the applied methodologies reference the same additionality tool and/or procedures, and where separate demonstration of additionality for each project activity is not practicable.

 For example, separate demonstration of additionality may not be practicable in project activities that are implemented at a single facility and therefore represent a single investment. The onus is upon the project proponent to demonstrate to the validation/verification body that separate demonstration of additionality is not practicable, failing which separate demonstration of additionality shall be provided. Where a methodology specifies requirements for demonstrating additionality in addition to those specified in the referenced additionality tool and/or procedures, such requirements shall be adhered to.
 - b) The criteria and procedures for identifying the baseline scenario may be combined where the relevant methodologies or the referenced additionality tool and/or procedures specify criteria and procedures for combining baseline scenarios.
 - 3) The criteria and procedures relating to all other aspects of the methodologies may be combined.
 - 4) Where AFOLU projects are required to undertake non-permanence risk assessment and buffer withholding determination, this shall be done separately for each project activity.

Note – Where a single methodology is applicable to more than one project activity and where the methodology does not provide clear procedures for the application of more than one project activity, the above requirements shall be adhered to.

- 3.5.3 AFOLU projects that include multiple project activities shall comply with the respective project requirements of each included AFOLU category.

For example, projects that combine agroforestry or enrichment planting with community forestry in a single project, where farmers integrate these activities within a single landscape, shall follow an ARR methodology for planting activities and an IFM methodology for community forestry activities (except where the activities have been combined in a single methodology). Similarly, projects that integrate avoided grassland and shrubland conversion and improved grazing practices shall follow an ACoGS methodology for grassland or shrubland protection activities and an ALM methodology for improved grazing practices (except where both activities have been combined into a single methodology). Avoided conversion projects in landscapes that contain both forest and non-forest shall follow a REDD methodology for forested lands and an ACoGS methodology for non-forested lands. For each activity covered by a different methodology, the geographic extent of the area to which the methodology is applied shall be clearly delineated.

Multiple Instances of Project Activities

- 3.5.4 Inclusion of further project activity instances subsequent to initial validation of a non-grouped project is not permitted (see Sections 3.5.8 – 3.5.16 for information on grouped projects).
- 3.5.5 The baseline determination and additionality demonstration for all project activity instances shall be combined (e.g., multiple wind turbines shall be assessed in combination rather than individually).
- 3.5.6 Where a project includes multiple project activity instances from multiple project activities, the project activity instances from each project activity shall be assessed in accordance with Sections 3.5.1 – 3.5.3.
- 3.5.7 Non-grouped projects with multiple project activity instances shall not exceed any capacity limits to which a project activity is subject.

Grouped Projects

Baseline Scenario and Additionality

- 3.5.8 Grouped projects shall have one or more clearly defined geographic areas within which project activity instances may be developed. Such geographic areas shall be defined using geodetic polygons as set out in Section 3.10 below.
- 3.5.9 Determination of baseline scenario and demonstration of additionality are based upon the initial project activity instances. The initial project activity instances are those that are included in the project description at validation and shall include all project activity instances currently implemented on the issue date of the project description. The initial project activity instances

may also include any planned instances of the project activity that have been planned and developed to a sufficient level of detail to enable their assessment at validation. Geographic areas with no initial project activity instances shall not be included in the project unless it can be demonstrated that such areas are subject to the same (or at least as conservative) baseline scenario and rationale for the demonstration of additionality as a geographic area that does include initial project activity instances.

- 3.5.10 As with non-grouped projects, grouped projects may incorporate multiple project activities (see Section 3.5.1 – 3.5.3 for more information on multiple project activities). Where a grouped project includes multiple project activities, the project description shall designate which project activities may occur in each geographic area.
- 3.5.11 The baseline scenario for a project activity shall be determined for each designated geographic area, in accordance with the methodology applied to the project. Where a single baseline scenario cannot be determined for a project activity over the entirety of a geographic area, the geographic area shall be redefined or divided such that a single baseline scenario can be determined for the revised geographic area or areas.
- 3.5.12 The additionality of the initial project activity instances shall be demonstrated for each designated geographic area, in accordance with the methodology applied to the project. Where the additionality of the initial project activity instances within a particular geographic area cannot be demonstrated for the entirety of that geographic area, the geographic area shall be redefined or divided such that the additionality of the instances occurring in the revised geographic area or areas can be demonstrated.
- 3.5.13 Where factors relevant to the determination of the baseline scenario or demonstration of additionality require assessment across a given area, the area shall be, at a minimum, the grouped project geographic area. Examples of such factors include, inter alia, common practice; laws, statutes, regulatory frameworks or policies relevant to demonstration of regulatory surplus; determination of regional grid emission factors; and historical deforestation and degradation rates.

Capacity Limits

- 3.5.14 Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows:
 - 1) Each project activity instance that exceeds one percent of the capacity limit shall be identified.
 - 2) Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters.

- 3) None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.

Eligibility Criteria

3.5.15 Grouped projects shall include one or more sets of eligibility criteria for the inclusion of new project activity instances. At least one set of eligibility criteria for the inclusion of new project activity instances shall be provided for each combination of project activity and geographic area specified in the project description. A set of eligibility criteria shall ensure that new project activity instances:

- 1) Meet the applicability conditions set out in the methodology applied to the project.
- 2) Use the technologies or measures specified in the project description.
- 3) Apply the technologies or measures in the same manner as specified in the project description.
- 4) Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.
- 5) Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area. For example, the new project activity instances have financial, technical and/or other parameters (such as the size/scale of the instances) consistent with the initial instances, or face the same investment, technological and/or other barriers as the initial instances.

Note – Where grouped projects include multiple baseline scenarios or demonstrations of additionality, such projects will require at least one set of eligibility criteria for each combination of baseline scenario and demonstration of additionality specified in the project description.

Inclusion of New Project Activity Instances

3.5.16 Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project. New project activity instances shall:

- 1) Occur within one of the designated geographic areas specified in the project description.
- 2) Comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.
- 3) Be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.

- 4) Be validated at the time of verification against the applicable set of eligibility criteria.
- 5) Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions).
- 6) Have a start date that is the same as or later than the grouped project start date.
- 7) Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only). Note that where a new project activity instance starts in a previous verification period, no credit may be claimed for GHG emission reductions or removals generated during a previous verification period (as set out in Section 3.4.4) and new instances are eligible for crediting from the start of the next verification period.

Where inclusion of a new project activity instance necessitates the addition of a new project proponent to the project, such instances shall be included in the grouped project within two years of the project activity instance start date or, where the project activity is an AFOLU activity, within five years of the project activity instance start date. The procedure for adding new project proponents is set out in the VCS Program document *Registration and Issuance Process*.

AFOLU Projects

- 3.5.17 AFOLU non-permanence risk analyses, where required, shall be assessed for each geographic area specified in the project description (for requirements related to geographic areas of grouped projects see the VCS Standard). Where risks are relevant to only a portion of each geographic area, the geographic area shall be further divided such that a single total risk rating can be determined for each geographic area. Where a project is divided into more than one geographic area for the purpose of risk analysis, the project's monitoring and verification reports shall list the total risk rating for each area and the corresponding net change in the project's carbon stocks in the same area, and the risk rating for each area applies only to the GHG emissions reductions generated by project activity instances within the area.
- 3.5.18 Activity-shifting, market leakage and ecological leakage assessments, where required, shall be undertaken as set out in Section 3.14.5 – 3.14.15, and the methodology applied, on the initial group of instances of each project activity and reassessed where new instances of the project activity are included in the project.

Project Description for Grouped Projects

- 3.5.19 A grouped project shall be described in a single project description, which shall contain the following (in addition to the content required for non-grouped projects):
- 1) A delineation of the geographic area(s) within which all project activity instances shall occur. Such area(s) shall be defined by geodetic polygons as set out in Section 3.10 below.
 - 2) One or more determinations of the baseline for the project activity in accordance with the requirements of the methodology applied to the project.

- 3) One or more demonstrations of additionality for the project activity in accordance with the requirements of the methodology applied to the project.
- 4) One or more sets of eligibility criteria for the inclusion of new project activity instances at subsequent verification events.
- 5) A description of the central GHG information system and controls associated with the project and its monitoring.

Note – Where the project includes more than one project activity, the above requirements shall be addressed separately for each project activity, except for the delineation of geographic areas and the description of the central GHG information system and controls, which shall be addressed for the project as a whole.

3.6 Ownership

Concept

Project and jurisdictional proponents shall demonstrate that they have the legal right to control and operate project or program activities.

Requirements

3.6.1 The project description shall be accompanied by one or more of the following types of evidence establishing project ownership accorded to the project proponent(s), or program ownership accorded to the jurisdictional proponent(s), as the case may be (see the VCS Program document *Program Definitions* for definitions of project ownership and program ownership). To aid the readability of this section, the term project ownership is used below, but should be substituted by the term program ownership, as appropriate:

- 1) Project ownership arising or granted under statute, regulation or decree by a competent authority.
- 2) Project ownership arising under law.
- 3) Project ownership arising by virtue of a statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals (where the project proponent has not been divested of such project ownership).
- 4) Project ownership arising by virtue of a statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions and/or removals (where the project proponent has not been divested of such project ownership).
- 5) An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals which vests project ownership in the project proponent.

- 6) An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals which vests project ownership in the project proponent.
- 7) Project ownership arising from the implementation⁷ or enforcement of laws, statutes or regulatory frameworks that require activities be undertaken or incentivize activities that generate GHG emission reductions or removals.

3.7 Project Start Date

Concept

The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals. The project start date of an AFOLU project is the date on which activities that led to the generation of GHG emission reductions or removals are implemented (e.g., preparing land for seeding, planting, changing agricultural or forestry practices, rewetting, restoring hydrological functions, or implementing management or protection plans). Projects shall complete validation within specific timeframes from the project start date.

Requirements

Non-AFOLU Projects

- 3.7.1 Non-AFOLU projects shall complete validation within two years of the project start date. Additional time is granted for non-AFOLU projects to complete validation where they are applying a new VCS methodology. Specifically, projects using a new VCS methodology and completing validation within two years of the approval of the methodology by Verra may complete validation within four years of the project start date.
- 3.7.2 Note that new VCS methodology in this context refers to both newly issued VCS methodologies and newly issued VCS revisions to approved GHG program methodologies. The grace period does not apply in relation to any subsequent versions of such new methodologies and new methodology revisions that may be issued.

AFOLU Projects

- 3.7.3 AFOLU projects shall complete validation within five years of the project start date.

⁷ Implemented in the context of this paragraph means enacted or introduced, consistent with use of the term under the CDM rules on so-called Type E+ and Type E- policies.

ODS Projects

3.7.4 ODS projects shall comply with at least one of the following in relation to project start date:

- 1) The project start date shall not be before the Montreal Protocol production phase-out deadline (except for critical/essential uses) for the relevant ODS as it applies to the host country and/or any country from which ODS destroyed by the project is imported (as applicable); or
- 2) The project start date shall not be before the date the host country and/or any country from which ODS destroyed by the project is imported (as applicable) implements the production phase-out, or consumption phase-out where such country does not produce the relevant ODS, of the relevant ODS (critical/essential uses exempted). Such phase-outs shall be implemented in combination with an import ban on the relevant ODS (critical/essential uses exempted). This project start date requirement accounts for countries that phase-out the relevant ODS in advance of their Montreal Protocol production phase-out deadline.

Note – The project can destroy ODS that has not been phased out under either of the two options in above (e.g., if one ODS has contaminated another), but it shall receive no credit for the destruction of such ODS. Note also that the relevant production phase-out deadlines are those of the individual substances and not the substance groups.

Note – The relevant production phase-out deadlines are those of the individual substances and not the substance groups.

3.7.5 Where the project imports ODS, it shall provide documentary evidence, such as shipping manifests and bills of lading, to demonstrate that the ODS originates from a country meeting with the above.

Standardized Methods

3.7.6 Notwithstanding the requirements set out in Sections 3.7.1 – 3.7.5 above, projects applying a standardized method for determining additionality shall initiate the project pipeline listing process set out in the VCS Program document *Registration and Issuance Process* within the project validation timelines set out above. Validation may be completed any time thereafter.

For example, a non-AFOLU project applying a standardized method for determining additionality shall initiate the project pipeline listing process within two years of the project start date, and may complete validation any time thereafter.

Projects Registered with Other GHG Programs

3.7.7 For projects registered under an approved GHG program which are seeking registration with the VCS Program, further specification with respect to the validation deadline is set out in Sections 3.19.5 and 3.19.6.

3.8 Project Crediting Period

Concept

The project crediting period is the time period for which GHG emission reductions or removals generated by the project are eligible for issuance as VCUs. Project crediting periods shall be renewed periodically in order to ensure that changes to a project's baseline scenario and regulatory surplus are taken into consideration throughout the lifetime of the project.

Requirements

Project Crediting Period Length

Non-AFOLU Projects

3.8.1 For non-AFOLU projects, the project crediting period shall be either seven years, twice renewable for a total of 21 years, or ten years fixed.

AFOLU Projects

3.8.2 For ALM projects focusing exclusively on reducing N₂O, CH₄ and/or fossil-derived CO₂ emissions, the project crediting period shall be either seven years, twice renewable for a total of 21 years, or ten years fixed.

3.8.3 For all other AFOLU projects other than such ALM projects described above, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times with a total project crediting period not to exceed 100 years.

3.8.4 AFOLU projects shall have a credible and robust plan for managing and implementing the project over the project crediting period.

3.8.5 For ARR or IFM extension of rotation age or low-productive to high-productive projects with harvesting, the length of the project crediting period shall be set to include at least one complete harvest/cutting cycle. In the case of selectively cut IFM projects, where trees are individually selected for harvest, the harvest/cutting cycle is the allowable re-entry period into the harvest area as determined by legal and regulatory requirements, and/or common practice.

3.8.6 The earliest project crediting period start date for AFOLU projects shall be 1 January 2002.

Projects Registered under Other GHG Programs

3.8.7 Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project crediting period under those programs. For example, a CDM project with a seven year twice renewable project crediting period is not eligible for VCU issuance beyond the end of those 21 years. Where projects have been registered under more than one other GHG program, they are not eligible for VCU issuance after the date that is the earliest end date of all applicable project crediting periods.

Note – Since the total project crediting period under the Joint Implementation (JI) program is not defined ex-ante, the total project crediting period shall be deemed as 21 years for non-AFOLU JI projects and as 60 years for AFOLU JI projects⁸.

Renewal of Project Crediting Period

3.8.8 Where projects fail to renew the project crediting period, the project crediting period shall end and the project shall be ineligible for further crediting.

3.8.9 The following shall apply with respect to the renewal of the project crediting period under the VCS Program:

- 1) A full reassessment of additionality is not required when renewing the project crediting period. However, regulatory surplus shall be demonstrated in accordance with the requirements set out in the VCS Program rules and the project description shall be updated accordingly.
- 2) The validity of the original baseline scenario shall be demonstrated, or where invalid a new baseline scenario shall be determined, when renewing the project crediting period, as follows:
 - a) The validity of the original baseline scenario shall be assessed. Such assessment shall include an evaluation of the impact of new relevant national and/or sectoral policies and circumstances on the validity of the baseline scenario.
 - b) Where it is determined that the original baseline scenario is still valid, the GHG emissions associated with the original baseline scenario shall be reassessed using the latest version of the *CDM Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period*.
 - c) Where it is determined that the original baseline scenario is no longer valid, the current baseline scenario shall be established in accordance with the VCS Program rules.
 - d) The project description, containing updated information with respect to the baseline, the estimated GHG emission reductions or removals and the monitoring plan, shall be submitted for validation. Such updates shall be based upon the latest approved version of the methodology or its replacement. Where the project does not meet the requirements of the latest approved version of the methodology or its replacement, the project proponent shall select another applicable approved methodology (which may be a new methodology or methodology revision it has had approved via the methodology approval process), or shall apply a methodology deviation (where a methodology deviation is appropriate). Failing this, the project shall not be eligible for renewal of its project crediting period.

⁸ Consistent with the UNFCCC's other project-based mechanism, CDM.

- 3) The updated project description shall be validated in accordance with the VCS Program rules. In addition, the project shall be validated against the (current) scope of the VCS. Such validation report shall be issued after the end of the (previous) project crediting period but within two years after the end of the (previous) project crediting period.

Additional time is granted for projects to complete such validation where they are switching to a new VCS methodology (*new VCS methodology* in this context has the same meaning as set out in Section 3.7.1) when renewing the project crediting period. Specifically, projects switching to a new VCS methodology and completing such validation within one year of the approval of the methodology by Verra may complete such validation within three years of the end of the (previous) project crediting period.

3.9 Project Scale

Concept

Projects are categorized by size according to their estimated average annual GHG emission reductions or removals. Materiality thresholds differ for projects of different sizes.

Requirements

3.9.1 Project size categorizations are as follows:

- 1) *Projects*: Less than or equal to 300,000 tonnes of CO₂e per year.
- 2) *Large projects*: Greater than 300,000 tonnes of CO₂e per year.

3.9.2 Materiality requirements for validation and verification differ according to project size, as set out in Section 4.1.8 below.

3.9.3 Where applying a methodology with scale and/or capacity limits, it shall be demonstrated that the project is not a fragmented part of a larger project or activity that would otherwise exceed such limits. The project shall be considered a fragmented part of a larger project if within one kilometer of the project boundary there exists another project where:

- 1) The project proponents for both projects are the same.
- 2) The sectoral scope and project activity for both projects are the same.
- 3) The other project has been registered under the VCS Program or another GHG program within the previous two years.

3.10 Project Location

Concept

The project location shall be provided in order to accurately describe project characteristics and to demonstrate a project's conformance with other requirements, such as project ownership and regulatory compliance.

Requirements

General

3.10.1 Project location shall be specified in the project description as follows:

- 1) Project location for non-AFOLU projects shall be specified by a single geodetic coordinate.
- 2) Where there are multiple project activity instances (see Sections 3.5.4 – 3.5.7 for more information on multiple project activities), project location shall be specified according to the following:
 - a) Where it is reasonable to do so, a geodetic coordinate shall be provided for each instance and provided in a KML file; or
 - b) Where there are a large number project activity instances (e.g., cookstoves or energy efficient light bulbs), at least one geodetic coordinate shall be provided, together with sufficient additional geographic information (with respect to the location of the instances) to enable sampling by the validation/verification body.
- 3) Project location for grouped projects shall be specified using geodetic polygons to delineate the project's geographic area or areas (see Section 3.5.8 for further information on geographic areas for grouped projects) and provided in a KML file.

AFOLU Projects

3.10.2 The project location for AFOLU projects shall be specified in the project description in terms of its project area. The spatial extent of the project shall be clearly specified to facilitate accurate monitoring, reporting and verification of GHG emission reductions and removals and to demonstrate that the project meets the eligibility criteria of the relevant project category. The description of the project location shall include the following information:

- 1) Name of the project area (e.g., compartment number, allotment number and local name).
- 2) Maps of the project area.
- 3) Geodetic polygons that delineate the geographic area of each AFOLU project activity, provided in a KML file.
- 4) Total size of the project area.
- 5) Details of ownership.

Where the project area is comprised of multiple polygons (parcels), the project location details of each polygon/parcel shall be included in the project description.

3.10.3 The project proponent shall demonstrate control over the entire project area with documentary evidence establishing project ownership, noting the following:

- 1) For non-grouped projects, the entire project area shall be under the control of the project proponent at the time of validation, or shall come to be under the control of the project proponent by the first verification event.
- 2) Where the project proponent does not yet have control over the entire area at validation, the entire project area (that shall be specified in accordance with Section 3.10.2) is to be validated as if it were under control and the project is ready to be implemented.
- 3) Where less than 80 percent of the total proposed area of the project is under current control at validation, the following applies:
 - a) It shall be demonstrated that the result of the additionality test is applicable to the project area at the time of validation and to the entire project area to come under control in the future.
 - b) The monitoring plan shall be designed such that it is flexible enough to deal with changes in the size of the project.
 - c) The project shall be verified within five years of validation. At verification, the size of the project becomes fixed.
 - d) Where the area fixed at verification is smaller than intended at validation, areas that at verification have not come under control of the project shall be considered in the leakage management, mitigation and accounting. This requires the selection, at validation, of a methodology with appropriate leakage methods that may be used in the event the entire area does not come under control of the project.

3.10.4 WRC projects shall demonstrate that:

- 1) There is no hydrological connectivity to adjacent (non-project) areas; or
- 2) It is not possible for hydrologically connected areas to have a negative impact on the hydrology within the project area that could cause a significant increase in GHG emissions; or
- 3) Where projects are hydrologically connected to adjacent areas that may have a negative impact on the hydrology within the project area, projects shall demonstrate that such impacts will not result in a significant increase in GHG emissions, as follows:
 - a) Peatland projects shall establish a buffer zone to ensure that potential negative impacts to the hydrology in the project area, such as causing the water table in the project area to drop or otherwise negatively impacting the hydrology, are mitigated. The buffer zone may be inside or outside the geographic boundary of the project area.

Where it is outside of the project area, the buffer zone shall be adjacent to the project geographic boundary and binding water management agreements with land holders in the buffer zone shall be in place by the time of the first verification. The size and shape of the buffer zone shall be sufficient to avoid such negative impacts on the project area, which may be demonstrated through peer reviewed literature or expert judgment.

- b) All other wetland projects shall establish a buffer zone as set out in Section 3.10.4(3)(a) above, or implement project activities or establish a mitigation plan to ensure that impacts to the hydrology (e.g., interrupted water or sediment supply) do not result in a significant increase in GHG emissions. Emphasis shall be placed on hydrological connectivity that is immediately adjacent to the project area. Coastal wetlands shall consider hydrological connectivity originating from adjacent lands and shall follow the applied methodology with respect to oceanic impacts.

Where a project activity to mitigate impacts from hydrological connectivity causes an increase in GHG emissions in the project area or buffer zone, such emissions shall be included in GHG accounting where above *de minimis*.

3.11 Project Boundary

Concept

The project boundary includes the GHG sources, sinks and reservoirs that are relevant to the project and baseline scenarios. The relevant GHG sources, sinks and reservoirs that shall be included or excluded, or are optional, are set out in the methodology(s) applied by the project.

Requirements

- 3.11.1 The project boundary shall be described (using diagrams, as required) and GHG sources, sinks and reservoirs shall be identified and assessed in accordance with the methodology applied to the project. The project shall justify not selecting any relevant GHG source, sink and reservoir.

3.12 Baseline Scenario

Concept

The baseline scenario represents the activities and GHG emissions that would occur in the absence of the project activity. The baseline scenario shall be accurately determined so that an accurate comparison can be made between the GHG emissions that would have occurred under the baseline scenario and the GHG emission reductions and/or removals that were achieved by project activities.

Requirements

- 3.12.1 The baseline scenario for the project shall be determined in accordance with the requirements set out in the methodology applied to the project, and the choice of baseline scenario shall be justified.
- 3.12.2 Equivalence in type and level of activity of products or services provided by the project and the baseline scenario shall be demonstrated and, where appropriate, any significant differences between the project and the baseline scenario shall be explained.
- 3.12.3 In developing the baseline scenario, assumptions, values and procedures shall be selected that help ensure that net GHG emission reductions and removals are not overestimated.

3.13 Additionality

Concept

A project activity is additional if it can be demonstrated that the activity results in emission reductions or removals that are in excess of what would be achieved under a “business as usual” scenario and the activity would not have occurred in the absence of the incentive provided by the carbon markets. Additionality is an important characteristic of GHG credits, including VCUs, because it indicates that they represent a net environmental benefit and a real reduction of GHG emissions, and can thus be used to offset emissions.

Requirements

3.13.1 Additionality shall be demonstrated and assessed in accordance with the requirements set out in the methodology applied to the project, noting the following exceptions:

- 1) Where a VCS module using an activity method (see the *VCS Methodology Requirements* for further information on activity methods) is applicable to the project, additionality may be demonstrated using the module in substitution of the additionality requirements set out in the methodology.

For example, if a module uses an activity method (i.e., positive list) to deem a project activity additional, the project proponent does not have to follow the additionality requirements in the methodology applied to the project and may instead demonstrate additionality by demonstrating that it meets the applicability conditions and any other criteria of the activity method.

Note that only modules may be used in this way. Where a methodology contains an activity method for additionality, the additionality procedures may not be applied in conjunction with a different methodology.

- 2) Where the applied methodology was developed under an approved GHG program and uses an activity method or other simplified procedure for demonstrating additionality, the project proponent shall demonstrate to the validation/verification body that the simplified procedure is appropriate to apply to the project considering the project characteristics, including the context in which the project activity takes place. Failing this demonstration, the project proponent shall not use the simplified procedure for demonstrating additionality, and shall instead use an appropriate additionality assessment method in substitution.

For example, where a project is developed in the United States and applies a CDM methodology which uses a simplified procedure for demonstrating additionality, the project proponent shall demonstrate to the validation/verification body that the simplified procedure is appropriate to apply given that the simplified procedure was originally developed for application in a developing country context.

ODS Projects

- 3.13.2 The project shall not be mandated by any law, statute or other regulatory framework applying in the host country that was implemented on or before 11 November 2001, or the compliance rate of any such law, statute or other regulatory framework during (part of) the project crediting period shall be below 50 percent.

3.14 Quantification of GHG Emission Reductions and Removals

Concept

GHG emission reductions and removals achieved by projects are the basis for the volume of VCUs that can be issued. GHG emissions reductions and removals shall be quantified in accordance with the applied methodology(s).

Requirements

- 3.14.1 GHG emission and/or removals shall be estimated for each GHG source, sink and/or reservoir relevant for the project (including leakage) and the baseline scenarios.
- 3.14.2 The net GHG emission reductions and removals generated by the project shall be quantified.
- 3.14.3 Metric tonnes shall be used as the unit of measure and the quantity of each type of GHG shall be converted to tonnes of CO₂e.
- 3.14.4 The six Kyoto Protocol greenhouse gases and ozone-depleting substances shall be converted using 100-year global warming potentials derived from the IPCC's *Fourth Assessment Report*.

AFOLU Projects

- 3.14.5 The potential for leakage shall be identified for AFOLU projects, and projects are encouraged to include leakage management zones as part of the overall project design. Leakage management zones can minimize the displacement of land use activities to areas outside the project area by maintaining the production of goods and services, such as agricultural products, within areas under the control of the project proponent or by addressing the socio-economic factors that drive land use change. Activities to mitigate ecological leakage in WRC projects may include the establishment of a leakage management zone inside the project boundary.
- 3.14.6 Activities to mitigate leakage and sustainably reduce deforestation and/or forest or wetland degradation are encouraged and may include the establishment of agricultural intensification practices on non-wetlands, lengthened fallow periods, agroforestry and fast-growing woodlots on degraded land, forest under-story farming, ecotourism and other sustainable livelihood activities, sustainable production of non-timber forest products, and/or sustainable aquaculture. Leakage mitigation activities may be supplemented by providing economic opportunities for local communities that encourage forest or wetland protection, such as employment as protected-area guards, training in sustainable forest use or assisting communities in securing markets for sustainable forest products, such as rattan, vanilla, cacao, coffee and natural medicines, or wetland products, such as rattan, fish and shellfish.
- 3.14.7 Where projects are required to account for leakage, such leakage evaluation shall be documented in the appropriate section of the project description and/or monitoring report, as applicable.
- 3.14.8 Market leakage assessments shall occur per the requirements set out in the applied methodology(s) at validation and verification.
- 3.14.9 Notwithstanding the requirement set out in Section 3.14.8 above, IFM projects may apply the appropriate market leakage discount factor identified in Table 2 to the net change in carbon stock associated with the activity that reduces timber harvest to determine market leakage.

Table 2: Market Leakage Discount Factors

Project Action	Leakage Risk	Market Leakage Discount Factor
IFM activity with no effect or minimal effect on total timber harvest volumes (e.g., RIL with less than 25% reduction)	None	0%
IFM activity that leads to a shift in harvests across time periods but minimal change in total timber harvest over time (e.g., ERA with rotation extension of 5-10 years)	Low	10%
IFM activity that substantially reduces harvest levels permanently (e.g., RIL activity that reduces timber harvest across the project area, or project that halts logging by at least 25%)	Moderate to High	<p>Conditional upon where timber harvest is likely to be shifted, as follows:</p> <ul style="list-style-type: none"> • Where the ratio of merchantable biomass to total biomass is higher within the area to which harvesting is displaced compared to the project area, 20% • Where the ratio of merchantable biomass to total biomass is similar within the area to which harvesting is displaced compared to the project area, 40% • Where the ratio of merchantable biomass to total biomass is lower within the area to which harvesting is displaced compared to the project area, 70% • Where the leakage is out of country, 0%

3.14.10 Leakage occurring outside the host country (international leakage) does not need to be quantified.

3.14.11 Projects shall not account for positive leakage (i.e., where GHG emissions decrease or removals increase outside the project area due to project activities).

3.14.12 Where the applied methodology(s) does not set out a method to determine whether leakage is *de minimis*, projects may use the process set out in the VCS Program document *VCS Methodology Requirements* or the CDM A/R methodological *Tool for testing significance of GHG Emissions in A/R CDM Project Activities*.

3.14.13 Projects may apply optional default leakage deductions at validation under the following circumstances:

- 1) Where the applied methodology requires the quantification of activity-shifting leakage, projects may apply the optional default activity-shifting leakage deduction of 15 percent to the gross GHG emission reductions and/or removals.
- 2) Where the applied methodology requires the quantification of market leakage and where a) timber is a significant⁹ commodity that is driving deforestation and/or degradation in the baseline scenario and b) the project country is not a leading producer or exporter of forest products as defined by the United Nations Food and Agriculture Organization (FAO)¹⁰, projects may apply the optional default market leakage deduction of 10 percent to the gross GHG emission reductions and/or removals.

3.14.14 Projects shall monitor and calculate leakage, per the applied methodology, for all ex-post accounting (i.e., at each verification), and leakage shall be deducted from the total GHG emission reductions and/or removals of the project. Any leakage shall be subtracted from the number of GHG emission reductions and removals eligible to be issued as VCUs.

3.14.15 The number of GHG credits issued to projects is determined by subtracting out the buffer credits from the net GHG emission reductions or removals (including leakage) associated with the project. The buffer credits are calculated by multiplying the non-permanence risk rating (as determined by the *AFOLU Non-Permanence Risk Tool*) times the change in carbon stocks only. The full rules and procedures with respect to assignment of buffer credits are set out in the VCS Program document *Registration and Issuance Process*.

3.15 Monitoring

Concept

The impacts of project activities on relevant emission sources, sinks and reservoirs shall be monitored in order to determine the net GHG benefit. Projects shall be monitored in accordance with the applied methodology(s).

⁹ Defined as contributing to 20 percent or more of baseline emissions.

¹⁰ The FAO releases annual listings of countries that are Major Producers of Forest Products (<http://www.fao.org/forestry/statistics/80938@180723/en/>) and Major Exporters of Forest Products (<http://www.fao.org/forestry/statistics/80938@180724/en/>).

Requirements

Data and Parameters

- 3.15.1 Data and parameters used for the quantification of GHG emission reductions and/or removals shall be provided in accordance with the methodology.
- 3.15.2 Quality management procedures to manage data and information shall be applied and established. Where applicable, procedures to account for uncertainty in data and parameters shall be applied in accordance with the requirements set out in the methodology.

Monitoring Plan

- 3.15.3 The project proponent shall establish a GHG information system for obtaining, recording, compiling and analyzing data and information important for quantifying and reporting GHG emissions and/or removals relevant for the project (including leakage) and baseline scenario.
- 3.15.4 A monitoring plan for the project that includes roles and responsibilities shall be established.
- 3.15.5 Where measurement and monitoring equipment is used, the project proponent shall ensure the equipment is calibrated according to the equipment's specifications and/or relevant national or international standards.

3.16 Safeguards

Concept

Project activities shall not negatively impact the natural environment or local communities. Project proponents shall identify and address any negative environmental and socio-economic impacts of project activities, and shall engage with local stakeholders during the project development and implementation processes.

Requirements

General

No Net Harm

- 3.16.1 The project proponent shall identify potential negative environmental and socio-economic impacts, and shall take steps to mitigate them. Additional certification standards may be applied to demonstrate social and environmental benefits beyond GHG emission reductions or removals.

Note that VCUs may be labeled with additional standards and certifications on the Verra registry where both the VCS Program and another standard are applied. The Verra website provides the list of standards that are accepted as VCU labels and the procedure for attaining such VCU labels.

Local Stakeholder Consultation

- 3.16.2 The project proponent shall conduct a local stakeholder consultation prior to validation as a way to inform the design of the project and maximize participation from stakeholders. Such consultations allow stakeholders to evaluate impacts, raise concerns about potential negative impacts and provide input on the project design.
- 3.16.3 The project proponent shall establish mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation.
- 3.16.4 The project proponent shall take due account of all and any input received during the local stakeholder consultation and through ongoing communications, which means it will need to either update the project design or justify why updates are not appropriate. The project proponent shall demonstrate to the validation/verification body what action it has taken in respect of the local stakeholder consultation as part of validation, and in respect of ongoing communications as part of each subsequent verification.

Public Comment Period

- 3.16.5 All projects are subject to a 30-day public comment period. The date on which the project is listed on the project pipeline marks the beginning of the project’s 30-day public comment period (see the VCS Program document *Registration and Issuance Process* for more information on the VCS project pipeline).
- 3.16.6 Projects shall remain on the project pipeline for the entirety of their 30-day public comment period.
- 3.16.7 Any comments shall be submitted to Verra at secretariat@verra.org and respondents shall provide their name, organization, country and email address. At the end of the public comment period, Verra provides all and any comments received to the project proponent.
- 3.16.8 The project proponent shall take due account of any and all comments received during the consultation, which means it will need to either update the project design or demonstrate the insignificance or irrelevance of the comment. It shall demonstrate to the validation/verification body what action it has taken.

AFOLU Projects

- 3.16.9 Where AFOLU project activities do not impact local stakeholders, projects are not required to meet the requirements set out in Sections 3.16.11– 3.16.18 below. The project proponent shall provide evidence that project activities do not impact local stakeholders at validation and each verification.

3.16.10 Where AFOLU projects complete a validation or verification to the Climate, Community & Biodiversity (CCB) Program at the same time as a VCS Program validation or verification, they are not required to conduct a separate demonstration of compliance with the requirements set out in this Section 3.16.

Note – Where an AFOLU project has previously certified to the Climate, Community & Biodiversity (CCB) Program, but is completing a VCS Program verification without also completing a CCB Program verification for the same verification period, the project proponent shall demonstrate compliance with the requirements set out in Sections 3.16.11 – 3.16.18 below.

Local Stakeholder Identification and Background

3.16.11 The project proponent shall conduct a thorough assessment of the local stakeholders that will be impacted by the project. The project description shall include information on local stakeholders at the start of the project, including:

- 1) The process(es) used to identify local stakeholders likely impacted by the project and a list of such stakeholders;
- 2) Identification of any legal or customary tenure/access rights to territories and resources, including collective and/or conflicting rights, held by local stakeholders;
- 3) A description of the social, economic and cultural diversity within local stakeholder groups and the differences and interactions between the stakeholder groups;
- 4) Any significant changes in the makeup of local stakeholders over time;
- 5) The expected changes in well-being and other stakeholder characteristics under the baseline scenario, including changes to ecosystem services identified as important to local stakeholders;
- 6) The location of communities, local stakeholders and areas outside the project area that are predicted to be impacted by the project; and
- 7) The location of territories and resources which local stakeholders own or to which they have customary access.

Risks to Local Stakeholders

3.16.12 The project proponent shall identify likely natural and human-induced risks to local stakeholder well-being expected during the project lifetime and outline measures needed to mitigate these risks.

3.16.13 The project proponent shall identify the risks for local stakeholders to participate in the project, including project design and consultation. Risks should include trade-offs with food security, land loss, loss of yields and climate change adaptation. The project shall be designed and implemented to avoid trade-offs and manage the identified risks to local stakeholders.

3.16.14 The project proponent or any other entity involved in project design or implementation shall not be involved in any form of discrimination or sexual harassment.

3.16.15 The management teams involved in the project shall have expertise and prior experience implementing land management and carbon projects with community engagement at the project scale. Where relevant experience is lacking, the project proponent shall either demonstrate how they have partnered with other organizations to support the project or have a recruitment strategy to fill the identified gaps.

Respect for Local Stakeholder Resources

3.16.16 The project proponent shall avoid negative impacts of project implementation and mitigate impacts when unavoidable, including the following:

- 1) The project proponent shall recognize, respect and support local stakeholders' property rights and where feasible, take measures to help secure rights. The project shall not encroach on private, stakeholder or government property or relocate people off their lands without consent. The project may affect property rights if free, prior and informed consent is obtained from those concerned and a transparent agreement is reached that includes provisions for just and fair compensation. In the event there are any ongoing or unresolved conflicts over property rights, usage or resources, the project shall undertake no activity that could exacerbate the conflict or influence the outcome of an unresolved dispute.
- 2) To reduce damage to the ecosystems on which the local stakeholders rely:
 - a) The project shall not introduce any invasive species or allow an invasive species to thrive through project implementation.
 - b) The project shall justify the use of non-native species over native species, explaining the possible adverse effects of non-native species.
 - c) The project shall justify the use of fertilizers, chemical pesticides, biological control agents and other inputs used by the project and their possible adverse effects.

Communication and Consultation

3.16.17 The project proponent shall take all appropriate measures to communicate and consult with local stakeholders in an ongoing process for the life of the project. The project proponent shall communicate:

- 1) The project design and implementation, including the results of monitoring.
- 2) The risks, costs and benefits the project may bring to local stakeholders.
- 3) All relevant laws and regulations covering workers' rights in the host country.
- 4) The process of VCS Program validation and verification and the validation/verification body's site visit.

3.16.18 The project proponent shall develop a grievance redress procedure to address disputes with local stakeholders that may arise during project planning and implementation, including with regard to benefit sharing. The procedure shall include processes for receiving, hearing, responding and attempting to resolve grievances within a reasonable time period, taking into account culturally-appropriate conflict resolution methods. The procedure and documentation of disputes resolved through the procedure shall be made publicly available. The procedure shall have three stages:

- 1) The project proponent shall attempt to amicably resolve all grievances and provide a written response to the grievances in a manner that is culturally appropriate.
- 2) Any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party.
- 3) Any grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction or b) competent courts in the relevant jurisdiction, without prejudice to a party’s ability to submit the grievance to a competent supranational adjudicatory body, if any.

3.16.19 All communication and consultation shall be performed in a culturally appropriate manner, including language and gender sensitivity, directly with local stakeholders or their legitimate representatives when appropriate. The results of implementation shall be provided in a timely manner and consultation shall be performed prior to design decisions or implementation to allow stakeholders adequate time to respond to the proposed design or action.

3.17 Methodology Deviations

Concept

Projects may deviate from the procedures set out in methodologies in certain cases, where alternative methods may be more efficient for project-specific circumstances, and where the deviation will achieve the same level of accuracy or is more conservative than what is set out in the methodology.

Requirements

3.17.1 Deviations from the applied methodology are permitted where they represent a deviation from the criteria and procedures relating to monitoring or measurement set out in the methodology (i.e., deviations are permitted where they relate to data and parameters available at validation, data and parameters monitored, or the monitoring plan).

3.17.2 Methodology deviations shall not negatively impact the conservativeness of the quantification of GHG emission reductions or removals, except where they result in increased accuracy of such quantification. Deviations relating to any other part of the methodology shall not be permitted.

3.17.3 Methodology deviations shall be permitted at validation or verification and their consequences shall be reported in the validation or verification report, as applicable, and all subsequent verification reports. Methodology deviations are not considered to be precedent setting.

3.18 Project Description Deviations

Concept

Projects may deviate from the validated project description in certain cases in order to accommodate changing circumstances post-validation. Such deviations shall be described and assessed by a validation/verification body during the next project verification.

Requirements

3.18.1 Deviations from the project description are permitted at verification.

3.18.2 The procedures for documenting a project description deviation depend on whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Interpretation of whether the deviation impacts any of these shall be determined consistent with the *CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD*, mutatis mutandis. The procedures are as follows:

- 1) Where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario, the deviation shall be described and justified in a revised version of the project description. This shall include a description of when the changes occurred, the reasons for the changes and how the changes impact the applicability of the methodology, additionality and/or the appropriateness of the baseline scenario.

An example of such a deviation is a change in project capacity where a different baseline scenario would be more plausible, the applied methodology would no longer be applicable, or there would be a significant impact on the investment analysis used by the project to demonstrate additionality. Other examples include changes to the project that might have similar impacts such as the addition of new carbon pools or new types of project activities.

- 2) Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report. This shall include a description of when the changes occurred and the reasons for the changes. The deviation shall also be described in all subsequent monitoring reports.

Examples of such deviations include changes in the procedures for measurement and monitoring, or project design changes that do not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

Note that project proponents may apply project description deviations for the purpose of switching to the latest version of the methodology, or switching to a different methodology. For example, a project proponent may want to switch to the latest version of a methodology where such version includes additional types of carbon pools or project activities.

- 3.18.3 The deviation shall be assessed by a validation/verification body and the process, findings and conclusions shall be reported in the verification report. The assessment shall determine whether the deviation is appropriately described and justified, and whether the project remains in compliance with the VCS Program rules. The deviation shall also be reported on in all subsequent verification reports. Project description deviations are not considered to be precedent-setting.
- 3.18.4 The validation/verification body assessing the project description deviation shall be accredited for the validation, recognizing that assessment of project description deviations is a validation activity, as further set out in the VCS Program Guide.

3.19 Participation under Other GHG Programs

Concept

Projects may be registered under both the VCS Program and either an approved GHG program or a GHG program that is not an approved GHG program.

Requirements

General

- 3.19.1 Project proponents shall not claim credit for the same GHG emission reduction or removal under the VCS Program and another GHG program. Projects issuing GHG credits under both the VCS Program and another GHG program shall also comply with the rules and requirements set out in the VCS Program document *Registration and Issuance Process*.
- 3.19.2 Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project crediting period under those programs (see Section 3.8.7 for further information).
- 3.19.3 For projects registered under the CDM as a program of activities (PoA), the following applies:
 - 1) Each component project activity (CPA) shall be registered with the VCS Program as a separate project accompanied by its associated program of activities design document.
 - 2) Each such project shall be validated in accordance with Section 3.19.5(1) below.
 - 3) The project start date for such projects is the date on which the first activity under the program of activities began reducing or removing GHG emissions.

- 4) Validation shall be completed within the relevant project start date deadline, as set out in Section 3.19(in this case, validation refers to validation of the first CPA under the associated PoA).

AFOLU Projects

3.19.4 In addition to the above, AFOLU projects registered under both the VCS Program and another GHG program shall comply with the following:

- 1) All and any (VCS) monitoring and verification reports shall state the total amount of credits (GHG credits and, where applicable, buffer credits) issued under the other GHG program.
- 2) The project shall prepare a non-permanence risk report in accordance with the VCS Program document *AFOLU Non-Permanence Risk Tool* and a validation/verification body shall undertake a full validation of same in accordance with the VCS Program rules. The non-permanence risk analysis shall be based upon the project as a whole, though the buffer withholding shall apply to the net change in carbon stocks for which credits are sought under the VCS Program.
- 3) Where temporary GHG credits (e.g., tCERs or ICERs) have been issued to the project, VCU's may be issued to the project only in accordance with the rules and requirements set out in the VCS Program document *Registration and Issuance Process*.
- 4) Where a loss event or a reversal occurs, the project shall comply with the rules for reporting a loss event and holding/cancelling credits set out in Section 3.2.15 and the VCS Program document *Registration and Issuance Process*. Such reporting, holding and cancelling shall apply to the proportion of credits (GHG credits and buffer credits) granted to date under the VCS Program.

For example, if 50 percent of the total credits (GHG credits and, where applicable, buffer credits) related to the project have been issued under the VCS Program and a loss event results in a reversal of GHG emission reductions or removals achieved, buffer credits would be cancelled to cover 50 percent of the reversal. An example calculation is available on the Verra website.

Approved GHG Programs

3.19.5 The following applies with respect to projects registered under an approved GHG program which are seeking registration with the VCS Program:

- 1) For projects registered under the CDM, the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6 of the *VCS Project Description Template* shall be completed. A validation/verification body shall undertake a validation of same, which shall be accompanied by a validation representation, to provide a gap validation for the project's compliance with the VCS Program rules.

- 2) For projects registered under the JI program, a new *VCS Project Description Template* shall be completed (applying a methodology eligible under the VCS Program). A validation/verification body shall undertake a full validation of same in accordance with the VCS Program rules. The validation report shall be accompanied by a validation representation.
- 3) For projects registered under the Climate Action Reserve, the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.15.1, 1.16, 1.17, 2.1, 2.2, 2.3, 2.4 and 3.6 of the *VCS Project Description Template* shall be completed. A validation/verification body shall undertake a validation of same, which shall be accompanied by a validation representation, to provide a gap validation for the project's compliance with VCS Program rules.
- 4) The approved GHG program validation (or verification, where the approved GHG program does not have a validation step) or VCS validation shall be completed within the relevant validation deadline as set out in Section 3.7. Validation (or verification) is deemed to have been completed when the validation (or verification) report that is submitted to the relevant program to request registration has been issued.

Other GHG Programs

3.19.6 Projects registered under a GHG program that is not an approved GHG program may also register with the VCS Program where a validation or verification report has been issued under such program (by an entity approved under the program to issue such reports). For such projects, the following applies:

- 1) The project start date shall be on or after 19 November 2007.
- 2) A new *VCS Project Description Template* shall be completed (using a methodology eligible under the VCS Program) and a validation/verification body shall undertake a full validation of same in accordance with the VCS Program rules. The validation report shall be accompanied by a validation representation.
- 3) The validation or verification that is submitted to request registration under the other GHG program shall be completed within the relevant validation deadline set out in Section 3.7. Validation or verification is deemed to have been completed when the validation or verification report that is submitted to the other GHG program to request registration has been issued.

Projects Rejected by Other GHG Programs

3.19.7 Projects rejected by other GHG programs due to procedural or eligibility requirements can be considered under the VCS Program, but the following conditions shall be met:

- 1) The project description (where the other GHG program has rejected the project before VCS validation) or monitoring report (where the other GHG program has rejected the project after VCS validation) shall clearly state all GHG programs to which the project has applied

- for registration and the reason(s) for rejection. Such information shall not be deemed as commercially sensitive information.
- 2) The validation/verification body shall be provided with the rejection document(s), including any additional explanations.
 - 3) The project shall be validated against the VCS Program rules. For projects where the other GHG program has rejected the project after VCS validation, this means a complete revalidation of the project against the VCS Program rules.

3.20 Other Forms of Credit

Concept

In order to maintain atmospheric integrity, GHG emission reductions/removals that are issued as VCU's cannot also be issued as other types of GHG credits or claimed as other forms of environmental credit. Project proponents shall demonstrate that project emission reductions or removals are not also used under emission trading programs, other mechanisms that include GHG allowance trading, or as other forms of environmental credit.

Requirements

Emission Trading Programs and Other Binding Limits

3.20.1 Where projects reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading, evidence shall be provided that the GHG emission reductions or removals generated by the project have not and will not be otherwise counted or used under the program or mechanism. Such evidence may include:

- 1) A letter from the program operator, designated national authority or other relevant regulatory authority that emissions allowances (or other GHG credits used in the program) equivalent to the reductions or removals generated by the project have been cancelled from the program or national cap, as applicable.
- 2) Evidence of the purchase and cancellation of GHG allowances equivalent to the GHG emissions reductions or removals generated by the project related to the program or national cap.
- 3) Evidence from the program operator, designated national authority or other relevant regulatory authority stating that the specific GHG emission reductions or removals generated by the project or type of project are not within the scope of the program or national cap.

Other Forms of Environmental Credit

3.20.2 Projects may generate other forms of GHG-related environmental credits, such as renewable energy certificates (RECs), though GHG emission reductions and removals presented for VCU issuance shall not also be recognized as another form of GHG-related environmental credit. The requirements set out in Sections 3.20.2 and 3.20.3 below assist Verra in confirming that this requirement has been met at the point of the issuance request (i.e., Verra uses the information disclosed in the project documents to perform its checks).

Therefore, project proponents interested in issuing (sequentially) both VCUs and another GHG-related environmental credit should consider which periods of time they wish to issue one credit or the other. Project proponents should also investigate whether such other GHG-related environmental credits can be cancelled from the relevant program, in case such credits have already been issued for periods where the project proponent wishes to issue VCUs. Note that additional requirements regarding evidence that no double issuance has occurred are set out in the VCS Program document *Registration and Issuance Process*.

3.20.3 Where projects have sought or received another form of GHG-related environmental credit, the following information shall be provided to the validation/verification body:

- 1) Name and contact information of the relevant environmental credit program.
- 2) Details of the project as registered under the environmental credit program (e.g., project title and identification number as listed under the program).
- 3) Monitoring periods for which GHG-related environmental credits were sought or received under the environmental credit program.
- 4) Details of all GHG-related environmental credits sought or received under the environmental credit program (e.g., volumes and serial numbers).

3.20.4 Where projects are eligible to participate under one or more programs to create another form of GHG-related environmental credit, but are not currently doing so, a list of such programs shall be provided to the validation/verification body.

Note – The requirements set out in Section 3.20.3 above and this Section 3.20.4 do not apply to non-GHG related environmental credits, such as water or biodiversity credits.

3.21 Records and Information

Concept

The project proponent shall make relevant information available to the validation/verification body during validation and each verification and retain documents and records related to the project for future reference.

Requirements

Records Relating to the Project

3.21.1 The project proponent shall ensure that all documents and records are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

Information for the Validation/Verification Body

3.21.2 For validation, the project proponent shall make available to the validation/verification body the project description, evidence of project ownership and any requested supporting information and data needed to support statements and data in the project description and evidence of project ownership.

3.21.3 For verification, the project proponent shall make available to the validation/verification body the project description, validation report, monitoring report applicable to the monitoring period and any requested supporting information and data needed to evidence statements and data in the monitoring report.

4 VALIDATION AND VERIFICATION REQUIREMENTS

This section sets out the rules and requirements for validation and verification of projects under the VCS Program. Validation/verification bodies must assess projects' compliance with VCS Program rules and requirements and the applied methodology(s) in accordance with the sections below.

Validation/verification bodies must be approved under the VCS Program, and meet the eligibility criteria set out in the *VCS Program Guide*.

4.1 Introduction and General Requirements

Concept

Validation is the independent assessment of the project by a validation/verification body that determines whether the project complies with the VCS Program rules. Verification is the periodic ex-post independent assessment by a validation/verification body of the GHG emission reductions and removals that have occurred as a result of the project during the monitoring period, conducted in accordance with the VCS Program rules.

Requirements

General

- 4.1.1 Validation and verification is a risk-based process and shall be carried out in conformance with *ISO 14064-3:2006* and *ISO 14065:2013*. Additional requirements with respect to validation and verification are set out in this Section 4 and shall be adhered to.
- 4.1.2 The validation/verification body shall select samples of data and information to be validated or verified to provide a reasonable level of assurance and to meet the materiality requirements of the specific project.
- 4.1.3 The project shall be validated and GHG emission reductions or removals verified by a validation/verification body that meets with the eligibility requirements set out in the *VCS Program Guide*.
- 4.1.4 Validation and verification of the project may be undertaken by the same validation/verification body, noting the rules on rotation of validation/verification bodies set out in Section 4.1.20 below. Validation may occur before the first verification or at the same time as the first verification.

- 4.1.5 The project shall be listed on the project pipeline before the opening meeting between the validation/verification body and the project proponent (such opening meeting representing the beginning of the validation process). The validation/verification body is responsible for checking that the project is listed on the project pipeline and shall not conduct the opening meeting or otherwise begin validation until such time as the project is listed.
- 4.1.6 Where the project applies a methodology from an approved GHG program that does not have an independent validation step, the VCS Program rules still require validation of the project.
- 4.1.7 Validation/verification bodies are expected to follow the guidance provided in the VCS *Validation and Verification Manual* when validating or verifying projects and conducting methodology assessments under the VCS Program.

Validation and Verification Process

- 4.1.8 In addition to the requirements set out in *ISO 14064-3:2006*, the following shall apply:
 - 1) The level of assurance shall be reasonable, with respect to material errors, omissions and misrepresentations, for both validation and verification.
 - 2) The criteria for validation shall be the *VCS Version 4*, or approved GHG program where the validation is performed under an approved GHG program (as in cases of participation under the VCS Program and an approved GHG program). The criteria for verification shall be the *VCS Version 4* (regardless of the VCS version or GHG program under which the project was validated). This means the validation or verification shall ensure conformance of the project with the VCS Program rules, or rules and requirements of the approved GHG program, as applicable.
 - 3) The objective of validation or verification shall be in conformance with the VCS Program rules and the methodology applied to the project.
 - 4) The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals shall be five percent for projects and one percent for large projects.
- 4.1.9 Where the project does not fully comply with the methodology, the validation/verification body shall determine whether this represents a methodology deviation or a methodology revision (in accordance with the specifications for each), and the case shall be handled accordingly.
- 4.1.10 Where the project applies a revision to an approved GHG program methodology and the version of the (underlying) methodology referenced by the methodology revision is no longer current, the validation/verification body shall determine whether material changes have occurred to the underlying methodology that affect the integrity of the methodology revision. Where such material changes have occurred, the project shall not be approved.

4.1.11 Where the project does not meet the criteria for validation or verification, the validation/verification body shall produce a negative validation conclusion and provide the validation or verification report and project description, or monitoring report, to Verra. The project shall be ineligible for registration until such time as corrective action is taken and the (same) validation/verification body has provided a positive validation or verification.

Competence

4.1.12 The validation/verification body and validation and verification team shall meet the competence requirements set out in *ISO 14065:2013*, mutatis mutandis.

Validation and Verification Reporting

4.1.13 The validation report describes the validation process, any findings raised during validation and their resolutions, and the conclusions reached by the validation/verification body. The validation/verification body shall use the *VCS Validation Report Template*, an approved combined validation report template available on the Verra website, or an approved GHG program validation report template where the project is registered under an approved GHG program, as appropriate, and adhere to all instructional text within the template. The validation report shall be accompanied by a validation representation, which shall be prepared using the *VCS Validation Deed of Representation Template*.

4.1.14 The verification report describes the verification process, any findings raised during verification and their resolutions, and the conclusions reached by the validation/verification body. The validation/verification body shall use the *VCS Verification Report Template* or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template. The verification report shall be accompanied by a verification representation, which shall be prepared using the *VCS Verification Deed of Representation Template*.

4.1.15 Where a monitoring report and associated verification report divide a verification period into vintages, separate VCU issuance records in accordance with vintage periods may be issued, as set out in the VCS Program document *Registration and Issuance Process*.

Validation and Verification Statement

4.1.16 The validation report and the verification report shall contain a validation statement and a verification statement, respectively.

4.1.17 Validation and verification statements shall:

- 1) Describe the level of assurance of the validation or verification.
- 2) Describe the objectives, scope and criteria of the validation or verification.
- 3) Describe whether the data and information supporting the GHG assertion were hypothetical, projected and/or historical in nature.

- 4) Include the validation/verification body’s conclusion on the GHG assertion, including any qualifications or limitations.
- 5) For AFOLU projects, state the version number of the non-permanence risk report or market leakage evaluation documentation upon which the statement is based.

4.1.18 The verification statement shall state the volume of GHG emission reductions or removals generated during the monitoring period that have been verified. For AFOLU projects, the verification statement shall also include the non-permanence risk rating, leakage emissions and number of GHG emission reductions or removals eligible to be issued as VCU.

Records of Validation and Verification

4.1.19 The validation/verification body shall keep all documents and records in a secure and retrievable manner for at least two years after the end of the project crediting period, even where they do not conduct verification for the whole project crediting period.

Rotation of Validation/Verification Bodies

4.1.20 Rotation of validation/verification bodies is required in respect of validation and verification, as follows:

- 1) Validation (including project crediting period renewal validation) and the first verification of a project (in a given project crediting period) may be undertaken by the same validation/verification body. However, the subsequent verification shall be undertaken by a different validation/verification body. For example, if validation and verification were undertaken at the same time, the subsequent verification would have to be undertaken by a different validation/verification body. If validation were undertaken first (i.e., separately), the first verification could be undertaken by the same validation/verification body, but the subsequent verification would have to be undertaken by a different validation/verification body.

Note – The gap validation of a project registered under an approved GHG program may be disregarded when assessing adherence to these requirements.

- 2) A validation/verification body may not verify more than six consecutive years of a project’s GHG emission reductions or removals. The validation/verification body may undertake further verification for the project only when at least three years of the project’s GHG emission reductions or removals have been verified by a different validation/verification body. Additionally, where a validation/verification body verifies the final six consecutive years of a project crediting period, the project crediting period renewal validation shall be undertaken by a different validation/verification body. Notwithstanding these rules, where AFOLU projects have verification periods longer than six years, a validation/verification body is permitted to verify more than six consecutive years of a project’s GHG emission reductions or removals, and the subsequent verification shall be undertaken by a different validation/verification body.

Note – Validations and verifications performed under other GHG programs shall be counted when assessing adherence to these requirements.

Validation and Verification Requirements for Grouped Projects

- 4.1.21 Validation and verification of grouped projects shall assess conformance of the project with the requirements for grouped projects set out in the VCS Program rules.
- 4.1.22 New project activity instances shall be validated, based on the information reported in the monitoring report, against the applicable set of eligibility criteria. The validation/verification body shall specify which instances meet the eligibility criteria for inclusion in the project. Such validation may be reported in the verification report or a separate validation report.
- 4.1.23 Where, due to the number of project activity instances, it is unreasonable to undertake an individual assessment of each initial or new instance, the validation/verification body shall document and explain the sampling methods employed for the validation of such instances. Such sampling methods shall be statistically sound. The number of instances included in the project, eligible for monitoring and generation of VCUs shall be proportional to the percentage of sampled instances found to be in compliance by the validation/verification body.
- 4.1.24 The verification report for grouped projects shall document and explain the sampling methods employed by the validation/verification body for the verification of GHG emission reductions or removals generated by the project. Such methods shall be statistically sound. Any subsequent changes to the sampling method(s) required as a result of the verification findings shall be documented.

Non-Permanence Risk Analysis and Market Leakage Evaluations for AFOLU Projects

- 4.1.25 Non-Permanence risk analysis and market leakage evaluations shall be assessed by the validation/verification body in accordance with the VCS Program rules.
- 4.1.26 The validation/verification body shall assess the risk analysis carried out by the project proponent in accordance with the VCS Program document *AFOLU Non-Permanence Risk Tool*. The project proponent shall respond to all and any of the validation/verification body's findings. As a result of any such findings, the project proponent shall amend the documentation as necessary and update the risk rating accordingly.

APPENDIX 1 ELIGIBLE AFOLU PROJECT CATEGORIES

This appendix defines the types of activities that are included within each AFOLU project category, and is intended to aid project proponents in determining which type of methodology may be applicable to their AFOLU project activity(s). As set out in Section 3.2 above, AFOLU projects must apply a methodology eligible under the VCS Program.

Additional information about the eligible activities and specific GHG sources, sinks and reservoirs that must be included in methodologies developed under the VCS Program for each eligible AFOLU project category is available in the VCS Program document *VCS Methodology Requirements*.

Afforestation, Reforestation and Revegetation (ARR)

A1.1 Eligible ARR activities are those that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation. Eligible ARR projects may include timber harvesting in their management plan. The project area shall not be cleared of native ecosystems within the 10 year period prior to the project start date, as set out in Section 3.2.4.

Note – Activities which improve forest management practices such as enrichment planting and liberation thinning are categorized as IFM project activities.

Agricultural Land Management (ALM)

A1.2 Eligible ALM activities are those that reduce net GHG emissions on croplands and grasslands by increasing carbon stocks in soils and woody biomass and/or decreasing CO₂, N₂O and/or CH₄ emissions from soils. The project area shall not be cleared of native ecosystems within the 10-year period prior to the project start date. Eligible ALM activities include:

- 1) Improved Cropland Management (ICM): This category includes practices that demonstrably reduce net GHG emissions of cropland systems by increasing soil carbon stocks, reducing soil N₂O emissions, and/or reducing CH₄ emissions.
- 2) Improved Grassland Management (IGM): This category includes practices that demonstrably reduce net GHG emissions of grassland ecosystems by increasing soil carbon stocks, reducing N₂O emissions and/or reducing CH₄ emissions.
- 3) Cropland and Grassland Land-use Conversions (CGLC): This category includes practices that convert cropland to grassland or grassland to cropland and reduce net GHG emissions by increasing carbon stocks, reducing N₂O emissions, and/or reducing CH₄ emissions.

Note – Project activities relating to manure management are eligible under sectoral scope 15 (livestock, enteric fermentation, and manure management), not sectoral scope 14 (AFOLU).

Improved Forest Management (IFM)

- A1.3 Eligible IFM activities are those that increase carbon sequestration and/or reduce GHG emissions on forest lands managed for wood products such as sawtimber, pulpwood and fuelwood by increasing biomass carbon stocks through improving forest management practices. The baseline and project scenarios for the project area shall qualify as forests remaining as forests, such as set out in the *IPCC 2006 Guidelines on National GHG Inventories*, and the project area shall be designated, sanctioned or approved for wood product management by a national or local regulatory body (e.g., as logging concessions or plantations).
- A1.4 Various sanctioned forest management activities may be changed to increase carbon stocks and/or reduce emissions, but only a subset of these activities make a measurable difference to the long-term increase in net GHG emissions compared to the baseline scenario. Eligible IFM activities include:
- 1) Reduced Impact Logging (RIL): This category includes practices that reduce net GHG emissions by switching from conventional logging to RIL during timber harvesting.
 - 2) Logged to Protected Forest (LtPF): This category includes practices that reduce net GHG emissions by converting logged forests to protected forests. By eliminating harvesting for timber, biomass carbon stocks are protected and can increase as the forest re-grows and/or continues to grow. Harvesting of trees to advance conservation purposes (e.g., the removal of diseased trees) may continue in the project scenario.
 - 3) Extended Rotation Age / Cutting Cycle (ERA): This category includes practices that reduce net GHG emissions of evenly aged managed forests by extending the rotation age or cutting cycle and increasing carbon stocks.
 - 4) Low-Productive to High-Productive Forest (LtHP): This category includes practices that increase carbon sequestration by converting low-productivity forests to high-productivity forests. Note - Activities that reduce GHG emissions from unsanctioned forest degradation (e.g., illegal logging) are considered REDD activities. Projects focusing solely on the reduction of forest fires are not eligible under IFM. Activities that degrade wetlands to increase forest production are not eligible.

Reduced Emissions from Deforestation and Degradation (REDD)

- A1.5 Eligible REDD activities are those that reduce net GHG emissions by reducing deforestation and/or degradation of forests. Deforestation is the direct, human-induced conversion of forest land to non-forest land. Degradation is the persistent reduction of canopy cover and/or carbon stocks in a forest due to human activities such as animal grazing, fuelwood extraction, timber removal or other such activities, but which does not result in the conversion of forest to non-

forest land (which would be classified as deforestation), and qualifies as *forests remaining as forests*, such as set out under the *IPCC 2003 Good Practice Guidance*. The project area shall meet an internationally accepted definition of forest, such as those based on UNFCCC host-country thresholds or FAO definitions, and shall qualify as forest for a minimum of 10 years before the project start date. The definition of forest may include mature forests, secondary forests, and degraded forests. Under the VCS Program, secondary forests are considered to be forests that have been cleared and have recovered naturally and that are at least 10-years-old and meet the lower bound of the forest threshold parameters at the start of the project. Forested wetlands, such as floodplain forests, peatland forests and mangrove forests, are also eligible provided they meet the forest definition requirements mentioned above.

- A1.6 Activities covered under the REDD project category are those that are designed to stop planned (designated and sanctioned) deforestation or unplanned (unsanctioned) deforestation and/or degradation. Avoided planned degradation is classified as IFM.
- A1.7 Activities that stop unsanctioned deforestation and/or illegal degradation (such as removal of fuelwood or timber extracted by non-concessionaires) on lands that are legally sanctioned for timber production are eligible as REDD activities. However, activities that reduce or stop logging only, followed by protection, on forest lands legally designated or sanctioned for forestry activities are included within IFM. Projects that include both avoided unplanned deforestation and/or degradation as well as stopping sanctioned logging activities, shall follow the REDD guidelines for the unplanned deforestation and/or degradation and the IFM guidelines for the sanctioned logging activities, and shall follow the requirements set out in Section 3.5.2.
- A1.8 Eligible REDD activities include:
 - 1) Avoiding Planned Deforestation and/or Degradation (APDD): This category includes activities that reduce net GHG emissions by stopping or reducing deforestation or degradation on forest lands that are legally authorized and documented for conversion.
 - 2) Avoiding Unplanned Deforestation and/or Degradation (AUDD): This category includes activities that reduce net GHG emissions by stopping deforestation and/or degradation of degraded to mature forests that would have occurred in any forest configuration.

Avoided Conversion of Grasslands and Shrublands (ACoGS)

- A1.9 Eligible ACoGS activities are those that reduce net GHG emissions by reducing the conversion of grassland and shrubland ecosystems to other land uses with lower carbon densities. Eligible avoided conversion activities include avoiding, at a minimum, the removal/replacement of vegetation and may also include avoiding soil disturbance.
- A1.10 The project area shall be native grasslands (including savanna) and/or shrublands (including chaparral). Non-forested wetlands, including peatlands, are not eligible under ACoGS and are covered under other AFOLU project categories.

A1.11 Activities covered under the ACoGS project category are those that are designed to stop planned (designated and sanctioned) conversion or unplanned (unsanctioned) conversion on public or private lands. This category type only includes avoided conversion of non-forested lands, noting that other management activities on non-forested land may qualify under ALM or ARR project categories.

A1.12 Eligible ACoGS activities include:

- 1) Avoiding Planned Conversion (APC): This category includes activities that reduce net GHG emissions by stopping conversion of grasslands or shrublands that are legally authorized and documented for conversion.
- 2) Avoiding Unplanned Conversion (AUC): This category includes activities that reduce net GHG emissions by stopping unplanned conversion of grasslands or shrublands.

Wetlands Restoration and Conservation (WRC)

A1.13 Eligible WRC activities are those that increase net GHG removals by restoring wetland ecosystems or that reduce GHG emissions by rewetting or avoiding the degradation of wetlands. The project area shall meet an internationally accepted definition of wetland, such as from the IPCC, Ramsar Convention on Wetlands, those established by law or national policy, or those with broad agreement in the peer-reviewed scientific literature for specific countries or types of wetlands. Common wetland types include peatland, salt marsh, tidal freshwater marsh, mangroves, wet floodplain forests, prairie potholes and seagrass meadows. WRC activities may be combined with other AFOLU project categories, as further explained in Section 59.

A1.14 A peatland is an area with a layer of naturally accumulated organic material (peat) at the surface (excluding the plant layer). Common peatland types include peat swamp forest, mire, bog, fen, moor, muskeg and pocosin. Rewetting of drained peatland and the conservation of undrained or partially drained peatland are sub-categories of restoring wetland ecosystems and conservation of intact wetlands, respectively¹¹.

A1.15 Activities that generate net reductions of GHG emissions from wetlands are eligible as WRC projects or combined category projects (such as REDD on peatland). Activities that actively lower the water table depth in wetlands are not eligible. Eligible WRC activities include:

- 1) Restoring Wetland Ecosystems (RWE): This category includes activities that reduce GHG emissions or increase carbon sequestration in a degraded wetland through restoration activities. Such activities include enhancing, creating and/or managing hydrological conditions, sediment supply, salinity characteristics, water quality and/or native plant communities. For the purpose of these requirements, restoration activities are those that

¹¹ These categories existed as rewetting drained peatlands (RDP) and conservation of undrained and partially drained peatlands (CUPP) in the *AFOLU Requirements v3.2*.

result in the reestablishment of ecological processes, functions, and biotic and/or abiotic linkages that lead to persistent, resilient systems integrated within the landscape.

- 2) Conservation of Intact Wetlands (CIW): This category includes activities that reduce GHG emissions by avoiding degradation and/or the conversion of wetlands that are intact or partially altered while still maintaining their natural functions, including hydrological conditions, sediment supply, salinity characteristics, water quality and/or native plant communities.

Wetland degradation or conversion can be planned (designated and sanctioned) or unplanned (unsanctioned). Planned and unplanned degradation or conversion of wetlands can therefore encompass a wide variety of activities such as those listed under REDD while adding a wetland component. Activities covered under the CIW project category are those that are designed to stop or reduce planned or unplanned degradation or conversion in the project area to other land uses. The following CIW activities are eligible:

- a) Avoiding Planned Wetland Degradation (APWD): This activity reduces GHG emissions by avoiding degradation of wetlands, or further degradation in partially drained wetlands that are legally authorized and documented for conversion.
- b) Avoiding Unplanned Wetland Degradation (AUWD): This activity reduces GHG emissions by avoiding unplanned degradation of wetlands, or by avoiding further degradation in partially degraded wetlands.

Note – Activities where drainage is continued or maintained are not eligible. This includes, for example, projects that require the maintenance of drainage channels to maintain the pre-project drainage level on a partially drained peatland (e.g., where periodic deepening may be needed to counteract peat subsidence). Projects that allow selective harvesting that results in a lowering of the water table depth (e.g., by extracting timber using drainage canals) or affects the ability of vegetation to act as a major hydrological regulation device (e.g., extracting trees which support the peat body) are also not eligible. Project activities may include selective harvesting where harvesting does not lower the water table, for example by extracting timber using wooden rails instead of drainage canals.

- A1.16 Activities that generate net GHG emission reductions by combining other AFOLU project activities with wetlands restoration or conservation activities are eligible as WRC combined projects. RWE may be implemented without further conversion of land use or it may be combined with ARR, ALM, IFM, REDD or ACoGS activities, referred to as ARR+RWE, ALM+RWE, IFM+RWE, REDD+RWE or ACoGS+RWE, respectively. CIW may be implemented on non-forest land or combined with IFM, REDD or ACoGS activities, referred to as IFM+CIW, REDD+CIW or ACoGS+CIW, respectively.

Table 3 illustrates the types of WRC activities that may be combined with other AFOLU project categories. The table identifies the applicable AFOLU requirements that shall be followed for combined category projects, based on the condition of the wetland in the baseline scenario, the land use in the baseline scenario and the project activity.

Table 3: Eligible WRC Combined Category Projects

Baseline Scenario		Project Activity	Applicable Guidance
Condition	Land Use		
Degraded wetland (including, drained, impounded, and with interrupted sediment supply)	Non-forest (including aquacultures, grasslands and shrublands)	Restoration of wetlands*	RWE
		Restoration of wetlands* and revegetation or conversion to forest	ARR+RWE
		Restoration of wetlands* and conversion to wetland agriculture (including paludiculture)	ALM+RWE
		Restoration of wetlands* and avoided conversion of grasslands or shrublands	ACoGS+RWE
	Forest	Restoration of wetlands*	RWE
	Forest with deforestation/ degradation	Restoration of wetlands* and avoided deforestation/degradation	REDD+RWE
	Forest managed for wood products	Restoration of wetlands* and improved forest management	IFM+RWE
Non-wetland or open water	Non-forest	Creation of wetland conditions and afforestation, reforestation or revegetation	ARR+RWE
	Open water or impounded wetland	Creation or restoration of conditions for vegetation development and afforestation, reforestation or revegetation	ARR+RWE
Intact wetland	Non-forest (including grasslands and shrublands)	Avoided drainage and/or interrupted sediment supply	CIW
		Avoided conversion to open water or impounded wetland (including excavation to create fish ponds)	CIW
		Avoided drainage and/or interrupted sediment supply and avoided conversion of grasslands and Shrublands	ACoGS+CIW
	Forest	Avoided drainage and/or interrupted sediment supply	CIW

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		Avoided conversion to open water or impounded wetland	CIW
	Forest with deforestation/ degradation	Avoided drainage and/or interrupted sediment supply and avoided deforestation/degradation	REDD+CIW
		Avoided conversion to open water or impounded wetland and avoided deforestation/degradation	REDD+CIW
	Forest managed for wood products	Avoided drainage and/or interrupted sediment supply and improved forest management	IFM+CIW

* *Restoration of wetlands* includes all the activities set out in Section A1.15.

A1.17 Combined category projects shall use the relevant WRC requirements and the respective AFOLU project category requirements for quantifying GHG emissions/removals, unless the former may be deemed *de minimis* or conservatively excluded.

APPENDIX 2 DOCUMENT HISTORY

Version	Date	Comment
v4.0	Released: 19 Sep 2019	Initial version released under <i>VCS Version 4</i> , with immediate effect except for the following:
	Updated: 9 Mar 2020	<p>For project activities that were eligible under <i>VCS Version 3</i>, but are now excluded from the scope of the VCS Program (Section 2.1):</p> <p>Updated on 9 March 2020 to revise the effective dates for projects registered with an approved GHG Program. New text is shown in red and deleted text is shown in strikethrough, below.</p> <ol style="list-style-type: none"> 1) Registered VCS projects and projects that request registration with the VCS Program on or before 31 December 2019 remain eligible under the VCS Program for the entirety of their crediting periods. 2) Grouped projects registered under the VCS Program shall be prohibited from adding new project activity instances of the newly excluded project types on or after 1 January 2020; verification reports dated on or after 1 January 2020 shall not be accepted where they include the validation of such new project activity instances. 3) Projects registered under an approved GHG program shall only be eligible to complete a gap validation and/or transfer to the VCS Program where the project has applied for registration with the VCS Program approved GHG program on or before 9 March 2020 31 December 2019, unless evidence of contracting for a VCS gap validation prior to 9 March 2020 is provided. 4) GHG credits issued under an approved GHG program shall only be eligible to be converted into VCU's where a conversion request has been submitted the project has applied for registration with the approved GHG program on or before 9 March 2020 31 December 2019, unless evidence of contracting for a CER conversion prior to 9 March 2020 is provided, in which case the conversion must take place on or before 9 April 2020. <p>For projects subject to new crediting period requirements under <i>VCS Version 4</i> (i.e., non-AFOLU projects and ALM projects focusing exclusively on reducing N₂O, CH₄ and/or fossil-derived CO₂ emissions) (Section 3.8):</p> <ol style="list-style-type: none"> 1) Registered projects and projects that complete validation on or before 19 March 2020 remain eligible to apply the crediting period requirements under <i>VCS Version 3</i>. 2) Projects applying a new VCS methodology (i.e., a methodology for which a concept note was submitted to Verra on or before 31 December 2018) shall be granted additional time to apply the crediting period requirements under <i>VCS Version 3</i>. Specifically, projects using a new VCS methodology and completing validation within two years of the approval of the methodology may apply the crediting requirements as set out under <i>VCS Version 3</i>.

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Standards for a Sustainable Future



Attachment AA

VCS Website



Verified Carbon Units (VCUs)

The world's leading voluntary GHG program

The VCS Program

The VCS Program is the world's most widely used voluntary GHG program. Almost 1,600 certified VCS projects have collectively reduced or removed more than 450 million tonnes of carbon and other GHG emissions from the atmosphere.

Individuals and corporations around the world are recognizing the importance of reducing their GHG emissions. As a result, many of them are reducing their carbon footprints through energy efficiency and other measures. Quite often, however, it is not possible for these entities to meet their targets or eliminate their carbon footprint, at least in the near term, with internal reductions alone, and they need a flexible mechanism to achieve these aspirational goals. Enter the carbon markets.

By using the carbon markets, entities can neutralize, or *offset*, their emissions by retiring carbon credits generated by [projects](#) that are reducing GHG emissions elsewhere. Of course, it is critical to ensure, or *verify*, that the emission reductions generated by these projects are actually occurring. This is the work of the VCS Program – to ensure the credibility of emission reduction projects.

Once projects have been certified against the VCS Program's rigorous set of [rules and requirements](#), project developers can be issued tradable GHG credits that we call . Those VCUs can then be sold on the open market and retired by individuals and companies as a means to offset their own emissions. Over time, this flexibility channels financing to clean, innovative businesses and technologies.

Verra's role is to develop and administer the program. We provide oversight to all operational components of the VCS Program and we are responsible for updating the VCS rules such that they ensure the quality of VCUs. The development of the VCS Program is supported by the [VCS Program Advisory Group](#), a multi-stakeholder body that helps ensure that the VCS Program continues to serve its users in an effective and efficient manner and drives practical and robust solutions to mitigate climate change.

How It Works

Projects developed under the VCS Program must follow a rigorous assessment process in order to be certified. VCS projects cover a diverse range of sectors, including renewable energy (such as wind and hydroelectric projects), forestry (including the avoidance of deforestation), and others. Emission reductions certified by our program are eligible to be issued as VCUs, with one VCU representing one metric tonne of greenhouse gas emissions reduced or removed from the atmosphere.



VCS Standard: The VCS Standard lays out the rules and requirements which all projects must follow in order to be certified.

Independent Auditing: All VCS projects are subject to desk and field audits by both qualified [independent third parties](#) and Verra staff to ensure that standards are met and methodologies are properly applied.

Accounting Methodologies: Projects are assessed using a technically sound GHG emission reduction [quantification methodology](#) specific to that project type.

Registry System: The registry system is the central storehouse of data on all registered projects, and tracks the generation, retirement and cancellation of all VCUs. To register with the program, projects must show that they have met all standards and methodological requirements.

While VCS projects typically include a discrete set of activities, governments are now establishing policies and programs to mitigate GHG emissions across entire national or subnational jurisdictions. In the forest sector, these programs (called REDD+ programs) can be accounted for and credited using the world's first jurisdictional-scale framework, the Verra [Jurisdictional and Nested REDD+ \(JNR\)](#) framework. JNR integrates government-led and project-level REDD+ activities and establishes a clear pathway for subnational- and project-level activities to be incorporated within broader REDD+ programs.

Attachment BB

Verra, Registration and Issuance Process, Version 4.0





Registration and Issuance Process

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

ABOUT VERRA



Verra supports climate action and sustainable development through the development and management of standards, tools and programs that credibly, transparently and robustly assess environmental and social impacts, and drive funding for sustaining and scaling up these benefits. As a mission-driven, non-profit (NGO) organization, Verra works in any arena where we see a need for clear standards, a role for market-driven mechanisms and an opportunity to achieve environmental and social good.

Verra manages a number of global standards frameworks designed to drive finance towards activities that mitigate climate change and promote sustainable development, including the [Verified Carbon Standard \(VCS\) Program](#) and its [Jurisdictional and Nested REDD+ framework \(JNR\)](#), the [Verra California Offset Project Registry \(OPR\)](#), the [Climate, Community & Biodiversity \(CCB\) Standards](#) and the [Sustainable Development Verified Impact Standard \(SD VISta\)](#). Verra is also developing new standards frameworks, including [LandScale](#), which will promote and measure sustainability outcomes across landscapes. Finally, Verra is one of the implementing partners of the [Initiative for Climate Action Transparency \(ICAT\)](#), which helps countries assess the impacts of their climate actions and supports greater transparency, effectiveness, trust and ambition in climate policies worldwide.

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1 INTRODUCTION

This document outlines the procedures for listing pipeline projects, registering projects and issuing verified carbon units (VCUs) under the VCS Program. This document is intended for use by project proponents, VCU buyers, VCU sellers and any other entities participating in the VCU market. Note that the *VCS Standard* and its related documents provide the rules and requirements for developing projects, and this document (the *Registration and Issuance Process*) should not be used for such purpose.

Projects may have one or many project proponents, though to aid readability, this document uses project proponent in the singular. For projects with multiple project proponents, *project proponents* should be substituted in place of *project proponent*, as appropriate.

Project proponents interact with the Verra registry to list pipeline projects, register projects and issue VCUs (i.e., project pipeline listing, project registration and VCU issuance are handled by the Verra registry). Verra staff are responsible for undertaking a completeness check on documentation and for ensuring adherence to the VCS Program rules with respect to the pipeline listing process and the project registration process. Verra staff also upload information to the Verra registry.

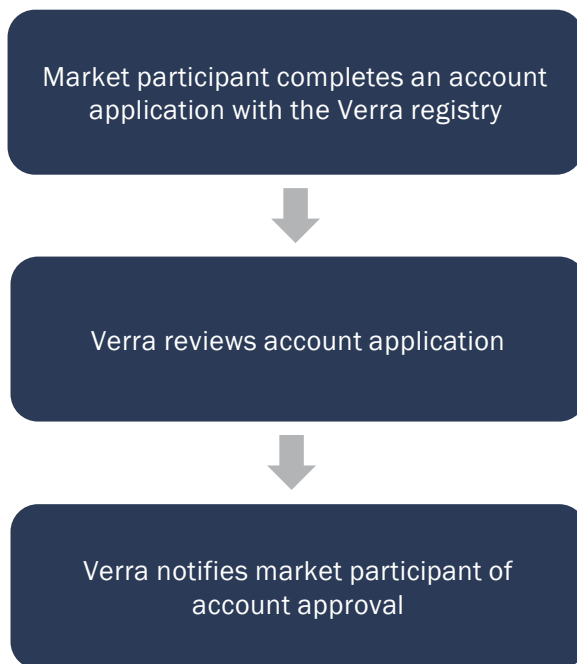
The Verra registry provides the central repository for all information and documentation relating to pipeline and registered projects. The registry is also responsible for ensuring uniqueness of projects, issuing VCU serial numbers and tracking VCU retirement. The registry makes project and VCU information and documentation publicly available and can be accessed via the Verra website. As set out in the VCS Program document *VCS Program Guide*, Verra is responsible for reviewing project documentation and overseeing validation/verification bodies to ensure the integrity of projects and VCUs in the Verra registry system.

This document will be updated from time-to-time and readers shall ensure that they are using the most current version of the document.

2 OPENING A VERRA REGISTRY ACCOUNT

A Verra registry account shall be opened by any market participant who wants to list a pipeline project, register a project and/or issue, trade or retire VCUs as set out in Diagram 1, with the notes that follow providing further details.

Diagram 1: Opening a Verra Registry Account



- 2.1.1 The Verra registry is managed and operated by Verra staff. Further details about the Verra registry system are available in the *VCS Program Guide*.
- 2.1.2 A market participant can apply to open a Verra registry account at any time. For example, a would-be project proponent does not need to have a validated or verified project and a would-be VCU buyer does not need to have entered into a legal agreement to purchase VCUs in order to open a Verra registry account.
- 2.1.3 Market participants can apply to open a Verra registry account through the Verra website. Market participants are also encouraged to contact the Verra registry at any time at registry@verra.org.

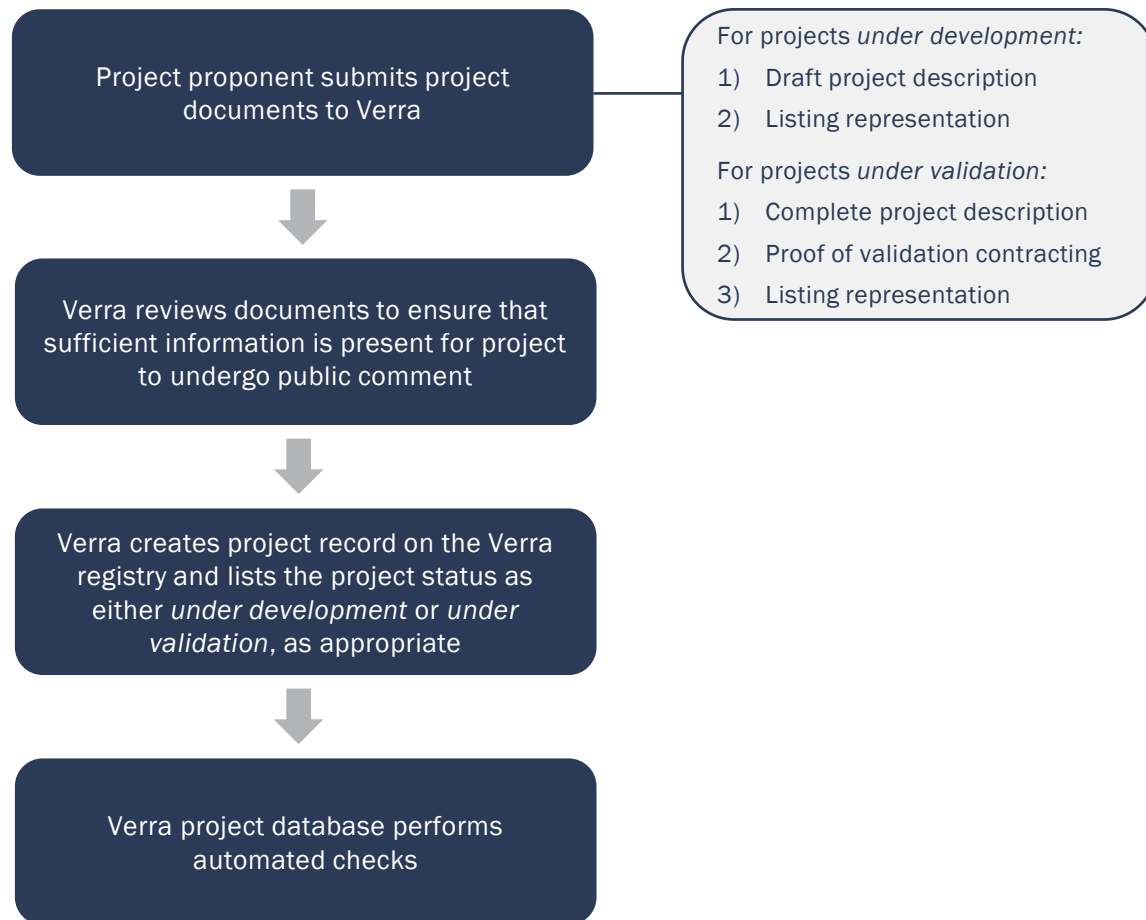
3 PIPELINE LISTING PROCESS

The Verra registry contains a project pipeline which lists projects before they are registered. Projects shall be listed on the project pipeline before the opening meeting between the validation/verification body and the project proponent (such opening meeting representing the beginning of the validation process). The validation/verification body is responsible for checking that the project is listed on the project pipeline and shall not conduct the opening meeting or otherwise begin validation until such time as the project is listed. Note, also, that where a methodology element is put on hold or withdrawn, only projects that have been listed on the project pipeline by the date on which the methodology element is put on hold or withdrawn shall be granted the grace period for using the methodology element (i.e., any projects not listed on the project pipeline by such date shall not be granted the grace period). Project proponents may therefore wish to list their projects at the early stages of project development to ensure that they can take advantage of any grace periods. See the VCS Program document *Methodology Approval Process* for more information on grace periods.

The date on which the project is listed on the project pipeline marks the beginning of that project's 30-day public comment period. Any comments shall be submitted to Verra at secretariat@verra.org and respondents shall provide their name, organization, country and email address. At the end of the public comment period, Verra provides all and any comments received to the project proponent. The project proponent shall address such comments as set out in the *VCS Standard*.

The process for listing a project on the project pipeline is set out in Diagram 2 below, with the notes that follow providing further details.

Diagram 2: Pipeline Listing Process



3.1 Process

- 3.1.1 The only entities that may initiate the pipeline listing process are the project proponent, an entity to which the project proponent has assigned sole right to the GHG emission reductions or removals for the entire project crediting period, an entity who has been authorized by the project proponent(s) to list the project on the project pipeline or the authorized representative of any of these entities. No other entity can initiate the pipeline listing process.
- 3.1.2 Pipeline projects shall be listed as either *under development* or *under validation*. Projects under development are those which have not yet contracted a validation/verification body to perform validation. Projects under validation are those that have contracted a validation/verification body to perform validation (i.e., are ready to begin or have begun the validation process).

- 3.1.3 To list a project as *under development*, the following shall be submitted to the Verra registry:
- 1) A draft project description which shall include (at a minimum) the cover page and drafts of sections 1.1, 1.2, 1.3, 1.5, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 3.1, 3.2, 3.3, 3.4, and 3.5 of the *VCS Project Description Template*. Note that indicative information is sufficient (e.g., the proposed approach for demonstrating additionality or establishing project ownership, rather than the full rationale and evidence that will be submitted for validation); and
 - 2) A listing representation.

- 3.1.4 To list a project as *under validation*, the following shall be submitted to the Verra registry:
- 1) A complete project description (i.e., one with all sections of the *VCS Project Description Template* completed);
 - 2) Proof of contracting of the validation, provided in accordance with Section 4.2.6; and
 - 3) A listing representation.

Note – Pipeline projects may either apply an approved methodology or a methodology that is under development. Where a methodology under development is applied, the project description shall provide a reference for the draft version of the methodology.

- 3.1.5 The project status may be updated from *under development* to *under validation* where the required documentation set out in Section 3.1.4 is submitted (noting that a second listing representation is not required). Verra shall undertake the relevant checks set out in Section 3.1.8.

- 3.1.6 The following applies with respect to the listing representation:
- 1) The Verra website provides the template for the listing representation. The template shall not be altered other than to fill in the project-specific details.
 - 2) The listing representation shall be properly executed as a deed in accordance with applicable local laws and the organization’s own constitutional documents (e.g., signature by directors and requirement of company seals).
 - 3) Where more than one individual or organization can claim rights in respect of the execution of the listing representation, and there exists no other (single) entity which may execute the listing representation, all such individuals and organizations shall execute the listing representation, using the appropriate template available on the Verra website for pipeline projects with multiple project proponents, as applicable. Note that such representations may be executed in any necessary number of counterparts.

- 3.1.7 All project documents may be submitted to the Verra registry in electronic format.

- 3.1.8 Verra shall check the submitted project documents to ensure that:
- 1) The relevant sections of the *VCS Project Description Template* have been completed in accordance with Sections 3.1.3 and 3.1.4.
 - 2) The listing representation has been signed by the relevant responsible parties.
 - 3) Where required, proof of contracting has been properly submitted.
- 3.1.9 Verra reviews the project documents to ensure that sufficient information is present for the project to undergo public comment and may require the project proponent to update project documentation before listing the project on the Verra registry.
- 3.1.10 Verra shall upload all relevant project documentation to the Verra registry. Verra will use the information from the project documents to create the project record in the Verra registry. The status of the project shall be *under development* or *under validation*, as appropriate.
- 3.1.11 Verra shall store the electronic and signed original project documents in its record-keeping system for a minimum period of 12 years from the date the project is listed on the project pipeline.
- 3.1.12 Where a pipeline project successfully completes validation, it may progress to project registration on the Verra registry, following the procedures set out in Section 4.
- 3.1.13 Where a pipeline project does not successfully complete validation within 12 months of its initial listing, Verra shall update the project status to *inactivated*, unless Verra is informed that validation is still being pursued. Likewise, inactivated projects may be reactivated by notifying Verra.
- 3.1.14 Where Verra has reason to believe that false or misleading project information has been submitted, Verra seeks clarification from the project proponent. Where the project proponent cannot satisfactorily justify the information provided for the pipeline project, Verra reserves the right to delist the project.

4 PROJECT REGISTRATION PROCESS

The following steps are required under the VCS Program to register a project and issue VCUs, and these are presented in detail in this Section 4:

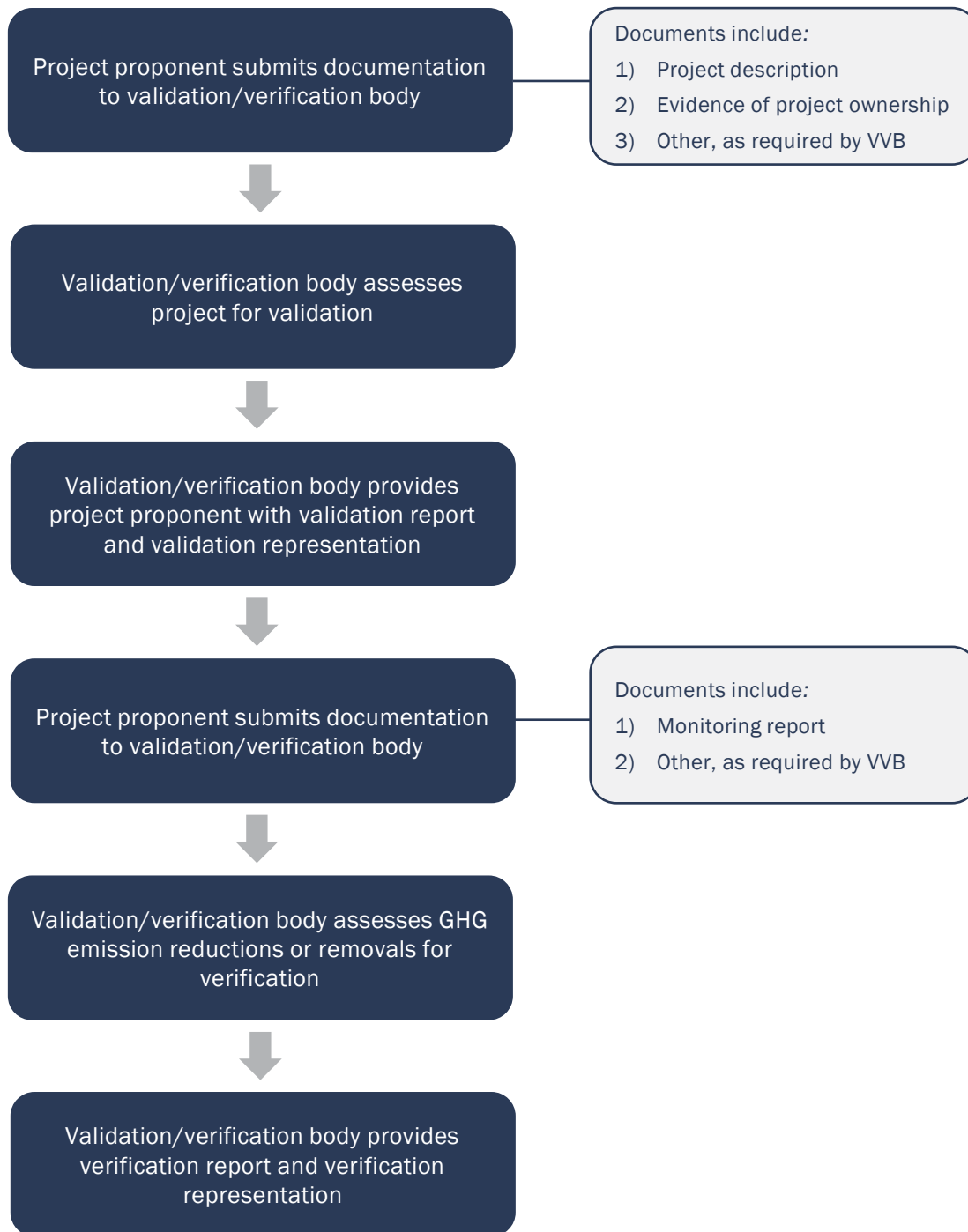
- 1) Project validation and verification
- 2) Registration and issuance request
- 3) Project review
- 4) Project registration and initial VCU issuance
- 5) Periodic VCU issuance
- 6) VCU retirements and cancellations
- 7) Project maintenance

For the purposes of this document, the project registration process refers to all or any of these six steps, as the case may be. The entity that initiates the project registration process may terminate the process at any one of these steps if it decides it does not want to register the project or have VCUs issued.

4.1 Step 1: Project Validation and Verification

The project shall be validated and the GHG emission reductions or removals verified as set out in Diagram 3 below, with the notes that follow providing further details.

Diagram 3: Validation of Project and Verification of GHG Emission Reductions or Removals



4.1.1 The requirements for validation and verification, including the requirements for validation/verification bodies, are set out in the *VCS Standard* and the *VCS Program Guide*. Projects must complete validation prior to requesting registration and projects must complete verification prior to requesting VCU issuance. The process for requesting registration and issuance,

including the documents required to be submitted for each type of request, are set out in Section 4.2 below.

4.1.2 The Verra registry can display separate vintages within one verification period.

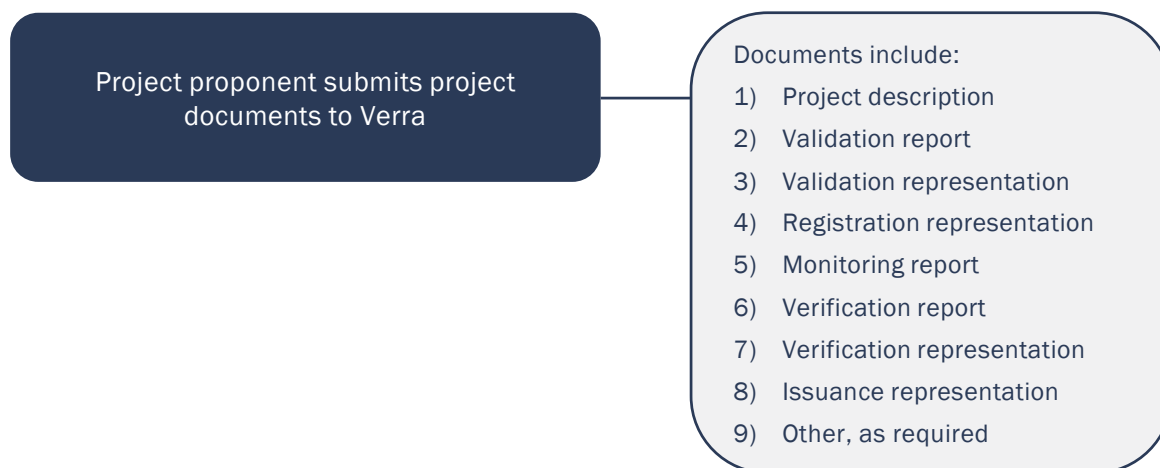
For example, where the verification period is 1 January 2012 to 30 June 2013, the project proponent may wish to have one VCU issuance record for the 2012 VCUs and a separate VCU issuance record for the 2013 VCUs. The creation of such separate VCU issuance records in respect of one verification period is only possible where the monitoring report and associated verification report specify the vintage breakdown. Thus, the monitoring report and associated verification report will need to specify the number of GHG emission reductions or removals generated in 2012 and the number generated in 2013. Vintage breakdown may be specified at a finer granularity than calendar years, and where vintage dates are specified with day, month and year, corresponding VCU issuance records can be created in the Verra registry accordingly. Where the vintage breakdown or the day, month and year start and end dates for the vintage period are not provided, there can only be one VCU issuance record in respect of the verification report (i.e., the Verra registry shall not arbitrarily assign a vintage breakdown where none is specified in the verification report).

Note – Due to the intricacies of accounting for GHG emission reductions and removals in AFOLU ARR and IFM projects with harvesting, such projects may not break down verification periods into vintage periods when any year within the verification period has a negative number of GHG emission reductions or removals. For such projects, the vintage period shall be equivalent to the verification period.

4.2 Step 2: Registration and Issuance Request

The project is presented to the Verra registry for registration and issuance as set out in Diagram 4 below, with the notes that follow providing further details.

Diagram 4: Project Registration Request



- 4.2.1 The only entities that may initiate the project registration process are the project proponent, an entity to which the project proponent has assigned sole right to the GHG emission reductions or removals for the entire project crediting period, or the authorized representative of either of these entities. No other entity can initiate the project registration process.
- 4.2.2 Registration of a project may be requested when the project has completed project validation but before the first verification of GHG emission reductions or removals. Some project proponents may be interested in doing this by way of giving market visibility and credibility to their projects.
- 4.2.3 Where the project is presented for registration without VCU issuance, the relevant documents that shall be provided to the Verra registry are the project description, the validation report, the validation representation, the registration representation, and any AFOLU specific documentation, communications agreement, proof of right or proof of contracting.
- 4.2.4 Where the project is presented for registration and VCU issuance, the relevant documents that shall be provided to the Verra registry are the project description, the validation report, the validation representation, the registration representation, the monitoring report, the verification report, the verification representation, the issuance representation, and any AFOLU specific documentation, communications agreement, proof of right, proof of contracting or evidence and representation with respect to cancellation of GHG credits under another GHG program. Where a project description deviation has been applied, and a revised project description is issued, such project description shall be provided to the Verra registry. Likewise, where a project crediting period has been renewed, the revised project description and new validation report and validation representation shall be provided to the Verra registry.
- 4.2.5 The following shall apply with respect to the project proponent representations:
- 1) The Verra website provides the templates for the registration representation, issuance representation and all other project proponent representations. The templates shall not be altered other than to fill in the project specific details.
 - 2) The project proponent representations shall be properly executed as deeds in accordance with applicable local laws and the organization's own constitutional documents (e.g., signature by directors, requirement of company seals).
 - 3) Where more than one individual or organization can claim rights in respect of the execution of the project proponent representations, all such individuals and organizations shall execute the project proponent representations, using the appropriate templates available on the Verra website for projects with multiple project proponents, as applicable. Note that such representations may be executed in any necessary number of counterparts.
- 4.2.6 Proof of contracting shall be provided to the Verra registry where required, as set out in Section 3.1.4. The project proponent or its authorized representative shall provide evidence of the legal agreement between the project proponent (or other entity that has contracted the validation/verification body to undertake validation) and the validation/verification body, in

relation to validation of the project. A final legal agreement, letter of intent, memorandum of understanding or term sheet shall serve as proof of contracting. Such evidence of proof of contracting shall be uploaded to the Verra registry as a private document (for Verra internal auditing purposes) and therefore will not be publicly available.

- 4.2.7 All project documents may be submitted to the Verra registry in electronic format.
- 4.2.8 There is no need to submit proof of right to the Verra registry where the project proponent or its authorized representative is initiating the project registration process. Proof of right shall be submitted to the Verra registry where an entity other than the project proponent or its authorized representative is initiating the project registration process. Evidencing proof of right is as set out below.
- 4.2.9 The entity initiating the project registration process or its authorized representative shall submit to the Verra registry the legal agreement(s) transferring the right to the GHG emission reductions or removals for the entire project crediting period to it from the project proponent. Where there are one or more intermediaries standing between the entity initiating the project registration process and the project proponent, Verra shall check all the legal agreements documenting the complete chain of transfer of right to the GHG emission reductions or removals to the entity from the project proponent. Legal agreement(s) shall be in English or shall be an official translation of the legal agreement(s).
- 4.2.10 In consideration of confidentiality, the entirety of the aforementioned legal agreement(s) need not be shown, but Verra shall undertake the checks set out in Table 1 (if submitting an official translation of the legal agreement(s), only such information needs to be translated and shown to Verra).

Table 1: Evidence for Proof of Right

Information required	Verra registry check
Names of the parties to the agreement	The parties are the entity initiating the project registration process (buyer or transferee) and the project proponent (seller or transferor), or where there is one or more intermediaries, the parties shall be the relevant parties in the chain of ownership between project proponent and the entity initiating the project registration process
Date of the agreement	Appropriate to the project and transaction subject of the legal agreement
Project name	Same as the project that the entity is presenting for registration
Project crediting period	The project crediting period is defined, with a start date and duration (or end date) specified

<p>Clause that transfers the right to the GHG emission reductions or removals between the parties to the agreement</p>	<p>The clause transfers the right to the GHG emission reductions or removals generated by the project for the project crediting period</p>
<p>Signatures of parties to the legal agreement</p>	<p>The legal agreement is signed by both parties to the agreement</p>

- 4.2.11 The project proponent may protect commercially sensitive information by uploading a public project description and a private project description. The private project description will not be publicly available. The public project description differs from the private project description only in that it does not contain commercially sensitive information.
- 4.2.12 The VCS Program allows projects registered under an approved GHG program (e.g., CDM) to also register with the VCS Program. In such cases, the documentation required for the project registration process is the same as required for projects registering under the VCS Program only, but noting the following:
- 1) The project description from the approved GHG program and a project description using the *VCS Project Description Template* with the relevant sections complete, as set out in the *VCS Standard*, must be submitted.
 - 2) Where GHG emission reductions or removals from one verification period are split between the VCS Program and an approved GHG program, evidence shall be submitted to the Verra registry that any GHG emission reductions or removals presented for VCU issuance have not been issued as GHG credits under the approved GHG program, or where such GHG credits have been issued under the approved GHG program that they have been cancelled. In the latter of these cases, the project proponent or its authorized representative shall also sign and submit to the Verra registry a VCU conversion representation.
 - 3) AFOLU projects are subject to the rules and requirements for non-permanence risk analysis and buffer withholding set out in Section 5. The buffer withholding percentage determined by the *AFOLU Non-Permanence Risk Tool* shall be applied to the proportion of GHG credits to be issued under the VCS Program (only).
 - 4) Where a loss event or a reversal occurs, the project shall comply with the rules for reporting a loss event and holding and cancelling credits set out in Section 5.3. Such reporting, holding and cancelling shall apply to the proportion of credits (GHG credits and buffer credits) granted to date under the VCS Program. For example, if 50 percent of the total credits (GHG credits and, where applicable, buffer credits) granted to the project to date have been granted under the VCS Program and a loss event results in a reversal of GHG emission reductions or removals achieved to date (in relation to which credits have been issued and buffered), buffer credits would be cancelled to cover 50 percent of the reversal.

- 4.2.13 Where the project is registered with both the VCS Program and the CDM, and where temporary GHG credits have been issued to the project (i.e., tCERs and ICERs) which have expired without having been sold or retired, such credits may be issued under the VCS Program in accordance with the requirements in Section 4.2.15. Where temporary credits have expired, evidence of their expiration shall be provided.
- 4.2.14 The VCS Program also allows projects registered under a non-approved GHG program to also register with the VCS Program. In such cases, the documentation required for the project registration process is the same as required for projects registering under the VCS Program only. Where GHG emission reductions or removals from one verification period are split between the VCS Program and a non-approved GHG program, the same requirements set out in Section 4.2.12(2) shall apply.
- 4.2.15 The VCS Program allows projects registered under an approved GHG program to cancel GHG credits issued under the approved GHG program and have them issued as VCU in the Verra registry. Project activities must be eligible under the VCS Program (i.e., included within the scope of the VCS Program, as set out in the *VCS Standard*) in order to be eligible for such conversion. In such cases, the following applies:
- 1) An official notification or other evidence of cancellation of the GHG credits under the approved GHG program and a signed VCU conversion representation shall be provided to the Verra registry.
 - 2) Where the project is registered under the CDM, those documents required for project registration and Certified Emission Reduction (CER) issuance under the CDM shall be provided to the Verra registry. Verra shall create a project record on the Verra registry, noting that such record shall have the status *credits transferred from other GHG program*. Such projects are not considered to be registered under the VCS Program and are not eligible for verification under the VCS Program without first complying with the procedures for registration with the VCS Program and an approved GHG program set out in Section 4.2.12.
 - 3) Where the project is registered under the JI program, the project shall also register with the VCS Program before Emission Reduction Units (ERUs) may be converted into VCUs¹. Following registration with the VCS Program, such projects shall provide those documents required for ERU issuance under the JI program to the Verra registry.
 - 4) Where the project is registered under the Climate Action Reserve (CAR), those documents required for registration and Climate Reserve Tonne (CRT) issuance shall be provided to the Verra registry. Verra shall create a project record on the Verra registry, noting that such record shall have the status *credits transferred from other GHG program*. Such projects are

¹ The flexibility inherent within the JI program (e.g., use of an approved methodology not required) means it is necessary for JI projects to register with the VCS Program in order to determine whether ERUs issued to such projects are eligible for conversion into VCUs.

not considered to be registered under the VCS Program and are not eligible for verification under the VCS Program without first complying with the procedures for registration with the VCS Program and an approved GHG program set out in Section 4.2.12.

- 5) Where the project is an AFOLU project, the project shall also register with the VCS Program before GHG credits issued under an approved GHG program may be converted into VCUs. The buffer withholding percentage for such projects shall be applied to the number of GHG credits being converted.

4.2.16 Where projects have created another form of GHG-related environmental credit, such as renewable energy certificates, evidence shall be provided to the Verra registry demonstrating that the GHG emission reductions or removals presented for VCU issuance have not also been recognized as another GHG-related environmental credit, or that any such credits have not been used and have been cancelled under the relevant program.

4.2.17 Grouped projects and AFOLU projects with geographic areas characterized by one or more geodetic polygons shall provide the geodetic information to the Verra registry in the format specified in the *VCS Standard*.

4.2.18 The VCS Program allows VCUs to be labelled with additional certifications that have been granted to the project. The Verra website provides the list of standards that are accepted as VCU labels, together with the procedure for attaining such VCU labels.

4.3 Step 3: Project Review

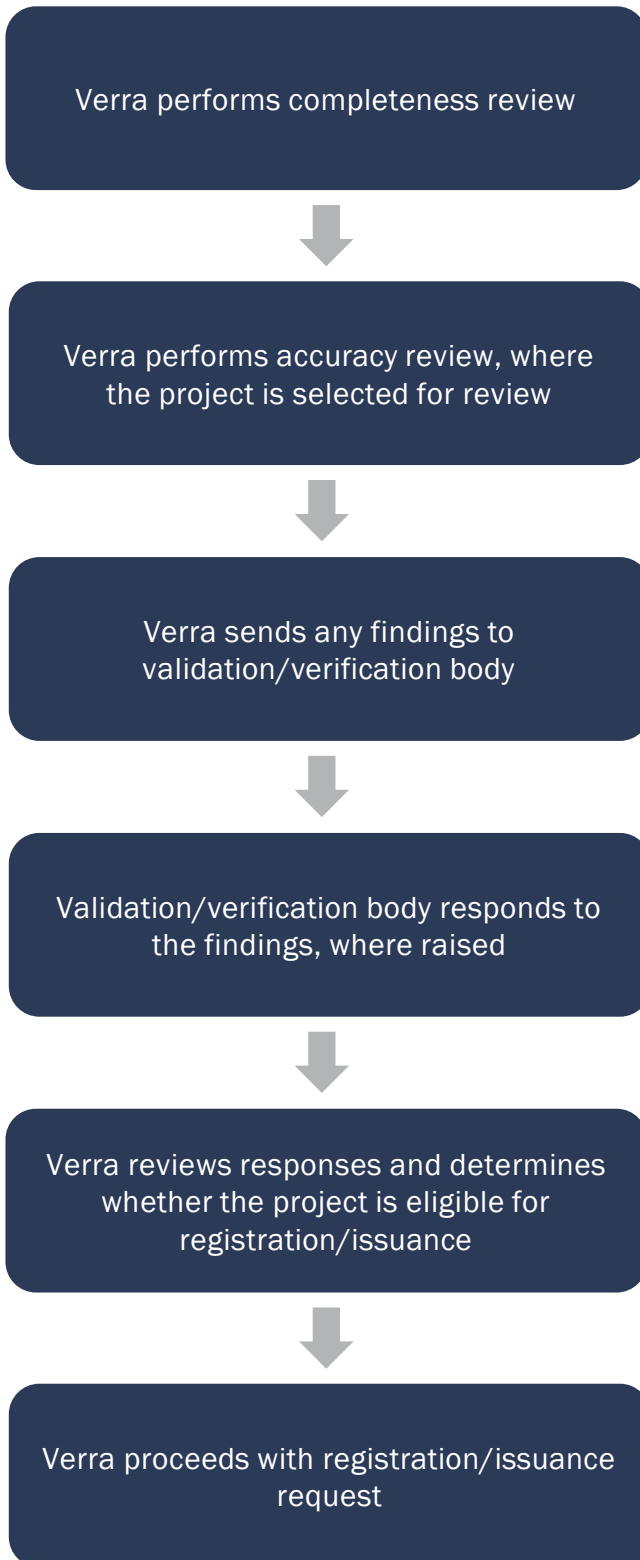
The project review is a two-part process consisting of a completeness review and an accuracy review (undertaken at Verra’s discretion) of the project registration, VCU issuance or project crediting period renewal request. The project review process is set out in Diagram 5 below. Verra notifies the project proponent (or its authorized representative) and the validation/verification body at the start and completion of each review.

Note that the project review process is triggered when the relevant documentation for registration, issuance or project crediting period renewal is submitted to the Verra registry. As such, project proponents are encouraged to submit their documentation to the Verra registry as soon as it is ready, so that the project review process may be completed at an early stage.

Note also that when submitting issuance documentation, it is not necessary to immediately request issuance of VCUs. Instead, Verra will begin the review process following receipt of the relevant documentation. VCUs may then be issued upon request to the Verra registry any time following the completion of such reviews.

Further details on the project review process are provided in this section.

Diagram 5: Review of Project Registration and VCU Issuance Request



Completeness Review

- 4.3.1 Verra undertakes a completeness review of the request. The purpose of the completeness review is to ensure that all documents are complete and duly signed where necessary, the validation or verification has been completed by an eligible validation/verification body and within required timeframes, the GHG emission reductions and removals have not been issued under another GHG program, appropriate information has been used to complete all project documents, and the baseline scenario and additionality have been correctly assessed. Verra completes the review within ten business days.
- 4.3.2 The validation/verification body shall be accredited for the sectoral scope(s) relevant to the project and shall have signed the required agreement with Verra. The Verra website maintains information on validation/verification bodies and Verra shall check the following:
- 1) The validation/verification body that conducted validation of the project was accredited for the relevant sectoral scope for validation at the date(s) on which the validation report and validation representation were issued.
 - 2) The validation/verification body that conducted verification of the project was accredited for the relevant sectoral scope for verification at the date(s) on which the verification report and verification representation were issued.
- 4.3.3 Verra checks that the requirement for rotation of validation/verification bodies has been met, as follows:
- 1) Validation (including project crediting period renewal validation) and the first verification of a project (in a given project crediting period) may be undertaken by the same validation/verification body. However, the subsequent verification shall be undertaken by a different validation/verification body. For example, if validation and verification were undertaken at the same time, the subsequent verification would have to be undertaken by a different validation/verification body. If validation were undertaken first (i.e., separately), the first verification could be undertaken by the same validation/verification body, but the subsequent verification would have to be undertaken by a different validation/verification body.
 - 2) A validation/verification body may not verify more than six consecutive years of a project's GHG emission reductions or removals. The validation/verification body may undertake further verification for the project only when at least three years of the project's GHG emission reductions or removals have been verified by a different validation/verification body. Additionally, where a validation/verification body verifies the final six consecutive years of a project crediting period, the project crediting period renewal validation shall be undertaken by a different validation/verification body. Notwithstanding these rules, where AFOLU projects have verification periods longer than six years, a validation/verification body is permitted to verify more than six consecutive years of a project's GHG emission reductions or removals, and the subsequent verification shall be undertaken by a different validation/verification body.

Where a project violates the requirements for rotation of validation/verification bodies for the first time, the project shall be subject to a mandatory accuracy review and Verra reserves the right to require the project to redo validation and/or verification with a different validation/verification body. Where a project violates these requirements for a second time, the project shall be required to redo validation and/or verification with a different validation/verification body.

4.3.4 Verra checks the project documents submitted to ensure that:

- 1) Each section of the project documents has been completed with appropriate information.
- 2) Each project document, with the exception of the project description, the non-permanence risk report, the validation report, the monitoring report and the verification report, is signed by the relevant responsible parties.
- 3) Validations have been contracted or completed within the appropriate timeframes, in accordance with the VCS Program rules.
- 4) Where VCU issuance is requested, the GHG emission reductions or removals presented for VCU issuance have not been issued under any other GHG program or recognized under a program which creates GHG-related environmental credits (such as renewable energy certificates). Where the GHG emission reductions or removals presented for VCU issuance are found to have been issued under another program, the VCU issuance request shall be rejected and the project shall no longer be eligible for crediting under the VCS Program. Such checks shall be performed upon each and every VCU issuance. Where the project is being presented for registration only (i.e., without VCU issuance requested), such checks need not be undertaken.

Note – As set out in Sections 4.2.12 and 4.2.13, GHG emission reductions or removals from one verification period can be split between the VCS Program and another GHG program.

- 4.3.5 Verra reviews the assessment of the project baseline and additionality (at validation and project crediting period renewal) to ensure adherence to the VCS Program rules and the applied methodology.
- 4.3.6 Verra may request that project documents be updated (e.g., where information is missing or incorrect). Any findings raised as a result of the completeness review shall be addressed before the registration or issuance request can proceed.
- 4.3.7 The Verra registry shall store the electronic project documents in its record-keeping system for a minimum period of 12 years from the retirement date of the last VCU to which the project documents relate.
- 4.3.8 Where Verra determines that the project has failed to comply with the VCS Program rules, Verra shall inform the project proponent (or its authorized representative) and the validation/verification body that the project fails to demonstrate compliance with the VCS

Program rules and is ineligible for registration or issuance, stating the reasons. Upon request by the project proponent or its authorized representative, Verra shall return the project documents to the project proponent or its authorized representative.

Accuracy Review

- 4.3.9 Verra may, at its discretion, undertake an accuracy review of the registration, issuance or project crediting period renewal request, the scope of which is to ensure full adherence of the validation or verification to the VCS Program rules and the applied methodology. Where Verra undertakes such an accuracy review, Verra shall notify the project proponent (or its authorized representative) and the validation/verification body. Any findings issued as a result of the Verra review shall be addressed before the registration or issuance request can proceed. Verra determines whether it will undertake a review, completes the review and issues any findings within 20 business days.
- 4.3.10 Where no findings are raised during the accuracy review, Verra notifies the project proponent (or its authorized representative) that the project registration or VCU issuance may proceed in accordance with Section 4.4.
- 4.3.11 Where material non-conformances are identified during the accuracy review (see the VCS *Standard* for further details on the threshold for materiality), the validation/verification body shall respond to the findings issued (e.g., corrective action requests and clarification requests) by Verra, in accordance with the following procedure:
- 1) The validation/verification body shall provide a written response to each finding, undertake (or ensure that the project proponent undertakes, as appropriate) revisions to the project documents where necessary, and submit all revised documents to Verra. Verra reviews such documents within 10 business days.
 - 2) Where the findings are addressed to the satisfaction of Verra, Verra notifies the project proponent and validation/verification body that the project registration or VCU issuance may proceed in accordance with Section 4.4.
 - 3) Where the findings are not addressed to the satisfaction of Verra, Verra may issue a further round of findings (not to exceed a total of three rounds of findings).
 - 4) Where the findings are not addressed to the satisfaction of Verra after the third round and/or where Verra otherwise determines that the project has failed to demonstrate compliance with VCS Program rules, the registration and/or issuance request shall not be accepted. Verra notifies the project proponent (or its authorized representative) and the validation/verification body of same. The findings may be addressed and the request resubmitted three months after such notification, except where the project is ultimately deemed by Verra to not qualify under the VCS Program.
 - 5) Where the accuracy review identifies errors or quality issues in a previous validation or verification, the procedures set out in Section 6 shall apply.

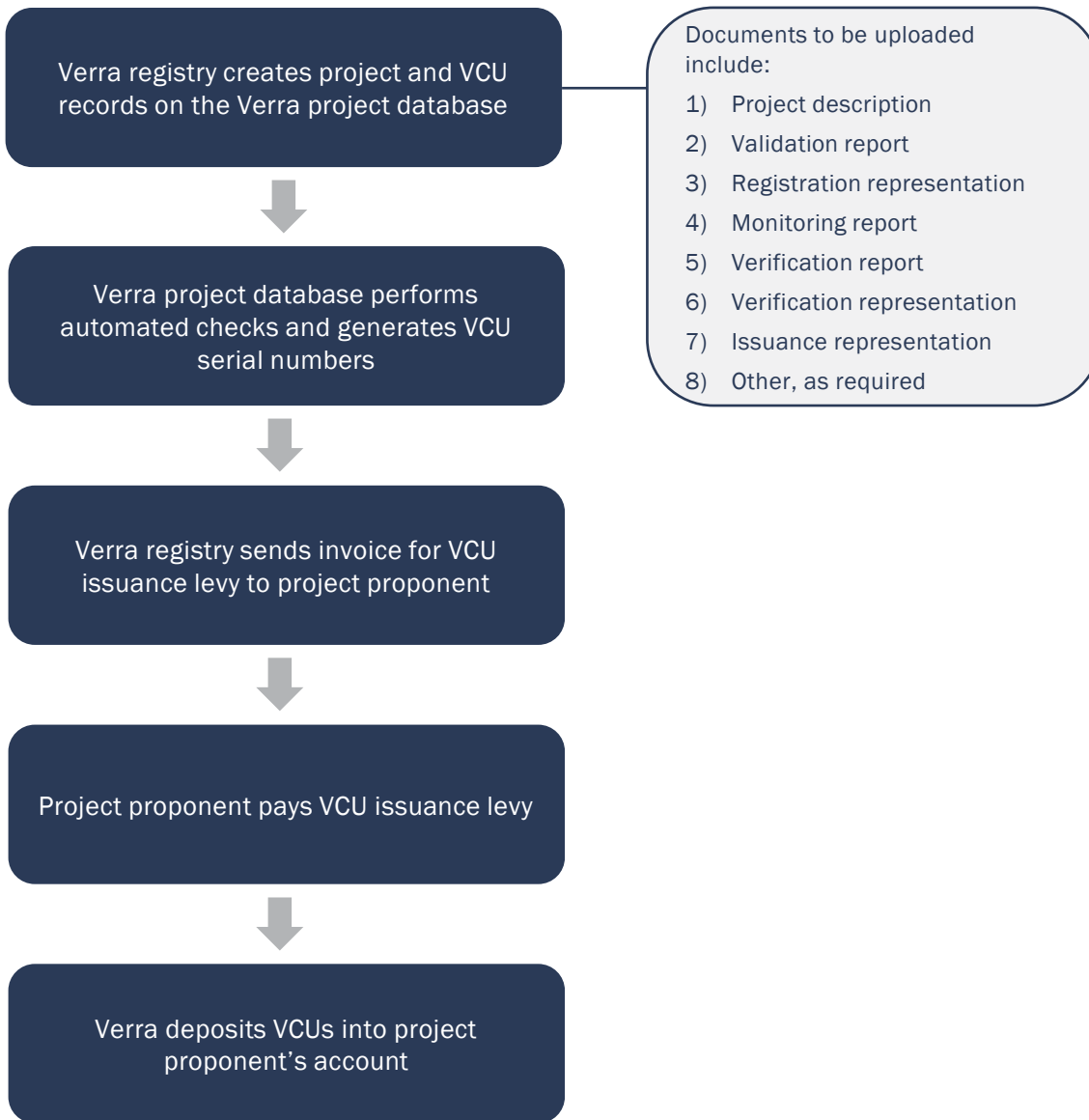
- 6) Where no response is received from the validation/verification body within 60 business days from the date the findings were issued, Verra reserves the right to assume that the project proponent does not intend to pursue the project registration or VCU issuance request. Where Verra determines this to be the case, the project registration and VCU issuance request shall not be accepted, and Verra notifies the project proponent (or its authorized representative) and the validation/verification body of same. The registration and/or issuance request may be resubmitted three months after such notification, except where the project is ultimately deemed by Verra to not qualify under the VCS Program.

Note – For the purpose of determining adherence to deadlines with respect to methodology validity and completion of validation and verification, the dates of the project documents submitted under the initial registration or issuance request shall be used (rather than the dates of the revised documents).

4.4 Step 4: Project Registration and Initial VCU Issuance

The project is registered and the VCUs are issued on the Verra registry as set out in Diagram 6, with the notes that follow providing further details.

Diagram 6: Project Registration and Initial VCU Issuance



- 4.4.1 Where the project is presented for registration without VCU issuance, the project description, validation report, validation representation, registration representation and any AFOLU specific documentation or communications agreement shall be uploaded to the Verra registry as public documents. Any proof of right or proof of contracting shall be uploaded to the Verra registry as private documents (for Verra internal auditing purposes) and therefore will not be publicly available.
- 4.4.2 Where the project is presented for registration and VCU issuance, the project description, validation report, validation representation, registration representation, monitoring report, verification report, verification representation, issuance representation and any AFOLU specific documentation, communications agreement or VCU conversion representation shall be

uploaded to the Verra registry as public documents. Any proof of right or proof of contracting shall be uploaded to the Verra registry as private documents (for Verra internal auditing purposes) and therefore will not be publicly available. Where a project description deviation has been applied, and a revised project description is issued, such project description shall be uploaded to the Verra registry as a public document. Likewise, where a project crediting period has been renewed, the revised project description and new validation report and validation representation shall be uploaded to the Verra registry as public documents.

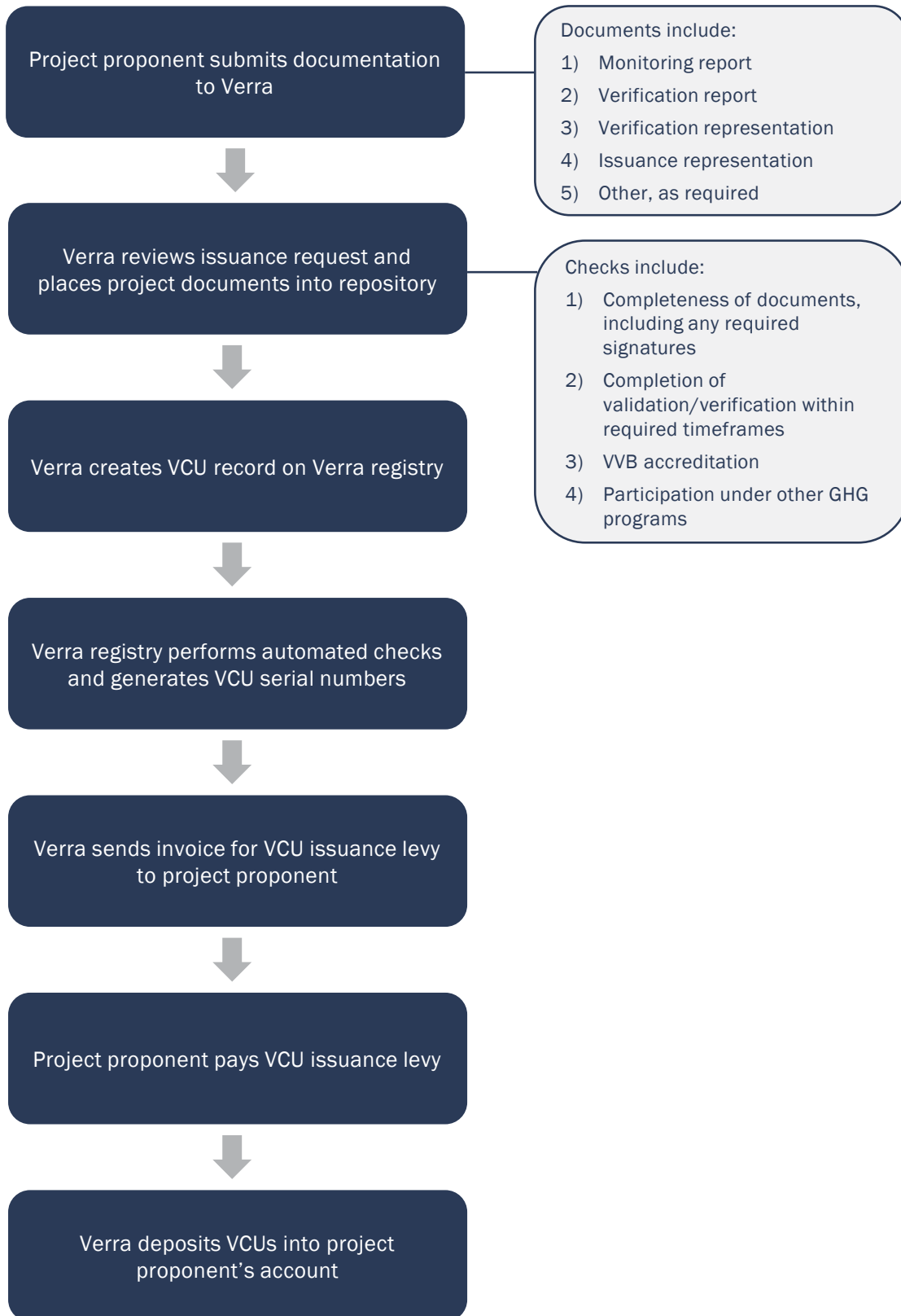
- 4.4.3 The project’s geodetic co-ordinates shall be entered onto the project record on the Verra registry. The Verra registry system checks that there are no other projects within a five kilometer radius. Where there are projects within a five kilometer radius, the Verra registry system notifies Verra and provides a list of the overlapping projects. Verra shall confirm that the project being presented for registration is unique and not one of the overlapping projects, noting that it is possible to have two projects operated by the same project proponent at the same location (they would be different activities described in separate project descriptions, with separate validation and verification). It may do this on its own if sufficient information is available or by contacting the validation/verification body of the project being presented for registration who shall confirm that it is unique and not one of the overlapping projects. Where Verra is unable to confirm uniqueness of the project, the project cannot be registered.
- 4.4.4 The registration fee shall be collected by Verra before the project is registered.
- 4.4.5 VCUs can be issued incrementally from a verification report (i.e., when the project proponent or its authorized representative requests VCU issuance, it can request issuance of part of the verification report volume and request issuance of the remaining volume at a later date). The following shall apply:
 - 1) The entity requesting VCU issuance shall instruct the Verra registry that it is requesting VCU issuance for only part of the verification report volume and shall specify the volume for which it is requesting VCU issuance.
 - 2) The VCU issuance levy and any fees charged by Verra are payable on the volume of VCUs which are issued, not the total verification report volume.
 - 3) Verra does not specify thresholds or timeframes on incremental VCU issuance (e.g., the total number of incremental VCU issuances that can be made from a verification report and the elapsed time between first and last VCU issuance from the verification report). Verra is entitled to apply such thresholds and timeframes as it deems necessary.
 - 4) The Verra registry displays the total verification report volume, the volume of VCUs issued to date and the history of VCU issuances with respect to the verification report.
 - 5) The entity requesting VCU issuance does not have to request VCU issuance of the total verification report volume (i.e., it can choose to only request VCU issuance for a part of the verification report volume and never request issuance of the remaining verification report volume).

- 6) VCUs are not subject to any discounting with respect to their fungibility. VCU owners, programs or other climate change efforts that accept VCUs may apply a discount at their own discretion.
- 4.4.6 Where the project has cancelled GHG credits issued under an approved GHG program and is having them issued as VCUs (as set out in Section 4.2.15), the project reference number under the approved GHG program shall be noted on the project record on the Verra registry.
- 4.4.7 The VCU issuance levy shall be collected by Verra before VCUs are deposited into an account.

4.5 Step 5: Periodic VCU Issuance

There may be issuance of VCUs subsequent to the initial issuance of VCUs to the project as set out in Diagram 7 below, with the notes that follow providing further details.

Diagram 7: Periodic VCU Issuance



4.5.1 All and any periodic VCU issuances shall be initiated by the project proponent stated on the project record in the Verra registry or its authorized representative. Where another entity wants to become the project proponent (and therefore assume the roles and responsibilities of a project proponent with respect to the Verra registry), the process set out in Section 7 shall be followed. The new project proponent on the project record in the Verra registry or its authorized representative can then initiate VCU issuance.

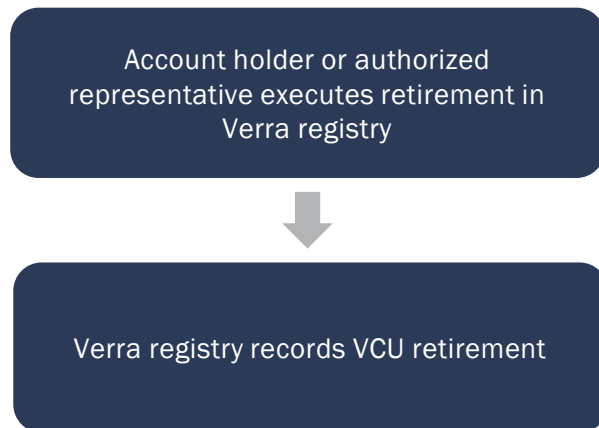
4.6 Step 6: VCU Retirements and Cancellations

The Verra registry displays the status of every VCU issued under the VCS Program. VCUs may have a status of active, retired or cancelled. Note that VCU *retirement* and *cancellation* have specific meanings, as set out in the VCS Program document *Program Definitions*.

The process for retiring active VCUs is set out in Sections 4.6.1 - 4.6.4 below. The process for cancelling active VCUs is set out in Sections 4.6.5 - 4.6.8 below.

4.6.1 VCUs may be retired as set out in Diagram 8 below, with the notes that follow providing further details.

Diagram 8: VCU Retirement

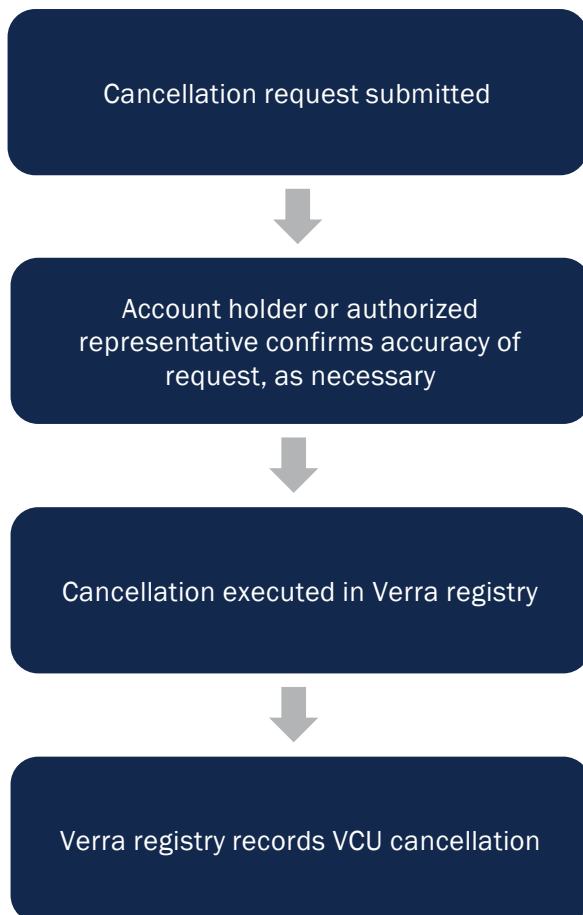


4.6.2 All and any VCU retirements shall be initiated by the registry account holder or its authorized representative.

4.6.3 The registry account holder or its authorized representative may execute a VCU retirement through its Verra registry account. The Verra registry system records the details of all VCU retirements.

- 4.6.4 VCUs can be retired incrementally from a registry accountholder’s VCU holdings (i.e., when the VCU holder or its authorized representative requests VCU retirement, it can request retirement of part of the VCU holdings and request retirement of any or all of the remaining holdings at a later date). In such cases, the following shall apply:
- 1) The registry account holder or its authorized representative shall designate the specific set of VCUs for retirement through its Verra registry account.
 - 2) Any fees charged by the Verra registry are payable on the volume of VCUs which are retired, not the total VCU holdings volume.
 - 3) Verra does not specify thresholds or timeframes on incremental VCU retirement (e.g., the total number of incremental VCU retirements that can be made from a registry accountholder’s VCU holdings and the elapsed time between first and last VCU retirement from those holdings). Verra is entitled to apply such thresholds and timeframes as it deems necessary.
- 4.6.5 VCUs may be cancelled as set out in Diagram 9 below, with the notes that follow providing further details.

Diagram 9: VCU Cancellation

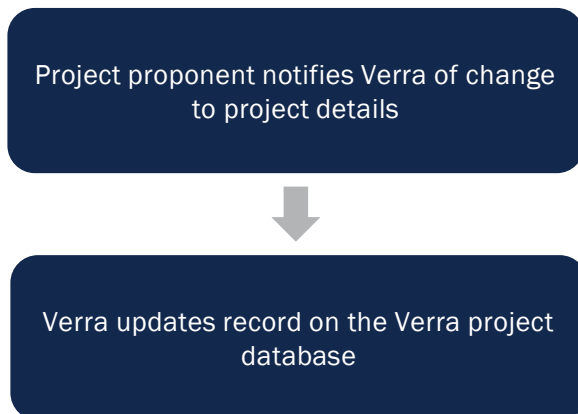


- 4.6.6 The registry account holder, its authorized representative, the other GHG program in which the registry account holder is participating or Verra may initiate a VCU cancellation. Note that the initiator and recipient of a VCU cancellation request depends on the specific circumstances of the cancellation (e.g., where VCUs are being converted into another form of GHG credit, the cancellation request may be submitted to Verra by the other GHG program in which the registry account holder is participating).
- 4.6.7 The registry account holder or its authorized representative may be asked to confirm the details of the VCU cancellation request.
- 4.6.8 VCUs are cancelled in the Verra registry and the Verra registry records the details of all VCU cancellations.

4.7 Step 7: Project Maintenance

Project details may be updated as set out in Diagram 10 below, with the notes that follow providing further details.

Diagram 10: Project Maintenance



- 4.7.1 Where a project fails to submit a verification report to the Verra registry within five years of its last verification, the following applies:
 - 1) Verra will send written communication to the project proponent to request evidence that the project is still active despite not having verified.
 - 2) The project proponent shall submit such evidence within one year of receiving the written communication from Verra.
 - a) Evidence may take the form of a letter submitted by the project proponent to Verra and should explain in detail the status of the project, including an explanation as to why the project has not verified and, where relevant, why it should still be considered active.

- b) The letter may be accompanied by any relevant documentation of activity implementation (e.g., photographic evidence, monitoring reports, contract for verification in the near future).
- 3) Where a letter is received, it shall be posted publicly to the Verra registry and the project status in the registry shall be changed to *late to verify*.
- 4) Where no letter is received, the project status shall still be changed to *late to verify*, but will not benefit from an explanation being available to potential buyers and other stakeholders. The project proponent is encouraged to submit an updated letter annually.

Note – Where a project has not verified because it has transitioned to another GHG program (e.g., integrated into a government program), its project status shall be changed to project transferred to other GHG program instead of late to verify.

Note – Where an AFOLU project fails to submit a verification report to the Verra registry within five, ten and fifteen years of its last verification, buffer credits are put on hold or canceled (and the project labeled as inactive), as appropriate, per the requirements set out in Section 5.3.4, below.

- 4.7.2 Where the project proponent wishes to withdraw the project from the VCS Program (e.g., in order to transfer the project to another GHG program), the following applies:
- 1) The project proponent shall submit a letter (in English) on its organization letterhead, to the Verra registry, requesting that the project be withdrawn. Such letter must include the project name, project ID, the reason for the withdrawal request and the signatures and contact information of all project proponents.
 - 2) Verra reviews the withdrawal request and may request additional information prior to approving the request.
 - 3) Upon approval, Verra shall update the status of the project to *withdrawn*. The project information shall remain publicly available on the Verra registry, but the project will not be able to issue VCUs.
 - 4) In the case of an AFOLU project where VCUs have been previously issued, the following applies:
 - a) The project shall not be eligible for any release of buffer credits.
 - b) Where Verra confirms that the project has registered with another GHG program, all buffer credits associated with the project shall be cancelled.
 - c) Where Verra is unable to confirm that the project has registered with another GHG program, buffer credits shall be cancelled over time in accordance with the rules set out in Section 5.3.4 below.
 - 5) Withdrawn projects may rejoin the VCS Program where the project proponent submits a letter to the Verra registry requesting same. Such letter must include the information specified in Section 4.7.1(1) above. Verra reviews the project to determine whether it is

eligible to rejoin the VCS Program, and notifies the project proponent of the outcome of the review. Where the project is eligible to rejoin the VCS Program, Verra updates the status of the project accordingly. Where the project is not eligible to rejoin the VCS Program, the project shall remain withdrawn.

5 AFOLU POOLED BUFFER ACCOUNT

The VCS Program addresses the non-permanence risk associated with AFOLU project activities by requiring projects to set aside non-tradable buffer credits to cover unforeseen losses in carbon stocks. The buffer credits from all projects are held in a single AFOLU pooled buffer account, which can be drawn upon in the event of a reversal in carbon stocks in any individual project.

5.1 Assignment of Buffer Credits at First Request for Issuance

At first VCU issuance, buffer credits shall be deposited into the AFOLU pooled buffer account, in accordance with the procedures below.

- 5.1.1 The number of credits to be deposited in the AFOLU pooled buffer account is determined by the non-permanence risk report assessed by the validation/verification body(s), in accordance with the requirements set out in the *VCS Standard*. The report establishes the non-permanence risk rating, and this percentage is applied to the net change in the project's carbon stocks (stated in the verification report) to determine the number of credits to be deposited in the AFOLU pooled buffer account.
- 5.1.2 Buffer credits are not issued a VCU serial number nor are they considered to be VCUs. They are not subject to the VCU issuance levy.

5.2 Assignment and Release of Buffer Credits at Subsequent Requests for Issuance

Buffer credits associated with the project may be released over time, as an incentive for continued verification and to recognize that certain project risks decrease as the project's longevity is demonstrated, in accordance with the procedures below.

- 5.2.1 The project is eligible to release buffer credits where the non-permanence risk rating in the current verification report remains the same or decreases from the previous verification report. The release of buffer credits from the AFOLU pooled buffer account occurs when a verification report is presented to the Verra registry and VCU issuance is requested. When buffer credits are released from the AFOLU pooled buffer account, they shall be issued as VCUs into the designated Verra registry account upon payment of the VCU issuance levy.
- 5.2.2 Release of buffer credits may only occur where a verification report (submitted to request VCU issuance) was issued at least five years after the issuance date of the verification report previously submitted to request VCU issuance. The first release of buffer credits shall be no sooner than five years after the first verification report was issued and presented to the registry for VCU issuance. Subsequent releases of buffer credits shall not occur more frequently than once every five years. Where verification reports are issued at intervals shorter than once every five years, buffer credits shall be released no sooner than the issuance date of a verification

report that is at least five years after the issuance date of the verification report used to request the previous release of buffer credits (and shall be released at the request for VCU issuance). Where verification events occur at intervals longer than five years, the 15 percent time release (see Section 5.2.4) shall be compounded based on the number of five-year intervals that have passed since the last verification report was issued.

- 5.2.3 Where the project’s non-permanence risk rating at the current verification period remains the same as the non-permanence risk rating at the last verification period, buffer credits shall be deposited into the AFOLU pooled buffer account in accordance with the procedure set out in Section 5.1 above.

A 15 percent “time release” of buffer credits is then applied where the five-year interval set out in Section 5.2.2 has passed. This 15 percent time release shall be applied to the total number of buffer credits associated with the project to-date (i.e., the number of buffer credits previously held in the AFOLU pooled buffer account plus the number of buffer credits newly deposited). The deposit and release of buffer credits may be calculated and handled so that the Verra registry carries out a single transaction for the deposit/release of net buffer credits. An example of how the buffer withholding may be reduced over time is available on the Verra website.

- 5.2.4 Where the project’s non-permanence risk rating at the current verification period is lower than the non-permanence risk rating at the previous verification period, the new non-permanence risk rating shall be applied and buffer credits shall be deposited into the AFOLU pooled buffer account in accordance with the procedure set out in Section 5.1 above.

The new non-permanence risk rating is also applied to all buffer credits associated with the project that are already deposited in the AFOLU pooled buffer account from previous verification periods. This means previously deposited buffer credits that are in excess of the reduced withholding percentage shall be released and issued as VCU where the five-year interval set out in section 5.2.2 has passed.

A 15 percent “time release” of buffer credits is then applied to the total number of buffer credits associated with the project to-date (i.e., the number of buffer credits previously held in the AFOLU pooled buffer account plus the number of buffer credits newly deposited). The deposit and release of buffer credits may be calculated and handled so that the Verra registry carries out a single transaction for the deposit/release of net buffer credits.

- 5.2.5 Where the project’s non-permanence risk rating at the current verification period is higher than the non-permanence risk rating at the previous verification period, no release of buffer credits shall occur. Buffer credits shall be deposited into the AFOLU pooled buffer account in accordance with the procedure set out in Section 5.1 above.

5.3 Cancellation and Holding of Buffer Credits

Buffer credits are cancelled from the AFOLU pooled buffer account where there are negative net GHG emission reductions or removals associated with the project (as compared to the baseline), and are put on hold in certain situations, as outlined in this section.

5.3.1 Where an event occurs that is likely to qualify as a loss event (see the VCS Program document *Program Definitions* for definition of loss event), the project proponent shall notify Verra within 30 days of discovering the likely loss event. Where VCUs have been previously issued, a loss event report shall be prepared and submitted to the Verra registry, as follows:

- 1) The loss event report shall be prepared using the *VCS Loss Event Report Template*.
- 2) The loss event report shall be accompanied by a loss event representation signed by the project proponent. The template for the loss event representation is available on the Verra website.
- 3) The loss event report shall be submitted to the Verra registry within two years of the date of discovery of the loss event. Where a loss event report is not submitted within two years of the date of discovery of the loss event, the project shall no longer be eligible to issue VCUs.
- 4) Verra shall put buffer credits from the AFOLU pooled buffer account on hold, in an amount equivalent to the estimated loss stated in the loss event report.

5.3.2 The following applies with respect to the verification report submitted subsequent to a loss event:

- 1) Where the net GHG benefit of the project for the verification period is negative, a reversal has occurred (see the VCS Program document *Program Definitions* for definition of reversal) and the following applies:
 - a) Where the total reversal is less than the number of credits put on hold after the submission of the loss event report, Verra shall cancel buffer credits equivalent to the reversal. Any remaining buffer credits shall be released from their on-hold status (though remain in the AFOLU pooled buffer account).
 - b) Where the reversal is greater than the number of credits put on hold after the submission of the loss event report, the full amount of buffer credits put on hold with respect to the submission of the loss event report shall be cancelled, and additional buffer credits from the AFOLU pooled buffer account shall be cancelled to fully account for the reversal.
- 2) Where the net GHG benefit for the verification period is positive (i.e., all losses have been made up over the verification period), a reversal has not occurred and buffer credits put on hold after the submission of the loss event report shall be released from their on-hold status (but shall remain in the AFOLU pooled buffer account).

5.3.3 The following applies with respect to the VCU issuance subsequent to a reversal:

- 1) Where the reversal is a catastrophic reversal (see the VCS Program document *Program Definitions* for the definition of catastrophic reversal) the following applies:
 - a) GHG credits shall be deposited in the AFOLU pooled buffer account in an amount equivalent to the additional number of buffer credits cancelled after the reversal, above what has been previously contributed by the project. For example, if the project previously contributed 100 buffer credits and 150 credits were cancelled from the AFOLU pooled buffer account after a reversal, the project would deposit 50 buffer credits (to replenish the pool at large). Buffer credits deposited to replenish the pool after a reversal (50 in the example above) shall never be eligible for release back to the project.
 - b) Where further GHG credits are available for VCU issuance after replenishing the AFOLU pooled buffer account, additional buffer credits shall be deposited in the AFOLU pooled buffer account in accordance with Section 5.2 (applying the non-permanence risk rating only to those remaining GHG credits eligible for VCU issuance).
- 2) Where the reversal is a non-catastrophic reversal, the following applies:
 - a) GHG credits shall be deposited in the AFOLU pooled buffer account in an amount equivalent to the full reversal.
 - b) Where further GHG credits are available for VCU issuance after replenishing the AFOLU pooled buffer account, additional buffer credits shall be deposited in the AFOLU pooled buffer account in accordance with Section 5.2 (applying the non-permanence risk rating only to those remaining GHG credits available for VCU issuance).

5.3.4 Where a project fails to submit a verification report to the Verra registry within five years of its last verification, 50 percent of the buffer credits associated with the project shall be put on hold. After a further five years, all of its remaining buffer credits shall be put on hold. Where no subsequent verification report has been presented within a period of 15 years, and the project crediting period has not yet expired, buffer credits shall be cancelled from the AFOLU pooled buffer account in an amount equivalent to the total number of VCUs issued to the project (including buffer credits put on hold) and the project shall be labeled as *inactive*.

Note – Where a project has not verified because it has transitioned to another GHG program (e.g., integrated into a government program), it shall be labeled as project transferred to other GHG program instead of inactive.

5.3.5 Where buffer credits are put on hold because a project does not submit a verification report within five years of the previous verification, the project may re-claim buffer credits. A new verification report shall be submitted prior to the expiration of the project crediting period. Verra shall re-assign buffer credits that have been put on hold in accordance with the procedure set out in Section 5.1.1 above. The remaining balance of buffer credits associated with a project shall be cancelled at the end of the project crediting period.

6 QUALITY CONTROL OF REGISTERED PROJECTS

6.1 Process

6.1.1 Verra may, at its discretion, review registered projects and issued VCUs where it has concerns about adherence of the project to the VCS Program rules and the applied methodology. A review may be triggered by any of the following:

- 1) A validation/verification body performing a verification of a registered project identifies an error or quality issue in a previous validation or verification.
- 2) A project proponent identifies an error or quality issue after the registration or issuance of the project.
- 3) A stakeholder has concerns about a registered project².
- 4) Verra itself identifies an error or quality issue, as part of routine operations.

6.1.2 Where a review is triggered, Verra notifies the project proponent (or its authorized representative) and the relevant validation/verification body of the review and may suspend further VCU issuance while the review is performed.

6.1.3 Where material non-conformances are identified during the review (see the *VCS Standard* for further details on the threshold for materiality), the validation/verification body shall provide a written response to findings (e.g., corrective action requests or clarification requests) issued by Verra. Verra also suspends further VCU issuance, where it has not already done so.

Note – Where the relevant validation/verification body is unable to respond due to reasons such as a cease of operations or accreditation, Verra may solicit a response to the findings from alternative entities such as the project proponent or another validation/verification body.

6.1.4 The follow-up actions of the validation/verification body and/or project proponent shall depend on whether the relevant validation or verification was completed before, on or after 8 April 2014, and shall be as set out in Tables 3 and 4 below. In all cases, the relevant validation/verification body shall undertake a root cause analysis to identify why such quality issues occurred.

² Concerns may be raised, in confidence, with Verra at any time.

Table 3: Actions for Validations and Verifications Completed Before 8 April 2014

	Issues found, but no excess VCU issuance and no risk of future excess issuance	Issues found, with excess VCU issuance and/or risk of future excess issuance
Project qualifies under program	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) Verra lifts suspension on VCU issuance 	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) Validation/verification body or project proponent, as appropriate, shall revise project documents 3) Verra lifts suspension on VCU issuance, upon acceptance of project document revisions 4) Verra shall upload revised project documents to the Verra registry
Project does not qualify under program	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) No further VCU issuance is permitted 	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) No further VCU issuance is permitted

Table 4: Actions for Validations and Verifications Completed On or After 8 April 2014

	Issues found, but no excess VCU issuance and no risk of future excess issuance	Issues found, with excess VCU issuance and/or risk of future excess issuance
Project qualifies under program	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) Validation/verification body or project proponent, as appropriate, shall revise project documents 3) Verra lifts suspension on VCU issuance, upon acceptance of project document revisions 4) Verra shall upload revised project documents to the Verra registry 	<ol style="list-style-type: none"> 1) Validation/verification body shall conduct a root cause analysis 2) Where significant performance issues are found, and as appropriate, disciplinary action shall be taken against the validation/verification body 3) Validation/verification body or project proponent, as appropriate, shall revise project documents 4) Project proponent may need to compensate for excess issuance (see Section 6.1.5)

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

		<p>5) Verra lifts suspension on VCU issuance, upon acceptance of project document revisions by Verra</p> <p>6) Verra shall upload revised project documents to the Verra registry</p>
<p>Project does not qualify under program</p>	<p>1) Validation/verification body shall conduct a root cause analysis</p> <p>2) Where significant performance issues are found, and as appropriate, disciplinary action shall be taken against the validation/verification body</p> <p>3) No further VCU issuance is permitted</p>	<p>1) Validation/verification body shall conduct a root cause analysis</p> <p>2) Where significant performance issues are found, and as appropriate, disciplinary action shall be taken against the validation/verification body</p> <p>3) Project proponent may need to compensate for excess issuance (see Section 6.1.5)</p> <p>4) No further VCU issuance is permitted</p>

6.1.5 Where Verra determines that VCUs have been issued in excess of the correct amount, the following applies:

- 1) The project proponent is responsible for compensating for excess VCU issuance where Verra deems, acting reasonably, that there has been a material erroneous issuance of VCUs in respect of the project, as a result of the fraudulent conduct, negligence, intentional act, recklessness, misrepresentation or mistake of the project proponent, as set out further in the issuance representation.
- 2) Any compensation for excess VCU issuance shall be through the following, with Verra using reasonable efforts to work with the project proponent to ensure that any adverse impacts on the project proponent are minimized to the extent possible.
- 3) Where the excess VCUs remain in the project proponent’s Verra registry account and it can be demonstrated that they have not been used for offsetting purposes, immediate cancellation of the VCUs.
- 4) Replacement of VCUs through immediate cancellation from subsequent issuances of VCUs to the project.
- 5) Purchase by the project proponent of an equivalent number of replacement VCUs, and cancellation of same, within 60 business days of receiving formal Verra notification of such required action.
- 6) Where the project proponent fails to compensate for excess VCU issuance, Verra may take action against the project proponent, including applying sanctions with respect to its registry account activities until such time as the excess issuance has been compensated.

7 FURTHER INFORMATION

7.1 Communications Agreement

7.1.1 The purpose of the communications agreement is to allow an authorized representative to interact with the Verra registry on behalf of the project proponent and designate the account into which VCUs may be deposited. Templates for Verra registry communications agreements are available on the Verra website. The following is provided by way of further clarification:

- 1) Where there are multiple project proponents stated in the project description a communications agreement shall be provided to the Verra registry signed by all project proponents. The communications agreement shall designate an authorized representative and the account into which any VCUs shall be issued. Where a subsequent registration representation is provided to the Verra registry for the purpose of switching the project proponent, a communications agreement shall also be provided in respect of designation of an authorized representative or the account into which any VCUs shall be issued. Such communications agreement shall supersede any prior communications agreement.
- 2) Where there is a single project proponent and a registration representation is provided to the Verra registry, a communications agreement may also be provided in respect of designation of an authorized representative or the account into which any VCUs shall be issued. Where a subsequent registration representation is provided to the registry for the purpose of switching the project proponent, a communications agreement may also be provided. Any such communications agreement shall supersede any prior communications agreement. Where a communications agreement is not provided, authorized representation reverts to the (new) project proponent.

7.2 Release and Accession of Project Proponents

7.2.1 Project proponents may join or leave a project subsequent to project validation and registration. Such accession and release is handled via representations made by acceding entities and project proponents as follows:

- 1) Where an entity wants to join a project, it and the existing project proponent(s) shall sign an accession representation, which shall be prepared using the *VCS Deed of Accession Template* and properly executed as a deed in accordance with applicable local laws and the organization's own constitutional documents. Where more than one entity wants to join the project, one accession representation shall be signed for each acceding entity.
- 2) Where a project proponent wants to leave a project (i.e., give up its rights and obligations in respect of the project), it, the remaining project proponent(s) and the Verra registry shall sign a partial release representation, which shall be prepared using the *VCS Deed of Partial*

- Release Template* and properly executed as a deed in accordance with applicable local laws and the organization's own constitutional documents. Where more than one project proponent wants to be released from the project, one partial release representation shall be signed for each project proponent that is leaving. Note that a project shall always have at least one project proponent, so there shall always be at least one remaining registration representor (project proponent) that signs the partial release representation.
- 3) The accession and/or partial release representations shall be submitted to the Verra registry, who shall upload the accession and/or partial release representations to the Verra registry and update the project record to reflect the change in project proponent.
 - 4) Once this process is complete, only the new project proponent or its authorized representative can initiate subsequent VCU issuance.

Note – Where a project has one project proponent only and the project proponent wants to leave the project in favor of another entity, this is handled by having the new entity accede to the project via an accession representation and the original project proponent released from the project via a release representation.

APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v4.0	19 Sep 2019	Initial version released under VCS <i>Version 4</i>



Standards for a Sustainable Future



Attachment CC

Verra, Terms of Use



Terms of Use

Verra

Verra Registry

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Title	Terms of Use
Parties	Verra a not-for-profit organization incorporated in the District of Columbia, USA, whose registered office is at 1090 Vermont Ave, NW, Suite 910, 20005 (Verra)
	You (User)

Recitals

- A These Terms of Use set out the terms on which Verra offers to make the Verra Registry (**Registry**) available to the user.
- B The Registry serves as the registry for the Verra Programs.
- C The User wishes to use the Registry on the terms and conditions of this Agreement, as amended from time to time.

Operative provisions

1. General Terms of Use

- 1.1 The User acknowledges and agrees that when using the Verra Registry, the User will be subject to, and must comply with, these Terms of Use as modified from time to time in accordance with the terms hereof.
- 1.2 Where there is any inconsistency between these Terms of Use and the Program Rules and Requirements of a Verra Program, the Program Rules and Requirements of the relevant Verra Program will prevail over these Terms of Use.
- 1.3 In addition, the User agrees to comply with any and all applicable Scheme Regulations imposed and updated from time to time by a third-party Scheme Regulator.
- 1.4 If the User does not agree to these Terms of Use, the User may not access or otherwise use the Verra Registry.

2. Term

- 2.1 These Terms of Use commence on the date on which the User indicates on the Verra Registry website that the User agrees with and accepts the Terms of Use (**Commencement Date**), and these Terms of Use shall continue in effect until terminated in accordance with clause 14 (**End Date**).

3. Services

- 3.1 Verra, through the Verra Registry, provides an electronic platform to list projects that follow the applicable protocols and standards for the relevant Verra Program and record the issuance, transfer, retirement and cancellation of Instruments within the Verra Registry.
- 3.2 The Verra Registry lists projects and issues Instruments in accordance with the Program Rules and Requirements of each of the Verra Programs it administers. Accordingly, before a project

can be listed or an Instrument issued, the User must provide Verra with appropriate documentation for its approval in accordance with the procedures set out by Verra including any Program User Guidelines.

- 3.3 The User is responsible for providing and maintaining all communications lines, telephone/transmission services, and all equipment and technology, necessary for the User to access and use the Verra Registry, and all costs and expenses associated with its accessing and using the Verra Registry.
- 3.4 The User shall take all appropriate steps and precautions to safeguard and protect the access, use, and security of the Verra Registry and the User's access information from unauthorized users.

4. Opening an Account

- 4.1 A User may request that Verra open a Verra Registry Account for that User in accordance with the procedures set out by Verra.
- 4.2 Verra will only open a Verra Registry Account for a User if:
 - (a) the User has indicated their acceptance of these Terms of Use; and
 - (b) the User has provided sufficient identification information including satisfying any relevant Know-Your-Client (**KYC**) or other background check requirements in accordance with the procedures set out by Verra including any Program User Guidelines.
- 4.3 Verra may, in its absolute discretion, refuse to open a Verra Registry Account for a User.

Program Sub-Accounts

- 4.4 A User may request that Verra open a Program Sub-Account under its Verra Registry Account for all transactions related to a particular Verra Program. For the avoidance of doubt, a User shall have a separate Program Sub-Account for each Verra Program it participates in.

5. Listing a Project or Activity

- 5.1 Once the User has opened a Verra Registry Account, the User may request that Verra list a Project or Activity in accordance with the procedures set out by Verra including any Program User Guidelines.
- 5.2 Verra will require any User who intends to list a Project or Activity to provide all documentation and information as required by the relevant Verra Program Rules and Requirements.
- 5.3 Verra will only list a Project or Activity if:
 - (a) the User has registered with Verra or any relevant Scheme Regulator (as applicable) and submitted all necessary information to Verra or the relevant Scheme Regulator in accordance with the applicable Verra Program Rules and Requirements or Scheme Regulations;
 - (b) the User has confirmed that it is not subject to any holding account restrictions in accordance with the applicable Scheme Regulations;
 - (c) the User has complied with all relevant laws in relation to the Project or Activity; and

- (d) the User has complied with any other requirements specified in the relevant Program Rules and Requirements or by the relevant Scheme Regulator or by Verra from time to time.
- 5.4 For the avoidance of doubt, a Project or Activity may be listed under more than one Program, provided that it meets the requirements for listing of each of the applicable Verra Program Rules and Requirements or Scheme Regulations.
- 5.5 Verra may, in its absolute discretion, refuse to list any Project or Activity in the Verra Registry.

6. Issuance of Registry Instruments

- 6.1 A User may request that Verra issue Instruments to its Verra Registry Account in accordance with the relevant Verra Program Rules and Requirements.
- 6.2 Verra will require any User who intends to issue Instruments in the Verra Registry to provide all documentation, attestations and information as required by the relevant Verra Program Rules and Requirements.
- 6.3 Verra will only issue Instruments if:
- (a) the User has submitted complete and signed original or certified electronic versions of all attestations and documentation required under the relevant Verra Program Rules and Requirements or by the relevant Scheme Regulator, these Terms of Use or the procedures set out by Verra including any Program User Guidelines;
 - (b) Verra is satisfied (based solely on the information provided by the User and third parties) that the project or activity for which Instruments are to be issued meets the relevant Verra Program Rules and Requirements;
 - (c) the User complies with all relevant laws;
 - (d) the User has established a Program Sub-Account for the relevant Program; and
 - (e) the User has complied with any other requirements specified in the relevant Verra Program Rules and Requirements or by the relevant Scheme Regulator or by Verra from time to time.
- 6.4 The User acknowledges and understands that Verra's issuance of Instruments is no guarantee of any relevant Scheme Regulator's issuance of corresponding Scheme Instruments, and that a Regulator may determine, pursuant to the relevant Program Rules and Requirements, that fewer or no Scheme Instruments will be issued relative to the quantity of Instruments issued by Verra. In such instances, Verra maintains the right to cancel the quantity of Instruments that it issued in excess of the number of Scheme Instruments issued by the relevant Scheme Regulator or take other action that it deems appropriate, considering the circumstances and facts available to Verra.
- 6.5 The User acknowledges and agrees that in the event that Verra or a relevant Scheme Regulator determines that GHG reductions or removals for a project or activity were incorrectly quantified or reported, such that the number of Instruments issued to the User was in excess of the correct number according to the requirements of the applicable Verra Program Rules and Requirements, it is the User's responsibility to compensate for the over-issuance of Instruments, irrespective of whether the Instruments are still held by the User.
- 6.6 The obligation to compensate for any over-issuance of Instruments survives the End Date.

- 6.7 Verra may, in its absolute discretion, refuse to issue Instruments to the User's Verra Registry Account.

7. Recording the Transfer of Instruments within the Verra Registry

- 7.1 Upon receiving notification from the User or a Financial Market Settlement System that there has been an erroneous or fraudulent dealing related to Instruments in the Verra Registry, Verra may at its total discretion reverse the transaction or movement of Instruments or remove any Instruments being held in a User's Verra Registry Account or Program Sub-Account in accordance with any instructions received from the User or the relevant Financial Market Settlement System.
- 7.2 Upon receiving any written instruction from a Scheme Regulator in relation to any dealing with Instruments in the Verra Registry, Verra may at its total discretion reverse any transaction or movement of Instruments or remove any Instruments being held in a User's Verra Registry Account in accordance with any written instructions received from the Scheme Regulator.

8. Cancellation and Retirement of Instruments

- 8.1 The User may request that Verra cancel or retire Instruments in accordance with the relevant Verra Program Rules and Requirements and the procedures set out by Verra including any Program User Guidelines.
- 8.2 The User acknowledges and agrees that if the User wishes Verra to cancel or retire Instruments:
- (a) all legal and beneficial title in such Instruments will be extinguished and to the extent that any legal or beneficial title remains, the User will transfer its remaining interest and title to Verra subject to any limitations or requirements as may be imposed from time to time by the relevant Verra Program Rules and Requirements, these Terms of Use or the procedures set out by Verra including any Program User Guidelines;
 - (b) neither it nor any third party will have any further rights to take the benefit of such Instruments nor the underlying Environmental Benefits corresponding to such Instruments; and
 - (c) it will procure that all relevant third parties enter into such agreements as are necessary to ensure that neither the User nor any third parties have any further rights to take the benefit of such Instruments nor the underlying Environmental Benefits corresponding to such Instruments.
- 8.3 Subject to clauses 11.4(o) and 11.4(p), any instruction by the User to Verra to cancel or retire Instruments in accordance with this clause 8 is irrevocable, and the User acknowledges that any such instruction will not be reversed.
- 8.4 Verra acknowledges and agrees that, once the User has complied with this clause 8 and Verra has cancelled or retired the Instruments, Verra will not take any action to exercise or purport to exercise any right or interest, or deal with or otherwise use, the cancelled or retired Instruments or the underlying Environmental Benefits corresponding to such Instruments and considers that no person has any further rights to take the benefit of the cancelled or retired Instruments or the underlying Environmental Benefits corresponding to such Instruments.

9. Legal Title to Instruments

- 9.1 Notwithstanding anything in clause 6, the User acknowledges and agrees that Verra does not in any way guarantee legal title to the Instruments and the User relies on any content obtained through the Verra Registry at its own risk.
- 9.2 For the avoidance of doubt, Verra is under no obligation to verify or otherwise enquire into the validity of, or legal title to, the Instruments.

10. Fees and Charges

- 10.1 Fees payable for use of the Verra Registry will be published by Verra from time to time.
- 10.2 The User shall provide User's billing information prior to opening a Verra Registry Account with the Verra Registry. Invoices will be sent to User by email. All payments made to Verra should be made by wire transfer of immediately available funds in United States dollars to the Verra Bank Account. For the avoidance of doubt, all costs associated with the User's payment of fees shall be borne by the User.

Late Payment

- 10.3 If User fails to pay when due any fees, costs or other amounts which User is obligated to pay under these Terms of Use, such amounts will be deemed delinquent and will accrue interest at the Interest Rate, such interest to be calculated from and including the due date to, but excluding, the date on which the delinquent amount is paid in full.
- 10.4 Acceptance of late payment of any such amounts or of any interest accrued thereon shall not constitute a waiver by Verra of the User's default with respect to such late payment, nor prevent Verra from exercising any other rights or remedies available to it under these Terms of Use or any applicable law.
- 10.5 If delinquent fees are not paid by the User within thirty (30) days of the Due Date, Verra maintains the right to freeze the User's access to its Verra Registry Account and Program Sub-Accounts until such time as User pays all outstanding fees, inclusive of interest.
- 10.6 Verra shall bear no liability to the User or any third party in connection with Verra's exercise of its rights and remedies hereunder.

Changes in Fees and Costs

- 10.7 Verra may, upon thirty (30) days' notice to User and in its sole discretion, increase or decrease any or all of the fees and costs payable hereunder at any time. In no event shall any portion of such fees and costs be prorated or refunded to User upon termination of these Terms of Use or termination or suspension of User's access to the Verra Registry.
- 10.8 Any use of the Verra Registry by the User after the effective date set forth in the notice shall be deemed to constitute acceptance of such changes to the fees and costs payable hereunder.

Taxes and Other Charges

- 10.9 User shall be responsible for all taxes and charges imposed by a governmental authority related to the use of the Verra Registry and all related hardware, software, and services, and any other costs the User incurs in connection with the purchase, sale, posting, or transfer of Instruments or any other use of the Verra Registry.

- 10.10 For the purposes of these Terms of Use, "taxes" includes, but is not limited to, any or all ad valorem, property, occupation, severance, first use, conservation, gross receipts, privilege, sales, use, consumption, excise, lease, and transaction taxes, and any other taxes and governmental charges, fees, and assessments, or increases therein, other than taxes based on Verra's net income or net worth.

11. Representations, Warranties and Covenants

- 11.1 On the Commencement Date and throughout the term of these Terms of Use, the User represents and warrants to Verra that:
- (a) it is duly organized, validly existing, and in good standing under the laws of the jurisdiction of its formation;
 - (b) it has all corporate and other authority and all regulatory and other consents, approvals and authorizations necessary for it to legally:
 - (i) enter into and perform its obligations under these Terms of Use and the associated procedures set out by Verra including any Program User Guidelines; and
 - (ii) engage in all of its activity (including the creation, receipt and transfer of Instruments) on or relating to the Verra Registry,
 - (c) the person indicating the User's acceptance of these Terms of Use through a website maintained by Verra has the authority to enter into these Terms of Use on behalf of the User, and these Terms of Use are binding on the User and enforceable against the User in accordance with their terms;
 - (d) it has examined and is familiar with the statements and other data and information submitted by it or on its behalf to Verra, and, to the best of its knowledge and belief, such statements and information are true, accurate, and complete;
 - (e) any Instruments issued by the Verra Registry have been created and verified in accordance with the relevant Verra Program Rules and Requirements;
 - (f) all legal title to and all Beneficial Ownership Rights in each Instruments held, retired or cancelled in any Verra Registry Account and Program Sub-Account held by the User are held by the User;
 - (g) all rights, title and interest in all data and other information provided to Verra or input into the Verra Registry by the User are held by the User, and all such data and other information are true and correct in all material respects; and
 - (h) any other representation, warranty, attestation or certification made to Verra by or on behalf of the User, whether prior to, on or following the Commencement Date is true and correct in all respects.

Covenants of User

- 11.2 On the Commencement Date and throughout the term of these Terms of Use, the User covenants to Verra that:
- (a) it will maintain its user ID and password in strict confidence, will allow only its employees and other representatives access to its Verra Registry Account and Program Sub-Accounts and will promptly notify Verra of any suspected unauthorized use of the Verra Registry or other breach of security; and

- (b) it will comply at all times with the relevant Verra Program Rules and Requirements as applicable, these Terms of Use, the procedures set out by Verra including any Program User Guidelines, and all laws applicable to its use of the relevant Verra Program.

Representations and Warranties of Verra

- 11.3 On the Commencement Date and throughout the term of these Terms of Use, Verra represents and warrants to User that:
- (a) to Verra's knowledge:
 - (i) the Verra Registry, the procedures set out by Verra including any Program User Guidelines and these Terms of Use comply in all material respects with any applicable laws, regulations and orders to which they may be subject; and
 - (ii) Verra possess any applicable licenses, authorizations, permits, consents and approvals of any governmental entity or other governmental authority that may be required to be possessed by Verra in connection with the operation of the Verra Programs and the Verra Registry; and
 - (iii) to Verra's knowledge, use of the Verra Registry by User in accordance with the provisions of these Terms of Use does not and will not infringe the intellectual property rights of any third party in the United States.

User Acknowledgements

- 11.4 User acknowledges and agrees that Verra is merely providing a service and, accordingly, acknowledges and agrees that:
- (a) neither Verra nor the Verra Registry Software Provider has any special or fiduciary relationship to the User or any other user of the Verra Registry;
 - (b) neither the Verra Registry nor the Verra Registry Software Provider is the User's agent or advisor;
 - (c) these Terms of Use create no relationship of partnership, joint venture, employment, franchise, or agency between Verra or the Verra Registry Software Provider and the User;
 - (d) all Instrument transactions shall be performed or settled by it and any third party in accordance with such separate agreements as may exist between the User and the relevant third party;
 - (e) neither the Verra Registry nor the Verra Registry Software Provider assumes any responsibility for the performance or settlement of any transactions;
 - (f) Verra is not in any way involved with and has no control over the disbursement of Scheme Instruments under any Scheme Regulations;
 - (g) it shall perform or settle any separate Scheme Instrument transactions in accordance with such separate agreements as may exist between User and any third party(ies), including Scheme Regulators;
 - (h) Verra makes no representations as to the achievement of the underlying Environmental Benefits of any Instruments;

- (i) Verra does not warrant that the Verra Registry software is free of bugs or errors;
- (j) Verra does not warrant that the information provided by Users and uploaded on the Verra Registry is true and correct at any point in time;
- (k) neither Verra or the Verra Registry Software Provider acts as a buyer or seller, or holds title to any Instrument or product listed on the Verra Registry;
- (l) once project information has been uploaded or posted to the Verra Registry; such project information cannot and shall not be deleted, removed, expunged or altered, except in accordance with Verra's normal operating procedures or as required by a relevant Scheme Regulator. Any subsequent changes or additions to information previously posted shall be posted as an update/amendment, but shall not replace the original posting;
- (m) Verra and the Verra Registry do not and will not provide any matching services whereby Users will be matched with any potential buyer or seller of Instruments or services related to the aggregation, verification or certification of emissions data;
- (n) in the event that a User does enter into an Instrument transaction or an aggregation, verification or certification arrangement with any third party using the Verra Registry, Verra does not guarantee and shall not be responsible for any obligation arising out of such transaction or arrangement or provide any assurance or guaranty that any such transaction or arrangement ultimately will be consummated;
- (o) Verra has the authority and power to reverse any transaction or movement of Instruments upon instruction from a relevant Scheme Regulator, Financial Market Settlement System or any other Government Authority without the authorisation of the User. If a transaction or movement of Instruments is reversed in accordance with this clause 11.4(o), the User will have no claim against Verra for any remedy;
- (p) the User has the right and the obligation to instruct Verra to correct any incorrect or inaccurate information held in the Verra Registry and inform Verra in writing of any changes to that information; and
- (q) Verra may, in its sole discretion, with or without cause or prior notice to the User:
 - (i) temporarily or permanently cease to operate the Verra Registry;
 - (ii) temporarily or permanently cease to make Instrument issuances or other services described hereunder available; or
 - (iii) terminate or suspend the User's access to the Verra Registry.

12. Limitation of Liability and Indemnification

Limitation of Liability

- 12.1 The User assumes full responsibility and risk of loss resulting from its use of the Verra Registry and will have no claim whatsoever against Verra or its independent contractors (including, without limitation, the Verra Registry Software Provider), other than where liabilities are determined by final adjudication to have been caused by Verra's or its independent contractors' wilful misconduct.
- 12.2 Verra's sole liability relating in any way, whether directly or indirectly, to the Verra Registry or these Terms of Use (including without limitation the performance or non-performance by Verra of its obligations), whether caused by the negligence of Verra or otherwise, and

regardless of whether any claim for damages is based on contract, tort, strict liability or otherwise, is limited to an aggregate amount equal to the fees paid by the User to Verra during the one-year period immediately preceding the earliest date on which any such claim(s) are made by the User.

- 12.3 In no event shall Verra or the Verra Registry Software Provider be liable for any:
- (a) consequential, incidental, special, exemplary, punitive or indirect damages;
 - (b) economic or commercial loss; or
 - (c) any loss of use, loss of data, loss of business, personal injuries, or property damages, sustained by the User or any third-parties.

Even if Verra has been advised by the User or any third-party of the possibility of such damages, the User hereby releases and discharges Verra and the Verra Registry Software Provider, any wholly owned subsidiaries of Verra and the Verra Registry Software Provider, any other corporate affiliates of Verra and the Verra Registry Software Provider, their successors and assigns, agents, directors, officers, employees, contractors, service providers and vendors from any and all liability with respect to any damage or injuries incurred by the User as relation to the Verra Registry.

No Counterparty Liability

- 12.4 Verra shall not be liable:
- (a) for the acceptability of or for any action or omission of any counterparty to or other third party involved in any transaction or arrangement that relates to Instruments or that is entered into or consummated with the use of the Verra Registry (including without limitation any Instrument provider or buyer and any verification or certification provider); or
 - (b) for the enforceability of or for any loss, expense or other liability arising from any such transaction or arrangement.

Indemnification

- 12.5 To the fullest extent permitted by law, the User agrees to indemnify, defend, and hold harmless Verra and its independent contractors (including, without limitation, the Verra Registry Software Provider) and their respective officers, directors, owners, employees, agents, subsidiaries, affiliates, successors and assigns (collectively, the **Indemnified Party**) against and from any losses, liabilities, damages, judgments, awards, fines, penalties, actions, claims, costs, and expenses, including, without limitation, any amounts paid in settlement or compromise and any fees and costs of counsel and experts, (collectively, **Losses**) incurred, directly or indirectly, in connection with or by reason of, or in any way relating to, arising out of or attributable to:
- (a) the User's use of the Verra Registry or Verra's website and/or any violation of any law, rule, or regulation arising from such use;
 - (a) any breach of any representation or warranty set forth in, and any failure to perform any covenant, obligation or agreement under, these Terms of Use by User, or any violation by User of these Terms of Use or the procedures set out by Verra including any user guidelines;
 - (b) any claim, action or proceeding asserted or brought by a third party arising out of any actual or alleged act or omission of the User;

- (c) any failure of any Instrument posted or transferred by the User on the Verra Registry to conform with Verra's or a relevant Scheme Regulator's requirements;
- (d) any information supplied by or through User, any transaction or arrangement entered into by User with any third party, or any misuse or improper disclosure of any information by User;
- (e) any dispute between User and any third party with respect to any Instruments (including, without limitation, any such dispute arising from or relating to any transaction between User and a third party with respect to the purchase, sale, or exchange of Instruments, or to the aggregation, verification or certification of emissions data or any other data underpinning claimed Environmental Benefits);
- (f) any loss suffered by or other harm to any person or property (including, without limitation, any personal injuries or death of any third person) in any way relating to or caused in whole or in part by the posting, purchase, sale or exchange of Instruments by the User or any other activity of User conducted using the Verra Registry;
- (g) any action (including, without limitation, any message, request to transfer, buy, offer to sell, bid to buy, and request for new suppliers) taken by any third person through the User's Verra Registry Account or Program Sub-Accounts or using the User's password on the Verra Registry, whether or not such third person gains access to such Verra Registry Account or Program Sub-Account or password as the result of any negligence or lack of vigilance by the User; and
- (h) the enforcement of the release, indemnity and other obligations referred to in this clause 12.5,

in any case, except to the extent that such Losses result from the Indemnified Party's fraudulent conduct or wilful misconduct.

- 12.6 For the avoidance of doubt, the Losses referred to in clause 12.5 include, and are not limited to, any Losses arising out of or related to:
- (a) any inaccuracy, error, or delay in or omission of any data, information, or service, or the transmission or delivery of any data, information, or service;
 - (b) any interruption of any such data, information, or service (whether or not caused by such Indemnified Party); or
 - (c) any financial, business, commercial or other judgment, decision, act or omission based upon or related to the information or the Registry.

13. Limited Warranty; Disclaimer of Warranty

- 13.1 The data contained in the Verra Registry has been gathered by Verra from sources believed by Verra to be reliable. However, neither Verra nor the Verra Registry Software Provider warrants that the information in the Verra Registry is correct, complete, current, or accurate, or that the software programs used in the Verra Registry will be error or bug-free, secure or free from service disruption.
- 13.2 The User acknowledges, understands and accepts that the Verra Registry is provided on an "As Is" basis at the User's sole Risk. Neither Verra nor the Registry Software Provider makes any representations, or warranties, express or implied, with respect to these Terms of Use, the procedures set out by Verra including any Verra Program User Guidelines or compliance with

the relevant Verra Program Rules and Requirements, or the adequacy or performance of the Verra Registry.

- 13.3 Verra and the Verra Registry Software Provider hereby disclaim any such warranties, including but not limited to warranties of merchantability, non-infringement or fitness for a particular purpose, and any implied warranties arising from any course of dealing, usage, or trade practice.
- 13.4 The User acknowledges that service or maintenance disruptions may occur from time to time. Verra and the Verra Registry Software Provider further disclaim liability for:
- (a) errors, omissions or other inaccuracies in any party of the Verra Registry, or the reports, Instruments or other information compiled or produced by or from or input into the Verra Registry;
 - (b) any delays, omissions or interruptions therein, and
 - (c) for the acts or omissions of any broker or Agent authorized within the Verra Registry by the User to utilize the Verra Registry services on behalf of the User.
- 13.5 Verra and the Verra Registry Software Provider are not responsible for the acts or omissions of parties who aggregate, input, verify or certify data for the Verra Registry or from whom data is obtained for inclusion in the Verra Registry, nor is Verra or the Verra Registry Software Provider responsible for any obligation of any User to provide or deliver a product or service or to pay any User for a product or service.
- 13.6 Neither Verra nor the Verra Registry Software Provider assumes any responsibility for, and neither shall be liable for, any damages to, or viruses that may infect, the User's equipment or other property on its Verra Registry Account and Program Sub-Accounts or the User's access to and use of the Verra Registry.
- 13.7 The User is solely responsible for the protection, security, and management of its computer network and of all usage thereof. Neither Verra nor the Verra Registry Software Provider will compensate the User for damages incurred due to violations of the security of the User's computer network, nor shall the User make deductions or set offs of any kind from or against fees due to Verra in respect of any such damages.

14. Termination and Suspension

Termination

- 14.1 Verra may terminate these Terms of Use by giving 10 Business Days notice to the User except in the event of a breach of the Terms of Use in which case Verra may terminate these Terms of Use immediately. For the avoidance of doubt, the power to terminate these Terms of Use in this clause 14.1 can be exercised immediately.
- 14.2 The User may terminate these Terms of Use and its use of the Verra Registry by providing thirty (30) Business Days written notice to Verra.
- 14.3 If these Terms of Use are terminated, the following provisions shall survive termination: 7 (Recording the Transfer of Instruments within the Verra Registry), 8 (Cancellation and Retirement of Instruments), 16 (Confidentiality), 10 (Fees and Charges), 12 (Limitation of Liability and Indemnification), 17 (Intellectual Property), and 19 (Dispute Resolution).

Suspension

- 14.4 Verra may suspend the User's access to the Verra Registry and the User's Verra Registry Account and/or Program Sub-Accounts at any time with or without cause and without prior notice to the User. Without limiting any other remedies or limiting the foregoing, Verra may suspend the User's access to the Verra Registry if:
- (a) Verra reasonably suspects that the User has engaged in fraudulent, unethical or illegal activity in connection with the Verra Registry, Verra or its website;
 - (b) it has received instructions to do so from the relevant Scheme Regulator;
 - (c) the User has failed to pay any fees, costs or other amounts required to be paid under these Terms of Use within five (5) Business Days of the applicable due date;
 - (d) the User has breached any representation, warranty, covenant or agreement contained herein, or otherwise failed to abide by these Terms of Use, the procedures set out by Verra including any Program User Guidelines, the Verra Program Rules and Requirements or any relevant Scheme Regulations;
 - (e) accreditation or approval for any Instruments listed by or on behalf of the User is withdrawn or threatened to be withdrawn for any reason other than such units having been issued in error;
 - (f) any Instruments listed by or on behalf of the User are the subject of, or become the subject of, a Dispute, other than to an issue of erroneous issuance; or
 - (g) if the User is acting as an Agent, any authorisation to act in that capacity has been revoked by the Principal.
- 14.5 Verra shall provide the User with written notice via email of any suspect circumstances affected under this section within fifteen (15) Business Days following such suspension.
- 14.6 While a User's access to the Verra Registry and/or Verra Registry Account and any Program Sub-Accounts is temporarily suspended, the User will have no right to deal with any listed Instruments in the Verra Registry and any instruction by the User to Verra to list, record the transfer of, retire or cancel Instruments in the Verra Registry will be declined.
- 14.7 When Verra forms a reasonable belief in accordance with clause 14.4(a), Verra may exercise one or more of the following rights:
- (a) a notation may be made in the Verra Registry and / or the Verra website indicating the temporary suspension and indicating the Disputed Instruments; and
 - (b) where the dispute concerns Instruments transferred, or purportedly transferred, by the User to another Verra Registry Account in accordance with clause 7, Verra may require the User to supply replacement Instruments of a quality and quantity specified by Verra.
- 14.8 Upon notification by Verra of temporary suspension, the User will have ten Business Days to:
- (a) show cause in writing as to why the User should not be permanently suspended from the Verra Registry and why the serial numbers of the Disputed Instruments should not be cancelled and
 - (b) where requested by Verra in accordance with clause 14.7(b), supply to Verra, replacement Instruments of a quality and quantity specified by Verra.

- 14.9 If within the ten Business Day period, the User fails, to the satisfaction of Verra, to show cause and/or provide replacement Instruments, Verra may exercise one or more of the following rights:
- (a) permanently suspend the User from the Verra Registry;
 - (b) close the User's Verra Registry Account(s) and any Program Sub-Accounts (in which case the provisions of clause 15 shall apply);
 - (c) record the serial numbers of the Disputed Instruments into the Verra Cancellation Account; and / or
 - (d) terminate these Terms of Use under clause 14.1.
- 14.10 For the avoidance of doubt, in the event that a listing or a transaction on the Verra Registry is found to be fraudulent or illegal, Verra reserves the right to refer the matter to the appropriate Governmental and legal authorities.

15. Closing an Account

- 15.1 The User may close a Verra Registry Account or Program Sub-Account at any time by providing written notice to Verra in accordance with the procedures set out by Verra including any user guidelines.
- 15.2 In the event of the User providing written notice to Verra in accordance with clause 15.1, the User will retain access to its other accounts on the Verra Registry (if any) and these Terms of Use will continue to apply until terminated under clause 14.
- 15.3 Upon receiving notification under clause 15.1, or carrying out its powers under clause 14, Verra will record the serial number of the Instruments listed in the relevant Verra Registry Account or Program Sub-Account of that User (if any) in Verra 's Cancellation Account.

16. Confidentiality

- 16.1 Verra agrees to use and maintain Confidential Information provided by User in accordance with the procedures set out by Verra including any Program User Guidelines and the relevant Verra Program Rules and Requirements, except as may be otherwise required or permitted under clause 16.4(a), or as requested by a relevant Scheme Regulator pursuant to its Scheme Regulations.
- 16.2 The User acknowledges that Verra will relay Confidential Information to the Registry Software Provider for the purpose of maintaining the Verra Registry and consents to and authorizes data sharing between Verra and the Registry Software Provider.
- 16.3 Verra and User shall each use commercially reasonable efforts to protect any Confidential Information of the other party from unauthorized disclosure or use, using at least the same level of care as it uses to protect its own Confidential Information.
- 16.4 Verra and the User each agree not to use or disclose Confidential Information of the other party except to the extent that such use or disclosure is:
- (a) reasonably necessary to perform under the procedures set out by Verra including any Program User Guidelines, Program Rules and Requirements, or these Terms of Use (including, without limitation, in connection with the production of reports or information requested and required by a relevant Scheme Regulator); or

(b) authorized in writing by the other party.

16.5 Neither Verra nor the User shall be deemed to have breached these Terms of Use on account of the use or disclosure of any Confidential Information of the other party if:

- (a) such use or disclosure is reasonably necessary to comply with any applicable law, regulation, order or other legally enforceable requirement, or any request by any governmental authority having jurisdiction (including a relevant Scheme Regulator) over Verra; and
- (b) the party using or disclosing such Confidential Information provides to the other party, as soon as reasonably practicable and, in any event, in advance of such use or disclosure, written notice of such use or disclosure so that the other party may seek a protective order or other appropriate remedy.

With respect to requests from a relevant Scheme Regulator for Confidential Information relating to a particular project or activity in connection with the relevant Scheme Regulator's review or crediting of that project or activity, Verra may disclose User information to the relevant Scheme Regulator without providing written disclosure to User.

16.6 If a User cancels or retires one or more Instruments, notwithstanding anything to the contrary in these Terms of Use, the following information related to such cancellation or retirement shall be subject to public disclosure by or at the direction of Verra, in such manner (including, without limitation, by inclusion in one or more reports posted on the Verra's website) and at such times as Verra may determine in its sole discretion:

- (a) the name of User;
- (b) the number of cancelled or retired Instruments;
- (c) the vintage and serial numbers of the cancelled or retired Instruments;
- (d) the date of such cancellation or retirement;
- (e) the name, type and identification number of the project or activity and the location of the project or activity site associated with the cancelled or retired Instruments;
- (f) if applicable, a statement to the effect that the cancellation or retirement was effected on behalf of another person or organization; and
- (g) any information not covered by the preceding clause 16.6(f) voluntarily disclosed by User to Verra regarding the reason for such cancellation or retirement.

16.7 If User obtains access to data in the Verra Registry that:

- (a) is not data provided or owned by User;
- (b) is not part of a publicly available Verra Registry report; and
- (c) the User is not otherwise authorized to use, then, regardless of whether such data is otherwise considered information subject to the provisions of this clause 16, the User shall:
 - (i) immediately notify Verra that the User has obtained such access; and
 - (ii) not disclose, disseminate, copy, or use any such information.

- 16.8 Verra and the User will each be entitled to all remedies available at law or in equity to enforce, or seek relief in connection with, the obligations of the other party under this clause 16.

17. Intellectual Property

- 17.1 The User hereby grants to Verra and the Verra Registry Software Provider, a perpetual, royalty-free license to:
- (a) use, reproduce, distribute, display and prepare derivative works from data provided by the User (**User Data**) and Confidential Information provided by the User; and
 - (b) grant sublicenses to such User Data and Confidential Information to subcontractors and other third parties,
- in each case to the extent reasonably necessary to perform any obligations of Verra under these Terms of Use, the procedures set out by Verra including any Program User Guidelines, and the relevant Verra Program Rules and Requirements, and to fulfil the purposes of the Verra Registry.
- 17.2 The rights and obligations of these Terms of Use shall run to the named parties and their successors in interest and permitted assigns. User shall ensure that any of its owners, trustees, members, officers, directors, employees and Agents to whom it has provided access to the Verra Registry agree to be bound by these Terms of Use.
- 17.3 The User acknowledges and agrees that the rights and licenses provided to User under these Terms of Use and the procedures set out by Verra including any user guidelines are solely for the benefit of the User and are to be exercised only in connection with the User's use of the Verra Registry. The User may not transfer, assign or sublicense its rights, licenses or Verra Registry Account(s) and Program Sub-Accounts, or any portion thereof, to any third party without the prior written consent of Verra, which consent Verra may withhold in its sole discretion.
- 17.4 The User acknowledges that Verra is and shall remain the sole owner of all aggregated data embodied in the Verra Registry, and of the selection, arrangement and compilation of such aggregated data.
- 17.5 Other than with Verra 's written permission, reproduction of part or all of the contents in any form of the Verra Registry is prohibited other than for individual use only and may not be copied and shared with a third party. The permission to copy by an individual does not allow for incorporation of material or any part of it in any work or publication, whether in hard copy, electronic, or any other form.
- 17.6 Unless otherwise noted, all materials in the Verra Registry are protected as the Intellectual Property Rights owned by Verra or by other parties that have licensed their material to Verra.

18. Privacy and User Information

- 18.1 Personal information about any individual will be maintained in accordance with the Privacy Policy.
- 18.2 The User acknowledges that Verra may be required by law or in compliance with its Know-Your-Client (**KYC**) policy to conduct background checks on the User.
- 18.3 The User agrees to use its best endeavours to assist Verra in carrying out any such obligations.

- 18.4 The User will review any communication issued by Verra in connection with the Verra Registry and will immediately notify Verra in writing if any information contained in the communication is inaccurate or incorrect.

19. Dispute Resolution

Governing Law

- 19.1 These Terms of Use shall be governed by the laws of the District of Columbia without regard to its rules on conflicts of laws.

Dispute Resolution

- 19.2 In the event of any claim or controversy arising out of or relating to these Terms of Use, or the breach thereof, or any other claim or controversy between the parties (any such claim or controversy, a **Dispute**), the parties first shall attempt to settle such claim or controversy by mediation administered by JAMS, which mediation shall take place in Washington, DC.
- 19.3 Either party may commence mediation by providing to JAMS and the other party a written request for mediation, setting forth the subject of the dispute and the relief requested, including the amount sought in the dispute.
- 19.4 The parties will cooperate with JAMS and one another in selecting a mediator from the JAMS panel of neutrals and in scheduling the mediation proceedings. The parties agree that they will participate in the mediation in good faith and that they will share equally its costs. At least fifteen (15) days prior to the commencement of the mediation, the party seeking to mediate (the **Demanding Party**) shall give the other party all documents available to the Demanding Party that support its position in the Dispute.
- 19.5 All offers, promises, conduct and statements, whether oral or written, made in the course of the mediation by any of the parties, their agents, employees, experts and attorneys, and by the mediator or any JAMS employees, are confidential, privileged and inadmissible for any purpose, including impeachment, in any arbitration or other proceeding involving the parties, provided that evidence that is otherwise admissible or discoverable shall not be rendered inadmissible or non-discoverable as a result of its use in the mediation.
- 19.6 Any Dispute that has not been resolved by mediation as provided herein within thirty (30) days after commencement of the mediation shall be finally resolved by arbitration administered by JAMS and all proceedings shall be held in Washington, DC. The arbitration will be conducted in accordance with the provisions of JAMS's Comprehensive Arbitration Rules and Procedures in effect at the time of filing of the demand for arbitration. The parties will cooperate with JAMS and with one another in selecting an arbitrator from JAMS panel of neutrals, and in scheduling the arbitration proceedings. The parties shall participate in the arbitration in good faith and shall share equally in its costs.
- 19.7 The provisions of this clause 19 may be enforced by any court of competent jurisdiction, and the party seeking enforcement shall be entitled to an award of all costs, fees, and expenses, including attorney fees, to be paid by the party against whom enforcement is ordered.
- 19.8 The parties shall continue to perform their respective obligations under these Terms of Use during the pendency of dispute resolution proceedings, including mediation and arbitration.
- 19.9 Each party waives, to the fullest extent permitted by applicable law, any right it may have to a trial by jury in respect of any Dispute.

- 19.10 Except as otherwise provided herein, each party shall be responsible for the payment of all of its costs associated with the resolution of any Dispute, whether in mediation, arbitration or before a court of law, including but not limited to any filing fees, mediator or arbitrator fees, its reasonable attorneys' fees, and other costs incurred in such proceeding, provided that if a Dispute is initiated in bad faith, as determined by the mediator, arbitrator or court, the party initiating the Dispute shall be responsible for all of the other party's defense costs.
- 19.11 The parties agree that neither may bring a claim nor assert a cause of action against the other, in any forum or manner, more than one (1) year after the later of:
- (a) the date on which the claim or cause of action accrued; and
 - (b) the earliest date on which the aggrieved party could have reasonably discovered the wrong giving rise to the claim or cause of action.

20. Force Majeure

- 20.1 To the extent Verra is prevented by Force Majeure from fully performing any of its obligations under the Verra Program Rules and Requirements, the procedures set out by Verra including any Program User Guidelines or these Terms of Use, then Verra shall be excused from the performance of such obligations for as long as the Force Majeure event is continuing.
- 20.2 Verra shall seek to remedy the Force Majeure using commercially reasonable efforts.
- 20.3 The User shall not be required to perform or resume performance of its obligations under the relevant Verra Program Rules and Requirements, the procedures set out by Verra including any Program User Guidelines or these Terms of Use corresponding to the obligations of Verra excused by Force Majeure.

21. General

Assignment

- 21.1 The User shall not assign these Terms of Use or any of its rights, benefits, duties, and obligations hereunder without the prior written consent of Verra, which consent Verra may withhold in its sole discretion. These Terms of Use shall be binding upon and inure to the benefit of the respective parties and their respective successors and permitted assigns.

No Third Party Beneficiaries

- 21.2 Except as set forth elsewhere in these Terms of Use, these Terms of Use confer no rights whatsoever upon any person other than the parties and shall not impose, or be interpreted as imposing, any standard of care, duty, or liability upon any person other than a party.

Severability

- 21.3 If any term or provision of these Terms of Use is held to be invalid or unenforceable in any respect, the validity and enforceability of the remaining terms and provisions of this Terms of Use shall not in any way be affected or impaired thereby.

Audit

- 21.4 Verra has the right, at its sole expense, upon reasonable notice and during normal working hours, to examine, audit, and obtain copies of the records of User to the extent reasonably necessary to verify:

- (a) the accuracy of any representation, warranty or attestation made by User to Verra; and
- (b) the User's performance during the prior (12) month period of its obligations under the procedures set out by Verra including any user guidelines or, as applicable, the relevant Verra Program Rules and Requirements, and these Terms of Use.

This right to examine, audit, and obtain copies shall not be available with respect to any information that is not directly relevant to the subject matter of the procedures set out by Verra including any user guidelines or, as applicable, the relevant Verra Program Rules and Requirements, or these Terms of Use.

Notices

- 21.5 All notices and other communications under these Terms of Use must be in writing and will be duly given hereunder:
- (a) upon delivery, if personally delivered, delivered by email or facsimile, or delivered by overnight courier with confirmation of delivery; and
 - (b) on the fourth business day after the postmark date, if mailed by certified or registered mail with postage prepaid.
- 21.6 Street and email addresses and facsimile numbers of each party are as indicated below or as subsequently modified by written notice to the other party.

If to Verra:

Verra
 Attn: Registry Administrator
 One Thomas Circle, NW, Suite 1050
 Washington, DC 20005
 Facsimile: 202-360-4257
 Email: registry@verra.org

If to the User:

To the address provided at the time of registration, as updated by the User from time to time.

Electronic Documents

- 21.7 To the extent permitted by law, for the purposes of this Declaration, Parties understand and agree that any document that is signed, executed, or submitted electronically will have the same force of law as if the same process had been conducted using physical documents.

Injunctive Relief

- 21.8 The User acknowledges that money damages would not adequately compensate Verra and the Verra Registry Software Provider in the event of a breach by the User of its obligations hereunder and that injunctive relief may be essential for Verra and the Verra Registry Software Provider to adequately protect themselves hereunder. Accordingly, the User agrees that, in addition to any other remedies available to Verra and the Verra Registry Software Provider or at law or in equity, including but not limited to any monetary damages, Verra and the Verra Registry Software Provider shall be entitled to seek injunctive relief in the event of any breach by User of any covenant, agreement, representation or warranty contained herein or in the procedures set out by Verra including any user guidelines.

Rights Cumulative

- 21.9 The rights, remedies and powers of the parties under these Terms of Use are cumulative and do not exclude any other rights, remedies or powers.

Schedule 1

Definitions

Agent means any User of the Verra Registry who does so in the capacity as a broker, agent or representative of any kind on behalf of a Principal for the purposes of utilising the Verra Registry services.

Agreement means these Terms of Use.

Beneficial Ownership Rights, with respect to any Instrument, means any contractual or other right to direct or control the sale or other disposition of, or the retirement of, such Instrument.

Business Day means any day except a Saturday, Sunday, or a Federal Reserve Bank holiday. A Business Day shall open at 8:00 a.m. and close at 5:00 p.m. Eastern Prevailing Time.

Cancellation Account means an account in the Verra Registry that lists the serial numbers of disputed Instruments, Instruments transferred to third parties without accounts in the Verra Registry and Instruments held by Users that have exited the Verra Registry.

Commencement Date means the date on which User indicated User's acceptance of these Terms of Use through a website maintained by Verra.

Confidential Information shall mean:

- (a) all information:
 - (i) to which User, Verra or the Verra Registry Software Provider, or any third party (to the extent such third party owes a duty of confidence to User, Verra or the Verra Registry Software Provider) has rights; and
 - (ii) which is marked to expressly indicate its confidential, restricted, or proprietary nature by the party having rights in the same, or which, under all of the circumstances, a reasonable business person should know to treat as confidential, restricted, and/or proprietary; and
- (b) all information that, at the applicable time, is deemed to be Confidential Information pursuant to clause 16.
- (c) Notwithstanding the foregoing and any provision of clause 16, Confidential Information does not include information:
 - (i) that is, as of the time of its disclosure, or thereafter becomes, part of the public domain through a source other than the receiving party;
 - (ii) that was known to the receiving party as of the time of its disclosure;
 - (iii) that is independently developed by the receiving party without reference to the Confidential Information of the disclosing party;
 - (iv) that subsequent to its disclosure, is received by the receiving party from a third party not subject to an obligation of confidentiality with respect to the information disclosed; or
 - (v) with respect to which the disclosing party provides to the receiving party in accordance with clause 16 or through an electronic interface comprising part of the Verra Registry an express waiver of any confidentiality protection under these Terms of Use.

Demanding Party has the meaning given to it in clause 19.3.

Dispute means any disagreement, claim, allegation, concerning the generation, creation, ownership, issuance, validity, legality or registration of any Instruments that may arise between the User and any third party including Verra.

Disputed Instruments means Instruments subject to a suspension notice in accordance with clause 14.5.

Due Date means the date at which any Fees charged and invoiced under this Agreement must be paid, which is no later than 30 days after the date of the relevant invoice.

End Date means the date these Terms of Use are terminated in accordance with clause 14.

Environmental Benefit(s) means all legal and equitable right, title, interest and benefit arising from or associated with (i) the protection, conservation or enhancement of the environment and/or biodiversity, or (ii) GHG Reductions, or (iii) the achievement of sustainable development outcomes; or (iv) any other legal and equitable right, title, interest or benefit relating to the environmental benefit as approved by Verra.

Financial Market Settlement System means an exchange, clearing house, central counterparty or other settlement system (as determined by Verra) that acts on settlement instructions to settle transactions.

Force Majeure means an event or circumstance which prevents Verra from performing its obligations under these Terms of Use, which event or circumstance was not anticipated as of the date these Terms of Use were agreed to, which is not within the reasonable control of, or the result of the negligence of, Verra, and which, by the exercise of reasonable commercial efforts, Verra is unable to overcome or avoid or cause to be avoided.

Government Authority means:

- (a) a government, whether foreign, federal, state, territorial or local;
- (b) a department, office or minister of a government acting in that capacity; or
- (c) a commission, delegate, instrumentality, agency, board, or other governmental, semi-governmental, judicial, administrative, monetary or fiscal authority, whether statutory or not, and includes any relevant international agency.

Instrument means a unit issued by, and held in the Verra Registry representing the right of an account holder in whose account the unit is recorded to claim the achievement represented by the unit. Such achievement may include, but is not limited to, a GHG emission reduction or removal in an amount of one (1) metric tonne of CO₂ equivalent that has been verified in accordance with the applicable Verra Program Rules.

Intellectual Property Rights means all rights in any patent, copyright, database rights, registered design or other design right, utility model, trade mark (whether registered or not and including any rights in get up or trade dress), brand name, service mark, trade name, eligible layout right, chip topography right and any other rights of a proprietary nature in or to the results of intellectual activity in the industrial, commercial, scientific, literary or artistic fields, whether registrable or not and wherever existing in the world, including all renewals, extensions and revivals of, and all rights to apply for, any of the foregoing rights owned, used, or intended to be used, by a party whether or not registered, registrable or patentable.

Interest Rate means, for any date, the per annum rate of interest equal to the prime lending rate published in The Wall Street Journal on such day (or if not published on such day, on the most recent preceding day on which published), plus two percent (2%).

Principal means a third party who owns Instruments or wishes to utilise the Verra Registry services and who has appointed an Agent to act on its behalf for the purposes of using the Verra Registry services.

Privacy Policy means the Verra Registry Privacy Policy available on the Verra Registry website, as amended from time to time.

Program Rules and Requirements means those rules and requirements adopted by Verra and set forth in the relevant Verra Program Rules and Requirements, Verra's formal guidance documents, and any additional direction provided by Verra as part of its implementation of the relevant Verra Program.

Program Sub-Account means a sub-account in a User's Verra Registry Account for the holding of Instruments related to a specific Verra Program.

Program User Guidelines means any user guidelines adopted for a Verra Program.

Scheme Instrument means a credit issued by a Scheme Regulator for a greenhouse gas (GHG) reduction or GHG removal enhancement of one metric ton of carbon dioxide equivalent, pursuant to the Scheme Regulations, including but not limited to an ARB Offset Credit.

Scheme Regulations means the regulations adopted by a Scheme Regulator for a national or sub-national emissions trading or offsets scheme, including any offset protocols adopted by the Scheme Regulator and which may be amended from time to time.

Verra Bank Account means the bank account nominated by Verra from time to time for the payment of fees by the User.

Verra Program means the following programs and standards managed by Verra:

- (a) the Verified Carbon Standard (VCS) Program;
- (b) VCS Jurisdictional and Nested REDD+ (JNR) Framework;
- (c) Climate, Community and Biodiversity (CCB) Program;
- (d) Verra California Offset Project Registry (OPR);
- (e) Sustainable Development Verified Impact Standard (SD VISTa)
- (f) LandScale;
- (g) Initiative for Climate Action Transparency (ICAT); and

any other sustainable development and /or climate action program or standard administered by Verra from time to time.

Verra Registry Account means an account held by the User in the Verra Registry in accordance with the procedures set out by Verra including any Program User Guidelines.

Verra Registry Software Provider means APX.

Attachment DD

Verra, Verified Carbon Standard, Methodology Approval Process





**Verified Carbon
Standard**

A VERRA STANDARD

Methodology Approval Process

Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

ABOUT VERRA



Verra supports climate action and sustainable development through the development and management of standards, tools and programs that credibly, transparently and robustly assess environmental and social impacts, and drive funding for sustaining and scaling up these benefits. As a mission-driven, non-profit (NGO) organization, Verra works in any arena where we see a need for clear standards, a role for market-driven mechanisms and an opportunity to achieve environmental and social good.

Verra manages a number of global standards frameworks designed to drive finance towards activities that mitigate climate change and promote sustainable development, including the [Verified Carbon Standard \(VCS\) Program](#) and its [Jurisdictional and Nested REDD+ framework \(JNR\)](#), the [Verra California Offset Project Registry \(OPR\)](#), the [Climate, Community & Biodiversity \(CCB\) Standards](#) and the [Sustainable Development Verified Impact Standard \(SD VISta\)](#). Verra is also developing new standards frameworks, including [LandScale](#), which will promote and measure sustainability outcomes across landscapes. Finally, Verra is one of the implementing partners of the [Initiative for Climate Action Transparency \(ICAT\)](#), which helps countries assess the impacts of their climate actions and supports greater transparency, effectiveness, trust and ambition in climate policies worldwide.

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1 INTRODUCTION

The methodology approval process is the process by which new methodologies, methodology revisions, modules and tools (referred to in this document as “methodologies”) are approved under the VCS Program. The process consists of two main steps. First, the methodology developer submits a methodology concept note for evaluation and acceptance by Verra. Second, following Verra acceptance of the methodological concept (“concept”), the methodology developer drafts the full methodology and submits it for assessment and approval. Such methodologies are subject to an in-depth review by Verra, a public stakeholder consultation hosted on the Verra website and an independent assessment by one validation/verification body, before final approval by Verra.

The methodology approval process is outlined at a high level in the *VCS Program Guide* and the purpose of this document is to provide detailed requirements and practical guidance on the process. The document lays out the steps involved in the methodology approval process and then provides further requirements and guidance for specific elements that are subject to the process. This document is intended for use by methodology developers (“developers”), project proponents, validation/verification bodies and any other parties who use the methodology approval process.

This document will be updated from time-to-time and readers shall ensure that they are using the most current version of the document.

2 SCOPE AND COST OF THE METHODOLOGY APPROVAL PROCESS

2.1 Scope of the Methodology Approval Process

The following are subject to the methodology approval process:

- 1) New methodologies.
- 2) Methodology revisions.
- 3) New modules and tools.
- 4) Module and tool revisions.

2.2 Methodology Approval Process

New methodologies, new methodology modules and tools, and methodology revisions are approved through the process set out in Section 4 below, which consists of an in-depth review by Verra, a public stakeholder consultation, an independent assessment by one validation/verification body and final review and approval by Verra.

Verra may pilot alternative processes for approving methodologies where it is deemed that an alternative approach may be more efficient, and equally robust. In such instances, Verra will define and transparently document the alternative process.

2.3 Cost of the Methodology Approval Process

The cost of the methodology approval process consists of two separate administration fees and the cost of contracting the validation/verification body to undertake assessment of the methodology. All costs are borne by the developer.

Specifically, an application fee is payable upon submission of a methodology concept note, as set out in Section 3.3. Following Verra acceptance of the concept, a processing fee is payable upon submission of the full methodology, as set out in Section 4.3. The administration fee rates are set out in the VCS Program document *Program Fee Schedule*.

In addition, validation/verification bodies charge for undertaking assessment of the methodology. Their rates are primarily dependent on the scope and complexity of the methodology. Developers are encouraged to contact several validation/verification bodies to determine their cost and service options.

Financial compensation is available to developers of new methodologies, the details and conditions of which are set out in the *VCS Program Guide*.

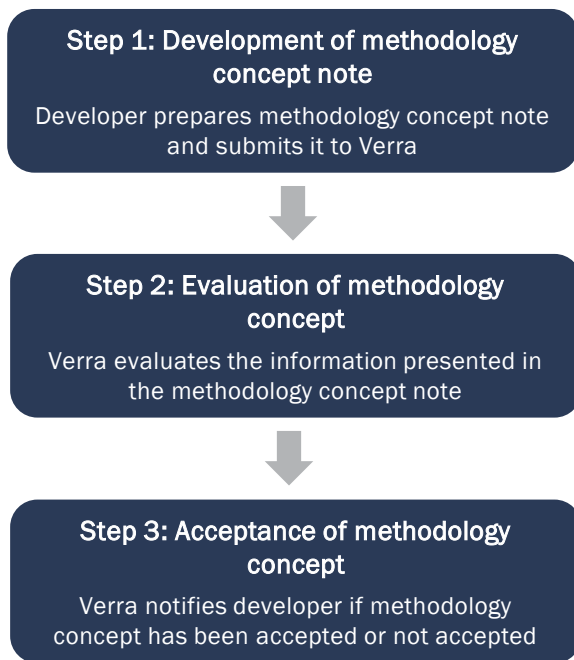
The time taken to complete the methodology approval process is largely dependent upon the initial quality of the methodology and the length of time taken by the validation/verification body to complete its assessment.

3 METHODOLOGY CONCEPT ACCEPTANCE

3.1 Overview

Diagram 1 summarizes the methodology concept acceptance process, which is further described in the sections that follow.

Diagram 1: Steps in the Methodology Concept Acceptance Process



3.2 Step 1: Development of Methodology Concept Note

- 3.2.1 The developer prepares the methodology concept note that will be subject to evaluation by Verra. The methodology concept note shall be prepared using the VCS Methodology Concept Note Template and written in a clear and concise manner. All instructions in the template shall be followed.
- 3.2.2 A methodology concept note shall be developed and submitted for new methodologies, modules and tools, as well as substantive methodology revisions. Minor methodology revisions shall be handled according to the procedure set out in Section 7.

3.3 Step 2: Evaluation of Methodology Concept

3.3.1 The developer shall submit the methodology concept note to Verra electronically at secretariat@verra.org. Upon submission, Verra invoices the developer for the methodology concept note application fee, the fee rate of which is set out in the VCS Program document *Program Fee Schedule*. The methodology concept note application fee shall be paid by the developer before Verra begins evaluation of the concept.

Note – Where a concept includes a group of methodology elements (e.g., a new methodology with associated modules), the concept will be handled as a single unit of work.

3.3.2 Verra evaluates the concept to determine whether:

- 1) The project activities covered by the concept are not covered by an existing methodology.
- 2) The concept is broadly applicable (i.e., not for a specific technology or process).
- 3) An overview of key methodological approaches is provided, and in particular the method for emission reduction quantification has been well thought through.
- 4) The methodology will be developed by an appropriately experienced team, and sufficient funding is in place to ensure that the methodology approval process can be completed.

3.3.3 Preference will be given to methodology concepts that include one or more of the following:

- 1) An innovative approach to demonstrating additionality or quantifying emission reductions or removals (e.g., the methodology concept uses a standardized method, modeling and/or approaches that simplify monitoring).
- 2) Demonstration that the concept has the potential for significant environmental impact (e.g., projects applying the methodology could generate more than 1 million tonnes of GHG emission reductions and/or removals during a 10-year period).
- 3) Demonstration that the concept is applicable to a sector or region that is underrepresented in the carbon markets.
- 4) Demonstration that proposed projects are awaiting the development and approval of the methodology.

3.4 Step 3: Acceptance of Methodology Concept

3.4.1 Verra will complete its initial evaluation of the concept within 25 business days of submission, and will submit questions or comments to the developer, as appropriate, where additional information is required for Verra to complete its evaluation.

Once Verra has sufficient information to complete its evaluation of the concept note, Verra will notify the developer of one of the following outcomes:

- 1) The concept has been accepted.
- 2) Revisions are required to the concept before it can be accepted.
- 3) The concept has not been accepted.

3.4.2 Where the concept is accepted, the developer drafts the full methodology and may submit it for approval following the procedure set out in Section 4.

3.4.3 Where revisions are required to the concept, Verra will specify the criteria that have not been met. The developer may then revise and resubmit the concept note for Verra to continue its evaluation.

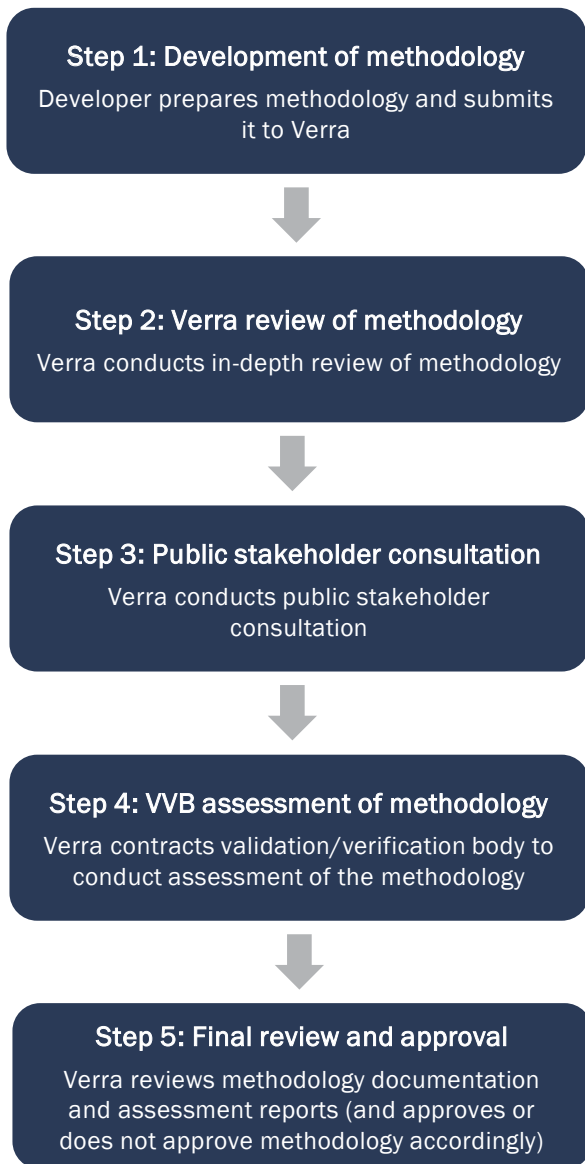
3.4.4 Where the methodology concept is not accepted, the concept note may be resubmitted if substantial revisions are undertaken. Resubmission of such concept notes shall be treated as original submissions and require payment of an application fee.

4 METHODOLOGY APPROVAL PROCESS

4.1 Overview

Diagram 2 summarizes the methodology approval process, which is further described in the sections that follow.

Diagram 2: Steps in the Methodology Approval Process



Attachment: WLC Responses to Appeal_9JUNE2020_Part 2 (4074 : World Logistics Center)

4.2 Step 1: Development of Methodology

- 4.2.1 The developer prepares the methodology documentation that will be subject to review by Verra, public stakeholder consultation and independent assessment by one validation/verification body.
- 4.2.2 The methodology documentation shall be prepared in accordance with all the applicable VCS rules. Methodology documentation shall be written in a clear, logical, concise and precise manner, to aid readability and ensure that criteria and procedures set out in the methodology can be applied consistently by intended users. In addition, the methodology documentation should apply the guidance on language and terminology set out in the *Validation and Verification Manual*.

Methodologies and methodology revisions shall be prepared using the *VCS Methodology Template* and modules and tools shall be prepared using the *VCS Module Template*. All instructions in the templates must be followed. The methodology documentation shall state clearly the date on which it was issued and its version number.

Note – The entity acting as developer may change during the course of taking a methodology through the methodology approval process, provided that any necessary authorization is secured from the original developer, Verra is notified and the new entity submits to Verra a signed methodology approval process submission form (see Section 4.3).

4.3 Step 2: Verra Review of Methodology

- 4.3.1 The developer shall submit to Verra a signed methodology approval process submission form (available on the Verra website) and the methodology documentation. Upon submission, Verra invoices the developer for the methodology processing fee, the fee rate of which is set out in the VCS Program document *Program Fee Schedule*. The methodology processing fee shall be paid by the developer before Verra begins its review of the methodology documentation.
- 4.3.2 Verra conducts a review of the methodology documentation to ensure that the methodology is of sufficient quality to enable its assessment under the VCS methodology approval process, and to ensure that the methodology documentation has been completed in accordance with VCS Program rules. Verra’s review of the methodology will focus on ensuring that the methodology is well-structured and clearly written, there is logical and technical consistency within the methodology and there are no major inconsistencies with VCS Program rules and requirements.

Note – Methodology developers must take the time to ensure that methodology documentation is professionally written, structured and formatted. Verra will not post methodology documentation for public comment until it is of acceptable quality (e.g., is free from typos and grammatical errors). Verra may contract, at its own expense, an external expert where Verra staff do not have sufficient technical expertise to review all technical aspects of the methodology or where Verra deems that an external expert would add value to the Verra review

of the methodology. Where it is deemed necessary, the developer shall revise the methodology documentation before it is accepted into the methodology approval process.

- 4.3.3 Where the Verra review of the methodology reveals that it is not yet of the requisite standard or would sanction politically or ethically contentious project activities, or may otherwise impact the integrity of the VCS Program or the functioning of the broader carbon market, Verra reserves the right not to accept the methodology into the methodology approval process.

4.4 Step 3: Public Stakeholder Consultation

- 4.4.1 Verra posts the methodology documentation on the Verra website for a period of 30 days, for the purpose of inviting public comment. As part of the consultation process, Verra may also host a presentation of the methodology. Any comments shall be submitted to Verra at secretariat@verra.org and respondents shall provide their name, organization, country and email address.
- 4.4.2 At the end of the public comment period, Verra provides all and any comments received to the developer. The developer shall take due account of such comments, which means it will need to either update the methodology or demonstrate the insignificance or irrelevance of the comment. It shall demonstrate to the validation/verification body what action it has taken.
- 4.4.3 All and any comments received are posted by Verra on the Verra website, alongside the methodology information.

4.5 Step 4: VVB Assessment of Methodology

- 4.5.1 Verra will send a request for proposals (RFP) to all validation/verification bodies which meet the relevant eligibility criteria to conduct the methodology assessment (set out in Section 5.1 below). Upon receipt of any proposals, Verra will narrow the pool of eligible validation/verification bodies based on those with the most relevant expertise and experience. Verra will forward the remaining proposals to the methodology developer, and the methodology developer may make a selection amongst the eligible pool of validation/verification bodies provided by Verra. Verra contracts the validation/verification body selected by the methodology developer, using its standard agreement. The developer pays the validation/verification body directly, as provided for in the contract between Verra and the validation/verification body and the methodology approval process submission form.
- 4.5.2 The validation/verification body shall not begin their assessment until the Verra review is complete and shall issue the assessment report only after the public stakeholder consultation period has ended.
- 4.5.3 The developer shall respond to all and any of the validation/verification body's findings. As a result of any such findings, the developer may need to amend the methodology documentation.

- 4.5.4 The validation/verification body shall produce an assessment report in accordance with the VCS Program rules and best practice. The assessment report shall be prepared using the *VCS Methodology Assessment Report Template*. The assessment report shall address the scope of assessment applicable to the methodology (see Sections 6.1, 7.2 and 8.1 for methodologies, methodology revisions and modules/tools respectively). In addition, the assessment report shall contain the following:
- 1) An explanation of whether and how the developer has taken due account of all comments received during the public stakeholder consultation (see Step 3 above).
 - 2) A summary of all methods, criteria and processes used to determine whether and how the methodology adheres to VCS Program rules and requirements. For example, the assessment process may include background research, document reviews, interviews and site visits.
 - 3) A list of the members on the assessment team, including their role and a summary description of the qualifications of each member of the team indicating their expertise and experience in the sectoral scope(s) relevant to the methodology. Where applicable, the name of the VCS-approved expert and his/her role in the assessment shall also be stated.
 - 4) A description of all and any of the validation/verification body's findings and the developer's response to them.
 - 5) An assessment statement prepared in accordance with the requirements for validation statements set out in the VCS Standard, *mutatis mutandis*. Such statement shall also state the version number of the methodology documentation upon which the statement is based.
 - 6) Evidence of fulfillment of eligibility requirements for validation/verification bodies, as set out in Section 5.2.

4.6 Step 5: Final Review and Approval

- 4.6.1 The developer shall provide Verra with the most recent methodology documentation, the assessment report produced by the validation/verification body and a signed *Methodology Element Approval Request Form*.
- 4.6.2 Verra reviews the most recent methodology documentation and the assessment report produced by the validation/verification body to ensure the methodology has been assessed in accordance with VCS Program rules. Where the review finds that the methodology has not been assessed in accordance with VCS Program rules, it will require the developer to revise the methodology documentation, involving the validation/verification body, as required. Where necessary, the validation/verification body shall revise the assessment report. Verra may withhold the acceptance of the assessment report until all findings from Verra's review have been satisfactorily addressed. Verra may also make revisions to the methodology where it deems necessary.

- 4.6.3 Where Verra approves the methodology, it notifies the developer and the validation/verification body of same. The approved methodology is assigned a reference number and posted with the assessment report on the Verra website. The methodology can then be used by project proponents to develop projects.
- 4.6.4 Where the assessment report does not approve the methodology and attempts to resolve the situation in accordance with Section 4.6.2 have been unsuccessful, it is not approved by Verra. Verra may also withhold approval where it is not satisfied with the quality of the methodology documentation, the assessment report, or where it deems that the methodology does not comply with the VCS Program rules or would sanction politically or ethically contentious project activities, or may otherwise impact the integrity of the VCS Program or the functioning of the broader carbon market.

Note – The validation/verification body shall be responsible for reviewing any minor modifications, edits or clarifications that need to be made to the methodology within two years of its approval. The process for such updates is set out in Section 9.

4.7 Procedure for Clarification and Facilitation by Verra

- 4.7.1 The developer and/or the validation/verification body may request that Verra provides clarification with respect to unresolved findings or the VCS Program rules. Verra consults all necessary parties before providing any clarification and notifies the developer as well as the validation/verification body when such clarification is provided.

4.8 Inactive Methodologies

- 4.8.1 Where a methodology under the methodology approval process does not progress to the subsequent step of the process within 12 months or where the developer chooses to withdraw the methodology from consideration under the methodology approval process, Verra updates the status of the methodology on the Verra website to *inactive*. However, recognizing that certain complex methodologies under the methodology approval process may require more time for assessment, Verra will not update the status of a methodology to *inactive* where a methodology is under ongoing assessment or where the developer notifies Verra that it is still pursuing the methodology under the approval process. The developer may reactivate the methodology at any time by notifying Verra.

5 ELIGIBILITY REQUIREMENTS FOR VALIDATION/VERIFICATION BODIES

5.1 Eligibility Requirements

- 5.1.1 The eligibility requirements for validation/verification bodies are set out in Table 1 below. Recognizing that the approval of methodologies has implications for more than a single project, the eligibility requirements ensure that the appropriate level of expertise and experience is applied in the methodology approval process. Table 1 also states (third column) for which of the applicable eligibility requirements the validation/verification body shall submit evidence of its fulfillment of same. The specific requirements regarding evidence of fulfillment of applicable eligibility requirements are outlined in Section 5.2.

Note – The eligibility requirements for validation/verification bodies set out in Table 1 are in addition to the requirements for competence set out in the VCS Standard.

Table 1: Eligibility Requirements for Validation/Verification Bodies

Methodology	Eligibility Requirements	Evidence Required?
Non-AFOLU methodologies	1) The validation/verification body shall be eligible under the VCS Program to perform validation for the applicable sectoral scope(s). Where there is more than one sectoral scope applicable to the methodology, the validation/verification body shall be eligible for all relevant sectoral scopes for validation; AND	N
	2) The validation/verification body shall have completed at least ten project validations or methodology assessments under the methodology approval process in the sectoral scope group applicable to the methodology. ¹ Project validations can be under the VCS Program or an approved GHG program and projects shall be registered under the applicable program. A validation of a single project under more than one program (e.g., VCS and CDM) counts as one project validation. Methodology assessments shall be for methodologies that have been approved by Verra.	Y
AFOLU methodologies	1) The validation/verification body shall be eligible under the VCS Program to perform validation for sectoral scope 14 ² (AFOLU); AND	N
	2) For non-ARR methodologies, the validation/verification body shall use an AFOLU expert (see Section 10) in the assessment; AND	Y
	3) The validation/verification body shall have completed at least ten project validations in any sectoral scope. Project validations can be under the VCS Program or an approved GHG program and projects shall be registered under the applicable program. A validation of a single project under more than one program (e.g., VCS and CDM) counts as one project validation.	Y
Methodologies using a standardized method	In addition to the above, the validation/verification body shall use a standardized methods expert (see Section 10) in the assessment.	Y

¹ The sectoral scope groups shall be determined in accordance with the ANSI project level groups to which the VCS sectoral scopes are mapped. The mapping of ANSI project level groups to VCS sectoral scopes is available on the Verra website. Where the methodology has more than one applicable sectoral scope and such scopes fall under more than one sectoral scope group, the validation/verification body must have validated at least ten projects or methodologies in each of the relevant sectoral scope groups.

² Or the approved GHG program equivalent to VCS Program sectoral scope 14, where the validation/verification body is accredited under an approved GHG program and the sectoral scopes under the approved GHG Program are not directly equivalent to the VCS Program numbering system for sectoral scopes.

- 5.1.2 In the unlikely event of there being no validation/verification bodies that meet the eligibility requirements set out in Table 1, the developer shall contact Verra, who will work with the developer to choose an appropriately qualified validation/verification body.

5.2 Evidence of Fulfilment of Requirements

- 5.2.1 The validation/verification body shall submit evidence of its fulfillment of eligibility requirements where indicated in the third column of Table 1. Such evidence shall be provided in the validation/verification body's assessment report of the methodology and shall be as follows:
- 1) Where the validation/verification body is required to have undertaken a certain number of project validations or methodology assessments, a summary of such work shall include the following:
 - a) For project validations, the name of the project, the date that the validation report was issued, the date that the project was registered and the name of the GHG program under which the project was registered.
 - b) For methodology assessments, the name of the methodology and the date that the assessment report was issued.
 - 2) Where the validation/verification body is required to use an AFOLU expert or a standardized methods expert, the assessment report shall state the name of the expert and their role in the assessment.

6 NEW METHODOLOGIES

6.1 Scope of Assessment

- 6.1.1 The validation/verification body shall determine whether the proposed methodology complies with the requirements set out in the VCS Program document *VCS Methodology Requirements* and any other applicable requirements set out under the VCS Program.
- 6.1.2 Validation/verification bodies shall adhere to the instructional text in the *Methodology Element Assessment Report Template* and refer to the guidance in the *Validation and Verification Manual* when completing the methodology assessment report.
- 6.1.3 The scope of assessment shall include (at a minimum) the following, and the assessment report shall provide an explanation of whether and how the methodology addresses these:
- 1) Relationship to approved or pending methodologies: Assessment of whether any existing methodology could reasonably be revised to meet the objective of the proposed methodology, determined in accordance with Section 6.2.
 - 2) Stakeholder consultation: Assessment of whether the developer has taken due account of all stakeholder comments.
 - 3) Structure and clarity of methodology: Assessment of whether the methodology is written in a clear, logical, concise and precise manner.
 - 4) Definitions: Assessment of whether the key terms in the methodology are defined clearly and appropriately, and are consistently used in the methodology.
 - 5) Applicability conditions: Assessment of whether the proposed methodology's applicability conditions are appropriate, adequate and in compliance with the VCS Program rules.
 - 6) Project boundary: Assessment of whether an appropriate and adequate approach is provided for the definition of the project's physical boundary and sources and types of GHGs included.
 - 7) Baseline scenario: Assessment of whether the approach for determining the baseline scenario is appropriate, adequate and in compliance with the VCS Program rules.
 - 8) Additionality: Assessment of whether the approach/tools for determining whether the project is additional are appropriate, adequate and in compliance with the VCS Program rules.
 - 9) Baseline emissions: Assessment of whether the approach for calculating baseline emissions is appropriate, adequate and in compliance with the VCS Program rules.
 - 10) Project emissions: Assessment of whether the approach for calculating project emissions is appropriate, adequate and in compliance with the VCS Program rules.

- 11) Leakage: Assessment of whether the approach for calculating leakage is appropriate, adequate and in compliance with the VCS Program rules.
- 12) Net GHG emission reductions and/or removals: Assessment of whether the approach for calculating the net GHG benefit of the project is appropriate, adequate and in compliance with the VCS Program rules.
- 13) Monitoring: Assessment of whether the monitoring approach is appropriate, adequate and in compliance with the VCS Program rules.
- 14) Data and parameters: Assessment of whether the specification for data and parameters (available at validation, and monitored) is appropriate, adequate and in compliance with the VCS Program rules.

6.1.4 Where the proposed methodology references tools or modules approved under the VCS Program or an approved GHG program, the validation/verification body shall determine whether the tool or module is used appropriately within the methodology. Reassessment of the actual tool or module is not required.

6.2 Relationship to Approved or Pending Methodologies

6.2.1 In order to safeguard against the unnecessary proliferation of methodologies, methodology developers are required to demonstrate that no approved or pending methodology under the VCS Program or an approved GHG program could reasonably be revised to meet the objective of the proposed methodology. Methodology revisions are appropriate where a proposed activity or measure is broadly similar to an activity or measure covered by an existing approved methodology such that the proposed activity or measure can be included through reasonable changes to that methodology. The procedure for demonstration and assessment that no existing methodology could reasonably be revised to meet the objective of the proposed methodology is as follows:

- 1) The methodology developer shall list the approved or pending methodologies, under the VCS Program or an approved GHG program, that fall under the same sectoral scope or same AFOLU project category³ or combination of sectoral scopes or AFOLU project categories, as applicable. The list shall include, at a minimum, all such methodologies that are available sixty days before the proposed methodology is submitted to Verra. Such list of methodologies (“listed methodologies”) shall contain the methodology name and reference number, and the GHG program under which it is approved or pending.
- 2) The methodology developer shall state whether, and explain how, the proposed methodology uses, includes, refers to or relies upon all or part of any of the listed methodologies. Where it does, the methodology developer shall demonstrate that none of the identified methodologies (“similar methodologies”) could have been reasonably revised

³ The current AFOLU project categories are ARR, ALM, IFM, ACoGS, WRC and REDD.

(i.e., developed as a methodology revision) to meet the objective of the proposed methodology. The onus is upon the methodology developer to demonstrate that a methodology revision would not have been more appropriate, failing which the proposed methodology shall not receive a positive assessment from the validation/verification body. Examples that sufficiently demonstrate the requirement for a new methodology include, but are not limited to, the following:

- a) The proposed methodology uses an approach to setting the baseline and assessing additionality that is different to any of the similar methodologies (e.g., the similar methodologies use a project method for additionality, whereas the proposed methodology uses a performance method).
- b) The proposed methodology uses, includes, refers to or relies upon all or part of a number of the similar methodologies, such that it would have been problematic to revise any particular one of the similar methodologies.
- c) The proposed methodology uses a modular approach to provide a more flexible methodology with wider applicability than any of the similar methodologies.
- d) The proposed methodology draws upon the similar methodologies to provide a simplified methodology for micro-scale projects.
- e) None of the similar methodologies could be revised without substantial changes to the sections on project boundary or procedure for determining the baseline scenario.
- f) None of the similar methodologies could be revised without the addition of new procedures or scenarios to more than half of its sections.

6.2.2 The methodology developer shall document the above in the relevant section of the methodology document, such document being subject to review by Verra, public consultation and independent assessment by the validation/verification body. Where Verra or the validation/verification body is unable to conclude that any approved or pending methodology under the VCS Program or an approved program could not have been reasonably revised to meet the objective of the proposed methodology, in accordance with the procedure set out above, it shall not grant the methodology a positive assessment.

6.3 Proposals for Methodologies Currently Excluded under the Scope of the VCS Program

- 6.3.1 The scope of the VCS Program is revised from time to time, such as with the inclusion of AFOLU into the program in November 2008 and ozone-depleting substances in January 2010. As part of the process of revising the scope of the VCS Program, it is useful for Verra to have a view of possible methodologies and projects that might be eligible under such revisions. Where developers would like to prepare methodologies that currently fall outside of the scope of the VCS Program and have them assessed by a validation/verification body, they are encouraged to contact Verra and to follow the requirements in this document if continuing with such methodology development and assessment.

7 METHODOLOGY REVISIONS

Methodology revisions shall be prepared using the *VCS Methodology Template*. The VCS Program distinguishes between three types of revisions based on the extent of the revisions and between revisions to VCS methodologies and revisions to approved GHG program methodologies. The requirements for each are set out in the sections below.

7.1 Types of Methodology Revisions

- 7.1.1 Verra determines on a case-by-case basis whether a methodology revision is substantive, minor, or represents a limited modification, edit or clarification, based on the extent and type of changes proposed.
- 7.1.2 Where the methodology requires revision (substantive or minor), the methodology shall be revised and approved via the methodology approval process set out in Sections 3 and 4 above.
- 7.1.3 For minor revisions the following applies:
 - 1) A description shall be developed and submitted using the *VCS Minor Methodology Revision Description Template*. All instructions in the template shall be followed. Upon submission, Verra invoices the developer for the methodology application fee, the rate of which is set out in the VCS Program document *Program Fee Schedule*.
 - 2) Verra will evaluate the description to determine whether the proposed revision meets the conditions for minor revisions.
 - 3) Where Verra determines that the proposed revision is substantive, the developer may submit a methodology concept note following the procedure set out in Section 3 and is subject to the appropriate application fee (in addition to the application fee paid upon the original submission).
- 7.1.4 For limited modifications, edits or clarifications to the methodology, the methodology may be updated via a process whereby Verra makes the required changes or coordinates with the developer to make the changes, and issues a revision (i.e., new version) of the methodology.

7.2 Scope of Assessment

The scope of assessment for methodology revisions shall be the same as for new methodologies (see Section 6.1), though excluding assessment of relationship to approved or pending methodologies.

7.3 Revisions to VCS Methodologies

A revision to a VCS methodology is handled as an update to the prevailing version of the methodology and the following applies:

- 1) The methodology revision shall not narrow the methodology's applicability or in any other way exclude project activities that are eligible under the prevailing version of the methodology, unless such narrowing or exclusion is authorized by Verra.
- 2) The methodology document of the prevailing version of the methodology shall be edited to incorporate the methodology revision. The Word version of the prevailing methodology document may be requested from Verra. Where the prevailing version of the methodology does not use the *VCS Methodology Template*, the methodology shall be transferred into the template.
- 3) Where the methodology revision is approved by Verra, the prevailing version of the methodology is withdrawn and the revised methodology replaces it. The previous version of the methodology may be used for up to six months from the date it was withdrawn.

7.4 Revisions to Approved GHG Program Methodologies

A revision to an approved GHG program methodology creates a parallel, revised methodology and the following applies:

- 1) The methodology revision shall reference the (underlying) methodology that it is revising, including the methodology name, version number, issue date and approved GHG program. The methodology revision shall require the use of the latest version of such methodology, such that the methodology revision keeps pace with developments that may occur in the underlying methodology.
- 2) The methodology revision shall use the *VCS Methodology Template*. The rationale for developing the methodology revision shall be clearly stated. Where sections of the underlying methodology are not altered, this shall be stated in the relevant section of the methodology revision document.
- 3) Where a methodology revision has been approved by Verra and a new version of the underlying methodology is issued such that the integrity of the methodology revision is affected and it no longer meets with VCS Program requirements, projects will not be able to use the methodology revision (as set out in the validation and verification section of the *VCS Standard*). The methodology revision may be updated and approved via the methodology approval process.

Note – Methodology deviations and monitoring plan deviations do not require the project proponent to prepare new methodology documentation and are not managed via the methodology approval process. Instead, the validation/verification body validates the deviation as part of the project validation or verification process (as applicable) in accordance with the VCS Standard.

8 NEW MODULES AND TOOLS

8.1 Scope of Assessment

- 8.1.1 New modules and tools shall be assessed against the aspects of the assessment scope for new methodologies set out in Section 6.1 that are relevant to the specific module or tool.
- 8.1.2 The assessment of a revision to a module does not require the reassessment of all methodology framework documents which reference it, though the assessment shall determine whether the revised module is appropriate for the methodologies and that all methodologies maintain their overall integrity. Likewise, the assessment of a revision to a tool shall ensure that the integrity of methodologies that use the tool is not adversely impacted.

9 REVIEW OF APPROVED VCS METHODOLOGIES

On occasion, Verra may review methodologies approved under the VCS Program to ensure that they continue to reflect best practice and scientific consensus. This includes ensuring that methodologies approved under the program are consistent with any new requirements issued by Verra and that methodologies have appropriate criteria and procedures for addressing all VCS Program rules and requirements.

As a result of a review, Verra may need to put on hold the prevailing versions of methodologies or permanently withdraw methodologies approved under the VCS Program. Relevant stakeholders will be kept informed during the review process. The procedure for reviews is set out in the sections below. Note that these procedures are applicable to all types of methodologies and a module may be put on hold or withdrawn without the parent methodology being put on hold. The statuses of all methodologies are available on the Verra website.

9.1 Trigger for Review

9.1.1 A review of a methodology may be triggered as a result of the following:

- 1) Verra periodically issues new requirements that reflect the on-going development of the program, best practice and/or emerging scientific consensus with respect to projects and methodologies. On occasion, methodologies may become materially inconsistent with new requirements subsequently issued (e.g., the inconsistency could lead to a material difference in the quantification of GHG emission reductions or removals by projects applying the methodology).
- 2) Verra may periodically review methodologies where there are concerns that they do not reflect best practice or scientific consensus, or they are materially inconsistent with VCS requirements. Such reviews may be triggered by general scientific or technical developments in the sector or specific concerns about a methodology that are brought to Verra's attention.
- 3) Verra sanctions the consolidation of a number of methodologies into one single methodology (requiring the withdrawal of the original methodologies).

9.2 Procedure for Review

- 9.2.1 The review of the methodology and any relevant issue that triggered the review is undertaken by Verra, with input sought from the developer, the validation/verification body(s) that initially assessed the methodology and appropriately qualified external experts, as required.
- 9.2.2 Where the review is triggered by new requirements being issued by Verra, Verra undertakes the review of approved VCS methodologies within 60 days of the new requirements being issued.

9.3 Outcome of Review

- 9.3.1 Where the review determines that the methodology meets all VCS Program rules and requirements and reflects best practice and scientific consensus, no further action is required.
- 9.3.2 Where the review determines that the methodology requires limited modifications, edits or clarifications, Verra coordinates with the developer to update the methodology documentation, in accordance with procedure set out in Section 7.1.4. Verra may require the validation/verification body that initially assessed the methodology to review and approve the updates via email. Likewise, Verra may seek input from appropriately qualified external experts.
- 9.3.3 Where the review determines that the methodology requires substantive revision, the methodology is put on hold. Where the developer or another entity would like to have the methodology reissued, the methodology shall be revised and approved via the methodology approval process set out in Section 4 (though the methodology shall be exempt from the submission of a methodology concept note and corresponding application fee, processing fee and the public stakeholder consultation). Verra may seek input from appropriate qualified external experts prior to approving the new version of the methodology.
- 9.3.4 Where the review determines that the methodology is fundamentally flawed, the methodology is withdrawn (or in certain circumstances put on hold pending further investigation). The withdrawal of a methodology is considered permanent.
- 9.3.5 Where the review determines that the methodology needs to be withdrawn due to consolidation of a number of methodologies, the methodology is withdrawn. The withdrawal of the methodology is considered permanent.

9.4 Grace Periods

- 9.4.1 Versions of methodologies put on hold or withdrawn may be used for the grace period set out for the methodology on the Verra website, provided the project has been listed on the VCS project pipeline on the Verra project database by the date the methodology is put on hold or withdrawn. Projects shall have their validation reports issued before the end of the grace period. Beyond such date, projects may only use any new approved version of the methodology. Grace periods are determined by Verra using the following guidelines:

- 1) Where the methodology only requires limited modifications, edits or clarifications (consistent with Section 9.3.2), the prevailing version of the methodology is considered withdrawn when the updated version of the methodology is issued and the prevailing version of the methodology may be used for up to six months from the date it was withdrawn. Where the continued use of the prevailing version of the methodology is not appropriate (e.g., a typo in an equation could lead to material misstatement in the estimation of GHG emission reductions or removals), no grace period is granted for the use of the prevailing version of the methodology.
 - 2) Where the methodology requires substantive revision (consistent with Section 9.3.3), or is withdrawn or put on hold due to fundamental flaws (consistent with Section 9.3.4), the following applies:
 - a) The prevailing version may be used for up to six months after it was put on hold.
 - b) Where the prevailing version of the methodology impacts the integrity of the VCS Program or the functioning of the broader carbon market, no grace period is granted (to any projects), subject to approval from the Verra Board.
 - 3) Where the methodology is withdrawn due to consolidation of methodologies in accordance with Section 9.3.5, the withdrawn methodology may be used for up to twelve months after the date of withdrawal.
- 9.4.2 Methodologies being developed under the methodology approval process do not have to comply (immediately) with new requirements where the assessment report has been submitted to Verra in accordance with the VCS Program rules before the time Verra issues such new requirements. However, such methodologies, where finally approved by Verra, are valid for six months from the date that the new requirements were issued by Verra (i.e., any projects shall have their validation report issued within such time periods). After such time period, projects cannot use the methodology and it is considered put on hold or withdrawn, as determined by Verra.
- 9.4.3 Notwithstanding the above, methodologies being developed under the methodology approval process shall be required, subject to Verra Board approval, to comply (immediately) with new requirements where a failure to do so would impact the integrity of the VCS Program or the functioning of the broader carbon market.

10 USE OF EXPERTS IN THE ASSESSMENT OF METHODOLOGIES

10.1 Purpose of Expert

10.1.1 Recognizing that there is currently limited experience and expertise within the broader validation/verification body community regarding the assessment of certain methodologies and the precedent that is set by new methodologies approved under the VCS Program, an expert shall be used in the assessment of the following:

- 1) Non-ARR AFOLU methodologies (see Table 1).
- 2) Methodologies that use a standardized method.

10.1.2 The process for use and designation of experts shall operate as set out in Sections 10.2 and 10.3. The requirement and necessity for validation/verification bodies to use an expert shall be revisited by Verra as and when it has been demonstrated that the validation/verification body community has developed sufficient experience and expertise in assessing the relevant types of methodologies.

10.2 Use of Expert

10.2.2 As set out in Section 5.1, a validation/verification body conducting an assessment of an AFOLU methodology or a methodology that uses a standardized method may need to use an expert in the assessment, and the following applies:

- 1) Experts shall be approved by Verra in accordance with the procedure set out in Section 10.3.
- 2) AFOLU experts shall be approved for the AFOLU project category relevant to the methodology.
- 3) Standardized method experts have the authority to assert their expert judgment in relation to the appropriateness of the proposed level(s) of the performance benchmark metric in ensuring environmental integrity and provision of sufficient financial incentive to potential projects, and therefore to require the methodology to use a level it deems appropriate.

10.2.3 The expert can be part of the validation team or act as technical expert to the validation team. Where the expert is acting as technical expert to the validation team, they shall meet all the requirements of technical experts set out in *ISO 14065:2013* and shall not carry out the assessment alone.

10.2.4 As set out in Section 5.2 the methodology assessment report shall state the name of the expert and its role in the assessment.

10.3 Application Procedure for Experts and List of Experts

10.3.1 The procedure for applying to be an expert is as follows:

- 1) The applicant shall complete the expert application form, available on the Verra website, and submit this together with two references, at least one of which shall be a professional non-academic reference, to Verra at secretariat@verra.org. The applicant shall also pay the expert application fee, the rate of which is set out in the VCS Program document *Program Fee Schedule*.
- 2) The application is assessed by members of an assessment panel and on a quarterly basis. Further information about the assessment panel, process and schedule is available on the Verra website.
- 3) The assessment criteria for AFOLU experts are as follows:
 - a) **AFOLU expertise and experience:** The applicant shall possess significant expertise in the project category. The applicant shall have at least three years of relevant work experience or an equivalent combination of education and work experience as follows:
 - i) Have expertise in assessing carbon baselines, modeling, leakage, and measurement and monitoring frameworks, as they relate to AFOLU methodologies;
 - ii) Have experience in developing AFOLU projects or methodologies or assessing projects or methodologies under the VCS Program or an approved GHG program; and,
 - iii) Be well-versed in current scientific thinking and best practices associated with AFOLU project design and implementation, and carbon accounting and reporting.

Such experience shall be demonstrated and supported with direct work experience, education/training, peer-reviewed journal articles, publications, publicly available reports and/or methodologies developed, applied or assessed.

Based on the above requirements, the following expertise and experience are expected for ALM, IFM, REDD, ACoGS and WRC AFOLU expert applicants:

- i) ALM AFOLU expert applicants shall demonstrate the above AFOLU expertise and experience with respect to agricultural and cropland systems. Applicants shall have knowledge and experience related to farming, fertilization and nutrient cycling.

Applicants shall have experience in quantifying emissions from agricultural systems and from fertilizer application and have experience modeling, measuring and monitoring soil carbon stocks and GHG emissions from agricultural activities and crop systems.

- ii) IFM AFOLU expert applicants shall demonstrate the above AFOLU expertise and experience with respect to plantations, silviculture, agro-forestry, and timber harvesting. Applicants shall have experience in determining baseline scenarios for managed forests and shall demonstrate an understanding of forest stand dynamics. Applicants shall demonstrate experience in modeling timber harvests or forest rotations and shall have experience quantifying carbon stock. Applicants shall have experience in measuring and monitoring forest carbon. Applicants shall understand the dynamics of market leakage with respect to timber production.
- iii) REDD AFOLU expert applicants shall demonstrate the above AFOLU expertise and experience with respect to forests facing threats of deforestation and degradation. Applicants shall have experience in determining the most plausible baseline scenario in either a planned or unplanned deforestation and/or degradation situations. Applicants shall demonstrate an understanding with regard to drivers of deforestation and/or degradation and approaches to modeling deforestation and/or degradation patterns, and be able to apply that knowledge to leakage. Applicants shall demonstrate an understanding of forest stand dynamics. Applicants shall demonstrate experience in measuring and monitoring changes in land use and carbon stock.
- iv) ACoGS AFOLU expert applicants shall demonstrate the above AFOLU expertise and experience with respect to grasslands and shrublands. Applicants shall have experience in establishing the most plausible baseline scenario in either a planned or unplanned land use conversion of forest or non-forest ecosystems. Applicants shall demonstrate an understanding with regard to drivers of land use conversion and approaches to modeling land use conversion, and be able to apply that knowledge to leakage. Applicants shall demonstrate an understanding of grassland and shrubland ecosystem dynamics. Applicants shall have experience modeling, measuring and monitoring soil carbon stocks.
- v) WRC AFOLU expert applicants are expected to demonstrate the above AFOLU expertise and experience with respect to wetland ecosystems. WRC experts many demonstrate wetlands expertise for peatlands only, wetlands excluding peatlands or wetlands including peatlands. WRC expert applicants for non-peatlands shall have knowledge and experience related to wetlands conservation and restoration activities such as enhancing, creating and/or managing hydrological condition, sediment supply, salinity characteristics and water quality. Applicants shall have experience in quantifying, measuring, modeling and monitoring GHG emissions or gas fluxes from wetland ecosystems. WRC AFOLU expert applicants for peatlands

shall have experience establishing the most plausible baseline scenario and quantifying trace gas fluxes from drained and undrained peatland ecosystems. Applicants shall demonstrate experience in measuring and monitoring changes in peat depth and extent as well as changes in site conditions relevant to GHG fluxes and shall demonstrate expertise in hydrological connectivity as it relates to ecological leakage.

- b) AFOLU project category and regional scope: The applicant shall possess appropriate regional experience in the relevant project category. For example, REDD applicants shall possess relevant developing country and tropical forest experience. This is required because it is expected that most REDD methodologies will be applied within such contexts and because of the unique characteristics that must be considered when establishing robust deforestation and degradation baselines in these regions.
 - c) Organizational affiliation and independence: The applicant shall demonstrate independence and freedom from conflict of interest in relation to the methodology assessment process.
- 4) The assessment criteria for standardized methods experts are as follows:
- a) Standardized methods expertise and experience: The applicant shall possess significant expertise in the development and use of standardized methods. The applicant shall have at least three years of relevant work experience or an equivalent combination of education and work experience as follows:
 - i) Have expertise and experience in developing projects or methodologies or assessing projects or methodologies that use standardized methods; and,
 - ii) Be well versed in current scientific thinking and best practices associated with standardized methods and their implementation.

Such experience shall be demonstrated and supported with direct work experience, education/training, peer-reviewed journal articles, publications, publicly available reports and/or methodologies developed, applied or assessed.
 - b) Organizational affiliation and independence: The applicant shall demonstrate independence and freedom from conflict of interest in relation to the methodology assessment process.
- 5) Applicants will be notified of the outcome of the assessment and, where approved, shall be added to the list of experts. The list shall state the name of the expert, the AFOLU project category(s) for which they are approved (for AFOLU experts), and their contact details. The list of experts is available on the Verra website.
- 6) An expert can request to be removed from the list of experts at any time by contacting Verra and requesting same. Verra also reserves the right to remove an expert from the list where it determines that the expert no longer meets the required criteria or performance quality for experts.

11 POST-APPROVAL ASSESSMENTS

Recognizing that market and sector conditions change over time, the procedures set out in this section are provided to ensure that methodologies, once approved, remain appropriate to evolving market and sector conditions. These procedures also provide an important safeguard given the limited experience to date with the development and use of standardized methods under GHG programs. These procedures may be revised as experience with standardized methods is acquired.

11.1 Post-Approval Assessment of Standardized Methods

11.1.1 For methodologies using a standardized method, an assessment shall be undertaken within five years of the approval of the standardized method and each subsequent five years, as follows:

- 1) The developer (or another entity) shall re-evaluate the standardized method to reflect current data or demonstrate that there have not been significant changes in data, as follows:
 - a) For performance methods, the data and dataset characterizing available technologies, current practices and trends within a sector (which may be documented and contained in the methodology or may be maintained in a separate database referenced by the methodology) shall be evaluated, and updated if there have been significant changes in the data. The developer does not need to undertake stakeholder consultation with respect to the level of the performance benchmark metric (as is required for the initial development of performance methods).
 - b) For activity methods, additionality shall be re-determined (from scratch using the activity penetration, financial viability or revenue streams options). Where the activity method uses the activity penetration option and the level of activity penetration has risen (since initial approval) to exceed the five-percent threshold level, the activity method may not be revised to use either of the other two options. Such activity methods become invalid and shall be withdrawn.

Note – The VCS Methodology Requirements should be read for further information on the use of data within standardized methods and appropriateness of the level of performance benchmarks.

- 2) The developer or another entity shall submit to Verra a report documenting the standardized method revaluation. This report shall be issued no earlier than four years after the previous approval of the methodology. Verra reviews the report and determines whether a revision to the standardized method or methodology is required.
- 3) Where a methodology revision is required, the revised methodology shall be approved via the methodology approval process set out in Section 4. In addition, the following applies:

- a) The methodology shall be exempt from the submission of a methodology concept note or minor methodology revision description, and corresponding application fee, processing fee and the public stakeholder consultation.
 - b) The scope of assessment shall be limited to assessment of the revisions undertaken as set out in Section 11.1.1(1) above.
 - c) For performance methods where data is maintained in a central repository (i.e., not documented and contained within the methodology), the validation/verification body shall assess whether there are still clear and robust custody arrangements for the data and defined roles and responsibilities with respect to the central repository.
 - d) For performance methods, Verra re-examines the appropriateness of the level(s) of the performance benchmark metric to ensuring environmental integrity and provision of sufficient financial incentive to potential projects, by re-evaluating the original (and any subsequent) analysis undertaken to determine the level of the performance benchmark metric and considering evidence from use of the methodology by projects. The methodology may need to be revised to reflect the outcome of such re-examination and Verra will co-ordinate with the developer accordingly.
 - e) Verra reviews the revised methodology and the assessment report submitted by the validation/verification body, together with the outcome of the re-examination of the appropriateness of the level(s) of the performance benchmark metric, following the procedure set out in Section 4.6, *mutatis mutandis*.
- 4) Where a report is not submitted to Verra within five years of the methodology's initial or previous approval, the methodology is put on hold until such time as it is determined that the methodology does not require revision or the revised methodology is approved. Where the methodology remains on hold on the day that is seven years after its previous approval, the methodology will be withdrawn.

Note – Where methodologies are put on hold or withdrawn, grace periods apply (as set out in Section 9) and registered projects may continue to issue VCUs for the remainder of their project crediting periods.

11.2 Interim Assessment of Activity Methods

11.2.1 For methodologies or modules using an activity method that uses the activity penetration option for establishing a positive list, an interim assessment shall be undertaken within three years of the initial or previous (where the activity method has already undergone post-approval assessment in accordance with Section 11.1) approval of the activity method, as follows:

- 1) The scope of the assessment shall be to assess whether the activity penetration level for the project activity remains within the permitted threshold.
- 2) The developer or another entity shall submit to Verra a report documenting the assessment. A full re-analysis of the activity penetration level is not required and other

proxies may be used to confirm that the activity penetration level for the project activity remains within the permitted threshold. Proxies may include the continued existence of barriers to the implementation of the project activity (such as cost of technology, cost of implementation of the project activity or level of awareness of the project activity) and the continuing validity of assumptions made within the activity method.

- 3) The report shall be submitted to Verra no sooner than 30 months, and no later than 34 months, after the initial (or previous) approval of the activity method.
- 4) Where Verra deems that the report does not adequately justify that the activity penetration level remains within the permitted threshold, and the developer (or other entity) does not provide sufficient further evidence, the methodology will be put on hold. It may be revised and assessed via the methodology approval process.

11.3 Periodic Assessment of Default Factors

11.3.1 For methodologies that establish (their own) default factors which may become out of date (see the *VCS Methodology Requirements* for further information on default factors), an assessment shall be undertaken within five years of the approval of the methodology and each subsequent five years, as follows:

- 1) The scope of the assessment shall be to assess whether the value of the default factor remains appropriate to current market, sector or other relevant conditions.
- 2) The developer or another entity shall submit to Verra a report documenting the assessment. An assessment of the key parameters used to establish the value of the default factor may be used to ascertain whether the value of the default factor remains appropriate (i.e., a full re-evaluation of the value is not required).
- 3) The report shall be issued no earlier than four years after the previous approval of the methodology.
- 4) Where Verra deems that the report does not adequately justify that the value of the default factor remains appropriate, and the developer (or other entity) does not provide sufficient further evidence, the methodology will be put on hold. It may be revised and assessed via the procedure set out in Section 9.3.2 or 9.3.3, as appropriate. The scope of assessment shall be limited to assessment of whether the new value of the default factor is appropriate.

APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v4.0	19 Sep 2019	Initial version released under VCS Version 4.



Standards for a Sustainable Future



**CITY OF MORENO VALLEY
CITY COUNCIL
NOTICE OF PUBLIC HEARING**

**VIA TELECONFERENCE ONLY
PURSUANT TO COVID-19
GOVERNOR EXECUTIVE ORDER N-29-20**

**WORLD LOGISTICS CENTER
CONSIDERATION OF DEVELOPMENT AGREEMENT
APPEALS OF PLANNING COMMISSION'S CERTIFICATION OF
REVISED FINAL ENVIRONMENTAL IMPACT REPORT (PEN18-0050)
APPEAL OF PLANNING COMMISSION'S APPROVAL OF**

TENTATIVE PARCEL MAP FOR FINANCE AND CONVEYANCE PURPOSES ONLY (PEN20-0017)

NOTICE IS HEREBY GIVEN that a teleconferenced Public Hearing will be held by the City Council of the City of Moreno Valley on the date and time set forth below:

Date and Time: June 16, 2020 at 6:00 p.m.
Location: **VIA TELECONFERENCE ONLY**
Go to <http://morenovalleyca.igm2.com/Citizens/default.aspx> for instructions.

Items: Statutory Development Agreement (Case No. PEN20-0018)
 Appeals of Planning Commission's Certification of Revised Final Environmental Impact Report (PAA20-0001 and PAA20-0002 - Appeals of Case No. PEN18-0050)
 Appeal of Planning Commission's Approval of the Tentative Parcel Map for Finance and Conveyance Purposes Only (PAA20-0003 - Appeal of Case No. PEN20-0017)

Appellant: Adriano L. Martinez, Council for Center for Biological Diversity, Center for Community Action & Environmental Justice, Coalition for Clean Air, San Bernardino Valley Audubon Society and Sierra Club. (PAA20-0002 & PAA20-0003)
 Angel Lopez (PPA20-0001)

Applicant: Highland Fairview
Property Owner: Highland Fairview
Project Location: World Logistics Center Specific Plan area, located generally south of SR-60, east of Redlands Boulevard, west of Gillman Springs Road and north of the San Jacinto Wildlife Area.

Proposal: (1) Consideration of a Development Agreement between the City of Moreno Valley and Highland Fairview regarding the World Logistics Center Project. (Proposed Project).
 (2) Deny Appeals and uphold the Planning Commission's Certification of the Revised Final Environmental Impact Report; and (3) Deny the Appeal and uphold the Planning Commission's Approval of Tentative Parcel Map 36457 for Finance and Conveyance Purposes Only which does not pertain to physical development.

Council District: 3

ENVIRONMENTAL DETERMINATION: The Proposed Project has been extensively evaluated pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines. A Revised Final Environmental Impact Report (EIR), Statement of Overriding Considerations, a Mitigation Monitoring and Reporting Program and Findings contained therein, have been prepared for the Proposed Project, Adopted and Certified by the Planning Commission. A "Revised Sections of the Final Environmental Impact Report" was circulated for public review pursuant to CEQA and the CEQA Guidelines in July 2018 and the "Recirculated Draft RSFEIR" was circulated for public review in December 2019. The "Revised Final EIR," along with the proposed Tentative Parcel Map and Development Agreement are available for review online at www.moval.org.

PUBLIC TESTIMONY: All interested parties will be provided an opportunity to submit oral testimony during the teleconferenced Public Hearing and/or provide written testimony at or prior to the teleconferenced Public Hearing. The application file and related environmental documents may be inspected by appointment at the Community Development Department at 14177 Frederick Street, Moreno Valley, California by calling (951) 413-3206 during normal business hours (7:30 a.m. to 5:30 p.m., Monday through Thursday).

COVID-19 – IMPORTANT NOTICES: Please note that due to the COVID-19 pandemic situation, the City will attempt to make reasonable arrangements to ensure accessibility to inspect the aforementioned

addition, special instructions on how to effectively participate in the teleconferenced Public Hearing, as approved by Governor Executive Order No. N-25-20 will be posted at <http://morenovalleyca.ig2.com/Citizens/default.aspx> and will be described in the Planning Commission agenda.

PLEASE NOTE: The City Council may consider and approve changes to the proposed items under consideration during the teleconferenced Public Hearing.

GOVERNMENT CODE § 65009 NOTICE: If you challenge any of the proposed actions taken by the City Council in court, you may be limited to raising only those issues you or someone else raised during the teleconferenced Public Hearing described in this notice, or in written correspondence delivered to the Planning Division of the City of Moreno Valley during or prior to, the teleconferenced Public Hearing.

ACCESSIBILITY: Upon request and in compliance with the Americans with Disabilities Act of 1990, any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Guy Pegan, ADA Coordinator, at (951) 413-3120 at least 48 hours before the meeting. The 48-hour notification will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

STAFF CONTACT: If you have questions regarding this teleconferenced Public Hearing, please contact Julia Descoteaux, Associate Planner, by telephone at (951) 413-3209 or via email at juliad@moval.org.

/s/	Press-Enterprise	June 5, 2020
Patty Nevins	Newspaper	Date of Publication
Planning Official		
Community Development Department		

Attachment: Notice of Public Hearing (4074 : World Logistics Center)



2121 Alton Parkway
Suite 100
Irvine, CA 92606
949.753.7001 phone
949.753.7002 fax

memorandum

date June 9, 2020

to Ms. Julia Descoteaux, Associate Planner

from Michael Houlihan, AICP
Principal Associate

subject **World Logistics Center – Response to Comments Submitted Prior to the Planning Commission Hearing**

Subsequent to the distribution of the Final Response to Comments and Revised Final EIR for the World Logistics Center (WLC) Project, and prior to and during the Planning Commission hearing on May 14, 2020, comment letters on the Revised Final EIR were submitted to the City. Formal responses to those comments are not required pursuant to State CEQA Guidelines Section 15088. However, written responses have been prepared and included herein for the benefit of the City Council and for completeness of the record. Each comment letter includes an alphanumeric identifier and each comment within each letter includes a numeric identifier within the right margin of the letter. Responses to each comment letter follow the corresponding letter. None of the responses provide significant new information that requires recirculation of the Revised Final EIR in accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15088.5.

Attachments:

- A General Comments
- B Additional Documentation Attachment to Comment Letter 3-B2
- C Additional Documentation Attachment to Comment Letter 3-F1
- D Additional Documentation Attachment to Comment Letter 3-F2
- E Additional Documentation Attachment to Comment Letter 3-G24
- F Additional Documentation Attachment to Comment Letter 3-G37

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

1.1.1 (3-A) Letters from Federal Agencies/Tribal Groups

No comment letters were received from Federal Agencies or Tribal groups.

1.1.2 (3-B) Letters from State Agencies

Comment Letters Received from State Agencies include the following:

- 3-B1: California Department of Fish and Wildlife
- 3-B2: State of California Department of Justice

Julia Descoteaux

From: Gibson, Joanna@Wildlife <Joanna.Gibson@wildlife.ca.gov>
Sent: Wednesday, May 13, 2020 12:10 PM
To: Julia Descoteaux
Cc: Pert, Heather@Wildlife; Kim, Richard@Wildlife; Sewell, Scott@Wildlife
Subject: CDFW comments on Revised Final EIR for the World Logistics Center, SCH No. 2020121045
Attachments: 2012021045_FEIR_CityofMorenoValley_WorldLogisticsCenter.pdf

Importance: High

Warning: External Email – Watch for Email Red Flags!

Hi Julia,

Please find attached the California Department of Fish and Wildlife's (CDFW) comments on the City of Moreno Valley's World Logistics Center Revised Final Environmental Impact Report (Revised FEIR).

CDFW has identified significant concerns with the Revised FEIR. CDFW requests that the Planning Commission not approve the Revised FEIR until the issues identified by CDFW in the attached letter are addressed. To help address our concerns CDFW has provided specific language for the revision of mitigation measures. CDFW requests that a copy of our letter and this email, which includes a brief summary of our concerns, be provided to the Planning Commission in advance of tomorrow's meeting.

A brief summary of some of CDFW's concerns:

- The Project, as proposed, will directly impact the public's use of the San Jacinto Wildlife Area (Wildlife Area; SJWA). The Project proposes to construct buildings and associated infrastructure within 450 feet of the SJWA's northern perimeter. SJWA is an active hunting area, and hunts are regularly conducted along the SJWA's northern boundary. Fish and Game Code section 3004 prohibits the discharging of firearms within 150 yards (450 feet) of any building without express permission of the owner. Because the City is proposing the construction of buildings and associated infrastructure within 450 feet of the northern property boundary of the SJWA, the City's actions will directly constrain the public's use of the SJWA. Unless the City increases the buffer distance between the SJWA and constructed elements of the Project to a minimum of 450 feet, the City will directly impact public use and enjoyment within the Wildlife Area.

CDFW has previously provided the City with information related to Fish and Game Code section 3004, however per the CEQA, the City still intends to construct Project elements within 450 feet of the SJWA's northern perimeter. As such, the City will directly impact public use and enjoyment on the SJWA. Unless the environmental document is revised, it continues to be deficient in its analysis of impacts on public access and recreational pursuits within the SJWA.

CDFW recommends that the buffer distance between the northern boundary of the SJWA and the Project be increased to a minimum of 450 feet.

- The Project will significantly increase traffic along Gilman Springs. It is critical to maintain connectivity for wildlife movement between the badlands and the SJWA. The CEQA does not include mitigation measures that require fencing to facilitate continued wildlife movement during and after Project construction. CDFW recommends that the City include the requirement for fencing before issuance of discretionary permits issued by the City. To ensure that fencing is constructed and that it is constructed appropriately, CDFW has proposed specific language for two new mitigation measures conditioned on the issuance of grading permits by the City. The two new measures require:
o Fencing along the project's eastern and southern boundary.
o Wildlife fencing along Gilman Springs Road and State Route 60 to ensure that wildlife are directed to existing undercrossings.
- Due to increased traffic associated with the Project improved wildlife crossings will be needed to maintain wildlife movement from the SJWA to the badlands. The CEQA identifies that the Project should contribute a fair share of improvements to Gilman Springs Road, but it does not include any specific measures that make this measure enforceable. CDFW is concerned that the CEQA currently lacks specific, enforceable measures conditioned on the City's discretionary actions. To ensure enforceability, CDFW has submitted specific language to the City for a new mitigation measure to improve wildlife crossings. The new measure is conditioned on the issuance of grading permits by the City.
- The City has proposed the review and approval of translocation plans for sensitive plant and wildlife species. CDFW should review and approve these proposals. CDFW has submitted specific language for the City to revise the mitigation measures to include review and approval by CDFW, and the USFWS and RCA, where relevant.
- The mitigation measures for translocation of sensitive plant and wildlife species also do not include specific or enforceable language identifying the entity responsible to fund all costs associated with the translocation, and the short-and long-term management costs of the receiver site. CDFW has submitted specific language to the City to revise the mitigation measures to identify that the Project Applicant will be responsible for these costs.
- The CEQA includes a mitigation measure for the development of a Biological Resource Management Plan for the Project's proposed 250-foot setback area, to be located immediately north of the SJWA's northern perimeter. The measure discusses that the plan will be reviewed by the City's "Planning Official in consultation with the San Jacinto Wildlife Area Manager." The SJWA's Land Manager has not been contacted by the City regarding the preparation of this Plan. CDFW appreciates that the City is requesting review of the proposed Biological Resource Management Plan, but we request that the City contact CDFW to discuss this proposal.
- The CEQA discusses the preparation of a Fuel Management Plan for areas adjacent to MSHCP lands. The CEQA makes no reference to whether this plan would adequately protect the SJWA. CDFW has submitted specific language to the City to revise the mitigation measure to also protect CDFW's SJWA.

CDFW appreciates the opportunity to provide comments on the City of Moreno Valley's World Logistics Center Project. We request that the Planning Commission be provided with copies of this email which summarizes CDFW concerns, along with copies of CDFW's comment letter in advance of the City's meeting scheduled for tomorrow, May 14, 2020.

If you have any questions, please feel free to contact me.

Joanna Gibson
Senior Environmental Scientist (Specialist)

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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

CA Department of Fish and Wildlife
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
(909) 563-0346 (mobile)
Joanna.Gibson@wildlife.ca.gov

Every Californian should conserve water. Find out how at:



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State of California - Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
 Inland Deserts Region
 3602 Inland Empire Blvd., Suite C-220
 Ontario, CA 91764
www.wildlife.ca.gov

Comment Letter 3-B-1
 GAVIN NEWSOM, Governor
 CHARLTON H. BONHAM, Director



1.A.k

May 13, 2020
 Sent via email

Ms. Julia Descoteaux
 Associate Planner
 City of Moreno Valley
 14177 Frederick Street
 PO Box 88005
 Moreno Valley, CA 92552-0805
juliad@moval.org

Subject: Revised Final Environmental Impact Report
 City of Moreno Valley, World Logistics Center Project
 State Clearinghouse No. 2012021045

Dear Ms. Descoteaux:

The California Department of Fish and Wildlife (CDFW) received the Revised Final Environmental Impact Report (RFEIR) on May 5, 2020 from the City of Moreno Valley (City) for the World Logistics Center Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.¹

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code. CDFW is concerned with the adequacy of the City's assessment of impacts to the San Jacinto Wildlife Area (Wildlife Area; SJWA), and with the adequacy and enforceability of mitigation measures for biological resources. CDFW's concerns related to the SJWA and recommended edits to the City's mitigation measures to improve specificity and enforceability are identified and discussed below.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA

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¹ CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW previously provided comments on the Draft EIR on April 8, 2013, on the Final EIR June 11, 2015, and on the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Determination of Biologically Equivalent or Superior Preservation (DBESP) on December 19, 2014.

CDFW Comments and Recommendations

CDFW's comments and recommendations on the Project are summarized below.

Impacts to rare, listed, and sensitive species

Mitigation Measures (MM) 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E identify the preparation of translocation plans for rare and listed plant species (MM 4.4.6.2A), burrowing owl (MM4.4.6.4D), and Los Angeles pocket mouse (MM 4.4.6.4E).

Sensitive Plant Species

MM 4.4.6.2A provides mitigation measures for impacts to sensitive plant species:

Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant's discretion, an impact

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fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

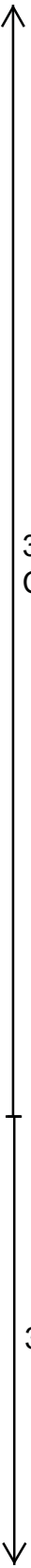
CDFW is concerned that City's "Planning Official" is not sufficiently qualified to review and approve a translocation plan for rare plant species. Further, thread-leaved brodiaea is a state endangered and federally threatened species and CDFW should review this proposal. To ensure that this proposal is implemented in compliance of rules and regulations related to state and/or federally listed plant species CDFW recommends that the City revise mitigation measure (MM) 4.4.6.2A and condition the measure to include the following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.2A Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's' mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, **the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review and approval** ~~they may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A.~~ Alternatively, at the applicant's discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

Burrowing Owl

MM 4.4.6.4D provides mitigation measures for impacts to burrowing owl:

If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife. A relocation plan may be required by California Department of Fish and Wildlife if active and/or passive relocation is necessary. The relocation plan will outline the basic process and provides options for avoidance and mitigation. Artificial burrows - may be constructed within the buffer area south of the World Logistics Center



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Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.

A relocation plan may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated to the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor.

CDFW previously provided comments on the City’s proposal to translocate burrowing owl to the “250-foot buffer area” in a joint CDFW – US Fish and Wildlife Service (USFWS) comment letter written in response to the City’s DBESP submitted for review as required by the Western Riverside MSHCP. In the joint letter (dated December 19, 2014) CDFW and the USFWS articulated to the City that the 250-foot buffer area is not appropriate as a receptor site for burrowing owl because it is insufficient in terms of area, spatial configuration, and conflicting planned use (the City has proposed the construction of detention basins, etc., within the buffer area). Burrowing owl require large open expanses of sparsely vegetated habitat to forage and nest, and the 250-foot buffer area would not provide these ecological needs. Further, because the buffer area is proposed to be planted with trees, CDFW and the USFWS also stated that the City’s proposal to plant trees within the buffer area would provide perch sites for bird-eating raptors, such as red-tailed hawks, which eat burrowing owls, further reducing the appropriateness of the City’s proposed mitigation approach.

MM 4.4.6.4D also includes reference to Planning Area 30. CDFW maintains similar concerns regarding the suitability of this area for burrowing owl: Planning Area 30 is insufficient in terms of area and spatial configuration. Further, based on CDFW’s review of aerial photography the topography of much of Planning Area 30 is unlikely to be suitable for burrowing owl.

CDFW appreciates that the City has included an additional relocation option: CDFW’s San Jacinto Wildlife Area. However, CDFW is concerned that MM 4.4.6.4D does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of burrowing owl (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant. CDFW is unable to assume this financial burden, and it is the responsibility of the Project Applicant to mitigate Project impacts.



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MM 4.4.6.4D identifies that CDFW would review any active and/or passive relocation plan for burrowing owl. Please note that these plans will also need to be reviewed and approved by the USFWS and the Western Riverside County Regional Conservation Authority (RCA).

To improve the specificity and enforceability of MM 4.4.6.4D and to ensure consistency with the MSHCP, CDFW recommends that the City revise mitigation measure MM 4.4.6.4D and condition the measure as following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.4D If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (**CDFW**), **U.S. Fish and Wildlife Service (USFWS)**, and the **Western Riverside County Regional Conservation Authority (RCA)**. A relocation plan may **will** be required by ~~California Department of Fish and Wildlife~~ **CDFW, the USFWS, and the RCA** if active and/or passive relocation is necessary. The relocation plan will outline the basic process, ~~and provides~~ options for avoidance and mitigation, **identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site.** Artificial burrows - may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW, **the USFWS, and RCA.**

A relocation plan may **will** be required by ~~California Department of Fish and Wildlife~~ **CDFW, the USFWS, and RCA** if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated **following written approval by CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include** the SJWA, the 250-foot buffer area or other suitable on-site or off-site areas). Construction activity may occur within 500 feet of the burrows at the discretion of



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the biological monitor, **following consultation with CDFW, the USFWS, and RCA.**

Los Angeles Pocket Mouse

MM 4.4.6.4E provides mitigation measures for impacts to Los Angeles pocket mouse (LAPM):

Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas as determined by the United States Fish and Wildlife Service. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division.

MM 4.4.6.4E identifies that the City will review LAPM “protocol surveys,” and the USFWS will review any relocation plan for LAPM. CDFW is concerned that City staff are not appropriately qualified to determine if appropriate survey methodology has been employed by the Project Applicant, or review trapping results. CDFW recommends that proposed survey methodology and trapping results be reviewed and/or approved by CDFW and the USFWS. Further, any relocation plan prepared for LAPM will also need to be reviewed and approved by CDFW (in addition to the USFWS).

CDFW appreciates that MM 4.4.6.4E identifies that LAPM translocation, if deemed necessary, may occur to a site other than the 250-foot buffer area. CDFW and the USFWS previously commented that the 250-foot buffer area may not be appropriate as a receiver site because of size and configuration (it will be a narrow, relatively restricted area), and because of potential disruptions to existing small mammal populations, and predator-prey relationships. CDFW appreciates that the City has included an additional relocation option however, CDFW is concerned that MM 4.4.6.4E does not include specific and enforceable language to ensure that the financial burden of any proposed translocation of

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LAPM (including the translocation itself, short-term habitat management needs, as well as long-term management needs) is provided by the Project Applicant.

To improve the specificity and enforceability of MM 4.4.6.4E CDFW recommends that the City revise mitigation measure MM 4.4.6.4E and condition the measure as following (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.4E Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to **CDFW and the USFWS for review and approval prior to submission to the City**. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated **to locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas)**~~as determined by the United States Fish and Wildlife Service~~. **All costs associated with the relocation, as well as short-and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant**. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biologically Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division **following coordination with CDFW and the USFWS**.

Fish and Game Code section 1602

MM 4.4.6.3C conditions the Project Applicant(s) to submit to the City copies of appropriate permits/agreements for impacts to Waters of the State and Waters of the U.S. The measure identifies the “need for permits based on the results of the 2012 jurisdictional delineation.” Please note that CDFW will require that any stream mapping submitted to CDFW as a component of a Notification of Lake or Streambed Alteration be current. CDFW recommends the measure be revised to remove all reference to the “2012 jurisdictional delineation.” In addition to removing reference to out-of-date mapping, CDFW recommends that errors



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included in the measure be corrected. CDFW recommends that the City revise mitigation measure MM 4.4.6.3C as follows (edits are in **bold** and ~~strikethrough~~):

MM 4.4.6.3C Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), **Regional Water Quality Control Board**, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements **are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City** ~~will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required.~~ **The Applicant shall consult with** ~~However, permitting through the Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) may still be required for these improvements. The applicant shall consult with~~ **and United States Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board** to establish the need for permits based on the results of the 2012 **current stream mapping jurisdictional delineation** and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the ~~U.S. Fish and Wildlife Service~~ **Regional Water Quality Control Board**, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.

Wildlife Movement

The Biological Resources section (Section 4.4) of the Revised Sections of the FEIR (page 4.4-37) discusses that the Project will incorporate fencing to separate development areas from MSHCP open space areas to the south and along Gilman Springs Road. CDFW agrees that fencing is appropriate to minimize unauthorized public access, illegal trespass, and dumping. In addition, fencing



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along Gilman Springs Road should be designed to minimize wildlife movement and direct wildlife towards wildlife crossings. CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the construction of such fences as the Project is developed. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the construction of fencing along the Project's southern and eastern boundaries, and wildlife fencing along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of appropriate fencing along the Project's eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.

CDFW is concerned about the project's potential to restrict wildlife movement to and from the San Timoteo Badlands (Badlands) and SJWA/Mystic Lake area. As proposed, the Project will border the Badlands along portions of its northern border as well as its nearly 2-mile long eastern border at Gilman Springs Road, creating an obstruction to wildlife movement between the Badlands and open areas to the south (Mystic Lake, Lake Perris, and SJWA). The Project is located between the SJWA and the two existing culverts under State Route 60 (SR-60), and will also be located immediately west of Gilman Springs Road and the existing culverts under this road. Because the Project encompasses logistics centers that will significantly increase traffic volume, CDFW argues that the Project will have substantial effects on existing wildlife movement patterns. Species of concern include mountain lion, bobcat, badger, coyote, deer, long-tailed weasel, black-tailed jackrabbit, and desert cottontail. A fair argument can be made that the Project will increase noise, lighting, and traffic which may in turn negatively affect wildlife through direct mortality or alter movement patterns by forcing wildlife to move east or west, away from the Project. CDFW recommends that the Project install appropriate fencing along Gilman Springs Road and SR-60 to reduce wildlife mortality and direct animals to future or existing wildlife crossings.

CDFW recommends that the City condition the Project to require the installation of wildlife fencing along SR-60 and Gilman Springs Road to reduce Project-related wildlife mortality. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:



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Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.

Section 4.4 of the Revised Sections of the FEIR (page 4.4-61) discusses that the RCA submitted comments to the City stating that the project would likely cause an increase in truck traffic along Gilman Springs Road which “could significantly affect wildlife movement between Core H and proposed Core 3.” To mitigate these impacts the Revised Sections of the FEIR (page 4.4-61) states that it would be appropriate for the Project to contribute (financially) to the “fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings.” CDFW agrees that contribution of funding for improvements to wildlife crossings along Gilman Springs Road would be appropriate, but CDFW is concerned that because a mitigation measure has not been developed and included in the FEIR the City will be unable to enforce the contribution of funds for this purpose. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the contribution of funds to a mitigation account, to held by CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.

Impacts to the San Jacinto Wildlife Area

CDFW previously provided comments on the Project’s proposal to construct buildings within 450 feet of the SJWA (refer to CDFW’s April 8, 2013, and June 11, 2015 comment letters). SJWA is an active hunting area, and hunts are regularly conducted along the SJWA’s northern boundary. Fish and Game Code Section 3004 prohibits the discharging of firearms within 150 yards (450 feet) of any building without express permission of the owner. Given that the City is proposing the construction of buildings within 450 feet of the northern property boundary of the SJWA, the City’s actions will directly constrain the public’s use of the SJWA. CDFW reiterates that unless the City increases the buffer distance between the SJWA and constructed elements of the Project to a minimum of 450 feet, the City will have effectively created restraints on hunting with the Wildlife

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Ms. Julia Descoteaux, Associate Planner
World Logistics Center Project
May 13, 2020
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Area. Further unless the environmental document is revised, it continues to be deficient in its analysis of impacts on public access and recreational pursuits within the SJWA.

CDFW strongly recommends that the buffer distance between the northern boundary of the SJWA and the Project be increased to a minimum of 450 feet.

Project’s Consistency with Adopted HCPs/NCCPs

Projects proposed for construction within the MSHCP and the Stephens’ kangaroo rat Habitat Conservation Plan (SKR HCP) are subject to payment of mitigation fees. Pages 4.4-60 and 4.4-61 discuss the required payment of these fees, however the City did not include a mitigation measure to ensure the enforceability of payment of fees. To ensure enforceability, CDFW recommends that the City include a new mitigation measure in the FEIR conditioning the payment of MSHCP and SKR HCP fees, as appropriate, prior to issuance of grading permits. CDFW recommends the inclusion of the following new mitigation measure in the FEIR:

Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens’ kangaroo rat Habitat Conservation Plan mitigation fees.

Resource Management

MM 4.4.6.4F discusses the development of a Biological Resource Management Plan for the proposed 250-foot setback area. The measure discusses that the plan will be reviewed by the City’s “Planning Official in consultation with the San Jacinto Wildlife Area Manager.” CDFW is unaware that the City contacted CDFW’s SJWA manager to verify that CDFW were available and able to contribute to the review of this plan, or whether this workload element could be accommodated based on CDFW’s current staffing levels. CDFW appreciates that the City is requesting review of the proposed Biological Resource Management Plan, but we request that review of this document be determined by CDFW.

CDFW recommends that the City revise mitigation measure MM 4.4.6.4F as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained **in perpetuity**. This plan will identify frequent and infrequent vegetation management requirements (i.e.,

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removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. **The Biological Resource Management Plan will include an estimate of short-and long-term management costs, a discussion of how funds will be made available in perpetuity, and entities responsible for contribution of funds to support the Biological Resource Management Plan.** The Biological Resource Management Plan will also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.6.2A, 4.4.6.4D, and 4.4.6.4E.

The Biological Resource Management Plan, **including the short-and long-term funding strategy** shall be reviewed and approved by the Planning Official in consultation with **California Department of Fish and Wildlife** ~~San Jacinto Wildlife Area Manager~~. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist, to the satisfaction of the City Planning Division.

Fuel Management

MM 4.4.6.4J discusses the preparation of a Fuel Management Plan for those Planning Areas adjacent to the south and east boundary of the Project and MSHCP lands. The measure identifies that the plan shall demonstrate that adjacent MSHCP lands are adequately protected from expected fire risks. CDFW recommends that MM 4.4.6.4J be revised to also demonstrate that the Fuel Management Plan adequately protect CDFW's SJWA lands. CDFW recommends that the City revise mitigation measure MM 4.4.6.4J as follows (edits are in **bold** and ~~strikethrough~~):

- 4.4.6.4J A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas **and/or San Jacinto Wildlife Area (SJWA) lands**. The Fuel Management Plan shall be prepared by the project proponent and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan **and/or SJWA** boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:

3-B1-2
CONT.

3-B1-2

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

- A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area.
- A list of non-native invasive plants that are prohibited from installation.
- Maintenance activities and a maintenance schedule.

Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas **and SJWA lands** are adequately protected from expected fire risks.

Minor Errors

MM4.4.6.2B and 4.4.6.3B include reference to the “Resource Conservation Agency (RCA).” CDFW assumes that the City is referring to the Western Riverside County **Regional Conservation Authority**. CDFW recommends that the City review the aforementioned mitigation measures and correct all references to the Regional Conservation Authority.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDDB). Information can be submitted online or via completion of the CNDDDB field survey form at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The completed form can be mailed electronically to CNDDDB at the following email address: CNDDDB@wildlife.ca.gov. The types of information reported to CNDDDB can be found at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>.

3-B1-2!
CONT.

3-B1-2!

3-B1-2!

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FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.).

3-B1-28

CDFW CONCLUSIONS AND FURTHER COORDINATION

CDFW appreciates the opportunity to comment on the RFEIR for the City of Moreno Valley’s World Logistics Center Project (SCH No. 2012021045) and recommends that the City address the CDFW’s comments and concerns prior to adoption of the RFEIR. Pursuant to CEQA Guidelines section 15097(f) CDFW has prepared a draft mitigation monitoring and reporting program (MMRP) for the new mitigation measures identified in this letter. The draft MMRP is enclosed at the end of this letter.

3-B1-29

If you should have any questions pertaining to the comments provided in this letter, and to schedule a meeting, please contact Joanna Gibson at (909) 987-7449 or at Joanna.Gibson@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Scott Wilson
8091B1A9242F49C...

Scott Wilson
Environmental Program Manager

3-B1-30

ec: California Department of Fish and Wildlife
HCPB CEQA Coordinator

Office of Planning and Research, State Clearinghouse
State.clearinghouse@opr.ca.gov

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Mitigation Monitoring and Reporting Program for the City of Moreno Valley’s World Logistics Center Project

Mitigation Measure	Timing	Responsible Parties
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or north of the San Jacinto Wildlife Area (Planning Areas 10, 12) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and to the City design plans for the construction of appropriate fencing along the Project’s eastern and/or southern boundary, as appropriate. The City shall also inspect fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit for Projects constructed immediately west of Gilman Springs Road (Planning Areas 6, 8, 11, 12), or south of State Route 60 (Planning Area 6) the Project Applicant shall provide for review and approval to the California Department of Fish and Wildlife and City design plans for the construction of wildlife fencing along State Route 60 and Gilman Springs Road. The City shall inspect wildlife fence construction prior to issuance of occupancy permits, or equivalent.</p>	<p>Prior to issuance of grading permit, and prior to issuance of occupancy permits.</p>	<p>City of Moreno Valley</p>
<p>Prior to issuance of any grading permit the Project Applicant shall provide to the City 5% of total Project costs to be deposited into a mitigation account, held by a CDFW-approved entity, for later use for improvements to wildlife crossings along Gilman Springs Road.</p>	<p>Prior to issuance of grading permit.</p>	<p>City of Moreno Valley</p>

3-B1-3:

3-B1-3:

3-B1-3:

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Prior to issuance of any grading permit the Project Applicant shall pay appropriate Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), and Stephens' kangaroo rat Habitat Conservation Plan mitigation fees.	Prior to issuance of grading permit.	City of Moreno Valley
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3-B1-3.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-B1: CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)

Response to Comment 3-B1-1: The comment states that the California Department of Fish and Wildlife (CDFW) identified significant concerns with the Revised Final EIR, and provided proposed specific revisions to several of the mitigation measures. CDFW also requested that their letter and email be provided to the Planning Commission for the May 14, 2020 public hearing. Responses to the specific revisions to the mitigation measures are found below in Responses to Comments 3-B1-15 to 3-B1-21, 3-B1-24, and 3-B1-25. The CDFW comment letter and email were provided to the Planning Commissioners prior to their action.

Response to Comment 3-B1-2: The comment claims that the proposed WLC project will have a direct impact on public use of the San Jacinto Wildlife Area (SJWA) for hunting as a consequence of buildings within 450 feet of the SJWA northern boundary. California Fish and Game Code (CFGC) Section 3004 prohibits discharge of firearms within 150 yards of any building without express permission of the property owner. The comment continues that CDFW previously submitted comments to the City regarding CFGC Section 3004 but the proposed WLC project would permit project elements within 450 feet of the SJWA northern boundary.

It is correct that the WLC Project does not require buildings to be setback 450 feet from the shared southern property boundary with SJWA. However, the Project design features to reduce potential impacts to resources and uses to the south include a 250-foot development setback, which the Specific Plan shows, an additional minimum 150-foot building setback from the development setback (total 400 feet), and the construction of a wall at the development setback and a fence along the southern boundary of the WLC site. The SJWA area adjacent to the WLC site is designated as Management Subunit D2 in the December 2017 Draft Land Management Plan for the SJWA. Subunit D2 consists of 715 acres and the entire area was previously leased for agricultural purposes. There are no wetlands resources located within this subunit and habitat conditions are generally poor with broad-leaved non-native herbaceous cover. Subunit D2 is a potential upland small game hunting area, which may occur year round. As stated in the Draft Land Management Plan, only shotguns using certified non-lead shot are allowed for upland small game hunting within the SJWA. However, the Draft Land Management Plan depicts the existing land use as “Agricultural” (Draft Land Management Plan, Figure 2-7a) and the Upland Game Hunting Map for SJWA does not include Subunit D2 as a designated hunting area.¹

Furthermore, the CDFW routinely includes hunting prohibitions for its recreation areas within 150 yards of occupied areas located within or external to the recreation area, consistent with Section 3004 of the California Fish and Game Code. For example, the General Hunting Information for Picacho State Recreation Area, states: “No hunting is permitted within 150 yards of any occupied campsite.” For Auburn State Recreation Area, the CDFW states: “No hunting is allowed at the following locations: . . . Within 150 yards of any access road, building, campground . . .” CDFW does not itself prohibit the existence of occupied areas within its recreation areas to accommodate hunting activities. CDFW manages the recreation areas that allow hunting in a manner that allows for other recreational uses. In addition, Section

¹ California Department of Fish and Wildlife, Inland Deserts Region. Upland Game Hunting Map San Jacinto Wildlife Area, Riverside County. December 2016. Available online [:https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=135649&inline](https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=135649&inline)

3004 does not authorize CDFW to prevent all uses in adjacent properties along the perimeter of its recreation areas.

The effective range for hunting with a shotgun is between 20 and 50 yards.^{2 3} With a maximum effective range of 50 yards for upland small game hunting, the WLC building setback of 400 feet (133 yards) would have a negligible impact on public use of the SJWA for hunting since a small percentage of upland small game would be within 17 yards of the northern SJWA boundary.

The April 8, 2013 CDFW comment letter recommended a 250-meter setback from the SJWA northern boundary. At the time of that comment letter, the SJWA Management Subunit D2 was actively disked farmlands and contained no documented special-status species or sensitive wetland/riparian habitat. The WLC 250-foot development setback is one of the design features that lessens impacts on the SJWA and would be located between the northern SJWA boundary and the southern building development area within the WLC. As discussed in Section 4.4.1.15, Other Issues, a. Setbacks, on page 4.4-49 of the 2018 RSFEIR, “typical setbacks to protect wildlife from human presence (though not warehousing) ranges from 50 to 500 feet, but 200–250 feet appears adequate for the most sensitive species”.⁴ In addition to the 250-foot development setback, the WLC Project includes a 150-foot building setback resulting in a total setback of 400 feet. Furthermore, the WLC Project includes a minimum 11-foot high solid wall along the southern boundary of the WLC site that would reduce potential urban/wildlands interface impacts. Because the programmatic project features would reduce potential interface issues between the WLC site and the SJWA, no further expansion of the setback area along the boundary with the SJWA is required. Additionally, prohibiting a building within 150 yards of the SJWA Management Subunit D2 hunting area in conformance with CFGC Section 3004 would have the effect of the taking of property.

Response to Comment 3-B1-3: The comment expresses concern regarding the increased traffic on Gilman Springs Road and need to allow wildlife movement between the SJWA and the Badlands to the east and recommends fencing along the southern and eastern WLC site boundary and wildlife fencing along Gilman Springs Road and State Route 60. The 2018 RSFEIR acknowledges that roadkill from vehicle traffic on Gilman Springs Road will occur but the impacts will be less than significant “as long as the County coordinates with the Resource Conservation Authority and takes wildlife movement between Core H and proposed Core 3 (to the north and east of the WLC site) into account when designing and improving Gilman Springs Road” (2018 RSFEIR page 4.4-67).). There are no existing or proposed linkages, or constrained linkage areas in the vicinity of the WLC project (Final MSHCP Volume 1, The Plan, Section 3.0 Conservation Planning Process, Figure 3.2, 2003).

Development within the WLC site along the west side of Gilman Springs Road will be separated from the roadway by fencing or walls as appropriate (see Revised Final EIR, Part 4 Appendix H, Specific Plan Section 4.2.4.4; this will help restrict human access to Gilman Springs Road and native areas along the east side of the roadway, and may incrementally reduce roadkill along Gilman Springs Road. Construction fencing, including the use of buried silt fencing for erosion control, will be erected at the perimeter of

² North Dakota Game and Fish Department. 2019. Tom Roster’s 2016 Nontoxic Shot Lethality Table. Available at: <https://gf.nd.gov/hunting/nontoxic-shot-lethality>

³ Diana Yang. 2003. The Physics Factbook: Range of a Shotgun Pellet. Available at: <https://hypertextbook.com/facts/2003/DianaYang.shtml>

⁴ McElfish, J., Kihlslinger, R., and Nichols, S., 2008. *Setting Buffer Sizes for Wetlands*. Available online: http://staging.ecosystemmarketplace.com/wp-content/uploads/archive/documents/Doc_456.pdf

construction work areas at the beginning of each separate construction project. Because there will be no wildlife habitat on the WLC site once the Specific Plan area is build out, wildlife fencing other than exclusionary fencing along Gilman Springs Road and State Route 60 is not appropriate as it would facilitate wildlife movement to a habitat dead end with the potential to increase mortality.

Response to Comment 3-B1-4: The comment states that improved wildlife crossings from the SJWA to the Badlands areas to the east will be needed because of the increased traffic associated with the WLC project. The comment recommends a new mitigation measure be included to improve wildlife crossing.

Migratory corridors/linkages are described in Section 4.4.1.12.g of the 2018 RSFEIR page 4.4-61). Both the southern portion of the WLC Specific Plan area and the northern portion of the SJWA do not provide suitable habitat or resources to support wildlife migration or regular wildlife movement. Wildlife movement through this area between SJWA and the Badlands is generally anticipated to take place further to the south, across the Mystic Lake portion of the SJWA. The 2018 RSFEIR acknowledges that roadkill from vehicle traffic on Gilman Springs Road will occur but the impacts will be less than significant “as long as the County coordinates with the Resource Conservation Agency and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (2018 RSFEIR page 4.4-67).

The appropriate resolution for increased traffic on Gilman Springs Road is payment of the Project’s fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings (2018 RSFEIR page 4.4-61). Payment of the required MSHCP developer fees will contribute toward the design and implementation of wildlife crossings, which would be located in areas not directly associated with the WLC project.

Response to Comment 3-B1-5: The comment recommends that CDFW review and approve translocation plans for sensitive plant and wildlife species and provides recommended language to revise the mitigation measures. Please see Responses to Comments 3-B1-15, 3-B1-16 and 3-B1-17 below regarding modifications to mitigation measures for sensitive plant species, burrowing owl and Los Angeles pocket mouse.

Response to Comment 3-B1-6: The comment states that the mitigation measures for translocation of sensitive plant and wildlife species do not include specific or enforceable language to identify the responsible entity for funding such measures. The comment provides recommended revisions to the mitigation measures to identify the Project applicant to be responsible for mitigation costs. Please see Responses to Comments 3-B1-15, 3-B1-16 and 3-B1-17 below regarding modifications to mitigation measures for sensitive plant species, burrowing owl and Los Angeles pocket mouse and financial responsibility.

Response to Comment 3-B1-7: The comment states that the development of a required Biological Resource Management Plan is to be reviewed in consultation with the SJWA area manager and requests that the City contact CDFW for discussion of the Biological Resource Management Plan. Please see Response to Comment 3-B1-24 below regarding modification to Mitigation Measure 4.4.6.3F and consultation with CDFW.

Response to Comment 3-B1-8: The comment references the Fuel Management Plan required by the

mitigation measures and provides revised specific language to the mitigation measure to verify protection of the SJWA. Please see Response to Comment 3-B1-25 below regarding modification to Mitigation Measure 4.4.6.3J and application to SJWA properties.

Response to Comment 3-B1-9: The comment thanks the City for the opportunity to comment on the WLC project and asks that their email and comment letter be provided to the Planning Commission prior to May 14, 2020 public hearing. All materials received prior to the public hearing were provided to the Planning Commission. No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-10: The comment thanks the City for the opportunity to comment on the WLC project and the Revised Final EIR. No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-11: The comment expresses the general CDFW concern about the adequacy of the assessment on impacts to the SJWA and the adequacy of the mitigation measures for biological resources. The comment indicates that revised mitigation edits are recommended in the following comments to improve specificity and enforceability of the mitigation measures, which are addressed below.

Response to Comment 3-B1-12: The comment summarizes the role of the CDFW as a Trustee Agency in conserving and protecting the fish, wildlife, native plants and their habitats. In addition, as a Trustee Agency, CDFW provides biological expertise on environmental efforts that may adversely affect fish and wildlife resources. No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-13: The comment summarizes the role of the CDFW as a Responsible Agency as a regulatory authority provided by the California Fish and Game Code. The comment references potential regulatory jurisdiction under Fish and Game Code Section 1600 *et seq.* and Section 2050 *et seq.* No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-14: The comment states that CDFW previously provided comments on the Draft EIR on April 8, 2013, on the Final EIR on June 11, 2015 and the Determination of Biologically Equivalent or Superior Preservation (DBESP) on December 19, 2014. No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-15: The comment provides specific recommendations to revise the sensitive plant species Mitigation Measure 4.4.5.2A (identified as MM 4.4.6.2A in the CDFW letter) because CDFW is concerned that the City's planning official will not be sufficiently qualified to review a translocation plan.

After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.5.2A (RSFEIR page 4.4.63).

4.4.5.2A Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter's goldfields, smooth tarplant, Plummer's mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation

of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review. They may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant's discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.

Response to Comment 3-B1-16: The comment references burrowing owl Mitigation Measure 4.4.6.3D (identified as MM 4.4.6.4D in the CDFW letter) and explicitly indicating that the proposed 250-foot setback area from the northern SJWA boundary and WLC Specific Plan Planning Area 30 are not appropriate locations to relocate burrowing owls. The commenter also writes that the financial responsibility for any translocation and subsequent management should be the Project Applicant. After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.6.3D (RSFEIR page 4.4.80).

4.4.6.3D A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the WLC site.

In the event no burrowing owls are observed within the limits of ground disturbance, no further mitigation is required.

If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a 500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.

If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the Western Riverside County Regional Conservation Authority (RCA). A relocation plan may will be required by California Department of Fish and Wildlife CDFW, the USFWS, and the RCA if active and/or passive relocation is necessary. The relocation plan shall outline the basic process and provides options for avoidance and mitigation, identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.

A relocation plan ~~will~~ may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated following consultation with the CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include ~~to~~ the SJWA, the 250-foot setback area or other suitable on-site or off-site areas). Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor, following consultation with CDFW, the USFWS, and RCA.

Response to Comment 3-B1-17: The comment references Los Angeles pocket mouse Mitigation Measure 4.4.6.3E (identified as MM 4.4.6.4E in the CDFW letter) because CDFW is concerned that City staff will not be appropriately qualified to review a translocation plan. Also of concern to CDFW is the potential use of the 250-foot setback area as a translocation receiver site and the financial responsibility to implement the mitigation measure.

After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.6.3E (RSFEIR page 4.4.81).

4.4.6.3E Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to CDFW and the USFWS for review prior to submission to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the WLC site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to locations pre-approved by CDFW and the USFWS (which may include ~~to~~ the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas). ~~as determined by the United States Fish and Wildlife Service.~~ All costs associated with the relocation, as well as short- and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division following coordination with CDFW and the USFWS.

Response to Comment 3-B1-18: The comment references Fish and Game Code Section 1602 Mitigation Measure 4.4.6.2C (identified as MM 4.4.6.3C in the CDFW letter) because the Revised Final EIR references a 2012 jurisdictional delineation, which is not current for the processing of a Lake or Streambed Alteration application. Also of concern to CDFW are unintended errors included in the mitigation measure.

After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.6.2C (RSFEIR page 4.4.77).

4.4.6.2C Prior to issuance of any grading permit for any offsite improvements that support development within the WLC site, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board, and California Department of Fish and Wildlife (CDFW) for review and concurrence. ~~If the offsite improvements are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required.~~ The Applicant shall consult with ~~However, permitting through the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) may still be required for these improvements. The applicant shall consult with and~~ United States Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board to establish the need for permits based on the results of the current stream mapping 2012 jurisdictional delineation and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions with a minimum 1:1 mitigation ratio. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the Regional Water Quality Control Board ~~U.S. Fish and Wildlife Service~~, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.

Response to Comment 3-B1-19: The comment references the WLC fencing along Gilman Springs Road and the southern WLC project boundary shared with SJWA. The comment concurs that fencing is appropriate in certain circumstances and that fencing along Gilman Springs Road should be designed to minimize wildlife movement onto the WLC site. CDFW recommends the inclusion of a new mitigation measure to require fencing along Gilman Springs Road and on the southern WLC property boundary.

Section 5.2.12 Walls and Fences of the WLC Specific Plan describes that walls and fences must be designed as an integral part of the overall architectural or landscaping design concept. Within designated edge treatment areas (Planning Areas 10 and 12) along the SJWA boundary, special fencing shall be used to restrict animals from passing between the SJWA property and the project site. This fencing shall be of a durable material (metal or plastic) and shall be partially buried to resist burrowing animals. Plot Plans shall include all site fencing details.

The proposed mitigation measure to require the review of fencing plans by the City and CDFW prior to the issuance of a grading permit is not tied to any specific biological resource impact. The WLC site does not contain any designated wildlife movement corridors or MSHCP linkages. The EIR concludes that impacts related to wildlife movement are less than significant, and no mitigation is needed. The commenter did not

provide evidence to change this conclusion. Consequently, the City does not determine that a mitigation measure is necessary for a less than significant impact.

Response to Comment 3-B1-20: The comment expresses concern about wildlife movement from SJWA, adjacent on the south and the San Timoteo Badlands to the northeast of the WLC site and adjacent along Gilman Springs Road. The comment states that the WLC project would create an obstruction to wildlife movement between the Badlands and open areas to the south. CDFW recommends the inclusion of a new mitigation measure to require wildlife fencing along Gilman Springs Road and State Route 60. Wildlife movement success within the Badlands will depend on circumventing the barrier that State Route 60 currently imposes on wildlife. The area with the best wildlife resources south of State Route 60 is the SWJA. The nearest linkage area as identified under the MSHCP is Proposed Linkage 5, which is located approximately 3 miles north of the WLC site and Proposed Constrained Link 20, which is approximately 3.6 miles south of the WLC site. The development of the WLC site will not impede the movement of any wildlife at these linkages. Wildlife movement onto the WLC site currently faces a substantial obstacle to movement in State Route 60 on the north and Gilman Springs Road on the east. While there may exist current wildlife linkages with culverts or nighttime movements, the WLC site will increasingly lose the current marginal habitat to support wildlife species through Project buildout. The Specific Plan includes provisions for fencing or walls where appropriate, and whose design will be primarily to exclude wildlife from entering the WLC site. The EIR concludes that the WLC project will not affect any wildlife movement corridor. Consequently, the City does not determine that a mitigation measure is necessary for a less than significant impact.

Response to Comment 3-B1-21: The comment states that increased traffic associated with the WLC project would significantly affect wildlife movement between Core H (Lake Perris and SJWA to the south) and proposed Core 3 (the Badlands east of the WLC site and SJWA). The comment recommends a new mitigation measure be included to assist in funding wildlife crossing improvements in order to enforce funding by the WLC project. Migratory corridors/linkages are described in Section 4.4.1.11.g of the 2018 RSFEIR (page 4.4-38). Both the southern portion of the WLC Specific Plan area and the northern portion of the SJWA do not provide suitable habitat or resources to support wildlife migration or regular wildlife movement. Wildlife movement through this area between SJWA and the Badlands is generally anticipated to take place further to the south, across the Mystic Lake portion of the SJWA. The 2018 RSFEIR acknowledges that roadkill from vehicle traffic on Gilman Springs Road will occur but the impacts will be less than significant “as long as the County coordinates with the Resource Conservation Agency and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (2018 RSFEIR page 4.4-67). The appropriate resolution for increased traffic on Gilman Springs Road is payment of the Project’s fair share of the improvements to Gilman Springs Road, including provisions for wildlife movement or crossings (2018 RSFEIR page 4.4-61). Payment of the required MSHCP developer fees will contribute toward the design and implementation of wildlife crossings, which would be located in areas not directly associated with the WLC project. The City concludes that a new mitigation measure is not necessary for a less than significant impact.

Response to Comment 3-B1-22: The comment expresses the CDFW concern regarding impact to hunting areas within the northern portion of the SWJA.

Please see Response to Comment 3-B1-2 above that concludes the programmatic project features of the WLC Specific Plan would reduce potential interface issues between the WLC site and the SJWA, and no further expansion of the setback area along the boundary with the SJWA is required.

Response to Comment 3-B1-23: The comment expresses the concern that payment of required mitigation fees for development within the MSHCP and the Stephen's kangaroo rat HCP may not be enforceable. The comment recommends the inclusion of a new mitigation measure to require payment of the mitigation fees prior to the issuance of a grading permit. This mitigation is unnecessary because the City already includes a mechanism for the collection of the required MSHCP and HCP fees for new development (Mitigation Measure 4.4.6.3C and City of Moreno Valley Municipal Code Title 3, Chapter 8.60, pursuant to Fee Resolution 89-92).

Response to Comment 3-B1-24: The comment references the Resource Management Mitigation Measure 4.4.6.3F (identified as MM 4.4.6.4F in the CDFW letter) because CDFW is concerned that the SJWA manager workload may not allow availability for review of the Biological Resource Management Plan at the time of submittal. After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.6.3F (RSFEIR page 4.4.81).

4.4.6.3F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan shall identify frequent and infrequent vegetation management requirements (i.e., removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological Resource Management Plan shall also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.5.2A, 4.4.6.3D, and 4.4.6.3E.

The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with California Department of Fish and Wildlife ~~the San Jacinto Wildlife Area Manager~~. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist, to the satisfaction of the City Planning Division.

The above revision to mitigation measure 4.15.7.4E is provided in the Mitigation Monitoring and Reporting Program.

Response to Comment 3-B1-25: The comment references the Fuel Management Plan Mitigation Measure 4.4.6.3J (identified as MM 4.4.6.4J in the CDFW letter) in requesting that the mitigation measure language to include protection of the SJWA lands to the south.

After review of the May 13, 2020 CDFW comment on this mitigation measure, the City accepts the following revision to Mitigation Measure 4.4.6.3J (RSFEIR page 4.4.82).

4.4.6.3J A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas and/or San Jacinto

Wildlife Area (SJWA) lands. The Fuel Management Plan shall be prepared by the project applicant and submitted for approval ~~to the~~ prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan and/or SJWA boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:

- A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area.
- A list of non-native invasive plants that are prohibited from installation.
- Maintenance activities and a maintenance schedule.

Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas and SJWA lands are adequately protected from expected fire risks.

Response to Comment 3-B1-26: The comment correctly cites minor errors found in the RSFEIR where the Regional Conservation Authority is listed as Resource Conservation Agency in Mitigation Measures 4.4.5.2B and 4.4.6.2B

Based on the error, the following revisions to Mitigation Measures 4.4.5.2B (RSFEIR page 4.4.63) and 4.4.6.2B (RSFEIR page 4.4.76) are made.

4.4.5.2B Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County ~~Resource-Regional Conservation Agency-Authority~~ (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the satisfaction of the City Planning Division and Riverside County ~~Resource Regional Conservation Agency-Authority~~ (“RCA”).

4.4.6.2B As required by the ~~Resource-Regional Conservation Agency-Authority~~ (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the ~~Resource-Regional Conservation Agency-Authority~~ prior to project grading permit approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.

If impacts to riparian habitat within the WLC site cannot be avoided at the time of specific development, then a separate project-level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.2A.

A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations. Mitigation required for compensation for impacts to riparian/riverine areas shall require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.

As outlined in the WLC programmatic DBESP, erosion control improvements shall be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat shall be enhanced within this drainage following the installation of the erosion control improvements (MM DBESP 4 and 5).

Response to Comment 3-B1-27: The comment requests that any special-status species or natural communities detected during Project surveys be reported to the California Natural Diversity Database (CNDDDB). The City concurs with this comment and will remind the environmental consultants conducting the Project surveys to report such occurrences to the CNDDDB.

Response to Comment 3-B1-28: The comment concludes that the Project would have an impact on fish and/or wildlife and consequently filing fees are necessary. The City concurs with this comment and will pay the required filing fees at the time the Notice of Determination is issued.

Response to Comment 3-B1-29: The comment thanks the City the opportunity to comment on the Revised Final EIR and provided appropriate timing and responsible party recommendations for the new mitigation measures recommend in this comment letter. The City welcomes the constructive comments provide by the CDFW and will incorporate the mitigation recommendations as discussed in the earlier comments above.

Response to Comment 3-B1-30: The comment is the ending of the letter and has no specific comments on the Revised Final EIR. No specific comments on the contents of the Revised Final EIR are provided by this comment.

Response to Comment 3-B1-31: The comment provides mitigation language for WLC project fencing. See Response to Comment 3-B1-3 and 3-B1-19 above.

Response to Comment 3-B1-32: The comment provides mitigation language for WLC project wildlife fencing. See Response to Comment 3-B1-3 and 3-B1-20 above.

Response to Comment 3-B1-33: The comment provides mitigation language for WLC project wildlife crossing improvements. See Response to Comment 3-B1-21 above.

Response to Comment 3-B1-34: The comment provides mitigation language for WLC project mitigation

fee payment for both the Western Riverside County MSHCP and the Stephen's kangaroo rat HCP. See Response to Comment 3-B1-23 above.

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May 14, 2020

VIA E-MAIL ONLY

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**RE: World Logistics Center Revised Final Environmental Impact Report
(SCH # 2012021045)**

Dear Ms. Descoteaux:

Attorney General Xavier Becerra, in his independent capacity,¹ and the California Air Resources Board (CARB) jointly submit the following comments on the April 2020 Final Environmental Impact Report (FEIR) prepared for the World Logistics Center (the Project) in advance of the Project’s May 14, 2020 Moreno Valley (City) Planning Commission hearing.

3-B2-1

The Attorney General and CARB have the following concerns regarding the FEIR, as explained in detail below:

1. The FEIR does not correct the improper GHG analysis the Attorney General and CARB critiqued in multiple comment letters on prior versions of the Project’s environmental impact report.²

3-B2-2

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14–15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the FEIR’s compliance with the California Environmental Quality Act (CEQA).

² The Attorney General and CARB previously reviewed the City’s July 2018 Revised Final Environmental Impact Report (RFEIR) and submitted comments regarding the RFEIR on September 7, 2018. As noted in those comment letters, the RFEIR’s analysis of greenhouse gas (GHG) related impacts does not meet CEQA’s requirements. On January 30, 2020, CARB also

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- 2. The FEIR also continues to misrepresent CARB’s positions.
- 3. The FEIR’s new GHG Mitigation Measure 4.7.7.1 is inadequate.
- 4. The FEIR fails to adopt feasible mitigation measures that would substantially lessen the Project’s significant adverse effects.
- 5. The addition of Mitigation Measure 4.7.7.1 is “significant information” that requires recirculation of the FEIR.

3-B2-2
CONT.

Until these shortcomings are corrected, the FEIR should not be certified by the City.

I. THE FEIR CONTINUES TO RELY ON ENVIRONMENTALLY IRRESPONSIBLE AND LEGALLY FLAWED ARGUMENTS TO AVOID PROPERLY ANALYZING AND MITIGATING THE PROJECT’S ENORMOUS GREENHOUSE GAS IMPACTS.

Under CEQA, a project’s significant GHG impacts must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact. 14 Cal. Code Regs. (CEQA Guidelines) § 15064.4. Yet, the FEIR continues to improperly divide the Project’s GHG emissions into two categories, which it terms “capped” and “uncapped”; classifications that are created by the FEIR and have no relevance under CEQA. The FEIR asserts that “capped” emissions are “covered” by CARB’s Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation.³

3-B2-3

To purportedly support its improper approach to GHG analysis and mitigation, the FEIR relies on a few weak, misguided bases: (1) two mitigated negative declarations (MND); (2) an outdated guidance document from an air district with no jurisdiction in the South Coast Air Basin; (3) an inapposite appellate court decision that did not benefit from the input of California’s expert agencies and other key stakeholders, and (4) unsupported arguments about indirect costs.

The FEIR does not, and cannot, explain why its GHG analysis and mitigation approach did not comply with the CEQA Guidelines, applicable case law, and other relevant guidance regarding GHG analysis and mitigation. In addition, the FEIR ignores the objections in our previous comment letters.

filed comments on the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR). These three comment letters are attached to this letter as Exhibits A-C. Further, the Attorney General and CARB’s amicus brief in *Paulek et al. v. Moreno Valley Community Services District et al.* (E071184) (*Paulek*), which further discusses the legal inadequacies of the GHG analysis, is attached hereto as Exhibit D.

³ Though Mitigation Measure 4.7.7.1 agrees to offset “capped” emissions in the event the City’s GHG analysis is invalidated in *Paulek*, the improper legal arguments regarding the distinction between “capped” and “uncapped” emissions will remain.

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The City cites the San Joaquin Valley Air Pollution Control District (SJVAPCD) Policy APR-2025, issued in 2014, and two MNDs approved by SCAQMD in 2014. The City states that its approach has been applied “for years” in light of those same documents. (FEIR at 23.) However, as the California Supreme Court has repeatedly held in more recent years, GHG law continues to evolve, and lead agencies have an obligation under CEQA to “stay in step.” *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504 (*SANDAG*).⁴ The documents the City relied on are out of date and not the appropriate guidance for analyzing GHG impacts under CEQA.

Note that in 2014, the California Supreme Court had not yet issued its seminal *Newhall* decision, which was published on November 30, 2015. *Center for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 230 (*Newhall*). The Court then issued the *SANDAG* decision on July 13, 2017. (*SANDAG, supra*, (2017) 3 Cal.5th 497.) The FEIR ignores post-2014 materials that establish its approach is unlawful, including the *SANDAG* California Supreme Court decision referenced above, as well as CARB’s 2017 Scoping Plan.⁵

The City also relies on *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*). However, as previously noted, *AIR* did not broadly validate the City’s approach of excluding all fuel and electricity related emissions from its GHG analysis, particularly for a project that is not regulated by the Cap-and-Trade Regulation. (See FEIR at 22, 23.) That issue simply was not before the court, and was not given due consideration as a result. (See Exhibit A at 6; Exhibit B at 11-12; Exhibit D at 30-31.) *AIR* is thus inapposite.

Finally, the City also attempts to argue that the Project would effectively be paying for GHG mitigation through fuel and electrical costs passed down to the end consumer. (FEIR at 18-19.) It still remains unclear how there would be any price signal to Project proponents in this situation, given that any fuel-related costs would be paid by the fuel suppliers, and potentially passed down to the Project’s tenant logistics companies. Regardless, these fuel costs would not be paid by the Project proponents.

⁴ As the California Supreme Court has held, “CEQA requires public agencies ... to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG* at 504.) The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Ibid.*) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17.)

⁵ Available at https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. See, in particular, the “Climate Action through Local Planning and Permitting” chapter beginning at page 99, which describes the critical role played by local government contributions to CEQA reductions, including through the CEQA review process. See also CARB’s 2018 comment letter for more information on this point.



3-B2-3
CONT.

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In sum, the City’s weak attempts to support the FEIR’s unlawful GHG analysis and mitigation approach are without merit. Thus, the FEIR violates CEQA by failing to fully analyze and mitigate the significant GHG impacts of the Project.

3-B2-3
CONT.

II. THE FEIR CONTINUES TO INCORRECTLY CLAIM THAT CARB SUPPORTS THE WLC’S GHG APPROACH.

The FEIR continues to misrepresent CARB’s views on GHG analysis and mitigation.⁶ As noted in CARB’s September 7, 2018 letter and in its *Paulek* amicus brief, CARB does not support the approach proposed; the approach is unlawful, inconsistent with relevant climate plans and regulations, and likely to set back the state’s climate mitigation efforts if applied. Once again, the Cap-and-Trade Program was not designed to mitigate all GHG impacts associated with land use planning decisions. Rather, it was designed with responsible local CEQA compliance in mind as a complementary strategy. (See, e.g., 2017 Scoping Plan at 99-102.) Cap-and-Trade, which is neither tailored to nor affected by the Project, simply does not provide project-level mitigation in this case.

3-B2-4

The FEIR points to several cherry-picked provisions from the 2011 Final Statement of Reasons for the Cap-and-Trade Project. (FEIR at 18-19.) Yet it fails to explain why there is not a single provision, from any point in time, indicating that CARB intended Cap-and-Trade compliance to constitute CEQA mitigation for unregulated entities and projects, or that it excuses land use projects wholesale from evaluating or mitigating their GHG emissions. Cap-and-Trade does not and CARB plainly never intended Cap-and-Trade to obviate CEQA mitigation requirements; that is a much bigger change that CARB would have expressly addressed had that been the intent. While the FEIR points out selected Scoping Plan provisions (FEIR at 25), it conveniently omits the directly applicable “Climate Action through Local Planning and Permitting” chapter describing how CARB relies on complimentary local planning actions (including robust CEQA analysis and mitigation) to accomplish the state’s GHG mandates and goals. (See 2017 Scoping Plan at 99-102.) The City’s approach would effectively render superfluous the CEQA mitigation recommendations in CARB’s Scoping Plan, as there would be essentially nothing left to mitigate if agencies took the City’s approach. It would also allow lead agencies to disregard their CEQA obligations and make less informed decisions. (See, e.g.,

3-B2-5

⁶ In the *Paulek* litigation, attorneys for the developer argued that because CARB did not specifically object to the project’s GHG significance methodology in its early comment letters, CARB “apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions.” (Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, p. 18, lines 3–7.) The City has failed to address this issue or otherwise correct this clear and consequential misrepresentation in its responses to comments.

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SANDAG, supra, 3 Cal.5th at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”].)

3-B2-5
CONT.

Despite failing to mitigate 95% of the Project’s emissions, the FEIR appears to claim that the Project would be consistent with the “Climate Action through Local Planning and Permitting” chapter of the Scoping Plan mentioned above. (FEIR at 29.) This is incorrect. As noted above, that chapter of the Scoping Plan discusses how the State needs more, not less, responsible GHG planning and mitigation from project developers and lead agencies. Here, the City seeks to avoid almost entirely its obligation to mitigate its GHG emissions.

3-B2-6

III. THE NEW GHG MITIGATION MEASURE 4.7.7.1 IS INADEQUATE.

As stated in our previous comments, under CEQA, the City must revise the FEIR to analyze all of the Project’s significant impacts relating to GHG emissions, including capped emissions. The FEIR must also adopt all feasible mitigation to address the Project’s significant GHG impacts. (*Newhall, supra*, 62 Cal.4th at p. 231.) Instead, the City revised the FEIR to add a mitigation measure for the Project, but this measure does not correct the FEIR’s CEQA violations. The new GHG mitigation measure would require the Project to purchase GHG offsets to mitigate its emissions, but only if the City loses the *Paulek* appellate litigation. (Measure 4.7.7.1.) This measure is inadequate for multiple reasons.

First, the City should adopt meaningful GHG mitigation measures in the FEIR, rather than continuing to avoid its responsibility to require mitigation unless specifically so ordered by a court. The City has conceded that such a measure is feasible by including its contingent GHG mitigation measure in the FEIR. (CEQA Guidelines, § 15092, subd. (b)(2)(A) [“A public agency shall not decide to approve or carry out a project for which an EIR was prepared unless . . . [t]he agency has . . . [e]liminated or substantially lessened all significant effects on the environment where feasible.”].) Indeed, more beneficial mitigation measures are feasible – including the use, for instance, of electrified trucks for the Project, which would reduce both GHGs and air pollution risk, as CARB has long recommended. Yet, the Project has not even adopted its inadequate offset measure, much less failed to explained why it has not adopted ostensibly feasible measures presented by CARB regarding design changes to favor zero emission vehicles. There is no indication in the record that even a more robust, legally-adequate GHG mitigation measure would be infeasible for the Project.

3-B2-7

Second, the proposed measure, if it ever becomes effective, may not actually reduce the Project’s GHG emissions. Mitigation Measure 4.7.7.1 uses similar language to CARB’s offsets program, it lacks the essential safeguards that make CARB’s program successful. For example, the measure states that any offsets used must be “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” (FEIR at 36.) However, these terms are not defined in the mitigation measure. They are left to the sole interpretation and discretion of the City’s Planning Official and thus not enforceable as CEQA requires. (See Pub. Resources Code, § 21081.6, subd. (b); CEQA Guidelines, § 15126.4, subd. (a)(2).) There is a broad continuum of voluntary-market offsets available for purchase by project proponents, ranging

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from ineffective and unenforceable to rigorous. It remains unclear which types of offsets would be deemed by the City’s Planning Official to meet these undefined criteria.

In the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. Offsets do not provide the important co-benefits of on-site mitigation such as local jobs, reduced local air pollution, local infrastructure and efficiency improvements. (See e.g. 2017 Scoping Plan at 102 (“CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from [vehicle miles traveled], and direct investments in GHG reductions within the project’s region that contribute potential air quality, health, and economic co-benefits locally.”) This is why the 2017 Scoping Plan prioritizes local direct investments, and recommends turning to offset credits “[w]here further project design or regional investments are infeasible or not proven to be effective.” (2017 Scoping Plan at 102.) The proposed measure, by contrast, does not obligate the Project to first consider additional direct reductions, or other local or regional GHG emissions reductions, before deciding to purchase offsets. Such direct or local measures could otherwise benefit those in the Project vicinity. Furthermore, the measure does not in any way limit the percentage of offsets which may be used to mitigate the Project’s GHG emissions, as compared to more direct methods of GHG reduction. California’s Cap-and-Trade Program, for its part, sets a quantitative usage limit, which allows only 4-8% (depending on the calendar year) of an entity’s compliance obligation to be met through surrendering offsets. (See 17 Cal. Code Regs., § 95854.) This helps ensure that offsets are a relatively small part of the overall Cap-and-Trade Program, ensuring that the majority of GHG reductions come from reductions by regulated entities rather than from non-covered sectors.

The FEIR’s proposed measure entirely lacks this protection, instead allowing offsets (even ones that may not actually result in GHG reductions, as described above) as the sole GHG mitigation mechanism. These disadvantages, combined with the lack of any adequate criteria to ensure quality or enforceability of the offsets that may be purchased in this case, make the mitigation measure ineffective and unreliable.

Mitigation Measure 4.7.7.1 also seems to imply that CARB has broadly “approved” the offset registries it lists. The measure’s text states: “Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, Verra (formerly Verified Carbon Standard) or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above.” (FEIR at 36). CARB has approved only the American Carbon Registry, Climate Action Reserve, and Verra for the limited purpose of participation as Offset Project Registries in CARB’s Cap-and-Trade Program, pursuant to the process set forth in section 95986 of Title 17 of the California Code of Regulations. This approval only pertains to the registry’s participation in the Cap-and-Trade Regulation, in connection with issuing CARB offset credits. By contrast, the offsets contemplated by Mitigation Measure 4.7.7.1 are known as “voluntary market” offsets, which are generated under separate protocols adopted by the registries. CARB does not review

3-B2-7
CONT

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these voluntary market protocols. CARB’s “approval” of a registry as an Offset Project Registry under the Cap-and-Trade Program does not mean CARB has reviewed or approved that registry’s voluntary market offset protocols.

Mitigation Measure 4.7.7.1 improperly bypasses onsite and local mitigation and violates CEQA because of its unenforceability and thus must be revised.

IV. THE FEIR IMPROPERLY DECLINES TO ADOPT FEASIBLE MITIGATION MEASURES THAT WOULD SUBSTANTIALLY LESSEN THE PROJECT’S SIGNIFICANT ADVERSE EFFECTS.

The FEIR simultaneously argues the proposed use of offsets and credits is a feasible mitigation measure, and yet refuses to adopt such a measure now by conditioning it on the outcome of the *Paulek* litigation. This approach violates CEQA, which instructs that “public agencies should not approve projects as proposed if there are... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects.” (Pub. Res. Code 21002). The FEIR recognizes it is possible to offset the entire 232,402 metric tons of GHG from this Project but only guarantees the offset of 8,563 metric tons of GHG emissions. (See FEIR at page 39.) The entire 232,403 metric tons of GHGs will *not* be offset if the “trial court’s judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed.” However, if the appeal is dismissed, an appellate court will not have upheld the City’s GHG analysis and, as described above, the City’s misleadingly-named “capped” emissions would be considered a significant environmental effect. These emissions would need to be mitigated, and could be via a feasible and rigorous GHG mitigation measure (as described above). By refusing to adopt such a feasible mitigation measure here, the FEIR violates CEQA. (See CEQA Guidelines, § 15092.)

V. MITIGATION MEASURE 4.7.7.1 IS “SIGNIFICANT NEW INFORMATION” THAT REQUIRES RECIRCULATION OF THE FINAL EIR.

Pursuant to Public Resources Code section 21092.1, Mitigation Measure 4.7.7.1 is “significant new information” that requires a new opportunity for public comment. “Significant new information” includes a new “feasible way to mitigate or avoid [a substantial adverse environmental effect]... that the project’s proponents have declined to implement.” (*Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1129, as modified on denial of reh. (Feb. 24, 1994)). As described above, Mitigation Measure 4.7.7.1 identifies a feasible, although not necessarily proper, way to mitigate the Project’s greenhouse gas emissions, yet declines to adopt such mitigation unconditionally.

When “significant new information... is added to an environmental impact report after notice... but prior to certification” the public agency must “give notice again pursuant to Section 21092... before certifying the environmental impact report.” (Pub. Resources Code, § 21092.1). Notice pursuant to Public Resources Code Section 21092(b)(2) requires a comment period.

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CONT.

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However, Mitigation Measure 4.7.7.1 was added to the FEIR through a “Response to Comments on the Revised Sections of the Final EIR and Draft Recirculated Revised Sections of the Final EIR” without any such comment period. Instead, the City simultaneously released that document and a Notice of Completion informing the public that the Moreno Valley Planning Commission would review the Revised FEIR at a public hearing on May 14, 2020. Moreno Valley should have recirculated the EIR and provided an opportunity for public comment on the EIR with the addition of Mitigation Measure 4.7.7.1.⁷

3-B2-9
CONT.

VI. CONCLUSION

The Attorney General and CARB urge the City of Moreno Valley not to certify the FEIR without further revisions to the GHG analysis as described above. As stated in our previous comments, the City must take its obligations as a local government to mitigate climate change impacts seriously. The addition of a weak GHG measure that would apply only if the City’s approach is invalidated on appeal is not enough. However, if the City implements the actions that the state’s expert agencies have requested for years, the Project could be an important environmental leadership project. Indeed, the Project could create jobs by building a world-leading clean logistics project, protecting communities all along its supply chains. We encourage the City to take this opportunity to innovate and to lead. As always, we would be happy to work with the City to take the additional steps needed to fully comply with CEQA’s GHG analysis and proper mitigation requirements for the Project. We appreciate your consideration of our comments.

3-B2-10

Sincerely,

HEATHER LESLIE
Deputy Attorney General

For XAVIER BECERRA
Attorney General

⁷ In its January 30, 2020 comments, CARB informed the City of its concerns with not being able to review the new GHG-related mitigation measure. (See January 30, 2020 CARB comment letter at page 1.) When CARB reached out to a City representative at that time, CARB was informed that the reference to the new GHG mitigation measure was included in the RRSFEIR in error, and it would be removed in the FEIR. Rather than remove that measure, the FEIR now includes a new GHG mitigation measure that has never before been circulated for public review, and which the City had previously indicated would not be part of the FEIR. The City only now has decided to release this measure as part of a vast FEIR package, just 14 days prior to the Project approval hearing.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Ms. Descoteaux
May 14, 2020
Page 9



Richard W. Corey
Executive Officer, CARB

cc: Albert Armijo, Interim Planning Manager, alberta@moval.org
Kenneth B. Bley, Attorney for Project Proponents, kbley@coxcastle.com

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-B2: STATE OF CALIFORNIA DEPARTMENT OF JUSTICE

Response to Comment 3-B2-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-B2-2: The comment summarizes the concerns of the commenter and the content of the comment letter, which are addressed below.

Response to Comment 3-B2-3: Topical Response A, The Use of Cap-and-Trade, and Topical Response B, Scoping Plan, were prepared prior to the submission (with the Applicant's approval) of revisions to Mitigation Measure 4.7.7.1. Mitigation Measure 4.7.7.1 has been revised to mitigate all Project emissions to net zero, not relying on Cap and Trade, and therefore mitigates Project GHG impacts fully. The Project does not violate CEQA and does not fail to fully mitigate GHG impacts. See revisions to Mitigation Measure 4.7.7.1, below.

4.7.7.1 The developer shall mitigate the WLC Project's GHG emissions to net zero by purchasing and retiring ~~providing offsets and/or~~ carbon credits, based upon where the amount of GHG emissions set forth in ~~to be mitigated is either "Total Uncapped" GHG emissions from Table 4.7-8 or "Project Emissions" from new Table 4.7-16 of the Revised Final EIR, depending on the outcome of the appeal in *Paulek v. Morono Valley Community Services District* ("*Paulek*"). If the trial court's judgment in *Paulek* is affirmed after the appellate process is completed or if the appeal is dismissed, then the GHG emissions to be mitigated to net zero will be the "Total Uncapped" GHG emissions from Table 4.7-8. If the trial court's judgment is reversed after the appellate process is completed, then the amount of GHG emissions to be mitigated to net zero will be the "Project Emissions" shown on Table 4.7-16. Upon the purchase and retirement ~~provision of offsets and/or the retirement of~~ carbon credits, no further analysis of capped and uncapped GHG emissions will be required, and no further reduction of those emissions will be required.~~

The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of ~~provide the city with any combination of qualified offsets and/or~~ carbon credits ~~in its sole determination~~ provided that the following conditions are satisfied:

- a) ~~Offsets: A developer shall provide proof of offsets to reduce or sequester GHG emissions (as distinguished from carbon credits) to the City's Planning Official that the offsets are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.~~
- ba) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), the carbon credits represent reductions in GHG emissions that are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency. Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon

~~Registry, or Verra (formerly Verified Carbon Standard), or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above. In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.~~

- ~~eb) Timing: The developer shall provide proof to the City that with offsets and/or carbon credits equal to the proportionate amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent, for the facilities proposed in each plot plan (by square footage as compared to the total square footage of the project) as a condition of the issuance of a certificate of occupancy for such facilities, using either Table 4.7-8 or Table 4.7-16, as appropriate. The City shall retire the carbon credits upon their receipt. The developer shall have the right at any time to provide such offsets and/or carbon credits in advance of the issuance of any certificate of occupancy for any of the facilities in the WLC Project.~~

Response to Comment 3-B2-4: The FEIR does not misrepresent CARB's view on the GHG analysis. All of CARB's comments have been addressed; please see Response to Comments 1-B1-1 through 1-B1-47 and 2-B1-1 through 2-B1-4.

Response to Comment 3-B2-5: Please Refer to Topical Response B, Scoping Plan which discusses aspects of the "Climate Action through Local Planning and Permitting" (pages 99 through 102 of the Scoping Plan). As discussed in Topical Response B, the 2017 Scoping Plan's guidance for project-level actions states: "... CARB recommends that projects incorporate design features and GHG reduction measure, to the degree feasible, to minimize GHG emissions." (2017 Scoping Plan, p. 101.) The 2017 Scoping Plan also states that lead agencies should prioritize on-site design features and regional improvements. The City's approach to GHG reduction followed the Scoping Plan recommendation by requiring Project Design Features and mitigation measures at the project-level, the community and the region although that

geographical hierarchy is not required by law or regulation. Topical Response B also, lists all the specific mitigation the City required that adheres to Scoping Plan guidelines. In addition, as discussed in Topical Response C, Project Approvals, Litigation, and the Effects of Litigation, the Revised Final EIR suggests Mitigation Measure 4.7.7.1, which makes the GHG emissions for the Project net zero, regardless of the outcome of the *Paulek v. Moreno Valley Community Services District* appeal. This measure has been revised to mitigate all Project emissions to net zero, not relying on Cap and Trade and not differentiating between capped and uncapped emissions. This mitigation measure is in line with the 2017 Scoping Plan which states “achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development”, (2017 Scoping Plan, p. 101.).

Response to Comment 3-B2-6: Please see Response to Comment 3-B2-5, above, and Topical Responses B and C, regarding consistency with the “Climate Action through Local Planning and Permitting” chapter of the 2017 Scoping Plan and net zero GHG emissions resulting from the Project. Refer to Response to Comment 3-B2-3 for revised Mitigation Measure 4.7.7.1.

Response to Comment 3-B2-7: As summarized below, the WLC Project incorporates on-site design features, feasible mitigation measures, and regional investment to reduce GHG emissions, and commits to reducing the Project’s GHG emissions to net zero by providing offsets carbon credits registered by a carbon registry approved by the California Air Resources Board (CARB). Refer to Response to Comments 1-B1-4 and 1-B2-12 for discussion of all feasible mitigation measures implemented by the Final EIR, including a discussion of the use of zero-emission technology and current status of commercial availability. Refer to Master Response to the Earthjustice Appeal for a discussion of the legitimacy of voluntary market carbon credits.

Design Features

The Project incorporates multiple building design features to achieve LEED certification for buildings over 500,000 square feet and energy conservation measures to enable the project to exceed 2019 Title 24 energy standards by 10 percent or meet current Title 24 requirements in place at the time the building permit is approved. (Revised Final EIR Part 2, p. 4.7-32, Table 4.7-6 and Mitigation Measure 4.7.6.1D) The Project is committed to maximize the use of onsite rooftop solar PV generation, subject to MVU’s restrictions on distributed solar (see Topical Response E). (Revised Final EIR Part 2, p. 4.7-28.) The Air Quality mitigation measures will also reduce GHG emissions, requiring that construction equipment greater than 50 horsepower by USEPA Tier 4 engines (Mitigation Measure 4.3.6.2[a]) and that heavy-duty trucks have model year 2010 engines (Mitigation Measure 4.3.6.2[h]). (Revised Final EIR Part 2, p. 4.7-29.) All plot plans approved within the Specific Plan area will include rideshare participation, pedestrian and bicycle improvements, bicycle storage space and shower and changing facilities, EV charging infrastructure, carpool/vanpool priority spaces, and informational packets of these benefits for tenants. (Revised Final EIR Part 2, p. 4.7-29.) Utility mitigation measures including high efficiency building systems, cool pavement materials, and energy efficient appliances will also help to reduce GHG emissions. (Revised Final EIR Part 2, p. 4.7-30.)

In particular, consistent with CARB’s recommendation, the Project analyzed the feasibility of integrating electrified vehicles and the status of the EV market to reduce GHG emissions. As described in response to Comment 1-F8-16, the 2019 Draft Recirculated RSFEIR and the Renewable Energy Technology Report

(RETR) (Revised Final EIR Part 2, Appendix E) evaluated the energy requirements for transportation activities to, from, and on the WLC site using the projected number of trips and the estimated vehicle miles traveled (VMT) per trip (2019 Draft Recirculated RSFEIR, page 4.17-14) although the court ruling only required an analysis of renewable energy (See Topical Response C). The energy assessment quantified the increased electricity use and decreased fuel use associated with a higher fleet percentage of electric vehicles due to California's 2016 Mobile Source Strategy. Three scenarios demonstrating low, medium, and high electric vehicle penetration were developed based on what can be reasonably expected for zero emission vehicle technology. The RETR compared feasible, cost-effective options for integrating the use of renewable energy and improving the overall energy performance of transportation operations by looking at a wide range of fuel and vehicle options, across all vehicle classes and assessed feasibility based on applicability to the project, relative cost, commercial readiness, funding availability, policy and regulatory support, potential industry partners, and other factors (2019 Draft Recirculated RSFEIR, page 4.17-24).

The RETR found that zero emission vehicle technology is steadily developing for both light-duty and heavy-duty vehicles, driven by both regulatory developments and market forces. Zero emission vehicles encompass a range of technologies including battery electric vehicles (BEVs), hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and range extended electric vehicles (REEVs) that utilize a fuel cell as an additional energy source. As outlined in the RETR and summarized in the 2019 Draft Recirculated RSFEIR, commercialization of passenger vehicles is occurring rapidly. A significant population of passenger electric vehicles is expected at the site by Phase 1 (2025) and that number will increase substantially by full buildout of the project (2035), representing a potential significant demand for on-site charging. The study also found that development of electric medium- or heavy-duty vehicles is still in the pilot or demonstration phase and it is speculative to predict when they will become commercially available.

Although it is speculative to state what the regional fleet mix will be as each phase of the project is completed, and the adoption of zero electric vehicles by WLC employees and customers will be beyond the direct control of the WLC, all EV types should be anticipated in planning for the onsite charging infrastructure. To that end, the Project will construct the WLC parking areas with cable raceways for installing future EV charging stations, which will enable WLC to more readily and cost effectively provide this service to future tenants if and when demand dictates. The analysis indicates that the low electric vehicle penetration scenario would use approximately 14 percent less electricity than the 2025 baseline scenario and approximately 16 percent less electricity than the 2035 baseline scenario (2019 Draft Recirculated RSFEIR, page 4.17-26). Although the medium electric vehicle scenario would use more electricity than the low electric vehicle scenario, the net electrical demand on MVU would still be 11 percent less than the 2025 baseline scenario and it would be 12 percent more than the 2035 baseline scenario due to the much higher electric vehicle penetration rates for light duty passenger cars consistent with the 2016 Mobile Source Strategy (2019 Draft Recirculated RSFEIR, page 4.17-26). For the high electric vehicle scenario, total electrical demand driven by populations of electric vehicle trucks would exceed total electrical demand in both the 2025 and 2035 baseline scenarios. However, a substantial reduction in the use of liquid transportation fuels (diesel and gasoline) would also be expected to occur under this scenario as more vehicles and trucks utilize electricity for power instead of gas or diesel. Replacing VMT powered by the combustion of diesel and gasoline fuels with EV-generated VMT, especially as electricity becomes less GHG-intensive under the State's Renewables Portfolio Standard (RPS), has the added advantage of reducing the emission of harmful air pollutants such as particulate matter nitrogen oxide associated with fuel combustion. (2019 Draft Recirculated RSFEIR, page 4.17-29). Additionally, the 2019 Draft Recirculated

RSFEIR discusses that the Project would accommodate alternative forms of transportation through the construction of sidewalks, improving site design to enhance pedestrian connections, providing bike storage and showers, and designing streets to accommodate bus service or other rideshare transportation options. Compliance with current building codes would include the installation of required electric vehicle charging stations. Furthermore, the WLC is committing to a publicly-accessible fueling station offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public.

Recognizing the challenges in transitioning to zero-emission heavy duty trucks, CARB proposed in late 2019 the Advanced Clean Truck Regulation to require manufacturers to make a certain percentage of sales of zero-emission trucks and buses. CARB received numerous comments on the proposed Regulation, and it has not been formally adopted, but CARB's Staff Report in support of the Regulation provided a detailed evaluation of the market in the Staff Report, including Appendix E, Zero Emission Truck Market Assessment. The Staff Report notes the importance of heavy duty trucks: "Heavy-duty trucks operate through California in numerous vocations and are an essential part of the state's economy." (Staff Report, p. I-4.) The Staff Report outlines the challenges in ZEV market, particularly with respect to heavy-duty trucks, including the incremental cost of ZEVs, infrastructure investment cost and availability, matching vehicle capability with fleet need and diverging standards. (Staff Report, pages. I-14 – I-17.) The Regulation sets forth proposed percentage sales for Class 7-8 Tractor Group at 3% by 2024. CARB's evaluation of the market and its proposed goal of 3% for 2024 demonstrates that Class 7-8 heavy-duty truck are not currently commercially available.

Moreover, according to a Feasibility Assessment for Drayage Trucks for the San Pedro Bay Ports Clean Air Action Plan, zero-emission and near zero-emission on-road haul truck availability, as of late-2018, includes one zero-emission and one near zero-emission fuel-technology platform sold by Original Equipment Manufacturers (OEMs) in commercially available Class 8 trucks suitable for drayage. With the development of zero-emission and near zero-emission platforms, infrastructure has emerged as one of the most significant near-term barriers to wide-scale adoption of these technologies due to standardization difficulties and the ability to develop the full charging infrastructure required by 2021. Additionally, according to the Feasibility Assessment, one OEM plans to begin offering a zero-emission battery-electric Class 8 truck by 2021, the other OEMs have similar or later timeframes. Furthermore, the International Council on Clean Transportation (ICCT) in a November 2017 white paper titled "Transitioning to Zero-Emission Heavy-Duty Freight Vehicles" states that there are "prevailing barriers to widespread viability" of plug-in electric heavy-duty freight vehicles, primarily limited electric range, high vehicle cost, long recharging time, and tradeoffs on cargo weight and/or volume. This report does not cite drayage trucking (Class 8) as a promising segment for widespread commercialization, further proof that the zero-emission and near zero-emission truck fleet won't be viable during construction of the Project or possibly be readily available enough for use during operation of the Project.

CARB's latest working group meeting Third Work Group for the FY 2019-20 Heavy-Duty Three-Year Investment Strategy on May 8, 2019 shows that the Zero Emission Vehicle technology readiness for medium- and heavy-duty trucks is primarily in the demonstration phase in 2019 which includes technology development and early stage demonstrations. As of late last year, CARB is funding a couple of pilot programs for electric truck fleets. BYD (Build Your Dreams) and Anheuser-Busch announced that Anheuser-Busch will pilot a scale project by deploying 21 BYD battery electric trucks at four Anheuser-Busch distribution facilities across southern California: Sylmar, Riverside, Pomona, and Carson. This is a

landmark achievement as the largest Class 8 electric truck deployment in North America. Additionally, another pilot program includes replacing PepsiCo's existing diesel powered freight equipment with fifteen Tesla Semi electric trucks with "zero-emission (ZE) and near-zero emission (NZE)" trucks and equipment at its Frito-Lay Modesto, California, manufacturing site by 2021. Automakers are expanding their electric vehicles to heavy duty trucks. However, the extent of commercial availability of such trucks as the WLC begins operations is unknown. Furthermore, since the Project will support a variety of future users which are unknown at this time, it is not possible to specify or require future users to have zero emission or alternative fuel fleets since most logistics companies use independent contractors and truck drivers rather than maintain their own fleets. Nonetheless, the Project has committed under various mitigation measures to require the most stringent levels of emission mitigation under existing emission control regulations.

Regional Investment

With respect to regional investment, the Scoping Plan references "direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally." (Scoping Plan 2017, p. 102.) On October 21, 2016, the Project entered into a settlement agreement with the SCAQMD to pay an Air Quality Improvement Fee of 64 cents per square foot for each building as the Project is constructed for a total of approximately \$26,000,000. The settlement agreement states:

"[T]he payment of the Air Quality Improvement Fee will adequately mitigate heavy-duty truck related air quality impacts that may result from the construction and operation of the World Logistics Center as described in the EIR and that no additional charges will be imposed on the World Logistics Center to mitigate emissions, including NOx, described in the EIR from heavy-duty trucks."

Funds may be used by SCAQMD for any purpose to improve air quality in the South Coast Air Basin. For example, individual or fleet truck owners could be offered a financial incentive to purchase a near-zero or zero-emission truck model, similar to the Carl Moyer Program. This type of program has been an effective tool for more than 19 years in speeding the transition of heavy-duty trucks and other equipment to cleaner models. The \$26,000,000 Air Quality Improvement Fee will have co-benefits of reducing air pollutants locally and GHG emissions globally. Because it is not yet known how the SCAQMD will use the funds, no credit in emissions has been taken by the Project.

The WLC Project is consistent with the Scoping Plan's guidance to local governments on the use of carbon offset for GHG emissions mitigation. The WLC Project incorporates on-site design features and feasible mitigation measures to reduce GHG emissions and invests regionally through the SCAQMD agreement with \$26,000,000 in air quality improvement fees. With these enforceable Project components as the foundation for the Project's GHG reductions, it would "be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits." (Scoping Plan 2017, p. 102.)

Response to Comment 3-B2-8: Refer to Response to Comments 1-B1-4 and 1-B2-12 for discussion of all feasible mitigation measures implemented by the Final EIR, including a discussion of the use of zero-emission technology and current status of commercial availability. The implementation of Mitigation Measure 4.7.7.1 (as revised) will mitigate to net zero all Project GHG emissions (without differentiation of capped and uncapped emissions) remaining after the application of other mitigation measures. Refer to Response to Comment 3-B2-3 for revised Mitigation Measure 4.7.7.1.

Response to Comment 3-B2-9: The comment asserts that the information within the Revised Final EIR includes significant new information, including new mitigation strategies, and therefore, a public comment period is required. The responses and errata provided in the Revised Final EIR does not alter the significance conclusions provided in the draft EIRs (i.e., Revised Sections of the Final EIR [RSFEIR]). The reference to new mitigation strategies refer to the addition of Mitigation Measure 4.7.7.1. Mitigation Measure 4.7.7.1 has been revised to mitigate all Project emissions to net zero, not relying on Cap and Trade (see Response to Comment 3-B2-3 for revised measure). The addition and subsequent revision of the mitigation does not change the impact determination, will reduce the impact of greenhouse gas emissions and would not result in a new significant impact as discussed on pages 755 to 756 within Section 4.3.1 of the Final Response to Comments. The introduction of a new Mitigation Measure therefore does not meet any of the requirements for recirculation set forth in CEQA Guidelines Section 15088.5(a). As required by CEQA Guidelines Section 15088, the City of Moreno Valley as the Lead Agency, provided written responses to public agencies that commented on either the RSFIER or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR.

Response to Comment 3-B2-10: No specific comments on the contents of the Revised Final EIR are provided.

1.1.3 (3-C) Letters from Regional Agencies

No comment letters were received from Regional Agencies.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

1.1.4 (3-D) Letters from County Departments/Agencies

Comment Letters Received from County Departments/Agencies include the following:

- 3-D1: Riverside County Airport Land Use Commission

Julia Descoteaux

From: Rull, Paul <PRull@RIVCO.ORG>
Sent: Sunday, May 10, 2020 8:53 AM
To: Julia Descoteaux
Subject: World Logistics Center EIR

Warning: External Email – Watch for Email Red Flags!

Hi Julia,

Thank you for transmitting the above reference project to ALUC for review. Please note that the project is located outside the AIA and therefore ALUC has no comments at this time.

3-D1-1

If you have any questions, please feel free to contact me.

Paul Rull
ALUC Principal Planner



Riverside County Airport Land Use Commission
4080 Lemon Street, 14th Floor
Riverside, Ca 92501
(951) 955-6893
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[County of Riverside California](#)

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-D1: Riverside County Airport Land Use Commission

Response to Comment 3-D1-1: The commenter stated that the Project is located outside of any Airport Influence Area (AIA) and as a result the Airport Land Use Commission (ALUC) did not have any comments at this time.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

1.1.5 (3-E) Letters from Local Agencies/City Departments

No comment letters were received from Local Agencies/City Departments.

1.1.6 (3-F) Letters from Community/Conservation Groups

Comment Letters Received from Community/Conservation Groups include the following:

- 3-F1: Ileene Anderson, Center for Biological Diversity
- 3-F2: Adrian Martinez, Earthjustice
- 3-F3: Albert Paulek, Friends of the Northern San Jacinto Valley
- 2-F4: Susan Nash, Friends of the Northern San Jacinto Valley
- 2-F5: George Hague, Sierra Club



Protecting and restoring natural ecosystems and imperiled species through science, education, policy, and environmental law

submitted via email

May 13, 2020

Planning Commissioners
City of Moreno Valley
City Hall Council Chamber
14177 Frederick Street
Moreno Valley, CA 92553
ashleya@moval.org

RE: Deny Public Hearing Item #2 - Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, Revised Final Environmental Impact Report, a Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary.

Dear Planning Commissioners,

These comments are submitted on behalf of the Center for Biological Diversity’s (the “Center”) members, staff and supporters, regarding the Revised Final Environmental Impact Report (“RFEIR”) for the World Logistics Center. The Center has reviewed the RFEIR and provides comments on primarily the biological issues. At this point, we urge the Planning Commission to reject the project and instead require the issues we raise below be addressed in a renewed CEQA process. The Center has closely monitored this project for many years and remains concerned about the RFEIR inadequate analysis and mitigation of the project’s impacts to sensitive species and habitats. The current RFEIR fails to adequately preserve southern California’s, and specifically western Riverside County’s incredible biodiversity. Troublingly, extensive conservation investments by State, County and local agencies remain imperiled by inconsistent language and inadequate impact analysis in the current RFEIR.

3-F1-1

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 1.7 million members and online activists throughout California and the United States. The Center has worked for many years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life for people in western Riverside County.

I. The RFEIR Fails to Provide a Cumulative Impacts Analysis

The RFEIR simply fails to provide a cumulative impact analysis to biological resources (at page 4.4-118 to 119). While Table 1.1-1: World Logistics Center Project Environmental Impact Summary provides a section on Cumulative Biological Impacts (at pg. 1-26) it does not

3-F1-2

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

actually provide an analysis, but instead references proposed project mitigation measures. In accordance with CEQA (CEQA Guidelines Section 15130 *et seq.*) an EIR must analyze the cumulative impacts of the proposed project in conjunction with other developments that affect or could affect the project area. According to CEQA, a cumulative impact refers to two or more individual effects that are considerable when taken together, or that compound or increase other environmental impacts (CEQA Guidelines Section 15355). And while an agency is not expected to foresee the unforeseeable, it is expected to use its “best efforts to find out and disclose all that it reasonably can.” (CEQA Guidelines § 15144; see also *City of Richmond*, *supra*, 184 Cal.App.4th at 96; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 428 [hereinafter *Vineyard*].)

3-F1-2
CONT.

Therefore, to comply with CEQA, a cumulative scenario needs to be developed that identifies and evaluates past, present, and reasonably foreseeable future projects within the cumulative study area that would be constructed or commence operation during the timeframe of activity associated with the proposed project. For example, but not limited to, the Villages of Lakeview housing development will also impact the southern portion of the San Jacinto Wildlife Area (“SJWA”). The lack of a cumulative impact analysis to biological resources violates CEQA. The purpose of analyzing cumulative environmental impacts is to assess adverse environmental change “as a whole greater than the sum of its parts.” (*Environmental Protection Information Center v. Johnson* (1985) 170 Cal.App.3d 604, 625.) Absent meaningful cumulative analysis there would be no control of development and “piecemeal development would inevitably cause havoc in virtually every aspect of the [] environment.” (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 721.)

II. The RFEIR Fails to Provide an Adequate Development Setback for the SJWA

The RFEIR still proposes only a 250-foot wide development setback from the southernmost property line along the SJWA boundary with a 150-foot area for truck traffic and other activities other than actual buildings (at pg. 4.4-97). Negative edge effects from human activity, traffic, lighting, noise, pollutants, invasive weeds, and increased fire frequency have been found to be biologically significant up to 300 meters (~1000 feet) away from anthropogenic features in terrestrial systems (Environmental Law Institute 2003). The RFEIR states “250-foot development setback is adequate for a project-SJWA **bufferseparation** and supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity” (at pg. 4.4-97, emphasis original), but the RFEIR does not provide the literature and studies to support this assertion.

3-F1-3

The SJWA is a core area under the Western Riverside Multi-Species Habitat Conservation Plan (“WR HCP”), serves as a mitigation site for a prior project’s impacts and is a regionally important wildlife area. Therefore, a larger development setback needs to be incorporated to prevent negative edge effects from occurring to the project’s southernmost property line along the SJWA boundary. While down lighting as required in the RFEIR will help minimize light pollution, the other negative edge effects – increased traffic, noise, pollutants, invasive weeds and increased fire frequency - have not been adequately addressed.

3-F1-4

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For example, Mitigation Measure 4.4.6.3J requires “A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas” (at pg. 4.4-118), but absent that plan being available, the plan’s adequacy is unclear. In this case, the fuels to be manage are actually wildlife habitat. The RFEIR should require a comprehensive Fire Management Plan to protect not only the development where fire ignitions are more likely to occur but also requirements to prevent the fires from escaping onto the SJWA, as well as actions to implement if indeed fire originating on the development spreads to the SJWA.

3-F1-5

III. The RFEIR Proposes Inconsistent Mitigation Measures

Despite the inadequate 250-foot development setback along the boundary with the SJWA, the RFEIR proposes inconsistent information as to where impact-mitigating fences/walls are to be constructed. First, MM 4.4.6.1A states “All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area” (at pg. 1-16). MM 4.4.6.1A also states “all truck activity areas adjacent to the 250- foot buffer area along the southern property line shall be enclosed by minimum 11-foot tall solid walls” (at pg. 1-17). The purpose of the mitigation measure is to reduce impacts to the SJWA. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 180.) Therefore, in order to minimize negative edge effect impacts, a solid wall, not a chain link fence, needs to be constructed. Secondly, the RFEIR states that “Warehousing will have a minimum 11-foot solid wall along the SJWA boundary” (at pg. 4.4-60) and “the Specific Plan requires solid walls along the property line.” (at pg. 4.4-97). However, having a wall at the boundary of the 250-foot development setback with the SJWA defeats the setback’s impact minimization purpose. The wall needs to be placed at the northern edge of the development setback nearest the development in order to help minimize the edge effect impacts.

3-F1-6

IV. The RFEIR Fails to Provide All Required Plans

The RFEIR does not provide even a draft of all of the required plans in order for the decision-makers and the public to be able to evaluate the adequacy of the avoidance, minimization and mitigation. In addition to the Fuel Management Plans, other missing plans include but are not limited to:

- Traffic Control Plan (at pg. 1-10)
- Landscape plan for the 250-foot setback area (at pg. 1-17 and 1-23)
- Compensatory Mitigation Plan (at pg. 1-18)
- Burrowing owl Relocation plan (at pg. 1-22) and,
- Biological Resource Management Plan (BRMP) to prescribe how the 250-foot setback area is maintained (at pg. 1-23)

3-F1-7

These plans are all key parts to evaluating the effectiveness of the proposed mitigation measures and should be included as part of the RFEIR.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

V. The RFEIR Fails to Address Traffic Impacts to Wildlife on Gilman Springs Road including through the SJWA

While truck and vehicle traffic will increase on Gilman Springs Road for both construction and operation, the RFEIR fails analyze much less avoid, minimize or mitigate the anticipated wildlife “roadkill”. The RFEIR fails to provide any analysis of the increasing wildlife injury and mortality that will occur from the increased traffic and instead states “these impacts would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road” (at pg. 4.4-97). By failing to adequately analyze impacts from increased traffic on wildlife injury and mortality, the RFEIR also fails to also provide avoidance, minimization and mitigation measures. Under CEQA, “the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project’s impact on the environment, the agency’s approval of the proposed project followed meaningful consideration of alternatives and mitigation measures.” (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 134.) It is not the RCA’s and the County’s responsibility to analyze, avoid, minimize and mitigate the impacts from this project, it the developer and the City’s responsibility as the lead agency.

3-F1-8

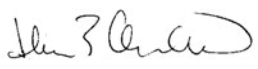
VI. CONCLUSION

Thank you for the opportunity to comment on the RFEIR for the World Logistics Center. Because of the numerous inaccuracies, short-comings and confusion in the RFEIR, we request that the Planning Commission deny recommending certification of the RFEIR, and the Mitigation Monitoring and Reporting Program (“MMRP”), Statement of Overriding Consideration, the Tentative Parcel Map 36457 that divides property for finance and conveyance purposes only, and the Development Agreement between the City of Moreno Valley and Highland Fairview within the World Logistics Center Specific Plan boundary. Rather than allowing this project to move forward with inadequate and incomplete environmental review, the City should send the RFEIR back t for revisions to address the failures identified above.

3-F1-9

Please keep the Center to your notice list for all future updates to the Project and do not hesitate to contact the Center with any questions at the number or email listed below.

Sincerely,


 Ileene Anderson
 Senior Scientist
 660 S. Figueroa St., Suite 1000
 Los Angeles, CA 90017
 323-490-0223
ianderson@biologicaldiversity.org

/S/
 Aruna Prabhala, Senior Attorney
 Urban Wildlands Program Director
 1212 Broadway, Suite 800
 Oakland, CA 94612

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

cc:

Julia Descoteaux, Moreno Valley Planning, juliad@moval.org

Honey Bernas, Interim Executive Director, RCA hbernas@wrc-rca.org

Karin Cleary Rose, USFWS karin_cleary-rose@fws.gov

Heather Pert, CDFW Heather.Pert@wildlife.ca.gov

References

Environmental Law Institute. (2003). *Conservation thresholds for land use planners*.

Environmental Law. Pgs. 64 <https://www.eli.org/research-report/conservation-thresholds-land-use-planners>

RESPONSES TO LETTER 3-F1: Ileene Anderson, Center for Biological Diversity

Response to Comment 3-F1-1: The comment is introductory and summarizes the subsequent comments in concluding that the current Revised Final EIR provides an inadequate analysis with respect to biological issues and recommends a new CEQA process.

As detailed in the responses below, the Revised Final EIR addresses the Project's potential impacts to biological resources in compliance with CEQA.

Response to Comment 3-F1-2: The comment states that the Revised Final EIR does not provide a Biological Resources cumulative impact analysis.

The Revised Final EIR provides an extensive cumulative impact assessment in Sections 6.0 through 6.17 of the document, more than 400 pages of cumulative impact analysis and analyzing more than 360 related projects. The Biological Resources cumulative impact assessment (Section 6.4) is 33 pages by itself and lists more than 100 related projects that are within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area with about 30 projects in the immediate area of the WLC site. It appears that this commenter did not see the Section 6 chapters and cumulative discussion.

Response to Comment 3-F1-3: The comment claims that the proposed WLC Project setback from the SJWA is insufficient, referencing the 2003 Environmental Law Institute publication Conservation Thresholds for Land Use Planners and a buffer of 300 meters. The comment claims that the effects discussion in the Revised Final EIR, including diesel emissions, provides no literature or studies to support the adequacy of the proposed WLC setback from the SJWA.

As discussed in Section 4.4.1.15, Other Issues, a. Setbacks, on page 4.4-46 of the 2018 RSFEIR, "typical setbacks to protect wildlife from human presence (though not warehousing) ranges from 50 to 500 feet, but 200–250 feet appears adequate for the most sensitive species" (McElfish, J., Kihslinger, R., and Nichols, S., 2008. *Setting Buffer Sizes for Wetlands*. Available online: http://staging.ecosystemmarketplace.com/wp-content/uploads/archive/documents/Doc_456.pdf). In addition to the 250-foot development setback, the WLC Project includes a 150-foot building setback resulting in a total setback of 400 feet. Furthermore, the WLC Project includes a minimum 11-foot high solid wall along the southern boundary of the WLC site that would reduce potential urban/wildlands interface impacts. The referenced 2003 Environmental Law Institute publication discusses buffers in relation to edge effects as a consequence to habitat fragmentation. For this location, the edge effects are pre-existing because of the current and past agricultural activities that have taken place on both the WLC site and the northern portion of the SJWA. Consequently, the size of the buffer is less critical as long as some buffer/setback is provided to minimize urban intrusions such as light, noise and pollutants into preserved areas such as the SJWA. The scientific literature regarding setbacks includes a variety of recommendations, depending upon a variety of parameters including adjacent habitat, species of concern and microclimates, and range from as little as eight meters to over five kilometers. Setbacks to avoid edge effects for birds and mammals range from a minimum of 16 to 45 meters up to 900 meters. In light of the current conditions, the proposed 250-foot setback is adequate to minimize urban/interface consequences.

Literature references are included as footnotes in the RSFEIR, e.g., page 4.4-70, in discussion of air emission impacts on wildlife.

Response to Comment 3-F1-4: The comment states that the SJWA is a core area within the MSHCP and as a consequence a larger development setback is required to prevent edge effects on the SJWA. The comment continues that impacts from increased traffic, noise, pollutants, invasive plant species and fire frequency have not been adequately addressed.

While this comment does not specify what development setback is considered adequate, it is assumed that that a distance of 300 meters is recommended, as specified in Comment 3-F1-3. The RSFEIR acknowledges the SJWA is a component of the MSHCP Core H, which also includes the Lake Perris State Recreation Area. The RSFEIR provides a discussion of how the WLC Project is consistent with the provisions of the MSHCP in Section 4.4.1.11 (starting on page 4.4-32) and the proposed setback of 250-foot is adequate to minimize urban/interface consequences, as described above in Responses to Comment 3-F1-3.

Similarly, this comment does not specify how the RSFEIR analysis of impacts to biological resources from traffic, noise, pollutants, invasive plant species and fire frequency is not adequately addressed. Impacts associated as edge effects, especially in regard to MSHCP conservation areas, are analyzed in the RSFEIR in Section 4.4.1.11.f MSHCP Consistency Analysis (page 4.4-36), Section 4.4.5.2.c Adopted Habitat Conservation Plans (page 4.4-62), in which pollutants are discussed, and Section 4.4.6.1 Significant Impacts on Endangered and Threatened Species (page 4.4.66), which includes a more detailed analysis of traffic, noise, lighting, and air pollutants. The RSFEIR states “the WLC sites that are within or adjacent to conservation areas will incorporate the design features and measures related to drainage features, toxics, lighting, noise, invasive plants, barriers, and grading/land development discussed below. These measures will make the project consistent with the MSHCP, Section 6.1.4, Guidelines Pertaining to the Urban/Wildlands Interface” (page 44-36). Lastly, the WLC Specific Plan landscaping palette does not include any of the invasive plant species listed in Section 6.1.4 of the MSHCP (Table 6-2), but there should be mitigation to ensure that no on-site landscaping along the southern boundary of the site conflicts with MSHCP invasive plant guidelines. Mitigation Measure 4.4.6.1A provides the appropriate setback mitigation to reduce impacts to less than significant levels. Mitigation Measure 4.4.6.3J requires the preparation of a fuel management plan to demonstrate adequate protection from potential fire risks to MSHCP areas from the WLC project.

Response to Comment 3-F1-5: The comment references Mitigation Measure 4.4.6.3J and the need for a fuel management plan but questions the effectiveness of such plan because the plan has not yet been prepared. The comment continues that there should be a fire management plan that protects both the WLC project and the SJWA.

Based on review of the comment received from the CDFW, the City has modified Mitigation Measure 4.4.6.3J to include specific reference to SJWA for inclusion of protection from expected fire risks. Please see Response to Comment 3-B1-25 above for the revised mitigation measure language.

Response to Comment 3-F1-6: The comment states that the RSFEIR provides inconsistent descriptions of a fence or wall along the WLC southern boundary shared with the SJWA. The comment states that the solid wall needs to be placed at the northern edge of the development setback.

The WLC project is consistent with the comment and the minimum 11-foot solid wall will be located at the northern edge of the development setback of 250 feet from the SJWA northern boundary. This is consistent

with the design provisions of the WLC Specific Plan (Section 4.2.4.3) that depicts the wall a minimum of 250 feet away from the SJWA boundary.

Response to Comment 3-F1-7: The comment states that without a draft of the required plans, decision makers and the public are not able to evaluate their adequacy. The comment refers to the fuel management plan, traffic control plan, landscape plan for the 250-foot setback area, compensatory mitigation plan, burrowing owl relocation plan, and the biological resource management plan.

The comment correctly states that the RSFEIR does not include drafts of the required plans that will assist in avoiding or minimizing project impacts, especially to biological resources. Because the WLC Specific Plan will be build out over many years, preparing drafts of these various plans prior to individual project designs being processed for entitlement would be speculative for inclusion of the best practices available at the time individual development entitlements are approved in the future. However, the basic components for inclusion into the required plans are listed within the specific mitigation measures. For example, the biological resource management plan required in Mitigation Measure 4.4.6.3F will guide the management of the 250-foot development setback area including the management of non-native species and selection of landscape species to promote roosting or nesting opportunities for raptors and other bird species. The preparation of a burrowing owl relocation plan, as required in Mitigation Measure 4.4.6.3D, at this time would not make sense because there currently is no need to relocate burrowing owls as no development has been approved and if there becomes a need to relocate burrowing owls at some time in the future, the relocation plan would be developed for either passive relocation, i.e., the individual burrowing owl departs the area on its own, or active relocation, e.g., if burrowing owl is found to be nesting onsite and relocation would take place only after the young owls have fledged.

Regarding landscaping plans, the WLC Specific Plan includes conceptual landscape designs for various areas of the WLC site including the 250-foot development setback area separating the SJWA from the WLC project.

Response to Comment 3-F1-8: The comment asserts that the RSFEIR fails to provide any analysis of potential increased wildlife injury and mortality resulting from increased traffic. The comment continues stating that it is the City's responsibility to analyze and appropriately mitigate impacts resulting from the private development project.

The City agrees that as lead agency it is responsible for the adequacy of impact analysis and the inclusion of appropriate and feasible mitigation measures to reduce the effects of potentially significant impacts. The RSFEIR provides the analysis of impacts on wildlife resulting from increased project traffic. The RSFEIR acknowledges increased wildlife injury and mortality as a result of additional traffic on Gilman Springs Road and other roadways. The WLC project design includes the construction of fences or walls along the west side of Gilman Springs Road that may incrementally reduce roadkill. The RSFEIR includes the statement that impacts from traffic would be less than significant as long as the County coordinates with the RCA and takes wildlife movement between Core H and proposed Core 3 into account when designing and improving Gilman Springs Road. This is an accurate statement because the MSHCP includes provisions for wildlife movement, especially along linkages for core conservation areas, and the RCA is the agency implementing those provisions as funding becomes available through the payment of MSHCP mitigation fees. The section of Gilman Springs Road south of the WLC site, where wildlife movement is more likely and preferred, is not

under the authority of the City but the County. The City's authority as an MSHCP permittee is through the collection of the required mitigation fees.

Response to Comment 3-F1-9: The comment summarizes the reasons why the Center for Biological Diversity recommends against certification of the EIR and that the EIR needs to be revised to address the perceived failures.

The City thanks the organization for their comments, which were presenting to the Planning Commission, but does not concur that the EIR needs to be revised for the reasons explained above in Responses to Comments 3-F1-1 through 3-F1-8.



May 8, 2020

Ms. Julia Descoteaux
Associate Planner
City of Moreno Valley
juliad@moval.org

**Re: NOTICE OF COMPLETION - Revised Final Environmental Impact Report
(Revised Final EIR) (2012021045)**

Dear Ms. Descoteaux:

I received an email with the Notice of Completion for the Revised Final Environmental Impact Report (EIR) on Friday of last week in the late afternoon. The email notice mentioned the item will be heard at the Planning Commission on Thursday, May 14, 2020. In reviewing the volumes of materials, there is significant new information, including new mitigation strategies, which the public is only now seeing for the first time. The major impacts of this massive development merit more time for public review of the Revised Final EIR.

Thus, I write to request an extension of time for commenting on the Revised Final EIR, including a delay in the Planning Commission hearing on the Revised Final EIR and related approvals, to allow for sufficient time to evaluate the volumes of materials, including all the new materials released for the first time last week. I respectfully request at least a 30 day window to comment on the Revised FEIR. Please let me know whether the City will accept or reject this request for an extension of the comment period.

Please do not hesitate to contact me if you have questions about this request. I appreciate your consideration of this request.

Sincerely,

Adriano L. Martinez
Staff Attorney

3-F2-
Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Julia Descoteaux

From: Adrian Martinez <amartinez@earthjustice.org>
Sent: Thursday, May 14, 2020 4:33 PM
To: Julia Descoteaux
Cc: amartinez@earthjustice.org
Subject: Earthjustice WLC Revised FEIR Comments Email 1 of 3
Attachments: WLC Revised FEIR Comments 5.14.2020.pdf

Warning: External Email – Watch for Email Red Flags!

Dear Ms. Descoteaux,

Please find the attached comment letter for the Agenda Item No. 2 on the Planning Commission Agenda for tonight. I will be sending two forthcoming emails with the relevant attachments referenced in the letter.

3-F2-2

All the best,
Adrian

Adrian Martinez
Staff Attorney
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Los Angeles, CA 90017
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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)



May 14, 2020

Ms. Julia Descoteaux
Associate Planner
City of Moreno Valley
juliad@moval.org

Re: NOTICE OF COMPLETION - Revised Final Environmental Impact Report (Revised Final EIR) (2012021045); Agenda Item No. 2 on May 14, 2020 Planning Commission Meeting (World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report)

Dear Ms. Descoteaux:

I respectfully submit the following comments to the 2020 Revised Final Environmental Impact Report (“Revised FEIR”) for the World Logistics Center Project (“WLC” or “Project”), in addition to the World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes Only. Please present these comments and the attachments to the Planning Commission prior to hearing this matter.

As described in the Revised FEIR, this Project entails construction of the largest warehouse development in the nation. For a development of this magnitude, it is vital to properly disclose the environmental consequences of the proposed action and to identify and adopt all feasible mitigation measures and alternatives. Unfortunately, the Revised FEIR continues to fail in its duty to comply with the California Environmental Quality Act (“CEQA”). As such, the City cannot rely on the environmental review contained in the document for the purpose of Project approval, and must require preparation and circulation of a new Recirculated Draft Environmental Impact Report (“Recirculated DEIR”) to allow the public and decision-makers an opportunity for meaningful review of the Project’s impacts, prior to issuing any Project approvals.

I. The Air Quality Analysis Continues To Be Flawed.

The various versions of the EIR constantly have sought to understate air quality impacts from this project. But, high levels of emissions and impacts will result from this Project. The thousands of trucks and other vehicles associated with this project will harm a large area of the region with impacts to local residents in the project vicinity most acutely. The decision on this Project is being based on a flawed air quality analysis.

For example, the Statement of Overriding Considerations concludes “[c]urrently, the 2016 AQMP is being reviewed by the U.S. EPA and CARB. Until the approval of the EPA and

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CARB, the current regional air quality plan is the Final 2012 AQMP adopted by the SCAQMD on December 7, 2012. Therefore, consistency analysis with the 2016 AQMP has not been included.” Statement of Overriding Considerations, at 151. This is wrong. The EPA approved the 2016 AQMP on October 1, 2019. 84 Fed. Reg. 52005 (Oct. 1, 2019). Therefore, the EIR must analyze the projects compliance against the 2016 AQMP. Moreover, conclusory statements about compliance with the 2016 AQMP are not sufficient. The Revised FEIR and the Statement of Overriding Considerations must actually analyze compliance with this most recently approved air plan.

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CON

The Revised FEIR also continues to ignore the feasibility of implementing zero-emission technologies, including zero-emission trucks – amongst many classes (ie class 2-8) – as a mitigation measure. The Revised FEIR notes “[t]he mitigation measures adopted included some of the suggestions from [California Air Resources Board’s (“CARB”)] previous letters, but do not include the zero-emission technology requirements. Subsequent environmental review may require that specific technology that work with future users be required as condition of approval, but a broad requirement that unknown future users use a specific technology is not currently feasible since current zero-emission technology is very limited in medium-duty and heavy-duty trucks.” Revised FEIR, at 89.

The Revised FEIR’s dismissal of zero-emissions technologies for a project that spans decades based on an analysis from the past is not supported by CEQA. The Revised FEIR notes that “[t]he status of zero-emission technology was addressed in the responses to both of CARB’s previous letters. Essentially, as CARB’s ongoing multi-year planning (not implementation) effort on the Sustainable Freight Plan to lay out pathways to get to a zero-emission freight sector demonstrates, there are no commercially available technology zero-emission on-road heavy-duty trucks available and as CARB’s own progress report on heavy-duty technology and fuels assessment states zero- and non-zero emission technologies are still at the demonstration phase.” Revised FEIR, at 89. This basis is largely based on an analysis completed by CARB in 2015.

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In fact in a more recent fact sheet from the Air Resources Board, the commercial availability is answered with the following:

Are any zero-emission trucks commercial available?

There are more than 70 different models of zero-emission vans, trucks, and buses that already are commercially available from several manufacturers. Most trucks and vans operate less than 100 miles per day and several zero-emission configurations are available to serve that need. As technology advances, zero-emission trucks will become suitable for more applications. Most major truck manufacturers have announced plans to introduce market ready zero-emission trucks in the near future.

California Air Resources Board, Advanced Clean Trucks Accelerating Zero-Emission Truck Markets, available at <https://ww2.arb.ca.gov/sites/default/files/2019-07/190521factsheet.pdf>. In fact, CARB feels comfortable enough with this feasibility of zero-emission trucks that next month it will adopt the Advanced Clean Trucks Rule, which will require manufacturers to produce zero-emission trucks starting as soon as 2024. The Revised FEIR never explains with substantial evidence why zero-emission trucks for any of the classes that will visit this Project

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are infeasible to be used at the project start for a portion (or all) of the trucks servicing the new warehouses as they are built. And the Revised FEIR also does not provide substantial evidence why these zero-emission technologies cannot be used out into the future when CARB will require manufacturers to make zero-emission trucks across a broad class of trucks. See CARB, Proposed Amendments to the Proposed Clean Trucks Regulation, available at <https://ww3.arb.ca.gov/regact/2019/act2019/30daynotice.pdf>. The Revised FEIR failure to address new data on feasibility of zero-emission trucks, including addressing the forthcoming sales mandate from CARB, violates CEQA.

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CONT

II. The Revised FEIR Fails to Adequately Disclose, Analyze the Significance of, and Provide Mitigation for the Project’s Significant Climate Impacts.

The City’s review of this Project’s climate and greenhouse gas (“GHG”) emissions impacts has always been fatally flawed, as outlined in numerous prior comment letters, which are hereby incorporated by reference. The sufficiency of that analysis is now pending before the California Court of Appeal. Now, in a final EIR released only days before the Planning Commission once again considers Project-related approvals, the City and developer have proposed an entirely new strategy for analyzing and mitigating GHG emissions. The new strategy, like the old, fails to satisfy CEQA’s requirements.

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a. Legal Standards

The City’s determinations regarding the significance of greenhouse gas (“GHG”) emissions and the effectiveness of mitigation must be based on a correct interpretation of the law. (See, e.g., *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 956 [agency’s use of erroneous legal standard constitutes a failure to proceed in a manner required by law].) Moreover, because the FEIR continues to use a quantitative threshold as the basis for its significance determination,¹ there must be specific, quantitative evidence to support a conclusion that mitigation measure (“MM”) 4.7.7.1 will actually reduce Project emissions sufficiently to achieve compliance with that threshold. (See *Center for Biological Diversity v. California Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 227-28.) And even to the extent the FEIR is still relying on the prior threshold of 10,000 metric tons CO₂-equivalent (“MM CO₂e”) per year, the same quantitative evidentiary standard controls.

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CEQA establishes strict standards for mitigation. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments.” CEQA Guidelines § 15126.4(a)(2). Development of specific mitigation measures may be deferred only if the agency makes an enforceable commitment to mitigation and adopts specific performance

3-F2-

¹ The EIR contains two independent thresholds of significance. (See Draft Recirculated Revised Sections of the Final Environmental Impact Report at 4.7-18.) Exceedance of either threshold would result in significant climate impacts. Accordingly, the City and developer may not dismiss fatal flaws in the EIR’s analysis of one threshold by attempting after the fact to rely solely on the other.

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standards that measures must meet. (CEQA Guidelines § 15126.4(a)(1)(B); *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 857-58.)

Proposals for the use of offsets or carbon credits as CEQA mitigation must be evaluated in light of other state statutes addressing these instruments. When it adopted Assembly Bill 32 (“AB 32”) in 2006, the Legislature established standards for greenhouse gas offsets used in any statewide Cap-and-Trade system: (1) they must be “real, permanent, quantifiable, verifiable,” and “enforceable” by the California Air Resources Board (“CARB”); and (2) they must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.” (Health & Safety Code, § 38562(d)(1), (2).) CARB adopted regulations applying these standards to carbon credits issued by private “registries”—essentially carbon market brokers—who wish to sell credits for use within the Cap-and-Trade system. (*See* Cal. Code Regs., tit. 17, §§ 95970(a), 95971, 95972.)

Evaluating compliance with these standards requires substantial expertise and rigorous analysis. CARB follows a detailed regulatory process in an effort to establish that offset “protocols”² intended for Cap-and-Trade compliance meet statutory and regulatory requirements. (*See* CARB, *California Air Resources Board’s Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation* (May 2013), at <https://ww3.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf> (visited May 10, 2020); attached as Exhibit A.) Offset credits must represent greenhouse gas reductions that are “permanent” (i.e., will last at least 100 years), “conservatively quantified to ensure that only real reductions are credited,” independently verifiable, and enforceable through “clear monitoring requirements that can be ... enforced by ARB.” (AR 1383:66171.) Offsets also must be “additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative business-as-usual scenario”; this would exclude any “project type that includes technology or GHG abatement practices that are already widely used.” (*Ibid.*; see also *id.*, pp. 66174-75.)

b. Mitigation Measure 4.7.7.1 Fails to Satisfy CEQA’s Requirements

MM 4.7.7.1 falls far short of CEQA’s standards for adequate mitigation. Any finding that the Project’s climate impacts would be less than significant based on implementation of MM 4.7.7.1 would lack both evidentiary and legal support.

i. Mitigation Measure 4.7.7.1 Cannot Support a Conclusion that the Project’s GHG Emissions Will Be Less Than Significant.

MM 4.7.7.1 proposes that the Project’s massive GHG emissions be mitigated through “proof” of either “offsets” or “carbon credits.” (FEIR 1a at 755-56.) As a threshold matter, the

² “Protocols” are, in effect, the rules offset projects must follow. CARB defines an “offset protocol” as “a documented set of procedures and requirements to quantify ongoing GHG reductions or GHG removal enhancements achieved by an offset project and calculate the project baseline. Offset protocols specify relevant data collection and monitoring procedures, emission factors, and conservatively account for uncertainty and activity-shifting and market-shifting leakage risks associated with an offset project.” (Cal. Code Regs., tit. 17, § 95802.)

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difference between “offsets” and “carbon credits” is not explained. “Offsets” appear to be purported GHG reductions from projects *other* than those listed by a registry or conducted pursuant to any established protocol or other recognized mechanism for reducing emissions. Yet MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.” These determinations require rigorous, transparent review and substantial expertise, as reflected in CARB’s Cap-and-Trade regulations and protocol review process. There is no evidence that “the City’s Planning Official” has the expertise or capacity to ensure compliance with or enforcement of these standards. Nor does MM 4.7.7.1 provide any performance standards to guide the Planning Official’s determinations. It also appears that the Planning Official would reach his or her determinations without any public or expert review—in short, without any transparency whatsoever. Finally, to the extent MM 4.7.7.1 would apply similar criteria to “offsets” and “carbon credits,” it cannot ensure compliance with those criteria for the reasons discussed below. As a result, MM 4.7.7.1’s reliance on “offsets” is vague, unenforceable, ineffective, improperly deferred, and inadequate under CEQA.

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The “carbon credits” provisions of MM 4.7.7.1 similarly are unsupported by either law or evidence.

First, there is no evidence MM 4.7.7.1 will result in effective mitigation. Although MM 4.7.7.1 lists the basic criteria required under Health and Safety Code section 38562(d)(1) and (2), it requires the City to “conclusively presume[]” that these criteria are satisfied by any offset credit purchased from “a carbon registry approved by the California Air Resources Board.” (FEIR 1a at 756 [listing without limitation “Climate Action Reserve, American Carbon Registry, Verra [formerly Verified Carbon Standard] or GHG Reduction Exchange (GHG RX)”].) The City cannot simply presume that every carbon credit purchased from one of these registries will meet the referenced criteria. On the contrary, to support such a conclusion, the City would need to identify substantial evidence showing that each and every credit generated under each and every protocol used by each and every registry “approved” by CARB, now or in the future, would meet these criteria. No such evidence exists. Indeed, MM 4.7.7.1’s reliance on a conclusive presumption is a tacit concession that no such evidence exists.

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Tellingly, MM 4.7.7.1 and CARB take complete opposite approaches to review of voluntary market carbon credits marketed by private registries. CARB does not simply presume all credits issued by specified registries are adequate, as MM 4.7.7.1 would require the City to do. Nor does CARB take registries at their word that all of their protocols meet state requirements. Rather, CARB independently evaluates each protocol through a full regulatory process in order to determine whether it complies with state standards. (See generally 17 Cal. Code Regs. §§ 95970-95972; see also Exhibit A.) Using these procedures, CARB has approved only six protocols for use in the Cap-and-Trade system over the last 10 years. (CARB, Compliance Offset Program, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (visited May 8, 2020).) And, as discussed below, CARB’s approved protocols remain beset by serious questions as to their adequacy and efficacy despite this process. MM 4.7.7.1, on the other hand, completely abandons any pretense of review or oversight. It would *require* the City to accept credits generated under any protocol listed by any registry, without any review

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

whatsoever of whether those credits or the protocols they were generated under satisfy the measure’s stated criteria, and without any ability even to question whether the credit is adequate.

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Second, CARB “approval” of a registry does not establish anything about the quality of carbon credits sold by that registry on the voluntary market. The reference to CARB approval in MM 4.7.7.1 is therefore deeply misleading.³ The fact that a registry is “approved by CARB” does not establish that voluntary market carbon credits sold by that registry satisfy the criteria listed in MM 4.7.7.1. CARB approval of a registry to list Cap-and-Trade-compliant credits does not entail CARB review or approval of other protocols used or credits listed by that registry; CARB’s procedures for approving compliance protocols and authorizing registries to list credits generated under those protocols are entirely separate. (Compare 17 Cal. Code Regs. §§ 95970-95972 [CARB compliance protocol approval process] with *id.*, § 95986 [establishing conflict of interest, insurance, expertise, and other business requirements for registries that list Cap-and-Trade compliance credits].) At best, MM 4.7.7.1’s reference to “approved” registries reflects a misinterpretation of CARB’s regulations and their application (or lack thereof) to the quality of offsets traded on the voluntary market; at worst, it reflects an intentional effort to mislead decision-makers and the public. Either way, the measure’s reliance on CARB “approval” is legally erroneous. As a result, a registry’s “CARB-approved” status cannot support any conclusion regarding the effectiveness of MM 4.7.7.1, the ability of registry credits to satisfy the measure’s purported criteria, or the significance of the Project’s impacts after mitigation.

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Third, although each private registry may use a wide range of protocols or methodologies in determining which carbon credits to list for sale, the City cannot simply presume that compliance with those protocols ensures compliance with the criteria that purportedly govern MM 4.7.7.1. All GHG offsets are inherently uncertain because reductions embodied in offset credits must be compared against what would have happened without the offset project—a counterfactual scenario that cannot be tested because it will never happen. (See Haya et al. 2016, attached as Exhibit B.) Studies have shown that even the Cap-and-Trade compliance protocols adopted through CARB’s regulatory process do not result in one-for-one reductions of GHG emissions. (Haya 2019, attached as Exhibit C; Anderson and Perkins 2017, attached as Exhibit D.) CARB’s compliance protocols are largely based on Climate Action Reserve protocols, which suffer from the same deficiencies. Moreover, American Carbon Standard and Verra both list projects using United Nations Clean Development Mechanism (“CDM”) methodologies.⁴

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³ Notably, despite MM 4.7.7.1’s suggestion to the contrary, the “GHG RX” registry has *not* been approved by CARB to handle transactions in Cap-and-Trade offsets. (California Air Resources Board, Offset Project Registries, at <https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm> (visited May 8, 2020), attached as Exhibit M.) The “GHG Rx” program was developed by the California Air Pollution Control Officers Association, but it currently lists no available projects or credits available for purchase, and appears for all practical purposes to be defunct. (See CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020); attached as Exhibit N.)

⁴ See American Carbon Registry, Carbon Accounting, at <https://americancarbonregistry.org/carbon-accounting/old/carbon-accounting> (visited May 8, 2020) (generally accepting CDM methodologies with some additional review); Verra, Verified Carbon Standard Methodologies, at <https://verra.org/methodologies/> (visited May 8, 2020) (accepting “any methodology developed under the [CDM] ... for projects and programs registering with VCS).

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Scientists and academic experts have long criticized CDM offset projects for their lack of additionality and other flaws. (See, e.g., Aldy and Stavins 2012, attached as Exhibit E; Cames et al. 2016, attached as Exhibit F; Haya 2009, attached as Exhibit G; He and Morse 2013, attached as Exhibit H; Wara 2008, attached as Exhibit I; Zhang and Wang 2011, attached as Exhibit J.) Carbon markets can also create perverse incentives that undermine the environmental integrity and additionality of offsets. (Schneider & Kollmuss 2015; attached as Exhibit K.)

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ii. MM 4.7.7.1 Improperly Defers Formulation of Mitigation.

Because MM 4.7.7.1 defers the identification of specific measures to offset the Project’s GHG emissions (whether those measures are denominated “offsets” or “carbon credits”), it must meet CEQA’s requirements for deferred mitigation. It fails to do so. MM 4.7.7.1 lacks specific performance standards “the mitigation will achieve.” (CEQA Guidelines § 15126.4(a)(1)(B).) The measure’s list of basic criteria offsets and credits must satisfy does not suffice, because the measure does not establish any performance standards governing how compliance with those criteria will be measured. Performance standards must be specific, not so vague as to grant officials unfettered discretion as to whether effective mitigation will be implemented at all. See *King and Gardiner Farms*, 45 Cal.App.5th at 857-58. As discussed above, there is no evidence the voluntary market registries’ processes are designed to ensure carbon credits comply with these criteria, and the City cannot wish this lack of evidence away by “presuming” otherwise. Nor is there any evidence the City’s Planning Official can credibly implement these criteria in the absence of any performance standards, guidance, or relevant expertise in evaluating offset projects or carbon credit purchases. MM 4.7.7.1 simply requires the City to presume that whatever a developer submits is adequate. That is not a performance standard. Nor is it even an adequate commitment to ensure mitigation is implemented. MM 4.7.7.1 is improperly deferred.

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iii. MM 4.7.7.1 Improperly Defers Implementation of Mitigation.

Implementation of mitigation under MM 4.7.7.1 is also improperly deferred until after emissions occur. Under CEQA, mitigation measures must be in place before an impact occurs; unmitigated impacts are not permitted before mitigation is implemented. *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 860. Rather, “[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place.” *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738. Accordingly, there must be substantial evidence that GHG reductions embodied in offsets or carbon credits have actually occurred prior to any GHG-emitting activity. MM 4.7.7.1 violates this requirement by allowing a developer to provide offsets or carbon credits as a condition of issuance of a certificate of occupancy. (FEIR 1a at 756). However, a certificate of occupancy cannot be issued until after grading and construction are complete and the buildings are inspected. (See generally 2019 California Building Code, tit. 24, Part 2, § 111.) By that time, all construction-related emissions will have occurred *before* mitigation is in place—a clear violation of CEQA’s prohibition against deferred implementation. Moreover, some carbon credit registries (including Climate Action Reserve) are now marketing carbon credits based on “forecasted” emissions reductions that have not yet occurred. Reliance on such credits—which MM 4.7.7.1 does nothing to restrict—also would violate CEQA’s requirement that mitigation be in place before impacts occur.

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iv. MM 4.7.7.1 Is Not Adequately Enforceable.

MM 4.7.7.1 improperly eliminates any role for the City in enforcing the effectiveness of mitigation. At best, MM 4.7.7.1 relies entirely on enforcement by carbon credit registries, without identifying any evidence as to how or whether enforcement might occur, and how or whether City enforcement could serve as a backstop in the event registry enforcement fails. As a result, credits under MM 4.7.7.1 are not “enforceable by an appropriate agency” as MM 4.7.7.1 purports to require. The term “agency” as used in CEQA means a *public* agency, not a third-party broker of offset credits. (See, e.g., Pub. Resources Code §§ 21001.1, 21004, 21062, 21063, 21065, 21069, 21070.) Public agencies are ultimately responsible under CEQA for the efficacy and enforcement of mitigation measures. Public agencies must make findings regarding the significance of impacts and the incorporation of feasible mitigation measures (*id.*, § 21081), and must adopt mitigation monitoring and reporting plans that ensure implementation and enforcement of mitigation (*id.*, § 21081.6). The City cannot delegate its basic legal responsibilities under CEQA to developers, offset program operators, registries, or other third parties.

Nor can MM 4.7.7.1 be deemed enforceable by virtue of any third-party agreements that might govern the registries’ issuance of carbon credits. Under MM 4.7.7.1, it does not appear the City would even be aware of, much less be able to monitor or enforce, any agreement between an carbon credit project developer and the registry listing the credits. And even if any such agreement were capable of being enforced by the registry (for example, where an offset project violated the agreement and credits issued by that project were subsequently invalidated), MM 4.7.7.1 contains no mechanism that would require the developer to provide additional credits or take any other action. As the California Attorney General pointed out in a recent amicus brief addressing a substantively similar mitigation measure proposed by the County of San Diego, such measures “lack any adequate criteria to ensure enforceability of the offsets purchased...” (Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, *Sierra Club, et al. v. County of San Diego*, Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019), attached as Exhibit L.) MM 4.7.7.1 improperly abdicates the City’s basic enforcement responsibility.

v. MM 4.7.7.1 Appears to Arbitrarily Limit Mitigation Obligations to 30 Years.

Although MM 4.7.7.1 is not entirely clear on this point, it appears that the developer’s mitigation obligations may be limited to “construction and 30-years operation [*sic*] of all Project facilities.” (FEIR 1a at 756 [citing Tables 4.7-8 and 4.7-16].) Yet nothing in the FEIR appears to limit the Project’s operations to a 30 years following buildout. Accordingly, the FEIR’s conclusion that MM 4.7.7.1 will reduce Project emissions to “net zero” is unsupported. Moreover, as the California Attorney General pointed out in its *Sierra Club v. County of San Diego* amicus brief, developments like the Project that increase VMT result in “structural” GHG emissions that likely will continue well beyond 2050, jeopardizing the state’s ability to meet its

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long-term emissions reduction goals.⁵ (See Exhibit L at 22-23.) Mitigation obligations must continue throughout the life of the project.

vi. The FEIR Fails to Address Potentially Significant Impacts of Mitigation.

The FEIR adds an entirely new mitigation strategy, but fails to address any of the environmental impacts of that strategy. CEQA requires analysis of potentially significant impacts that could occur from implementation of mitigation measures. (CEQA Guidelines § 15126.4(a)(1)(D).) Two offset project types generating large shares of offsets on the voluntary offset market globally can have significant environmental and social impacts. Large hydropower projects often impact river water quality and river ecosystems (Haya & Parekh 2011; attached as Exhibit O). Numerous articles have documented the impact that avoided deforestation offset projects have had by displacing forest communities or barring forest communities from their traditional use of the forest. (See, e.g. Kansanga & Luginaah 2019, attached as Exhibit P; Beymer-Farris & Bassett 2012, attached as Exhibit Q.) Researchers also have identified severe adverse environmental and social effects from international forest carbon projects. (See, e.g., Cavanagh & Benjaminsen 2014, attached as Exhibit R.) In the United States and around the world, solar and wind energy projects, livestock digesters, and solid waste to energy projects—all of which are eligible carbon offset projects under various registry protocols—can damage wildlife habitat and increase air pollution. The FEIR’s complete omission of any analysis of these readily foreseeable environmental impacts is legal error and also deprives the FEIR of any evidentiary support.

c. The FEIR Must Be Recirculated for Full Public Review and Comment.

The FEIR contains significant new information and must be recirculated for public review and comment before being considered by the City. (CEQA Guidelines § 15088.5.) The FEIR reflects a fundamental change in how climate impacts are disclosed, analyzed, and mitigated. Prior to release of the FEIR, environmental review for this Project assumed that all GHG emissions with some tenuous connection to the state’s Cap-and-Trade system (what the FEIR still misleadingly calls “capped” emissions) could be dismissed as less than significant. Now, with the California Court of Appeal poised to rule on the correctness of this argument, the City and the developer have switched strategies entirely, substituting a “net zero” analysis for the EIR’s previous “capped emissions” analysis.

Recirculation is required here for at least two reasons. First, the FEIR’s new analysis, however conditional, shows that prior versions of the EIR were fundamentally inadequate. By including a brand new mitigation strategy in the FEIR only a few days before the Planning Commission hearing, the City has thwarted meaningful public comment on significant new information raising complex new issues. Recirculation is required on this basis alone. Second, the FEIR’s new analysis in reveals that impacts previously dismissed as insignificant before mitigation are, in fact, significant. Table 4.7-5 as it appeared in the Draft Recirculated Revised

⁵ This aspect of the Project also deprives the FEIR’s conclusions under the second threshold of significance for climate impacts (interference with policies or plans) of support.

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Sections of the Final Environmental Impact Report measured only “Total Uncapped” Project emissions in applying the 10,000 MT CO₂e/year significance threshold. (DRRSFEIR at 4.7-27 to 4.7-28.) The table thus concluded that emissions for 2020 through 2023 would be less than significant without mitigation, even though “Total Capped” emissions exceeded 10,000 MT CO₂e for each year. (*Ibid.*) The FEIR, in contrast, at least conditionally considers all Project emissions—both “capped” and “uncapped”—in applying the 10,000 MT CO₂e/year threshold. By this measure, Project emissions for 2020 through 2023 would exceed the 10,000 MT CO₂e threshold in each year, and thus would be significant before mitigation. The FEIR may not dismiss this impact by concluding that MM 4.7.7.1 will prevent any significant impact after mitigation; the significance of impacts must be disclosed and analyzed prior to development and incorporation of mitigation measures, not after. avoidance (See *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 655-58.) The FEIR must be recirculated.

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III. The Revised FEIR’s Continued Reliance on the Cap and Trade Program to Cover the Vast Majority of GHG Emissions Remains Unlawful.

The Response to Comments in the Revised FEIR does not resolve the significant critiques to the GHG analysis. In fact, it doubles down on the flawed approach of using cap and trade as a mechanism to disguise the vast majority of GHG emissions from this Project. This letter solely addresses a few new items included in the Revised FEIR.

Importantly, the California Air Resources Board, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, has stated several times that the “[Cap-and-Trade] Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground.”⁶ In fact, this issue was raised in the Final Statement of Reasons for the 2018 revisions to the California Environmental Quality Act Guidelines where the Building Industry Association made the following request:

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Comment 44.37

Guideline 15064.4. Analyzing Impacts from Greenhouse Gas Emissions
Consistent with *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, the following sentence should be added at the end of subsection (b)(3): “Project-related greenhouse gas emissions resulting from sources subject to the cap-and-trade program shall not be considered when determining whether the project-related emissions are significant.”⁷

The Natural Resources Agency emphatically rejected this comment from the Building Industry Association in stating the following:

⁶ Letter from California Air Resources Board to Moreno Valley, September 7, 2018, *available at* https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.143040245.1938875667.1580500719-1770248365.1564513994.

⁷ California Natural Resources Agency, Final Statement of Reasons for Regulatory Action Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, Exhibit A. at p. 219 (November 2018) *available at* http://resources.ca.gov/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

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Response 44.37

The Agency declines to make any changes in response to this comment. The decision in Association of Irrigated Residents v. Kern County Board of Supervisors (2017) 17 Cal.App.5th 708 (“AIR v. Kern”) is from one state appellate court and has not been consistently applied by any other appellate courts. Moreover, the Agency finds that the case does not support the suggested addition. The holding in that case is limited to its facts. That court held only that the CEQA Guidelines may authorize a lead agency to determine that a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap-and-Trade program. The project in that case was directly regulated by the Cap-and-Trade program. The decision did not hold that all emissions from may be subject to the Cap-and-Trade regulation at any point in the supply chain are exempt from CEQA analysis, regardless of how those sources are used by the project.⁸

The Natural Resources Agency further elaborated referencing the Air Resources Board’s letter on the exact project studied in the Draft Recirculated FEIR.

The Agency notes that the California Air Resources Board (CARB) has prepared an extensive legal analysis setting forth why the Cap-and-Trade program does not excuse projects from CEQA’s analysis and mitigation requirements, including emissions from vehicular trips or energy consumption from development projects. (This analysis, prepared by CARB as CEQA comments regarding a major freight logistics facility, is available at <https://www.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf>.) The Agency further notes that CARB’s analysis is consistent with this Agency’s discussion of how greenhouse gas regulations factor into a CEQA analysis of greenhouse gas emissions. (See Final Statement of Reasons (SB 97), December 2009, at p. 100 (“Lead agencies should note ... that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant”).)

The effect of existing regulations is addressed further in the updates to Sections 15064(b) and 15064.7 of the CEQA Guidelines.⁹

Thus, the agency responsible for implementation of AB 32 and the Cap-and-Trade Program, in addition to the agency responsible for drafting the CEQA Guidelines the Draft Recirculated FEIR relies upon for authority disagrees with the approach taken by the City to rely on Cap-and-Trade for all transportation and energy emissions.

Instead of adhering to the position of the relevant agency, the Revised FEIR continues to rely on two agencies that deserve no deference on this issue. But, even if these agencies positions were entitled to deference on this issue, which they are not, the evidence in the record is flawed. The Revised Final EIR includes new attachments A and B, which are the specific South Coast AQMD Documents relied upon for the conclusion to support the use of cap and trade to erase

⁸ *Id.*

⁹ *Id.*

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transportation and energy emissions. Importantly, both of these documents are from 2014. Since that time, the South Coast has produced several other CEQA documents. In fact, in the most recent document from 2020, they do not use this same approach of arguing emissions from transportation will be addressed under the cap and trade program. See South Coast AQMD, Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Environmental Impact Report, available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>. The Developer asked the South Coast to weigh in on its settlement in Attachment Q, so it is unclear why the Developer failed to ask whether the South Coast AQMD continues to use this clearly flawed cap and trade rationale for transportation and energy-related emissions. In reviewing the other CEQA documents where the South Coast AQMD was a lead agency, I could not find other instances of this approach being used after 2014.



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In the context of the San Joaquin Valley APCD document, the Revised FEIR fails to explain the relevance of an agency interpretation that has no nexus to this Project. Because of this, the City must recirculate a Draft EIR to properly disclose the significant climate pollution impacts from this Project.

IV. The FEIR Must Be Recirculated Before Project Approval and Certification.

Under CEQA, an EIR must be re-circulated for review and comment whenever significant new information becomes known to the lead agency and is added to the EIR after public notice of the availability of the draft document has been made, and before the EIR is certified. Pub. Res. Code § 21092.1. Under such circumstances the lead agency is specifically required to re-notice the environmental review document to the public and all responsible agencies, and is required to obtain comments from the same, before certifying the document’s impacts and alternatives analyses as well as any mitigation measures. See *id.*; see also, Pub. Res. Code § 21153. A lead agency’s decision not to recirculate an EIR must be supported by substantial evidence. Cal. Code Regs. tit. 14 (“CEQA Guidelines” or “Guidelines”) § 15088.5(e). “Significant new information” includes any information regarding changes in the environmental setting of the project under review. Guidelines § 15088.5(a). It also includes information or data that has been added to the EIR and is considered “significant” because it deviates from that which was presented in the draft document, depriving the public from a meaningful opportunity to comment upon a significant environmental effect of the project, or a feasible way to mitigate or avoid such an effect at the time of circulation of the draft. *Id.* Some examples of significant new information provided in the CEQA Guidelines are: “(1) information relating to a new significant environmental impact that would result from the project or a new mitigation measure; (2) a substantial increase in the severity of an environmental impact [that] would result unless mitigation measures are adopted; and (3) any feasible alternative or mitigation measure considerably different from others previously analyzed ...” Guidelines § 15088.5 (a)(1)-(3). Recirculation is further required where the draft EIR is “so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.” Guidelines § 15088.5 (a).

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The required re-noticing and new comment period for a re-circulated EIR is essential to meeting CEQA’s procedural and substantive environmental review requirements, as the EIR’s

assessment of a project’s impacts, mitigation measures and alternatives and the public’s opportunity to weigh in on the same is at the heart of CEQA. *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1123. Where new information is added to an EIR in such a way as to highlight informational deficiencies in the draft document’s environmental impacts, mitigation and alternatives analyses, the public must be allowed the opportunity and additional time to comment on the changes made in the final document’s analyses. Moreover, where significant new information that is added to the EIR’s assessment of a particular impact area falls within the purview of another responsible agency’s area of expertise that agency must also be allowed a meaningful opportunity to review and respond to such new information and any changes implicated in the EIR’s analyses.

While re-circulation is indeed an exception and not the rule in the preparation of final environmental review documents, it is an exception that must be invoked here – where the absence of significant information rendered the draft EIR ineffective in meeting CEQA’s substantive mandates, and now, where included, the addition of significant new information substantially changes the FEIR’s analyses and conclusions regarding the Project’s impacts, feasible alternatives and required mitigation. *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1132. As stated in numerous comments to the various versions of the EIR, that document failed to provide critical information regarding the project area and scope of the project’s impacts; it failed to adequately describe fundamental information relating to the phasing and timing of the project’s massive structural and infrastructural developments; it lacked adequate detail specifically regarding the construction and operations phases of the project; and it contained analyses and mitigation measures relating to the Project’s air quality, traffic, human health and biological resources impacts based on outdated or inapplicable studies and data. In some instances the Revised FEIR erratically and arbitrarily includes selective new data into its analysis of the Project’s impacts and mitigation measures, and in others critical information remains absent from the document. Whether referenced in the Revised FEIR as new information, or wholly omitted from the document’s analyses, the addition of such information is essential to the public’s ability to participate in the environmental review process. The Revised FEIR must therefore be re-drafted and re-circulated document to provide the public at large and the Project’s numerous other responsible agencies with more time to review and analyze the Project’s impacts and to assess or prescribe necessary mitigation measure to minimize those impacts. The City cannot render a determination on the issuance of the project approvals under consideration until such recirculation occurs, and CEQA compliance is assured.

V. The Draft Statement of Overriding Considerations is Unsupported by Substantial Evidence and Fails To Justify the Project’s Significant Impacts and Interference with Health Protective Air Quality Standards Attainment

The Statement of Overriding Considerations is insufficient to justify the Project’s significant and unavoidable impacts for the reasons explained below. The statement’s terms are insufficiently analyzed in both the draft EIR and in the Revised FEIR. Moreover because the Revised FEIR as a whole suffers from serious deficiencies that taint the whole of the analyses contained in the document, the draft statement cannot adequately weigh the Project’s adverse, significant impacts with the espoused benefits from the Project contained in any statement of overriding considerations. *Vedanta Society of So. California v. California Quartet, Ltd.* (2000)

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84 Cal.App.4th 517, 530 (a project with significant and unmitigated environmental impacts can only be approved when “the elected decision makers have their noses rubbed” in the Project’s environmental effects, and still vote to move forward). As such the statement and its purported benefits must be rejected.

As the lead agency for the Project, if the City is to approve a project of this magnitude, and with the unmitigated significant environmental and human health impacts that the Project will cause, it “must adopt a statement of overriding considerations.” Pub Res. Code § 21081, subd. (b); Guidelines, § 15093. In contrast with mitigation and feasibility findings, overriding considerations can be “larger, more general reasons for approving the project, such as the need to create new jobs, provide housing, generate taxes, and the like.” *Concerned Citizens of South Central L.A. v. Los Angeles Unified School Dist.* (1994) 24 Cal.App.4th 826, 847. Yet, like mitigation and feasibility studies, a statement of overriding consideration is also subject to a substantial evidence standard of review. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).” Thus, an agency’s unsupported claim that the project will confer general benefits is insufficient, and the asserted overriding considerations must be supported by substantial evidence in the FEIR or somewhere in the record. *Sierra Club v. Contra Costa County* (1992) 10 Cal.App.4th 1212, 1223; Guidelines § 15093, subd. (b).”

As part of the EIR review process, statements of overriding consideration are intended to “vindicate the ‘right of the public to be informed in such a way that it can intelligently weigh the environmental consequences’ of a proposed project[;]” and they must make a good-faith effort to inform the public of the risks and potential benefits of the Project whose approval is proposed. *Woodward Park Homeowners Ass’n, Inc. v. City of Fresno* (2007) 150 Cal.App.4th 683, 717-718 (citing *Karlson v. City of Camarillo* (1980) 100 Cal.App.3d 789, 804).

In accordance with this standard, before approving the Project and the FEIR the City must show that it has considered each of the Project’s significant and unavoidable impacts in light of **each** of the alleged overriding considerations that it asserts will justify those impacts. *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 357 (upholding a statement of overriding consideration on the basis that “the City found the project had eight benefits, each of which ‘separately and individually’ outweighed its unavoidable impacts). Thus, the City must specifically consider and set forth overriding considerations to justify the Project’s significant and unavoidable direct indirect and cumulative impacts in each of the following areas: aesthetics, land use and biological resources, noise, traffic and air quality.

The statement of overriding consideration attached to the FEIR asserts two general areas of benefits that it asserts outweigh the Project’s significant and detrimental, un-mitigated impacts: (1) an increase in jobs that improves the job to housing ratio in the City of Moreno Valley, and (2) an increase the in the City’s overall tax revenue, which could be used to improve schools and confer other public benefits to the residents of the City. Any additional public benefits that the draft statement assumes may result from approval of the Project flow from one of those two underlying considerations.

These two alleged benefits are, however, based on erroneous assumptions that (a) the

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Project will bring secure, desirable and certain jobs to the City of Moreno Valley; and (b) that the environmental degradation caused by the Project’s significant and unavoidable impacts will not outweigh the benefits conferred by the Project in monetary terms, or based on any other form of valuation methodologies. While the draft statement sites thoroughly to “appendix O” the Fiscal and Economic Impact Study, it fails to account for aspects of the job market that will undoubtedly impact the nature and desirability of the jobs made available at the Project, if it is approved, constructed and permitted to operate. Just some of these unmentioned aspects include trends towards employing largely contract, part-time or temporary or short-term labor to fill the jobs created by the WLC. Indeed the study is based on an assumption that either the WLC or other logistics uses will result in the permanent employment of .5 employees per 1,000 building square feet. Appendix O, at 20. Yet the study fails to calculate what the rate of employment would be if some or all of those jobs were characterized as part-time or temporary contract labor employment.

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The draft statement of overriding considerations similarly fails to account for any discrepancy in full-time vs. part time, temporary or contract jobs. Moreover, additional aspects of job desirability including working conditions for laborers employed at the WLC or similar logistics enterprises that would operate in the project area are left wholly omitted from both the Appendix O study and the statement, and to the extent the draft statement relies on the development agreement to ensure that such jobs are actually ensured, such assurances are illusory as the development agreement terms remain unclear.

The draft statement of overriding considerations also fails to adequately quantify, either monetarily or based on some other form of valuation method, the consequences of the Project’s impacts, specifically including its impacts to human health, the environment and invaluable threatened and endangered biological resources that surround the proposed project area.

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Weighing the Project’s true impacts against its purported benefits is a critical environmental review requirement. *See Woodward Park Homeowners Ass’n, Inc. v. City of Fresno*, 150 Cal.App.4th, 720. The City must therefore engage in a good faith effort to thoroughly analyze of the full scope of the impacts for which the statement of overriding consideration is being offered.

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Doing so here would involve some process by which to measure conclusory statements that fully contradict the evidence on the record, such as the statement that the Project will improve health public health. Draft Statement of Overrid., at 209.

Finally, the draft statement of overriding considerations fails to justify the Project’s impediment to the South Coast Air Basin achieving federal and state NAAQS, and it’s steady, foreseeable future contribution to the region’s ability to meet Air Quality Management Plan targets, which are essential to ensuring compliance with state and federal law. The statement of overriding consideration cannot, in essence justify the Project’s apparent conflict of potentially causing violations of air quality standards, which carry severe economic sanctions for the 18 million people living the South Coast Air Basin based on parochial economic justifications for one city.

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For these reasons stated herein and because the alleged Project benefits included in the draft statement of overriding consideration run counter to the evidence on the record, the City cannot approve the Project, and cannot certify the Revised FEIR as an informational document.

3-F2-1

Given the limited time, this comment only raises some of the issues that are of concern related to this project. We appreciate your consideration of these comments. Please do not hesitate to contact us at amartinez@earthjustice.org if you have questions about this comment letter.

3-F2-1

Sincerely,



Adriano L. Martinez
Earthjustice

3-F2-1

The following Exhibits have been emailed to the Planning Commission for Review.

Exhibit List
(All exhibits submitted in electronic format)

Exhibit	Title
A	California Air Resources Board, <i>California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap and Trade Regulation</i> (May 2013).
B	Haya, B., A. Strong, E. Grubert, and D. Cullenward, <i>Carbon Offsets in California: Science in the Policy Development Process</i> , in J.L. Drake et al. (eds.), <i>Communicating Climate-Change and Natural Hazard Risk and Cultivating Resilience</i> , <i>Advances in Natural and Technological Hazards Research</i> 241-254 (2016) ("Haya et al. 2016").
C	Haya, B. (2019). The California Air Resource Board's U.S. Forest Projects offset protocol underestimates leakage. GSPP Working Paper ("Haya 2019").
D	Anderson, C. & J. Perkins. (2017). Counting California Forest Carbon Offsets: Greenhouse Gas Mitigation Lessons from California's Cap-and-Trade U.S. Forest Compliance Offset Program. Stanford ("Anderson & Perkins 2017").
E	Aldy, J. E. & R. N. Stavins. (2012). The Promise and Problems of Pricing Carbon: Theory and Experience. <i>Journal of Environment & Development</i> , 2, 152-180 ("Aldy & Stavins 2012").
F	Cames, M., R. O. Harthan, J. Füssler, M. Lazarus, C. M. Lee, P. Erickson & R. Spalding-Fecher. (2016). How additional is the Clean Development Mechanism? Berlin ("Cames et al. 2016").
G	Haya, B. (2009). Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism (Report No. ERG09-001). Berkeley: Energy and Resources Group ("Haya 2009").

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

H	He, G. & R. Morse. (2013). Addressing Carbon Offsetters' Paradox: Lessons from Chinese Wind CDM. <i>Energy Policy</i> , 63, 1051-1055 ("He & Morse 2013").
I	Wara, M. (2008). Measuring the Clean Development Mechanism's Performance and Potential. <i>UCLA Law Review</i> , 55, 1759-1803 ("Wara 2008").
J	Zhang, J. & C. Wang. (2011). Co-benefits and additionality of the clean development mechanism: An empirical analysis. <i>Journal of Environmental Economics and Management</i> , 140-154 ("Zhang & Wang 2011").
K	Schneider, L. & A. Kollmuss. (2015). Perverse effects of carbon markets on HFC-23 and SF6 abatement projects in Russia. <i>Nature Climate Change</i> , 5, 1061-1063 ("Schneider & Kollmuss 2015").
L	Amicus Brief of the California Attorney General in Support of Petitioners and Respondents, <i>Sierra Club, et al. v. County of San Diego</i> , Cal. Ct. App., Fourth Dist., Div. 1, Case No. D075478 (filed Oct. 29, 2019).
M	California Air Resources Board, Offset Project Registries, at https://ww3.arb.ca.gov/cc/capandtrade/offsets/registries/registries.htm (visited May 8, 2020).
N	CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx), at www.ghgrx.org (visited May 8, 2020).
O	Haya, B. & P. Parekh. (2014). Hydropower in the CDM: Examining additionality and criteria for sustainability (Working Paper ERG-11-001). Berkeley: Energy and Resources Group ("Haya & Parekh 2011").
P	Kansanga, M. M. & I. Luginaah. (2019). Agrarian livelihoods under siege: Carbon forestry, tenure constraints and the rise of capitalist forest enclosures in Ghana. <i>World Development</i> , 113, 131-142 ("Kansanga & Luginaah 2019").
Q	Beymer-Farris, B. A. & T. J. Bassett. (2012). The REDD menace: Resurgent protectionism in Tanzania's mangrove forests. <i>Global Environmental Change</i> , 22, 332-341 ("Beymer-Farris & Bassett 2012").
R	Cavanagh, C. & T. A. Benjaminsen. (2014). Virtual nature, violent accumulation: The 'spectacular failure' of carbon offsetting at a Ugandan National Park. <i>Geoforum</i> , 56, 55-65 ("Cavanagh & Benjaminsen 2014").

RESPONSES TO LETTER 3-F2: ADRIAN MARTINEZ, EARTHJUSTICE

Response to Comment 3-F2-1: The comment asserts that the information within the Revised Final EIR includes significant new information, including new mitigation strategies, and therefore, the commenter requests additional time for public review. The responses and errata provided in the Revised Final EIR does not alter the significance conclusions provided in the draft EIRs (i.e., Revised Sections of the Final EIR [RSFEIR]). The reference to new mitigation strategies refer to the addition of Mitigation Measure 4.7.7.1. The addition of the mitigation does not change the impact determination, will reduce the impact of greenhouse gas emissions and would not result in a new significant impact as discussed on pages 755 to 756 within Section 4.3.1 of the Final Response to Comments. The introduction of a new mitigation measure therefore does not meet any of the requirements for recirculation set forth in CEQA Guidelines Section 15088.5(a). As required by CEQA Guidelines Section 15088, the City of Moreno valley as the Lead Agency, provided written responses to public agencies that commented on either the RSFIER or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR.

Response to Comment 3-F2-2: The commenter states that their comment is attached to the e-mail and that forthcoming emails will contain relevant attachments referenced in the comment letter. No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F2-3: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F2-4: The comment claims that the Revised Final EIR fails to comply with CEQA and serves as an introduction to specific comments on the contents of the Revised Final EIR.

Response to Comment 3-F2-5: The commenter claims that the Revised Final EIR understates air quality impacts from the Project. To the contrary, the air quality analysis includes several conservative assumptions that include but are not limited to 1) a compressed construction schedule, (see Section 4.3, page 4.3-20), 2) more project construction is occurring sooner rather than later, when air quality improvements in construction equipment could be available (see Section 4.3, page 4.3-20), 3) construction phase and plot activity overlap (see Section 4.3, page 4.3-20), 4) utilizing EMFAC2017 vehicle fuel mix projections which assumes zero electric heavy duty trucks (see Section 4.3, page 4.3-21), and 5) assuming 5-minute idling while Mitigation Measure 4.3.6.2A and 4.3.6.3B limit idling to 3 minutes (Section 4.3, page 4.3-22). Therefore, the Revised Final EIR has not understated air quality impacts, but rather has provided a conservative analysis to properly present potential impacts related to air quality.

Also, in the Settlement Agreement between the developer and the South Coast Air Quality Management District (“SCAQMD”) for the Project as referenced in Response to Comment 2-F2-23, the SCAQMD determined that the approximately \$26 million Air Quality Improvement Fee to be paid by the applicant “will adequately mitigate heavy-duty truck related air quality impacts that may result from the construction and operation of the World Logistics Center”

Response to Comment 3-F2-6: According to 84 Fed. Reg. 52005, the EPA has approved the five state implementation plan (SIP) revisions to meet Clean Air Act requirements for the 1970 1-hour, 1997 8-hour, and 2008 8-hour ozone national ambient air quality standards (NAAQS) in the Los Angeles – South Coast

Air Basin, California ozone nonattainment area.⁵ At the time of preparation of the 2019 Draft Recirculated RSFEIR, the 2016 AQMP had not been approved by the EPA. Nonetheless, a detailed discussion of the 2016 AQMP is included on page 4.3-12 to 4.3-13. Additionally, the 2019 Draft Recirculated RSFEIR states that the “project would comply with all applicable rules and regulations enacted as part of the 2016 AQMP, including transportation control measures from the 2016 RTP/SCS” (2019 Draft Recirculated RSFEIR, page 4.3-37).

Response to Comment 3-F2-7: The commenter claims that the Revised Final EIR ignores the feasibility of implementing zero-emission technologies. See Response to Comments 1-B1-4 and 1-B2-12 for discussion of CARB’s proposed Advanced Clean Trucks Rule and discussion of the viability of such technologies while the Project is under construction. Also discussed are pilot programs funded by CARB for electric truck fleets.⁶ Therefore, the Revised Final EIR does not dismiss nor ignore the feasibility of zero-emission technologies. Section 6.17 (Part 2 of the Revised Final EIR) addresses the potential penetration of electric trucks and potential use in association with the Project. As noted by the commenter, the potential for electric vehicle penetration is possible. However, as noted in Part 2 of the Revised Final EIR (page 4.3-21), the emissions calculations relies on EMFAC2017’s projected vehicle fuel mix, which assumes zero electric heavy-duty trucks, to ensure that worst case emissions have been assumed . Assuming zero electric trucks and analyzing the worst case emissions from the Project fleet does not exempt future development from complying with vehicle fleet fuel requirements at the time of development approval. Therefore, the Revised Final EIR has not failed to address new data on feasibility of zero-emission trucks and, therefore, complies with CEQA.

Response to Comment 3-F2-8: The comment claims that the approach to GHG analysis in the Revised Final EIR is flawed and serves as an introduction to specific comments on the GHG analysis and mitigation strategies, which are addressed below.

Response to Comment 3-F2-9: The implementation of new Mitigation Measure 4.7.7.1, as revised (see Response to Comment 3-B2-3) will mitigate to net zero all Project GHG emissions remaining after the application of other mitigation measures. Therefore, although not required by law, the Project Applicant has committed to net zero GHG emissions per Mitigation Measure 4.7.7.1, which would be below the quantitative significance threshold. Specific quantitative evidence is that Mitigation Measure 4.7.7.1 will provide proof to the City that Project GHG emissions are offset or carbon credits are purchased and these reductions are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency” which is the same language that CARB has adopted in their regulations to ensure that offsets and carbon credits do what they are supposed to do. See 17 California Code of Regulations §95802(a). Thus, the mitigation measure is enforceable under CEQA as the appropriate agency will oversee the offsets and/or carbon credits and assure that the requirement is met and then the proof will be submitted to the City.

Response to Comment 3-F2-10: Refer to Master Response to Earthjustice appeal.

⁵ 84 Fed. Reg. 52005. Document Number 2019-21325. <https://www.federalregister.gov/documents/2019/10/01/2019-21325/approval-of-air-quality-implementation-plans-california-south-coast-air-basin-1-hour-and-8-hour>

⁶ California Air Resources Board, 2019. CARB Approves \$533 million funding plan for clean transportation investments, October 25, 2019. Available online: <https://ww2.arb.ca.gov/news/carb-approves-533-million-funding-plan-clean-transportation-investments>

Response to Comment 3-F2-11: The comment claims that MM 4.7.7.1 falls short of CEQA's standards for adequate mitigation, that difference between “offsets” and “carbon credits” is not explained, and that MM 4.7.7.1 provides no standards for the City’s Planning Official to use in determining whether such “offsets” are “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.”

Mitigation Measure 4.7.7.1 has been revised to specify that “the developer shall mitigate the WLC Project’s remaining GHG emissions to net zero by purchasing and retiring offset carbon credits” that have been “registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a).” For an explanation of why Mitigation Measure 4.7.7.1 meets the CEQA standard for adequate mitigation, please see Master Response to Earthjustice appeal.

Response to Comment 3-F2-12: The comment states that there is no evidence MM 4.7.7.1 will result in effective mitigation, and that the City cannot simply presume that every carbon credit purchased from one of CARB’s approved registries will meet the referenced criteria of being “real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency” because the City could not provide substantial evidence that each credit from a CARB-approved registry would meet these criteria.

As explained in Master Response to the Earthjustice appeal, the third-party validation and verification process established by each of the CARB-approved registries is designed to ensure that the offset credits they approve and list do meet these criteria.

Mitigation Measure 4.7.7.1 has been revised to specify that the developer, for each offset carbon credit used for mitigation, “shall provide the City’s Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.” As explained in Master Response to the Earth Justice appeal, these records are kept by each of the CARB-approved registries and are publicly available.

Response to Comment 3-F2-13: The comment states that the fact that a registry is “approved by CARB” does not establish that voluntary market carbon credits sold by that registry satisfy the criteria listed in MM 4.7.7.1.

As explained in Master Response to Earthjustice appeal, the third-party validation and verification process established by each of the CARB-approved registries is designed to ensure that the offset credits they approve and list do meet the criteria listed in MM 4.7.7.1. Through their formal verification programs and protocols, each of these registries applies the same standard of quality to all offset credits – regardless of their end use in the compliance or voluntary markets.

Response to Comment 3-F2-14: The comments states that the City cannot presume that compliance with the protocols in the approved registries ensures compliance with the criteria that purportedly govern carbon credits as defined by MM 4.7.7.1. As explained in Master Response to Earthjustice appeal the City can presume that offset credits listed under CARB’s approved registries, as independently validated and verified, are in compliance with the criteria that they be “real, permanent, additional, quantifiable, verifiable, and enforceable.” This applies to all offset projects listed in these registries, regardless of the protocol used to quantify their reductions.

Response to Comment 3-F2-15: The comment claims that MM 4.7.7.1 does not establish any performance standards governing how compliance with offset criteria will be measured. Mitigation Measure 4.7.7.1 has been revised to require the developer, in order to prove that the offset carbon credits meet the required criteria, shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired. As explained in Master Response to Earthjustice appeal, the offset carbon credits listed under CARB's approved Offset Project Registries go through a rigorous process of independent validation and verification. As such, they meet the criteria that they are "real, permanent, additional, quantifiable, verifiable, and enforceable" as those terms are defined in 17 California Code of Regulations § 95802(a).

Response to Comment 3-F2-16: Mitigation Measure 4.7.7.1 has been revised to require the retirement of the appropriate amount of carbon credits equal to the amount of GHG emissions resulting from grading, construction, and operation of facilities prior to issuance of grading permits, building permits, and certificate of occupancy, respectively. See Response to Comment 3-B2-3 for the revised measure. Revisions made to Mitigation Measure 4.7.7.1 would ensure that mitigation would be in place prior to occurrence of impacts.

Response to Comment 3-F2-17: The comment claims that MM 4.7.7.1 is not adequately enforceable because it supposedly eliminates any role for the City in enforcing "the effectiveness of the mitigation." CEQA's requirement that mitigation measures be "fully enforceable" means that the performance of the mitigation must be "fully enforceable through permit conditions, agreements, or other measures." (Publ. Res. Code § 21081.6; see also *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 444 (2007).) All of the Project's mitigation measures, including MM 4.7.7.1, are fully enforceable through the Project's approvals and the Development Agreement. The mitigation measure identifies the action to reduce the Project's potentially significant environmental impacts, defines the timing during which the mitigation measure is to be implemented and monitored, and is fully enforceable through permit conditions.

MM 4.7.7.1 requires the developer "to mitigate the WLC Project's emissions to net zero by providing offsets and/or carbon credits" MM 4.7.7.1 also sets forth the specific amounts of GHG emissions to be mitigated through the use of carbon credits or offsets and provides the precise timing as to when the carbon credits are to be retired [at grading permit, building permit or certificate of occupancy stages] correlated to the GHG emissions from each of those stages of development. These requirements are sufficiently concrete to be enforceable. See *Sierra Club v. County of Fresno*, 6 Cal.5th 502, 525-526 (2018) (mitigation measures provide sufficient details to be enforceable). The project mitigation ultimately relies on enforcement from a City planning official which satisfies CEQA's requirement for enforcement by a public agency.

The comment raises concerns regarding reliance on credits that may be subsequently invalidated. The approved registries provide mechanisms to resolve the over-issuance of carbon credits. See Master Response to Earthjustice appeal.

Response to Comment 3-F2-18: As stated on page 4.7-23 of the RSFEIR, "the lifetime of the Project extends until 2064 when the final structures are presumed to have reached their 30-year lifetime." This presumed lifetime is consistent with SCAQMD's Interim CEQA Greenhouse Gas Significance Threshold

Draft Guidance which states, “the project proponent would be required to provide offsets for the life of the project, which is defined as 30 years.”⁷ The Project analysis satisfies this guidance from SCAQMD by calculating year-by-year emissions from the start of construction in 2020 and from Project buildout (2035) through the recommended 30-year lifetime of each warehouse within the Project, ending in 2064.

Response to Comment 3-F2-19: The comment states that the environmental impacts of Mitigation Measure 4.7.7.1 that mitigates the WLC Project’s GHG emissions to net zero by providing carbon offsets and/or credits need to be evaluated. The comment asserts that carbon offsets and/or credits could result in new significant environmental impacts. However, as stated in Mitigation Measure 4.7.7.1, the offsets/credits that are obtained are required to be registered by an Offset Project Registry approved by the California Air Resources Board (CARB). The CARB-approved registries require that the projects generating the carbon offsets/credits must fulfill all applicable local, regional and national environmental requirements that apply based on the offset location as identified in Title 17 of the California Code of Regulations, Sections 95973(b) and 95977.1(b)(3)(D)(2)(f) of the Cap-and-Trade Regulations. Therefore, the potential environmental effects associated with a carbon offset and/or credit are required to be evaluated prior to the carbon offsets/credits being available for the proposed Project.

Response to Comment 3-F2-20: The comment asserts that the information within the Revised Final EIR includes significant new information, including new mitigation strategies, and therefore, recirculation and a public comment period is required. The responses and errata provided in the Revised Final EIR does not alter the significance conclusions provided in the draft EIRs (i.e., Revised Sections of the Final EIR [RSFEIR]). The reference to new mitigation strategies refers to the addition of Mitigation Measure 4.7.7.1. The addition of the mitigation does not change the impact determination, will reduce the impact of greenhouse gas emissions and would not result in a new significant impact as discussed on pages 755 to 756 within Section 4.3.1 of the Final Response to Comments. The introduction of a new mitigation measure therefore does not meet any of the requirements for recirculation set forth in CEQA Guidelines Section 15088.5(a). As required by CEQA Guidelines Section 15088, the City of Moreno Valley as the Lead Agency, provided written responses to public agencies that commented on either the RSFEIR or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR.

The comment also asserts that Revised Final EIR was required to be recirculated because it ostensibly determined that a new significant impact exists prior to the application of MM 4.7.7.1, based on the holding in *Lotus v. Department of Transportation*, 223 Cal.App.4th 645 (2014). The decision in *Lotus* did not involve recirculation, and in fact, the court states: “Whether the correction requires recirculation of the EIR is for Caltrans to decide in light of the standards governing recirculation of an EIR prior to certification.” *Lotus*, 223 Cal.App.4th at 658. Here, the Project’s GHG emissions were fully disclosed in the Draft Recirculated Sections of the FEIR and in the Revised Final EIR, MM 4.7.7.1 was added to reduce the Project’s GHG potentially significant emissions to net zero, a less than significant impact. Recirculation is not required.

Response to Comment 3-F2-21: Mitigation Measure 4.7.7.1, as revised, will mitigate to net zero all Project GHG emissions remaining after the application of other mitigation measures, not relying on Cap and Trade. See Response to Comment 3-B2-3 for the revised measure. This comment is substantially the same

⁷ South Coast Air Quality Management District, 2008. *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, October., page 3-16. Available online: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf)

comment raised by the commenter on the 2019 Recirculated Draft RSFEIR (Comment 2-F3-3) and has been addressed in the Revised Final FEIR Part 1 (Response to Comments). Refer to Response to Comment 2-F3-3 for a discussion of CARB's response to a comment by the California Building Industry Association (CBIA) on the proposed CEQA Guidelines (adopted in 2018).

The SCAQMD prepared a Final Negative Declaration and Addendum for the Phillips 66 – Ultra Low Sulfur Diesel Project in 2004, prior to the 2010 Cap-and-Trade regulation, and thus, the GHG analysis used in the other SCAQMD MND would not have been used in this one. The Phillips 66 Negative Declaration and Addendum was taken to court (California Superior Court, Los Angeles County, Case Nos. BS091275 and BS091276) and ultimately the California Supreme Court found a deficiency in the previously prepared CEQA document, relating specifically the baseline emissions⁸, which required the preparation of an EIR. Other aspects of the CEQA documents that were challenged in the litigation were rejected by the trial court's rulings and were upheld on appeal. Thus, the Phillips 66 ULSD Final EIR⁹ focused only on the air quality analysis with regard to potential NOX emission from operation of the ULSD Project. Therefore, the approach that was used in the SCAQMD documents discussed in the Revised Final EIR (capped transportation and energy emissions under cap-and-trade) was not used in the Phillips 66 MND because cap-and-trade wasn't in existence at the time the original documents were written and the subsequent document only focused on the air quality analysis, specifically NOX emissions from operation of the ULSD. Thus, stating that subsequent SCAQMD CEQA documents, specifically citing the Phillips 66 ULSD Project Final MND prepared in March 2020, did not use the same GHG approach as used in the WLC Project isn't a viable argument as to why the WLC approach is invalid.

Response to Comment 3-F2-22: The comment asserts that the information within the Revised Final EIR includes significant new information, and therefore, recirculation and a public comment period is required. The responses and errata provided in the Revised Final EIR does not alter the significance conclusions provided in the draft EIRs (i.e., Revised Sections of the Final EIR [RSFEIR]). The reference to new mitigation strategies refer to the addition of Mitigation Measure 4.7.7.1. The comment references Section 15088.5(a)(3) of the CEQA Guidelines, and asserts that "significant new information" includes "any feasible alternative or mitigation measure considerably different from others previously analyzed" but omits the qualifying language to that phrase. Section 15088.5(a)(3) actually states: "A feasible project alternative or mitigation measure considerably different from others previously analyzed *would clearly lessen the environmental impacts of the project, but the project proponents decline to adopt it.*" (Italicized language omitted by commenter.) The Project is adopting MM 4.7.7.1, and the addition of the mitigation does not change the impact determination, will reduce the impact of greenhouse gas emissions and would not result in a new significant impact as discussed on pages 755 to 756 within Section 4.3.1 of the Final Response to Comments. The introduction of a new mitigation measure therefore does not meet any of the requirements for recirculation set forth in CEQA Guidelines Section 15088.5(a). As required in the CEQA Guidelines Section 15088, the City of Moreno Valley as the Lead Agency, provided written responses to

⁸ The court ruled that the proposed Project must be compared to the environmental conditions that exist at the time the CEQA analysis was commenced, not the level of development or activity that would be allowed under existing permits or approvals. Neither the Court of Appeals decision nor the Supreme Court decision invalidated any aspect of the prior CEQA documents except for the baseline used in the analysis of air quality impacts from Project operation.

⁹ South Coast Air Quality Management District, 2020. Phillips 66 Los Angeles Refinery Ultra Low Sulfur Diesel Project Final Environmental Impact Report, March 2020. Available online: <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2020/01-feir-chapters1-7.pdf?sfvrsn=6>

public agencies that commented on either the RSFIER or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR.

The comment generally lists the issues raised in other comments to support the recirculation claim, and these other issues have been fully addressed in the Revised Final EIR.

Response to Comment 3-F2-23: The Statement of Overriding Considerations is required for the WLC project because the decision-making body is required to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. The comment asserts that the Statement of Overriding Considerations cannot adequately weigh the Project's adverse, significant impacts with the benefits due to deficiencies within the Revised Final EIR. The commenter's claims regarding alleged deficiencies in the Revised Final EIR have been addressed in other responses. This comment generally identifies that the overriding considerations are not supported by substantial evidence but does not include specific reasons in this comment.

Response to Comment 3-F2-24: The Statement of Overriding Considerations that was prepared for the WLC project included a discussion of the benefits of the project. The decision-making body has reviewed the benefits as well as the significant unavoidable impact of the WLC Project. The Revised Final EIR provides a good-faith effort to inform the decision-making body and the public of the environmental effects of the Project. The benefits are identified in the Statement of Overriding Considerations and supported in the Revised Final EIR. Resolution No. 2020-20 approves and adopts the Statement of Overriding Considerations and finds that economic, social, and environmental considerations of the proposed Project outweigh the unavoidable significant adverse impacts described in the Revised Final EIR. The comment references *Cherry Valley Pass Acres & Neighbors v. City of Beaumont*, 190 Cal.App.4th 316 (2010), where it upheld the statement of overriding considerations, but that case did not require that "each" of the overriding considerations justify "each" of the remaining significant impacts. Here, the findings explain that each of the remaining significant impacts is supported by the Statement of Overriding Considerations.

Response to Comment 3-F2-25: The comment asserts that the benefits identified within the Statement of Overriding Considerations do not account for aspects of the job market that will impact the nature and desirability of the Project jobs. The reference within the comment that the calculation of employment rates was not accurate for the Project is unsubstantiated. No documentation of different employment rates was identified in the comment. The Fiscal and Economic Impact Study (Revised Final EIR Part 4, Appendix O) identifies the employment rates for the Project. These rates provide substantial evidence for the anticipated employment for the Project. The Statement of Overriding Considerations uses this substantial evidence in identifying the benefits of increase employment opportunities with Project development.

Response to Comment 3-F2-26: The comment requests that the Statement of Overriding Considerations quantify the consequences of the Project's impacts. The environmental effects associated with the Project are adequately addressed in the Revised Final EIR. The fiscal and economic impacts associated with the Project are identified in the Fiscal and Economic Impact Study (Revised Final EIR Part 4, Appendix O). The comment requests that a monetary value of the potential environmental impacts of the proposed Project be determined. Documentation to support the comment's claim of assigning monetary values to environmental impacts was not provided in the comment and is not required under CEQA as part of the Statement of

Overriding Considerations. In addition, the Statement of Overriding Considerations was challenged and the trial court found that it did not violate CEQA. Therefore, the adequacy of the Statement of Overriding Considerations cannot be challenged again.

Response to Comment 3-F2-27: The comment questions one of the benefits identified in the Statement of Overriding Considerations. The benefit is the improvement to public health. As stated in the Statement of Overriding Considerations, an increase in employment opportunities in the City would improve public health within the City of Moreno Valley. This statement is substantiated within the discussion of the benefit. The comment does not provide any evidence that the increase in employment opportunities would not improve public health. In addition, the Statement of Overriding Considerations was challenged and the trial court found that it did not violate CEQA. Therefore, the adequacy of the Statement of Overriding Considerations cannot be challenged again.

Response to Comment 3-F2-28: The comment states that the Statement of Overriding Considerations does not justify the significant and unavoidable air quality impacts. As required by CEQA Guidelines Section 15091, the City of Moreno Valley is required to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of the proposed Project against its unavoidable environmental risks when determining whether to approve the project. The Revised Final EIR adequately identifies the potential significant and unavoidable impacts of the Project. The Statement of Overriding Considerations identifies the benefits of the Project. One benefit includes the Settlement Agreement between the developer and the South Coast Air Quality Management District (“SCAQMD”) for the Project as referenced in Response to Comment 2-F2-23. The SCAQMD determined that the approximately \$26 million Air Quality Improvement Fee to be paid by the applicant “will adequately mitigate heavy-duty truck related air quality impacts that may result from the construction and operation of the World Logistics Center” The City of Moreno Valley is not required to justify the significant and unavoidable impacts, but only balance the Project Benefits against the significant and unavoidable impacts of the Project.

Response to Comment 3-F2-29: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F2-30: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F2-31: No specific comments on the contents of the Revised Final EIR are provided, and thus no further response is needed (State CEQA Guidelines §15088(a) requires that a lead agency only evaluate and respond to comments raised on environmental issues.).

Julia Descoteaux

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 9:47 AM
To: Julia Descoteaux

From: Tom
Sent: Tuesday, May 12, 2020 6:37 PM
To: Patty Nevins ; Planning Email_DG
Cc: Nash, Susan
Subject: Public Comment Moreno Valley Planning Commission Meeting May, 14, 2020 - Agenda Item No. 2

Warning: External Email – Watch for Email Red Flags!

FRIENDS OF THE NORTHERN SAN JACINTO VALLEY
1610 SAMS CANYON
BEAUMONT, CALIFORNIA 92223

May 12, 2020

Planning Commission
City of Moreno Valley
C/O Pattyn@mval.org
PlanningEmail@mval.org
14177 Frederick Street
PO Box 88005
Moreno Valley CA 92552

Re: Planning Commission May 14, 2020, Public Hearing Agenda Item No. 2
World Logistics Center Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report.

We would point out to the Moreno Valley Planning Commission members that the City of Moreno Valley has yet to comply with the June 7, 2018 Superior Court Writ of Mandate. The City of Moreno Valley has yet to perform the Court's direction for re-analysis of the World Logistic Center (WLC) impacts on Biological Resources.

3-F3-1

In performing the mandated/required re-analysis of the WLC impacts on Biological Resources, the City of Moreno Valley cannot continue to disregard/ignore the law as it relates to CEQA Mandatory Findings of Significance (CEQA Guidelines § 15065(a)(1) [The WLC project clearly has the potential to: "substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species..] The failure of the City of Moreno Valley to identify the "take" of MSHCP/NCCP Covered species as a Mandatory Significant Impact in the initial FEIR for the WLC and the City's current efforts to comply with Judge Waters Writ of Mandate has and continues to corrupt the CEQA review of Biological Resources for the WLC project. It allows the City of Moreno Valley to avoid/circumvent the required examination/analysis of alternatives and mitigation measures for the "take" of MSHCP/NCCP covered species.

3-F3-2

The consideration of cumulative impacts on Biological Resources in the 2015 FEIR and the Draft Recirculated RSFEIR fails to consider the cumulative impacts of the "take" of MSHCP Covered species. This is contrary to Judge Waters Ruling on the Peremptory Writ of Mandate indicating: "...any new cumulative impact analysis should also consider and discuss whether any environmental insignificant impacts may be cumulatively significant, taking into account all relevant past, present, probable future projects." The SKRHCP and the MSHCP authorizes the incidental "take" of endangered and special status plants and animals throughout western Riverside County [including the City of Moreno Valley] thereby eliminating habitats and population of already declining species in exchange for the establishment in perpetuity of designated wildlife Conservation Area/Reserves such as the San Jacinto Wildlife Area(SJWA) adjoining the WLC project site. Absent an adequate CEQA cumulative analysis it is impossible for the public and the state and federal Wildlife Agencies to know whether the plant and animal populations are dropping below self-sustaining levels [in jeopardy of extinction] both in the area of "take" and on the designated Conservation Reserves such as the SJWA. (CEQA Guideline § 15065 (a)(3) - Mandatory Finding of Significance)

3-F3-3

We are requesting the City of Moreno Valley NOT certify the proposed Draft Recirculated RSFEIR as being in compliance with CEQA. We are also requesting the City of Moreno Valley comply with the June 14, 2018 Peremptory Writ of Mandate voiding the 2015 World Logistic Center EIR in whole.

3-F3-4

Thank you for your courtesy.

Albert Paulek, CWB
FNSJV, Conservation Chair

Julia Descoteaux
Associate Planner
Community Development
City of Moreno Valley
p: 951.413.3209 | e: juliad@mval.org W: www.mval.org
14177 Frederick St., Moreno Valley, CA 92553

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-F3: ALBERT PAULEK, FRIENDS OF THE NORTHERN SAN JACINTO VALLEY

Response to Comment 3-F3-1: Refer to Response to Comment 1-F3-4 for discussion of the Court's direction for re-analysis of the Project's impacts on Biological Resources.

Response to Comment 3-F3-2: Refer to Response to Comment 1-F3-4 for discussion of potential significant impacts to wildlife species. The evaluation identified a potential significant impact, but mitigation measures are provided in the RSFEIR to reduce potential impacts to wildlife species to less than significant.

Response to Comment 3-F3-3: Refer to Response to Comment 1-F3-5 for discussion on cumulative biological resource impacts. As discussed, cumulative impacts on biological resources are analyzed in 2018 RSFEIR Section 6.4 (pages 6.4-1 through 6.4-33). The cumulative impact geographic area for biological resources is the MSHCP area, which also includes the San Jacinto Wildlife Area (SJWA).

Response to Comment 3-F3-4: No specific comments on the contents of the Revised Final EIR are provided.

-----Original Message-----

From: Susan Nash
Sent: Tuesday, May 12, 2020 9:50 AM
To: Patty Nevins ; Planning Email_DG
Subject: Planning Commission May 14, 2020 item #2 comment letter

Warning: External Email – Watch for Email Red Flags!

Attached is our comment letter on Item #2 for the May 14, 2020 Planning Commission Hearing: World Logistics Center Project Development Agreement, tentative parcel map for finance and conveyance purposes only with certification of the Recirculated Revised Final Environmental Impact Report.

Please deliver this document to all the Planning Commissioners prior to the May, 14 meeting.

Susan Nash
President
Friends of the Northern San Jacinto Valley

3-F4-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

FRIENDS OF THE NORTHERN SAN JACINTO VALLEY
1610 Sams Canyon
Beaumont CA 92223 (new address)

May 12, 2020

Patty Nevins, Planning Official
pattyn@moval.org
City of Moreno Valley Planning Division
PlanningEmail@moval.org
14177 Frederick Street
PO Box 88005
Moreno Valley CA 92552

Re: Planning Commission May 14, 2020, Public Hearing Agenda Item 2:
WORLD LOGISTICS CENTER PROJECT DEVELOPMENT AGREEMENT, TENTATIVE PARCEL MAP FOR
FINANCE AND CONVEYANCE PURPOSES ONLY WITH CERTIFICATION OF THE RECIRCULATED
REVISED FINAL ENVIRONMENTAL IMPACTS REPORT.

Ms. Nevins:

Please ensure the Planning Commission is in receipt of these comments prior to the May 14, 2020, public hearing.

The FRIENDS OF THE NORTHERN SAN JACINTO VALLEY strongly object to any further action by the City of Moreno Valley regarding the RECIRCULATED REVISED FINAL ENVIRONMENTAL IMPACT REPORT (hereinafter the RR-FEIR) for a number of procedural and substantive reasons.

THE WLC SPECIFIC PLAN MUST BE REVISED TO COMPLY WITH THE COURT’S FEBRUARY 8, 2018 ORDER.

The City’s RR-FEIR is a legal absurdity and a clear violation of CEQA. The City is putting the cart (EIR) before the horse (Specific Plan). In the same way the City cannot first prepare an EIR and then prepare a Specific Plan, the City cannot revise the Specific Plan by revising the EIR. The court ordered the Specific Plan be amended/revise to exclude all references to the California Department of Fish and Game Wildlife Conservation Buffer Area (hereinafter the CDFWCBA). The WLC Specific Plan was not revised/amended. The court then ordered that based on the removal of the CDFWBA from the Specific Plan, the “potential environmental impacts on biological resources should be re-analyzed without any consideration of said buffer area” in an EIR.

The WLC Specific Plan must be amended and then an EIR prepared for the new/revise Specific Plan. The alleged RR-FEIR is not based on any existing Specific Plan and therefore is a meaningless document. When the Court’s judgment stated that “All references to the ‘CDFW Conservation Buffer Area’ should be removed and the potential environmental impacts should be re-analyzed without any consideration of said buffer area”, the Court was first referring to

3-F4-2

3-F4-3

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

the revising Specific Plan and then to preparing an EIR to reflect the changes in the Specific Plan. There is zero legal authority for the proposition that a revised EIR is a legally adequate document for an unrevised Specific Plan.

THE APPEAL BY PETITIONERS AND THE CROSS APPEAL BY RESPONDENTS MUST BE FINAL BEFORE THE SPECIFIC PLAN/ENVIRONMENTAL IMPACT REPORT CAN BE REVISED.

As stated above, any and all revisions must first be made to the Specific Plan and then, and only then, can those revisions can be reflected in an EIR. However, revisions to the Specific Plan are meaningless until all appeals are final. The judgment is not final until all appeals are final.

The RR-FEIR correctly states that Petitioners appealed the February 8, 2018 Judgment, but omits the fact that Respondents also appealed the February 8, 2018 Judgment. Even after the Court of Appeal Fourth District, Division two issues its opinion, any party may petition the California Supreme Court for review.

Even if a revised Specific Plan had been prepared, this RR-FEIR cannot simply assert that "MITIGATION MEASURE CONDITIONED ON THE OUTCOME OF THE APPEAL IN PAULEK V. MORENO VALLEY." Mitigation Measures cannot be deferred to an indefinite time in the future because no one has a crystal ball.

The contents of the Appeal Courts' future opinions/orders are mere speculation. The court rarely grants exactly the requests of the appealing parties. Even if it were permissible to defer mitigation, the courts' orders as to each of the issues raised in the appeal and cross-appeal cannot be known. The attempt to do so in any revisions to the Specific Plan is magical thinking and has no basis in fact or law.

Please acknowledge receipt of this public comment letter and keep the undersigned informed of any actions taken by the City regarding the World Logistics Center Project by addressing such notices to the above address.

Susan Nash, President
Friends of the Northern San Jacinto Valley

3-F4-3
CONT
3-F4-4
3-F4-5
3-F4-6
3-F4-7

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

FRIENDS OF THE NORTHERN SAN JACINTO VALLEY
1610 Sams Canyon
Beaumont CA 92223 (new address)

May 13, 2020

Patty Nevins, Planning Official
pattyn@moval.org
City of Moreno Valley Planning Division
PlanningEmail@moval.org
14177 Frederick Street
PO Box 88005
Moreno Valley CA 92552

Re: Planning Commission May 14, 2020, Public Hearing Agenda Item 2:
WORLD LOGISTICS CENTER PROJECT DEVELOPMENT AGREEMENT, TENTATIVE PARCEL MAP FOR
FINANCE AND CONVEYANCE PURPOSES ONLY WITH CERTIFICATION OF THE RECIRCULATED
REVISED FINAL ENVIRONMENTAL IMPACTS REPORT.

Ms. Nevins:

Please ensure the Planning Commission is in receipt of these **additional** comments prior to the May 14, 2020, public hearing.

3-F4-8

The RR-FEIR must comply with the requirements of CEQA Guidelines § 15130(a)(3).

CEQA Guidelines 15130(a)(3) states in full:

“An EIR may determine that a project’s contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project’s contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of mitigation measure or measures designed to alleviate the cumulative impact. **The lead agency [in the EIR] shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.**” (CEQA Guidelines, § 15130(a)(3).

3-F4-9

The RR-FEIR, in stating that MSHCP compliance is automatically CEQA compliance, provided **zero facts and analysis** to show that the contribution of the Project to the cumulative impacts on all wildlife including endangered, rare or threatened species will be rendered less than cumulatively considerable by the payment of mitigation fees to the MSHCP. (see City of

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Marina v. Board of Trustees of California State University (2006) 39 Cal.4th 341, 346; Anderson First Coalition v. City of Anderson (2005) 130 Cal. App. 4th 1173,1187; Gray v. County of Madera (2008) 167 Cal. App. 1099, 1122).

The RR-FEIR fails to comply with CEQA because it fails to show the **facts and analysis** required by Guidelines § 15130(a)(3) that the Project’s contribution **will be rendered less than cumulatively considerable.**

Please acknowledge receipt of this public comment letter and keep the undersigned informed of any actions taken by the City regarding the World Logistics Center Project by addressing such notices to the above address.

Susan Nash, President
Friends of the Northern San Jacinto Valley

3-F4-9
CONT

3-F4-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-F4: SUSAN NASH, FRIENDS OF THE NORTHERN SAN JACINTO VALLEY

Response to Comment 3-F4-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F4-2: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F4-3: The comment claims that the WLC Specific Plan must exclude reference to the CDFW Conservation Buffer Area and that impacts on biological resources be revised without consideration of the CDFW Conservation Buffer Area.

The WLC Specific Plan was adopted by the City in August 2015 and there is no reference to the CDFW Conservation Buffer Area, which is the northern portion of the SJWA adjacent to the southern boundary of the WLC project site. Further, the court did not order that the Specific Plan be revised to exclude all references to the CDFW Conservation Buffer Area, but to remove any such references from the EIR. The City's EIR was revised in 2018 to remove all reference to the SJWA as a buffer area.

Response to Comment 3-F4-4: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F4-5: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F4-6: Refer to Response to Comment 3-F2-16.

Response to Comment 3-F4-7: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F4-8: No specific comments on the contents of the Revised Final EIR are provided. The comment letter was provided to the Planning Commission for their consideration prior to their action.

Response to Comment 3-F4-9: The comment states that the EIR must comply with the State CEQA Guidelines, specifically Section 15130(a)(3), in regard to cumulative biological resources impacts in compliance with the MSHCP and the analysis must be supported by facts and analysis.

The RSFEIR prepared a comprehensive cumulative analysis of impacts to biological resources in Section 6.4. Specifically, the required cumulative impact analysis is provided in Section 6.4.3 of the RSFEIR in which the WLC project, when considered with cumulative projects, would not cause a cumulatively considerable effect on the MSHCP or the SJWA. When considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to impacts to biological resources would not be cumulatively considerable, and cumulative impacts to biological resources would be less than significant. The substantial evidence supporting this conclusion is found in Section 6.4 of the RSFEIR.

Response to Comment 3-F4-10: No specific comments on the contents of the Revised Final EIR are provided.

Julia Descoteaux

From: George Hague <gbhague@gmail.com>
Sent: Thursday, May 14, 2020 5:01 PM
To: Julia Descoteaux
Cc: City Clerk; Ashley Aparicio
Subject: Sierra Club's WLC letter to the Planning Commissioners

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commissioners May 14, 2020

RE: World Logistic Center (WLC) Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report.

The Sierra Club will be very impressed with each Planning Commissioner who will be able to say that (s)he was able to read all the documents under review for tonight’s meeting during the last two weeks — prior to voting. I am still reading and that is why my letter may appear to be last minute, but the public needs even more time to give justice to the comments we want you to consider prior to voting. I also hope if anyone on the commission has accepted gifts of any size from Highland Fairview that they will disclose that at the very beginning and remove themselves from the meeting room during the hearing on the WLC. The public will be grateful for this act of transparency.

3-F5-1

The Sierra Club appreciates this opportunity to express a few of many concerns. A major concern is that one of the alternatives doesn’t require the maximum coverage of each building with solar as well as some of the passenger car parking areas. This would make it much more likely that all equipment, appliances, cars and many large trucks would be zero emission electric. They would run on sunshine which Moreno Valley has plenty. It is a crime not to use it to reduce the harmful health and global effects of diesel and other petroleum as well as other carbon/hydro carbon based products. It is sad that the Moreno Valley Utility (MVU) doesn’t appear to want maximum use of Solar on the WLC’s buildings and other large buildings because they want to make money by selling power to them. The City needs to think of the people and the environment and require this alternative. The noise impacts caused by the WLC would be significantly reduced with electric forklifts, yard goats, hostlers, yard trucks, sweepers, Alternative Power Units (APU’s), pallet jacks, trucks of all different sizes as well as all the job-eliminating automation and robotics.

3-F5-2

3-F5-3

The trucks also emit diesel particulate matter that lingers over communities, creating ‘diesel death zones’ that elevate levels of asthma, heart disease and cancer. Rapidly phasing out diesel trucks for clean electric trucks would be a huge win for our community, public health, and air quality. The WLC must pre-wire the entire project for electric trucks to protect their workers and residents. Much of Moreno Valley’s officially designated “Disadvantage Areas” is the result of diesel pollution, from approved warehouses. Electric trucks are already on the road in California and will be used everywhere well before the proposed 15 year buildout of the WLC. Maximum Solar on all roofs and car parking areas could be a source of energy for these trucks and also help to reduce the pollution in our non-attainment area. To protect the Health, Safety and Welfare of Moreno Valley residents and warehouse workers the City decision makers must do everything possible to reduce particulate pollution of the WLC.

3-F5-4

"Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California" from UCLA’s Fielding School of Public Health April 2020 study is found in the following link:
<https://ucla.app.box.com/s/xyzt8jclixnetiv0269qe704wu0ihif7>.

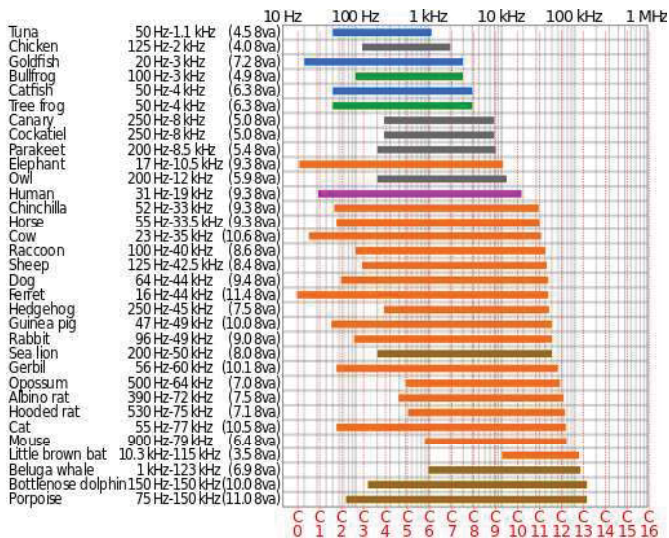
On page 54 of this article it reads that Riverside County produces 72 Tons/year of PM 2.5 Emissions from Gas Appliances and 960 Tons/year of NOx Emissions from Gas appliances . The WLC must be required to use only electric appliance which includes all water heaters. Regarding outdoor air quality, this report indicates that under a 2018 scenario where all residential gas appliances were transitioned to clean-energy electric appliances, the reduction of secondary nitrate fine particulate matter (PM2.5) [from nitrogen oxides (NOX)] and primary PM2.5 would result in 354 fewer deaths, and 596 and 304 fewer cases of acute and chronic bronchitis, respectively. The reduction in associated negative health effects is equivalent to approximately \$3.5 billion in monetized health benefits for just one year. While the WLC isn’t a residence it will have many appliance and water heaters. The WLC must be part of the solution of reducing PM2.5 and NOx by requiring it to have only electric appliances/water heaters.

3-F5-5

Both operational and construction noise pollution will have a major impact of those nearby homeowner and those forced to be within the WLC specific plan, but also many of the resources of the San Jacinto Wildlife Area(SJWA) which would be forced to have an almost two mile border with the WLC. The location of the noise level monitoring sensors for the information in Table 4.4.--7 on page 4.4-98 is very import to make these readings valid for their impact on the SJWA. "Available research indicates that increased noise levels near wildlife areas can contribute to behavioral changes such as increased startling in birds, which can be especially harmful during nesting periods, hunting pattern changes or avoidance which decrease habitat value and use, sleep pattern disruption, and decreased overall health from noise stress. These impacts can affect mammals, birds, and other species present within the SJWA." (page 4.4-99) The World Logistic Center may have some set backs from the SJWA, but they are not restricting mechanical equipment/trucks within these setbacks and therefore much noise will still be produced to impact the SJWA.

3-F5-6

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)



As shown in the chart found above the range of hearing ability ranges widely within the animal kingdom. There is nothing in the the WLC environmental documents to show the impacts on the many plants, animals and insects of the San Jacinto Wildlife Area. Remember, this is a wildlife area and not urban park. Some of these species are threatened or endangered or species of concern and based on scientific literature the WLC's generated noises will harm many in many ways. Increased noise levels will not only significantly impact the northern portion of the San Jacinto Wildlife Area, but also along major roads adjacent to the SJWA which will handle a significant increase in truck traffic because of the WLC. Riverside County and the Riverside County that Transportation Commission originally litigated the WLC to provide some improvement and relief to these impacted roads which include, but are not limited to the following roads adjacent to the SJWA as seen in the map: Gilman Springs Road, Bridge Street and the Ramona Expressway. All of these roads will generate additional significant noise as a result of the WLC and will impact many parts of the SJWA. The many different species that rely on the SJWA's very important habitat will be impacted and the current noise analysis doesn't do justice to how each species will react and be harmed.



3-F5-6
CONT.

"Gilman Springs Road from Alessandro Boulevard to Bridge Street (S-16) is already deficient and needs to be widened to four lanes and will need to be widened to six lanes in the future. In accordance with General Plan Policy 5.5.7, the City will require the developer to widen Gilman Springs Road to provide three southbound lanes and one northbound lane along the frontage of the WLC project. The developer will receive a TUMF credit for the portion of the cost of this improvement that exceeds the project's fair share contribution.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

1. However, because Gilman Springs Road is partially a Riverside County facility and is thus partially outside the jurisdiction of the City of Moreno Valley, the City cannot ensure that the identified improvements would be made outside of its jurisdiction. Moreover, there are right-of-way constraints involving sensitive environmental areas that may limit widening to four lanes between Alessandro Boulevard and Bridge Street, or even preclude any widening at all. The project's impacts in the Existing Plus Project scenario on Gilman Springs Road must therefore be considered significant and unavoidable. The City will work with Riverside County find funding for improvements that would provide an acceptable LOS on this road to the extent feasible.
2. **Gilman Springs Road from SR-60 to Alessandro Boulevard (S-17)** is already deficient and needs to be widened to four lanes. In accordance with General Plan Policy 5.5.7, the City will require the developer to widen Gilman Springs Road to provide three southbound lanes and one northbound lane along the frontage of the WLC project. The developer will receive a TUMF credit for the portion of the cost of this improvement that exceeds the project's fair share contribution.

Section 4.15 Traffic and Circulation 4.15-113

Revised Sections of the Final Environmental Impact Report

However, because Gilman Springs Road is partially a Riverside County facility and is thus partially outside the jurisdiction of the City of Moreno Valley, the City cannot ensure that the identified improvements would be made outside of its jurisdiction. The project's impacts in the Existing Plus Project scenario on Gilman Springs Road must therefore be considered significant and unavoidable. The City will work with Riverside County to find funding for improvements that would provide an acceptable LOS on this road to the extent feasible." (four paragraphs found above page" (4.15-112/113)

The Different Charts on the Level of Service along Gilman Springs Road from SR-60 to Bridge St. shows a LOS "F"(Table 4.15-7,Table 4.15-15 and others). Since a large portion of Gilman Springs Road is within the County it may remain a LOS F because the City will not be able to require its improvement. The WLC will add significant traffic to Gilman Springs Road which as the Map found above shows runs along much of San Jacinto Wildlife Area's —Davis unite-- eastern border. Traffic wanting to enter/leave the eastern portion of the WLC as well as other portions will use Gilman Springs Road and many of those will also use Bridge Street to transition with the Ramona Expressway. The improvements to the Ramona Expressway will not reach Bridge Street for many years and therefore the project's impact to Bridge Street and the entire section of the Ramona Expressway west to I-215 needs to be fully analyzed.— from Bridge St, This is a route between the WLC and the I-215 that truckers/commuters will heavily utilize. As the CA Department of Fish and Wildlife map found above shows Gilman Springs Road, Bridge Street and the Ramona Expressway are all adjacent to the SJWA. The air quality, noise/vibration, light and water run off pollution as well as fumes/smells from WLC's trucks/commuters using these roads will all significantly impact the resources of the SJWA. The WLC environmental documents fails to analyze/address all these pollutions impacts on the many different species that rely on the SJWA for their very survival as well as the survival of their species. Each SJWA species — which are different at different times of the year — has their own special senses and their reaction/response to the various forms of pollution caused by the WLC will develop/manifest differently from what you and I might suffer.

"The following article on "Noise pollution and the environment : (<https://www.science.org.au/curious/earth-environment/noise-pollution-and-environment>) expresses concerns on the impact of noise on wildlife. Some of the studies shared by the WLC looked at animals in urban settings which in some cases have adapted to City noises. The SJWA is not an urban park, but a wildlife area and noise from WLC human activity will be a big change for a large portion of it. The article found above and partially printed below has a study from Boise State University which shows how a road can impact an area used by wildlife and wrote that noise "prompt more than the usual number of birds on thousand-mile marathons to skip a chance to rest and refuel". The SJWA is a major stop over for many species of birds. Audubon Society during their Christmas bird count in and around the SJWA usually spots between 140 and 155 different species. This includes 25 species of Raptors of which five are owls. These owls are acoustic predators and will be impacted as explained below. This Christmas bird count usually puts this area in the top 1 or 2 % for diversity of bird species for an inland area in all of North America. How will the WLC impact these counts? Gilman Springs Road currently has very few large trucks, but that will change because of the WLC as will the level of noise impacting wildlife/habitat on both side of the road. The WLC needs to fund at least one linkage under or over Gilman Springs Road to reduce road kill of wildlife and also project human life from vehicles hitting wildlife. The WLC is required to "provide three southbound lanes on one northbound along the frontage of the WLC". This will result in very unsafe conditions on the entire southbound portion of Gilman Springs Road which is south of the WLC. The entire northbound lanes of Gilman Springs Road will be unsafe and put truckers and car drivers in harms way which will jeopardize their lives.

There is also a portion of the article found below that also shows how an impact on a species can impact the entire ecosystem. There is nothing in the WLC environmental documents that shows how all the various pollutions generated by the WLC could easily lead to the decline in the ecological value of the SJWA which in turn could harm many species. The state of California has spent more than \$80,000,000 on the SJWA which is also a

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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

The following comes from this link: <https://www.science.org.au/curious/earth-environment/noise-pollution-and-environment>

"The population and diversity of certain bird populations has been shown to decline or change when exposed to continuous noise generated by urban environments, such as roads, cities and industrial sites.



Birds may seem well adapted to live alongside humans, but our noises disrupt the way they live. Image source: [Tim Rich and Lesley Katon / Flickr](#).

*Several species have begun to adjust their vocal calls in an attempt to be heard above the din. Male great tits (*Parus major*) for example, have been noted to **change the frequency of their call** in order to be heard over anthropogenic noise. Female great tits prefer lower frequency calls when selecting a mate, but these frequencies are harder to hear over urban noise. Males who sing at higher frequencies are less attractive to females, but females may still mate with them if there are no lower-frequency singers available. Males are therefore placed in a difficult position—sing at a lower frequency and not be heard, or sing at a higher frequency and potentially be dismissed!*

*Another study, conducted in 2007, found that urban European robins (*Erithacus rubecula*), highly territorial birds who rely strongly on vocal communication, **adjusted the timing of their singing** to compensate for acoustic pollution. They began to sing at night when it was quieter, rather than only during the daytime, when noise pollution was at a peak. If birds need to sing at night rather than sleep, it can begin to alter behavioural patterns in urban species.*



The European robin has been known to sing at night, because it's hard to be heard during the day. Image source: [nutmeg66 / Flickr](#).

Scientists **studying the behaviour of scrub jays**, birds common across the western United States, found that they avoid nesting in noisy areas, such as near gas wells where the constantly running compressors drowned out their communication calls. The study's lead author, *Clinton Francis*, said, 'We're starting to see that noise may actually be a big problem, because [it] acts as a form of sensory pollution, forcing animals to adapt their calls to be heard over it, or leave the area altogether'.

3-F5-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

However, the study also found something else—as the scrub jays relocated, the forest they left behind is considered critical to the health of the pinyon pine ecosystem in New Mexico. In normal conditions, the birds collect and bury pine seeds in preparation for winter. The birds fail to collect all the seeds they bury, and these become the next generation of trees. In the areas near the gas wells, without jays to plant the seeds, the pines are disappearing. This could have long-term effects on ecosystem diversity and structure.



When scrub jays leave their homes to find more quiet areas to live, the forests they once helped to seed start to disappear. Image source: [Bob Devlin / Flickr](#).

Similarly, some birds, such as the black-chinned hummingbird (*Archilochus alexandri*), have been shown to commonly select noisy areas, such as near active gas wells, to avoid nest predators who are themselves more susceptible to sound. Again, this change in behaviour can have unexpected flow-on effects. By discouraging species sensitive to loud sound, and replacing them with more tolerant ones, noise may be reshaping ecosystems. This can potentially alter whole food webs and species combinations, resulting in groupings that may never have occurred naturally in the wild. As researcher at Boise State University in Idaho, [Jesse Barber](#), said, 'We're not studying noise. We're studying ecology'.

There are other effects too. A 2013 study by researchers at Boise State University created a 'phantom road' using a series of electronic speakers placed in the woods which played the sounds of a busy highway at regular intervals. The phantom road was situated near an important stop for migratory birds, where they would traditionally rest and fatten up before undertaking the journey ahead. For four days the team turned on the speakers playing the faux traffic noise. The results showed that during the periods of noise, birds stopping to rest in the area declined by more than one-quarter. When the speakers were off, the numbers bounced back. The researchers concluded that *noise can change an animal's most basic stay-or-go assessments of habitat*, and 'prompt more than the usual number of birds on thousand-mile marathons to skip a chance to rest and refuel'.

Birds are not the only animals affected by noise. A study published in 2010 found that noise pollution—specifically traffic noise—decreased the foraging efficiency of an acoustic predator, the greater mouse-eared bat (*Myotis myotis*). Successful foraging bouts decreased and search times increased dramatically with proximity to the highway. As the animals being hunted by the bats are themselves predators, the study noted that 'the noise impact on the bats' foraging performance will have complex effects on the food web and ultimately on the ecosystem stability'. Noise pollution could potentially interfere with other acoustic predators, such as owls, in a similar fashion."

Land species

"Noise pollution can also kill off your sex life—at least if you're a frog. A study conducted in Melbourne, Australia, by Dr Kirsten Parriss and colleagues found that, for some highly vocal frog species, *noise pollution is correlated with an increase in the frequency of their calls*. This increase partially compensates for the loss of communication distance in noise-traffic areas experienced by these frogs. The mating call of male pobblebonk frogs could historically be heard up to 800 metres away by interested females. At very noisy sites, this is reduced to just 14 metres. If male frogs alter their call to a higher frequency to be heard, the females may not like what they hear. Female frogs of some species prefer lower-pitched calls, which often indicate larger and/or more experienced males. Once again for the male frogs, it's a tough call—to not be heard, or to be heard and rejected!

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The pobblebonk frog and other highly vocal frog species have trouble being heard in noisy areas. Image source: [Will Brown / Flickr](#).

Researchers noted a *different outcome for the black-tailed prairie dog* (*Cynomys ludovicianus*) in free-ranging colonies in Colorado. The dogs were exposed to simulated traffic noise from a series of speakers, similar to that which would be heard if a real highway were 100 metres from the colony. The dogs did not leave their homes, but the researchers did note a distinct change in their behaviour during times of traffic noise broadcast:

- o The number of prairie dogs above ground declined by 21 per cent.
- o The proportion of individuals foraging declined 18 per cent.
- o Vigilance (looking out for predators) increased by 48 per cent.
- o Social interactions and resting declined by 50 per cent.

The researchers concluded that 'road noise can alter key survival behaviours' and that 'these findings highlight that the presence of animals in a location is no guarantee of population and ecological integrity'. So while noise pollution may not necessarily drive animals away from a site, it may alter their established behaviours and be having a less-obvious negative effect on their physical wellbeing. "

The following link explains of other impacts to wildlife as a result of noise/vibrations:

<https://www.healthyhearing.com/report/52843-Hearing-in-the-animal-kingdom>

It mentions how human ears are controlled by three muscles, but a 'cat's ear is controlled by close to three dozen muscles". The noise analyze by the WLC fails to study all the frequencies/vibration levels that will impact the many animals, insects and plants that use the SJWA during all times of the year. Since the SJWA doesn't have the noise levels of Moreno Valley, these organisms have never had to adapt and this could result in them as well as the SJWA being harmed.

The article further explains how "birds in the wild rely on their keen sense of hearing to alert them of danger" and also locate their next meal. How their ears work in tandem with sharp sight to hunt in the dark. "Scientists say some species of moths have hearing 150 times more sensitive than any human. Their ability to hear the highest frequencies (300 kilohertz), helps them escape bats, their main predator, before they are attacked." The article even mentions that spiders are most sensitive to low-frequency sounds. Snakes and lizards also respond to noise/vibrations. The current WLC documents have not done the sounds studies of all the frequencies at all times of day/night that might impact all the wildlife at the SJWA which makes them inadequate. Page 4.4-98 reads that "The northern portion of the SJWA will experience increased, fluctuating sound levels during construction and operation (e.g., vehicle traffic and truck loading and unloading), but truck traffic and human activity will result in an incremental increase in overall ambient sound over the long term." "The SJWA, may be subject to construction activity on a 24-hour-per-day, 7-day-per-week schedule." (Page 4.4-98) These sounds that are mentioned appear to make the SJWA and all its resources collateral damage to the construction and operation of the WLC. That there is nothing or very little within the documents to show how to make this not the case means that much more needs to be done concerning the impacts of the WLC on the SJWA. No operations of the WLC should be allowed within 450 feet of the border of the SJWA — not just structures as required by the CDFW.

The SJWA's ecosystems has evolved over many years of careful management by the California Department of Fish and Wildlife, resulting in diverse and complex biological communities living in balance with their environment. Harm to anyone of those communities by any of the pollutions generated by the WLC will also impact other SJWA communities. These pollutions include, but are not limited to the following: noise/vibrations, air quality, light and water runoff pollution as well as fumes/smells. These forms of pollution would result from both the project site and also from the roads used by those vehicles connected to the WLC. All of these pollutions' direct, indirect, cumulative impacts on the SJWA's ecosystem, resources and all forms of life must be fully analyzed and

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eliminated to produce no harm or the WLC's environmental document will be inadequate. The WLC documents relied heavily on what they called the "CDFW owned Conservation Buffer Area" within the SJWA to mitigate impacts on some of the resources of the SJWA. Since the judge ruled against using these lands being used to help mitigate/reduce the WLC's impacts to the SJWA and its resources, almost nothing in the recent WLC documents have replaced those lands for mitigation. In previous environmental documents the WLC used these CDFW owned lands to try to show they will not impact the "MSHCP Conservation Criteria Areas" and Federal Migratory Bird Act and CA DF&W" as shown with redlines on pages 4.4-61 through 4.4-74. Throughout the biological section these "CDFW owned Conservation Buffer Area" previous importance are shown with redlines without any adequate mitigations to replace this "buffer" in the latest WLC environmental documents currently being reviewed. The "CDFW buffer area" and "CDFW Conservation Buffer Area" were mentioned beginning on pages 4.4-3 and 4.4-4 and were continued to be redlined throughout the document without any or adequate replacement mitigations for impacts to the SJWA.

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The article's link found above contain the following paragraphs on the impacts of noise to wildlife and domestic animal life:

Our furry best friends

"Even the most pampered of domesticated cats have excellent hearing. They can detect an extremely wide range of frequencies, hearing higher-pitched sounds than humans or dogs. While a human ear consists of three muscles and the three tiniest bones in the body, a cat's ear is controlled by close to three dozen muscles, which allow them to rotate their ears 180 degrees.

3-F5

By today's standards, most dogs would not be considered wildlife with all the creature comforts lavished upon them by dog lovers, but dogs' sense of hearing is impressive when compared to that of their owners. According to Bark magazine, the frequency range dogs can hear is far greater than that of humans. That's why dogs can hear the ultra high-pitched pulse of the crystal resonator in most alarm clocks and even vibrations emitted by termites inside building walls. Their ears can move independently of one another. If you pay close attention to your best friend, you can gain clues about his mood from the position of his ears.

Birds

Birds in the wild rely on their keen sense of hearing to either alert them of danger or, in the case of birds of prey, to find their next meal with amazing precision. Owls, for example, have crooked ears. One ear is located slightly forward than the other, which aids them in pinpointing sounds of their prey. Because they are nocturnal animals, their hearing works in tandem with sharp sight to help them hunt successfully in the dark. During flight, an owl's left ear picks up sounds from below while the right ear hears sounds from above.

3-F5

Moths and spiders

Consider the lowly moth, an insect that has spent so many centuries evading predators that its hearing has evolved to being the best in the human and animal kingdom. Scientists say some species of moths have hearing 150 times more sensitive than any human. Their ability to hear the highest frequencies (300 kilohertz), helps them escape bats, their main predator, before they are attacked."

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Since The WLC would be across the street from many homes and it has even forced homes to be within the Specific Plan, its noise impacts will also impact domestic animals and residents of homes that would be forced to live near this massive warehouse project. Nothing or very little will be done to analyze these impacts or to mitigate the WLC's noise and other pollutions that would result from the project site or any of the roads that the trucks/cars use to access/exit the project site. The project noise mitigations have been reduced since the first documents such as construction (grading) activity setbacks have lessened by 2/3 and there are mitigation measure to do away with mitigation measure for sound barriers if there is not 100% approval for installation by those affected. It appears there is a change in how close the Cactus extension will get to Wilmount and there are no longer any mitigation measures for all the streets with increased noise and pollution levels brought on by the project. Allowing more noise and other pollution impacts on people, domestic animals, wildlife and the San Jacinto Wildlife Area is even more evident in these current WLC environmental documents under review versus the previous poorly written WLC documents.

3-F5

"Some available research¹ states that night lighting can have a wide range of adverse effects on wildlife, including mammals, birds, bats, amphibians, insects, fish, even plants. Effects range from reduced health by upsetting diurnal rhythms, reduced clutch size, egg size, or survival success of nesting birds, to actual mortality from increased predation under higher ambient lighting levels. Bats and certain insects are also attracted to outdoor night lighting, which may adversely affect their survival or cause them to become dependent on the lighting. Small mammals would also be attracted to these areas and might suffer increased predation or roadkill crossing streets."

3-F5

Page 4.4-100 The World Logistic Center needs to honor the International Dark Sky standards and without that they Page 106

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bringing harm to the resources of the SJWA. In addition they need to limit light poles to 20 feet as well as turn off a majority of them by midnight. Failing to do this means the WLC is not doing everything feasible to reduce significant impacts to the ecosystem of the SJWA and all its resources. If WLC is allowed to move ahead without these restrictions on lighting as well as emitting significant noise and as a result the SJWA resources are severely impacted, then what will be the recourse for the SJWA to be able to return to normal and restore its ecosystem? What is the WLC responsibility to make that happen?

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CON

"Research by the California Air Resources Board (CARB)¹ indicates that 80 percent of the particulates generally settle out of the atmosphere within 1,000 feet of emission sources. Therefore, diesel particulate deposition may occur within approximately 1,000 feet of truck activities within the project, which would extend part way into the northern portion of the SJWA. (Page 4.4 104) Read the relined words within this section and one realizes that they relied heavily on the CDFW owned Conservation Buffer Area to mitigate the toxic pollution. The document then does nothing replace what they considered was mitigation — CDFW Buffer — for the construction and operation of the WLC. This impact actually extends beyond 1,000 feet because 80% is not 100% and other experts recognize 500 meters (about 1,500 feet) is the area of impact from diesel truck and car pollution. The quote found above only mentions the northern portions of the SJWA., but as explained above both sides of Gillman Springs Road, Bridge Street and the Ramona Expressway will impact habitat as well as the SJWA. The current documents a woefully inadequate in all the studies of all the forms of biological life that can and will be impacted by the construction and operation of the WLC — especially but not limited to the SJWA. Since different animals and other forms of wildlife/plant life/insect life use the SJWA and surrounding lands at different times of the year, the much needed revised studies will be inadequate unless they are all included.

3-F5

"Most of the available (and most applicable) research is on diesel pollutant impacts on humans. Although the physiology of many animals is very different than humans, data on health effects from diesel pollution may nonetheless be somewhat instructive when attempting to assess diesel impacts on wildlife. Potential health effects on wildlife obviously depend on the species involved, but in general health effects from air pollution/diesel exhaust include impaired cardiac and lung or respiratory function, reduced heart function or longevity, decreased clutch size or hatching success, increased incidence of cancer and other mutagenic or teratogenic effects, ingestion of air deposited particulates, reduction in overall biodiversity, reproductive failure, etc. In general, impacts on higher animals are most commonly attributed to food loss and reproductive effects, rather than to direct toxic effects on adults." *"Research⁶ suggests that wildlife may be more susceptible to air pollutant impacts than humans, due to their smaller size, higher respiration rates, smaller lung capacities, ingestion of local plant materials that have also been exposed, higher metabolic rates, etc., although some factors like shorter lifespans would reduce the length of exposure over time. For these reasons and for the purposes of this analysis, it is assumed that animals within the SJWA would be at least as susceptible to health effects from air pollution, including diesel exhaust compared to, as humans."* (Pages 4.4–101/4.4–102.) The important words in the last sentence are "At Least" which means animals could easily be much more susceptible to all the concerns listed above. The sentence also doesn't address plant life and insect life which are all important parts of the ecosystems. Providing information on tumors may be valid but it doesn't eliminate all the other significant impacts that can befall biological life as a result of the construction and operation of the WLC.

3-F5

"In addition to pollutants associated with diesel trucks, passenger vehicles produce additional air 2 pollutants including carbon monoxide, nitrogen oxides, particulates, etc. These pollutants will also have indirect impacts on wildlife resources of the SJWA. Two impacts of most concern would be ozone degradation (e.g., plants having an unusual dry or "burned" look) and the deposition of additional nitrogen, both of which can disrupt plant growth cycles. (Page 4.4-102). Direct, indirect and cumulative impacts of all pollutions resulting from the construction and operation of the WLC on the entire SJWA ecosystem as well as surrounding lands needs to fully analyzed and subject to peer review prior to any decision maker voting. The winds that are mentioned would blow the WLC pollutions/noise towards the MSHCP Criteria Cells to the east across Giliman Springs Road. These cells also need the same attention as the SJWA when analyzing the WLC's impacts on their resources. While they try to dismiss some impacts to the SJWA by saying that sometimes the winds blow another direction, they fail to mention the cloud cover we often have that makes noise pollution eve worse.

3-F5

"Based on available scientific data, it is reasonable to conclude that the proposed project, due to its size and expected amount of truck traffic, will have potentially significant impacts on wildlife within the SJWA and east across Gilman Springs Road from project air pollution, including diesel truck exhaust." (Page 4.4–103) Nothing is analyzing the significant impact of fumes/urban smells on the wildlife of the SJWA and surrounding lands. I was once in a wolf preserve and was told by the guide that when we stepped out of the car the wolf already smelled us. We were the equivalent of three city blocks away when we parked. Many animals have much keener senses of smell than we humans and could easily be impacted by the smell of diesel and other urban smells. These could be coming from the project site or from diesel trucks as well as the activities of built warehousing. The environmental documents are inadequate in this area and data is missing for all the species that use the SJWA. How will the impacts be manifested by each species and what will the WLC do to significantly reduce them. Again the ideas of electric equipment for all warehouse related work needs to be required and all warehouses being prewired for electric big rigs must also be required.

3-F5

Removing almost 2,600 acres from raptor foraging is recognized as an "adverse" impact, but the WLC believes "no mitigation is necessary or proposed". (page 4.4-111) With 25 species of raptors using the area, this is not an acceptable response to this direct, indirect and cumulative impact to this wonderful natural resource. Migration in the area is needed for the loss of raptor foraging and can be combined with mitigation for loss of Agricultural lands.

3-F5

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"The SJWA is a significant resource for avian species and other wildlife. In 1981–82, the State Wildlife Conservation Board initially purchased 15,000 acres of the Mystic Lake area as mitigation for habitat impacts associated with the construction of the State Water Project (SWP)" (Page 4.4 - 22) The above sentence is very incorrect about the initial purchase to begin the SJWA and when Mystic Lake became part of the SJWA as well as its size. The WLC must not compromise the California Department of Fish and Wildlife's mission in regards to the SJWA. That mission is as follows: The Mission of the Department of Fish and Wildlife is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The WLC's many forms of direct, indirect and cumulative pollutions based on the current proposal will significantly undermine the CDFW's mission and the ecological value/ecosystem/biological life of the SJWA.

3-F5-

"Research by the California Air Resources Board (CARB)¹ indicates that 80 percent of the particulates generally settle out of the atmosphere within 1,000 feet of emission sources. Therefore, diesel particulate deposition may occur within approximately 1,000 feet of truck activities within the project, which would extend part way into the northern portion of the SJWA. (Page 4.4 104) This information means that at the very least family homes within 1,000 feet will also be impacted by what happens during the construction and operation of the WLC. As mentioned above some experts believe pollution impacts will happen to those who live within 500 meters. Articles like the following mention 500 meters,

<https://www.sciencedaily.com/releases/2018/09/180910111237.htm>

<https://dieselnet.com/news/2010/01hei.php>

3-F5-

Operations of the WLC includes all the diesel trucks and cars associated with the project that travel on Moreno Valley roads. Those individuals who at the very least live within 1000 feet of diesel truck routes to and from the WLC will very likely result in health impacts and this may take place over time — especially to the young and elderly. What will be the WLC's responsibility if children along these truck routes or who live within 1,000 feet or 500 meters of the project develop life threatening asthma or other medical problems? Will many develop more underlining conditions and make them more susceptible to COVID—19. The environmental documents must include a large section on COVID — 19 and its impact on Moreno Valley residents — especially those who will live within 500 meters or at the least 1,000 feet of the project and current/proposed truck routes. Making sure all equipment at the WLC is electric and installing electric plugins at all truck docking bays for electric APU's. That all landscape equipment is electric. That each warehouse is required to have a lounge for truckers with TV and fully stocked vending machines to reduce diesel trucks idling their diesel APU's. Require the WLC system to have an enforcement mechanism to immediately refuse entry to the WLC by diesel trucks that do not meet 2010 or newer standards. Build the infrastructure at each warehouse for electric big rig trucks to be recharged and for all electric cars to fast charge. That all homes within a minimum of 1,000 must have a completely new HVAC and air filtration system as well as a ten year maintenance agreement. This happened on two settlement agreements with the Sierra Club on Moreno Valley warehouse projects approved in the last two years and must be required of the WLC.

Title 24 Building Energy Efficiency Standards are updated about every three years and the WLC must be required to meet the current Title 24 standards at time of any construction...Not the Title 24 standards at the time of the entire project approval which could be 15 years old. This will make a big difference in the project's impacts on global warming and Greenhouse Gas as well as other pollutions. The entire project also needs to be required to meet the current LEED standards on all warehouse construction. TUFF fees must be paid throughout the life of the project and at the rate they are at the time they are paid.

3-F5-

We have large areas that are listed as disadvantaged communities because of the pollutions from warehouse projects that have been approved by our decision makers as well a some low income areas. The WLC is a big part of the reason we are on the disadvantaged area map and the current project before the Planning Commission does little to reduce the pollution impacts to our City or the impacted residents. Environmental justice doesn't seem to be important to Moreno Valley's City Council majority. The City is currently undergoing a General Plan Update (GPU) with the World Logistic developer as one of the seven members on the General Plan Advisory Committee. The WLC project before the planning commission will prejudice the General Plan Update and make Moreno Valley's environmental justice and other GPU elements much worse.

3-F5-

The Sierra Club appreciates the opportunity to make comments on the World Logistic Center (WLC) Project Development Agreement, Tentative Parcel Map for Finance and Conveyance Purposes only with Certification of the Recirculated Revised Final Environmental Impact Report. More needs to be written, but time requires that I stop at this point. Most of the pages numbers found above came from the Revised FEIR with Redlines — July 2018. The Sierra Club hopes that all documents where made available to both the public and the decision makers. If any were missing, then the public has a right to see them and use them as the basis for comments prior to any decisions on this project. The Sierra Club believes the current documents are inadequate and incomplete.

3-F5-

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Planning Commissioners to vote in favor of any aspect of the project at this time. You need to research the problems/inadequacies/incompleteness we mention above as well as others we didn't have time time to research and convey.

Comment Letter 3-F5

1.A.k

3-F5-30

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Please keep the Sierra Club informed by using this email address and the address under my name.

Sincerely and Stay Safe,

George Hague

Sierra Club

Moreno Valley Group

P.O. Box 1325

Moreno Valley, CA 92556-1325

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RESPONSES TO LETTER 3-F5: GEORGE HAGUE, SIERRA CLUB

Response to Comment 3-F5-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F5-2: Refer to Response to Comment 1-F6-17 for discussion how the Project would reduce emissions, utilize zero emission technologies, and provide maximum solar as allowed by the utility provider.

Response to Comment 3-F5-3: As explained in Response to Comment 2-F2-9, although electric vehicles and equipment emit less noise than internal combustion engine (ICE) vehicles and equipment, there may not be an appreciable difference due to the minimum sound requirements required by the NHTSA.¹⁰

Response to Comment 3-F5-4: Refer to Response to Comment 1-F6-17 for discussion how the Project would reduce emissions, utilize zero emission technologies, and provide maximum solar as allowed by the utility provider.

Response to Comment 3-F5-5: As discussed on page 123 of the Air Quality, Greenhouse Gas, and Health Risk Assessment Report (Revised Final EIR Part 2, Appendix A1), all heating and cooling for the Project would be provided via direct evaporative cooling and heating pumps and natural gas is not required.

Response to Comment 3-F5-6: Refer to Response to Comment 1-F6-7 for discussion of noise impacts on the SJWA.

Response to Comment 3-F5-7: Refer to Response to Comment 1-F6-19 for discussion of impacts from traffic on Gilman Springs Road with respect to the SJWA.

Response to Comment 3-F5-8: No specific comment on the content adequacy of the Revised Final EIR is provided.

Response to Comment 3-F5-9: The comment claims that the noise from the WLC project would disrupt bird migratory behavior. The comment continues in asking how the WLC project may affect the annual Christmas bird count conducted by the Audubon Society. The comment also recommends that the WLC project fund a wildlife linkage below or over Gilman Springs Road because of the increased truck traffic that will result from the Project. The comment also includes a statement regarding the adequacy for safety of the roadway improvements for Gilman Springs Road for which the WLC proponent will be responsible.

Noise impacts on wildlife are discussed in the RSFEIR in Section 4.4.6 Significant Impacts (page 4.4-67). The RSFEIR concludes that with implementation of the two setback areas (totaling 400 feet) and the proposed solid walls along development setback away from the SJWA boundary, the anticipated increase in operational noise from the Project will not have a significant impact on wildlife and would not require mitigation.

The WLC project bird surveys were not conducted at the same time as the Audubon Society annual Christmas bird count, so it would be speculative to predict what change will be observed during the annual

¹⁰ U.S. Department of Transportation National Highway Traffic Safety Administration. Minimum Sound Requirements for Hybrid and Electric Vehicles Draft Environmental Assessment. January 2013.

Christmas bird count. The results of the annual counts are dependent upon a variety of factors but primarily climate-related (e.g., rainfall, winter temperatures, etc.), which makes comparative casual determinations subjective.

Migratory corridors/linkages are described in Section 4.4.1.11.g of the 2018 RSFEIR (page 4.4-38). Both the southern portion of the WLC Specific Plan area and the northern portion of the SJWA do not provide suitable habitat or resources to support wildlife migration or regular wildlife movement. There are no existing or proposed linkages, or constrained linkage areas in the vicinity of the WLC project. The nearest linkage areas as identified under the MSHCP are Proposed Linkage 5, which is located approximately 3 miles north of the WLC site and Proposed Constrained Link 20, which is approximately 3.6 miles south of the WLC site. The development of the WLC site will not impede the movement of any wildlife at these linkages. The WLC project will be contributing funds in the form of the MSHCP mitigation fees that may be used to improve wildlife linkage connections over or under Gilman Springs Road. Such linkages would have the highest benefit between the SJWA west of the Gilman Springs Road and the Badlands area on the east side of Gilman Springs Road, which is within Riverside County jurisdiction and not within the City's control.

Roadway improvements are detailed in Section 4.15 Traffic and Circulation of the RSFEIR.

Response to Comment 3-F5-10: Refer to Response to Comment 1.F6-6 for discussion on of potential impacts on species from pollution generated by the Project.

Response to Comment 3-F5-11: The comment references an article from the Australian Academy of Sciences that documents various consequences on wildlife as a result of human-made noise. Please see Response to Comment 3-F3-9 regarding potential noise impacts on wildlife.

Response to Comment 3-F5-12: The comment references an article from the Australian Academy of Sciences that documents various consequences on wildlife as a result of human-made noise. Please see Response to Comment 3-F3-9 regarding potential noise impacts on wildlife.

Response to Comment 3-F5-13: The comment criticizes the RSFEIR noise analysis because it fails to analyze all frequencies of noise, since different animal species hear frequencies in a manner different from humans.

The comment is correct that the noise analysis regarding impacts to wildlife species did not complete an analysis over a range of different frequencies. The noise analysis in the Revised Final EIR is based on predominant noise scales of Equivalent Noise Level (Leq) and the Community Noise Equivalent Level (CNEL). Although these noise scales are primarily adapted for impacts to human ears, they have been also applied to some noise impact analyses on wildlife species in general. Please see Response to Comment 3-F5-9 regarding noise impacts on wildlife.

Response to Comment 3-F5-14: The comment states that many different wildlife species will be impacted by noise from the WLC project during both construction and operations.

The noise impact analysis on wildlife in the RSFEIR is based on the most current data available that is specific to the WLC site. The majority of the WLC project will be further than 450 feet away from the SJWA northern boundary and those noise effects will be attenuated by the distance. It is primarily project-related

development activities in Planning Areas 10 and 12, those along the southern WLC project boundary, that have the potential for noise impacts to effect wildlife. Existing noise levels in the northern SJWA area are affected by road noise from Gilman Springs Road to the east and from noise generated at the existing natural gas facilities. Recent noise studies by ESA (2018) conclude that construction noise levels would not exceed 60 dB within the SJWA, with the highest construction noise level projected to be 52 dB at the SJWA boundary with the incorporation of the Specific Plan 250-foot setback.

Response to Comment 3-F5-15: The comment references the property now incorporated into the SJWA that was previously labeled as CDFW Conservation Buffer Area and mentions that it is discussed within the RSFEIR.

The changes to the Revised Final EIR which are referenced in this comment have replaced the “CDFW Conservation Buffer Area” language with text describing this area as the northern portion of the SJWA -- the two areas are physically the same. The revised biological resource analysis contained in the RSFEIR clarifies that the SJWA property is not utilized to buffer impacts associated with the WLC project.

Response to Comment 3-F5-16: The comment references an article from the Healthy Hearing website, an organization providing a directory for hearing clinicians, that describes hearing in non-human animal species. However, there is no specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F5-17: The comment references an article from the Healthy Hearing website, an organization providing a directory for hearing clinicians, that describes hearing in non-human animal species. However, there is no specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F5-18: The comment references an article from the Healthy Hearing website, an organization providing a directory for hearing clinicians, that describes hearing in non-human animal species. However, there is no specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-F5-19: Refer to Response to Comment 2-F5-8 for discussion of the noise analysis. In addition, as noted in the Note to Reader on page 4.12-1 of the 2018 RSFEIR (Revised Final EIR Part 3), the section replaces the 2015 FEIR section. The analysis was redone and based on the new analysis, mitigation measures that would reduce identified impacts are to be implemented. Therefore, it is not appropriate to compare mitigation measures between the 2015 FEIR and the 2018 RSFEIR.

Response to Comment 3-F5-20: The comment lists concern about the impacts from lighting on wildlife species and recommends that WLC project comply with International Dark Sky standards.

Impacts from lighting on biological resources are described in Section 4.4.6 Significant Impacts of the RSFEIR (page 4.4-69). The WLC project will comply with both the City’s Municipal Code regarding night lighting as well as the City’s Dark Sky Lighting Ordinance. Adherence to the City’s lighting design guidelines and restrictions will help ensure that night lighting increases will not result in significant indirect lighting impacts on native wildlife within the SJWA.

Response to Comment 3-F5-21: The comment refers to the pollutant analysis and their impacts on wildlife and concludes that the EIR analysis is inadequate in describing impacts from air pollution on wildlife.

Air emission impacts on wildlife are discussed in Section 4.4.6, Significant Impacts, of the RSFEIR (page 4.4-70). This discussion assumes that animals within the SJWA would be at least as susceptible to health effects from air pollution, including diesel exhaust, as humans. Studies suggest that diesel particulate matter may be a factor in increased allergic reactions in animals. Direct air pollutant impacts on wildlife within the northern end of the SJWA will be reduced somewhat because prevailing winds are mainly to the southeast with the remainder mostly to the east (i.e., very little to the south), based on data from the Project air quality study (MBA 2012). However, some diesel and other Project-related air pollutants will still be expected to disperse toward the SJWA, including gases and particulates, from trucks and passenger vehicles, when prevailing winds are absent. The RSFEIR concludes that the Project, due to its size and expected amount of truck traffic, will have potentially significant impacts on wildlife within the SJWA and east across Gilman Springs Road from project air pollution, including diesel truck exhaust.

Response to Comment 3-F5-22: The comment quotes from the RSFEIR regarding impacts from diesel particulate matter and expresses concern that air pollutant impacts will also affect plants and insects. Nitrogen deposition can lead to impacts on sensitive species including (1) direct toxicity, (2) changes in species composition among native plants, and (3) enhancement of invasive species. Direct toxicity refers to impacts associated with direct contact with the nitrogen pollutants. There is no scientific documentation that links direct toxicity to impacts associated with sensitive plant and wildlife species. Therefore, direct toxicity is not considered a significant impact. An increase in available nitrogen promotes the growth of non-native weedy species, which alone is not considered a significant impact. An increase in nitrogen deposition does not inhibit the growth of native plants, but promotes the rapid growth of non-native invasive species that could out-compete native plants for available water and nutrients. If the increase of non-native plant species is detrimental to the growth of native plants, the result may be a conversion from a native plant community to a non-native plant community. This change in habitat is only considered a significant impact if that change occurs in suitable habitat for a federally threatened or endangered species within USFWS-designated critical habitat, of which there is none on the WLC site. Because of the way in which nitrogen is generated by the WLC project, its overall patterns for dispersion, and the multi-variant parameters that would need to be taken into consideration for such an analysis, there is no established scientific basis or standards to study the effects of nitrogen dispersion for non-point pollution sources; hence, project-specific conclusions or mitigation would be overly speculative. See Response to Comment 3-F5-21 regarding general conclusion of significant impacts on biological resources, including insects, from air pollution.

Response to Comment 3-F5-23: The comment quotes from the RSFEIR regarding impacts from air pollutants and expresses concern that air pollutant impacts will affect areas beyond the SJWA.

There is no established scientific basis or standards to study the effects of nitrogen dispersion for non-point pollution sources, including beyond the WLC site. According to available research previously presented in Section 4.4.1.18a, a 250-foot development setback is adequate for a Project-SJWA separation and is supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity. See Response to Comment 3-F5-21 regarding general conclusion of significant impacts on biological resources from air pollution, including beyond the SJWA..

Response to Comment 3-F5-24: The comment raises the potential impact on wildlife olfactory senses and states that the environmental documents do not analyze how the WLC project may affect the sense of smell

on each wildlife species using the SJWA. See Response to Comment 3-F5-21 regarding conclusion of significant impacts on biological resources from air pollution.

The only scientific literature found regarding impacts on wildlife olfactory senses was an article regarding the desert tortoise. The WLC site does not provide habitat for the desert tortoise. Further evaluation of the impacts of odors on wildlife would be speculative because of the lack of information.

Response to Comment 3-F5-25: The comment disputes the conclusion that the loss of raptor foraging habitat does not require mitigation.

The RSFEIR addresses the loss of raptor foraging habitat in page 4.4-75. Because much of the WLC site has experienced continued disturbance from various agricultural activities, the prey base for raptors is limited. In addition, the surrounding core areas of the Lake Perris State Recreation Area, the Badlands and the SJWA possess greater foraging area for raptors than does the WLC site. The payment of MSHCP mitigation fees, for which the MSHCP provides 13 raptor species with protection, will contribute to preserving raptor foraging habitat within the MSHCP area. The MSHCP incorporates suitable raptor foraging habitat within the MSHCP conservation areas. The objective of the long-range planning is to maintain sustainable populations within the MSHCP boundary. As a result of conservation planning within the MSHCP area enabled through the contribution of fees required for approved development, cumulative impacts to raptor foraging habitat will not be considerable.

Response to Comment 3-F5-26: The comment states that the WLC project will significantly undermine the mission of the SJWA.

The SJWA contributes to the Core H of the MSHCP and contains potentially suitable habitat for small rodents, common mammals, and burrowing owl. No WLC logistics development will be allowed within 250 feet of the SJWA. However, development that will be near the SJWA may cause significant indirect impacts to species within the SJWA, which will require mitigation that include a fair share contribution toward safety improvements along Gilman Springs Road. Potential indirect impacts to avian and other biological resources within the SJWA will be reduced to less than significant levels by the creation of a 250-foot on-site development setback.

Response to Comment 3-F5-27: Refer to Response to Comment 3-F5-21.

Response to Comment 3-F5-28: Mitigation Measure 4.7.6.1D (page 4.7-28 of the 2019 Draft Recirculated RSFEIR) requires that new development increase efficiency for buildings by implementing 10 percent over the 2019 Title 24's energy saving requirements "or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict". Each building will need to demonstrate adherence to this measure prior to issuance of building permit and the more strict requirement will be implemented. Additionally, as stated in Table 4.7-6 of the 2019 Draft Recirculated RSFEIR (page 4.7-32), Project buildings would be LEED certified.

With regard to payment of TUMF fees through the life of the Project, the TUMF Program is implemented by the approved Measure A, voted on in 1988 and extended in 2002. The Program includes a single uniform fee program to mitigate the cumulative regional impacts of new development on the area's arterial highway system. Under the TUMF, developers pay a one-time development fee to fund transportation projects when

a development reaches the building permit stage. Therefore, payment of TUMF fees through the life of a project is inappropriate and not consistent with the intent and implementation of the Riverside County TUMF program. For further information on the TUMF program, see page 4.15-109 to 4.15-111 of the 2018 RSFEIR.

Response to Comment 3-F5-29: Emissions potentially impacting air quality were evaluated in Section 4.3 of the 2019 Draft Recirculated RSFEIR. Maximum regional daily emissions of VOC, NOX, CO, and PM10 would exceed SCAQMD daily regional thresholds during construction and max daily regional emissions of VOC, NOX, CO, PM10, and PM2.5 would exceed daily operational thresholds at full build out. A dispersion analysis for CO, NOX, PM10, and PM2.5 was performed to evaluate Project impacts during potential overlap of construction and operational activities on localized air quality. As described on page 4.3-21 of the 2019 Draft Recirculated RSFEIR, localized thresholds represent the maximum emissions from a Project that would not cause or contribute to an exceedance of the most stringent applicable Federal or State ambient air quality standards and are developed based on the ambient concentrations of that pollutant for each source receptor area identified by SCAQMD. As summarized on Table 4.3-19, the Project would result in significant localized impacts with regard to PM10. PM10 emissions consist of roadway dust generated by tire wear and brake wear from commuters traveling to their jobs. As shown in Table 4.3-21 of the 2019 Draft Recirculated RSFEIR, approximately 96 percent of unmitigated regional PM10 mobile emissions at project buildout are attributable to roadway dust.

A health risk assessment (HRA) was conducted to allow decision makers to evaluate the cancer-related impacts of the WLC project with the assumption that new technology diesel exhaust (NTDE) causes cancer, contrary to what was found by the HEI study. The HRA was conducted consistent with South Coast Air Quality Management District (SCAQMD) Health Risk Assessment Guidance and the current 2015 Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance for Preparation of Health Risk Assessments. The HRA methodology applied a risk characterization model to the results from an air dispersion model to estimate potential health risks at each sensitive receptor location. A multi-pollutant health risk assessment was conducted for the WLC which included exhaust emissions of particulate matter (PM) and total organic gases (TOG) from diesel and gasoline combustion, as well as toxics associated with fugitive PM from tire wear and brake wear of mobile sources. To be conservative, the HRA relied on EMFAC2017 to determine the breakdown of vehicle types and fuel types and did not consider potential reductions in toxic air contaminants (TACS) emissions and health risks from increased penetration of zero emission vehicles. The estimation of cancer risk involves the specification of several parameters including the concentration level of the toxic air contaminants, the rate of inhalation of the toxic, the exposure frequency (number of days per year), the exposure duration in years, the time period over which the exposure takes place, what is termed a slope factor that represents an upper bound on the increased cancer risk from a lifetime exposure to a toxic by ingestion or inhalation and early-in-life age sensitivity factors. The values of these parameters depend on the type of receptor, i.e., sensitive/residential, worker, and student as discussed below. The health risk calculation does not rely on the Health Effects Institute (HEI) finding that new technology diesel exhaust (2007-compliant) does not cause cancer. The principal focus of the HRA was on the potential health impacts to sensitive/residential receptors located within and surrounding the Project site. Table 4.3-5 on page 4.3-26 of the 2019 Draft Recirculated RSFEIR provides the exposure assumptions for the cancer risk.

Table 4.3-26 on page 4.3-67 in the 2019 Draft Recirculated RSFEIR presents the estimated cancer risks for the 30-year exposure duration that starts from the beginning of Project Construction (Construction + Operation HRA). The results are provided separately for the incremental increase in cancer risk during Project construction, incremental increase in cancer risk during Project Operation, and the total incremental increase in cancer risk prior to the application of mitigation measures. As shown in Table 4.3-26, the Project would exceed the SCAQMD's cancer risk significance threshold of an incremental increase of 10 in a million prior to the application of mitigation and would represent a significant impact. Construction impacts contribute the greatest proportion of the total impact presented in Table 4.3-26. Table 4.3-27 on page 4.3-68 of the 2019 Draft Recirculated RSFEIR shows the estimated cancer risk for the 30-year exposure duration that starts from the beginning of Project full operation in 2035 (Operational HRA). Table 4.3-27 shows that during full Project operation, the total incremental increase in cancer risk is greater than the 10 in a million threshold, prior to mitigation, and would represent a significant impact. Overall, without mitigation and without consideration of the HEI study, the Project is expected to have a significant impact mainly due to diesel PM emissions from construction activities and heavy-duty diesel truck activities. With mitigation incorporated (2019 Draft Recirculated RSFEIR, page 4.3-73 – 4.3-74), the cancer risks are substantially lower. As shown on Table 4.3-28, 2019 Draft Recirculated RSFEIR, page 4.3-27, the estimated incremental increase in lifetime cancer risks for the 30-year exposure duration for construction (construction and operation HRA) would not exceed the SCAQMD cancer risk significance threshold after incorporation of mitigation. The large reduction in cancer risk after mitigation is attributable principally to the reduced diesel PM associated with the commitment to Tier 4 construction equipment (Mitigation Measure 4.3.6.2A[a]). Table 4.3-29, 2019 Draft Recirculated RSFEIR shows that the increase in lifetime (30-year exposure) cancer risk for operation would still exceed the SCAQMD cancer risk significance threshold for sensitive receptors located within and outside the project boundary. Therefore, Mitigation Measure 4.3.5.4.A, the use of MERV 13 filters to impacted residences, was added. This mitigation measure reduced the total incremental cancer risk to less than the SCAQMD significance threshold as shown on Table 4.3-30 (page 4.3-74 of the 2019 Draft Recirculated RSFEIR). Thus, with the implementation of mitigation, any possible risk from the Project, including risks from diesel trucks, to an on-site or off-site receptor, within the study area, was less than significant. It should also be noted that the owners of the houses that would experience a significant health risk have already accepted, in writing, the developer's offer to install MERV 13 filters.

As shown above, the cancer risk and chronic and acute non-cancer risk to sensitive receptors in the community would be less than significant with incorporation of mitigation for construction and operation of the WLC.

Section 4.3.6.6 Summary of Health Effects of Air Quality Emissions, starting on page 4.3-79 of the 2019 Draft Recirculated RSFEIR discusses the health effects from ozone and PM_{2.5} resulting from the project. Tables 4.3-32 through 4.3-35 show the annual percent of background health incidence for PM_{2.5} and ozone health effects associated with the unmitigated and mitigated Project, respectively. The "background health incidence" is the actual incidence of health effects (based on available data) as estimated in the local population in the absence of additional emissions from the Project.¹¹ When taken into context, the small increase in incidences and the very small percent of the number of background incidences indicate that these health effects are minimal in a developed, urban environment. There are no relevant significance

¹¹ Background health statistics were obtained from data included in the BenMAP model, and the sources are referenced in the BenMAP manual (USEPA, 2018). For example, EPA obtained mortality rates from the Centers for Disease Control (CDC) WONDER database, and hospital admissions rates from the Healthcare Cost and Utilization Project (HCUP).

thresholds for health effects from criteria pollutants adopted by state, federal, or local agencies; thus, this information is provided for background understanding regarding the air quality emissions. Table 4.3-32 and Table 4.3-33 show the health effects, morbidity and mortality, of the unmitigated project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Table 4.3-34 and Table 4.3-35 show the health effects, morbidity and mortality, of the mitigated project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Potential PM2.5 Mitigated Project related health effects show an increase in asthma-related emergency room visits (0.0047%), asthma-related hospital admissions (0.0028%), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.00059%), all respiratory-related hospital admissions (0.0015%), mortality (0.0044%), and nonfatal acute myocardial infarction (less than 0.0020% for all age groups). Potential Project Mitigated Ozone-related health effects increased respiratory-related hospital admissions (0.00062%), mortality (0.00027%), and asthma-related emergency room visits for any age range (lower than 0.011% for all age groups). Because the health effects from ozone and PM2.5 are minimal, in light of background incidences, and health effects from other criteria pollutants would be even smaller, the health effects of those other criteria pollutants were not quantified. Because there are no established thresholds, this data was provided for informational purposes.

As stated in the OEHHA factsheet (<https://oehha.ca.gov/media/downloads/calenviroscreen/factsheet/ces30factsheetfinal.pdf>), CalEnviroScreen 3.0 is a mapping tool that can be used to identify California communities (by census tract) that are most affected by sources of pollution and are most vulnerable to the effects of pollution. The CalEnviroScreen score measures the relative pollution burdens and vulnerabilities in one census tract compared to others and is not a measure of health risk. The data presented in the comment is consistent with the results of CalEnviroScreen 3.0 tool.

Construction activities during the Proposed Project would be performed in accordance with and exceed standard mitigation practices commonly implemented to protect surrounding communities from the effects of construction-related impacts. Page 4.3-42 and 4.3-43 of the 2019 Draft Recirculated RSFEIR lists construction mitigation which include, but are not limited to, the use of Tier 4 Final off-road equipment (Mitigation Measure 4.3.6.2A[a]), provide electrical hookups to power electric construction tools (Mitigation Measure 4.3.6.2A[e]), limit idling to 3 minutes in any hour (Mitigation Measure 4.3.6.2A[d]); preparation of a Construction Staging Plan to identify staging, truck routes, and construction parking (Mitigation Measure 4.3.6.2B); prohibit grading on days with an Air Quality Index forecast greater than 150 for particulates or ozone for the project area (Mitigation Measure 4.3.6.2D); and the Project compliance with SCAQMD's proposed Indirect Source Rule for warehouses constructed after the rule goes into effect (Mitigation Measure 4.3.6.2E) (See Topical Response D for more information on the Indirect Source Rule).

Operational mitigation measures, listed below (page 4.3-53 and 4.3-54 of the 2019 Draft Recirculated RSFEIR) have been implemented to ensure that operational emissions are reduced and limited to the extent feasible. Operational mitigation includes, but is not limited to, signage informing truck drivers of idling (Mitigation Measure 4.3.6.3B[a]) and truck route information (Mitigation Measure 4.3.6.3B[c]), staff training on vehicle records and diesel technologies (Mitigation Measure 4.3.6.3B[e]), compliance of all tenant fleets with all current air quality regulations (Mitigation Measure 4.3.6.3B[h]), use of on-site equipment powered by electricity, natural gas, propane, or an equivalent non-diesel fuel and have emissions standards meet or exceed Tier 4 Interim or greater or off-road equipment and 2010 engine emission standards for on-road vehicles (Mitigation Measure 4.3.6.3B[k]), all diesel trucks shall meet or exceed 2010 engine emission

standards (Mitigation Measure 4.3.6.3B[!]), and limit on-site idling to 3 minutes (Mitigation Measure 4.3.6.3B[n]); prior to issuance of building permits for more than 25 million square feet of logistics warehousing, a publically-accessible fueling station (Mitigation Measure 4.3.6.3C) a food and convenience store will be built and operational (Mitigation Measure 4.3.6.3D); refrigerated warehouse space is prohibited (Mitigation Measure 4.3.6.3D); and the project shall comply with SCAQMD's proposed Indirect Source Rule for warehouses constructed after the rule goes into effect (Mitigation Measure 4.3.6.2E) (See Topical Response D for more information on the Indirect Source Rule).

As discussed above, although the Project would result in significant and unavoidable impacts related to regional and localized criteria pollutant emissions, the Project would result in less than significant increases in cancer risk and minimal health effects. Additionally, implementation of the Project would result in the generation of temporary and permanent jobs, many of which would benefit local residents, shorten the commute of many workers by providing a job source in a City with a severe jobs/housing imbalance, and contribute to the public education system (specifically, Moreno Valley Unified School District and San Jacinto Unified School District). Therefore, the Project would not subject a disproportionate share of health consequences to a disadvantaged population and would not conflict with Government Code section 11135(a).

Response to Comment 3-F5-30: The City website includes all the documents prepared for the Project. As shown on the website, the various documents are dated. All portions of the Revised Final EIR, including the 2015 Final EIR, 2018 RSFEIR, 2019 Draft Recirculated RSFEIR, Response to Comments, Mitigation Monitoring and Reporting Program, and all associated appendices are available for review by the public.

Response to Comment 3-F5-31: No specific comments on the contents of the Revised Final EIR are provided, and thus no further response is needed (State CEQA Guidelines §15088(a) requires that a lead agency only evaluate and respond to comments raised on environmental issues.)

1.1.7 (3-G) Letters from Private Individuals

The following are responses to “G” comments from the general public. These responses are organized as follows:

- Responses to comments on the Revised Final EIR where the comment letter requires one or more specific responses. For these comments, each comment letter is followed by a response to the comment letter (refer to each individual comment letter to see bracketed comments).
- Comments indicating general support, general opposition, or otherwise not raising substantive environmental issues and therefore not warranting a specific response. These general comments are located in Attachment A of this Memorandum. A general response to these general comments follows the response provided to Letter 3-G42. The discussion that precedes the general response identifies the number of each general comment to which the general response is applicable.

Comment Letters Received from private individuals include the following:

- 3-G1: Alejandro & Georgina Briseno
- 3-G2: Alicia Wright
- 3-G3: Amado Hernandez
- 3-G4: Ana Cabrera
- 3-G5: Andrea Chouinard
- 3-G6: Angel Lopez
- 3-G7: Angelico Hinojosa
- 3-G8: Beatriz Mendoza
- 3-G9: Blanca Calderon
- 3-G10: Cassandra Gonzalez
- 3-G11: Cecilia Amarillas
- 3-G12: Cipriano Castellano
- 3-G13: Cira Delgado
- 3-G14: Daniel Mendoza
- 3-G15: Denise Creer-Utterbach
- 3-G31: Isabel Bojorquez
- 3-G16: Dolores Rojas Robles
- 3-G17: Edd Williams
- 3-G18: Esteban Hernandez
- 3-G19: Eunice Kang
- 3-G20: Frank Huddleston
- 3-G21: Frank Wright
- 3-G22: Walter Guinea
- 3-G23: Gemma Arrate
- 3-G24: George Hague
- 3-G25: Greg and Susan Billinger
- 3-G26: Guadalupe Marquez
- 3-G27: Guillermo and Manuela Patino
- 3-G28: Guillermo Reza
- 3-G29: Yuliana Lopez
- 3-G30: Isabel Baldenegro
- 3-G55: Vilma Restrepo

- 3-G32: Janet Giles
- 3-G33: Jessica Reza
- 3-G34: Jose and Soledad Lope
- 3-G35: Karen Jakpor
- 3-G36: Linda Castellano
- 3-G37: Lindsay Robinson
- 3-G38: Luis Baldenegro
- 3-G39: Manuel and Carolina Rodriguez
- 3-G40: Margarita Espanza
- 3-G41: Maria Esparza
- 3-G42: Melody Lardner
- 3-G43: Monica Esparza
- 3-G44: Nazly Badillo
- 3-G45: Petra Olazabal
- 3-G46: Raul Sanchez
- 3-G47: Richard Olvera
- 3-G48: Rosemary
- 3-G49: Sharon Eirew
- 3-G50: Silvia Abrego
- 3-G51: Silvia Callente
- 3-G52: Susan and Conrado Lansang
- 3-G53: Teresa Salas
- 3-G54: Tony Reza
- 3-G79 Maria Mereyman
- 3-G56 Annie Burch
- 3-G57 Ana Lilia Cisneros
- 3-G58 Joel and Ana Villaverde
- 3-G59 Aureliano and Maria Jacobo
- 3-G60 Beatriz Garcia
- 3-G61 Bertha Garcia
- 3-G62 Bertha Lozano
- 3-G63 Carlos Reza
- 3-G64 Delfina Gomez
- 3-G65 Frances Saldana
- 3-G66 Ines Arnica
- 3-G67 Inez Gonzalez
- 3-G68 Irma Padilla
- 3-G69 Israel and Alma Flores
- 3-G70 Joel and Ana Villaverde
- 3-G71 John Peikert
- 3-G72 Joseph Martinez
- 3-G73 Juanita Gone
- 3-G74 Karen Flores
- 3-G75 Keith Howerton
- 3-G76 Laysha Saldana
- 3-G77 Luis Buenrostro
- 3-G78 Maria Hernandez
- 3-G89 Petra Avina

- 3-G80 Maura Garcia
- 3-G81 Miguel Gutierrez
- 3-G82 Nelly Martinez
- 3-G83 Nelly Menjivar
- 3-G84 Maria Galazar
- 3-G85 Noemi Cisneros
- 3-G86 Norma Preciado
- 3-G87 Olegario Rojas
- 3-G88 Pascuala Urista
- 3-G90 Porfiro G Siordia
- 3-G91 Rodolfo Lepe
- 3-G92 Roger Flores and Ruth Perez
- 3-G93 Santiago Hernandez
- 3-G94 Teodora Garcia
- 3-G95 Vilma Restrepo
- 3-G96 Walter Guinea
- 3-G97 Consuelo Siordia
- 3-G98 Socorro Gutierrez

Julia Descoteaux

From: Cipriano Castellano <cyegone@verizon.net>
Sent: Thursday, May 14, 2020 4:25 PM
To: Julia Descoteaux
Subject: REVISED ENVIRONMENTAL IMPACT REPORT

Warning: External Email – Watch for Email Red Flags!

As a home owner in a rural residential area, I am concerned!

This email is regarding the "revised EIR for WLC"

The proposed changes will make MY neighborhood a "Commercial Route"
This will compromise what is supposed to be a Rural Neighborhood without "Commercial".

Our 2 lanes steets are what they are...2 lanes street that are not to commadate Commercial Trucks! with will bring "Traffic".

Changing the streets to 4 lanes street will "open the door" for "Commercial Trucks"! mark my words.

Along with the changes will bring "code changes" & changes to OUR neighborhood & so on.....

I moved out into this area, outside the Moreno Valley City...to get away from the "Traffic" & again...
Changing our 2 lanes to 4 lanes will bring that "Traffic" especially the Commercial Trucks! & after that, the door that WE opened will be hard to close.

These map street changes that were buried in Mr. Benzeevi's EIR, he has not made the changes "needed" to Mitigate the traffic, noise, pollution.

Our neighborhood has already had a "taste" of that Commercial Traffic.... when the 60 freeway is diverted due to accidents, closures, fires.....traffic is unbearable especially if you are resident i the ares.

My Voice matters,
Cipriano Castellano
cyegone@verizon.net



3-G12-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G12: CIPRIANO CASTELLANO

Response to Comment 3-G12-1: The commenter claims that the Revised Final EIR does not mitigate traffic, noise, and pollution impacts. As demonstrated below, the Revised Final EIR conducts a thorough analysis of air quality, noise, and traffic impacts and implements all feasible mitigation to reduce those impacts.

See the Response to Comment 3-F5-29 with respect to health risk assessment.

The health studies are conservative and based on the assumption that diesel trucks cause significant health impacts, contrary to the HEI study which analyzed 2007-compliant diesel engines and found that the application of new emissions control technology to diesel engines “showed few exposure-related biologic effects” and any such exposure to NO₂ “is being substantially further reduced in 2010-compliant engines.” (HEI, p.4.) Furthermore, only 2010-compliant diesel trucks will be allowed to service the WLC per mitigation measures 4.3.6.2A h) (page 4.3-32, construction on-road haul trucks) and 4.3.6.3 b) (page 4.3-53, trucks servicing the WLC when operational).

The 2018 RSFEIR also evaluated the potential noise impacts generated from the construction and operation of the WLC. As shown in Table 4.12-8 of the 2018 RSFEIR, construction activities within the Project area would elevate existing ambient noise levels by as much as 50 dB. The existing sensitive receptors that would be most affected by on-site construction activities are located within, to the west, and to the southwest of the Project area. Therefore, noise generated during onsite construction activities would result in a significant impact. Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a Noise Reduction Compliance Plan (NRCP), which is expected to attenuate construction noise levels by 10 dB and prohibit construction activities within 800 feet of residences during nighttime hours. As shown in Table 4.12-8 and Table 4.12-10, even with implementation of Mitigation Measure 4.12.6.1A, sensitive receptors located near on-site and off-site construction areas would be exposed to construction noise levels that would elevate the existing ambient noise levels above the applied 10 dB substantial temporary increase threshold. Therefore, this would result in a significant and unavoidable impact with mitigation.

A Transportation Impact Analysis (TIA) in Appendix F in the 2018 RSFEIR, was conducted for the Project which identified specific near-term and longer-term circulation improvements that would be required to mitigate Project impacts and maintain acceptable peak hour and daily levels of service (LOS) on surface streets and freeways affected by the project. As part of the TIA, impacts to freeways were analyzed with regard to LOS. As indicated in the analysis, many of the freeway segments along SR-60 and I-215 would be impacted as discussed in Section 4.15.6 of the 2018 RSFEIR. The WLC project would increase the traffic in the area, with most of the area operating at a degraded level of service. Therefore, traffic impacts were found to be significant and unavoidable for roads and intersections, and on all freeway mainline, weaving, and ramp facilities because those roads, intersections, and freeways are not within the City’s jurisdiction as discussed in Section 4.15.7 of the 2018 RSFEIR. However, payment of fair share mitigation fees is required for the improvements not within the City of Moreno Valley and those jurisdictions that have established fair share mitigation programs (see mitigation measure 4.7.15.4E and 4.7.15.4F). In addition, payment is also required for the Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44 (See Mitigation Measure 4.7.15.4D on page 4.4-63 of the 2018 RSFEIR).

Among the improvements that the Project would be required to mitigate include payment of TUMF fees to widen Gilman Springs Road to provide three southbound lanes and one northbound lane along the frontage of the WLC Project and to pay into the TUMF and fair-share contribution towards the widening of Redlands Boulevard between SR-60 eastbound ramps and Eucalyptus Avenue. As shown in Table 72 of the TIA, these roadway segments operate at insufficient LOS prior to the implementation of the Project. The number of lanes that a street segment consists of does not determine the type of vehicles that would travel on that road as the commenter suggests.

Julia Descoteaux

From: George Hague <gbhague@gmail.com>
Sent: Thursday, May 7, 2020 5:22 PM
To: Julia Descoteaux
Cc: City Clerk
Subject: Comments on the World Logistic Center (WLC) Revised Final Environmental Impact Report for the Planning Commission

Warning: External Email – Watch for Email Red Flags!

Good afternoon/evening Moreno Valley Planning Commissioner,

RE: World Logistic Center Revised Final Environmental Impact Report (RFEIR)

A clean and healthy environment is a fundamental right for all California residents. To that end, more can be done to reduce exposure to pollutants and improve the quality of life in California communities facing environmental and economic challenges. This project will prejudice the current Moreno Valley General Plan Update and especially the Environmental Justice Element. The RFEIR fails to analyze how the WLC will reduce its impact on Moreno Valley's Disadvantaged Community to less than significant.

You must ask for the Moreno Valley map that shows what parts of our town are considered Disadvantaged by the state in large part because of the significant pollution – they are largely near where warehouse projects have been approved and where their trucks use city streets.

The closer people are to particulate Diesel Pollution the more health impacts they are subjected. If we did not have so many warehouses, most trucks would use I-10 and not SR-60. We as part of the SCAQMD also must significantly help reduce our particulate pollution or we will very likely be subject to fines, penalties, and major federal regulation — as written below.

Even COVID-19 is more deadly because of the pollution produced with each warehouse and their 1000,s of diesel trucks you approve as can be read below.

Sincerely,

George Hague

3-G24

3-G24

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G24: GEORGE HAGUE

Response to Comment 3-G24-1: The comment states that more can be done to reduce exposure to pollutants and claims that the Revised Final EIR fails to analyze how the Project would reduce its impact on Moreno Valley's disadvantaged communities. As discussed in responses to Comment Letter 1-F6 and Comment Letter 2-F2, the 2019 Draft Recirculated RSFEIR fully evaluated the potential air quality and health risks of the WLC project to sensitive receptors from diesel trucks. As demonstrated in responses to Comment Letter 2-F2, the Project incorporates all feasible mitigation, including feasible measures suggested by the commenter. In addition, the settlement that the project's developers have entered into with the South Coast Air Quality Management District (SCAQMD) requires the payment of 64 cents per square foot for each building as the Project is constructed. These funds would be used by SCAQMD to improve air quality within the South Coast Air Basin "to develop mitigation efforts focused on reducing emissions in the areas affected by the warehouse project."¹²

Response to Comment 3-G24-2: The comment references the potential health effects of air pollution, and claims that COVID-19 is more deadly because of the Project's air pollution, citing a Los Angeles Times article and a Harvard study. Potential health effects resulting from the implementation of the Project has been analyzed in the Revised Final EIR as summarized in Response to Comment 2-F2-12. With regard to the attached Los Angeles Times article linking air pollution to risk of death due to COVID-19, the authors of the study investigated whether air pollution exposures are associated with increased risk of death from COVID-19, finding large and significant associations even with very small increases in air pollution. Air pollution, and specifically PM_{2.5}, has been correlated with various disease, including respiratory and cardiovascular disease. COVID-19 deaths are also highly correlated with underlying respiratory and cardiovascular diseases, so there is a possibility that exposure to PM is also correlated with COVID-19 deaths.

However, this study was released before it went through the peer-review process for publication. This peer-review process, in which experts in the field scrutinize the methods and results, is a critical step in order to ensure the quality and validity of study results. The findings of this study received substantial media attention, even though it was not yet a peer-reviewed publication. The study has not been published in a peer-reviewed journal, and the researchers have already gone through one round of corrections to their calculations based on more updated information. It is possible that there will be additional changes as a result of the peer-review process.

The study has a number of shortcomings that are likely to delay or prevent its publication in the peer-reviewed literature. Probably the most important limitation is that the COVID-19 pandemic is evolving rapidly and affecting areas of the US differently, and at different times. The data are still being collected to varying degrees in different states and many deaths are likely to still be under-reported. Because we do not have complete information on COVID-19 related deaths, this could significantly bias the findings in the Harvard study.

There are also important concerns that the study may be, at best, incomplete. For example, the spikes in COVID-19 deaths in any particular county are more likely a reflection of where that county is on the COVID-19 curve than on air pollution in that county. Many large cities, like New York City have higher air pollution

¹² SCAQMD press released October, 21, 2016, announcing the settlement.

levels, but also have higher population density and therefore more opportunity for the virus to spread. These larger cities would be expected to have higher COVID-19 related deaths that could be unrelated to air pollution levels. In addition, different states and counties adopted COVID-19 policies at different times (e.g., social distancing) and this greatly impacted the death rates from COVID-19. A mortality study would need to account for differences in both air pollution and social distancing to disentangle the effect of each of these factors. Most air pollution mortality studies also assume that deaths are unrelated to each other, but this is not the case for COVID-19. In fact, deaths tend to be clustered, for example in retirement homes. These outbreaks are related to social interactions (based on current data), and because local health systems may be overwhelmed, this could lead to higher mortality rates.

Overall, the results from the Harvard study are premature and the issues discussed here, among others, call into question the findings. More data needs to be collected on COVID-19-related deaths before a scientifically sound assessment can be conducted to assess the potential impacts of air pollution exposures on COVID-19 deaths.

Julia Descoteaux

From: Greg and Susan Billinger <GSK99@msn.com>
Sent: Thursday, May 14, 2020 4:24 PM
To: Julia Descoteaux
Subject: Don't Approve The World Logistics Center!

Warning: External Email – Watch for Email Red Flags!

Please share our email with all the planning commissioners. We are residents of Moreno Valley who view the World Logistics Center as a LOSE-LOSE project for the City of Moreno Valley. Residents will lose because they and their children will have to breathe filthy air from particulate matter as the 12,000 daily big rig wheels hit the asphalt and cause huge amounts of particulate matter to enter the air. Young children will be the primary victims of the filthy air here, causing even higher rates of asthma and other life-long health problems. Adults and Older people will also suffer earlier death from the particulates and emissions going into the air. Air pollution and very heavy big-rig traffic is degrading, and the City of Moreno Valley itself will be degraded overall, by having such heavy big-rig traffic and air pollution. It will result in a lowered reputation for the City as a whole.

3-G25-1

Residents should not be financially burdened as their tax dollars go into widening all the city roads for big-rigs. The tax dollars should be used for amenities for residents, like parks and libraries that benefit residents, like the beautiful new library Riverside is building. Instead the Moreno Valley taxpayers have to pay, pay, pay more and more taxes, to have massive road widening, just to accommodate big-rigs. This is a totally unfair tax burden on Moreno Valley residents which will benefit one developer but not the residents in any way. Besides enduring very heavy big-rig traffic and noise and pollution, they will see a few warehouse jobs available and no amenities from all the taxes.

3-G25-1

Increasing sophistication of robotics in factories will ensure that Moreno Valley residents get few jobs out of this massive polluting development. It is such a VAGUE CONCEPT OF DEVELOPMENT that I believe the planning commission needs to really investigate exactly what all the warehouses will be used for, before approving such a development. By rushing into such a development without really understanding clearly the exact steps and timing and end result and effects, and without being 100% certain that it will really bring any benefits to the majority of Moreno Valley residents, it could turn into a colossal disaster.

3-G25-3

This World Logistics Center is a flawed project. Most residents will be deeply unhappy with all the big-rig traffic, pollution, and few jobs.

3-G25-4

Do Not Approve This Project!

Sincerely,

Long-time Residents

Greg and Susan Billinger

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G25: GREG AND SUSAN BILLINGER

Response to Comment 3-G25-1: The 2019 Draft Recirculated RSFEIR fully evaluates the Project's health risk and traffic impacts and imposes feasible mitigation measures to reduce the effects of the Project. As discussed on page 4.3-24 of the 2019 Draft Recirculated RSFEIR, California Office of Environmental Health Hazards Assessment (OEHHA) guidance for health risk assessments, which the Project air quality analysis is consistent with, incorporates the importance of early-in-life sensitivities for young children to exposures to toxic air contaminants. Refer to Response to Comments 3-G12-1 and 3-F5-29 for a summary of health risk, health effects, and traffic-related impacts and mitigation.

Response to Comment 3-G25-2: As discussed in Response to Comment 3-G12-1, payment of fair share mitigation fees is required for the improvements not within the City of Moreno Valley and those jurisdictions that have established fair share mitigation programs (see mitigation measure 4.7.15.4E and 4.7.15.4F). In addition, payment is also required for the Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44 (See Mitigation Measure 4.7.15.4D on page 4.4-63 of the 2018 RSFEIR. The City of Moreno Valley Development Impact Fee (DIF) program is used to fund roads and intersection improvements needed within the City. See page 4.15-111 of the 2018 RSFEIR for a description of the City's DIF program. As stated in footnote 8 on page 4.15-111, the Development Agreement requires that the Applicant fully fund or construct all needed improvements within the City of Moreno Valley in lieu of paying the DIF for traffic. Therefore, all improvements within the City would be fully funded by the Project and the Project will pay into established fair share and TUMF programs for improvements required outside of the City.

Response to Comment 3-G25-3: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G25-4: Refer to Response to Comments 3-G12-1 and 3-F5-29 for a summary of health risk, health effects, and traffic-related impacts and mitigation.

Julia Descoteaux

From: Karen Jakpor <kmjakpor@gmail.com>
Sent: Thursday, May 14, 2020 1:01 PM
To: Julia Descoteaux
Cc: City Clerk; Jakpor, Karen
Subject: written comments for tonight's meeting on WLC revised EIR
Attachments: Moreno Valley Planning Commission Hearing on the World Logistics Center Revised Final EIR Report.docx

Warning: External Email – Watch for Email Red Flags!

I am submitting these written comments for the Planning Commission to consider for tonight's meeting about the WLC revised EIR.

Best,
 Karen Jakpor, MD, MPH
 Riverside, CA

3-G35-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Moreno Valley Planning Commission Hearing on the World Logistics Center Revised Final EIR Report
5-13-2020 by Zoom

Comments submitted by Karen Jakpor, MD, MPH 5-14-2020

Dear Members of the Moreno Valley Planning Commission and City Council Members,

You would think that a project that consumes a portion of land equivalent in size to 700 football fields, would be a project that would concern all Moreno Valley residents and would motivate the city to provide for as much public input as possible. You would think that a proposal for “the nation’s largest master-planned warehouse complex” with impacts extending throughout the entire region would warrant hearings conducted in a way as to provide the most environmental justice possible. But here we are, in the middle of a public health crisis the likes of which we have never seen before, and the developer is trying to rush through his project in such a way that community input will definitely be hindered. Shouldn’t the City of Moreno Valley be focusing instead on the immediate needs of the citizens of Moreno Valley while they are suffering through this crisis?

How many of you members of the Planning Commission have read the entire Revised Final Environmental Impact Report cover to cover that you plan to approve during this hearing? Again, the developer is trying to flood us with information written in a difficult way for the community to understand, and I bet challenging for you planners as well. You have to flip back and forth through countless pages to refer to tables in various documents as you are reading. Did you actually do that? If not, how can you say that you have properly evaluated the project being proposed. And for the record, I am very dissatisfied with the responses I received to the numerous questions I submitted during the review process of the revised EIR. In my opinion, this remains an inadequate environmental impact report.

My name is Dr. Karen Jakpor, and I am a physician volunteer with the American Lung Association. I have also been diagnosed with severe asthma and have been hospitalized more times than I can count. Let me distill this enormous report for you. The project should not be approved, because there were “significant and unavoidable impacts” before, and now in the revised EIR there will still be “significant and unavoidable impacts.” So this project can only be approved if the City Council decides there are “overriding considerations.”

Why claim that there are “overriding considerations” warranting project approval when the City of Moreno Valley and the entire Inland Empire already has a hugely disproportionate share of the nation’s warehouses and accompanying air pollution from the association diesel truck trips? Why do we need another warehouse of this size consuming such a huge portion of the land to produce jobs for robots. What we really need are jobs for people, and other projects could provide far more jobs per acre than large warehouses run by robots.

I believe the City of Moreno Valley should consider the impact of COVID-19 in their planning. We could be dealing with the impacts of COVID-19 for some time, and the COVID-19 pandemic directly affects the environmental health impacts of the proposed World Logistics Project. So these impacts, which are not address in this revised final EIR, must be fully evaluated and considered in this report. Without that consideration, the mortality projections from the report are no longer correct.

3-G3

3-G3

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

The reason I say this is that a recent study from Harvard University showed that for each increase in particulate air pollution of 1 µg in PM_{2.5}, there was an associated 8% increase in the risk of death from COVID-19. We know that pre-existing conditions increase the risk of death for COVID-19. Air pollution is causes an increase in many of these same pre-existing conditions, such as cardiovascular disease.

The study found that a person living in a county with high levels of fine particulate air pollution is 15% more likely to die from COVID-19 than someone living in a county with less fine particulate air pollution. The bad news is that we live in a county with some of the highest particulate air pollution. Do we really want to make our risk of dying of COVID-19 even higher by building the World Logistics Center?

So remember, even a small increase in particulate air pollution results in a large increase in the risk of death from COVID-19. That should be your overriding concern as you evaluate this project for approval during a pandemic!

Sincerely,

Karen Jakpor, MD, MPH
Riverside, California

References

<https://projects.iq.harvard.edu/covid-pm>

<https://www.nytimes.com/2020/04/07/climate/air-pollution-coronavirus-covid.html>

<https://www.bloomberg.com/opinion/articles/2020-05-04/how-trump-s-epa-is-making-covid-19-more-deadly>

↑
3-G35
CON

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G35: KAREN JAKPOR

Response to Comment 3-G35-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G35-2: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G35-3: The commenter references a recent study conducted by Harvard researchers on the effects of long-term air pollution exposures on COVID-19-related mortality.¹³ Refer to Response to Comment 3-G24-2.

¹³ <https://projects.iq.harvard.edu/covid-pm>

From: Linda M Castellano <linda@lindacastellano.com>
Sent: Thursday, May 14, 2020 3:23 PM
To: Julia Descoteaux
Subject: Revised Environmental Impact Report

Warning: External Email – Watch for Email Red Flags!

Julia, this email is regarding the revised EIR for WLC. I moved to this area to stay in Moreno Valley but to get away from the "city". I am 100% against changing some of our 2 lane streets to 4 lanes. I for one do not want truck routes in my neighborhood. Why is this map of street changes buried in Mr. Benzeevi's EIR? He has not made the changes needed to mitigate the traffic, noise, pollution so the planning commission needs to vote NO! We already have enough trucks and pollution with the warehouses just southeast of the 60 freeway. The negative impact this would bring to the rural area of Moreno Valley is terrifying!

3-G36-1

Hear my voice, it matters!

Linda M. Castellano
 Linda@LindaCastellano.com

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G36: LINDA CASTELLANO

Response to Comment 3-G36-1: The commenter claims that the Revised Final EIR does not mitigate traffic, noise, and pollution impacts. As demonstrated in Response to Comments 3-G12-1 and 3-F5-29, the Revised Final EIR conducts thorough analysis of air quality, noise, and traffic impacts and implements all feasible mitigation to reduce those impacts.

Julia Descoteaux

From: Lindsay Robinson <lr92555@gmail.com>
Sent: Thursday, May 14, 2020 6:32 AM
To: Julia Descoteaux
Cc: City Clerk
Subject: For the record- opposition to wlc EIR approval
Attachments: Oppose approval of wlc revised eir.pdf

Warning: External Email – Watch for Email Red Flags!

Ms. Descoteaux,

Please find my submission opposing the approval of the "revised" final EIR for the wlc. I would appreciate this being part of the public record and as we cannot attend meetings it needs to be considered by all city parties involved in the decision making process.

This meeting along with the general plan update and Theodore interchange project all need to be postponed until the public can fully participate at an open public meeting.

Thank you,
Lindsay Robinson

3-G37-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

To whom it may concern,

For the public record, I am writing to oppose the approval by the planning commission of the “revised” final wlc EIR as it still does not adequately address nor fix all the issues described by the courts. This is another non-essential project at this time along with the general plan update and Theodore interchange project that all need to be postponed during this lockdown until the residents can fully participate in person. The Riverside Board of Supervisors and the Riverside City Council have both acknowledged the importance of the democratic process and postponed these types of decisions until the public can fully participate. Our lives, health and quality of life will be greatly negatively impacted if Mr. Benzeevi is allowed full participation while residents are denied full the same right.

3-G37

Of great concern is the fact that the mayor recently fired the city manager, assistant city manager, city attorney, the head of the Planning Dept. and the head of Human Resources among others. The message to city staff is quite clear- do what the mayor (HF) tells you to do or you will be fired. Ethics and integrity don’t matter in Moreno Valley. This is another reason to postpone these actions until the public can fully attend and participate.

3-G37

The wlc revised EIR is far too large of a document to adequately read, study, comprehend and compare to the former EIR, the judge’s writ and AG Becerra’s suit to be sure it has been changed and improved adequately. Three of the planning commissioners are also tasked with the general plan update at the same time, making it impossible for them to perform their due diligence on both items. Additionally this EIR should not move forward as the majority of the planning commissioners need to recuse themselves for conflict of interest due to their relationships with Iddo Benzeevi and Highland Fairview.

3-G37

As the general plan update is in progress at the same time, the land use of this property needs to be re-examined and rezoned to more appropriate uses that better benefits the city and protects the residents. The 2006 general plan recognized the value of land use and this area should be rezoned for the high end homes and businesses for which it was intended. This EIR offers no consideration for development alternatives of mixed land uses. To not touch this land during the process and allow Benzeevi to control the city is again opening the city up for more litigation. Please do not approve this EIR and recommend that this land be rezoned to more appropriate land use that provides more jobs, diverse jobs and state required housing.

3-G37

Time has shown that these warehouses provide little to no jobs/acre especially as automation takes over which is another reason this land use needs to be re-evaluated. The lies of high paying jobs/exaggerated numbers of jobs need to stop now. We have far too many warehouses in our city already and calling this project “logistics” doesn’t change the reality that they will be warehouses. Our residents deserve better and now that the state is calling for more housing of different types, this property needs to be reverted to 2006 plan which offered housing, and a greater diversity of businesses and jobs. Please take this into consideration and reject this EIR.

3-G37

Major concerns and many environmental impacts are still not mitigated or reduced in this “new” revised EIR. In fact little has changed, therefore it needs to be denied. A few items are mentioned below:

3-G37

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

The massive wlc will impact a large region of the Inland Empire and people from throughout this area should have been told of this meeting, because the project will likely negatively impact their quality of life and the health of their family. Please find out whether all neighboring regions were notified and supplied with information of this hastily called meeting for approval. As we're all in lockdown you should have supplied additional time for review and notification to allow surrounding regions adequate time to respond.

3-G37
CON1

There has been no change to the project setback, land uses, or design adjacent to all existing residential neighborhoods for traffic, air quality or noise impacts. As this project is entirely without known tenants it is impossible to mitigate all the negative impacts adequately. **Prior to approval- The city needs to enact a noise ordinance for warehouses before any more are approved/built to protect the residents from 24hr/day noise. Warehouses need to follow the same noise ordinances as residents/construction/yard workers and shut down from 10 pm-7 am. Solaris Paper Company is a prime example of unreasonable noise all night long. The wlc should not be allowed to build across the street from occupied homes as is their current plan and setbacks need to be increased to protect the existing residents.**

3-G37

3-G37

The Newkirk home on Dracea was always left out of the maps during the wlc hearing in spite of their efforts to inform the city staff and attendees. They requested many times that it be shown so that everyone would know what was being done to their property. They have been threatened with warehouses only several hundred feet from their front door. This travesty needs to be rectified and their property protected. Residents should have priority over out of town people "paying to play".

3-G37

There has been no change to the project along the 2-mile border with San Jacinto Wildlife Area. **The judge specifically called him out on his buffer where he was using land that wasn't his to be the buffer. wlc land needs to be added to the buffer zone. Again lights/noise need to end at night to protect our resident's health and quality of life, protect the wildlife and protect our highly valued night skies.**

3-G37

The master planned trail system connecting the north side of the city to Lake Perris is missing again. Please ensure that the safe multiuse trail is included in any and all approvals. Our original overcrossing at Sinclair was moved to Theodore to accommodate Mr. Benzeevi for skechers. This change needs to be honored and the trail system needs to show on these maps.

3-G37

There is no extra mitigation to the diesel exhaust from trucks. The offer to buy greenhouse gas credits in other counties which do nothing for us here. The 2010 or newer diesel trucks are cleaner, but not clean. They will bring health impacts to us as they further degrade our air quality with particulate pollution, but especially for the young and elderly. The COVID-19 pandemic has demonstrated how bad air quality has compounded the deadliness of respiratory diseases and unfairly affects those who live in areas of irresponsible planning. This project does not mitigate their compounded unhealthful air quality effects and thus this EIR needs to be rejected. Our residents and those in the surrounding areas deserve much better.

3-G37

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

The wlc’s greenhouse gas (GHG) impacts are huge and are not mitigated locally or even within California. GHG is causing the Earth’s atmosphere to warm, resulting in changes to the climate we are already starting to see today.

3-G3: 4

The wlc doesn’t have any system in place to turn away diesel trucks which are not 2010 compliant. As HF and followers have little to no regard for the law, self-policing is a joke especially when the land is sold to others who do not have to follow the development agreement.

3-G3: 5

There is no remedy to the traffic impacts on the already congested SR-60. Even with three or four lanes SR-60 will not be able to accommodate the addition of more than 12,000 daily diesel truck trips and 45,000 more daily car trips generated by the WLC. It will become many times worse than what we currently suffer. Caltrans has no plans to widen the 60 freeway thru Moreno Valley and even if they were to do so, it would require eminent domain on existing developments. It appears his plan is to widen our neighborhood streets so those roads and residents will suffer more traffic, noise, pollution, and danger. The roads will then need more frequent repairs which the city can’t afford, and his development agreement absolves him from paying for damages/improvements. This is not of benefit to the city nor the residents. Please reject this EIR.

There is no further addressing of city street impacts other than to exempt him from paying. Diesel Trucks should only be allowed to enter and exit the WLC by using SR-60 and not using any streets that pass peoples' homes. The new development agreement exempts him from paying for street improvements therefore entrance needs to be directly from freeway. Sec. 4.8 ...” HF shall not pay the fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals) and 3.42.050 (interchange improvements). **“...HF SHOULD pay the fees required by MV Municipal codes as noted in section 4.8. The excessive traffic this project will subject our roads to requires HF to pay these fees. Do not accept this provision.**

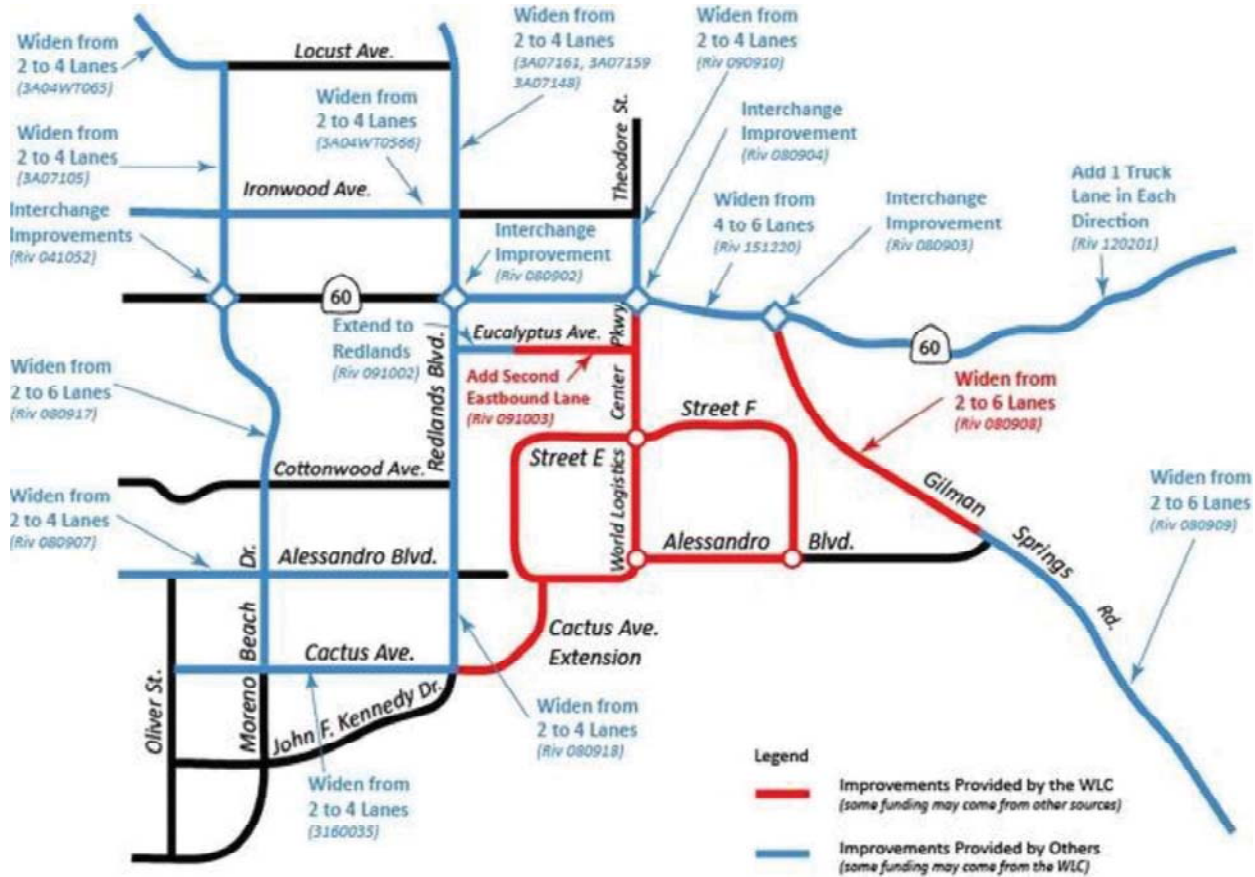
3-G3: 3

It is horrifying to see this new map of road widenings in our neighborhoods that is buried in this file. All residents in the affected areas should have received individual notices of the road proposals that Benzeevi is hiding in the EIR. Four lanes are NOT needed in these neighborhoods and destroying Gilman Springs with 6 lanes is reprehensible. There are homes along Redlands Blvd. yet no mention on what will happen to these residents. Also, he is forcing us to pay for these widenings that will harm our neighborhoods and our pocketbooks. Clearly this is his sneaky way to turn non-truck routes into truck routes further destroying our quality of life and health. Please do not approve this street widening map and remove it from this EIR.

Mr. Benzeevi has failed to honor his commitment to improve Eucalyptus by skechers although he has had plenty of time to do so. Now it appears the taxpayers will be paying for his responsibility.

Please deny this proposed street widening plan in its entirety until all affected residents are properly notified and able to voice their concerns.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)



This revised EIR also neglects to adequately provide a location for truck servicing and parking. A project of this magnitude needs to provide those amenities and not force them to go to outlying areas. NE Moreno Valley is NOT where truck stops/fueling stations belong. They belong on the wlc property.

3-G3 7

There was little to no consideration from comment letters addressing the resident's concerns. Please reject this EIR until all concerns are addressed.

Now on to the conflict of interest that should stop this from moving forward at all-

Under common law conflicts, there is no need of financial benefits just the connection in which benefits one of those in the connection (Highland Fairview).

3-G3 8

Even the Appearance of a Conflict of Interest Should Be Avoided for Government Employees. This includes those who are appointed and especially because they receive payment and promise to behave ethically and in a fair and impartial manner. Because of their connections and undue influence exerted over them by HF the following Planning Commissioners need to recuse themselves resulting in no quorum. I contend that Robert Harris, Raphael Brugueres, Joann Stephens, Alvin Dejohnette and Ray Baker all need to recuse themselves from hearing, voting or advocating for in their official capacity any item which involves Highland Fairview directly and

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

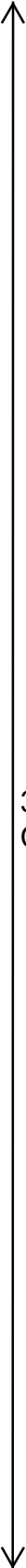
in some cases, indirectly if Highland Fairview would disproportionately benefit based on the ground of standing conflicts of interest as follows.

Mr. Robert Harris has been directly connected with Highland Fairview/Iddo Benzeevi (HF) serving as an officer on his Political Action Committees (PAC) and was the person of standing who signed the paperwork for HF initiatives later deemed illegal in their efforts to circumvent the CEQA laws. He was one of the least qualified applicants but his relationship with HF and friendship with Mayor Gutierrez gave him the seat. He needs to recuse himself with anything remotely connected to HF due to conflict of interest thru association and bias.

Mr. Raphael Brugueres has been directly connected with Highland Fairview/Iddo Benzeevi (HF) serving as an officer on his Political Action Committees (PAC), collected signatures for the illegal initiatives used to circumvent CEQA laws, illegally harassed and blocked residents from signing legal referendum petitions and bragged about it on video at city council meetings, and at a city council meeting (1/15/2019) verbally threatened action against residents who opposed HF. Additionally he needs to recuse himself as he stated at several planning commission meetings prior to his appointment that all projects need to be approved and settled later in court. I am concerned that he is unable to read and comprehend the extensive data presented in anything related to planning and development and he was the **least** qualified applicant but his relationship with HF and friendship with Mayor Gutierrez gave him the seat. He needs to recuse himself with anything remotely connected to HF and should be removed from the planning commission.

Ms. Joann Stephens also has a long standing relationship with HF serving as an officer on his Political Action Committees (PAC) formed to promote the wlc. In a video dated 10/7/2013 she speaks in favor of wlc and that “we should all embrace Iddo”. At the June 11, 2015 she states ...” I've lived in the city 30-plus years and this is the best thing that I've ever seen that wants to come in here”... “I hope the City Council members are looking because I don't know how anybody can vote no on this”... Additionally she currently serves on the mayor’s general plan update committee and is under the undue influence of Iddo Benzeevi who has taken major control of the committee now that the public is not able to be present. The fact that his wlc and aquabella properties are not being touched as they consider rezoning many other properties indicates his control while he is also pushing for warehouses/commercial rezoning north of the freeway in an inappropriate area. Again she was one of the least qualified applicants to the planning commission, but her association with HF, Ms. Baca and Mayor Gutierrez gave her a seat at both tables. There is a clear conflict of interest and bias that requires Ms. Stephens recuse herself.

Mr. Baker currently serves on the mayor’s general plan update committee and is under the undue influence of Iddo Benzeevi who has taken major control of the committee now that the public is not able to be present. The fact that his wlc and aquabella properties are not being touched as they consider rezoning many other properties indicates his control while he is also pushing for warehouses/commercial rezoning north of the freeway in an inappropriate area. Mr. Baker needs to recuse himself from this vote because of the undue influence he’s under while working with Iddo Benzeevi. A clear conflict of interest by association so therefore Mr. Baker must recuse himself.



3-G37
CON 3

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Mr. Dejohnette needs to recuse himself as he is also serving on the mayor’s general plan update committee and is under the undue influence of Iddo Benzeevi who has taken major control of the committee now that the public is not able to be present. The fact that his wlc and aquabella properties are not being touched as they consider rezoning many other properties indicates his control while he is also pushing for warehouses/commercial rezoning north of the freeway in an inappropriate area. Additionally he didn’t apply for the planning commission, but the mayor appointed him as they were co-workers at March Middle School. Along with undue influence from Iddo Benzeevi, he is also under the influence of the mayor who is funded by HF. A clear conflict of interest by association so therefore Mr. Baker must recuse himself.

The mayor did a disservice to the city and the residents by forming a planning commission of some of the least qualified applicants who were already supporters of HF and similarly with the general plan update advisory committee. His actions open the city to even more unnecessary litigation and were unethical to say the least.

With the necessary recusals there is no quorum for the planning commission to consider this EIR or anything related to HF, thus this EIR and the project cannot move forward.

Should these recusals be refused, then the EIR needs to be rejected for the reasons given as well as many more that were not addressed.

Thank you,

Lindsay Robinson, resident

Proof of the PAC association included. Copies of ALL planning commissioner applications are available from the city clerk and they will clearly demonstrate lack of qualifications in comparison to other applicants. It will also show that Mr. Dejohnette did not apply for Planning Commission, but it was written in by someone else.

The following pages from the 410 noted above show proof of the PAC officers for HF Moreno Valley Coalition...

3-G37
CON }
Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G37: LINDSAY ROBINSON

Response to Comment 3-G37-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G37-2: No specific comments on the contents of the Revised Final EIR are provided. The commenter opines that the Project should be postponed due to the “lockdown” situation so that the public can fully participate. All Project documents are available for download and review on the City’s website. Therefore, anyone who wishes to access, review, and comment on Project documents has the ability to do so without needing to leave their home. As stated on the Notice of Completion, City Staff was available to make reasonable arrangements to ensure that Project documents were accessible to those wanting to review them in person. Therefore, an extension of the review period due to current stay at home guidelines is not warranted. In accordance with Governor Executive Order N-29-20, the Planning Commission hearing on May 14, 2020 was held via teleconference pursuant to the COVID-19 pandemic. Detailed instructions on how to effectively participate in the public hearing was posted on the City’s website and described in the Planning Commission agenda. Over 60 people spoke using the Zoom platform at the May 14, 2020, Planning Commission hearing.

Response to Comment 3-G37-3: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G37-4: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G37-5: The alternative analysis was presented in Section 6.0, Alternatives to the Proposed Project, of the 2015 Final EIR,¹⁴ which is part of the Public Record. The judge’s ruling did not find the Alternatives section deficient, thus there was no need to recirculate this portion of the 2015 Final EIR. The 2018 RSFEIR was prepared to correct the deficiencies identified in the 2015 Final EIR under the February ruling. Thus, the 2018 RSFEIR was circulated for public comment and those portions of the 2015 Final EIR that were found to be in compliance with CEQA by the Court were not re-circulated but are part of the public administrative record.

Response to Comment 3-G37-6: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G37-7: Refer to Response to Comment 3-G35-2 for a discussion of the availability of Project documents and participation in the public hearing process. Pursuant to City of Moreno Valley noticing procedures, a Notice of Public Hearing was mailed to property owners within 600 feet of the Project site and agencies and members of the public who requested notices on April 30, 2020, posted on the City’s Website, and posted to the local newspaper (Press Enterprise) on May 3, 2020

The commenter opines that additional time should have been provided for review due to the current “lockdown” situation. All Project documents are available for download and review on the City’s website. Therefore, anyone who wishes to access, review, and comment on Project documents has the ability to do

¹⁴ City of Moreno Valley, 2015. World Logistics Center Project Final Programmatic Environmental Impact Report, Volume 3 – Final Environmental Impact Report, State Clearinghouse No. 2012021045, May.

so without needing to leave their home. As stated on the Notice of Completion, City Staff was available to make reasonable arrangements to ensure that Project documents were accessible to those wanting to review them in person. Therefore, an extension of the review period due to current stay at home guidelines is not warranted. In accordance with Governor Executive Order N-29-20, the Planning Commission hearing on May 14, 2020 was held via teleconference pursuant to the COVID-19 pandemic. Detailed instructions on how to effectively participate in the public hearing was posted on the City's website and described in the Planning Commission agenda. Over 60 people spoke using the Zoom platform at the May 14, 2020, Planning Commission hearing.

Response to Comment 3-G37-8: The commenter claims that the Revised Final EIR does not mitigate traffic, noise, and air quality impacts. As demonstrated in Response to Comments 3-G12-1 and 3-F5-29, the Revised Final EIR conducts thorough analysis of air quality, noise, and traffic impacts and implements all feasible mitigation to reduce those impacts.

Response to Comment 3-G37-9: The commenter request that the City enact a noise ordinance requiring warehouse to shut down from 10:00 pm to 7:00 am. In addition, the commenter states that setbacks need to be increased to protect existing residences located across the street from the Project. As discussed in Section 4.12.6.3 of the 2015 FEIR, with the implementation of a 250-foot buffer between the operation of any logistics facilities and residential areas, increases in ambient noise at adjacent sensitive receptors would be less than significant. An increase in buffer is not required.

Response to Comment 3-G37-10: The Newkirk home, located at 29080 Dracea Avenue (within the Project site), is shown in Figure 4.3-2 of the 2019 Draft Recirculated RSFEIR and identified as an on-site receptor. Therefore, this residence has been accounted for in the analysis set forth in the Revised Final EIR.

Response to Comment 3-G37-11: The Superior Court ordered that “the FEIR should remove all references to and consideration of the 910 acres of SJWA and MSHCP land as “buffer zone” or “CDFW Conservation Buffer Area” in the Biological Resources and Habitat Impacts analysis” (see page 4.4-1 of the 2018 RSFEIR, which has been done As presented in Section 4.4.1.15. in the 2018 RSFEIR, a 250-foot development setback is adequate for a project-SJWA separation and is supported by a compilation of available academic and scientific literature and studies on wildlife impacts from diesel emissions, and also the distance established in nesting bird surveys for setbacks from human activity. In addition, the Specific Plan Mitigation Measure 4.4.6.1A requires solid walls along the 250-foot development setback where are truck activity areas adjacent, which will help provide an additional buffer from building lighting and noise and effectively mitigate potential direct and indirect impacts on the SJWA. In addition to the 250-foot development setback and solid walls, the WLC Project includes a 150-foot building setback resulting in a total setback of 400 feet that would further reduce potential impacts on wildlife within the SJWA area. Regarding impacts to threatened and endangered species, the coastal California gnatcatcher was detected on the WLC site for which mitigation is included in Mitigation Measure 4.4.6.3A in the 2018 RSFEIR.

The 250-foot development setback is one of the design features that lessens impacts on the SJWA. As discussed in Section 4.4.1.15.a, Other Issues, a. Setbacks on page 4.4-49 of the 2018 RSFEIR, “typical setbacks to protect wildlife from human presence (though not warehousing) ranges from 50 to 500 feet, but

200–250 feet appears adequate for the most sensitive species.¹⁵ In addition to the 250-foot development setback, the WLC Project includes a 150-foot building setback resulting in a total setback of 400 feet. Furthermore, the WLC Project includes a minimum 11-foot high solid walls along the southern boundary of the WLC site that would further reduce potential urban/wildlands interface impacts. As discussed in Section 4.4.6.1 of the 2018 RSFEIR, construction and operational noise levels would result in less than significant impacts with the implementation of the two setback areas and proposed solid wall along the SJWA boundary (RDEIR at page 4.4-68). Because the project features would reduce potential interface issues between the WLC site and the SJWA, no further expansion of the setback area along the boundary with the SJWA is required

- *Setbacks:* Establishes a 250-foot wide development setback from the southernmost property line along the SJWA boundary, and an additional 150-foot building setback from the development setback to help minimize potential impacts on biological resources of the SJWA (WLC Specific Plan Section 2.2.3.f.4, Exhibit 4-16).
- *Architecture and Building Restrictions:* Requires ground- and roof-mounted equipment to be screened from off-site view (WLC Specific Plan Section 5.3.15).
- *Landscaping Restrictions:* Provides “Special Edge Treatment Areas” in terms of adjacent uses, including the SJWA and Gilman Springs Road (WLC Specific Plan Section 2.5.3, Exhibit 2-1 and Section 2.5.4, Exhibit 2-3).
- *Off-Site Lighting:* All lighting in the vicinity of SJWA shall be designed to confine all direct light rays to the project site and preclude the visibility of direct light rays from the wildlife area (WLC Specific Plan Section 4.3). The Project would also comply with the City’s new Dark Sky Lighting Ordinance, which reduces spillover light to 0.25 foot-candles at five feet from the adjacent property lines.

Response to Comment 3-G37-12: The Project will include features that would support the use of alternative modes of transportation such as bicycles. Mitigation Measure 4.3.6.4A (page 4.3-60 of the 2019 Draft Recirculated RSFEIR) requires the incorporation of Class II bike lanes and pedestrian pathways into site circulation, site design and building placement to provide pedestrian connections between internal and external facilities, and pedestrian connection of the project to residential uses within 0.25 miles away. Additionally, the project would provide bicycle parking, shower facilities, and transit availability and scheduling to all tenants and their workers (Mitigation Measure 4.3.6.4A(j)).

¹⁵ McElfish, J., Kihlsinger, R., and Nichols, S., 2008. *Setting Buffer Sizes for Wetlands*. Available online: http://staging.ecosystemmarketplace.com/wp-content/uploads/archive/documents/Doc_456.pdf

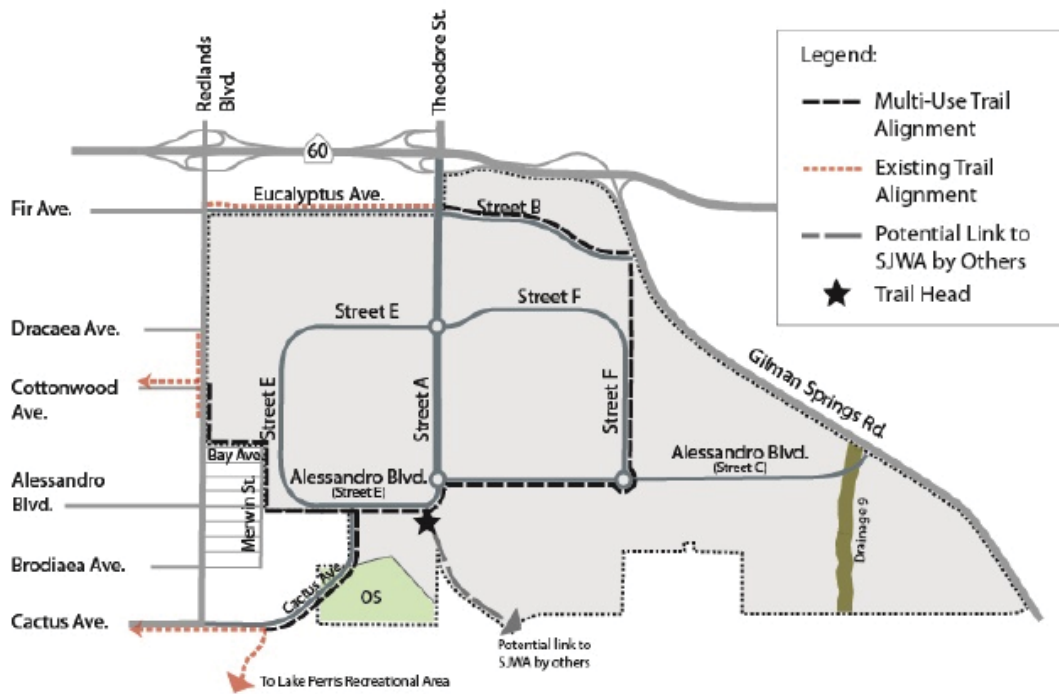


Exhibit 3-17 Multi-Use Trail Plan

As detailed on pages 3-13 and 3-14 of the World Logistics Center Specific Plan (Appendix H-1 of the 2015 FEIR), the Project will connect to and extend the existing multi-use trail on the north side of Eucalyptus Avenue to continue along Street B to Gilman Springs Road and then southerly to connect with the trail head as shown in Exhibit 3-16, below. In addition, a future connection between the trailhead to the SJWA (located on the Project site) will be allowed to be constructed by others.

Response to Comment 3-G37-13: The commenter claims that the Revised Final EIR does not mitigate exhaust from diesel trucks. As demonstrated in Response to Comments 3-G12-1 and 3-F5-29, the Revised Final EIR conducts thorough analysis of impacts associated with diesel exhaust and implements all feasible mitigation to reduce those impacts. In addition, in the Settlement Agreement between the developer and the South Coast Air Quality Management District (“SCAQMD”) for the Project as referenced in Response to Comment 2-F2-23, the SCAQMD determined that the approximately \$26 million Air Quality Improvement Fee to be paid by the applicant “will adequately mitigate heavy-duty truck related air quality impacts that may result from the construction and operation of the World Logistics Center” With regard to COVID-19, more data needs to be collected on COVID-19-related deaths before a scientifically sound assessment can be conducted to assess the potential impacts of air pollution exposures on COVID-19 deaths.

Response to Comment 3-G37-14: : The commenter claims that the Revised Final EIR does not mitigated greenhouse gases. See page 4.7-1 of the 2019 Recirculated RSFEIR for background on greenhouse gas emissions and climate change as a global issue. As demonstrated in Response to Comment 3-B2-7, the

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Revised Final EIR conducts thorough analysis of greenhouse gas emissions and implements all feasible mitigation to reduce those impacts.

Response to Comment 3-G37-15: Mitigation measure 4.3.6.3B I) specifies that all diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Chapter 1, Section 2025 or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time. This will be enforced through facility operators maintaining a log of all trucks entering or operating at the facility and monitoring for excess idling; the Vehicle Identification Number will be identified as the primary method of verifying truck compliance, as well as on-site inspections, and this log will be kept onsite and available for inspection by the City at any time. Noncompliance triggers an administrative process in the City which results in compliance efforts and if they don't comply, then a certificate of occupancy could be revoked as outlined in the MMRP. CEQA requires that mitigation measures be enforceable and does not mandate that any particular agency be responsible for such enforcement. As specified, the mitigation measures have enforcement mechanisms in place and are thus credible mitigation measures under CEQA. Additionally, the development agreement does not become void if/when the land is sold. The conditions of the development agreement are tied to the land and remain effective and enforceable.

Response to Comment 3-G37-16: The commenter claims that the Revised Final EIR does not mitigate traffic, noise, and pollution impacts. As demonstrated in Response to Comments 3-G12-1 and 3-F5-29, the Revised Final EIR conducts thorough analysis of air quality, noise, and traffic impacts and implements all feasible mitigation to reduce those impacts.

As discussed in Response to Comment 3-G12-1, payment of fair share mitigation fees is required for the improvements not within the City of Moreno Valley and those jurisdictions that have established fair share mitigation programs (see mitigation measure 4.7.15.4E and 4.7.15.4F). In addition, payment is also required for the Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44 (See Mitigation Measure 4.7.15.4D on page 4.4-63 of the 2018 RSFEIR. The City of Moreno Valley Development Impact Fee (DIF) program is used to fund roads and intersection improvements needed within the City. See page 4.15-111 of the 2018 RSFEIR for a description of the City's DIF program. As stated in footnote 8 on page 4.15-111, the Development Agreement requires that the Applicant fully fund or construct all needed improvements within the City of Moreno Valley in lieu of paying the DIF for traffic. Therefore, all improvements within the City would be fully funded by the Project and the Project will pay into established fair share and TUMF programs for improvements required outside of the City.

Response to Comment 3-G37-17: Mitigation Measure 4.3.6.3B(a) of the 2019 Draft Recirculated RSFEIR (page 4.3-53) requires that "signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations, and the prohibition of parking in residential areas." Although overnight parking is prohibited by the Specific Plan (see page 3-10 of the Specific Plan, Appendix H-1 of the 2015 FEIR), truck parking stalls are included in the project design and designated resting areas would be provided at the on-site CNG/LNG fueling station for truck drivers to rest.

Response to Comment 3-G37-18: The commenter opines that there has been little to no consideration of comment letters to address residents' concerns. To the contrary, all written comments submitted to the City,

including those of Moreno Valley residents have been reviewed and responded to as a part of the Final Response to Comments document. This document was posted to the City's website along with other Project documentation for review ten days prior to the May 14, 2020 Planning Commission Hearing.

With regard to alleged conflict of interest on the part of Planning Commissioners, the Common Law Doctrine Against Conflicts of Interest (Section 2.161 of the Municipal Law Handbook) requires a public official to "abstain from participation in cases when the public official's private financial interest may conflict with his or her duties". The commenter does not present evidence of financial interest that would require any Planning Commissioner to recuse themselves from the decision-making process.

Julia Descoteaux

From: Melody <malardner@aol.com>
Sent: Tuesday, May 5, 2020 6:49 PM
To: Julia Descoteaux
Subject: WLC project/EIR

Warning: External Email – Watch for Email Red Flags!

I would like to be on the email list for any notices/meetings/hearings for this project. My home address is:
Melody Lardner
28201 War Admiral St.
Moreno Valley, CA 92555
Email: malardner@aol.com

Sent from my iPhone

3-G42-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Julia Descoteaux

From: malardner@aol.com
Sent: Thursday, May 14, 2020 4:14 PM
To: Julia Descoteaux
Subject: WLC Revised EIR comments for tonight

Warning: External Email – Watch for Email Red Flags!

There has not been adequate time given to review these large documents for the WLC in time for tonight's meeting especially with the chaos and disruption of lives due to the virus. We have also been unable to easily meet with neighbors and go over these documents due to disrupted lives, stay at home orders, etc. . Little notice was put out to the communities and neighborhoods about this revised EIR being released and the planning commission meeting happening tonight. It appears there was no news release from the city and this project revised EIR is not obvious on the city web site. For a project with as many impacts as this, there should have been wide public notice to the residents of Moreno Valley as it affects many in the city, especially on the east end and will have long lasting impacts on our quality of life here.

It appears little has changed from the prior version of the EIR to mitigate any prior impacts that were described in the previous EIR and it would appear that additional impacts to our neighborhoods have been added now. There is a proposal to significantly expand streets around the east end that would have a direct impact on our lives in our neighborhood. Street widenings are now proposed for Moreno Beach, Redlands, Ironwood, and Locust. Moreno Beach widening to six lanes over Petit Hill would be a significant impact to our neighborhood with significantly increased noise and traffic over a greater number of hours and destroy the beauty of the hills around this area and the quiet of our neighborhoods. The hills would need to be cut into or even leveled significantly to do this widening. At one time the connection via Eucalyptus to Redlands was supposed to be completed instead of widening Moreno Beach to not impact hills and neighborhoods around this area. And last time this project was discussed the truck traffic from the WLC was supposed to be contained to areas on the east end such as Theodore and Gilman Springs and not onto Redlands and into San Timoteo Canyon. But now it appears the plan is for traffic to be directed even more into our neighborhoods and significantly impact our quality of life. We were promised last time that truck traffic would not flow into San Timoteo Canyon nor impact Redlands Blvd and streets west of there but with these street widenings being proposed that now appears to be the plan - trucks all over the east end. And no where is there a plan for any kind of truck stop or rest area for trucks within the WLC so they will park all over nearby streets illegally as they are already doing now but to a much greater extent. The WLC should incorporate some place like this within the center and not create more impact on neighborhoods.

In this revised EIR there appears to be no change to project set backs, or change to designs adjacent to residential neighborhoods for traffic, air quality or noise. There appears to be no change to the border with the San Jacinto Wildlife Area (where there needs to be a buffer), There is no change to mitigations needed for the diesel exhaust from trucks with the exception of buying greenhouse credits but that does nothing for the people living near this project. There is very little promise of going green with solar installations or green trucks and other vehicles. There is no additional mitigations for city street impacts. There is no mitigation for night time sky lighting from this project. There is no consideration of the increased impacts to Highway 60 and Gilman Springs and this project would add significantly to impacts from traffic on those already busy roadways.

I wish I had more time to review and comment on this project EIR revision but the turn around time is so short. Packing together a general plan update, the Theodore Street interchange and the WLC EIR review in a short time is not fair to the residents in this time of chaos and disruption of lives. And during this time we have an inability to have public meetings where people can easily attend and there is an inability to meet with friends and neighbors due to stay at home orders. And not all people are able to participate via zoom meetings at this time so it is unfair to them. The process should be slowed down during this time of chaos and not rushed and slipped by many residents of the city. Please give us additional time to adequately review the documents and comment on the revised plans. These plans will change our entire way of living and enjoying our home on the east end. We moved to the east end for a more rural life and this is not what we bought into. Please help save our neighborhoods from these increased impacts.

Melody Lardner
a resident of the east end of Moreno Valley (near Moreno Beach and Cottonwood)

3-G42
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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RESPONSES TO LETTER 3-G42: MELODY LARDNER

Response to Comment 3-G42-1: No specific comments on the contents of the Revised Final EIR are provided.

Response to Comment 3-G42-2: . The commenter states that adequate time to review the Revised EIR has not been provided. Part 1 of the Revised Final EIR (page 2) provides a summary of the public review periods provided to review each circulation of the EIR. The 2018 RSFEIR public review period began July 25, 2018, and extended for 45 days to September 7, 2018. Information, which was considered significant, required revision and recirculation of portions of the RSFEIR pursuant to CEQA Guidelines Section 15088.5. The 2019 Draft Recirculated RSFEIR public review period began December 17, 2019, and extended for 45 days to January 31, 2020. As required in the CEQA Guidelines Section 15088, the City of Moreno Valley as the Lead Agency, provided written responses to public agencies that commented on either the RSFEIR or Draft Recirculated RSFEIR at least 10 days prior to certifying the Revised Final EIR. The public has had ample opportunity to review and comment on both the 2018 RSFEIR and 2019 Draft Recirculated RSFEIR prior to the Planning Commission Hearing held on May 14, 2020. Pursuant to City of Moreno Valley noticing procedures, a Notice of Public Hearing was mailed to property owners within 600 feet of the Project site and agencies and members of the public who requested notices on April 30, 2020, posted on the City's Website, and posted to the local newspaper (Press Enterprise) on May 3, 2020. The City has also received a number of comments on the Revised Final EIR which demonstrates that sufficient time to review and comment on it, although not required by law or regulation, has been provided.

Response to Comment 3-G42-3: Mitigation Measure 4.3.6.3B(a) of the 2019 Draft Recirculated RSFEIR (page 4.3-53) requires that "signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations, and the prohibition of parking in residential areas." Although overnight parking is prohibited by the Specific Plan (see page 3-10 of the Specific Plan, Appendix H-1 of the 2015 FEIR), truck parking stalls are included in the project design and designated resting areas would be provided at the CNG/LNG fueling station for truck drivers to rest.

As discussed on page 3-8 of the Specific Plan, "the circulation system is designed to move large vehicles between the regional highway system and the businesses of the World Logistics Center while directing heavy trucks away from nearby residential neighborhoods. The World Logistics Center plan directs all heavy truck traffic to SR-60 and Gilman Springs Road and away from Redlands Boulevard (south of Eucalyptus Avenue) and Cactus Avenue. These prohibitions are incorporated in the City's Truck Route Ordinance." See *Exhibit 3-11 Truck Routes* found on page 3-8 of the Specific Plan, below.

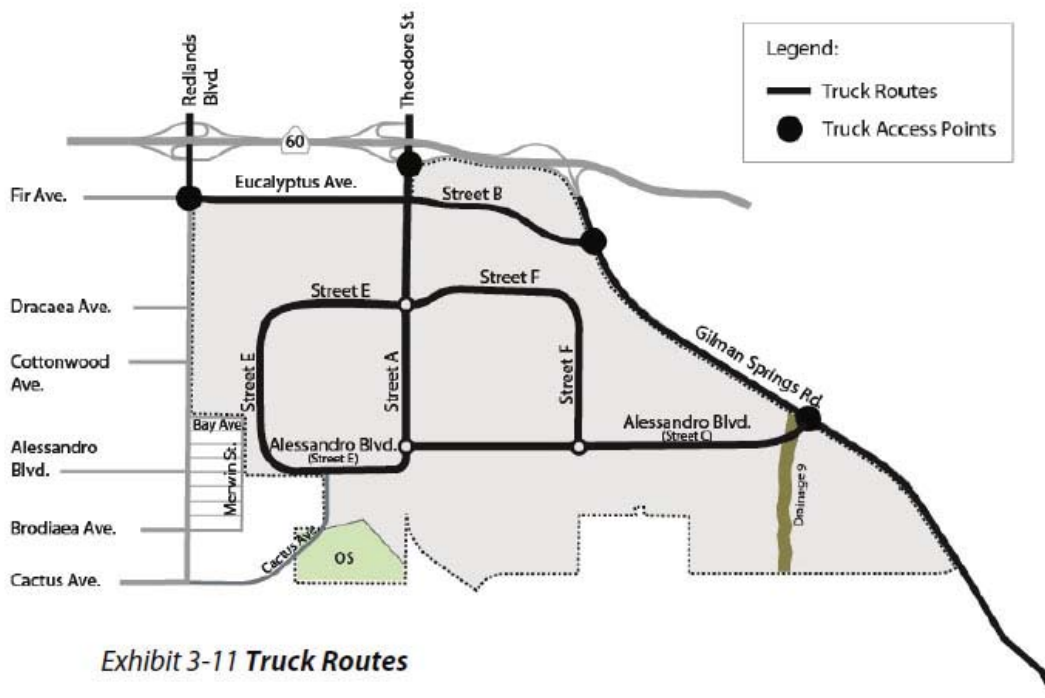


Exhibit 3-11 Truck Routes

In addition, Mitigation Measure 4.3.6.3B of the 2019 Draft Recirculated RSFEIR (page 4.3-53) requires that signage directing trucks to the designated truck routes be posted at each project exit driveway. Project trucks are anticipated to arrive at the site via State Route 60 to the north, using the Redlands Boulevard, World Logistics Center Parkway, and/or Gilman Springs off ramps and anticipated to leave the site following the same route to State Route 60. Based on the location of State Route 60, to the north of the Project site and north of Eucalyptus Avenue, trucks would not need to travel south of Eucalyptus Avenue to gain access to the Project site. Therefore, due to the location of regional access routes, Project access points, and required rerouting of construction traffic, it is reasonable to assume that Project trucks would follow directional signage when leaving the project site toward regional access routes.

Response to Comment 3-G42-4: The commenter claims that the Revised Final EIR does not mitigate traffic, noise, air quality, greenhouse gas, or lighting impacts. As demonstrated in Response to Comments 3-G12-1 and 3-F5-29, the Revised Final EIR conducts thorough analysis of air quality, noise, and traffic impacts and implements all feasible mitigation to reduce those impacts. Refer to Response to Comment 1-B2-12 for discussion of the Project’s commitments to emissions reductions, zero-emissions technology, and solar. See Response to Comment 3-F1-3 for discussion of the adequacy of a 250-foot buffer along the SJWA area.

With regard to lighting impacts, the WLC will comply with the new night lighting guidelines in the City’s Municipal Code Section 9.08.100, which limits off-site impacts to 0.25 foot-candles per square meter. The Specific Plan design guidelines, as they affect the SJWA, include a development setback of 250 feet, an additional building setback of 150 feet, an 11-foot high solid wall, orientation of lighting downward so that no direct rays extend up into the sky or onto adjacent properties, and high-pressure sodium or low-emitting

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

diodes (LEDs) as discussed on page 4.1-81 of the 2015 Final EIR. The municipal restrictions are contained in the City's Municipal Code (Section 9.08.100 Lighting), which states that any outdoor lighting associated with nonresidential uses shall be shielded and directed away from the surrounding residential uses (Section 9.08.100 C.3.a). Such lighting shall not exceed one-quarter (0.25) foot-candle at property lines and shall not blink, flash, oscillate, or be of unusually high intensity or brightness (Section 9.08.100 C.3.a). Lighting in parking areas and drive aisles must be at least 1.0-foot candle and cannot exceed a maximum of 8.0-foot candles (Section 9.08.100 C.4.a). These municipal restrictions are also discussed on page 4.1-81 of the 2015 Final EIR.

Response to Comment 3-G42-5: No specific comments on the contents of the Revised Final EIR are provided. The commenter opines that additional time should have been provided for review due to the inability to attend public hearings. All Project documents are available for download and review on the City's website. Therefore, anyone who wishes to access, review, and comment on Project documents has the ability to do so without needing to leave their home. As stated on the Notice of Completion, City Staff was available to make reasonable arrangements to ensure that Project documents were accessible to those wanting to review them in person. Therefore, an extension of the review period due to current stay at home guidelines is not warranted. In accordance with Governor Executive Order N-29-20, the Planning Commission hearing May 14, 2020 was held via teleconference pursuant to the COVID-19 pandemic. Detailed instructions on how to effectively participate in the public hearing was posted on the City's website and described in the Planning Commission agenda. Over 60 people spoke using the Zoom platform at the May 14, 2020, Planning Commission hearing.

Responses to General Comments

The following response applies to the Group 3-G Comment Letters (see Attachment D) listed as follows: 1-6, 7-11, 13-23, 26-34, 38-41, 43-98.

The comment does not raise any environmental issues or address the adequacy of the Revised Final EIR, and thus no further response is needed.

Attachment A

General Comments



From: Alejandro Briseno <ab24888@aol.com>
Sent: Thursday, May 14, 2020 3:53 PM
To: City Clerk <cityclerk@moval.org>
Subject: recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council. We are MR. and Mrs. Alejandro Briseno and have been living here in Moreno Valley for the last 29 years,same address. all our 5 kids and some our grand kids lived with us,We just love our city because it offer us security and the pleasure of having lake Perris and other nice places to enjoy. I used to go downtown Los Angeles to work,now Im retired and happy to support this project ..WLC. We are sure and very positve that it will help and improve the quality of live of all of us residents of Moreno Valley and all others that will come and work here...please, we need to ask you to expedite the RECERTIFICATION OF THE WLC PROJECT.

MAY GOD BLESS YOU ALL.
Alejandro and Georgina Briseno 24888 Fortune Bay Lane Moreno Valley Ca 92551 951) 498-9390

3-G1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Feb. 15, 2020

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Moreno Valley Planning Commission
Jeffery D. Sims
Chairman

Dear Mr. Sims,

My name is Alicia Wright and married to Frank Wright, retires Navy veteran and residing here in M.V. for over 20 years.

I have seen through the passing of times the very need of the people of this city and the political and cultural efforts in change of improvements in all values and forms of life, and living conditions.

In prospective view, it is imperative that the Planning Commission pertains all efforts in the procedure in initiating the proper need of accepting and certifying the revised change of the environmental Impact Report.

Your personal care is essential to the vital care for all the Moreno Valley people.

Thank you.

Most cordial,

Alicia Wright CNA, AT Social Worker
14656 Rio Hondo Dr
Moreno Valley, CA 92553

3-G2

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Amado Hernandez <reoempire@live.com>
Sent: Friday, May 8, 2020 4:03 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC



Dear Planning Commission,

I politely ask and urge you as a family man, business owner and resident for over 30 years, to please move the revision to the Environmental Impact Report (EIR) forward and to certify it, to be presented to The Judge again. Thanking you in advance for your promptness and for allowing opportunities and jobs. Best regards.

P.S. let's work together towards: PANDEMIC ECONOMIC RECOVERY

Respectfully,

Amado Hernandez,
DRE Cal. Broker#00990373
Excellence Empire Real Estate
Regional Director of The Inland Empire & OC
California Association of Realtors (BOD) Director & Government Affairs
NAHREP (BOD) Director & Government Affairs
12220 Pigeon Pass Road Ste. O
Moreno Valley, CA 92557
Direct Line. 951.323.1477
P.951.488.8644
F.951.488.8640
reoempire@live.com

"If you can see the invisible you can do the impossible"
-Debbie Cobrae

3-G3

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission of M.V.
c/o City Hall / Clerk's office
14177 Frederick Street.
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Ana Cabrera and
I've been a resident of Moreno
Valley for about 15 years.
I am all in support of the World
Logistics Center Project. I hope
and encourage you all to
approve the revised EIR for
the community of Moreno Valley.
Thank You.

- Ana Cabrera

Ana Cabrera
22523 Adrienne Ave. #D
Moreno Valley CA, 92553
ana.cabrera13@yahoo.com

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

3-1 1

-----Original Message-----

From: Andrea Chouinard <andrea1@usa.com>

Sent: Monday, May 11, 2020 6:08 PM

To: City Clerk <cityclerk@moval.org>

Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council,

I am writing to ask you to recertify the plans for the WLC. I am happy to strongly support the WLC in Moreno Valley. I ask that you do everything possible to speed up the process to make the World Logistics Center a long over due reality.

3-G5-1

Thank you,

Andrea Chouinard
10510 Canyon Vista Rd.
Moreno Valley, CA. 92557
951-924-0558

Julia Descoteaux

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 9:50 AM
To: Julia Descoteaux
Attachments: MVJobsCoalition410-051216-hf-OFFICERS-ROBT-HARRIS-joann-raphael.pdf; Iddo_Rafael_Robert.jpg

From: ANGEL LOPEZ <CaliSSAV@hotmail.com>
Sent: Tuesday, May 12, 2020 5:56 PM
To: Dr. Yxstian A. Gutierrez <yxstiangu@moval.org>; Victoria Baca <victoriab@moval.org>; Ulises Cabrera <ulises@moval.org>; Dr. Carla J. Thornton <carlat@moval.org>; David Marquez <davidma@moval.org>
Cc: City Clerk <cityclerk@moval.org>; City Manager's Office_DG <cmoffice@moval.org>; City Attorney <cityattorney@moval.org>; byarbrough@scng.com
Subject: Planning Commission Regular Meeting 05/14/2020 7pm

Warning: External Email – Watch for Email Red Flags!

Good evening City Council Members,

I am writing to convey my objections to the Planning Commission Regular meeting scheduled 05/14/2020 at 7pm. The meeting must not go forward with certain Planning Commissioners who are not fit to legislate Public Hearing Item #2. In addition, I request the City Clerk submit comments in their entirety to the public record and I have included Mr. Beau Yarbrough of The Press Enterprise.

My objections are for Public Hearing Item #2:

#2 Case: PEN18-0050 Revised Final EIR (RFEIR)
PEN20-0017 Tentative Parcel Map 36457 (Finance)
PEN20-0018 Development Agreement

Applicant: Highland Fairview
Property Owner: Highland Fairview

Planning Commissioners Alvin Dejohnette, Joann Stephan, Robert Harris and Rafael Brugueras are not fit to convene at the Public Hearing item #2 due to their connections to both the Mayor of Moreno Valley, Dr. Yxstian Gutierrez and Iddo Benzeevi of Highland Fairview.

The Planning Commission Agenda was posted in accordance with the Ralph M. Brown Act:

54954.2.

(a) (1) At least 72 hours before a regular meeting, the legislative body of the local agency, or its designee, shall post an agenda containing a brief general description of each item of business to be transacted or discussed at the meeting, including items to be discussed in closed session. A brief general description of an item generally need not exceed 20 words. The agenda shall specify the time and location of the regular meeting and shall be posted in a location that is freely accessible to members of the public and on the local agency's Internet Web site, if the local agency has one. If requested, the agenda shall be made available in appropriate alternative formats to persons with a disability, as required by Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Sec. 12132), and the federal rules and regulations adopted in implementation thereof. The agenda shall include information regarding how, to whom, and when a request for disability-related modification or accommodation, including auxiliary aids or services, may be made by a person with a disability who requires a modification or accommodation in order to participate in the public meeting.

As such, I am now exercising my rights under the Ralph M. Brown Act to submit my public comments and raise my objections due to prejudice and bias by the four named Planning Commissioners, further that they must recuse their votes to the matter:

54954.3.

(a) Every agenda for regular meetings shall provide an opportunity for members of the public to directly address the legislative body on any item of interest to the public, before or during the legislative body's consideration of the item, that is within the subject matter jurisdiction of the legislative body, provided that no action shall be taken on any item not appearing on the agenda unless the action is otherwise authorized by subdivision (b) of Section 54954.2. However, the agenda need not provide an opportunity for members of the public to address the legislative body on any item that has already been considered by a committee, composed exclusively of members of the legislative body, at a public meeting wherein all interested members of the public were afforded the opportunity to address the committee on the item, before or during the committee's consideration of the item, unless the item has been substantially changed since the committee heard the item, as determined by the legislative body. Every notice for a special meeting shall provide an opportunity for members of the public to directly address the legislative body concerning any item that has been described in the notice for the meeting before or during consideration of that item.

Prejudice is defined in The Free Dictionary as follows:

"A forejudgment; bias; partiality; preconceived opinion. A leaning toward one side of a cause for some reason other than a conviction of its justice.

A juror can be disqualified from a case for being prejudiced, if his or her views on a subject or attitude toward a party will unduly influence the final decision."

Source: https://legal-dictionary.thefreedictionary.com/prejudice

Bias is defined in The Legal Dictionary as follows:

"The term bias refers to the tendency of a person to favor one thing, idea, or person over another. In a legal context, bias can lead an individual, such as a judge or juror, to treat someone unfairly, in spite of the fact that hearings and trials are designed to be unbiased assessments of the facts

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

3-G6.

of a case. Bias may also affect such issues as applications for jobs or entry into the country, and recruitment of individuals from other countries. To explore this concept, consider the following bias definition."

Source: <https://legaldictionary.net/bias/>

Alvin Dejohnette is a Special Education Teacher with the Moreno Valley Unified School District. As such, I am submitting a link to Transparent California which shows his perceived connection to Mayor Yxstian Gutierrez as Special Ed Teachers. Based on this connection, Alvin Dejohnette must recuse himself due to the prejudice of "leaning toward one side of a cause" from the perceived connection to the Mayor; further, from bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Alvin Dejohnette Employment with Moreno Valley Unified School District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/alvin-d-dejohnette/>

Mayor Yxstian Gutierrez Employment with Moreno Valley Unified School District: <https://transparentcalifornia.com/salaries/2018/school-districts/riverside/moreno-valley-unified/yxstian-a-gutierrez/>

Joann Stephan, Robert Harris and Rafael Brugueras are listed as Principal Officers with the Political Action Committee "Moreno Valley Jobs Coalition, Supporting Jobs Creation and Workforce Training Initiatives and The World Logistics Center Development, Major Funding by Highland Fairview." As filed with The Moreno Valley City Clerk on 05/12/2016 on California Form 410 (attached).

Joann Stephan, in addition has openly supported the World Logistics Center as an advocate for them from this video posted on YouTube October 7, 2013. Joann Stephan from her comments, presents prejudice and bias. Further Joann Stephan must recuse herself due to the prejudice of "leaning toward one side of a cause" from YouTube video; further, from bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Source: <https://www.youtube.com/watch?v=XygdPnfohiw>

A second video of Joann Stephan openly advocating for the World Logistics Center can be seen on YouTube, posted 08/05/2015 with video evidence from 06/11/2015. In the video, from the 1 minute, 40 second mark you will find Joann Stephan advocating, and turning her head directly toward Iddo Benzeevi of Highland Fairview. This video footage presents clear and convincing evidence for a "conflict of interest" with prejudice and bias that Joann Stephan must recuse herself.

Source: https://www.youtube.com/watch?v=Ou6_Gc1rQZY&feature=youtu.be&fbclid=IwAR0ZOpAOdDFT9NTjrj1yL7skym99jCCv2eSe20RbGMInl1FWapxq71pibZU

The following link I am presenting was brought to my attention, which was a Photo taken with Iddo Benzeevi, Robert Harris and Rafael Brugueras on 04/15/2019 by a Real Estate seller on Facebook with her page made public. And I may add was a celebration before a City Council Vote the next day on 04/16/2019 to vote on the Skechers Building Expansion project.

Because of the photo taken with Iddo Benzeevi. There is clear and convincing evidence Robert Harris and Rafael Brugueras must recuse their selves for a "conflict of interest" with prejudice and bias favoring the outcome for a "Yes" vote on Public Hearing Item #2.

Source: <https://www.facebook.com/233736366829261/photos/a.415890128613883/968618826674341/?type=3&theater>

The photo itself is attached.

For my City Council members. I have presented clear and convincing evidence the Planning Commissioners named. Alvin Dejohnette, Joann Stephan, Robert Harris and Rafael Brugueras must recuse their selves from Public Hearing Item #2.

Very respectfully,

Angel Lopez-Ramirez
Combat Veteran, Wounded Warrior and Public Servant
Cell: 818-388-1231

Julia Descoteaux
Associate Planner
Community Development
City of Moreno Valley
p: 951.413.3209 | e: juliad@moval.org W: www.moval.org
14177 Frederick St., Moreno Valley, CA 92553



3-G6
CON

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

**Statement of Organization
Recipient Committee**

Comment Letter 3- **1.A.k**

CITY CLERK
MORENO VALLEY
RECEIVED

CALIFORNIA
FORM **410**
For Official Use Only

16 MAY 12 PH 12: 33

Statement Type Initial Amendment Termination - See Part 16
 Not yet qualified or List I.D. number: # _____
 Date qualified as committee _____ Date qualified as committee (If applicable) _____
 Date of Termination 04 / 30 / 2016

1. Committee Information

NAME OF COMMITTEE MORENO VALLEY JOBS COALITION, SUPPORTING JOBS
 CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS
 CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW
 STREET ADDRESS (NO P.O. BOX) _____
 CITY STATE ZIP CODE AREA CODE/PHONE
 SAN RAFAEL CA 94901 _____
 MAILING ADDRESS (IF DIFFERENT) _____
 FAX / E-MAIL ADDRESS _____
 COUNTY OF DOMICILE JURISDICTION WHERE COMMITTEE IS ACTIVE
 MARIN MORENO VALLEY

2. Treasurer and Other Principal Officers

NAME OF TREASURER
 JASON D. KAUNE
 STREET ADDRESS (NO P.O. BOX) _____
 CITY STATE ZIP CODE AREA CODE/PHONE
 SAN RAFAEL CA 94901 _____
 NAME OF ASSISTANT TREASURER, IF ANY
 JAMES W. CARSON
 STREET ADDRESS (NO P.O. BOX) _____
 CITY STATE ZIP CODE AREA CODE/PHONE
 SAN RAFAEL CA 94901 _____
 NAME OF PRINCIPAL OFFICER(S)
 LEONARDO DANIEL GONZALEZ
 STREET ADDRESS (NO P.O. BOX) _____
 CITY STATE ZIP CODE AREA CODE/PHONE
 MORENO VALLEY CA 92557 _____

Attach additional information on appropriately labeled continuation sheets.

3. Verification

I have used all reasonable diligence in preparing this statement and to the best of my knowledge the information contained herein is true and complete. I certify under penalty of perjury under the laws of the State of California that the information is true and correct.

Executed on 5/6/2016 By _____
 DATE SIGNATURE OF TREASURER OR ASSISTANT TREASURER
 Executed on _____ By _____
 DATE SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT
 Executed on _____ By _____
 DATE SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT
 Executed on _____ By _____
 DATE SIGNATURE OF CONTROLLING OFFICEHOLDER, CANDIDATE, OR STATE MEASURE PROPONENT

www.netfile.com

FPPC Form 410 (Jan/2016)
 FPPC Advice: advice@fppc.ca.gov (866/275-3772)
 www.fppc.ca.gov

nt: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Statement of Organization Recipient Committee

CALIFORNIA FORM 410

Page 2 of 6

INSTRUCTIONS ON REVERSE

COMMITTEE NAME MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

I.D. NUMBER 1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S)

MARSHALL SCOTT

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92557 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

GABRIEL COLANGELO

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92557 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

ROBERT HARRIS

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92557 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

LANCE MARTIN

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92553 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

JOANN STEPHAN

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92557 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

DANNY SCHWIER

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92557 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

PEDRO HURTADO

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92555 [Redacted]

NAME OF OTHER PRINCIPAL OFFICER(S)

JOE CHACKO

MAILING ADDRESS

[Redacted]

CITY STATE ZIP CODE AREA CODE/PHONE MORENO VALLEY CA 92555 [Redacted]

Statement of Organization Recipient Committee

CALIFORNIA
FORM **410**

Page 2 of 6

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER
DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

ID. NUMBER
1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S)

DAVID LARA-TELLEZ

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92555	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

ANTONIO REZA

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92553	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

IDDO BENZEEVI

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92553	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

RAFAEL BRUGUERAS

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92555	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

TOM R. GERELE, SR.

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92557	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

TED BOECKER

MAILING ADDRESS

[REDACTED]

CITY	STATE	ZIP CODE	AREA CODE/PHONE
MORENO VALLEY	CA	92553	[REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)

MAILING ADDRESS

CITY	STATE	ZIP CODE	AREA CODE/PHONE
------	-------	----------	-----------------

NAME OF OTHER PRINCIPAL OFFICER(S)

MAILING ADDRESS

CITY	STATE	ZIP CODE	AREA CODE/PHONE
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**Statement of Organization
Recipient Committee**

CALIFORNIA FORM	410
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I.D. NUMBER 1379766	

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

- All committees must list the financial institution where the campaign bank account is located.

NAME OF FINANCIAL INSTITUTION BANK OF MARIN	AREA CODE/PHONE (415) 927-8905	BANK ACCOUNT NUMBER [REDACTED]
ADDRESS 504 TAMALPAIS DRIVE	CITY CORTE MADERA	STATE CA
		ZIP CODE 94925

4. Type of Committee Complete the applicable sections.

Controlled Committee

- List the name of each controlling officeholder, candidate, or state measure proponent. If candidate or officeholder controlled, also list the elective office sought or held, and district number, if any, and the year of the election.
- List the political party with which each officeholder or candidate is affiliated or check "nonpartisan."
- If this committee acts jointly with another controlled committee, list the name and identification number of the other controlled committee.

NAME OF CANDIDATE/OFFICEHOLDER/STATE MEASURE PROPONENT	ELECTIVE OFFICE SOUGHT OR HELD (INCLUDE DISTRICT NUMBER IF APPLICABLE)	YEAR OF ELECTION	PARTY
			<input type="checkbox"/> Nonpartisan
			<input type="checkbox"/> Nonpartisan

Primarily Formed Committee

Primarily formed to support or oppose specific candidates or measures in a single election. List below:

CANDIDATE(S) NAME OR MEASURE(S) FULL TITLE (INCLUDE BALLOT NO. OR LETTER)	CANDIDATE(S) OFFICE SOUGHT OR HELD OR MEASURE(S) JURISDICTION (INCLUDE DISTRICT NO., CITY OR COUNTY, AS APPLICABLE)	CHECK ONE	
		SUPPORT	OPPOSE
MORENO VALLEY JOBS INITIATIVE	CITY OF MORENO VALLEY	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MORENO VALLEY WORKFORCE TRAINING INITIATIVE : .	CITY OF MORENO VALLEY	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1.A.k

**Statement of Organization
Recipient Committee**

CALIFORNIA
FORM **410**

INSTRUCTIONS ON REVERSE

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COMMITTEE NAME

I.D. NUMBER

MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT
HIGHLAND FAIRVIEW

566756 MAJOR FUNDING BY

Primarily Formed Committee

Primarily formed to support or oppose specific candidates or measures in a single election. List below

CANDIDATE(S) NAME OR MEASURE(S) FULL TITLE (INCLUDE BALLOT NO. OR LETTER)	CANDIDATE(S) OFFICE SOUGHT OR HELD OR MEASURE(S) JURISDICTION (INCLUDE DISTRICT NO., CITY OR COUNTY, AS APPLICABLE)	CHECK ONE	
		SUPPORT	OPPOSE
WLC LAND BENEFIT INITIATIVE : .	CITY OF MORENO VALLEY	X	

**Statement of Organization
Recipient Committee**

CALIFORNIA FORM	410
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I.D. NUMBER	1379766

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
 MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER
 DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

4. Type of Committee (Continued)

General Purpose Committee

Not formed to support or oppose specific candidates or measures in a single election. Check only one box:

CITY Committee COUNTY Committee STATE Committee

PROVIDE BRIEF DESCRIPTION OF ACTIVITY

Sponsored Committee

List additional sponsors on an attachment.

NAME OF SPONSOR		INDUSTRY GROUP OR AFFILIATION OF SPONSOR		
STREET ADDRESS	NO. AND STREET	CITY	STATE	ZIP CODE
HIGHLAND FAIRVIEW OPERATING CO.		LOGISTICS FACILITY BUILDER/DEVELOPER		
		MORENO VALLEY	CA	92553

Small Contributor Committee

Date qualified

5. Termination Requirements By signing the verification, the treasurer, assistant treasurer and/or candidate, officeholder, or proponent certify that all of the following conditions have been met:

- This committee has ceased to receive contributions and make expenditures;
 - This committee does not anticipate receiving contributions or making expenditures in the future;
 - This committee has eliminated or has no intention or ability to discharge all debts, loans received, and other obligations;
 - This committee has no surplus funds; and
 - This committee has filed all campaign statements required by the Political Reform Act disclosing all reportable transactions.
- There are restrictions on the disposition of surplus campaign funds held by elected officers who are leaving office and by defeated candidates. Refer to Government Code Section 89519.
- Leftover funds of ballot measure committees may be used for political, legislative or governmental purposes under Government Code Sections 89511 - 89518, and are subject to Elections Code Section 18680 and FPPC Regulation 18521.5.

1.A.k



Patricia Hillman Sells Real Estate

Like This Page · April 15, 2019 ·

Dinner at Iddo Benzeevi's Home, Supporting h
Skechers Building Project Coming to Moreno \
Soon. Realtor Patricia, supporting her Commu
Highland Fairview Community

2

2 Con

Like Comment Share

Most Relevant

Amado Hernandez Proud of You

Like · Reply · 1y

Amado Hernandez Patricia Campos
Congratulations

Like · Reply · 1y

Write a comment...

The Planning Commission of Moreno Valley
 of Moreno Valley
 City Hall/ clerk's office
 14177 Frederick Street,
 Moreno Valley, California 92553

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
 Planning Division

Dear Planning Commissioners.
 My name is Angelica Hinojosa and I live
 in Moreno Valley for many years. I fully sup-
 port the World Logistic center project and I
 ask you to please and the most attentive way
 to vote in favor of the changes that were
 made regarding the environmental repor, since
 the conclusion of the final repor that judge
 waters asked came out that would not harm us
 and that in term of traffic there would be
 little to what in these correncies there are
 since many people leave daily outside our city
 to work for that reason I ask them to vote
 as soon as possible so that the project can
 be built soon thanks for your attention

Atte

Angelica Hinojosa

14151 Galvin Ct
 Moreno Valley CA
 92553

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:07 PM
To: Julia Descoteaux

From: Beatriz Mendoza <beamendoza5@gmail.com>
Sent: Wednesday, May 13, 2020 10:46 AM
To: City Clerk <cityclerk@moval.org>
Subject: Re-certification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council:

3-G8-1

My family and I know of the five points that were certified for the World Logistics Center and it has recently come to my attention that the World Logistics Center Environmental Impact Report needs to be re-certified. As a resident of Moreno Valley, I have come to know the struggles this city has had. The World Logistics Center is the opportunity our community needs to flourish in an ever changing world. While other cities have become known for their great economic merits, Moreno Valley remains unknown by most. A project such as this will allow 15,000 construction job opportunities; if not more. As a result, many people in our communities will be able to financially support their families. Currently, our city is undergoing budget cuts due to the pandemic. This project will provide our local schools with over \$25 million to prevent the layoff of many teachers and the ensure the continued support of low-income families. The city will also be receiving money each year to help our brave first responders. Moreno Valley can and will become the epitome of financial excellence as well as diversity; everyone coming together and working for a common goal. Moreno Valley can become a partner and asset for other businesses and cities alike. Denying this change will negatively impact any chance this city and its people have to prosper. I kindly urge you to re-certify and thus accelerate the process of the Environmental Impact Report.

--
Best Regards,

*Beatriz Mendoza
Cell:(951) 269-1601*

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

City council of Moreno Valley c/o
City Hall / Clerk's office
14177 Frederick street
Moreno Valley 92553

Dear Planning Commissioners,

My name is Blanca, I live in Moreno Valley and I want to tell you through this letter I support the WORLD LOGISTICS CENTER, and I ask you to please vote for the new changes of the EIR in the project it would benefit thousands of people in the city and the economy would grow and with that there will be many benefits to all the community of Moreno Valley Thanks to your attention.

Sincerely

Blanca Calderon

15214 Perris Blvd # 102
Moreno Valley C.A. 92551

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission of M.V
c/o city hall / Clerk's office
14177 Frederick Street
Moreno Valley CA 92553

Dear Planning Commissioners My name is Cassandra Gonzalez I've lived in Moreno Valley for more than 15 years. I am a strong supporter of the World Logistics Center and I believe that EIR should pass it has been long enough on hold and I strongly believe it is great for our community. Thank you

3-C .1

Cassandra Gonzalez
22523 Adrienne Ave #D
Moreno Valley CA 92553
Cassandrareyes01@gmail.com
(951) 379-8153

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RECEIVED

MAY 11 2020

Comment Letter 3-G11

CITY OF MORENO VALLEY
Planning Division

The Planning Commission of Moreno Valley
Moreno Valley
City Hall Clerk's Office
1477 Frederick Street
Moreno Valley, CA. 92553

My name is Cecilia Amabilles I live in Moreno Valley and I want to tell you through this letter, I strongly support the world LOGISTIC CENTER and I ask you to please vote for the new changes of the EIR in the project. It would benefit thousands of jobs to our city and all the Inland Empire region also the economy would grow. Please don't delay the vote process in the city council and vote as soon as all the paper work of the EIR is in the city so they can start building. The project has been 5 years waiting for this big moment in our city.

Thanks to your attention
Sincerely
Cecilia Amabilles
24306 Central Av. #1-6
92553 Moreno Valley CA.

3-(-1
Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
of City Hall / Clerk's office
14177 Federico Street
Moreno Valley Cal. 92553

Dear members of the Planning Commission
my name is Ciria Delgado, I've
been a resident of Moreno Valley
for over 10 years. The reason for
my letter is to express my support
for the World Logistics Center because
it will bring more job opportunities
to our community. My kids, and
other family have needed to commute
outside the city in order to
work. I encourage you to approve
the revised E.I.P. in order for this
project to move forward. Thank you
for your consideration.

Sincerely,
Ciria Delgado
25434 Cov. of Ct.

3-C .1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Daniel Mendoza <danprestigeone@gmail.com>
Sent: Thursday, May 14, 2020 10:43 AM
To: City Clerk <cityclerk@moval.org>
Subject: Re-certification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council:

It has recently come to my attention that the World Logistics Center Environmental Impact Report needs to be re-certified. As a resident of Moreno Valley, I have come to know the struggles this city has had. The World Logistics Center is the opportunity our community needs to flourish in an ever changing world. While other cities have become known for their great economic merits, Moreno Valley remains unknown by most. A project such as this will allow 15,000 construction job opportunities; if not more. As a result, many people in our communities will be able to financially support their families. Currently, our city is undergoing budget cuts due to the pandemic. This project will provide our local schools with over \$25 million to prevent the layoff of many teachers and the ensure the continued support of low-income families. The city will also be receiving money each year to help our brave first responders. Moreno Valley can and will become the epitome of financial excellence as well as diversity; everyone coming together and working for a common goal. Moreno Valley can become a partner and asset for other businesses and cities alike. Denying this change will negatively impact any chance this city and its people have to prosper. I kindly urge you to re-certify and thus accelerate the process of the Environmental Impact Report.

3-G14-1

Best Regards,

Daniel Mendoza
Prestige One Development Corp.
Cell: (951) 906- 8471

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:07 PM
To: Julia Descoteaux

From: Denise Creer <denisecreer@gmail.com>
Sent: Wednesday, May 13, 2020 4:50 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council:

I support the WLC project. I think it is a fantastic opportunity to bring more jobs to our local community so we will not have to commute extremely long distances for employment. Please encourage you to truly consider granting their recertification.

3-G15-1

Thank you,
Denise Creer-Utterbach
26518 Bay Avenue,
Moreno Valley, CA 92555
323-791-4010 mobile.

Comment Letter 3-G16

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Infra Commission of Moreno Valley
40 City Hall / Clerk's Office
14177 Frederick St.
Moreno Valley CA 92553

Dear Commissioners,

My name is Dolores Rojas. I have been in the city for over 10 years. I'm a mother of two children. I work night shift for me is difficult to work and been a mother. Moreno Valley lacks of working women programs and jobs that can help us pay our bills and more.

I'm so glad for the project WVLC that will change Moreno Valley. We need well paid jobs. Please make this happen approve the revise EIR

Sincerely,

Dolores Rojas Robles 13078 Sunlit St
Moreno Valley, CA 92553



From: Williams, Edd <Edd.Williams@mvc.edu>
Sent: Monday, May 11, 2020 8:54 PM
To: Julia Descoteaux
Cc: City Clerk
Subject: Citizen comments

Warning: External Email – Watch for Email Red Flags!

I have been working at Moreno Valley College since 1994 and live in Moreno Valley; 26 years of driving in Moval gives me good insight into how Moval has evolved as a city. I can understand growth; home ownership, businesses such as the shopping center off Moreno Beach and the 60, west to Nasson; the car dealerships seem well-located; Sketchers off Theordore Dr.; even the other huge "tilt-ups" off Redlands and the 60 are tolerable. Growth is inevitable.

3-G17-1

But count me among the MVC residents and workers who object to the developments of the 2020 WLC.

How might I someday, somehow support this major development?

- (1) Make the builders pay for extensive expanded roadways for the surrounding areas affected by massive increases in diesel trucks and autos.
- (2) Make the builders pay for extensive EPA protections of the air quality, wildlife environs, and noise pollution that will result from such a massive development -- and NOT through carbon imprint payments that do nothing to protect Moval, but through sincere, relevant, well-considered LOCAL policies that will protect Moval and its surrounding communities.
- (3) Make the builders pay for Annual growth impact assessments that allow for adjusted *direct* costs to the builders, payable within 30 days, if those impact reports provide EIR evidence of inadequate policies to-date for environmental concerns noted in item 2; along with a required physical/actual adjustment within 90 days of the report's release.

At this time, I cannot support the WLC, not with little meaningful and almost no changes to prior environmental impact reports. There is something fishy in the state of Moval if this WLC moves forward without meaningful assessments and adjustments, particularly the expansion of roadways plus extensively increased environmental protections at the exclusive cost of the builders -- assuming their project moves forward.

Thank you for your time.
Edward A. Williams
Professor of English, MVC
Resident, Moreno Valley

To: Julia Descoteaux
Subject: Recertification for the WLC

From: Esteban Hernandez <hernandezesteban1@yahoo.com>
Sent: Tuesday, May 12, 2020 6:46 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Hello, my name is Esteban Hernandez and I am a resident of Moreno Valley California. The planning commission and the city council should move quickly to re-certify the environmental impact report for the work logistics center.

3-G18-1

Sincerely: Esteban Hernandez
Hernandezesteban1@yahoo.com

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 9:53 AM
To: Julia Descoteaux

Julia Descoteaux
Associate Planner
Community Development
City of Moreno Valley

p: 951.413.3209 | e: juliad@moval.org W: www.moval.org
14177 Frederick St., Moreno Valley, CA 92553

-----Original Message-----

From: Eunice Kang <eunice4kang@gmail.com>
Sent: Wednesday, May 13, 2020 12:34 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification of the world logistics center

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council members,

I have been a resident of Moreno Valley for 20 years and have been on the Board of Directors for the Mountain View community in Moreno Valley for 4 years.

I am asking that you move quickly to re-certify The Environmental Impact Report for the World Logistics Center so that our city and the people who live here can begin to reap the benefits of this project in terms of additional jobs, city revenue, and reduction of freeway traffic.

3-G19-1

Sincerely,
Eunice Kang,
28550 Grandview Dr.,
Moreno Valley, CA 92555
951-500-3835

Sent from my iPhone

From: Frank Huddleston <fhuddleston52@gmail.com>
Sent: Thursday, May 7, 2020 11:28 AM
To: Julia Descoteaux
Subject: WLC

Warning: External Email – Watch for Email Red Flags!

We are going to need JOBS. Let's start building

|

3-G20-1

Feb. 15, 2020

Comment Letter 3-G21

1.A.k

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Moreno Valley Planning Commission
Jeffery D. Sims
Chairman

Dear Mr. Sims,

This letter is in pertaining to the need of adoption in revision of the present Environmental Impact Report necessary to be certified for the advancement of the future construction of the World Logistic Center Project.

As a resident citizen since 1985, and retired Korean Campaign, also member of the VFW Local Chapter 8547, it has been seen that the City of M.V. has the developable of extensive potential in future growth, already founded.

Therefore, the people of this city are encouraging for your support of approval and pertinent care being essential for the City needs by certifying the change of the Environmental Impact Report.

Thank you.

Most sincerely and respectfully,



Frank Wright MMC USNRR
14656 Rio Hondo Dr
Moreno Valley, CA 92553

3-G21

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Julia Descoteaux

From: Julia Descoteaux
Sent: Wednesday, May 13, 2020 5:46 PM
To: Julia Descoteaux
Subject: WLC

From: Frank Wright <railroad8@yahoo.com>
Sent: Monday, May 11, 2020 10:37 AM
To: City Clerk <cityclerk@moval.org>
Subject: WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council,

It is imperative that all issues of environmental control, air pollution and any forms related to be adjusted, recommended and accepted in the quickest time possible; further delays results to more problems and higher expenses. The WLC construction has proved itself of high values of utmost concern for the residences of

3-G21-2

Moreno Valley and the foundation for the influx of multiple business companies now in place and of the desire for future development .

The people have longed for the this change for better living conditions,.....so it is urgent that you act now in making MV a historical location so well deserved.

Most sincerely, Frank Wright

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:02 PM
To: Julia Descoteaux

Julia Descoteaux

Associate Planner
Community Development
City of Moreno Valley

p: 951.413.3209 | e: juliad@moval.org W: www.moval.org
14177 Frederick St., Moreno Valley, CA 92553

-----Original Message-----

From: Walter Guinea <walantqui@yahoo.com>

Sent: Tuesday, May 12, 2020 8:48 PM

To: City Clerk <cityclerk@moval.org>

Subject: WLC care for all people progress and city of Moreno Valley doing right for our future.

Warning: External Email – Watch for Email Red Flags!

Dear members of the planning comission city council the recertification of the WLC will secure the project for our city of Moreno Valley,the revenue that this project will bring will help our city to be better and our community will have more jobs locally I stand for it, this is for the best of MVC. I'm a business owner, and I own a house here too, so I see Riverside growing in business, we has to do same growth for the future of our kids for them not to has to travel far away to go to work and so.I have lots of friends big rig truck drivers living here in Moreno Valley and we has to travel down to LA,Fontana,San Bernardino and so and to go to work,I have clean air in my truck law compliance, we need to make our city the best so please decertify, the best project of WLC.thanks for doing your best to the best of our city and residents of here like me. I brought my business and pay taxes us a Moreno Valley resident and happy to be here. Thanks again go Moreno Valley get biG.

3-G22-1

Sent from my iPhone

Planning Commission
 % City Hall/Clerk's Office
 14177 Frederick St,
 Moreno Valley, CA 92553

RECEIVED
 MAY 11 2020
 CITY OF MORENO VALLEY
 Planning Division

To the members of the Planning Commission,

I'm so honored to write this letter to you. Thank you for taking care the business of our city. My name is Gemma Arrate. I come from Florida to Moreno Valley twenty five years ago and I'm so please to live here. This is a beautiful city, but I have seen gangs in our city, transportation problems, and some business had been closed out, this worried me too much.

I ask you to please take close attention to the World Logistic Center project. We cannot lose this opportunity to bring jobs and better economic opportunities for the city.

We want busines to come to the city. Moreno Valley its beautiful but we need the money, investments and progress.

Please make it happen, do not make more obstacles. The World Logistic Center is a great project to come to our city.

Sincerely,

Gemma Arrate, District 1

24169 Eucalyptus Ave. # 232, Moreno Valley 92553

Mariano Arto Orrego

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission
c/o City Hall/Clerk's Office
14177 Fredrick St
Moreno Valley, CA 92553

3-G26

Dear Planning Commission
It is a great blessing to write to you,
my name is Guadalupe Marquez, I am
a retired resident of Moreno Valley, I've
lived here for the last 7 years. I like
my city and I can see the potential
for this city to be the best in California
if your department allows better businesses
in our city, as of right now I see great
need for improvement in our streets and
residential areas.

I truly believe that the World Logistic
Center will definitely bring the progress,
jobs and tax revenue so much needed in
our city.

I kindly ask you to please allow this
great project to start now. At the end
we will all gain much.

Respectfully yours
Guadalupe Marquez
24169 Eucalyptus Ave. Apt 140
Moreno Valley, CA 92553
Guadalupe Marquez

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

The Planning Commission of Moreno Valley

c/o City Hall / Clerk's office
14177 Frederick Street
Moreno Valley, California 92553

3-G27

My name is Manuela Patiño and my husband Guillermo Patiño we live in Moreno Valley CA and I want to tell you through this letter I support the World Logistic Cent and I ask you please vote of the new changes of the EIR in project. It will be a good benefit for many people that work in of the community of Moreno Valley grow and with that there will be many benefits for the community of Moreno Valley.

Thanks to your attention

Sincerely

Manuela Patiño - Guillermo Patiño

24791 Fir Ave
Moreno Valley CA 92553

Planning Commission
c/o City Hall/Clerk's Office
14177 Frederick Street,
Moreno Valley, Calif. 92553

RECEIVED
MAY 11 2020
CITY OF MORENO VALLEY
Planning Division

Dear Members of the Planning Commission,

I am writing in regards of the World Logistic Center project, I fully support the project because it would be great for our city. My name is Guillermo Reza, I had been living in the city of Moreno Valley for about 15 years; our city is growing and all kinds of needs too as jobs, better roads, and schools etc.

The World Logistic Center project was approved on the year 2015 and up to this year has not been built, I would like to ask you to help open the avenues to bring this project in our city.

Don't delayed any longer, we want our city to progress! Do not hold us back!

3-G28

Thank you for your attention to this letter,

Guillermo Reza
25251 Turquoise Lane
Moreno Valley, California 92557



Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RECEIVED

JUN 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission
c/o city Hall/clerks office
14177 Frederick Street,
moreno valley, california 92553

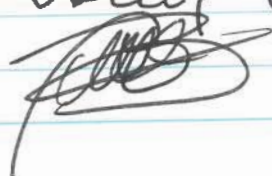
Dear planning Commissioners

I am a long time resident of our town and I am writing to express my support to the World Logistic Center.

My name is Juliana Lopez. I am a mother of three children. My oldest son is looking for job but I saw many young people move to other cities to work and continue their studies. But I don't want that road for my son. I prefer he could stay home and continue his studies and work that is why I support 100% the WLC project to come

Thank you for your attention to this letter.

JULIANA Lopez
24201 WEBSTER AVE
MORENO VALLEY CAL. 92553



3-G29-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Comment Letter 3-G30

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission
14177 Frederick Street.
Moreno Valley California 92553

Dear Mayor, and Council, and Planning

I am Isabel Baldenegro, I have 11 years living in Moreno Valley, and I'm a mother of three children. I would like to express my opinion regarding the WLC project. We want this project to be built to have more job opportunities in our city. It would be great if my husband could get a local job and a blessing for my family to have more time to spend with him.

Some times my husband had been out for months for work.

Bringing the WLC project to Moreno Valley will help families a better quality of life.

Thank you!

Isabel Baldenegro
24807 Fir Ave.
Moreno Valley CA. 92553



3-G30-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Comment Letter 3-G31

Planning Commission
City of Moreno Valley

c/o City Hall / Clerk's office

14177 Frederick Street,
Moreno Valley, CA 92553

RECEIVED
MAY 1 12 2020
CITY OF MORENO VALLEY
Planning Division

Dear members of the Planning Commission,

My name is Isabel Bojorquez, I am a resident of Moreno Valley. The reason for my letter is to express my support for the World Logistics Center. This project that was approved a few years ago in the city of Moreno Valley, and it has been highly anticipated by the community, as it would bring many opportunities for our city to progress and succeed. Over the last few years, the City of Moreno Valley, along with Highland Fairview have endured many lawsuits that have delayed the project from breaking ground, and I am asking you to do the right thing and approve any necessary items for this project to move forward. Thank you for your consideration.

3-G: 1

Sincerely,

Isabel Bojorquez

Resident of Moreno Valley

23920 Doe Court.

Moreno Valley, CA 92553

Isabel Bojorquez
Jose Bojorquez
Jose Bojorquez.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Janet Giles <janetegiles@gmail.com>
Sent: Tuesday, May 5, 2020 1:58 PM
To: Julia Descoteaux; City Clerk
Subject: WLC

Warning: External Email – Watch for Email Red Flags!

Please no WLC. We have too many warehouse and too much truck traffic already. Moreno Valley needs high paying jobs, not more warehouses. Do the right thing. Do not allow the building of the WLC. Do 3-G32-1

Sincerely,
Janet Giles

--
Janet Giles

-----Original Message-----

From: Jessica Reza <jgreza@yahoo.com>
Sent: Thursday, May 14, 2020 4:45 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification of the WLC - Support

Warning: External Email – Watch for Email Red Flags!

De city council & planning commission,

My name is Jessica Reza and I have been a resident of Moreno Valley resident for over 20 years. Over the course of the years I have seen the city come a long way with development and am proud to live in our city that has a lot of good business within it. Keeping this in mind I would like to express my support for the WLC. Highland Fairview is a company that has a great track record as a business partner in our city. They have supported a lot of local causes in our cities such as non profit organizations to our local hospital to families in need. I am in complete support of anything they bring to the table for business and look forward to seeing a business expansion from a company such as theirs. We need more companies like this in our city to continue to thrive. Please move forward in approving this project again and brining more economic growth, opportunities and tax revenue to our city. Thank you for your time in this matter,
Jessica Reza
951-992-9691

3-G33-1

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

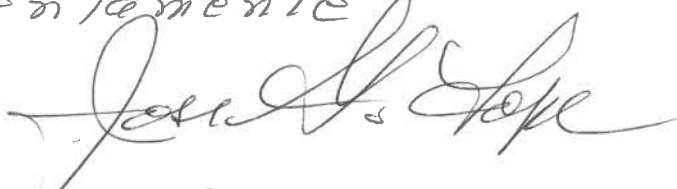
Comment Letter 3-G34

The Planning Commission de Moreno Vall
 c/o City Hall / Clerk's Office
 14177 Frederick Street
 MORENO VALLEY Ca. 92553

3-G34

Nosotros somos un matrimonio nuestro nombre - Jose Lope y Soledad Lope que vivimos en Moreno Valley por 32 años mi familia y yo apollamos a World Logistics Center y lo hemos apollado durante 5 años y por medio de esta carta le pedimos que aprueben lo mas pronto posible. Los cambios que hubo para el medio ambiente ya los resultados fueron insignificante en cuanto al impacto ambiental le pedimos que voten a favor para que pronto comiencen a construir el proyecto y podamos tener los beneficios economicos para la ciudad que tanto necesitamos

atentamente



25051 SLATE CREEK DR.
 MORENO VALLEY Ca. 92551



Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

To the Planning Commission of Moreno Valley,
We are a couple, our names are Jose G Lope,
and Soledad Lope. We have lived in Moreno
Valley for 32 years. My family and I support the
World Logistics Center, and we have supported it
for the last 5 years. Through this letter we ask that
you can as soon as possible, approve the
changes that were made for the environmental
impact report. The results were insignificant in
terms of the impact on the environment. We ask
that you please vote in favor, so that soon they
can start building the project, and we can have
the economic benefits that our city needs so
much. Sincerely, Jose and Soledad Lope

3-G34-1
(contd.)

Comment Letter 3-G38

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission
c/o city hall clerk's office
14177 frederick Street.
Moreno Valley California 92553

Dear members of the Planning Commission

My name is Luis Baldenegro I moved to moreno valley eleven years ago. I love moreno valley because is a quite city. the only problem I have is that I spent 4 to 5 hours on the freeway with traffic on my way to work I'm writing to show my support for the WLC this project is different to the others warehouses. this project will reduce traffic and less than significant on pollution. I really wish that this project will be built do not delayed it. we are losing opportunities for residents to work close to home

thank you for your time on reading my letter

Luis Baldenegro
24807 fir ave
Moreno Valley CA 92553



3-G38-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

The Planning Commission of Moreno Valley
 City Hall / Clerk's Office
 14177 Frederick St.
 Moreno Valley Ca. 92553

RECEIVED
 MAY 11 2020
 CITY OF MORENO VALLEY
 Planning Division

Dear Members of the Planning Commission
 Our name is Manuel & Carolina Rodriguez
 We live in Moreno Valley for 25 years and We
 support the World Logistic Center 100%. Our
 city has a good project where many families
 would benefit from the jobs and even the city
 and all the residents that we live in Moreno
 Valley will benefit.

I ask you to please vote YES on the
 new updates of the project so they can
 start ^{to} build as soon as possible

Sincerely

Manuel Rodriguez

Carolina Rodriguez

Manuel Rodriguez

Carolina Rodriguez

13931 Elsworth St. apt. 6
 Moreno Valley Ca. 92553

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

1.A.k

Comment Letter 3-G40

Planning Commission
c/o City Hall/S clerk's Office
14177 Frederick Street
Moreno Valley, California 92553

Dear Planning Commissioners,

Thank you for all you do in our city.
I'm Margarita Espanza. I'm a resident
of Moreno Valley for over 25 years.
I'm very concerned for our city, criminal
acts has been raised. Our city need more
programs for the homeless, more educational
programs for the youth, Also our city
needs more job opportunities.
I fully support the World Logistic
Center project because it will help our
economy and tax revenue to bring all
the necessary programs in our city and
also jobs that are need it.

Sincerely

Margarita Espanza, resident District 1
124369 Eucalyptus Ave. #114
Moreno Valley, CA 92553

Margarita Espanza

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

RECEIVED

1.A.k

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Comment Letter 3-G

The Planning Commission of Moreno Valley
C/O City Hall / Clerks Office
14177 Frederick Street
Moreno Valley CA 92553

3-G .1

Mi nombre es Maria C Esparza
Vivo en la Ciudad de Moreno Valley por 9 años
mi familia y yo, apostamos el proyecto
Centro logístico mundial con este proyecto
nos beneficiaría a la Comarca de Moreno
Valley, por que tendríamos mas trabajos, y
mas escuelas, por favor podrian votar lo
mas pronto posible, en los nuevos
Cambios del medio ambiente, que pidio la
Sueza Waters, y asi poder pronto
beneficiarnos los residentes de Moreno Vall

Muchas gracias por su atencion
esperemos que pronto lo tengan en la
reunion del Consilio y lo puedan votar lo
mas pronto posible

Maria C Esparza *Maria C Esparza*
23373 C Hallis Ct Moreno Valley CA 92553

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

My name is Maria C Esparza,

I have lived in the city of Moreno Valley for 9 years. My family and I support the World Logistics Center project. With this project, the Moreno Valley community would benefit greatly because we would have more jobs and more schools. Please vote as soon as possible on the changes that were made for the environmental report, which Judge Waters asked to do so, that way Moreno Valley residents may soon reap the benefits of the project.

3-G41-1
(contd.)

Thank you very much for your attention. Hopefully it will be brought up soon at the council meeting so a vote can take place as soon as possible.

Maria C Esparza.

Julia Descoteaux

From: Julia Descoteaux
Sent: Wednesday, May 13, 2020 5:58 PM
To: Julia Descoteaux
Subject: FW: Recentrification for the WLC

From: Monica Esparza <monicaesparza601@gmail.com>
Sent: Tuesday, May 12, 2020 6:57 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recentrification for the WLC

Warning: External Email – Watch for Email Red Flags!

Hello, my name is Monica Esparza and I have lived in Moreno Valley California for 18 years. Since January, unemployment is up 26.38% in Moreno Valley. Thousands of Moreno Valley residents are now out of work . Local small businesses are closing. The World Logistics Center will turn this around.

Sincerely: Monica Esparza
Monicaesparza601@gmail.com

Julia Descoteaux
Associate Planner
Community Development
City of Moreno Valley
p: 951.413.3209 | e: juliad@moval.org W: www.moval.org
14177 Frederick St., Moreno Valley, CA 92553

3-G4

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)


RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

Planning Commission
14177 Frederick street.
Moreno Valley CA 92553.

Hello, my name is Mónica Esparza, I am
am a house wife; I have been living in
Moreno Valley for the past 17 years. I have
four young children that have grew up in this
city. I strongly support the World Logistic
Center for the job opportunities that it will be
bringing to my children and community. I would
really like the project to come to our city
because it is going to bring great opportunities
to all the region. I have strong faith that this
project will greatly benefit my city and the economy
I am very excited for what is to come! I hope
council members approve this project and
make it happen. Thank you for your time of
day.

Sincerely, Mónica Esparza 
24748 Myers Ave.
Moreno Valley CA 92553

3-G .1
(col)

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

THE PLANNING COMMISSION OF MORENO VALLEY

DEAR MEMBERS OF THE PLANNING COMMISSION,
 MY NAME IS NAZLY BADILLO, RESIDENT OF THIS
 CITY SINCE 2003. (17 YEARS). I FULLY SUPPORT THE
 WORLD LOGISTICS CENTER PROJECT AND ITS
 CONSTRUCTION SINCE IT WILL BE SOMETHING
 POSITIVE FOR THE CITY OF MORENO VALLEY,
 BRINGING MORE JOBS FOR THE CITY AND THUS
 BRINGING ENORMOUS ECONOMIC PROGRESS TO THE
 CITY. WE LOOK FORWARD TO YOUR FAVORABLE
 DECISION SO THAT THIS PROJECT CAN SOON BE
 BUILT, SEEING HOW IT WILL NOT HAVE ANY
 NEGATIVE EFFECTS ON THE CITY'S ENVIRONMENT.
 I APPRECIATE YOUR ATTENTION TO THIS LETTER.

SINCERELY, NAZLY BADILLO

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

3-()-1
 Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

THE PLANNING COMMISSION
OF MORENO VALLEY, CA.

C/O CITY HALL CLERK'S OFFICE
MORENO VALLEY, CA. 92553

ESTIMADOS MIEMBROS DE PLANNING
COMMISSION, MI NOMBRE ES NELY
BODILLO, CIUDADANA DE ESTA
CIUDAD DESDE EL 2003 (17 años)
YO APOYO EN SU TOTALIDAD EL
PROYECTO WORLD LOGISTIC CENTER
PARA SU CONSTRUCCION YA QUE
SERIA POSITIVO PARA LA CIUDAD
DE MORENO VALLEY TRAYENDO
MDS EMPLEOS PARA LA CIUDAD,
TRAYENDO ASI UN ENORME PROBLEMA
ECONOMICO PARA LA CIUDAD.

ESPERAMOS SU DECISION FAVORABLE
PARA QUE PRONTO SE PUEDA
CONSTRUIR ESTE PROYECTO QUE
NO HANIA NINGUN EFECTO NEGATIVO
PARA EL MEDIO AMBIENTE DE
LA CIUDAD.

AGRADECIENDO LA ATENCION
A ESTA CARTA DE USTED
DENTAMENTE,

NELY BODILLO, 22527 HONOLULUA, ?
MORENO VALLEY, CA
92557

Comment Letter 3-G45

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

~~City of Moreno Valley~~ Moreno Valley
c/o city Hall/clerk's office
14177 Frederick street
Moreno Valley, California 92553

Dear planning commissioners
the city of Moreno Valley is a great place to live,
but we need more jobs, it's so hard for me because
I'm a single mom and I have to commute every
single day 120 miles back and forth from Los Angeles
to my work. I think this project the World Logistics Center
is going to change the city for good bringing more
jobs. my name is

Petra Olazabak
10890 Breezy Meadow DR
Moreno Valley, CA, 92557

Petra Olazabak

From: Raul Sanchez
Sent: Thursday, May 14, 2020 9:58 AM
To: City Clerk
Subject: WLC Hearing

Warning: External Email – Watch for Email Red Flags!

+Hello

I'm writing this email in hopes it reaches the planning commission before today's hearing. I want them to see another resident is in support of the City Planning Commission recertification of the WLC's Environmental Report.

3-G46-1

This project is so important on so many levels. Too many to list. One primary reason I am in favor is the positive impact the project will have on our city's economy. In my humble opinion, this should be a cut and dry decision considering this project and the E.I.R. report was approved years ago and this is just a formality due to Highland Fairview revising the E.I.R. to what was asked of them.

Thank you,

Raul Sanchez
So Cal Culture Group
951.295.4261

From: Richard Olvera
Sent: Thursday, May 14, 2020 10:05 AM
To: City Clerk
Subject: WLC project

Warning: External Email – Watch for Email Red Flags!

These are scary and challenging time. Many people fear what the future holds. But with the construction of the World Logistics Center will revive Moreno Valley’s economy. It will create thousands of jobs here in our city. Plus, the taxes and fees paid by the developer to can be used to preven layoffs of teachers, deputy sheriffs and fire fighters. That’s why the city’s EIR must be recertified without further dela y

3-G47-1

These are scary and challenging time. Many people fear what the future holds. But with the construction of the World Logistics Center will revive Moreno Valley’s economy. It will create thousands of jobs here in our city. Plus, the taxes and fees paid by the developer to can be used to preven layoffs of teachers, deputy sheriffs and fire fighters. That’s why the city’s EIR must be recertified without further dela

From: Rosemary <maestrose13@aol.com>
Sent: Wednesday, May 13, 2020 7:31 AM
To: Julia Descoteaux
Cc: City Clerk
Subject: WLC

Warning: External Email – Watch for Email Red Flags!

Once again, I would like to voice my comments on this project. This is definitely not what Moreno Valley needs at this time. I cannot comprehend how this project is still under consideration with so many buildings still standing empty. The negative impacts on our community do not erase the few low paying jobs it will bring. Also, I am wondering why this has not been put on hold so residents may have the opportunity to voice their opinions in person. Why the rush forward at this time?
Thank you.

3-G48-1

From: Sharon Eirew <seirew@icloud.com>
Sent: Thursday, May 14, 2020 4:41 PM
To: Julia Descoteaux; Ulises Cabrera; Dr. Yxstian A. Gutierrez; Victoria Baca; David Marquez; Dr. Carla J. Thornton
Subject: City council/ warehouses

Warning: External Email – Watch for Email Red Flags!

Dear Sirs,

I want to voice my strong objection to the continuation of building warehouses. The developer has done nothing for the city. The jobs are mostly low wage and the impact of pollution and destruction of roads destroys the city fabric.

I also object that the city council would push such a hot button topic through with out advance notice to its citizens and the ability to meet in person. I hope they look at the polls which show this topic has a negative poll of 87%. It is pretty clear to me that the citizens of Moreno Valley are tired of fighting this topic.

I am hoping to be part of this virtual meeting but in the event I'm tied up I want my disapproval on record. I just hope the city council doesn't keep giving in to this developer. It makes their decisions questionable when the citizens don't want the warehouses built. Why else would it have been in litigation for so long?

Sincerely,

Sharon Eirew

Sent from my iPhone

3-G49-1

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:06 PM
To: Julia Descoteaux

From: Silvia Stella <silviager1.ss@gmail.com>
Sent: Wednesday, May 13, 2020 4:16 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear planning commission and city council My name is Silvia Abrego. I'm a resident of Moreno Valley
The city of Moreno Valley will get more than \$ 5 million in taxes each year from the World Logistics Center. With upcoming budget cuts caused
by the pandemic, the money can be used to keep our city's brave first responders on the job.
My address is 13325 Heacock St, Moreno Valley, CA 92553
Phone number
(562) 372-1019

3-G50-1

Sincerely,
Silvia Abrego

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

THE PLANNING COMMISSION OF MORENO VALLEY
C/O City Hall / Clerk's office

14177 Frederick Street,
Moreno Valley, California 92553

Dear Planning Commissioners

3-G51

My name is SILVIA CALLENTE and I live in Moreno Valley for many years. I support the World Logistics Center Project and I ask you the most attentive way to vote in favor of the changes that were made regarding the environmental report. Where they reflect of the report - said is less the insignificant, I ask you vote as soon as possible so the project can start to built soon.

Thanks for your attention.

Atte Silvia Callente
Silvia Callente

14170 Galvin Ct
Moreno Valley CA 92553

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:01 PM
To: Julia Descoteaux

Julia Descoteaux
Associate Planner
Community Development
City of Moreno Valley

p: 951.413.3209 | e: juliad@moval.org W: www.moval.org
14177 Frederick St., Moreno Valley, CA 92553

-----Original Message-----

From: Susan Lansang <susan_lansang@yahoo.com>
Sent: Tuesday, May 12, 2020 10:17 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

"Dear Planning Commission and City Council,

We want to encourage our planning commissioners and council members to re-certify the improved and revised EIR (environmental impact report) for the World Logistic center.

They should work quickly to re-certify the EIR so the WLC can be the revival of our cities economy, by bringing thousand of jobs and millions in revenue.

Your speedy action for the above will be highly appreciated for the cause of our community.

Sincerely,
Susan and Conrado Lansang

Sent from my iPhone

3-G52-1

Comment Letter 3-G53

RECEIVED

MAY 11 2020

CITY OF MORENO VALLEY
Planning Division

THE PLANNING COMMISSION OF MORENO VALLEY
 C/O CITY HALL / CLERK'S OFFICE
 14177 FREDERICK STREET
 MORENO VALLEY CA 92553

TO THE MEMBERS OF THE PLANNING COMMISSION
 MY NAME IS TERESA SALAS I'M A LONG TIME
 MORENO VALLEY RESIDENT.

STRONGLY SUPPORT THE WORLD LOGISTICS CENTER
 PROJECT AND THROUGH THIS LETTER I WANT TO
 ASK YOU TO PLEASE VOTE YES ON THE CHANGES
 OF THE EIR IN THE PROJECT.

SO MANY PEOPLE WILL BENEFIT OF THE THOUSANDS
 OF JOBS IN THIS PROJECT WILL HAVE.

SO MANY PEOPLE WILL STAY IN THE CITY WORKING
 INSTEAD COMMUTING TO OTHER CITIES OF THE SOUTHERN
 CALIFORNIA SPENDING AS MUCH AS TWO HOURS OF THE
 FREEWAY.

THANKS OF YOUR ATTENCION

SINCERELY

Teresa Salas

TERESA SALAS
 25855 KARISA CIRCLE
 MORENO VALLEY CA 92551

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Julia Descoteaux
Sent: Thursday, May 14, 2020 12:04 PM
To: Julia Descoteaux

From: tony pc <anreza@hotmail.com>
Sent: Tuesday, May 12, 2020 6:27 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertificacion for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and city council

Blessings my name is Tony Reza, I have been living in the city for more than 28 years. These are scary and challenging time. Many people fear what the future holds. But with the construction of the World Logistic Center will revive Moreno Valley's economy. It will create thousands of jobs here in our city Plus the taxes and fees paid by the developer to can be used to prevent layoffs of teachers, deputy sheriffs and fire fighters. That's why the city's EIR must be recertified without further delay.

3-G54-1

Thank you!!

Tony Reza,
951 5051913

-----Original Message-----

From: Vilma Restrepo <vilmarestrepo25@gmail.com>
Sent: Wednesday, May 13, 2020 5:18 PM
To: City Clerk <cityclerk@moval.org>
Subject: Recertification for the WLC

Warning: External Email – Watch for Email Red Flags!

Dear Planning Commission and City Council

My name is Vilma Restrepo and I am a resident of Moreno Valley for over 25 years.

The Planning Commission and the City Council should move quickly to re-certify the Environmental Impact Report for the WLC. With the thousands of jobs that will be created by the WLC we can rest assured that is going to give Moreno Valley an economic boom. Now as we deal with the consequences of the Coronavirus Pandemic, the World Logistics Center will be a super-powered engine that drives the economic recovery of our city, Please re-certify the EIR for the World Logistics Center

3-G55-1

Thank you very much for your consideration

Sent from my iPad

Moreno Valley Planning Commission
c/o City Hall / Clerk's Office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is ^{ANNIE}Ana Burch and I am a resident of Moreno Valley. I know that the World Logistics Center project was approved by the city some years ago. Our city desperately needs an economy boost, and I strongly believe this Industrial park will bring the money and the jobs that our city lacks. Please, Let's not delay the project any further. The E.I.R has been updated, and I Urge you to approve it in order for our community to be able to reap the Benefits.
Thank you for your time.

Sincerely,

^{ANNIE}
Ana Burch
25105 Fir Ave. Apt 316
Moreno Valley, CA 92553

3-G56-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Clerck
Planning Commission
14177 Frederick St
Moreno Valley, Ca 92553

Estimada City Clerck y miembros de la Comisión de Planeamiento, Mi Nombre es Ana Lilia Cárneros vivo en la Ciudad de Moreno Valley ya por muchos años, mis hijos han crecido y estudian aquí hace 5 años yo ya habia escuchado acerca del Proyecto World Logistic Center y desde el primer día se me hizo un buen proyecto ya que traerá trabajo a nuestra ciudad, trabajos de los cuales se beneficiaría mis hijos, así como las siguientes generaciones. Yo les pido que aprueben lo más pronto posible estos cambios que se han hecho en el proyecto relacionada al medio ambiente, y por lo tanto pido que ya en este año se resuelva y se empiece a construir

ATTE: Ana Lilia Cárneros
15071 Elm Ct #A
Moreno Valley, CA 92551

Dear City Clerk and members of the Planning Commission, my name is Ana Lilia Cisneros. I have lived in the city of Moreno Valley for many years, my children have grown up and studies here. 5 years ago I had already heard about the World Logistic Center project and from the first day I thought it was a good project since it would bring work to our city, work from which my children would benefit as well as the following generations. I ask you to approve as soon as possible these changes that have been made in the project related to the environment and therefore I ask that this year it be resolved and construction begin.

14177 Frederick Street
Moreno Valley, Ca. 92553

Dear Members of the Planning
Commission our name is Joel and Ana Villaverde
we are a marriage that when we got
married we decided to start our family
in Moreno Valley since it is a beautiful city
to raise our children.

We support the World Logistic Center project
100% since the first day that someone
went to my house to talk to us about
the project, we have a good project
where many families would benefit from
the jobs and even the some city and
residents that we live in Moreno Valley
we can be benefits that the city will
have by having this great project
I ask you to please vote yes to the
World Logistic Center so that it can
be built as soon as possible.

3-G58-1

25845 Harold Lane
Moreno Valley Ca 92551

sincerely

Ana Lilia Pazo Villaverde
Ana Lilia Pazo
Villaverde..

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Moreno Valley Planning Commission
c/o City Hall / Clerk's office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Aureliano Jacobo and my wife's name is Maria Jacobo,
we are residents of Moreno Valley for 16 years,
As a home owners and business owners we feel that the WLC project will benefit
Our city, with the revenue the WLC will bring to our city it will boost our economy
And, therefore will benefit all the local businesses and the entire region.
We are eagerly waiting for the WLC to start breaking ground and start reaping all
The benefits this amazing project will bring.
All my family support this project because Moreno Valley is our home and this is
Where we will continue to support the creation of new local jobs.
We are looking forward to Planning Commission and the City Council to make the
Right decision for our city and approve the necessary items for the WLC project
To move forward.
Thank you very much,

3-G59-1

Aureliano and Maria Jacobo
14909 Meridian Place
Moreno Valley, CA 92555

Aureliano Jacobo
Maria R Jacobo

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
c/o City Hall/Clerk's Office
14177 Frederick Street,
Moreno Valley, California 92553

Dear members of the Planning Commission,

I'm happy to express myself through this letter. I pray for your office that God gives you the wisdom to make the best decisions for our city.

My name is Beatriz Garcia, I have been a resident of Moreno Valley for about 26 years. I'm a mother of three children. Some of my children already graduated and they can't find jobs in Moreno Valley. For me this is a big issue because my husband commutes for up to 6 hours for work. This is a cruel reality and I don't want my children ending up in the same situation. My family will eventually get sick and stressed from all the commuting hours.

I am thankful for CEO Iddo Benzeevi, and his great vision to bring jobs to our city and keep families together. Please approve revisions made to the WLC environmental analysis. Thank you for your attention.

3-G60-

Beatriz Garcia,
24289 Dimitra Dr.
Moreno Valley, California 92553
(District 3)

Beatriz Garcia

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
of City Hall / Clerk's office
14177 Frederick St
Moreno Valley, CA 92553

Dear Planning Commission of Moreno Valley

I'm writing this letter of the excitement my family and I have regarding the world Logistic Project. we are on board 100% with this project. It will bring more income to our city and help our communities.

Sincerely *Bertha Garcia*

Bertha Garcia
14371 Redwing Dr.
moreno Valley CA 92553

3-G61-

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission
City Council of Moreno Valley
City Hall / Clerk's Office
14177 FREDERICK STREET
Moreno Valley cal 92553

To The members of the planning commission
My name Bertha Lozano and want
to tell you through this
letter I support The World Logistics
Center and ask you to please vote
for the new changes in The projects as it
would benefit thousands of people in the
city and the economy would grow and
with that there will be many
benefits to all The community of
Moreno Valley Thanks for your attention
Cincerely Bertha Lozano
15085- EIM Ct Apt. B
Moreno Valley cal 92551

3-G6

Planning Commission of Moreno Valley
 % city Hall / clerk's office
 14177 Frederick Street,
 Moreno Valley CA. 92553

DEAR PLANNING COMMISSIONER
 MY NAME IS CARLOS REZA A RESIDENT OF
 MORENO VALLEY (10 YR) I
 I KNOW YOU ARE GOING TO REVIEW THE
 (S) ENVIRONMENTAL POINTS THAT THE JUDGE ASK
 FOR AND YOU ALSO KNOW THAT THE RESULTS
 WERE LESS THAN SIGNIFICANT
 I SUPPORT THE WORLD LOGISTIC CENTER (WLC)
 SINCE ITS BEGINNINGS FOLLOW THE LAWSUIT
 PROCESS AND NOW THIS I HOPE THIS IS THE FINAL
 PAGE AND THE BEGINNING OF BREAKING
 POINT FOR OUR SO WANTED PROJECT.

PLEASE APPROVE THIS ENVIRONMENTAL
 CHANGES AND MOVE FORWARD

SINCERELY

Carlos Reza
 CARLOS REZA

Olga Reza
 OLGA REZA

3-G63-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Council of Moreno Valley
c/o City Hall / clerk's office
14177 Fredericks street
Moreno Valley CA 92553

To the Members of the planning Commission

Hi My Name is Delfina Gómez
I lived in Moreno Valley for many
years. I struggled a lot through many
years living here. I would like to
see more opportunities not just for me
but for the new generation. I want
to see more money spent in our city.
Improvements and jobs. The WLC will
be helping the city to bring more
jobs opportunities on tax revenue
so the city will look better and
thank you very much for your attention.

Sincerely Yours
Delfina Gómez
Delfina Gómez

15113 Norton Ln
Moreno Valley CA
92551

3-G64-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
c/o City Hall/ Clerk's office
14177 Frederick Street
Moreno Valley CA 92553

Dear Planning Commissioners

My name is Frances Saldaña I have been a resident of Moreno Valley for over 20 years. I am raising my voice through this letter, letting you know that I am in support of The World Logistics Center Project like many in our city that want progress. Our city has been blessed with a visionary investor like Mr. Iddo Benzeevi who is a Moreno Valley resident for more than 30 years like many of us. He saw the very lack this city has from its roots. No jobs, jobs that this project will provide.

3-G65-

Soon you will be having a public meeting and I hope that your decision will be to move this project to a closer break ground. Waiting is costing our city too much money.

Sincerely,



Frances Saldaña

10853 Anemone Circle
Moreno Valley CA 92557

Cell: (951) 413-9166

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Moreno Valley Planning Commission.
C/O City Hall / Clerk's Office
14177 Frederick Street.
Moreno Valley, California 92553

My name is Inés Arriaga. I have been living in Moreno Valley, for 22 years. When I heard about WLC project, I'm really excited about all prosperity and blessings that is coming to our city. I'm currently unemployed. I'm looking for a job and I find it very difficult to find a local job.

3-G6

I believe it will make our lives easier if we have more jobs in our city.

I urge you to please among all those who make decisions please move this project forward. We need the jobs and the tax revenue.

Sincerely

Inés Arriaga. Inés A.

24391 Postal ave #5
Moreno Valley, Ca. 92553

city clerk
planning Commission
14177 frederick st.
Moreno Valley Ca. 92553

Dear city clerk and members of the planning
Commission.

My name is Inez Gonzalez and I live in the
city of Moreno Valley for 24 years. The reason
for this letter is to tell you that my family
and I strongly continue supporting the World
Logistic Center project since it will bring many
benefits to our city as well as jobs that
many families would benefit from.

3-G67-1

Inez Gonzalez
14684 Joshua tree ave
Moreno Valley, Ca.
92553

Moreno Valley
Planning Commission
C/O City Hall / Clerk's Office
14177 Frederick Street.
Moreno Valley CA 92553

Dear planning Commissioners

My name is Irma Padilla and as a resident of Moreno Valley for 26 years I would like to express my strong support to the development of the WLC project because it will impact our city and the entire region in a great way.

The WLC will be built with the highest technologies which will represent an asset to our city. This kind of project keeps families together and helps us grow as a community. This project will offer thousands of job opportunities that will make our city thrive. Please allow this great project to break ground soon with no further delays.

THANKS VERY MUCH.

IRMA PADILLA
29219 Boy Ave Moreno Valley CA 92555

Irma Padilla

3-G6

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Council Of Moreno Valley
c/o City Hall/Clerk's Office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

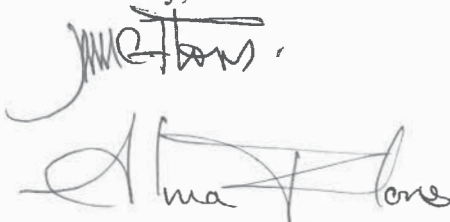
Our names are Israel and Alma Flores. We have lived in Moreno Valley for 21 years. When our family moved here, there were barely any houses or traffic. We have seen Moreno Valley grow little by little from being a bedroom town to a prosperous city. We, here in Moreno Valley, would like our city to be a job-based city such as San Diego, Irvine, and Orange County. The World Logistic Center (WLC) project would allow us to become a self-sufficient city like the ones mentioned before.

Riverside County will be blessed to receive more than \$5.7 million dollars every year of city funds and the residents will be blessed to have a variety of job opportunities to support their families. We would see a decrease in homelessness and unemployment.

We respectfully ask that you please pass the 5 reviewed environmental impact results from the WLC's Environmental Impact Report (EIR) as soon as possible. As you know, these results were less than significant making the EIR more powerful. Please think about all the job opportunities and the revenue that will help our city and county grow; and it will also prepare us for the future.

3-G69-

Sincerely,



Israel Flores and Alma Flores

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

c/o 'CITY HALL / CLERK'S OFFICE'
14177 FREDERICK STREET
MORENO VALLEY, CA 92553

DEAR MEMBERS OF THE PLANNING COMMISSION,

OUR NAME IS JOEL & ANA VILLAVERDE,
WE ARE A MARRIAGE THAT WHEN WE DECIDED TO
START OUR FAMILY IN MORENO VALLEY SINCE
IT IS A BEAUTIFUL CITY TO RAISE OUR CHILDREN.

WE SUPPORT THE WORLD LOGISTIC CENTER
PROJECT 100% SINCE THE FIRST DAY THAT
SOMEONE WENT TO MY HOUSE TO TALK TO US
ABOUT THE PROJECT, WE HAVE A GOOD PROJECT
WHERE MANY FAMILIES WOULD BENEFIT FROM
THE JOBS & EVEN THE SAME CITY & RESIDENTS
THAT WE LIVE IN MORENO VALLEY, WE CAN BE
BENEFITS THAT THE CITY WILL HAVE BY
HAVING THIS PROJECT. I ASK YOU TO PLEASE
VOTE YES TO THE WORLD LOGISTICS CENTER
SO THAT IT CAN BE BUILT AS SOON AS
POSSIBLE.

3-G7

SINCERELY,
JOEL E. VILLAVERDE

25843 HORADO LN.
MORENO VALLEY, CA 92551

Ana Villaverde
Ana Villaverde

Planning Commissioners
~~City Council~~ of Moreno Valley
 c/o City Hall/Clerks office
 14177 Fredrick street
 Moreno Valley California 92553

Dear Planning Commissioners

My name is John Peikert.
 I have resided at 24730
 Firavenue m.v. Ca 92553
 Since 1973. The population
 growth since 1973 has been
 Enormous. In my opinion the
 W.L.C would be good in many
 ways. It would provide jobs
 for local residents which would
 bring in tax revenue for our city.
 Also it would keep our residents
 from being stuck on the freeway
 for hours commuting.

Please do the right thing
 to help our city create jobs
 and revenue. Please vote
 yes on the W.L.C. E.I.R

John W. Peikert 24730 Firave
 m.v. Ca 92553 John W. Peikert
 951 742 1932

3-G7

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of
City Council of Moreno Valley c/o City Hall /
Clerk's Office
14177 Frederick Street
Moreno Valley CA 92553

Dear Planning Commissioners
My name Joseph S Martinez, and I want to
tell you through this letter that I and my wife
support the World Logistics Center Project and I
ask you to please vote for the new changes in
the project as it would benefit thousands of peo-
ple in the city as. Throughout the inland empire,
the economy would grow and with that there will
be many benefits for the city.

Sincerely Joseph S Martinez and Silvia
Delgado

Joseph S Martinez


23450 Gerbera St
Moreno Valley CA 92553

3-G72

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission
14177 FREDERICK Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Guemita Goni, I am a resident of Moreno Valley for 12 years. I am a strong supporter of the WLC project. I would love to see my city grow and flourish.

I would love for my kids and grandkids to be able to find a local job. My kids and grandkids have to commute every day and I am concern about their wellbeing every day being on the road exposed to all kind of danger in order to make a living. It's not fair that we have to wait for the WLC project this long.

Hope that we have this marvelous project in our city soon.

Thank you for your consideration

Guemita Goni
15930 Widow Drive
Moreno Valley, CA 92551
951-385-7391

Guemita Goni

3-G73

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Council Of Moreno Valley
c/o City Hall/Clerk's Office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Karen Flores and I have lived in Moreno Valley for 20 years out of my 26 years of life. Moreno Valley use to be dirt, a few schools, and a few fast food places. One thing that I remember the most is the fact that no one I ever spoke to knew what Moreno Valley was; today that remains the same. There have been positive developments thanks to the projects of Iddo Benzeevi. The World Logistics Center is another world class project that will create an abundance of job opportunities, increase revenue, and contribute to the green initiative. The Environmental Impact Agencies have gone out of their way to place lawsuits despite the fact that the Environmental Impact Report is in the project's favor. The agency attempted to do the exact same thing with the Sketchers facility, however, this facility was awarded the gold lead award for being the most environmentally self sufficient building in the nation. The World Logistics Center is going to be built with the same gold standards to help our environment. All five Environmental Impact Reports were reviewed and showed that they were less than significant.

3-G74

As a millennial and part of the future generation, I ask for you to please approve the Environmental Impact Reports that were reviewed and move forward with this great project. With this project our city will not only grow in profits but we will become the paragon of change.

Sincerely,



Karen Flores

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission
c/o City Hall/ Clerk's Office
14177 Frederick St.
Moreno Valley, Calif. 92553

Dear Member of the Planning Commission,

My name is Keith Howerton. I have lived in Moreno Valley for 36 years. I have supported the World Logic Center from almost its beginning. I believe it will be a great thing for our city. I would ask that you do all that is necessary to move this project along. I speak specifically about the Environment Impact Report.

Thank you for your consideration.

Keith Howerton
25350 Santiago Dr. #106
Moreno Valley, Calif. 92551
(951)924-3984
BKHOWRU@live.com

3-G 1
Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
c/o City Hall/ Clerk's office
14177 Frederick Street
Moreno Valley CA 92553

Dear Planning Commissioners

My name is Laysha Saldaña, a resident of Moreno Valley for many years. I work at TJ Maxx here in the city. I am one of the fortunate few that don't have to deal with commuting. I am in support of The World Logistics Center which is the subject that I want to address. The project was approved in 2015. The process has been long and tedious. We are at the end of the process soon you are going to have a meeting and discuss the decision of the changes made to the original environmental (EIR) the majority of our city wants this project.

3-G76-1

Please consider the benefits that this mega project will bring just in tax revenue not counting \$22 million that will benefit our school and colleges. I urge you to accelerate the progress of this project so we can break ground soon.

Sincerely,



Laysha Saldaña

10853 Anemone Circle
Moreno Valley CA 92557

Cell: (951) 413-9166

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

PLANNING COMMISSION
CITY COUNCIL OF MORENO VALLEY
C/O CITY HALL / CLERK'S OFFICE
14177 FREDERICK STREET
MORENO VALLEY CA 92553

TO THE MEMBERS OF THE PLANNING COMMISSION:

MY NAME IS LUIS BUENROSTRO
I AM A MORENO VALLEY RESIDENT FOR
YEARS.

I STRONGLY SUPPORT THE WORLD LOGISTIC
CENTER

AS A RETIRED PERSON I THINK THAT IS A
GOOD OPPORTUNITY THAT THE CITY HAS,
AN EXCELLENT PROJECT WANTS TO BE
BUILT IN MORENO VALLEY.

I PERSONALLY WORKED ALL MY LIFE
OUTSIDE OF MORENO VALLEY BECAUSE
THERE WERE NO JOBS HERE AND
WITH THIS PROJECT MANY PEOPLE WOULD
BENEFIT AND THE ECONOMY OF THE CITY
WOULD GROW IN LARGE PERCENTAGES

PLEASE VOTE YES ON THE
WORLD LOGISTIC CENTER

SINCERELY

Luis Buenrostro

LUIS BUENROSTRO
14685 HAMBY COURT
MORENO VALLEY CA. 92553

3-G77

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
c/o City Hall/ Clerk's office
14177 Frederick Street
Moreno Valley CA 92553

Dear Planning Commissioners

My name is Maria Hernandez resident of Moreno Valley for 24 years and I have seen the city slowly grow. We came from Orange County and my husband used to commute every day to go to work hours on the freeway to feed his family, hours that he could have spent with us, that is one of the reasons why I believe that the World Logistics Center (WLC) project is going to be a blessing for many residents here in our city and the entire region.

I ask you, to please consider passing the reviews. I think it's time to move forward.

Sincerely,


Maria Hernandez

10853 Anemone Circle
Moreno Valley CA 92557

Cell: (951) 413-9166

3-G78

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Moreno Valley Planning Commission
c/o City Hall / Clerk's office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Maria Mereyman and I am a resident of Moreno Valley for many years. I can't wait for the WLC project to move forward and start breaking ground soon To provide all the jobs that are so needed in our city. I have children and grandchildren Growing up and living in Moreno Valley and it's only fair that they will be able to find A local job in the near future, that is why I am urging you to please allow the WLC Business Park to move forward with no further delays so that my family as well as the Community of Moreno Valley can start taking advantage of all the benefits the WLC Project will bring to our city.
Thank you for considering my letter



3-G79-1

Maria Mereyman
23318 Harland Drive
Moreno Valley, CA 92557

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commissioners and
City Council of Moreno Valley
e/o City Hall/Clerk's Office
1477 Frederick St,
Moreno Valley, CA 92553

Dear Planning Commissioner

- My name is Maura Garcia, I'm retired. I have been living in Moreno Valley for the past 20 years. - I had the saddest experience with my son. He was looking for job in our city, now he has to commute to other city. - We need more jobs in Moreno Valley. -

The world Logistics Center will help our city, "creating more jobs; not only for my son; but for my great grand children will benefit. -

Thank you for your attention

Maura Garcia ~~Maura~~
24169 Eucalyptus Ave #130
Moreno Valley CA 92553
tel. 951 413 6362

3-G8

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

To the members of the Planning Commission,

My name is Miguel Gutierrez, I'm a resident of Moval for 11 years @ the same address. (home)

I moved to Moreno Valley in 2009, been happy here for all these years. My only problem is that for the first 8 years, I had to commute to L.A county, sometimes as far as the city of Santa Clarita. Many times, I had to stay and sleep in my truck in one of my job sites. My vehicle and body took a lot of stress and beating, taking that long trip every day. I'm happy that the World Logistics Center is going to be built, and a lot of people are excited that this project is being planned. I believe that this project will benefit, my family, especially my son. He will be graduating in 2021, and I would like that he stays and work in Moreno Valley and don't have to move out of the city or that he doesn't have to make that long commute to another county (L.A) (San Diego) We need the World Logistics Center built ASAP. Thanks



3-G81

Miguel Gutierrez

24700 Webster Ave.

Moreno Valley CA 92553

909-753-5784

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission
City Council of M. Valley
c/o city hall / clerk's office
14177 Frederick st
Moscow Valley, Ca. 92553

Miguel Gutierrez
909-753-8984

1.A.k

2-12-2020

to the members of the Planning Commission,

My Name is Miguel Gutierrez. I'm a resident
of M. Val. for 11 years @ the same address. (Home)

I move to Moscow Valley in 2009. I've been happy here for
all this years... My only problem is that for the
first 8 years I had to commute to L.A. County
same times as far as the city of Santa Clarita
many times I had to stay and sleep in my truck
or in one of my jobs sites.

My vehicle and body took a lot of stress and
betting... making that long trip... every day.

I'm happy that the World Logistics Center is
being build, and a lot of people are excited
that this project is being planned.

I believe that this project will benefit my family
especially my son. He will be graduating in

2021; and I would like that he stay and
work in Moscow Valley and don't have to move
out of the city or that he doesn't have
to make that long commute to another County
(i.e. San Diego). We need the World Logistics
Center build. A.S.A.P.

Thank you

Miguel Gutierrez
24700 website
909-753-8984

Packet Pg. 3531

Planning Commission of Moreno Valley
c/o City Hall / Clerk's office
14177 Frederik St
Moreno Valley, CA 92553

Dear Planning Commission of Moreno Valley

Mi nombre es Nelly Martínez, soy residente de Moreno Valley por 27 años.

Mi familia y yo apoyamos el Proyecto Logístico Mundial desde el principio en el año 2015 y seguimos aprobándolo 100%.

Creo que nosotros como residentes de Moreno Valley queremos que esta ciudad progrese y mejore en todas las áreas y creo que con este proyecto se va a poder lograr.

Gracias por su atención

Nelly Martínez
24809 El Dorado Dr.
Moreno Valley CA: 92557
Nelly Martínez.

3-G8

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Dear Planning Commission of Moreno Valley,

My name is Nelly Martinez and I am a resident of Moreno Valley for 27 years. My family and I support the project, World Logistics since the beginning of the year 2015 and we continue to approve it 100%.

I think we as residents of Moreno Valley want this city to progress and improve in all areas and I believe that with this project it will be able to be achieved.

Thanks for your attention.

Planning Commission of Moreno Valley
c/o City Hall / Clerk's Office
14177 Frederick Street
Moreno Valley, CA 92553

Subject: Comment letter in Support of the World Logistics Center

Dear Planning Commissioners,

As a homeowner in Moreno Valley, I am writing this letter to express my support of the World Logistics Center. I strongly believe that this project will do exactly what it has been created to do. I understand all the concerns that have been brought up such as energy, biological resources, noise, farmland and cumulative impacts. As you can clearly see in the last revision of the EIR, these areas of concern have been reevaluated to ensure that this project will be of huge benefit to our city.

I see many new warehouses being built within 2 miles of my home and I've yet to receive a letter or notice or hear about them in the news asking for my permission or approval. I am not against these businesses, but I am a little concerned that the WLC project has received so much scrutiny while other projects have not. I understand this project is much more on a grander scale however, every single new construction, big or small that is erected in our city or any city for that matter, impacts the air, noise levels, biological resources etc., but I understand that these effects are necessary and come as a result of our growing city.

I especially support Highland Fairview because I can see that they have done their due diligence in making sure they address and mitigate the concerns listed above. This project is good, and our city needs it.

Sincerely,



Nelly Menjivar
14830 ARTISAN ST.
MORENO VALLEY CA 92555.

3-G8:

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

city council of Moreno Valley
c/o city Hall/clerk's office
14177 Frederick street.
Moreno Valley, California 92553

Dear Planning Commissioners
My name is Maria Galanza and I've been living in
Moreno Valley for more than 21 years.
I love my city and I want the best for
my community. and the World Logistic Center
is a wonderful project for the whole city
I approved this project 100%

23682 Tomada 2W.
M.V. ca 92557.
Maria Galanza.

3-G8

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission
City Council of Moreno Valley
40 City Hall / Clerk's office
14177 Frederick Street,
Moreno Valley, California 92553

To the members of the planning commission
my name is Noemi Cisneros a resident of Moreno-
Valley California for 9 years already. I have seen
our city grow little by little. I support the
World Logistic Center because I know this mega-
project will give our city the job base we don't have.
I know about the 5 environmental impacts
that the Judge order to be reviewed in order
to continue with the project as you all know
the results of it were LESS THAN SIGNIFICANT.
I ASK you to please move forward with
it, pass this 5 environmental impacts for
our WLC project break floor soon.
Thank you all very much.

Sincerely,

Noemi Cisneros

Planning Commission
14177 Frederick Street
Moreno Valley, California 92553

Dear Planning Commissioners

My name is Norma Preciado and I am a resident of the city of Moreno Valley for 12 years. The WLC Project will be very beneficial to our city and Region once the Project breaks ground.

A good example of the need of WLC Project is that my daughter just graduated from high school and she is struggling to find a local job. We are counting on this great Project to provide a better future for our children and the generations to come.

I urge you to take immediate action and approve this great Project.

Thank you very much for considering my letter

Norma Preciado
13882 Caspian Way
Moreno Valley CA 92553
323-440-6862

PLANNING COMMISSION OF MOVAL
C/O CITY HALL / CLERKS OFFICE
14177 FREDERICK ST.
MORENO VALLEY CA 92553.

Dear Planning Commission.
My name is Olegario Rojas,
a resident in Moreno Valley
for over 10 years.
I understand that the
WLC's E.I.R. was updated
and I would like to en-
courage you all to
approve its revisions.

Thank you!

Sincerely
Olegario Rojas
13078 Sunlit St. Moreno Valley CA

Olegario ROJAS

Planning &
 City Council of Moreno Valley
 c/o City Hall / clerk's office
 14177 Frederick street
 Moreno Valley, CA 92553

Dear: Members of the Planning Commission,

I Pascuala Urista live in Moreno Valley for about 15 years and during those years it was lack of jobs and struggled a lot for my kids. I worked many hours with low payment so my children wouldn't suffer a lot. I used to work for the newspaper printer in Santa Ana Ca. for many years. I support the WLC to come to our city so there will be more jobs and opportunities for the residents to have a better live than mine

3-G88-1

Sincerely yours

~~Pascuala Urista~~ PASCUALA.URISTA-
 15113 Norton Ln
 Moreno Valley CA 92551

Moreno Valley Planning Commission
c/o City Hall / Clerk's office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Petra Avina, I am a resident of Moreno Valley since 2009.
I am retired and I am a home owner.

Through this letter I would like to express my continue support for
The WLC project. As a resident of Moreno Valley for 11 years, I see
The great need our city has for jobs, but not only jobs is what our city
Needs, we need all the revenue that the WLC will generate. This revenue
Will be utilized to improve our city and specially our schools that will be
Beneficial for our children and future generations.

My grandkids biggest desire is to be able to find a local job once they
Graduate so that they won't have to move out of the state due to the
Lack of jobs. Please don't delay the WLC project any longer and lets
Make this amazing project a reality as soon as possible.

Sincerely,

Petra Avina
15327 Adobe Way
Moreno Valley, CA 92555

3-G89-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City council of Moreno Valley
c/o City Hall/ Clerk's office
14177 Frederick Street,
Moreno Valley, California 92553

Dear planning commissioners

My name is Porfirio G Siordia I've been a resident of Moreno Valley for 15 years and I am a heavy equipment engineer operate I've been working in construction of more about 40 years and I know how frustrating it is to drive in traffic for more than 2 hours to get to work and sometimes 2 and a half to three hours to get back home, Hours that I should have spend with my family. That is why I am in pro of the WLC project. Because, many like me go through the same thing in order to feed their families .

So please I humbly ask you to please pass 5-re-viewed environmental impacts from the WLC and EIR the results as you know were less than significant making the EIR stronger than ever. Think about the revenue this will bring to our city the prosperity of our community with more people working in Moreno Valley we will be a self sufficient city like Irvine California or San Diego California just to mention a few.

3-G 1

Sincerely,


Porfirio G Siordia

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commission of Moreno Valley
c/o City Hall/ Clerk's office
14177 Frederick Street
Moreno Valley CA 92553


Dear Planning Commissioners

My name is Rodolfo Lepe and I have been living in Moreno Valley for 20 plus years and I work on the west coast and paint company thank god I have a job. When I heard about The World Logistics Center I knew it was going to be a big change in our city it is the very first mega project for our city and the first thing that came to my mind was the job opportunities in the city and the entire region. I know you are going to have meetings where you are going to make a decision in regards to the updates of the environmental impact report.

3-G91.

I just want to ask you and urge you at the same time to move forward with this project we have waited long enough and the city is losing money while this project is still on hold.

Sincerely,


Rodolfo Lepe

10853 Anemone Circle
Moreno Valley CA 92557

Cell: (951) 413-9166

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Council Of Moreno Valley
c/o City Hall/Clerk's Office
14177 Frederick Street
Moreno Valley, CA 92553

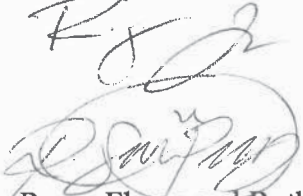
Dear Planning Commissioners,

Our names are Roger Flores and Ruth Perez and we have lived in Moreno Valley for 20 years. Moreno Valley use to be dirt, a few schools, and a few fast food places. There have been positive developments thanks to Mr. Iddo Benzeevi' projects. The World Logistics Center is another world class project that will create an array of job opportunities, will increase revenue, and will contribute to the great green initiative. The Environmental Impact Agencies have placed lawsuits despite the fact that the Environmental Impact Report is in the project's favor. They tried doing the same thing to the Sketchers facility, but no matter what they did, this facility was awarded the gold lead award for being the most environmentally self sufficient building in the nation. The same standards will be applied to the World Logistics Center. All five Environmental Impact Reports were reviewed and showed that they were less than significant.

3-G92

We ask for you to please approve the Environmental Impact Reports that were reviewed so that this great project can move forward. This project will help our city grow in revenue and will be a row model for change.

Sincerely,



Roger Flores and Ruth Perez

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Planning Commissioning
c/o City Hall / Clerk's office
14177 Frederick Street
Moreno Valley, CA 92553

Dear Planning Commissioners,

My name is Santiago Hernandez, I have been living in Moreno Valley for 27 years.
I am a Business owner.

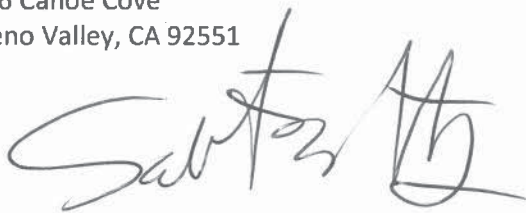
When I moved to Moreno Valley in 1993 I used to commute to Torrance every single Day. I was on the road for over 4 hours each day and my children were little and sadly I wasn't around to spend quality of time with them because I was always busy driving And working. My biggest fear was that when my children grow up they will have to Follow my footsteps and have to commute like I did because of the lack of jobs in Our city. That's when I decided to get really involved and started attending all the City Council meetings and to get informed in all the events that will bring improvement to our City.

When I heard about the WLC project, I knew right away that this project will be an economic transformation not only to our city but the entire region. I knew right away that a project of such a magnitude will bring thousands of jobs and our residents will be able to work in their own city.

Please start building this project as soon as possible.

Thank you very much.

Santiago Hernandez
16756 Canoe Cove
Moreno Valley, CA 92551



3-G93-1

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

City Council of Moreno Valley
% City Hall/Clearks Office
14177 Frederick St.
Moreno Valley, CA. 92553

Dear Members of the Planning Commission,

My name is Teodora Garcia. I ~~had~~ been living in Moreno Valley for approximately 16 years. I love my city and I enjoy living here. But there is one inconvenience; my husband commuted the first 8 years to Fullerton city and for the last 8 years he is going up to Nebraska city.

I would like to see in our city better Job opportunities so our families do not have to commute long distances.

I ask to our council members, our Mayor, and the planning commissioners to let the WLC be built.

This project will help our city bringing jobs.

Thank you!

Teodora Garcia *Teodora Garcia*
25783 Margaret Ave. Moreno Valley Ca. 92551

3-G94

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Moreno Valley Planning Commission
 4/0 City Hall / Clerk's Office
 1477 Frederick Street,
 Moreno Valley - Ca - 92553

Dear Planning Commissioners

My name is Vilma Restrepo, I am a resident of Moreno Valley for 26 years.

As a Moreno Valley resident I fully support The WLC project. My family and I will be highly impacted if this project succeeds. With new developments comes growth and the creation of new jobs and therefore economic prosperity. Our City needs jobs and prosperity and The WLC project offers that to our community.

Many of our residents travel long distance to work, which diminishes the quality of time they spend with their families.

Please keep bringing projects like this to our community.

Thank you for your consideration

Vilma Restrepo
 12980 Perrier Blvd. apt. 212
 Moreno Valley - Ca - 92553

Vilma Restrepo

3-G95

Planning Commission of Moreno Valley
c/o City Hall / Clerk's Office
14177 Frederick Street
Moreno Valley CA 92553

Dear Members of the Planning Commission

Hi. I am writing you in regards of The World Logistics Center Project EIR. I understand that it is been updates to the latest standards. While we wait, we lose. Change is necessary in our city. Don't delay any further.

As a resident of Moreno Valley, for many years and a family man, I have followed the process of this Project that has been much accepted by The Community for the benefits that It represents, I am a truck driver who is going from state to state in order to support my family. We need a job base in our city there is no doubt about it.

3-G96-1

Thank you very much for your attention.

Sincerely



Walter Guinea
24349 Kurt Court
Moreno Valley CA 92551
951-522-8985

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

From: Socorro Gutierrez

Sent: Thursday, May 14, 2020 7:02 PM

To: City Clerk

Subject: Moreno Valey, necesita que aprueben el protexto de Centro Logístico Mundial.para revivir la economía de nuestra ciudad y tener empleos para todos muchas gracias espero su comprencion

Warning: External Email – Watch for Email Red Flags!

3-G98-1

Subject: Moreno Valley needs to approve the project Center Logistic World to revive the economy of our city and have jobs for everyone.
Thank you very much for your understanding.

Attachment B
Additional Documentation
Attachment to Comment Letter
3-B2



EXHIBIT A



XAVIER BECERRA
Attorney General

State of California
DEPARTMENT OF JUSTICE

1300 I STREET, SUITE 125
P.O. BOX 944255
SACRAMENTO, CA 94244-2550

Public: (916) 445-9555
Telephone: (916) 210-7832
Facsimile: (916) 327-2319
E-Mail: Heather.Leslie@doj.ca.gov

September 7, 2018

Albert Armijo, Interim Planning Manager
City of Moreno Valley
14177 Frederick Street
Post Office Box 88005
Moreno Valley, California 92552
Phone: (951) 413-3206
Email: alberta@moval.org

RE: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project

Dear Mr. Armijo:

Attorney General Xavier Becerra submits the following comments on the Revised Sections of the Final Environmental Impact Report (“RFEIR”) prepared for the World Logistics Center (the “Project”).¹ The Project, a proposed warehouse and logistics complex in the City of Moreno Valley (“City”), would be one of the largest warehouse facilities in the world, with square footage equaling approximately 700 regulation-size football fields.

INTEREST OF THE ATTORNEY GENERAL

For well over a decade, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change. It is now well-established that California, through law and policy, and consistent with sound science, is committed to achieving a low-carbon future by 2050 in order to reduce and avoid the most catastrophic effects of climate change. California has already begun to experience adverse climate effects, such as rising sea levels and longer, more intense fire seasons. The Attorney General is particularly concerned about how such effects may impact our most vulnerable communities, such as Inland Empire residents, who are already burdened by some of the worst air quality in the country.

¹ The Attorney General’s Office submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State from pollution, impairment, or destruction, and in furtherance of the public interest. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RFEIR’s compliance with the California Environmental Quality Act (“CEQA”).

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

Mr. Armijo
 September 7, 2018
 Page 2

Every large development project has the potential either to facilitate, or instead hinder, the State’s achievement of its climate goals. It is therefore important that as lead agencies consider the impacts of individual development projects – many of which will operate for decades into the future – they evaluate and impose feasible mitigation for climate change impacts.

With these goals in mind, the Attorney General has provided guidance to local governments, commented on potential projects, and engaged with local interest organizations concerned with climate change and environmental justice. (See California Department of Justice, Office of the Attorney General, *California Environmental Quality Act*, <https://oag.ca.gov/environment/ceqa> (as of Sept. 7, 2018).) The Attorney General has also participated in litigation throughout the State to ensure that local governments comply with state requirements to fully analyze and implement all feasible mitigation measures to lessen significant impacts from greenhouse gas emissions (“GHGs”) caused by land use development projects. (See, e.g., *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497; *People of the State of California v. County of San Bernardino* (Cty. of San Bernardino filed April 12, 2007) No. CIVSS700329.) The Attorney General also has a long-standing interest in ensuring environmental justice throughout the State and for communities in the Inland Empire. (See, e.g., *CCA EJ v. County of Riverside, et al.*, Case No. RIC1112063; California Department of Justice, Office of the Attorney General, *Environmental Justice at the Local and Regional Level: Legal Background* (July 10, 2012) https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.)

After review of the GHG analysis in the RFEIR, the Attorney General believes that the City has failed to comply with CEQA’s requirements for analyzing and implementing feasible mitigation for the significant GHG emissions that will result from this Project. For the reasons outlined below, the City’s approach falls substantially short of meeting the requirements of CEQA, the regulations implementing CEQA – the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), and applicable case law. The City’s approach in the RFEIR has the potential to seriously undermine the overall effort to meet the State’s science-based GHG reduction goals for the transportation and land use sectors, and to disproportionately disadvantage environmental justice communities.

THE RFEIR’S GHG ANALYSIS VIOLATES CEQA AND UNDERMINES THE STATE’S CLIMATE OBJECTIVES.

As the RFEIR acknowledges, this Project at buildout will cause over 281,000 metric tons of GHGs to be released into the atmosphere every year, and will result in over 200,000 metric tons of GHG emissions beginning as early as 2028. (RFEIR at 4.7-35.) These emissions will presumably continue throughout the life of the project, though the RFEIR does not address this.

The RFEIR takes a very unusual and troubling approach to addressing the Project’s GHG-related impacts, especially since climate pollution is undeniably a *cumulative* problem. (*Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 256-257.) The RFEIR divides the Project’s GHG emissions into two categories, which it terms

Mr. Armijo
 September 7, 2018
 Page 3

“capped” and “uncapped” – classifications created by this RFEIR. What the RFEIR deems “uncapped” emissions constitute only about 3% of the Project emissions. They include the comparatively minor landfill emissions caused by waste generated at the Project and the use of refrigerants at the Project. (RFEIR at 4.7-33.) For these emissions, the RFEIR follows the approach that would be expected under CEQA: the City has, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHGs as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold.² (RFEIR at p. 4.7-19.) What the RFEIR terms “capped” emissions, however, constitute the remaining 97% of the Project’s predicted emissions. Those include emissions caused by mobile sources (namely, diesel trucks) and electricity use at the Project. (RFEIR at p. 4.7-33.) With respect to these emissions, the RFEIR deviates dramatically from standard CEQA methodology. The RFEIR asserts that these emissions are “covered” by the California Air Resources Board’s (“CARB”) Cap-and-Trade Program, and therefore claims that they are exempt from any further CEQA analysis or mitigation. (RFEIR at p. 4.7-22.) This is a novel and unsupportable approach under CEQA.

As discussed below, the RFEIR’s approach does not comply with CEQA, for several reasons. First, the Project is not regulated under the State’s Cap-and-Trade Program, so purported compliance with that Program cannot be used to exclude 97% of the Project’s GHG emissions from the analysis of whether the Project’s GHG emissions will result in significant climate change impacts. Second, CEQA requires that all of the emissions attributable to the Project be evaluated for significance, regardless of their source. Third, when comparing all of the Project’s emissions to California’s ambitious, science-based climate goals, as well as statewide, regional, and local plans for the reduction or mitigation of GHG emissions, the Project’s GHG emissions are clearly significant, requiring further feasible mitigation measures.

We are concerned about the City’s use of this analytical approach, both in the context of this Project and more generally. If the RFEIR’s approach is put into general use by the City, or followed by other lead agencies, emissions from transportation and electricity could largely be exempt from analysis and mitigation under CEQA. This is directly counter to the purposes of CEQA, and the Legislature’s considered decision to make clear that GHG emissions must be analyzed. (Senate Bill 97 (2007); Pub. Resources Code, § 21083.05.) The State cannot meet its well-established, long-term environmental GHG reduction goals if new local projects are free to add hundreds of thousands of tons of GHGs to the atmosphere every year without undergoing the

² Lead agencies may choose to use a “threshold of significance,” a working presumption that can assist in determining whether an impact is significant. (Cal. Code Regs., tit. 14, §§ 15064.4(b)(2); 15064.7.) “A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” (Cal. Code Regs., tit. 14, § 15064.7, subd. (a).)

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analysis and mitigation that CEQA requires. Moreover, the RFEIR’s approach will likely expose already-burdened communities in the State to greater amounts of GHG co-pollutants, such as diesel particulate matter and nitrogen oxides.

We urge the City to revise its GHG analysis to comply with CEQA by properly evaluating whether *all* of the Project’s emissions—for all phases of the Project, direct and indirect, short-term and long-term—are cumulatively significant, and adopting feasible mitigation to ensure those emissions do not have a significant impact on the environment.

I. THE RFEIR’S NOVEL APPROACH TO “CAPPED” EMISSIONS VIOLATES CEQA.

The purpose of an environmental impact report is “to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project.” (Pub. Resources Code § 21061.)

The City’s approach violates a number of well-established CEQA principles. Lead agencies must “consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect.” (Cal. Code Regs., tit. 14 § 15003, subd. (h).) This Project as a whole includes both the “capped” and “uncapped” GHG emissions, but the RFEIR fails to analyze and mitigate “capped” emissions. Moreover, both “direct and indirect significant effects” and “short-term and long-term effects” should be considered. (Cal. Code Regs., tit. 14, § 15126.2, subd. (a).) The RFEIR fails to inform the public of the long-term effects of the Project’s GHG emissions by failing to analyze GHG emissions past buildout.

In addition to violating these more general principles, the City’s approach to “capped” emissions contradicts the CEQA Guidelines specific to GHG analysis. “The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data.” (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The CEQA Guidelines advise lead agencies on how to determine the significance of a Project’s GHG emissions. A lead agency should consider three non-exclusive methods for determining climate significance:

- (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project[.];
- (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. . . . If there is substantial evidence that the possible effects of

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a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. (Cal. Code Regs., tit. 14, § 15064.4, subd. (b)).

While “[a]n ironclad definition of significant effect is not always possible,” (Cal. Code Regs., tit. 14 § 15064, subd. (b)), the RFEIR’s conclusion that the Project’s GHG impacts are not significant under CEQA (RFEIR at p. 4.7-33) is based solely on its unjustifiable exclusion of the vast majority of the GHG emissions of the Project. That exclusion is neither consistent with CEQA nor justified by the Cap-and-Trade Program, which does not apply to the Project.

A. Since the Project is Not Regulated Under Cap-and-Trade, The RFEIR Cannot Use Cap-and-Trade to Ignore the Significance of the Project’s GHG Emissions.

The RFEIR effectively treats the Cap-and-Trade Program as if it is a qualified mitigation plan for the Project and its “capped” emissions. (See Cal. Code Regs., tit. 17, §§ 15064, subd. (h)(3); 15064.4 subd. (b)(3)). It is not.

California’s Cap-and-Trade Program applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for compliance instruments.” (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) The Cap-and-Trade Program only applies to expressly identified entities, such as cement producers, petroleum refiners, electricity generators, natural gas supplies, fuel importers, and liquid petroleum gas supplies. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities.

Although the operator of a refinery that produces liquefied petroleum gas in California is subject to the Cap-and-Trade Program, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing its own GHG emissions or surrendering compliance instruments, but the gas station that resells the gas, the truck drivers who purchase it, and the warehouses to which the trucks drive do not. Because CEQA Guidelines section 15064.4, subdivision (b)(3) instruct lead agencies to consider the extent to which *the project* complies with GHG regulations or requirements, it is inappropriate to rely upon compliance with Cap-and-Trade by other entities downstream in the chain of commerce as a basis for avoiding analysis of project-related emissions. In the Final Statement of Reasons for the CEQA Guidelines addressing GHG emissions, the California Natural Resources Agency confirmed that, in implementing CEQA Guidelines section 15064.4, a lead agency must show that a GHG reduction plan “actually addresses the emissions that would result from the project.” (California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009), available at http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf, at p. 27.)

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Further, the City’s approach is not, as the RFEIR claims (RFEIR at 4.7-20), supported by *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 (“AIR”). Without commenting on whether or not that case was rightly decided, AIR is facially inapposite because the project being evaluated under CEQA in that case was a refinery, a covered entity under the Cap-and-Trade Program. Because this Project is not a covered entity under the Cap-and-Trade Program, it is unjustifiable for the RFEIR to use compliance with Cap-and-Trade as a factor in analyzing the significance of the Project’s GHG emissions. There is no basis in the law for the use of Cap-and-Trade to exclude a full 97% of the Project’s GHG emissions from analysis or mitigation.

The flaw in the City’s approach becomes even more apparent when one considers its incongruous results. The RFEIR describes the Project, in part, as follows: “Goods imported through the Ports of Long Beach and Los Angeles as well as other locations are delivered via truck to the proposed distribution centers and distributed via truck both in and out of state locations. . . .” (Original FEIR at 3-27-3-28.) The heart of this Project is this movement of goods via trucks. Yet, the City’s approach avoids any analysis of 210,596 metric tons of GHG emissions associated with the movement of goods via trucks. (RFEIR at p. 4.7-33.) 97% of the Project’s total GHG emissions are simply dismissed under this approach. CEQA does not permit such a dismissal.

B. The RFEIR Must Consider All Emissions in Determining Significance.

Correctly applying CEQA requires an evaluation of *all* the Project’s GHG emissions in determining significance. (See Cal. Code Regs., tit. 14, §§ 15064.4, subd. (b)(2); 15378 (defining “project” as “the whole of an action. . . .”)) There is no basis here for comparing some of the Project’s emissions to the significance threshold, but not others. Here, the City elected to use a threshold of 10,000 metric tons of GHGs. (RFEIR at p. 4.7-19.) CEQA Guidelines section 15064.4, subdivision (b)(2), notes that when using a threshold, an agency should compare all of the “project emissions” of GHGs to that threshold. Emissions from trucks and electricity are a result of the Project just as much as the “uncapped” emissions. They therefore must be compared to the significance threshold, and mitigated to the extent feasible.

Further, the City’s attempt to exempt an impact from any significance analysis based solely on purported compliance with a single rule or regulation is unwarranted. Courts have repeatedly held compliance with a single environmental or land use law or regulation does not create an exemption from CEQA’s requirement that lead agencies evaluate all of a project’s significant environmental impacts. For example, “compliance with a general plan in and of itself ‘does not insulate a project from the EIR requirement, where it may be fairly argued that the project will generate significant environmental effects.’” (*East Sacramento Partnerships for a Livable City v. City of Sacramento* (2016) 5 Cal.App.5th 281, 301; see also *Keep Our Mountains Quiet v. County of Santa Clara* (2015) 236 Cal.App.4th 714, 732 (“[A]n EIR is required if substantial evidence supports a fair argument that [a project] may have significant unmitigated noise impacts, even if other evidence shows the [project] will not generate noise in excess of [a] County’s noise ordinance or general plan.”))

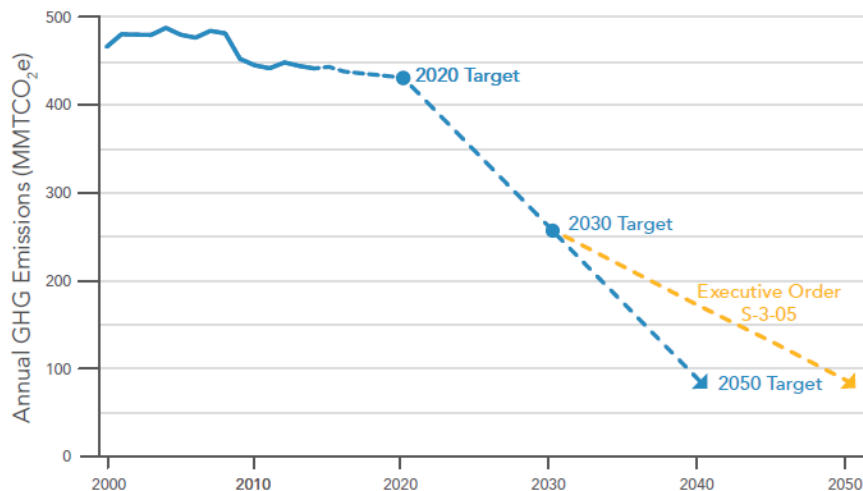
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C. In Light of the Project’s Substantial, Long-Term Projected Emissions, Its GHG Impacts Must Be Deemed Significant.

It seems impossible a proper evaluation of the Project’s emissions under CEQA could support a finding that the Project’s emissions are not significant. This Project—as currently designed—will lock in hundreds of thousands of tons of GHG emissions for decades to come, and may put this City and the region on a path that deeply undermines the State’s climate goals.

To reduce and avoid the most catastrophic effects of climate change, science tells us that we must dramatically reduce our annual statewide GHG emissions. California has taken ambitious steps to accomplish that objective. Assembly Bill 32 (“AB 32”) requires California to reduce its total statewide GHG emissions to 1990 levels by 2020. (Health & Saf. Code, § 38550.) Under Senate Bill 32 (“SB 32”), California must reduce its GHG emissions to 40% below 1990 levels by 2030. (Health & Saf. Code, § 38566.) In addition, the Governor’s Executive Order S-3-5 (“EO S-3-05”) directs state agencies to reduce statewide GHG emissions to 80% below 1990 levels by 2050. To achieve such ambitious but necessary goals, California will have to reduce GHG emissions from various sectors of the economy. Transportation, industry, and electricity generation are the top three contributing sectors to the State’s total GHG emissions. (CARB, 2017 Climate Change Scoping Plan (Nov. 2017) at p. 11 (“Scoping Plan”).) Below is a graph showing the dramatic downward trajectory of statewide GHG reductions necessary to achieve the State’s climate goals.

FIGURE 5: PLOTTING CALIFORNIA’S PATH FORWARD

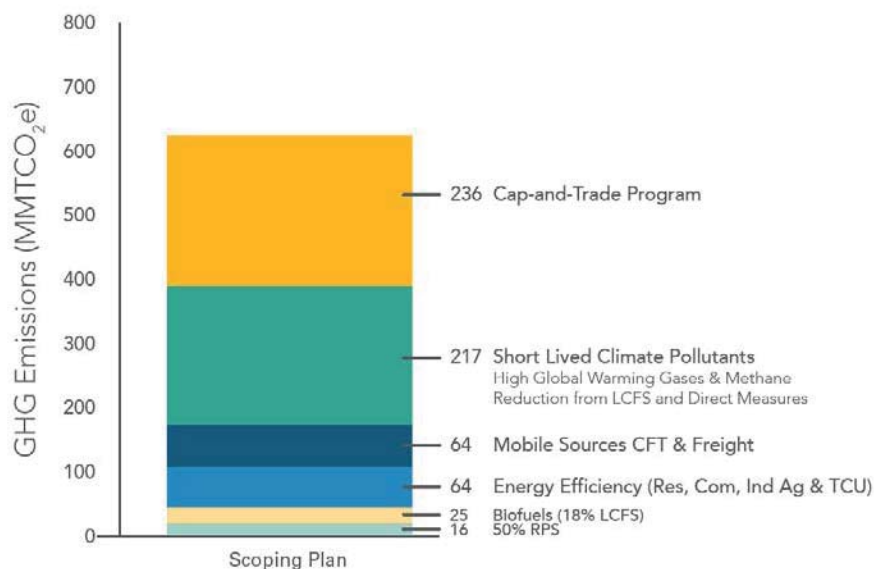


(Scoping Plan at p. 24.)

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California has adopted a multitude of regulations, requirements, plans, and policies to achieve the substantial reductions in statewide GHG emissions required by AB 32, SB 32, and EO S-3-5. CARB identified, in its Climate Change Scoping Plan, multiple required and voluntary measures working in concert as necessary for California to achieve its ambitious climate goals as depicted in the graph below. (See Scoping Plan at p. 28.)

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴

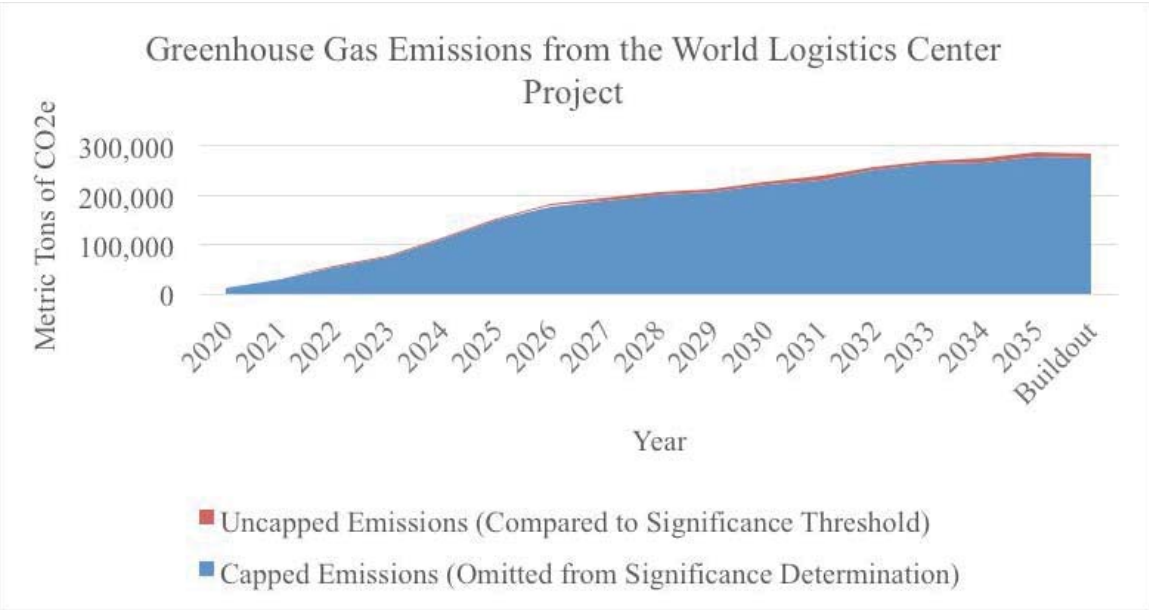


The Scoping Plan proposes various strategies for reductions in emissions from transportation and energy sectors. The Scoping Plan notes that for the GHG reductions from the transportation sector, “[vehicle miles traveled (“VMT”)] reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan.” (Scoping Plan at p. 112.) In addition, under SB 375, CARB assigns California’s 18 Metropolitan Planning Organizations targets for GHG emission reductions in the transportation sector which are to be achieved based on land use patterns and transportation systems. (CARB, Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (2017), available at https://www.arb.ca.gov/cc/sb375/final_staff_proposal_sb375_target_update_october_2017.pdf.) CARB’s recommended target for the Southern California Association of Governments is a 19% reduction in GHG emissions from transportation by 2035. (*Id.* at p. 34.)

CEQA requires the City evaluate the consistency of the Project’s substantial increases in GHG emissions with state and regional plans and policies calling for a dramatic reduction in GHG emissions. The Supreme Court in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (“*SANDAG*”) affirmed that an EIR should consider the project’s long-range greenhouse gas emission impacts through the year 2050, and address whether the project as a whole is in accord with the state’s climate goals. (*Id.* at p. 515.) The Supreme Court further instructed lead agencies to “stay in step with evolving scientific knowledge and state regulatory schemes.” (*Id.* at p. 504.)

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The RFEIR estimates that the Project’s total emissions will increase from the existing conditions of no emissions at the Project site to over 281,000 metric tons of GHG emissions annually at full buildout of the Project in 2040. (RFEIR at p. 4.7-33.) See the graph below depicting the trajectory of the Project’s GHG emissions.³



The Project’s substantial *increase* in GHG emissions conflicts with the downward trajectory for GHG emissions necessary to achieve state climate goals. This is illustrated clearly in the sharp difference in the upward trajectory of the graph of the Project’s GHG emissions versus the steep downward trajectory in the graph of the State’s climate goals as depicted in Figure 5 of the Scoping Plan and reproduced above. Yet, the RFEIR failed to evaluate the Project’s consistency with state and regional goals, requirements, plans, and policies to reduce

³ Visual depictions such as this graph make it easier to understand the significant impact of GHG emissions from the Project on the environment. Such clarity is encouraged by the CEQA Guidelines, which state that EIRs should be “written in plain language and may use appropriate graphics so that decisionmakers and the public can rapidly understand the documents.” (Cal. Code Regs., tit. 17, § 95811.) Such graphs are also helpful because they allow the decisionmakers to see a project’s proposed greenhouse gas emissions as a trajectory and assess the “significance of the *shape* of that emissions curve as a whole.” (Janill Richards, *The SANDAG Decision: How Lead Agencies Can “Stay in Step” with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17, 19, available at http://legal-planet.org/wp-content/uploads/2018/09/environmental-law-news_2017_vol-26-no-2_fall_the-sandag-decision.pdf.) To better inform the public of the Project’s unmitigated GHG emissions, we recommend revising the RFEIR to include graphical representations of the emissions trajectory of the project.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

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GHGs that should have been analyzed under CEQA. Comparing the Project's GHG trajectory against the state's climate goals would inform the public of the Project's GHG impacts. For example, the RFEIR's GHG analysis should have considered whether the Project will increase VMT. Because it did not, it is inconsistent with SB 375. Although the RFEIR's revised traffic analysis does include a VMT analysis, it is included only to address air quality issues, and not GHGs. (RFEIR at pp. 4.7-19 and 4.15-3.) Under CEQA, the City is required to consider how the project can reduce VMT and electricity use, "rather than expecting[ing] these reductions to come [only] from technological advances or other measures." (SANDAG, at 523.) The City ignores its CEQA obligations and instead, the RFEIR obscures the Project's GHG impacts by improperly exempting them from CEQA analysis.

In addition, there is no discussion in the RFEIR of the GHG emissions from the Project over its expected lifespan. GHG emissions are estimated up until the Project's full buildout in 2040 (RFEIR at p. 4.7-33), but the Project will clearly continue beyond that point, and the RFEIR gives no indication of how long that will be. The cumulative impact of the Project's GHG emissions over its entire lifespan should be considered and mitigated to the greatest extent feasible. Notably, by failing to estimate emissions through 2050, the RFEIR obscures the extent to which the Project does or does not comply with California's explicit 2050 climate goals.

D. The RFEIR Should Analyze and Adopt Feasible Mitigation Measures to Avoid or Lessen the Project's GHG Impacts.

CEQA requires that an EIR consider and adopt feasible alternatives or mitigation measures that would substantially lessen the significant and harmful environment effects of the project being analyzed. (See Pub. Resources Code, § 21002.) The RFEIR's failure to properly analyze the Project's significant GHG impacts also results in a failure to mitigate those impacts as required by CEQA. If the RFEIR's analysis were done properly, the Project's GHG emissions from vehicles and electricity would have vastly exceeded the significance threshold selected by the City. Those emissions would therefore have to be reduced through changes or alterations in the Project, or the City would be required to explain why "[s]pecific economic, legal, social, technological, or other considerations including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives... ." (Cal. Code Regs., tit. 22, § 15091, subds. (a)(1) and (a)(3).) There may be mitigation measures or project alternatives that could reduce or avoid the Project's GHG emissions, such as the adoption of requirements mandating the use of zero emission vehicles or a certain percentage of electricity from renewable electricity sources, such as on-site solar power generation.⁴ By

⁴ The Attorney General recognizes that devising climate mitigation on a project-by-project basis can be challenging. Many local governments have therefore elected to move toward enforceable Climate Action Plans ("CAPs") integrated with their general plans. (CARB, California Climate Action Portal Map, <https://webmaps.arb.ca.gov/capmap/> (as of Sept. 7, 2018).) Done correctly, CAPs can put local governments on the path to a lower-carbon future

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excluding 97% of the Project's GHG emissions from its significance determination, the RFEIR obscures the extent of the Project's emissions and improperly evades the City's obligation to mitigate the Project's GHG impacts.

II. ADOPTION OF THIS METHOD OF EXEMPTING "CAPPED" EMISSIONS FROM CEQA ANALYSIS WILL UNDERMINE THE STATE'S VARIOUS POLICIES AND PROGRAMS TO REACH OUR AMBITIOUS CLIMATE GOALS.

The RFEIR's failure to comply with CEQA will have real consequences. If this RFEIR's approach is widely adopted, the State will not be able to achieve its ambitious climate goals. The RFEIR exempts the Project's emissions attributable to mobile sources and electricity use from CEQA analysis and mitigation. And yet transportation and electricity are two of the State's three largest sources of GHG emissions. (Scoping Plan at p. 11). Transportation and electricity are thus two of the most important areas in which GHG emissions must be reduced.

The RFEIR's approach to the transportation and electricity sectors incorrectly presumes that the Cap-and-Trade Program will achieve *all* GHG reductions necessary in those areas. But as CARB's 2017 Scoping Plan points out, "[l]ocal land use decisions play a particularly critical role in reducing GHG emissions associated with transportation, both at the project level, and in long-term plans..." (Scoping Plan at pp. 100-101.) If other lead agencies adopt the City's approach, millions of metric tons of GHGs resulting from development projects would be ignored and unmitigated through what amounts to a categorical exemption from CEQA. Local governments would therefore not be doing their part to help the State reach its ambitious, yet necessary, climate goals of emitting 40% below 1990 GHG levels by 2030 and 80% below 1990 levels by 2050. (Heath & Saf. Code, § 38566, Governor's Executive Order No. S-3-05 (June 1, 2005).)

Instead of claiming that no amount of transportation and electricity emissions can be significant under CEQA, and thus excluding them from any analysis and mitigation, lead agencies have an obligation to acknowledge the significance of such emissions and work to implement feasible mitigation of them.⁵

III. REVISING THE GHG ANALYSIS WILL LIKELY LEAD TO GREATER PROTECTION OF ENVIRONMENTAL JUSTICE COMMUNITIES.

In addition to, and separate from, the CEQA issues, revising the RFEIR's GHG analysis will likely help mitigate some of the Project's direct harmful effects on environmental justice communities. Moreno Valley contains some of the most pollution-burdened census tracts in the

while substantially streamlining the approval of individual projects that are consistent and comply with the CAP.

⁵ There are several examples of economically viable land use development projects that contributed no net additional GHG emissions. (Scoping Plan at p. 99.)

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State according to California Environmental Protection Agency's CalEnviroScreen tool.⁶ City residents experience ozone and particulate matter (PM) 2.5 at rates higher than 90% of the State. The South Coast Air Basin, where Moreno Valley is located, exceeds federal public health standards for ozone, ozone precursors, and particulate matter. Exposure to these air contaminants contributes to asthma, lung cancer, and cardiovascular disease. Indeed, residents in Moreno Valley experience higher than average emergency room visits due to asthma and higher than average rates of cardiovascular disease, particularly residents living along freeways.

Furthermore, environmental justice concerns are significant for the residents of Moreno Valley. Moreno Valley residents are predominately people of color, made up of 56.5% Hispanic and 18% African American populations. (United States Census Bureau, Quick Facts for Moreno Valley, California, <https://www.census.gov/quickfacts/fact/table/morenovalleycitycalifornia.ca/PST045217> (as of Sept. 7, 2018).) The rates of poverty are dramatically higher in Moreno Valley compared to the state—according to U.S. Census data, 18.6% of Moreno Valley residents live in poverty, compared with the statewide poverty rate of 14.4%. (*Ibid.*, and United States Census Bureau, Quick Facts for California, <https://www.census.gov/quickfacts/fact/table/ca/PST045217> (as of Sept. 7, 2018).) They experience high rates of unemployment and housing burdens (paying more than 50% of their income for housing costs). These socioeconomic characteristics of Moreno Valley residents increase their sensitivity to the health effects of the heavy pollution burdens they experience.

Adding to these burdens, Riverside County as a whole, and the City of Moreno Valley specifically, are experiencing a great influx of logistics warehouse projects. Recent developments in Moreno Valley alone include an 825,000 square-foot distribution facility for the Aldi grocery chain, a 1.6 million square-foot distribution facility for Deckers Brands footwear company, and a 1.25 million square-foot fulfillment center for Amazon. These large projects, and their related impacts on the low-income communities of color who live nearby and in the communities residing along the freeways serving them, are dwarfed by the over 40 million square-foot Project.

By conducting a proper GHG analysis in the RFEIR and adopting feasible mitigation, the City will likely better protect the environmental justice communities living near both the Project and along the freeways that trucks will use to reach the Project. Reduction of GHG emissions leads to the reduction of co-pollutant emissions. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL'Y REV. 377, 387 (“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant

⁶ CalEnviroScreen is a tool that uses environmental, health, and socioeconomic information to produce scores and rank every census tract in the state. A census tract with a high score is one that experiences a much higher pollution burden than a census tract with a low score. (See CalEnviroScreen 3.0 Report, Office of Environmental Health Hazard Assessment, January 2017, available at <https://oehha.ca.gov/media/downloads/calenviroscreen/report/ces3report.pdf>.)

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reductions as GHGs are being reduced [which] should improve the health of local communities.”)) This is especially true in the context of diesel truck emissions, where a VMT reduction would reduce both GHG emissions and co-pollutant emissions. Indeed, the RFEIR acknowledges that “[t]he *most effective way to reduce air pollution* impacts on the health of our nearly 17 million residents, including those in disproportionately impacted and environmental justice communities that are concentrated along our transportation corridors and goods movement facilities, *is to reduce emissions from mobile sources,*” and that those mobile sources constitute “the principal contributor to our air quality challenges.” (RFEIR at 4.3-11 (emphasis added).) Therefore, while revising the GHG analysis is necessary to comply with CEQA, the City should also see this as an opportunity to implement mitigation measures that would benefit the City’s residents and the other environmental justice communities impacted by this Project.

CONCLUSION

We appreciate the difficulty in analyzing GHG emissions under CEQA. However, local agencies must comply with the CEQA Guidelines for GHG analysis and cannot exempt GHG emissions from any significance analysis because of California’s Cap-and-Trade Program. We urge the City of Moreno Valley to revise the GHG analysis in the RFEIR as described above so as to support this State’s efforts to reduce GHG emissions, achieve our ambitious but necessary climate goals, and benefit local communities in the area who are already suffering some of the worst air pollution in the country. We would be happy to work with the City of Moreno Valley to take the additional steps needed to fully comply with CEQA’s GHG analysis and mitigation requirements for the Project. We appreciate your consideration of our comments.

Sincerely,



HEATHER LESLIE
 BRIAN BILFORD
 Deputy Attorneys General

For XAVIER BECERRA
 Attorney General

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EXHIBIT B



Mary D. Nichols, Chair
 Matthew Rodriguez, CalEPA Secretary
 Edmund G. Brown Jr., Governor

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Re: World Logistics Center Revised Final Environmental Impact Report
 (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the World Logistics Center (WLC or project) Revised Final Environmental Impact Report (RFEIR). CARB appreciates the opportunity to comment on the RFEIR. Unfortunately, despite revisions, the RFEIR mischaracterizes (1) the scope of the Cap-and-Trade Program administered by CARB as they relate to the state's overall greenhouse gas reduction mandates, and (2) how that program may be relevant to a CEQA analysis. Because the RFEIR's GHG analysis relies almost entirely on those mischaracterizations for its GHG analysis and significance determination, it does not meet California Environmental Quality Act (CEQA) requirements.

The RFEIR's core flaw with regard to greenhouse gases (GHGs) is that it declines fully to analyze or mitigate emissions from fuel and electricity demand that the project will cause - the vast majority of the project's emissions - on the ground that CARB's Cap-and-Trade Program purportedly "covers" the project's emissions for this purpose. In fact, the Program does not, and was never designed to, adequately address emissions from local projects and CEQA does not support a novel exemption for such emissions on this ground. The RFEIR's approach obscures the project's significant potential contribution to greenhouse gas emissions, and does not properly account for the combination of federal, state, and local approaches to address climate change that the crisis demands and the law requires.

We also note that the project still has not been modified to address serious health concerns from criteria and toxic air pollutants that CARB discussed in prior letters. Although this letter focuses on GHGs, we continue to be very concerned that local communities may face undue pollution from this project, if completed, as a result of inadequate mitigation.

We urge the City of Moreno Valley (City) to address the criteria and toxics issues we previously raised, and to revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, adopt feasible mitigation to

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ensure those emissions would not cause significant impacts, and recirculate the RFEIR, all as required by CEQA.

I. CARB's Participation in This Project's Review Process

CEQA requires analysis of a project's GHG emissions. Like all CEQA analyses, these disclosures must inform the public and provide appropriate information on mitigation. Planning for greenhouse gas reductions is critical at the project level, as CARB and other state agencies have repeatedly determined. Although various statewide programs address the climate change crisis as well, the CEQA guidelines, and state guidance documents, are clear that achieving the necessary reductions requires project-level focus.

The WLC project proponents have taken a different view in prior versions of the RFEIR and in related litigation, *Paulek v. City of Moreno Valley* (Riverside County Superior Court Case No. RIC 1510967) ("*Paulek*"). That case addresses, among other topics, the initial GHG analysis conducted for the WLC, and in the RFEIR. There, WLC advocates contended that, because some of the suppliers of the fuels and electricity consumed by the project are in the Cap-and-Trade Program CARB administers, the project was not required to analyze or mitigate the significant emissions impacts it would cause. Attorneys for the WLC also argued that because CARB did not specifically object to the project's GHG significance methodology, CARB "apparently had no problem with the EIRs not counting capped emissions against the [WLC] in order to determine the significance of greenhouse gas emissions."¹

CARB had, in fact, recommended an array of project-based emissions reductions strategies contrary to these claims. CARB takes this opportunity to reiterate those recommendations (prior letters are attached) and to explain why the Cap-and-Trade Program's operations do not allow a departure from CEQA's general rule that project-level impacts be properly addressed.²

¹ Transcript of January 22, 2018 hearing in *Paulek* case, before Hon. Sharon J. Waters, page 18, Lines 3-7.

² In both of CARB's comment letters, which we again incorporate by reference, CARB indicated that its recommendations were for the purpose of reducing not only criteria and toxics pollutants, but also for GHG emissions. CARB reviewed the Draft Environmental Impact Report (DEIR) and provided comments to the City of Moreno Valley in a letter dated April 16, 2013. CARB's comment letter expressed concern over the increase in health risk in the immediate area and the significant and unavoidable air quality and greenhouse gas (GHG) related impacts caused by the proposed WLC. To address those concerns, CARB recommended actions to support the development, demonstration, and deployment of zero and near-zero emission technology at the WLC. On June 8, 2015, CARB again provided comments on the Final Environmental Impact Report (FEIR), making similar recommendations. In those comments, CARB noted that the FEIR was unresponsive to the comments CARB provided in its April 16, 2013 letter regarding the DEIR. (See CARB April 16, 2013 letter at 2; CARB June 8, 2015 letter at 1, 3, and 8.)

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II. The RFEIR's Claims About CARB's Cap-and-Trade Regulation Are Incorrect

CEQA translates between high-level policy goals, and individual project choices to better inform the public and support decision-making. The GHG section of the RFEIR takes a novel, and factually unsupported, departure from ordinary CEQA practice by essentially excusing analysis and potential mitigation of GHG emissions when they are indirectly "covered" by a state program. Yet, state programs regularly address at least some aspect of essentially all CEQA impact areas – from state water pollution standards to habitat conservation laws to building codes to endangered species mandates, projects are always considered against a backdrop of state rules. In the ordinary course, the presence of state programs is not taken simply to "cover" the relevant project level impact. On the contrary, CEQA requires project proponents to inquire as to how the project affects environmental resources of statewide concern and to focus on project-level analysis and mitigation. The same rule applies with regard to greenhouse gases. As the California Supreme Court has held, "[l]ocal governments thus bear the primary burden of evaluating a land use project's impacts on greenhouse gas emissions."³

Project proponents may refer to statewide analyses and programs, but, as the Court held, ultimately must provide "substantial evidentiary support" explaining how project-level decisions relate to state-level programs to justify findings of significance based on those programs.⁴ This is particularly important for new projects, as, per the Court, "a greater degree of reduction may be needed from new projects than from the economy as a whole."⁵ And these projects may not simply point to *any* statewide regulations; on the contrary, "[a] significance analysis based on compliance with such statewide regulations ... only goes to impacts within the area governed by the regulations."⁶

In this instance, the Cap-and-Trade Program simply does not cover the project, or require it do anything to mitigate its emissions. As the Court explained, CARB has not "propose[d] statewide regulations of land use planning, but relies instead on local governments." (*Id.* at 230).

CARB has expressed its non-binding views on these matters via the Scoping Plans it is required to prepare under AB 32. The California Supreme Court has recognized the

CARB was not silent. Moreover, an inference from silence would be improper, in any event. CARB sometimes does not comment on individual projects' GHG or other analyses due to resource constraints and other considerations. Nothing should be inferred from silence on a particular matter.

³ *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 230).

⁴ *Id.* at 226-230.

⁵ *Id.* at 225.

⁶ *Id.* at 229.

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Scoping Plan as a valuable source of data for local governments.⁷ As each version of CARB's Scoping Plan, including the recent 2017 Scoping Plan Update, explains, on the basis of extensive modeling and analysis, the Cap-and-Trade Program is not intended to address project-level impacts and does not do so. Rather, complementary measures, including land-use planning and project-level analyses, are vital adjuncts to the Cap-and-Trade Program, serve additional purposes to address climate change, and, if neglected, put undue and unanticipated pressure on the Program. The RFEIR's analysis would thus make the problem it purports to analyze even worse; if followed generally, it would result in development patterns and mitigation choices that would lessen the state's ability to address climate change, and would contribute to cumulatively considerable impacts.

Rather than address project-level emissions, the Cap-and-Trade Program covers activities related to electricity generation, natural gas supply, oil and gas extraction, refining, and transportation fuel supply and combustion. The points of regulation are the operators of electricity generating plants, natural gas fuel suppliers, operators of oil and gas extraction facilities, refinery operators, and transportation fuel suppliers at the rack. See Tit. 17, Cal. Code Regs., § 95811. The Program also addresses GHG emissions in aggregate at the state level and is not intended nor designed to mitigate greenhouse gas from, or otherwise inform, local land use decisions. Without adequate analysis and mitigation, local jurisdictions may not appropriately consider the greenhouse gas implications of their decisions, conflicting with a core CEQA principle of promoting informed decisionmaking. Rather, demand for fuels and electricity created by poorly-planned local projects creates unnecessary demand on the Cap-and-Trade system, potentially raising prices in the system and making statewide compliance more difficult.

These impacts could be substantial because the transportation sector is the state's largest source of GHG emissions (as well as criteria and toxic pollutant emissions, as we have previously addressed with regard to this project). The recently released California Greenhouse Gas Emission Inventory – 2018 Edition shows that while the state's overall GHG emissions declined from 2015 to 2016, the emissions in the transportation sector increased 2 percent over that same time period.⁸ This increase was driven by increases in fuel purchases and use. To effectively achieve the State's GHG target, both production and demand for energy and fuels must be addressed. The

⁷ As the California Supreme Court has held "CEQA requires public agencies...to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." The Court viewed the Scoping Plan as a particularly useful source of information, given the extensive study and public participation involved in its preparation. (*Cleveland National Forest Foundation v. San Diego Ass'n of Governments* (2017) 3 Cal. 5th 497, 504.) A recent article provides a useful primer on this body of law. (See Janill Richards, *The SANDAG Decision: How Lead Agencies Can "Stay in Step" with Law and Science in Addressing the Climate Impacts of Large-Scale Planning and Infrastructure Projects* (2017) 26:2 Environmental Law News 17))

⁸ See https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf.

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Legislature recognized this need with regard to electricity when passing SB 350 (Stats. 2015 Ch. 547, De León) to increase the Renewable Portfolio Standard and double energy savings. A similar approach is needed for transportation sector emissions. State-level production side policies such as the Renewable Portfolio Standard, Low Carbon Fuel Standard, and Cap-and-Trade Program cannot alone achieve the State's GHG reduction targets.

In this instance, the RFEIR not only improperly relies on the Cap-and-Trade Regulation; it also fails fully to address consistency with the local measures that *do* more clearly apply. There are a suite of potential emissions reduction strategies identified in the 2017 Scoping Plan aimed at reducing GHG emissions from on-road vehicle travel (e.g., fuel economy standards, technology advancements, SB 375⁹), and the majority of such emissions are not covered in any way by the Cap-and-Trade program.

The City chose not to analyze the project's consistency with the applicable Regional Transportation Plan (RTP), for example, which is subject to GHG emissions reduction targets set by CARB pursuant to SB 375. The City asserted that the RTP does not apply to this project (Table 4.7-11, page 4.7-41 of the RDEIR). We disagree, and suggest that a more appropriate analysis would be whether the project's GHG emissions from on-road transportation would be consistent with, or conflict with, assumptions in the applicable RTP found to comply with SB 375. The city might also refer to the additional nonbinding recommendations offered in CARB's Scoping Plan, though the application of these recommendations, if used, depend on the circumstances of a particular project.

We discuss these points in more detail below.

A. The Cap-and-Trade Regulation Was Never Designed to Achieve All Necessary GHG Reductions From Land Use and Logistics Planning.

The Cap-and-Trade Program was designed from the start as one of a diverse suite of measures, some statewide and some local, to move California toward achieving its GHG targets. To understand the Cap-and-Trade Program's purposes and limitations, the Scoping Plan provides helpful context. The Cap-and-Trade Program covers about 80 percent of all GHG emissions in California.¹⁰ Crucially, just because emissions are "covered" by Cap-and-Trade does not mean all of those emissions from any particular covered entity are mitigated or reduced. It simply means they are included in the cap.

⁹ SB 375 (Steinberg, Statutes of 2008).

¹⁰ Scoping Plan at ES16.

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Thirty-nine percent of California's GHG emissions come from the transportation sector, including logistics-related transportation (like the WLC would involve).¹¹ Another 19 percent of the state's GHG emissions comes from electricity generation.¹² In addition to Cap-and-Trade, the Scoping Plan includes various other CARB measures, some of which also address transportation and electricity sector emissions, including SB 350, the Low Carbon Fuel Standard, the Mobile Source Strategy, and the Sustainable Freight Action Plan. In addition to the other complementary Scoping Plan measures, the Scoping Plan also clearly states that "[l]ocal government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals."¹³

The RFEIR's GHG methodology departs from this science, and has enormous implications for other projects across the state: it would amount to a determination that massive logistics centers, sprawling far-flung residential developments, and other types of remote greenfield development need not do anything to address and mitigate their GHG emissions because those emissions are already "taken care of" by the Cap-and-Trade Program. This is simply not true.

B. The Cap-and-Trade Regulation Is Not Intended to Bear the Burden of Achieving the State's Transportation and Energy Sector GHG Goals Alone.

Cap-and-Trade is not intended to achieve California's climate goals on its own. Rather, Cap-and-Trade is designed to motivate behavior by capping and pricing carbon at the regulated entity level – that is, at the industrial facility and fuel/energy supplier level. It does not send a direct price signal to developers of land use or logistics projects. This means, if CEQA and other "checks" on unsustainable development are weakened as the WLC analysis proposes, such development would simply continue without direct cost to the developers, while adding market demand without mitigating the WLC's emissions.

Moreover, if land use development does not account for GHG emissions, more and more of our state's carbon "cap" would be taken up by increasing transportation emissions. Developers do not receive a price signal from Cap-and-Trade, meaning that there will be no clear incentive to alter this pattern, even as it impacts the Cap-and-Trade system. Thus, the prices of compliance instruments under the Cap-and-Trade Program would increase at a higher rate than was contemplated when CARB developed the Cap-and-Trade Program. This would eventually cause a greater cost burden than

¹¹ As noted above, transportation-related GHG emissions have increased, from 37% in 2015, to 39% in 2016. See CARB, *California Greenhouse Gas Emissions for 2000 to 2016, Trends of Emissions and Other Indicators* (July 2018) at 1 (available at https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf); see also Scoping Plan at ES1.

¹² Scoping Plan at ES1.

¹³ Scoping Plan at 99.; see also page 101.

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anticipated, and it would be borne by all Californians rather than dealt with during the project design phase. Properly-designed local policies, by contrast, may account for GHG emissions of development in a direct way—which furthers the equity objectives of AB 32, complements Cap-and-Trade, and better achieves California’s climate goals.

C. There Is No Substantial Evidence Showing that the Project’s Transportation and Electricity Related Emissions Would Actually Be Mitigated.

In the face of these substantial difficulties, the RFEIR does not articulate substantial evidence demonstrating a rational connection to the Cap-and-Trade Program – and that connection is badly attenuated, as we have explained. The project developer in this instance is claiming it may do nothing with regard to fuels and electricity, and will rely on reductions other entities may achieve. This is not the tight evidentiary connection required by the Supreme Court and by CEQA, and it is not consistent with the State’s GHG reduction programs.

The Final Statement of Reasons (FSOR) prepared when section 15064.4 of the CEQA guidelines, concerning GHGs, was promulgated demonstrates that to properly rely on subsection (b)(3), concerning compliance with statewide programs, a project must demonstrate *with evidence in the record* how the regulations of GHG emissions would actually address the emissions that result from the project. That document states:

Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. *Thus, for example, a subdivision project could not demonstrate consistency with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision.* (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)¹⁴

Here, there is no evidence in the RFEIR regarding who is responsible for complying with Cap-and-Trade for all the GHG emissions at issue in this case – and it certainly is not the project itself. The project is a logistics facility, with trucks involved in interstate commerce, and it is not covered by that Program. Indeed, there is no basis for the

¹⁴ See Natural Resources Agency, Final Statement of Reasons for Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009) at 27 (emphasis added).

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RFEIR's conclusion that the fuel for all of the vehicles serving the project would be covered under the Cap-and-Trade regulation, since it is not clear that all of these vehicles would even purchase their fuel in California.

D. The Project Fails to Account for the Duration of the Project Compared to the Duration of the Cap-and-Trade Program.

The RFEIR states the project's buildout year is 2035,¹⁵ yet the GHG analysis seems to stop after 2035. This raises multiple problems for the RFEIR analysis.

First, it is unclear why the analysis stops at buildout, when GHG emissions (and other environmental impacts) would continue into the indefinite future – at their highest levels – once full operations begin. Without further analysis throughout the project's anticipated life (which does not appear to be stated in the RFEIR but, presumably, would be at least 30 years after buildout), the analysis is incomplete and dramatically understates the project's GHG emissions. This also means the project would likely place a much higher burden on the Cap-and-Trade program than disclosed in the RFEIR – a burden that, as described above, is pushed onto all Californians instead of the project developer as a result of the project's failure to mitigate the vast majority of its GHG emissions.

Second, the RFEIR fails to account for, or even consider, the fact that the current Cap-and-Trade regulation extends only to 2030 – which is five years *before* the project's full buildout is achieved. This means that the RFEIR has no plan whatsoever to account for its GHG emissions once the project is fully built out. The RFEIR also does not address the inconsistency between the project's GHG emissions and Executive Order S-03-05, which, among other things, establishes a state GHG reduction target to reduce GHG emissions to 80 percent below 1990 levels by 2050.¹⁶ The California Supreme Court has emphasized the importance of California's GHG targets in selecting appropriate CEQA thresholds.¹⁷ Despite these considerations, there is no substantial evidence in the record to ensure that *any* of the project's post-buildout operational emissions are mitigated by the Cap-and-Trade program.

E. The Project Fails to Include a Backstop In Case Cap-and-Trade is Altered.

¹⁵ Revised FEIR at 3-1.

¹⁶ See Governor's Executive Order No. S-03-05 (June 1, 2005) (available at [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf)); see also Governor's Executive Order No. B-30-15 (April 29, 2015) (available at <https://www.gov.ca.gov/2015/04/29/news18938/>).

¹⁷ See *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497 at 516-519.

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In addition to its other evidentiary flaws, the RFEIR does not analyze how the analysis would change, and how the project's significant GHG impacts would be mitigated, if Cap-and-Trade were revised in a way that affects the state's GHG levels. In other words, the RFEIR's approach puts an almost complete reliance on the Cap-and-Trade Program in ways that, if adopted generally, would considerably affect the Program, and then fails to consider the possibility that the Program might change even as the Project continues to exist. This could include, for example, a scenario in which:

- The Cap-and-Trade program ceased to exist, or
- If the scope of the program were limited to exclude fuels and electricity, or
- If the Legislature or other factors required the program to be amended in a way that allows a higher cap.

Rather than anticipating any of these or other potential contingencies and building in an appropriate backstop to ensure the project's GHG emissions are mitigated below significance, the RFEIR instead blindly relies on the current Cap-and-Trade Program, with no further commitments or requirements. As a result, the RFEIR fails to provide substantial evidence supporting its conclusion that the project will result in less than significant GHG emissions, while forwarding an analysis that, if accepted, would make the state significantly less able to address climate change impacts resulting from its built infrastructure.

III. The RFEIR is Inconsistent with CEQA Requirements.

The RFEIR's multiple errors with regard to the Cap-and-Trade Program render it contrary with CEQA law. The RFEIR misapplies the key CEQA Guideline, section 15064.4(b), which provides in pertinent part:¹⁸

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 3. The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and

¹⁸ CEQA Guidelines § 15064.4(b) (emphasis added).

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must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. *If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Thus, the CEQA Guidelines focus on project-level compliance and project-level impacts. State programs are available for consideration, but they are not held out as a panacea, for GHGs any more than for any other resource area.

Yet, the RFEIR relies upon subsection (b)(3) of this provision to claim that emissions which are indirectly included under the “cap” created by the Cap-and-Trade Program (referred to in the RFEIR as “capped emissions”) need not be analyzed and mitigated under CEQA. This approach would excuse all of the WLC’s transportation and electricity related emissions, leaving the project only “on the hook” for analyzing and mitigating a tiny fraction of its emissions. The following sections explain why this approach is legally and factually flawed.

A. Subsection (b)(3) Itself Does Not Allow The Approach Used in the Revised Final EIR.

As noted above, subsection (b)(3) of CEQA Guidelines section 15064.4 can be used as a factor to assess GHG significance when “*the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions...*” Here, the RFEIR concedes that the project is not subject to the Cap-and-Trade Regulation.¹⁹ This in itself should be sufficient to demonstrate that subsection (b)(3) is inapplicable to the project, as “the project” does not “comply” with Cap-and-Trade at all.

B. The RFEIR’s Hybrid Approach Used To Determine Significance Is Not Allowed.

In addition to improperly relying on subsection (b)(3), as described above, the RFEIR improperly attempts to create a “hybrid” significance scheme based on selectively combining subsection (b)(3) with the South Coast Air Quality Management District’s (SCAQMD) bright-line threshold. As explained in the RFEIR, a potentially appropriate significance threshold in this case is the SCAQMD’s 10,000 metric ton threshold.²⁰ The problem here is that the RFEIR does not compare the project’s GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Rather, the RFEIR simply subtracts from its emissions quantifications any GHG emissions that it deems to be “capped,” and compares only the net “non-capped” emissions against the bright-line threshold.

¹⁹ See page 4.7-4.

²⁰ RFEIR at 4.7-21.

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This approach is unsupported in law. Regardless of which threshold applies, CEQA requires lead agencies to “make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project.”²¹ CEQA then provides that the lead agency must consider “whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project.”²² Thus, even if subsection (b)(3) properly applied here (which it does not, as explained above), nothing in the CEQA Guidelines allows this hybrid approach of cherry-picking what emissions are applied to an otherwise-applicable bright-line threshold. The City has not even attempted to satisfy its burden of providing such substantial evidence. As noted elsewhere in this letter, Cap-and-Trade does not result in ton-for-ton mitigation of each metric ton covered by the program. Rather, it is a declining market-wide cap designed to achieve certain statewide goals – which, as explained elsewhere in this document, is not designed to mitigate all GHG emissions from land use and logistics facilities.

Because the REFIR fails to properly apply the vast majority of the project’s GHG emissions to the applicable bright-line significance threshold, it also fails to mitigate those emissions, as it simply dismisses them as “less than significant”. If the full scope of the GHG emissions attributable to the project were compared to the applicable bright-line threshold, the mitigated emissions would still be substantially over the threshold. CEQA requires that the project’s significant GHG emissions must be mitigated to the extent feasible. Additional mitigation measures are available to further reduce the project’s GHG emissions that were not considered due to the inappropriate exclusion of the majority of project-generated emissions from the analysis.

C. Reliance Upon *AIR v. Kern County* Is Improper.

While the RFEIR provides little support for the GHG significance approach it takes, the briefing for *Paulek* further explains the reasoning behind the project’s GHG analysis. In those briefs, attorneys for the developer claim that an unrelated appellate ruling, the *AIR v. Kern County* decision²³ is relevant. That decision concerned CEQA analyses for sources actually covered by the Cap-and-Trade Regulation, but the claim is that it somehow applies not only to GHGs from projects that are directly subject to the Cap-and-Trade Regulation, but also to all transportation and electricity related GHG

²¹ CEQA Guidelines § 15064.4(a).

²² CEQA Guidelines § 15064.4(b)(2).

²³ *Association of Irrigated Residents v. Kern County Board of Supervisors* (2017) 17 Cal. App. 5th 708. In CARB’s view this case was wrongly decided as to the Cap-and-Trade issue, and it is certainly not apposite in this very different context.

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emissions, the logic being that those emissions are technically included in the statewide “cap” on emissions. This is incorrect factually, for all the reasons discussed above.

It is also not a controlling case legally. The holding in *AIR v. Kern County* addressed whether it “is appropriate for a lead agency to conclude a *project compliance* [sic] with the cap-and-trade program provides a sufficient basis for determining the impact of the project's greenhouse gas emissions will be less than significant.”²⁴ The project at issue in that case was a refinery that was directly subject to the Cap-and-Trade Regulation. The court did not address the broader question of whether *all* GHG emissions from resources that are indirectly covered by Cap-and-Trade, at some undefined upstream point, may be cast aside as less than significant. Here, as noted above, the WLC is *not* subject to the Cap-and-Trade regulation. It therefore does not “comply” with the Cap-and-Trade program, and is distinguishable from the project at issue in *AIR v. Kern County*.

C. Reliance Upon Obscure 2013 Negative Declarations and a Policy Document from Another District Is Similarly Uncompelling.

The RFEIR itself also attempts to justify excluding “capped emissions” from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations,²⁵ and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD) titled Policy APR-2025. The RFEIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a 2014 policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. Furthermore, the primary SJVAPCD guidance documents regarding analyzing and mitigating GHG emissions under CEQA make no mention of Policy APR-2025, including the guidance documents relied upon in the *AIR v. Kern County* decision.²⁶

To the extent the RFEIR is considering what other air districts have done, it is worth noting that the California Air Pollution Control Officers' Association (CAPCOA) has considered a range of potential CEQA significance thresholds, none of which summarily

²⁴ *AIR v. Kern County* at 743 (emphasis added).

²⁵ The Revised FEIR only cryptically references these MNDs, without citations or links to the documents, and without any other information explaining the basis for their CEQA significance approach. The RFEIR's failure to include or adequately reference these mitigated negative declarations hampers the public's ability to review and comment on the RFEIR.

²⁶ See, e.g., *AIR v. Kern County* at 743-744; see also http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf; http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf; and <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>.

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exclude emissions that are indirectly included within the Cap-and-Trade program.²⁷ While that document was generated in 2008, it makes multiple references to the Cap-and-Trade program, and does not endorse simply subtracting all so-called “capped emissions” from GHG analyses.

D. Even If CEQA Guideline 15064.4(b)(3) Applied Here, The RFEIR Ignores Other Requirements in the CEQA Guidelines.

The sections above provide in-depth analysis regarding why subsection (b)(3) of CEQA Guideline 15064.4 does not allow this project to simply disregard the vast majority of its GHG emissions. Even if that subsection did apply, there are other deficiencies in the RFEIR’s GHG analysis that must be addressed.

First, the CEQA Guidelines make clear that an agency cannot focus solely on a single significance consideration while ignoring other evidence or indicators showing potentially significant impacts. For example:

- Section 15064.4(b) states that “[a] lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment.”
- Section 15064.4(b)(3) provides in pertinent part: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.”
- Section 15064(h)(3) provides: “If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding that the project complies with the specified plan or mitigation program addressing the cumulative problem, an EIR must be prepared for the project.”

As discussed in depth above, there is evidence in this record showing significant GHG impacts that were not analyzed or mitigated in the RFEIR. CEQA does not allow these impacts to be overlooked, even if the lead agency believes the project’s GHG emissions would be less than significant under one particular (and here, improper) significance metric.

IV. Criteria Pollutants and Toxic Emissions Must Still Be Considered

In its 2013 and 2015 comment letters, CARB noted its substantial concerns regarding the project’s air pollutant and toxics emissions, and suggested several feasible means of reducing the significant impacts from those emissions. These emissions raise

²⁷ See CAPCOA, CEQA & Climate Change (January 2008). Available at <http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf>.

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substantial local exposure and environmental justice concerns, as Moreno Valley already suffers from very substantial air pollution exposures. These exposures would likely be worsened without appropriate mitigation measures.²⁸ CARB incorporates the comments from those letters into this letter by reference, and strongly recommends that the RFEIR be revised to incorporate all mitigation recommended in its 2013 and 2015 comment letters.

V. Conclusion

While the WLC has enormous GHG implications in itself, the attention this project has received, and the recent legal developments in the emerging *AIR v. Kern County* and *Paulek* line of cases, demonstrate that the City's decisions in the RFEIR have implications beyond the WLC project as well. The City should revise its GHG analysis to accurately account for all GHG emissions that would result from the project, apply those emissions against the applicable significance threshold identified in the RFEIR, and adopt feasible mitigation to ensure those emissions would not cause significant impacts, as required by CEQA.

Sincerely,



Richard W. Corey
Executive Officer

²⁸ On these issues of acute local exposure, especially to roadway emissions, and the importance of fully addressing these sources of risk, see Ann Carlson, *The Clean Air Act's Blind Spot: Microclimates and Hotspot Pollution* (2018) 65 UCLA L. Rev. 1036.

EXHIBIT C



Gavin Newsom, Governor
 Jared Blumenfeld, CalEPA Secretary
 Mary D. Nichols, Chair

January 30, 2020

Albert Armijo, Interim Planning Manager
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Re: World Logistics Center Draft Recirculated Revised Sections of the Final Environmental Impact Report (SCH # 2012021045)

Dear Mr. Armijo:

The California Air Resources Board (CARB) has reviewed the Draft Recirculated Revised Sections of the Final Environmental Impact Report (RRSFEIR) for the World Logistics Center (WLC or Project). CARB appreciates the opportunity to comment on the RRSFEIR, and raises two primary issues with the RRSFEIR in this letter.

1. The RRSFEIR contains the same flawed GHG analysis as the RFEIR.

CARB previously reviewed the City's July 2018 Revised Final Environmental Impact Report (RFEIR), and submitted comments regarding the RFEIR on September 7, 2018. As noted in that comment letter, CARB believes the RFEIR's analysis of greenhouse gas (GHG) related impacts does not meet California Environmental Quality Act (CEQA) requirements, as it relies almost entirely on mischaracterizations to reach its less-than-significant impact determination.

Unfortunately, the flaws described in CARB's September 7, 2018 comment letter remain in the RRSFEIR, which continues to rely upon mischaracterizations regarding California's Cap-and-Trade Program to dismiss any serious analysis or mitigation of the Project's GHG emissions. Therefore, as part of its comments on the current draft RRSFEIR, CARB re-submits its September 7, 2018 comment letter (attached to this letter) in its entirety. CARB directs its comments toward both the direct and cumulative impact analysis sections in the RRSFEIR.

2. The RRSFEIR does not include the new GHG mitigation measures it references.

The RRSFEIR includes passing references to new GHG-related mitigation measures, particularly measures 4.7.6.1E-1 and 4.7.6.1E-2 (see pages 4.7-20, 6.7-14, and 6.7-20). However, it appears the measures themselves have not been included in the RRSFEIR. Without the ability to review the mitigation measures relied upon by the City in reaching its significance determinations, the public has no way to evaluate the effectiveness of those measures, thwarting CEQA's public disclosure purpose.

Mr. Albert Armijo
January 30, 2020
Page 2

Conclusion

Both this comment letter and CARB's September 7, 2018 comment letter set forth substantial deficiencies in the environmental analysis prepared for the WLC project. Given these deficiencies, the City should revise the RRSFEIR to include adequate analysis and mitigation regarding all of the Project's environmental impacts, including GHG, air quality, and cumulative impacts. The City should then re-circulate the document for public review to allow the public to review and comment on the City's revised proposal.

Thank you for your consideration. As always, we welcome any questions from the City regarding ways to adequately analyze and mitigate the Project's GHG emissions.

Sincerely,


Richard W. Corey
Executive Officer

Enclosure: CARB's September 7, 2018 comment letter regarding the WLC RFEIR.

EXHIBIT D

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FOURTH APPELLATE DISTRICT, DIVISION TWO

ALBERT THOMAS PAULEK, et al.,

Plaintiffs and Respondents,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Appellants.

HF PROPERTIES, et al.,

Real Parties in Interest and Appellants.

Case No. E071184
(Riverside Cty.
Super. Ct. No.
RIC1510967 MF,
RIC1511279, RIC1511327,
RIC1511421, &
RIC1511195)

**LABORERS INTERNATIONAL UNION OF
NORTH AMERICA, LOCAL 1184, et al.,**

Plaintiffs and Appellants,

v.

**MORENO VALLEY COMMUNITY
SERVICES DISTRICT, et al.,**

Defendants and Respondents.

HF PROPERTIES, et al.,

Real Parties in Interest and Respondents.

(Riverside Cty. Super. Ct.
No. RIC 1511279 &
RIC1511327)

Riverside County Superior Court
The Honorable Sharon J. Waters, Judge

**BRIEF OF AMICI CURIAE THE ATTORNEY GENERAL AND THE
CALIFORNIA AIR RESOURCES BOARD IN SUPPORT OF PLAINTIFFS
AND RESPONDENTS ALBERT THOMAS PAULEK, ET AL. AND
PLAINTIFFS AND APPELLANTS LABORERS INTERNATIONAL UNION
OF NORTH AMERICA, LOCAL 1184, ET AL.**

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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

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INTRODUCTION

The massive World Logistics Center (Project) will cause approximately 70,000 daily truck trips transporting goods from the ports of Long Beach and Los Angeles to Moreno Valley. (AR 003039, 058605–06.) These vehicle trips will emit hundreds of thousands of metric tons of greenhouse gas (GHG) emissions every year over the life of the Project. (AR 002729.) These GHG emissions, along with emissions from electricity needed to power the more than 40-million-square-foot project, will add to the existing climate pollutant problem, accumulating in the atmosphere and persisting for decades or longer.

Rather than analyzing and mitigating the Project’s emissions, lead agency Respondents Moreno Valley Community Services District, *et al.* (Respondents) shirk their responsibility as a local government to address climate change. They improperly rely on CARB’s statewide Cap-and-Trade climate program (Cap-and-Trade Program), which does not impose any regulatory requirements on this Project, as an excuse not to analyze and mitigate the Project’s climate change impacts. Respondents improperly ignore roughly 95% of the GHG emissions from the Project (AR 002718–19), disregarding the significance of those emissions, avoiding their duty to adopt all feasible mitigation measures, and failing to properly disclose their responsibility for this pollution to the public.

Respondents’ approach mischaracterizes the way state climate policies work and violates the California Environmental Quality Act (CEQA). CEQA directs that Respondents take “all action necessary” to protect the environment, recognizing the importance of local action driven through “meaningful” consideration of environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21002, 21002.1.) CEQA does not allow Respondents to waive their CEQA obligations by pointing to a regulation that does not bind them (Cal. Code Regs., tit. 14, § 15000 et seq. (CEQA

Guidelines), § 15064.4), and Respondents wholly misconstrue the regulatory scheme they seek to use.

Although Respondents claim their approach is consistent with state climate policy, it is not. (See Plaintiffs/Appellants’ Supplemental Request Regarding Judicial Notice, Exhibit 1, California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) (2017 Scoping Plan) at pp. 19 [“Local actions are critical for implementation of California’s ambitious climate agenda”], 97–99 [more extensive discussion about the need for local action to achieve California’s climate goals]; see also Health & Saf. Code, §§ 38502, subd. (h) [identifying competing priorities to balance in emissions reductions], 38592 [nothing in this division relieves any person, entity, or agency of compliance with other law], 38690 [identifying overlapping automobile emissions policy].) Respondents’ approach has been repudiated by CARB, the Attorney General’s Office, and the Natural Resources Agency, as contrary to critical state climate goals. The state has long—and expressly—relied on a portfolio of climate change measures, including significant efforts by local governments, to address emissions that result from their land use decisions.

Respondents rely on the Cap-and-Trade Program to excuse their obligation to make better land use decisions. Cap-and-Trade is not intended as a stand-alone climate policy; instead, it assumes steady efforts to reduce emissions across the state. While Cap-and-Trade has an important role to play in limiting emissions from entities like power plants and refineries, the Program does not cover a host of other sources, including warehouses. Although the Program creates financial and legal obligations on fuel suppliers and electricity generators that may ultimately supply this Project, the Project experiences neither the direct legal requirements of the Program nor the full economic costs associated with its additional emissions. If projects were allowed to evade responsibility in

this way, they would steadily increase Cap-and-Trade Program costs upstream, while locking the state into ever-more expensive and inappropriate high-emitting development patterns. This is a recipe for failure in achieving the state’s climate goals. To avoid this scenario, the state relies on local governments to limit emissions from new development projects. Emissions from such projects are the responsibility of local governments and should be mitigated through the proper application of CEQA. Eliminating this crucial piece of the state’s portfolio approach undermines the state’s climate goals.

We have arrived at a crossroads for the future of GHG analysis under CEQA. If Respondents prevail, this case could singlehandedly undo the will of the Legislature by excusing essentially all projects from the obligation to consider GHG impacts from vehicle trips and energy use. This Court should reject Respondents’ argument and confirm that all lead agencies must do their part if we are to meet the state’s long-term climate stabilization objective.

STATEMENT OF INTERESTS

I. INTEREST OF THE ATTORNEY GENERAL

California has already begun to experience significant adverse impacts from climate change such as “more frequent, more catastrophic and more costly” wildfires, drought, “coastal erosion, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.” (2017 Scoping Plan at p. ES2.) As California’s chief law enforcement officer, the Attorney General has the independent power and duty to protect the interest of all of California’s current and future residents in a clean, health, and safe environment. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600–12612; *D’Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 15.)

Upholding this duty, the Attorney General has actively encouraged lead agencies to fulfill their CEQA responsibilities as they relate to climate change for well over a decade. (See, e.g., *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 519 [“nothing we say today invites regional planners to ‘shirk their responsibilities’ under CEQA”]; *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465; *People v. County of San Bernardino* (San Bernardino County 2007) No. CIVSS0700329.)

The World Logistics Center, like every large development project, has the potential to either facilitate or hinder the state’s achievement of its climate goals. Here, Respondents’ unsupported approach to analyzing the Project’s GHG emissions has the potential to seriously undermine the overall effort to meet the state’s science-based GHG reduction goals for the transportation and land use sectors and to disproportionately affect environmental justice communities.¹ Given these significant interests, the Attorney General submits this amicus brief in support of Appellants,² in compliance with rule 8.200(c)(7) of the California Rules of Court in his independent capacity and on behalf of the California Air Resources Board (CARB).

¹ The Attorney General opposed this methodology in a comment letter it submitted on the revised sections of the Final EIR for this Project (Revised Final EIR or RFEIR). (Letter re: Revised Sections of the Final Environmental Impact Report for the World Logistics Center Project, Sept. 7, 2018, at:

<<https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/comments-revised-sections-feir.pdf?>>.) The Revised Final EIR is not at issue in this litigation, but it includes the original EIR’s same flawed GHG analysis.

² This brief is submitted in support of Plaintiffs and Respondents Albert Thomas Paulek, et al. and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, et al.

II. INTEREST OF THE CALIFORNIA AIR RESOURCES BOARD

CARB has a strong interest in participating in this case as amicus curiae. CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. As creator and administrator of the Cap-and-Trade Program, and as the lead agency on the Scoping Plan setting out many of the state’s climate policies, CARB is an expert on how the Cap-and-Trade Program was designed to function and interact with other state laws and programs as part of California’s portfolio approach to addressing GHG emissions. In their briefing, Respondents misrepresent CARB as effectively endorsing the EIR’s approach to GHG analysis. (Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 17, 36–38, 47–48, 56, 63.) But CARB has repeatedly made clear it does *not* support Respondents’ approach.³ As explained more fully below, Respondents’ arguments regarding GHG analysis are contrary to the construction given to applicable regulations by CARB, and by the Natural Resources Agency, agencies charged with interpreting and enforcing the programs at issue.

BACKGROUND

I. LEGAL BACKGROUND REGARDING CALIFORNIA’S EFFORTS TO COMBAT CLIMATE CHANGE

In 2006, recognizing the importance of combatting climate change and furthering the objectives of Executive Order S-3-05, the Legislature enacted the Global Warming Solutions Act of 2006, commonly known as

³ CARB also explained this approach when it formally opposed the GHG analysis Respondents rely on here through its comments on the RFEIR for this Project. (Letter re: World Logistics Center Revised Final Environmental Impact Report, Sept. 7, 2018, at: <https://ww3.arb.ca.gov/toxics/ttdceqalist/logisticsfeir.pdf?_ga=2.236813640.855160185.1575908432-1460774677.1564163003>.)

AB 32. (Health & Saf. Code, § 38500, et seq.) AB 32 mandates that, by 2020, California must reduce its total statewide annual GHG emissions to the level they were in 1990, and to 40 percent below that level by 2030. (Health & Saf. Code, §§ 38550, 38566.) This mandate puts the state on a trajectory of significant and continuous GHG emissions reductions through 2050, in order to stabilize the atmospheric levels of GHGs and reduce the risk of dangerous climate change.

Under AB 32, the Legislature tasked CARB with preparing a guidance planning document, known as the Scoping Plan that, while not binding, set out the state's views based on extensive environmental and economic analyses on how policies may be effectively implemented so that California will meet the its ambitious GHG reduction goals. (See Health & Saf. Code, §§ 38561 et seq.) The Scoping Plan emphasizes the need for a multi-pronged emissions reduction approach that can be carried out by many entities and reflects the state's position that it is necessary to reduce emissions at the source and through reductions in demand for energy. (2017 Scoping Plan, pp. 12, 19, 28).

The Scoping Plan includes a suite of regulations, measures, and policies designed to operate together to reduce GHG emissions. The Cap-and-Trade Program is one such policy. Entities that are directly subject to the Cap-and-Trade Program—like power plants, factories, refineries, and electricity generators and importers—must purchase and surrender compliance instruments (e.g., allowances) for their emissions. (See Cal. Code Regs., tit. 17, § 95812.) Downstream emitters such as cars and trucks, much less warehouses that such cars and trucks drive to, are not covered entities under Cap-and-Trade and have no such obligation to purchase or surrender allowances. The existence of the Program, in other words, does not obviate the need for action at other levels of the economy. On the contrary: If sources like the long-lasting development project in this

case build without regard to their emissions, they will increase overall state emissions and hence increase pressure and costs within the Cap-and-Trade Program.

To address the wide range of GHG emissions sources that are not directly controlled through the Cap-and-Trade Program, the state relies on other policies⁴—many of which require collaboration between the state and local governments. Agencies large and small across the state (including, crucially, cities and counties) are responsible for ensuring that proposed new land use plans, transportation projects, and development projects are consistent with evolving scientific knowledge and state regulatory schemes; CEQA is a critical tool for implementing these obligations.⁵ (See *SANDAG, supra*, 3 Cal.5th at p. 519; see also CEQA Guidelines, § 15064.4, subd. (b).)

The Scoping Plan makes clear that the Cap-and-Trade Program was *not* designed to replace local governments’ long-term planning obligations, but rather designed to work in concert with those policies to achieve the

⁴ See, e.g., Health & Saf. Code, §§ 38561, subd. (e) (requiring CARB to consider “the relative contribution of each source or source category to statewide greenhouse gas emissions”), 43018.5, subd. (a) (requiring CARB to “adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles”).

⁵ For example, CARB provides regional emission reduction targets for local jurisdictions’ land use and transportation planning obligations under Senate Bill (SB) 375. (See Health & Saf. Code, § 65080, subd. (b)(2)(A) [known as “The Sustainable Communities and Climate Protection Act”].) CARB also works with regional air pollution control districts and air quality management districts to address emission sources that have both local and global effect, including methane from landfills and hydrofluorocarbons (HFCs), as well as to support state- and federally-mandated permitting of certain industrial sources of GHG emissions. (See California Air Resources Board, California’s 2017 Climate Change Scoping Plan (Nov. 2017) pp. 3, 104 <https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf>.)

state’s goals. (2017 Scoping Plan at p. 102 [“California’s future climate strategy will require increased focus on integrated land use planning”].)

Recent state reports have shown that California’s vehicular GHG emissions continue to increase year after year, and CARB has emphasized the need for local action. (See California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) These increasing emissions demonstrate the crucial need for *more* complementary local action—not less—to ensure the state meets its GHG targets in cost-effective ways.

In light of the state’s GHG reduction policies, and CEQA’s focus on embedding environmental considerations in local decision-making, the Supreme Court has emphasized that careful CEQA analysis of GHG impacts will be required going forward, as lead agencies must “stay in step” with the evolving science and law related to the state’s long-term climate objectives in order to carry out their duties under CEQA. (*SANDAG, supra*, 3 Cal.5th at p. 519.)

II. OVERVIEW OF THE GHG ANALYSIS IN RESPONDENTS’ EIR

Mischaracterizing the collaborative efforts required to combat climate change and the role of the Cap-and-Trade Program, Respondents’ EIR takes a very unusual and troubling approach to addressing the Project’s GHG-related impacts.⁶ Respondents divide the Project’s GHG emissions into two categories, which the EIR terms “capped” and “uncapped.” (AR 002719.) What the EIR deems “uncapped” emissions constitute only about 4.6% of the Project’s emissions. (*Ibid.*) The “uncapped” category includes comparatively minor landfill emissions caused by waste generated at the

⁶ The Attorney General and CARB only address Respondents’ inappropriate use of the Cap-and-Trade Program in the GHG analysis of the EIR. This amicus brief is not intended to and should not be construed as an exhaustive discussion of the EIR’s compliance with CEQA.

Project and the use of refrigerants at the Project. (*Ibid.*) For these emissions, the EIR follows the approach that would be expected under CEQA: the City of Moreno Valley, in its discretion, designated a significance threshold (in this case, 10,000 metric tons of GHG emissions as recommended by the South Coast Air Quality Management District), compared the “uncapped” emissions to that threshold, and required feasible mitigation measures to ensure those emissions fall below that threshold. (AR 002719, AR 002729.)

What the EIR terms “capped” emissions, however, constitute the remaining 95.4% of the Project’s predicted emissions. (AR 002719.) Those include emissions caused by mobile sources (namely, diesel trucks), as well as natural gas and electricity use at the Project. (*Ibid.*) For these emissions, the EIR deviates dramatically from standard CEQA methodology. The EIR asserts these emissions are “covered” by Cap-and-Trade and therefore wholly exempt from any further CEQA analysis or mitigation. (AR 002723.) The EIR does *not* compare the Project’s “capped” emissions to the 10,000 metric ton threshold. (AR 002725.) Indeed, after mitigation measures are applied to the Project, the “capped” emissions remain nearly 40 times greater than the significance threshold. (AR 002729.) In forgoing any attempt to decrease the Project’s true total emissions to a less-than-significant level, Respondents fail to consider further mitigation measures that could have made this Project more compatible with the state’s climate goals. As described below, this approach is unlawful.

ARGUMENT

Respondents avoid disclosing and addressing mitigation for thousands of tons of GHG emissions each year pursuant to the misguided theory that those emissions are addressed by Cap-and-Trade. This argument is founded on misunderstandings of both the Cap-and-Trade Program and

CEQA—both of which require different industries and projects to take responsibility for their own impacts, rather than rely on others for mitigation. Most fundamentally, warehouse projects like the Project are not subject to Cap-and-Trade. Respondents therefore cannot accurately assert that “compliance” with Cap-and-Trade provides any legal basis to avoid analyzing and adequately mitigating the majority of the Project’s emissions.

The CEQA Guidelines allow projects to consider regulations “[with] which the project complies” for purposes of considering significance of GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3).) However, that consideration does not apply here and Respondents’ approach, which in effect relies on other entities to undertake Respondents’ CEQA mitigation, not only violates both CEQA’s legal requirements and public disclosure and mitigation purposes, but also undermines the state climate objectives Cap-and-Trade is intended to further. Cap-and-Trade is designed to act in tandem with—not in spite of—critical tools like local land use planning to reduce GHG emissions. If allowed for Respondents and adopted by other local jurisdictions, such abdication by local governments would dramatically hinder the state’s ability to achieve its legislatively mandated long-term climate stabilization objectives and forgo pollution reduction co-benefits from GHG mitigation measures that are vital for environmental justice communities.

The Resources Agency agrees with CARB that “to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project.” (See California Natural Resources Agency, Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97 (2009),

<http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf>, at p. 27.)

I. WAREHOUSE AND LOGISTICS PROJECTS ARE NOT REGULATED BY CAP-AND-TRADE AND THEIR EMISSIONS MUST STILL BE MITIGATED BY LOCAL GOVERNMENTS

Warehouse and logistics complexes are not regulated by Cap-and-Trade. The Cap-and-Trade Program thus provides no legal or policy basis for Respondents to avoid their obligation to evaluate and mitigate GHG emissions. Cap-and-Trade applies “an aggregate greenhouse gas allowance budget [to] *covered entities* and provides a trading mechanism for” such allowances. (Cal. Code Regs., tit. 17, § 95801 (emphasis added).) Respondents seek to use Cap-and-Trade to zero-out and excuse the application of feasible mitigation measures to over 95% of all GHG emissions from the Project. Cap-and-Trade applies only to expressly identified entities (“covered entities”) such as cement producers, petroleum refiners, electricity generators, natural gas suppliers, fuel importers, and liquid petroleum gas suppliers. (Cal. Code Regs., tit. 17, § 95811.) Warehouse and logistics complexes are *not* covered entities. Cap-and-Trade compliance instruments do not factor in *whatsoever* because this Project is not covered by Cap-and-Trade.

The mere fact that warehouse and logistics complexes are in the chain of commerce with covered entities does not transform them into covered entities themselves. As an example, although the operator of a refinery that produces gasoline in California is subject to Cap-and-Trade, (Cal. Code Regs., tit. 17, § 95811, subd. (e)(1)), entities downstream from that refinery in the chain of commerce are not. The refinery itself may have compliance obligations under the Cap-and-Trade Program, which can be met by reducing the refinery’s own GHG emissions or surrendering allowances, but the gas station that resells the gas, the truck drivers who purchase it, and

the warehouses to which the trucks drive do not have compliance obligations. Under the state's portfolio approach, while the refinery may have met some or all of its climate obligations via Cap-and-Trade, the downstream entities have not. Because warehouses receive no set price or regulatory signals from Cap-and-Trade, they are not being directly incentivized to reduce emissions. Instead, other components of the state's portfolio address those emissions. Nothing in Cap-and-Trade explicitly or impliedly repealed the use of other measures to address climate change; they were designed to work together. (See, e.g., 2017 Scoping Plan at p. 28.) Local governments must responsibly plan new development to further the state's climate goals.

II. ALLOWING RESPONDENTS' UNTENABLE APPROACH TO GHG ANALYSIS WOULD HAVE SIGNIFICANT, NEGATIVE STATEWIDE CONSEQUENCES

If Respondents' approach to GHG analysis is endorsed, other lead agencies will undoubtedly follow this approach, and emissions from the transportation and land use sectors will be largely omitted from analysis and mitigation under CEQA. Widespread adoption of this approach would: (1) place the entire burden of California's well-established, long-term land-use related GHG reduction goals on Cap-and-Trade, thereby straining the program beyond its intended purpose and (2) expose already burdened communities in the state to greater amounts of GHG emissions and co-pollutants that accompany GHG emissions, such as diesel particulate matter and nitrogen oxides.

A. Respondents' GHG analysis undermines California's GHG reduction goals

As explained above, the Cap-and-Trade Program is just one part of a suite of complementary measures designed to achieve California's ambitious GHG reduction and climate stabilization objectives. Cap-and-

Trade provides no legal basis for Respondents to avoid local governments' obligations as lead agencies under CEQA to evaluate and mitigate GHG emissions from a project that the Cap-and-Trade Program does not even cover.

While any one policy may be insufficient or at risk of circumvention, the suite of policies work in concert toward the state's goals.^{7,8} This overlap is by design, and makes the suite of policies more resilient to changed circumstances, enforcement problems, and legal challenges. The upstream Cap-and-Trade Program thus works in tandem with downstream choices, including planning choices, to ensure both that total emissions decline and that projects throughout the state are designed to avoid putting undue upstream pressure on emissions or control costs. Weakening one policy because another policy might address it runs contrary to this approach.

⁷ See 2017 Scoping Plan, *supra*, pp. ES7–8, 10, 22, 97; cf. Elinor Ostrom, A Polycentric Approach for Coping with Climate Change (2014) 15 *Annals Econ. & Fin.* 97, 123 <<https://perma.cc/YSF4-B7N8>> (Nobel laureate describing an ideal policy approach to climate change as “Complex, Multi-Level Systems to Cope with a Complex, Multi-Level Problem”); Amir Bazaz, et al., Global Covenant of Mayors, Summary for Urban Policymakers: What the IPCC Special Report on Global Warming of 1.5.°C Means for Cities (Dec. 2018) pp. 22–23 <<https://perma.cc/R37B-3WDD>> (identifying interaction between sources of governance and importance of incentives beyond financial consequences at the community level).

⁸ Complementary measures are also important in light of the risk to any one measure posed by litigation. Private parties and the federal government have challenged California's GHG reduction policies, including aspects of the Cap-and-Trade Program. California's GHG vehicle emissions regulatory authority is currently also under challenge. The wisdom of the portfolio approach endorsed by the Scoping Plan is to ensure that the state's efforts continue via many channels, rather than relying on any one potentially challenged measure.

If other lead agencies adopt Respondents’ approach to GHG analysis under CEQA, their development projects would produce millions of metric tons of GHG emissions that would go unmitigated through what amounts to an unauthorized categorical exemption from CEQA. The economic analyses and feasibility of achieving the state’s legislatively mandated goals in the Scoping Plan account for all policies working in tandem. If any one policy fails to deliver reductions, this would put strain on the Cap-and-Trade Program to deliver more reductions than anticipated and at higher costs.

Respondents’ failure to account for the significance of the Project’s GHG emissions from transportation is particularly troubling in light of the fact that the transportation sector accounts for over 35% of the state’s total GHG emissions and these emissions continue to rise. (2017 Scoping Plan, *supra*, pp. ES1, 11 [charts of emissions by source]; see also California Air Resources Board, 2018 Progress Report: California’s Sustainable Communities and Climate Protection Act (November 2018) at 4.) As the California Supreme Court noted, “transportation emissions are affected by the location and density of residential and commercial development, the Scoping Plan does not propose statewide regulation of land use planning but *relies instead on local governments.*” (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 230; emphasis added.) Local governments thus play a unique role in decreasing GHG emissions from the transportation sector.

Respondents contend that because statewide emissions are capped under the Cap-and-Trade Program, the amount of emissions from “capped” sources will be the same with or without their Project, but this claim ignores both their obligations under CEQA to disclose and mitigate their emissions and the intended design of the Cap-and-Trade Program. (See

Combined Respondents’ and Cross-Appellants’ Opening Brief at pp. 48–49.)

Cap-and-Trade is not a program designed to reduce emissions from local government actions, or land use; instead, it was designed on the assumption that local actors would simultaneously work to reduce emissions within their spheres. Cap-and-Trade alone was designed to account for less than 40% of the total emissions reductions needed to achieve California’s 2030 climate goals, and on the explicit assumption that local design choices would continue to reduce overall emissions (and hence economy-wide costs in the Cap-and-Trade Program). (2017 Scoping Plan at p. 28.) Indeed, relying entirely on the Cap-and-Trade Program to address land use would produce a mismatch that would strain the Program by functionally increasing demand for emissions reductions as unregulated entities displace their obligations onto the Program rather than taking action themselves, raising compliance costs for covered entities across all sectors and all consumers across the state at all income levels. California’s portfolio approach was designed to meet AB 32’s requirement that “greenhouse gas emissions reduction activities . . . adopted and implemented by [CARB] are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.” (Cal. Health & Saf. Code, § 38561.) By taking a portfolio approach, the state has recognized that taking GHG action in specific sectors ensures that we achieve our broader climate and energy demand reduction goals. (See 2017 Scoping Plan at pp. 2, 24, 100 [describing Governor Brown’s five key climate change strategy “pillars”].) Ultimately, cost increases could make the Cap-and-Trade Program less effective as a key part of the suite of California’s climate policies.

In sum, Respondents’ position is fundamentally inconsistent with the state’s approach to climate change, and so disregards significant emissions

that should properly be addressed under CEQA, not an unrelated emissions program like Cap-and-Trade. Moreover, Respondents' approach would allow similar emissions from other projects that would follow its lead. (See Part III(A), *infra.*) The majority of land use projects are, like this Project, not covered by the Cap-and-Trade Program. Freight alone is an enormous industry; over 1.5 billion tons of freight were moved in California during 2015. (*Id.* at p. 73.) And other types of projects such as residential developments or agricultural enterprises may seek to invoke precedent created by this case. Thus, even if the Project standing alone does not excessively strain the Cap-and-Trade system, the collective weight of new projects failing to address GHG emissions in the CEQA process would.

B. Respondents' GHG analysis prevents co-pollutant reduction measures necessary to protect California's environmental justice communities

Permitting massive land development projects without requiring the necessary mitigation measures to decrease project emissions will also harm California's environmental justice communities—those already suffering from the worst environmental pollution in the state. The census tract the Project will be built in is ranked in the 75th to 80th percentile of census tracts in California in terms of greatest pollution burden indicators and health and vulnerability factors for population characteristic indicators. (CalEnviroScreen 3.0 for Census Tract 6065042624, Office of Environmental Health Hazard Assessment, last visited November 27, 2019 <<https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>>.) Even without the Project, residents of this census tract already experience ozone, the main ingredient of smog, at a rate higher than 98% of the rest of California. (*Ibid.*) Relatedly, these residents also experience cardiovascular disease, which can result from exposure to air pollution, at a rate higher than 95% of the state. (*Ibid.*)

Considering additional mitigation properly may have resulted in additional zero-emissions technologies used for the Project, including, perhaps, from its trucks, as many commenters recommended. If such measures are not considered from this Project and other future projects like it are not mitigated, Moreno Valley and communities throughout the state will likely continue to suffer from worse air pollution. (See Nicky Sheats, *Achieving Emissions Reductions for Environmental Justice Communities Through Climate Change Mitigation Policy* (2017) 41 WM. & MARY ENVTL. L. & POL’Y REV. 377, 387 [“[E]ven without the intentional maximization of co-pollutant reduction, there should be incidental co-pollutant reductions as GHGs are being reduced [which] should improve the health of local communities.”]; see also Scoping Plan at p. 74 [“Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions . . . , low income communities, and communities of color.”].)

III. RESPONDENTS’ EIR VIOLATES CEQA

As explained above, the EIR’s approach to GHG analysis misrepresents the Cap-and-Trade Program and the Project’s place in that scheme. As a result, the EIR takes an unsupportable approach to evaluating the significance of GHG emissions from the Project. Contrary to CEQA’s focus on information disclosure and local responsibility for mitigation, the EIR ignores the vast majority of the Project’s emissions, and, in a misleading analysis, compares only a small fraction of the Project’s emissions to the applicable significance threshold. This flawed analysis leads the EIR to conclude that the impact from GHG emissions would be mitigated to a less-than-significant level, misleading the public and shirking mitigation responsibilities. Even if the Cap-and-Trade Program directly

applied to the Project’s emissions (it does not since, as explained above, this Project is not a covered entity under the Program), this method of evaluating a project’s significance *after* taking into account purported “mitigation” or impact-reducing components is not allowed by CEQA. As a result of its flawed analysis, the EIR fails to adopt all feasible mitigation measures and subverts CEQA’s important political function of ensuring informed decision making and informed public participation.

The EIR’s approach to GHG analysis fails on multiple levels. Perhaps most critically, in addition to pointing to “compliance” with a regulation that simply does not cover the Project to excuse mitigation, the EIR focuses on a single significance consideration while ignoring other evidence showing potentially significant impacts. CEQA does not allow clearly significant GHG impacts to be overlooked, even if a lead agency believes those impacts are considered less than significant under one particular metric. (See, e.g., *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal.App.3d 872, 274 [citizens’ personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards]; accord *SANDAG, supra*, 3 Cal.5th at p. 515 [“An adequate description of adverse environmental effects is necessary to inform the critical discussion of mitigation measures and project alternatives at the core of the EIR”].) This failure to address potentially significant impacts not only minimizes the Project’s significant impacts, but also warps the evaluation of whether the Project’s contribution to GHG emissions is a cumulatively considerable impact. (CEQA Guidelines, § 15064.) The cumulative effect of dozens of similar warehouse projects in the Moreno Valley area could—and almost certainly will—be significant.

A. The EIR improperly applies CEQA Guidelines Section 15064.4 to determine the significance of the Project’s GHG emissions.

The Resources Agency, the state’s expert on CEQA, has rejected the approach of using purported “compliance” with an inapplicable program to mitigate emissions. (Final Statement of Reasons for the CEQA Guidelines Amendments (2018) at p. 27 [“a subdivision project could not demonstrate ‘consistency’ with [CARB’s] Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision”].)

The EIR misapplies CEQA Guidelines section 15064.4, which offers multiple factors a lead agency should consider in assessing the significance of impacts from GHG emissions. That Guideline provides, in pertinent part:

- (b) A lead agency should consider the following factors, *among others*, when assessing the significance of impacts from greenhouse gas emissions on the environment:
 - (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
 - (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - (3) The extent to which *the project complies* with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project’s incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a *particular project* are still cumulatively considerable notwithstanding compliance with the adopted

regulations or requirements, an EIR must be prepared for the project.⁹

(CEQA Guidelines, § 15064.4, subd. (b), italics added.)

As reflected in subdivision (b)(3), compliance with “regulations or requirements adopted to implement a statewide, regional, or local plan” can factor into the assessment of GHG significance, but only when *the project complies* with those regulations or requirements. Yet, the EIR relies upon subsection (b)(3) to claim that emissions for which upstream suppliers surrendered allowances need not be analyzed and mitigated under CEQA. This approach excuses all of the Project’s transportation- and electricity-related emissions, thus requiring analysis and mitigation of only a tiny fraction of the Project’s emissions.

⁹ The 2018 update to the CEQA Guidelines added the following language:

(b) In determining the significance of a project’s greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.

(b)(3) . . . In determining the significance of impacts, the lead agency may consider a project’s consistency with the State’s long-term climate goals or strategies, provided that substantial evidence supports the agency’s analysis of how those goals or strategies address the project’s incremental contribution to climate change.

(c) A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Respondents' application of subdivision (b)(3) to this Project is wrong. Because the Project is not a covered entity under the Cap-and-Trade Program, subsection (b)(3) is inapplicable, as the project cannot "comply" with Cap-and-Trade at all. Moreover, as discussed above, such "compliance" would undermine Cap-and-Trade's purposes if adopted as a CEQA approach, not serve the environmental goals both AB 32 and CEQA set out to deliver.

B. The EIR failed to apply the SCAQMD's GHG emissions threshold to *all* of the Projects' GHG emissions.

The EIR takes an impermissible approach of applying the Cap-and-Trade Program to ostensibly reduce the Project's emissions significantly, then comparing only that reduced quantity to the bright-line significance threshold. This approach is not supported in law.¹⁰

CEQA requires lead agencies to "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." (CEQA Guidelines, § 15064.4.) CEQA then provides that the lead agency must consider "whether *the project emissions* exceed a threshold of significance the lead agency determines applies to the project." (*Id.* at subd. (b)(2).) As explained in the EIR, a potentially appropriate

¹⁰ The EIR also attempts to justify excluding "capped emissions" from its significance analysis by referencing two seemingly cherry-picked 2013 mitigated negative declarations from other lead agencies, and one 2014 guidance document from the San Joaquin Valley Air Pollution Control District (SJVAPCD). (EIR 4.7-33.) The EIR does not explain why it chose to follow the methodology allegedly used in two obscure mitigated negative declarations and in a policy document from an air district in a different air basin, rather than following traditional CEQA GHG analysis and mitigation principles. These irrelevant, project-specific documents do not constitute substantial evidence supporting Respondents' argument.

significance threshold in this case is the South Coast Air Quality Management District's (SCAQMD) SCAQMD's 10,000 metric ton limit.¹¹ (EIR at p. 4.7-32.)

The problem here is that the EIR does not compare the Project's total GHG emissions against this 10,000 metric ton threshold, and then mitigate those emissions to below that threshold to the extent feasible. Instead, the EIR simply subtracts from the total any GHG emissions it deems to be "capped," and compares only the few "non-capped" emissions to the bright-line threshold. Because the EIR only compares a small fraction of the Project's GHG emissions to the applicable bright-line significance threshold, it only requires relatively minor mitigation measures to reduce the Project's emissions to what the EIR considers "less than significant." (EIR at pp. 1-55–57.)

Respondents' approach improperly applies so-called "mitigation" (the Cap-and-Trade Program) *before* comparing GHG emissions to the significance threshold. By combining impacts and mitigation analyses, it is unclear how the purported mitigation reduces impacts. This approach was rejected in *Lotus v. Dept. of Transportation* (2014) 223 Cal.App.4th 645, where the court stated:

The failure of the EIR to separately identify and analyze the significance of the impacts . . . before proposing mitigation measures is not merely a harmless procedural failing. . . . [T]his shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decisionmaking and informed public participation. It precludes both identification of potential

¹¹ It is worth noting that the Scoping Plans are not binding as to any particular CEQA methodology, or as to land use planning generally, and do not require use of any particular significance threshold. They are guidance documents; individual land use authorities can and do depart from particular suggestions in them if they have appropriate reasons to do so. The issue in this case, however, is that the Cap-and-Trade program does *not* provide such an appropriate reason.

environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The deficiency cannot be considered harmless.

(*Id.* at p. 658.)

Furthermore, if the full scope of the GHG emissions attributable to the Project were compared to the applicable bright line threshold, the emissions, as mitigated, would still be substantially over the threshold—and would therefore require consideration of additional mitigation measures. (See EIR, pp. 4.7-35–36.)

Applying appropriate mitigation measures to reduce the so-called “capped” emissions would not “result in double counting and double mitigating emissions that are already mitigated through cap-and-trade” as Respondents assert. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 57.) Gesturing towards Cap-and-Trade regulated entities is not proper mitigation because Cap-and-Trade does not apply to this Project in any way, and the Project itself has ample mitigation opportunities onsite. To mitigate this Project’s GHG emissions, Respondents would have to address emissions from mobile sources, which account for over 70% of the Project’s total emissions (which again are nearly 40 times greater than the significance threshold). (AR002729.) To reduce these emissions, fewer trucks could drive from the Project to the Ports of Long Beach and Los Angeles every day, the Project could be built closer to the ports, the Project could require more zero emission vehicles be used or provide charging equipment or incentives to encourage their use, or any number of other meaningful mitigation measures. But Cap-and-Trade does not require any of this. Such measures are instead included by local governments in local land use projects to ensure approved project impacts fall below significance thresholds. By never counting the “capped” emissions toward the significance threshold, there is *no* counting and *no*

project-level mitigation of hundreds of thousands of tons of yearly GHG emissions from this Project.

C. Respondents fail to consider the long-term GHG impacts of the Project.

The Supreme Court has made clear that an EIR should consider a project’s long-term GHG impacts, and should address whether the project as a whole is in accord with the state’s climate goals. (*Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG*) at p. 515.)¹² The state’s climate change goals extend beyond 2030. (See, e.g., Executive Order S-03-05 [established a statewide target of reducing GHG emissions to 80 percent below 1990 levels by 2050].) Because the Project is expected to operate for decades into the future, Respondents must account for emissions beyond 2030. But Respondents fail to account for emissions beyond that point—despite the fact that the Project’s full operation will not start until *five years later*, in 2035. (EIR at p. 4.3-61.) Respondents present no substantial evidence that any of the Project’s post-buildout operational emissions are mitigated by the Cap-and-Trade Program. (See, e.g., EIR, pp. 4.7-36–37 [stating, without citation, that “[s]ome of the project’s GHG emissions are subject to the requirements of the AB 32 Cap and Trade Program and will have a GHG allocation based on current GHG emissions levels”].) This is not an adequate CEQA analysis. (See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 904 [EIR must contain substantial evidence that mitigation measures will reduce associated impacts to less-

¹² The parties in *AIR v. Kern* did not have the opportunity to brief the significance of *SANDAG* because the California Supreme Court filed its opinion in *SANDAG* over a month after the close of briefing in *AIR v. Kern*. It appears to amici that this is the first case at the California Court of Appeal where parties have had the opportunity to address both *SANDAG* and *AIR v. Kern* in their briefs.

than-significant-levels, such as by requiring compliance with applicable regulatory standards and preparation of site-specific studies]; Cal. Code Regs. tit. 14, § 15370, subd. (d) [“mitigation” includes “[r]educing or eliminating the impact over time by preservation and maintenance operations during the life of the action”].)

D. Reliance on *AIR v. Kern County* is improper.

Respondents incorrectly claim the Fifth Appellate District’s decision in *Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708 (*AIR*) upheld the use of the same GHG methodology as Respondents attempt to use here. (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 53.) Respondents’ use of the Cap-and-Trade Program here goes far beyond what was sanctioned in *AIR*. In *AIR*, the project being evaluated under CEQA was a refinery, a *covered entity* under Cap-and-Trade. The court held a lead agency was authorized “to determine that a project’s greenhouse gas emissions will have a less than significant effect on the environment based on *the project’s* compliance with the cap-and-trade program.” (*Id.* at p. 718; italics added.) Regardless of whether or not *AIR* was rightly decided, *here*, the question is much simpler and different from the question before the court in *AIR*. Here, it is undisputed that the Project is *not* a covered entity required to comply with the Cap-and-Trade Program. (Cal. Code Regs., tit. 17, § 95811.) Accordingly, this Court need only decide if projects that are *not* covered entities under Cap-and-Trade are nonetheless allowed to use the program to ignore significant GHG emissions they cause. The answer to that question is no.

Respondents argue the distinction between covered and non-covered entities is “a distinction without a difference.” (Combined Respondents’ and Cross-Appellants’ Opening Brief at p. 63.) Respondents are incorrect.

This distinction is crucial under CEQA and vital to the success of California’s ambitious climate policies.

From a CEQA perspective, the distinction is important because CEQA Guidelines section 15064.4, subdivision (b)(3) instructs lead agencies to consider the extent to which *a project* complies with GHG regulations or requirements. It is thus inappropriate for entities downstream in the chain of commerce from a covered entity to rely upon compliance with the Cap-and-Trade Program as a basis for avoiding analysis of project-related emissions.

From a policy perspective, as described above, the distinction is crucial because projects that are not subject to the Cap-and-Trade Program do not have the same direct incentives to reduce their GHG emissions as covered facilities, and Cap-and-Trade alone is not designed to achieve California’s ambitious climate goals. The distinction between covered and not-covered entities is thus crucial to the portfolio of climate change measures the state is relying on to protect our citizens going forward.

E. Respondents’ GHG analysis obfuscates the climate change impacts of this Project, undermining CEQA’s public disclosure purpose.

By failing to comply with CEQA Guidelines Section 15064.4, failing to compare all of the Project’s emissions to the GHG emissions threshold, and failing to consider the long-term GHG impacts of the Project, Respondents’ analysis undermines the informational purpose of CEQA. The purpose of an EIR “is to inform the public generally of the environmental impact of a proposed project.” (Cal. Code Regs. tit. 14, § 15003, subd. (c).)

CEQA prohibits public agencies from approving or carrying out a project that will have significant effects on the environment unless the agency makes “findings” demonstrating either that it made changes to the

project to avoid or mitigate those significant impacts, or that certain overriding considerations outweigh the impact. (Pub. Resources Code, § 21081.) Without a full and accurate disclosure of the Project’s impacts, Respondents erroneously concluded that the GHG impact would be less-than-significant, and thereby avoided making the subsequent findings that would inform the public whether the Project’s significant impacts are unavoidable and/or justified. Additionally, Respondents’ approach hinders the public’s ability to submit informed comments during the EIR’s public comment period—aside from addressing the *lack* of analysis—because the public is not provided with, and thus cannot evaluate, complete information or proper CEQA analysis.

CONCLUSION

California is striving on all fronts to meet its ambitious, long-term GHG reduction objectives; the health of its citizens and the environment depend on it. But this Court’s approval of Respondents’ approach to GHG analysis and mitigation would treat the Cap-and-Trade Program as the sole remedy to limit GHG emissions from land-use projects, placing unnecessary strain on Cap-and-Trade’s cost-effectiveness and seriously undermining the state’s critical climate change efforts. Amici respectfully request this Court reject the trial court’s holding and find in favor of Appellants as to GHG analysis.

Dated: January 10, 2020

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CERTIFICATE OF COMPLIANCE

I certify that the attached Brief of Amici Curiae the Attorney General and the California Air Resources Board in Support of Plaintiffs and Respondents Albert Thomas Paulek, *et al.* and Plaintiffs and Appellants Laborers International Union of North America, Local 1184, *et al.* uses a 13 point Times New Roman font and contains 7,647 words.

Dated: January 10, 2020

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No.: **E071184**

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I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on January 10, 2020, at Sacramento, California.

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Declarant

/s/ Paula Corral
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Attachment C

Additional Documentation

Attachment to Comment Letter

3-F1



CONSERVATION THRESHOLDS FOR LAND USE PLANNERS





Front Cover:

Encroachment, Gnatcatcher Habitat

Photo courtesy of Claire Dobert, U.S. Fish and Wildlife Service.

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INTRODUCTION

While there are many threats to biological diversity in the United States, the loss and fragmentation of habitats and ecosystems have become the most significant (Wilcove et al. 1998). The survival of plant and animal species and whether our natural systems will continue to provide essential services—recycling of nutrients, flood and pest control, and maintenance of clean air, water, and soil—significantly depends upon where and how land is used, converted, and managed. Land use change resulting from development and associated human activities (e.g., agriculture, grazing, forest harvesting, and hunting) often alters the abundances and varieties of native species; introduces novel and potentially detrimental species to an area; and disrupts natural water and nutrient cycles, and natural disturbance patterns (e.g., fire) (U.S. Geological Survey 1998).

Everyday, land use planners are faced with decisions regarding whether and how land is developed, parcelized, and used, and in what pattern. For the most part, such land use decisionmaking occurs without taking into account individual and cumulative impacts to biological resources. Implementing biologically sensitive spatial planning early in the development process will help preserve our natural heritage for the future, since the most crucial time for planning is when the first 10 to 40 percent of the natural vegetation is altered or removed from the landscape (Forman and Collinge 1997). A growing interest exists among land use planners and developers to use the tools at their disposal to better protect biological diversity. However, these professionals often lack the necessary information to incorporate ecological principles into their decisionmaking and to transform their traditional planning approaches into progressive, ecologically-based conservation tools.

To encourage and facilitate better integration of ecological knowledge into land use and land management decision-making, the scientific community needs to provide planners with applicable ecological information and guidance. To this end, the Ecological Society of America (ESA) convened a

committee of leading scientists to identify principles of ecological science relevant to land use and to develop guidelines for land use decisionmaking.¹ The result was the development of eight general guidelines to assist land use planners in evaluating the ecological consequences of their decisions (see Box 1).

Conservation guidelines, such as those established by the ESA Land Use Committee, are designed to be flexible and to apply to diverse land use situations. As a result, they tend to be general in nature. For ecological principles to be put into practice, however, land use planners will need more specific information on potential threshold responses of species and ecosystems to development activities, particularly in relation to habitat fragmentation. To facilitate the adequate preservation of contiguous or

connected natural areas, land use planners will need to know what science tells them about the minimum sizes of habitat patches species need to survive, or the amount of habitat necessary for the long-term persistence of native populations and communities in a region. In addition, they need information about the adequate size and placement of habitat corridors that would facilitate species movement and colonization among disjunct habitat patches, and about recommended widths of riparian buffers to protect water quality and provide wildlife habitat. Similarly, knowing the extent to which edges influence natural habitats would help land use professionals evaluate the effective area of any given habitat patch or corridor. Other fragmentation thresholds—such as the maximum distance between isolated patches tolerable in a landscape before ecological processes and patterns become disrupted—would arm decisionmakers with specific parameters that could be incorporated into land use design and modeling.

“Spatial planning is most significant in nature conservation when 10-40% of the natural vegetation has been removed from a landscape.”

Forman and Collinge (1997), Landscape and Urban Planning 37, p. 129

¹ “The Ecological Society of America (ESA) is a non-partisan, nonprofit organization of scientists founded in 1915 to: promote ecological science by improving communication among ecologists; raise the public’s level of awareness of the importance of ecological science; increase the resources available for the conduct of ecological science; and ensure the appropriate use of ecological science in environmental decision making by enhancing communication between the ecological community and policy-makers.”
As cited in Ecological Society of America. “About ESA.” <www.esa.org> (31 July 2002).

Given the inherent complexity of ecological systems, scientists are understandably reticent about providing exact prescriptions for land use planning and design because answers vary depending on the species, ecosystem, or scale in question. Nevertheless, by not promoting the use of even

partial knowledge about species or ecosystem responses to human disturbance and fragmentation, the result is that land use decisions—even the most well-intentioned—are being made completely uninformed by science.

BOX 1. GUIDELINES FOR LAND USE PLANNING AND MANAGEMENT

In the face of rapid land use change, the Ecological Society of America's Land Use Committee recommends that land use planners and developers take into consideration the following eight guidelines to evaluate the potential impact of their decisions on our natural systems (see Dale et al. 2000 for full discussion):

1. Examine the impacts of local decisions in a regional context.

The persistence of species and the sustainability of ecosystems are determined not only by immediate surroundings but also by larger landscape factors, such as how habitats are interspersed across the landscape. Thus, local land alterations may have broad-scale regional impacts. Land use planners should both identify the surrounding region that is likely to affect and be affected by a local project and examine how adjoining jurisdictions are using and managing their lands. Regional environmental data (e.g., land cover classes, hydrologic patterns, and habitats for species of concern) should be incorporated into the decision-making process to facilitate a regional assessment of impacts.

2. Plan for long-term change and unexpected events.

Ecological processes, such as nutrient cycling, energy flow patterns, and disturbance regimes, may function over lengthy and variable time scales. In addition, ecosystems change over time. As a result, impacts posed by land use decisions are often long-term and unpredictable. Impacts may be delayed and not fully realized until years or decades later, or they may be cumulative such that a "unique trajectory of events" results that could not have been predicted from any single event. The complexity and variability of ecosystem responses dictate that land use decisions consider potential occurrences and implications of unanticipated and long-term events (e.g., variations in weather and disturbance patterns).

3. Preserve rare landscape elements and associated species.

Rare landscape elements, such as wetlands, riparian and mountain zones, and old-growth forests, often provide critical habitats for rare and endangered species. To protect a region's biological diversity, the natural diversity within a landscape must be preserved. Land use planners should identify the location of rare and unique landscape elements, by methods such as inventory and analysis of vegetation types, geology, hydrology, and physical features, and by their associated species. Once such landscape elements are identified, development should be guided away from such areas and toward more common landscape features.

4. Avoid land uses that deplete natural resources over a broad area.

Depletion of natural resources over time will lead to the irreversible disruption of ecosystems and associated processes. Consequently, land use planning and development should strive

to prevent the diminishment of natural resources (e.g., soil, water, and habitat types such as wetlands) in any given area by identifying vital or at-risk resources and by taking the necessary precautions to avoid actions that threaten resource sustainability. Certain land uses or land activities may be deemed altogether incompatible in particular settings.

5. Retain large contiguous or connected areas that contain critical habitats.

Large habitat patches typically support a greater diversity and abundance of plants and animals and can maintain more ecosystem processes than small patches. Large intact habitats provide more resources, allowing larger populations of a species to persist, thus, increasing the chance of survival over time. Parcelization of large habitats often decreases the connectivity of systems, negatively affecting the movement of species necessary for fulfilling nutritional or reproductive requirements. To counter such effects, large intact areas and small areas that are well connected to other critical habitats should be protected.

6. Minimize the introduction and spread of non-native species.

Non-native species often negatively affect the survival of native species and disrupt the functioning of ecosystems. The spread of non-natives is facilitated by the development of transportation infrastructure and by the creation of edge environments and artificial landscapes. Land use professionals should strive to minimize the potential introduction and spread of non-native species into natural environments.

7. Avoid or compensate for effects of development on ecological processes.

Development may not only cause site-specific impacts, but may also disturb regional ecological processes. Ecological processes, such as fire, grazing, dispersal patterns, and hydrologic cycles, help to sustain plant and animal populations across a landscape. Thus, land uses that could negatively affect other systems or lands through the disruption of these processes should be avoided while those that benefit or enhance ecological attributes should be encouraged.

8. Implement land use and land management practices that are compatible with the natural potential of the area.

The natural potential of a site, as determined in part by local physical and biologic conditions, should be factored into how land is used and managed. Land uses that do not take advantage of a site's natural potential or consider its limitations, will likely result in unnecessary resource loss and high economic costs.

For more information on ecological principles to guide land use planning decisionmaking, see Dale et al. (2000), Duerksen et al. (1997), and Dramstad et al. (1996).

FROM GUIDELINES TO THRESHOLDS

The Environmental Law Institute (ELI) surveyed existing scientific literature to determine whether a body of knowledge has emerged within the scientific community relevant and applicable to national land use decision-making, specifically pertaining to biological conservation thresholds. A literature search of the major ecological, conservation, and land use journals was conducted using the Science Citation Index (ISI Web of Science) using search terms under the following categories: habitat fragmentation,² buffers,³ corridors,⁴ ecological thresholds,⁵ and indicator species.⁶ To increase applicability to current land use decisionmaking in the states, the search was confined to studies pertaining to the continental United States, as well as articles published between 1990-2001, and pre-1990 articles commonly cited within the scientific community. Only those articles containing quantitative information directly relevant to determining conservation thresholds for land use planning and land management were considered.⁷ In addition to the literature search, review papers found in the gray literature (e.g., those produced by land management and regulatory agencies) were also included when possible and applicable.

ELI found adequate information on potential ecological threshold measures for the following areas: habitat patch area, percent of suitable habitat, edge effects, and buffers. Corridor design is reviewed in brief; however, specific guidance on corridor size was not feasible given inadequate available information within the scientific literature. This survey reflects scientific information largely related to habitat fragmentation and landscape ecology issues, with a focus on the spatial relationships (e.g., size, shape, location) and interactions of land attributes over large geographic areas.⁸ This

review does not cover other important conservation elements such as how to account for the biological integrity or ecological significance of habitat patches, which land use planners should consider when determining which parcels of land to protect. In addition, the thresholds presented in this review does not adequately address the conservation of species or habitat types that are naturally rare or localized (e.g., those with patchy distributions or limited ranges).

This report summarizes the Institute’s findings and provides a platform for identifying gaps in existing knowledge to help guide more in-depth ecological research directly applicable to land use planning. This report in no way attempts to misrepresent the complexity of species and ecosystem response to land conversion, degradation, and fragmentation by providing simplified prescriptions. Land use planners should cautiously interpret the presented threshold values and ranges and tailor them to their unique circumstances and geographic settings.

First and foremost, land use planners need to establish their priorities for conservation—whether they be water quality or quantity, wildlife habitat, or biodiversity. In addition, conservation targets need to be established—whether they be regionally rare or endangered species or unique landscape elements (e.g., wetlands, old growth forests, riparian zones), or other targets—because this will directly influence the value and scale of any threshold.⁹ Thresholds should be chosen or developed to meet the needs of the resources a locality is most concerned with managing and conserving. Planners should place great emphasis on evaluating site-specific and regional physical and biological conditions that influence the resiliency of particular systems to human disturbance.

The threshold values presented in this report should not detract from the larger goals of conserving or restoring indigenous species, rare and representative habitats, ecosystem functions, and natural connectivity. Where possible, the ESA land use guidelines should be followed. Land use planners should strive to protect large, intact parcels of land, high quality and ecologically important habitat, and where appropriate, should connect protected natural areas. When development is deemed necessary, land use planners should promote more compatible land uses and avoid or minimize fragmenting habitat patches wherever possible.

² To locate papers with potential habitat fragmentation threshold information, the following search terms were used: minimum habitat size, habitat size, habitat requirement, habitat fragmentation, patch size, minimum fragment size, island biogeography, landscape connectivity, habitat connectivity, and metapopulation theory.

³ To locate papers with potential threshold information on buffer width, the following search terms were used: riparian buffer, wetland buffer, buffer zone, buffer distance, forest buffer, buffer width, and buffer size.

⁴ To locate papers with potential threshold information on corridor width, the following search terms were used: fragment connectivity, boundary permeability, landbridge, highway overpass, highway underpass, stream cross, habitat corridor, corridor, migration corridor, riparian corridor, and underpass.

⁵ To locate papers with potential ecological threshold information, the following search terms were used: ecological threshold, conservation threshold, environmental threshold, and landscape threshold.

⁶ To locate papers with potential threshold information relevant to indicator species, the following search terms were used: indicator species, indicator species and habitat fragmentation, and indicator species and thresholds.

⁷ The majority of the papers encountered and selected focus on terrestrial species and to a lesser extent freshwater aquatic communities.

⁸ As defined by Risser et al. (1984), "Landscape ecology considers the development and dynamics of spatial heterogeneity, spatial and temporal interactions and exchanges across heterogeneous landscapes, influences of spatial heterogeneity on biotic and abiotic processes, and management of spatial heterogeneity."

⁹ Thresholds presented in this report reflect a taxonomic bias in the scientific literature toward birds and mammals. Thus, for many of the recommended threshold values, these two animal groups are assumed to be the conservation targets.

BOX 2. DEFINITION OF TERMS

Biological diversity (or biodiversity) – the variety of life and its processes, which includes the abundances of living organisms, their genetic diversity, and the communities and ecosystems in which they occur (The Keystone Center 1991). Diversity at all levels from genes to ecosystems need to be maintained to preserve species diversity and essential ecosystem services like climate regulation, nutrient cycling, water production, and flood/storm protection (Dale et al. 2000).

Biological (or ecological) integrity – refers to a system's wholeness, including presence of all appropriate elements and occurrence of all processes at appropriate rates, that is able to maintain itself through time (Angermeier and Karr 1994).

Boundary – a zone comprised of the edges of adjacent ecosystems or land types (Forman 1995).

Corridor – a linear strip of a habitat that differs from the adjacent land on both sides, connecting otherwise isolated larger remnant habitat patches (Forman 1995, Fischer et al. 2000).

Buffers – linear bands of permanent vegetation, preferably consisting of native and locally adapted species, located between aquatic resources and adjacent areas subject to human alteration (Castelle et al. 1994, Fischer and Fischenich 2000).

Ecosystem – a geographic area including all the living organisms (e.g., people, plants, animals, and microorganisms), their physical surroundings (e.g., soil, water, and air), and the natural cycles (nutrient and hydrologic cycles) that sustain them. Ecosystems can be small (e.g., single forest stand) or large (e.g., an entire watershed including hundreds of forest stands across many different ownerships) (USFWS 1994).

Ecosystem functions – the biophysical processes that take place within an ecosystem, apart from any human context (e.g. nutrient, energy, and hydrologic cycling; or soil formation).

Ecosystem services – refer to the ecosystem goods (e.g., food, and medicine) and services (e.g., climate regulation, water purification, and flood control) that humans derive benefit, directly or indirectly, from ecosystem functions (Costanza et al. 1997).

Ecosystem sustainability – the tendency of a system to be maintained or preserved over time without loss of decline to elements such as its structure, function, diversity, and production. Sustainability is widely regarded as economically and ecologically desirable and the only viable long-term pattern of human land use (Dale et al. 2000).

Edge – the portion of an ecosystem or habitat near its perimeter, where influences of the surroundings prevent development of interior/core-area environmental conditions (Forman 1995).

Edge effects – the negative influence (e.g., such as the profound modifications of biological and physical conditions) of habitat or ecosystem edges on interior conditions of habitat or on associated species (Meffe and Carroll 1997, Lindenmayer and Franklin 2002).

Habitat – consists of the physical features (e.g., topography, geology, stream flow) and biological characteristics (e.g., vegetation cover and other species) needed to provide food, shelter, and reproductive needs of animal or plant species (Duerksen et al. 1997).

Habitat fragmentation – the breaking up of previously continuous habitat (or ecosystem) into spatially separated and smaller parcels. Habitat fragmentation results from human land use associated with forestry,

agriculture, and settlement, but can also be caused by natural disturbances like wildfire, wind, or flooding. Suburban and rural development commonly change patterns of habitat fragmentation of natural forests, grasslands, wetlands, and coastal areas as a result of adding fences, roads, houses, landscaping, and other development activities (Dale et al. 2000).

Landscape – a large heterogeneous land area (e.g., multiple square miles or several thousand hectares) consisting of a cluster of interacting ecosystems repeated in similar form (e.g., watershed) (Forman 1995, Duerksen et al. 1997).

Land use – the purpose to which land is used by humans (e.g., protected areas, forestry for timber production, plantations, row-crop agriculture, pastures, or human settlement) (Dale et al. 2000).

Local population – set of individuals of a species that live in the same habitat patch and interact with each other; most naturally applied to "populations" living in such small patches that all individuals practically share a common environment (Hanski and Simberloff 1997).

Matrix – the background ecosystem or land use type in a mosaic, characterized by extensive cover, high connectivity, and/or major control over the landscape functioning (Forman 1995). For example, in a large contiguous area of mature forest embedded with numerous small disturbance patches (e.g., timber harvest patches or clearcut areas), the mature forest constitutes the matrix element type because it is greatest in areal extent, is mostly connected, and exerts a dominant influence on the associated species and ecological processes (McGarigal 2003).

Metapopulation – a network of semi-isolated populations with some level of regular or intermittent migration and gene flow among them, in which individual populations may be extinct but then be recolonized from other subpopulations (Meffe and Carroll 1997).

Mosaic – a pattern of patches, linear corridors, and matrix in a landscape (Forman 1995).

Minimum viable population - The minimum viable population size is the smallest number of individuals required to maintain a population over the long-term (Forman 1995).

Non-native (or exotic) species – organisms (plants, animals, insects, and microorganisms) that occur in locations beyond their known historical, natural ranges or have been brought in from other continents, regions, ecosystems, or habitats (National Invasive Species Council 2001).

Patch – a relatively homogeneous type of habitat that is spatially separated from other similar habitat and differs from its surroundings (Forman 1995).

Remnant patch – habitat patches that escape disturbance (e.g., development) and are left remaining from an earlier more extensive span of habitat (e.g., woodlots in an agricultural area) (Dramstad et al. 1996).

Scale – the relative size or degree of spatial resolution of an area of interest. Small areas of interest (e.g., area around a house of single subdivision) are considered to be fine scale; in contrast to a larger area (e.g., a county or watershed), which is considered to be of coarse scale (Forman 1995, Duerksen et al. 1997).

Suitable habitat – habitat that meets the survival and reproductive needs of a species, allowing for a stable or growing population over time (Lamberson et al. 1994).

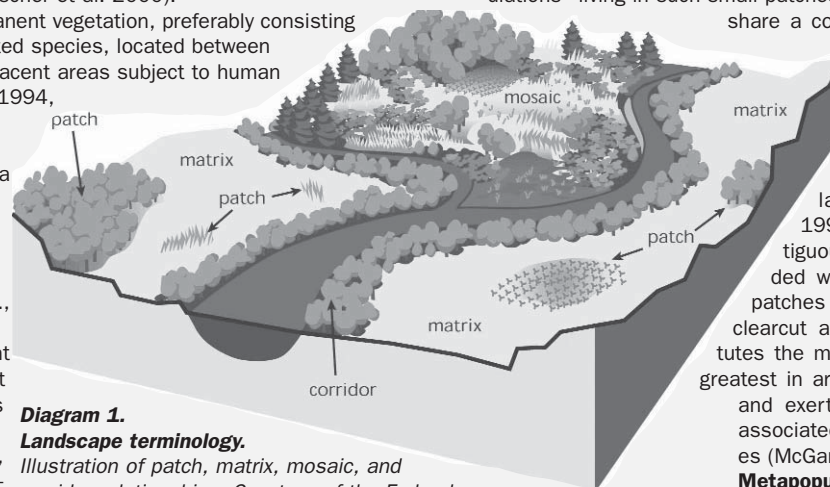


Diagram 1.

Landscape terminology.

Illustration of patch, matrix, mosaic, and corridor relationships. Courtesy of the Federal Interagency Stream Restoration Working Group (FISRWG), Stream Corridor Restoration: Principles, Processes, and Practices (10/98).

THRESHOLDS FOR LAND USE PLANNING: ADDRESSING HABITAT FRAGMENTATION

Habitat fragmentation severely threatens biodiversity and ecosystem functioning wherever humans dominate the landscape. Land use planners play a significant role in determining whether and how landscapes and ecosystems are fragmented or maintain natural connectivity.

Habitat fragmentation is the process whereby contiguous natural areas are reduced in size and separated into discrete parcels. Fragmentation results from a reduction in the area of the original habitat due to land conversion for other uses, such as residential and commercial development. It also occurs when habitat is divided by roads, railroads, drainage ditches, dams, power lines, fences or other barriers that may prohibit the free movement and migration of plant and animal species (Primack 1993, Forman 1995). When habitat is destroyed, a patchwork of habitat fragments is left behind, often resulting in patches that are isolated from one another in a modified and inhospitable landscape matrix.¹⁰ Fragmentation causes the microclimate to be altered due to changes in solar radiation, wind, and humidity; habitat patches become more isolated with a growing distance between remnant patches; and the resulting landscape is modified by changes in size and shape of the resulting patches (Saunders et al. 1991). These changes have varying impacts on species persistence and ecosystem sustainability.

Groups of organisms respond differently to habitat fragmentation. Some species, such as game species like white-tailed deer and bobwhite quail (referred to as edge species), may actually thrive under altered conditions (Bolger et al. 1997). However, many other species—often rare species and habitat specialists—are negatively affected. Species that depend upon the interior of forests, prairies, wetlands or other natural habitats will be absent from landscapes that lack sufficient natural areas containing true core habitat (Meffe and Carroll 1997). Although a fragmented landscape may enhance the abundance of certain generalist species, overall, fragmentation threatens the maintenance of biodiversity and the functioning of natural systems (Soulé 1991, Forman 1995).



Varying shapes and configuration of habitat patches resulting from habitat fragmentation, Buchanan, Alabama. Courtesy of John R. Tolliver, USDA Forest Service, www.forestryimages.org.

To the detriment of many species, particularly those that are area-sensitive, habitat patches may lack the range of resources necessary to support permanent populations (Primack 1993, Forman 1995). Habitat fragmentation will reduce the foraging and nesting ability of animals and can lead to the rapid loss of species due to the creation of barriers to dispersal and colonization. In a fragmented landscape, normal dispersal will be disrupted when the land surrounding the remaining patches is inhospitable to species formerly thriving in the contiguous habitat (e.g., because it is degraded or is home to predators). For example, many bird species that dwell in the forest interior will not cross even short distances of open areas (Askins 1995). When species migration and dispersal is limited, new immigrants are less likely to supplement diminishing populations, thereby, increasing extinction vulnerability (Askins 1995).

The negative effects of habitat fragmentation are compounded by an altered physical environment (*see* “Edge Effects”). Land conversion and land transformation can cause major alterations in hydrologic regimes, mineral and nutrient cycles, radiation balance, wind and dispersal patterns, and soil stability (Harris 1984 as cited in Collinge 1996; Hobbs 1993 as cited in Forman 1995). Changes in such ecosystem properties and processes in turn affect native species composition, abundance, and long-term persistence, further degrading the biodiversity and the integrity of the affected natural areas.

¹⁰ Matrix is the background ecosystem or land use type in a mosaic, characterized by extensive cover, high connectivity, and/or major control over the landscape functioning (Forman 1995) (see Box 2).

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 1 (4074 : World Logistics Center)

UNDERSTANDING THE EFFECTS OF FRAGMENTATION

Over the past 25 years, the scientific community has devoted much energy to understanding the various components of fragmentation—the influence of fragment size, shape, configuration, heterogeneity, connectivity, among other factors—and how they effect the sustainability and persistence of species and natural processes in a landscape. Ideally, scientists would understand the influence and interaction of these characteristics on the continued survival of species and the integrity of ecosystems. Due to gaps in scientific knowledge, available information was only found within the literature to present potential threshold responses related to patch area, proportion of suitable habitat, edge effects, and buffers.

This paper provides land use decisionmakers with concrete information culled from the scientific literature in order to translate the land use guideline #5 offered by the Ecological Society of America (see Box 1) for on-the-ground practice. Recommendations on “how to retain large contiguous or connected areas that contain critical habitat” are presented, with specific information on how to best protect habitat patches and sufficient natural area, to minimize edge effects, and to design riparian buffers and habitat corridors.

HABITAT PATCHES

A common consequence of land development is the fragmentation of an originally connected natural landscape into a mosaic of disconnected habitat patches.¹¹ The size of the remaining habitat fragments significantly influences the type, abundance, and diversity of species that can persist in the affected region. In general, large patches better sustain wildlife populations and ecosystem functions over time than small patches. Holding other factors constant—such as patch shape, condition, and configuration—larger areas of habitat tend to support larger population sizes and a greater number of interior, specialist, and native species due to increased habitat diversity and more core area (Harris 1984, Dramstad et al. 1996, Forman 1995). The probability of a species population being extirpated generally increases with decreasing patch size.¹² This is due to the tendency of larger patches to retain a greater array of the natural resources and ecological functions provided by healthy ecosystems than smaller patches with more edge, increased susceptibility to invasion by exotics or predators, and more disturbed conditions

(Soulé 1991, Metro 2001) (see “Edge Effects”). Area-sensitive forest bird species in the mid-Atlantic United States, for example, have been found to exhibit lower species diversity and higher extinction and turnover rates in landscapes with smaller mean forest patch size (Boulinier et al. 2001).

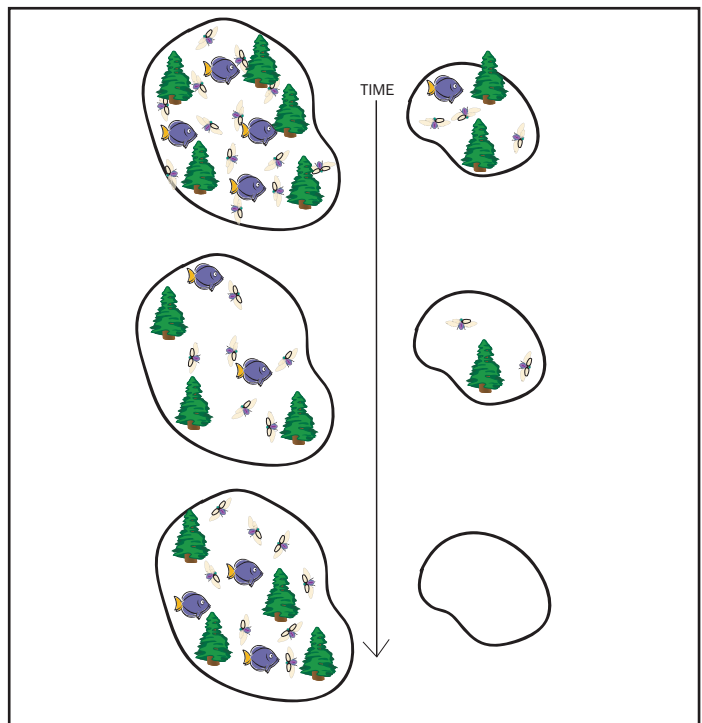


Diagram 2. Patch size and local extinction. Probability of a local species population going extinct increases with decreasing habitat patch size. A larger patch generally supports a larger population size for a given species than a smaller patch, making it less likely that the species will go locally extinct in the larger patch. Modified from Dramsted et al (1996), *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning*, p. 20.

In general, to ensure the survival of individual species, population levels must remain large enough to protect against extinction from random natural events (e.g., floods, fires, droughts) and to maintain sufficient genetic variation to adapt to changing environmental conditions (e.g., changes in rates of predation, competition, disease, and food supply) (Gilpin and Soulé 1986, Meffe and Carroll 1997). A common tool used to determine the size of a population(s) needed to ensure long-term survival is a Population Viability Analysis (PVA). A PVA uses quantitative methods to predict the likely future status of a population or set of populations of conservation concern—often those that are at risk of extinction (Morris et al. 2002). This technique can take into account the many environmental, demographic, and genetic variables that determine extinction probabilities for individual species (Meffe and Carroll 1997).

¹¹ A patch is a relatively homogeneous type of habitat that is spatially separated from other similar habitat and differs from its surroundings (Forman 1995).

¹² What is being discussed in this report is to the local extinction of a species population from a particular habitat or region (termed extirpation or population extinction), rather than the overall elimination of the species worldwide (termed global extinction).

Because plant and animal population size is the best predictor of extinction probability, habitat patches should be large enough to maintain viable populations of important species—including rare, endangered, and economically important species—and to maintain the ecological processes that support these communities. Based on Population Viability Analyses, general guidelines have been proposed for minimum viable population sizes:¹³ 1) populations less than 50 individuals being too small and vulnerable to extinction due to their rapid loss of genetic variability and inability to withstand natural catastrophes; and 2) populations of 1,000 to 10,000 individuals being adequate to ensure long-term persistence (Meffe and Carroll 1997). Such numbers, however, should be viewed with scrutiny because much debate still exists about what size constitutes a minimum viable population for the many different species that make up natural systems (Saunders et al. 1991).

MANAGING FOR ADEQUATE HABITAT PATCH SIZE

For purposes of this review, minimum patch area is the smallest habitat patch that should be protected in order to sustain a species, a diversity of species or communities, or functioning of ecosystems. The literature suggests that, depending on the species or habitat in question, minimum critical patches range from as little as 0.0004 hectares (0.001 acres) (based on the needs of certain invertebrates) up to 220,000 hectares (550,000 acres) (based on the needs of certain mammals) to sustain target species or communities (*see* Appendix B). This wide range reveals that a generic “minimum” critical patch size or habitat requirement does not exist; thresholds are entirely dependent on the target species in question.

Ultimately, the amount of habitat necessary to maintain healthy wildlife populations varies according to many factors, such as taxonomic group, body size, foraging and resource requirements, and dispersal patterns of the species (Bender et al. 1998). Taxonomic groups, such as invertebrates and plants, which have smaller dispersal ranges and tend to respond to their environment at smaller spatial scales, are reported to need less habitat area (e.g., less than 10 hectares or 25 acres) (McGarigal and Cushman 2002).

Larger patch areas are recommended to support bird, mammal, and fish species. Minimum habitat requirements for birds ranged from one hectare up to 2,500 hectares (6,250 acres), with the majority (75 percent) of the values found within the literature to be under 50 hectares (125 acres).¹⁴ Minimum patch size required by mammals ranges from one hectare to 10 hectares for small mammals and up to 220,000 hectares for large-bodied or wide-ranging mam-

mals (e.g., bears, cougars). Larger bodied vertebrates and wide-ranging predators tend to require larger territories to meet resource and reproductive needs (Soulé 1991). Minimum habitat area is greater for predators, such as bears, with recommended patch sizes greater than 900 and 2,800 hectares and cougars with 220,000 hectares (Mattson 1990, Mace et al. 1996, Beier 1993, respectively).¹⁵ In contrast, estimates for habitat requirements for small mammals, such as rodents and rabbits, varied from one hectare to 10 hectares (Soulé et al. 1992, Barbour and Litvaitis 1993, Bolger et al. 1997). Only one study was found to provide evidence on possible watershed area needed to sustain fish species, finding that suitable patch sizes larger than 2,500 hectares might increase the chance of bull trout occurrence in Idaho (Rieman and McIntyre 1995).

Overall, the majority of the findings in this survey pertain to birds and mammals (*see* “A Closer Look at Habitat Patch Size” in Appendix A for specific information on numbers and trends). Few studies were found to recommend patch sizes to sustain plant, invertebrate, or fish populations. Keeping in mind this sample represents a narrow array of species and habitats, the protection of habitat patches of 55 hectares (137.5 acres) or more appears to capture 75 percent of species requirements reviewed in this select survey (*see* Figure 1). Such minimum land parcels, however, are not likely to capture particularly area-sensitive species, like wide-ranging predators or particularly sensitive interior bird species, found to need habitat patches greater than 2,500 hectares (or about 6,175 acres) (Trine 1998, Mattson 1990, and Beier 1993).

Given the great scientific uncertainty and gaps in the knowledge base on minimum habitat requirements of species and ecosystems, land use planners should adopt a conservative approach. The goal should be to maintain sufficiently large intact and well-connected habitat patches that would support the most area-sensitive species, species of greatest environmental concern (e.g., rare, threatened, or endangered species), or focal species, such as keystone species,¹⁶ link species,¹⁷ or umbrella species.¹⁸ Declines in these groups of organisms may have wide ranging implications, negatively affecting the persistence of other associated species and ecosystems (Dale et al. 2000).

Land use planners should carefully consider the conservation needs of species with large-area or specialized life history requirements or that depend upon a combination of different habitats (e.g., large-ranging predators; interior species, or rare species); these species are likely to survive only in rel-

¹⁵ One hectare is equal to approximately 2.5 acres.

¹⁶ Keystone species are species that have greater effects on ecological processes than would be predicted by their abundance or biomass alone (Dale et al. 2000).

¹⁷ Link species are species that exert critical roles in the transfer of matter and energy across trophic levels of a food web or that provide critical links for energy transfer within complex food webs (Dale et al. 2000).

¹⁸ Umbrella species are species that either have large area requirements or use multiple habitats and thus overlap the habitat requirements of other species (Dale et al. 2000).

¹³ The minimum viable population size is the smallest number of individuals required to maintain a population over the long-term (Forman 1995); for example, the size of a population that would have a 95 percent probability of persisting for 100 years (Boyce 1992).

¹⁴ Recommended conservation threshold values are based on the goal of capturing 75 percent of the requirements found for species, communities, and habitats surveyed in this literature review; thus, the third quartile was used by calculating the value for which 75 percent of the threshold values lie below this value (after numerical ranking).

atively large areas or in very specific habitat types (potentially very small, localized areas), which should be actively targeted for protection (Saunders et al. 1991, Ruggiero et al. 1994, Collinge 1996). To help guide conservation planning, umbrella species (e.g., vertebrate mammals such as cougars and grizzly bears) have been proposed as targets for conservation, because their protection may ensure the protection of other secondary species (Franklin 1993). By protecting areas large enough to maintain viable populations of wide-ranging species, sufficient habitat may be maintained to ensure survival of other species dependent on the same habitat. Land use planning that allows for the persistence of focal species—like rare and endangered species, keystone or umbrella species—may help direct land conservation. Land use planners will need the help of local biologists to identify appropriate focal and area-sensitive species in their region to better implement habitat conservation strategies.

Land use planners should strive to protect and maintain habitat patches larger than 55 hectares (137.5 acres).

Even though protecting large expanses of connected habitat is the ultimate goal, this may not be practicable in the often highly developing landscapes in which land use planners often find themselves working. In these settings, land use professionals should try and conserve what habitat remains and, where possible, work with land management agencies and land trusts to identify potential areas for habitat restoration. Working to conserve even the smallest remaining natural areas is important, particularly in human-dominated landscapes. A series of small- or medium-sized reserves may capture a greater diversity of habitat types, environmental heterogeneity, and biological diversity than the preservation of one large fragment (Tschardt et al. 2002) (see “Role of small patches”). Protecting natural habitats with the greatest conservation significance locally and regionally—regardless of size—is vital to preserving biological diversity and ecosystem services. No matter how small habitat patches may be, they still have ecological and/or aesthetic values, whether providing habitat for small organisms like amphibians or insects; providing green space for recreational activities; helping moderate temperature and provide shade in urban areas; or decreasing run-off from streets, pavements, and other impermeable surfaces.

OTHER PATCH AREA DESIGN CONSIDERATIONS

The size of any given habitat patch is only one factor determining whether or not the patch will support species persistence, biological diversity, and ecosystem functions. Other factors to consider are the shape, location/configuration, condition, and boundaries of patches, as well as the role of small habitat patches. The following is general guidance on ways to counteract the negative impacts of habitat fragmentation and habitat loss at a landscape scale.

- Patch shape:** Patch size and shape determine the distance of the patch’s edge to the habitat interior and the amount of core area remaining in any remnant habitat patch (see “Edge Effects”) (Collinge 1996). Shape determines the edge to interior ratio of a habitat patch, which should be as low as possible to minimize edge effects (Wilcove et al. 1986, Saunders et al. 1991, Collinge 1996). Circular habitat reserves are recommended to minimize contact between the protected core habitat and adjacent environmental or human pressures (Wilcove et al. 1986). In contrast, long, thin remnants have proportionally more edge, and thus, more negative edge effects (Forman and Godron 1981, Saunders et al. 1991).

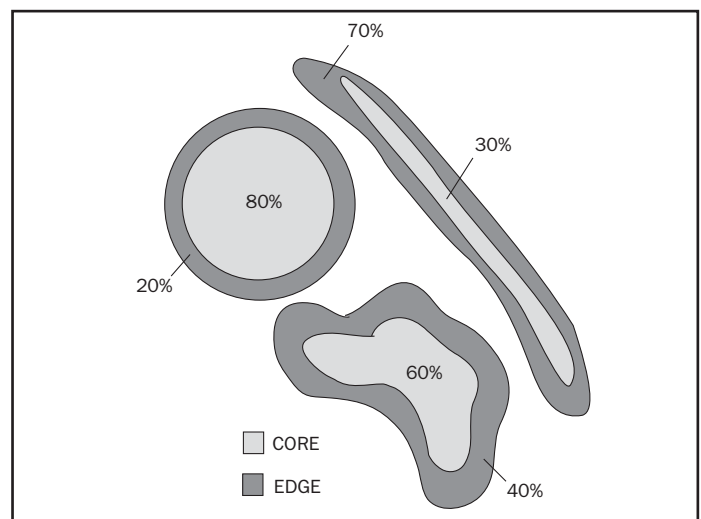


Diagram 3. Patch shape and edge. The edge to interior ratio of a habitat patch is affected by patch shape. A more convoluted, irregular, or linear patch will have a higher proportion of edge, thus, increasing the number of edge species and decreasing the number of interior species.

- Patch location/configuration:** The landscape context in which patches reside may have an even greater effect on the function and sustainability of a habitat fragment than the characteristics of the patch itself (Forman 1995). The distances between suitable habitat patches and the nature of the matrix between these patches will influence species survival (Ruggiero et al. 1994, Andren 1997). In general, more connected habitats are better than isolated habitats because patches in close proximity are likely to enhance species dispersal, recolonization, and persistence (Fahrig and Merriam 1994). Even where wildlife populations may decline or disappear in isolated patches due to random events or patch conditions, recolonization may occur if species are able to successfully disperse from nearby habitat (Pulliam et al. 1992). To maintain demographic linkages, suitable patches should be positioned to provide stop-over points or “stepping stones” for species dispersal (Forman and Godron 1981). The allowable distance between patches will depend

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upon individual species' dispersal capabilities, which vary within and among species groups (Ruggiero et al. 1994, Bender et al. 1998). When making land use planning decisions, practitioners should consider the contribution of patches to the overall landscape structure and how well the location of any given patch relates or links to other patches (Dramstad et al. 1996).

- Boundary zone:** The contrast between a patch edge and the surrounding landscape matrix (also referred to as the boundary zone) affects the severity of edge effects and the dispersal abilities of wildlife populations. The higher the contrast between patch types or patches and their surrounding matrix, the greater the edge effects (Franklin 1993). Boundaries in a landscape could be either “hard” or “soft.” Hard boundaries usually result from human activities, such as clearcutting and development, and have linear borders with high vegetation contrast, such as between a forest and cultivated field. Soft edges, which dominate natural landscapes, tend to have varying degrees of structural contrast with curved habitat boundaries (Forman 1995). To minimize edge effects at the local scale and facilitate the movement of species between a patch and the surrounding matrix, land use planners should mimic naturally occurring edges and provide gradual thinning of vegetation (e.g., smaller shrubs grading into larger shrubs and taller trees at the edge of a wooded patch) rather than an abrupt transition from vegetated to denuded areas (Forman and Godron 1981, Forman 1995, Duerksen et al. 1997).
- Patch condition:** The quality of the habitat patch itself will also influence the ability of remnant species and systems to persist or function over the long-term (Fahrig and Merriam 1994, Forman 1995). Large patches with degraded habitat—such as those dominated by non-native species, or with diminished biological diversity, severe erosion, or modified hydrologic patterns—may have less conservation value than small patches of high biological integrity.¹⁹ The biological integrity of land parcels and whether or not they contain unusual or distinctive landscape features (e.g., cliffs, caves, meadows, thermal features, and vernal pools), old-growth forests or mature habitats, or rare, threatened, or endemic species, are also factors that land use planners should consider when selecting which lands to conserve (Dramstad et al. 1996, Duerksen 1997, Lindenmayer and Franklin 2002).
- Role of small patches:** While large patches generally are recommended to provide sufficient habitat to sustain populations of species—particularly area-sensitive

species—small patches also play a vital role in regional conservation. Although larger patches may contain greater habitat diversity than smaller ones, a collection of multiple small patches may capture a greater array of habitats, and perhaps more rare species, than a single large habitat patch (Forman and Godron 1981, Saunders et al. 1991, Forman 1995, Tschartnke et al. 2002). Small wetlands of less than two hectares, for example, can support surprisingly high species richness of amphibians (Richter and Azous 1995 as cited in Metro 2001). Proximity to core habitat and local habitat heterogeneity, rather than riparian habitat area, may better predict reptile and amphibian richness (Burbink et al. 1998). In addition, small isolated riparian habitat patches have been found to be vital stop-over sites for en-route migratory birds in the southeastern United States (Skagen et al. 1998). If strategically positioned between larger habitat patches, smaller patches can serve as “stepping stones” to allow for greater species dispersal and recolonization (Murphy and Weiss 1988; Burel 1989 and Potter 1990 as cited in Fahrig and Merriam 1994; Forman 1995).

Many of the above described factors influence not only the effective habitat patch size, but also other fragmentation thresholds, such as the proportion of suitable habitat or the amount of edge in a landscape. Thus, land use planners should keep these design considerations in mind when interpreting the thresholds presented below.

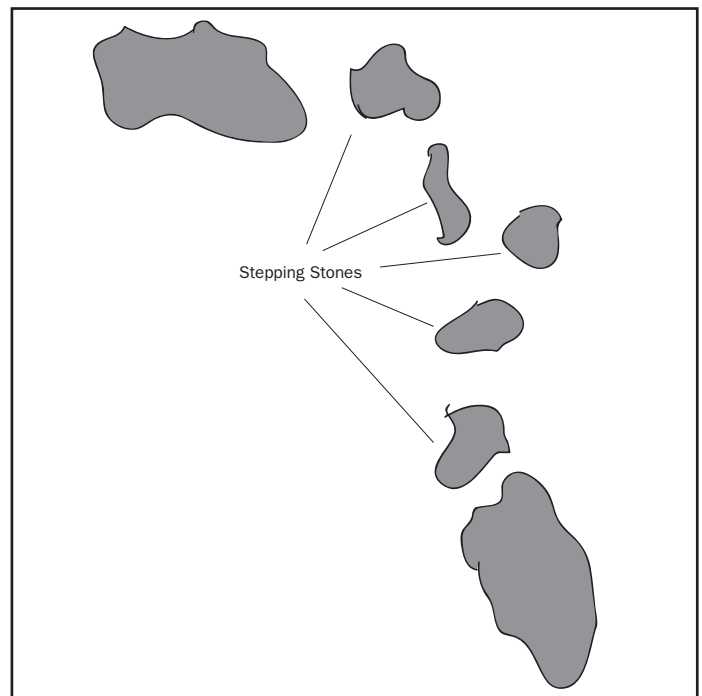


Diagram 4. Stepping stone patches. Protecting habitat patches strategically positioned between larger habitat patches can be a way to enhance species dispersal and colonization in a landscape, and to increase local species population persistence. Modified from Duerksen et al. (1997), *Habitat Protection Planning: Where the Wild Things Are*, p 14.

¹⁹ Biological integrity refers to “a system’s wholeness, including presence of all appropriate elements and occurrence of all processes at appropriate rates” (as cited in Angermeier and Karr 1994).

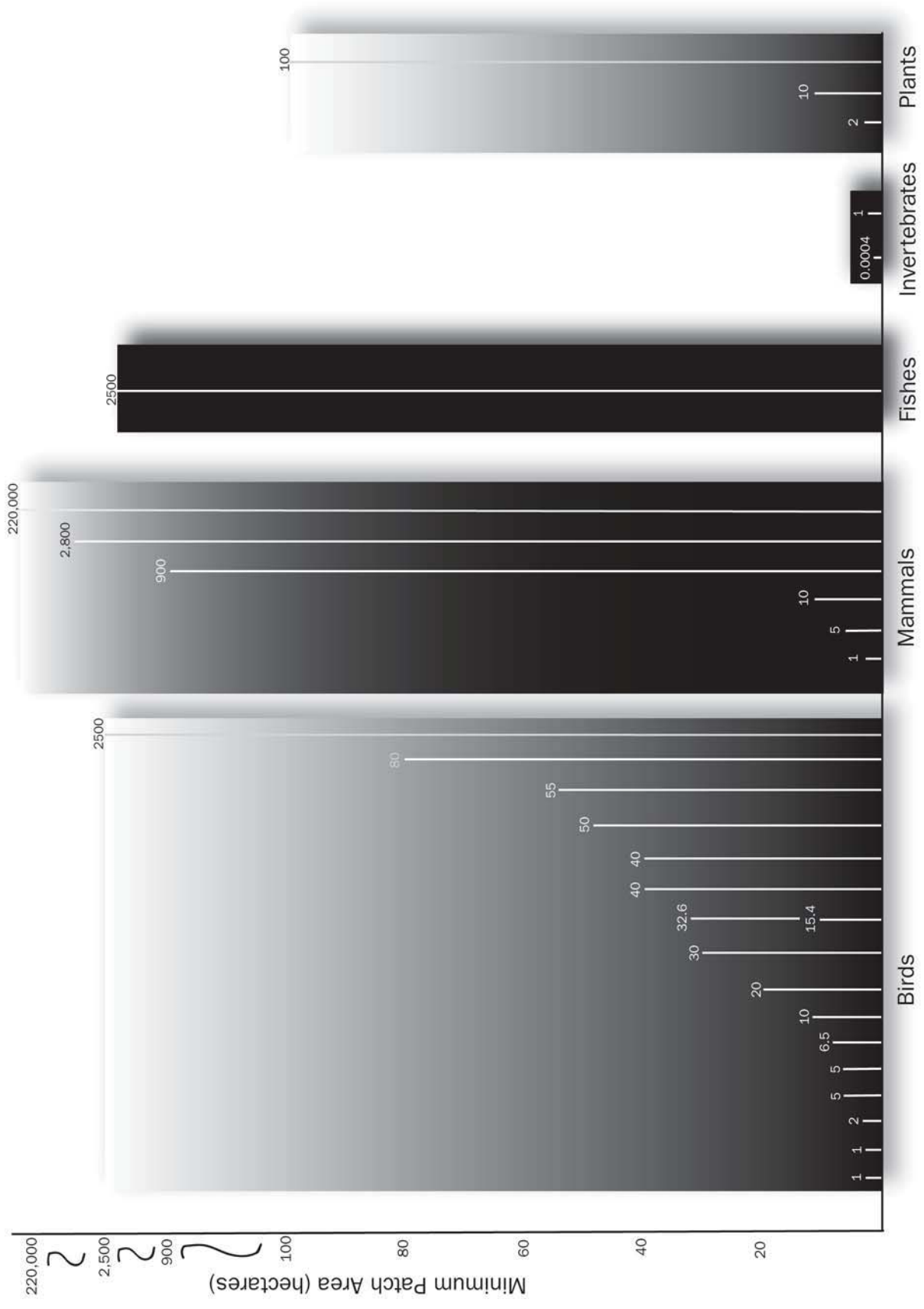


Figure 1. Minimum patch area requirements (in hectares) needed to maintain populations or communities of birds, mammals, fishes, invertebrates, or plants species in the United States, as cited in the scientific literature. Numbers represent the recommended minimum patch area sizes; two numbers along one line indicate a recommended range (see Appendix A for specific findings). Lines extend from zero to the recommended minimum patch area sizes to indicate the span of habitat needed for protection.

SUITABLE HABITAT IN LANDSCAPE

Landscapes are complex assemblages of many habitat fragments that together help sustain large-scale biological systems. As a result, meeting minimum patch sizes for species in a given landscape may be inadequate to ensure their persistence (Fahrig 2001). The configuration and nature of the landscape surrounding a patch also greatly determine whether a region will support species persistence and diversity (Lindenmayer and Franklin 2002).

In addition to considering the size of patches, land use planners must consider the total amount of suitable habitat in a given landscape. Local populations of plants and animals are often linked together by dispersal, essentially forming a larger “metapopulation” (Hanski and Simberloff 1997).²⁰ Individual species from such subpopulations migrate between habitat patches, interacting and breeding with other individuals, which influences the overall survivorship of the species in a region. In addition, the quality and availability of habitat patches can greatly determine the viability of a metapopulation. Some habitat patches may be of higher quality allowing for the local species population to benefit from higher reproductive rates than death rates. These “source” populations produce excess individuals that could emigrate into neighboring patches to settle and breed, thus, expanding the overall population and helping to buffer it from local extirpation. On the other hand, some habitat patches may be of poor quality, where local productivity is less than mortality. Referred to as “sink” populations, these areas lack immigration of individuals from source populations, leading to the extirpation of the local population (Pulliam 1988). For species populations that exhibit a metapopulation structure, land use planners should strive to protect existing source habitat patches, as well as restore habitat that may serve to support future source populations. However, land use planners should be cautious not to designate critical habitat solely by the proportion of the local population present; a source habitat could support as little as 10 percent of the metapopulation, which is responsible for maintaining the other 90 percent of the total population (Pulliam 1988). Rather, land use planners should work with ecologists to identify source habitat by demographic characteristics (e.g., death and birth rates of species).

Metapopulation theory reveals that the local extinction of a subpopulation can be prevented by occasional immigration from neighboring patches, termed the “rescue effect,” which is considered important in maintaining small populations and high levels of species diversity (Brown and Kodric-Brown 1977, Stevens 1989). Local extinctions may commonly occur within small habitat patches; about 10-20 percent of certain local populations of plants, arthropods, amphibians, birds, and small mammals within various habi-

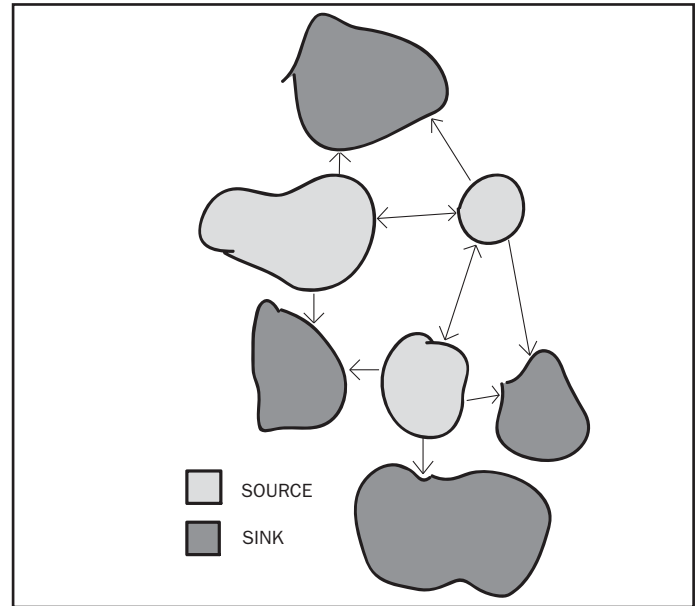


Diagram 5. Metapopulation and Source/Sink Dynamics. Local populations of organisms in different habitat patches may be linked demographically, forming an interdependent metapopulation. “Source” habitat patches, which supplement local populations in “sink” habitat patches, should be targeted for protection. Ideally, land use planners should protect entire metapopulations. Modified from Mette and Carroll (1994), *Principles of Conservation Biology*, p 188.

tat types have been found to go extinct per year (Fahrig and Merriam 1994). Thus, a set of interconnected habitat patches should be conserved to sustain sufficiently large metapopulations that would allow for regional species persistence.²¹ Habitat patches must also be configured to facilitate dispersal and recolonization between patches, particularly those used for breeding and foraging (Saunders et al. 1991, Fahrig and Merriam 1994, Boulinier et al. 2001, Fahrig 2001). Land use planners should strive to identify particular subpopulations, habitat patches, or links between isolated patches that are critical for the maintenance of the overall metapopulation of priority species (Meffe and Carroll 1997).

Not only is the quality of the habitat patches themselves important, but also the condition of the matrix between isolated habitat patches. If the matrix is able to support populations of species present in the original contiguous habitat or allows for adequate species dispersal or migration between fragments, then communities in remnant patches may retain diverse and viable populations of native plants and animals (Askins 1995). Estimating the proportion of suitable habitat in a landscape is a larger scale method of determining how much suitable habitat should be conserved to ensure the persistence of species in a region.

MANAGING FOR THE AMOUNT OF NECESSARY HABITAT IN A LANDSCAPE

Scientists generally offer recommendations on the proportion of suitable habitat that should be conserved in a

²⁰ A metapopulation is a set of local populations that interact by individuals moving between the local populations (or subpopulations) (Hanski and Gilpin 1991).

²¹ A local extinction refers to the extinction of a single, local population in a given geographic area; a local extinction does not entail that the entire species has gone extinct within its known range.

landscape based on two scientific trends. First, species disappear in a landscape with the loss of a certain amount of habitat, and different species go extinct at different thresholds of habitat loss (Fahrig 2002). Thus, scientists have estimated extinction thresholds to determine the proportion of suitable habitat needed to sustain specific species.²² The “extinction threshold” is the minimum amount of habitat required for a population to persist in a region below which the population will go extinct (Fahrig 2001, Fahrig 2002).²³ Extinction thresholds are essentially the converse of population viability estimates derived from PVAs (described above).

Second, threshold values may be based on the amount of habitat below, which the negative effects of habitat fragmentation may compromise species persistence. This is termed “habitat fragmentation thresholds” (Andrén 1994, Fahrig 1998). As the proportion of suitable habitat decreases in a

²² From a species perspective, suitable habitat has been interpreted as habitat utilized for nesting, with associated expected birth and death rates that allow for a stable or growing population (Lamberson et al. 1994).

²³ The extinction threshold may be estimated by: 1) the minimum amount of habitat below which the equilibrium population is zero; or 2) the minimum amount of habitat below which the probability of long-term population survival is less than one (Fahrig 2002).

landscape, the reduction in patch sizes and the increasing isolation of these fragments begins to significantly affect the abundance, distribution, or diversity of species in the landscape due to alterations in species movement or the spread of disturbance (e.g., wildfire, flooding, invasion by exotic species), among other factors (Gustafson and Parker 1992, Andrén 1994). The recommendations presented in this review are largely based on existing literature reviews of both extinction thresholds and habitat fragmentation thresholds (see Andrén 1994, Fahrig 2001).

Studies of suitable habitat range between 5 percent to 80 percent of the landscape depending on the species, geographic region, and parameters in question (see Appendix C). Seventy-five percent of the surveyed studies reported that suitable habitat should be up to 50 percent of the total landscape, whereas 50 percent of the studies reported at least 20 percent of habitat (see Figure 2). Given the constraints presented by the available literature (see “A Closer Look at Proportion of Suitable Habitat” in Appendix A for explanation on limitations), the conservation of greater proportions of habitat—such as a minimum of 60 percent—is recom-

BOX 3. PLANNING AT THE RIGHT SCALE

Natural communities vary greatly in the area in which they occur. In order to determine which land parcels and how much habitat to protect, land use planners should plan at the appropriate scale for the target system or species. Ideally, planning would occur across multiple scales to capture the greatest habitat and species diversity (see Box 2 for a definition of scale).

1. Coarse scale

Certain habitats and species, termed “matrix” habitats and “coarse-scale” species, will require planning to occur at a very large scale to capture their wide-ranging needs. Natural communities—such as spruce-fir forests (Northeast), longleaf pine forests (Southeast), tallgrass prairie (Midwest), and sagebrush (West)—can span as much as one million contiguous acres. Matrix communities are historically dominant habitat and exist across widespread physical gradients, such as broad ranges of elevation, precipitation, and temperature. Coarse-scale species (also termed wide-ranging species) require large areas to access the quantity of habitat or the different habitat types needed for survival (e.g., prairie chicken, fox, badger, marten, and pike minnow). Migratory species (e.g., migratory birds or salmon) and top-level predators (e.g., caribou, wolves, and bears) may depend upon not only matrix communities, but also associated habitat patches (described below), connecting corridors, and aquatic systems. To address the needs of such expansive communities and wide-ranging species, land use planners will need to take a landscape scale and regional approach; an area of several thousand acres up to one million acres may need to be conserved. This scale of planning will likely demand an inter-jurisdictional perspective and inter-municipal cooperation.

2. Intermediate scale

Planning may need to occur at a smaller scale—on the order of several hundred to a thousand acres—to conserve “large patch” community types and “intermediate-scale” species. Occurring in large patches, but not as vast an area as matrix types, are communities like red maple-black ash swamps or northern hardwood forests. Large patch communities may span a thousand acres but

are bound by certain physical factors (e.g., coastal salt marshes being defined by low topographic position and predictable tides) or by a single dominant ecological process (e.g., fire, flooding, or drainage). Intermediate-scale species are those that depend on a single large patch or several different kinds of habitats (e.g., amphibians that depend on both wetland and upland complexes).

3. Fine scale

Land use planners will need to plan at a more “fine” or site-specific scale to ensure that “small patch” communities and local-scale species are protected. Small patch communities are communities that naturally occur in narrow, localized, or discrete areas (e.g., fens, bogs, glades, caves, or cliffs) or occur only where specific or narrow physical factors and local environmental conditions are present (e.g., seepages, outcrops, certain types of soil). Local-scale species are species with limited movement and dispersal abilities or specific habitat needs that restrict their populations to a single community or habitat type. Belonging to this category are many rare and threatened species, insects, and plants. Occurrences of small patch communities and local-scale species may be found in only a couple of acres up to several hundred acres.

Given the natural variability in occurrence of communities and species and their wide-ranging geographic needs land use planners will need to plan at multiple scales to capture the biological diversity of a region, as well as to plan at the right scale for designated conservation targets.

The conservation thresholds found within this literature survey are predominately based on matrix and large patch communities, as well as coarse- and intermediate-scale terrestrial species. Thus, the findings and recommendations in this report do not fully address the conservation needs for small patch communities, local-scale species, and aquatic environments. To ensure the protection of restricted communities and rare species, land use planners will need to collaborate with local ecologists to identify priority conservation areas for their region.

The above information is based on research by The Nature Conservancy (TNC) (see Poiani and Richter 2000, and TNC 1998).

mended to sustain long-term populations of area-sensitive species and rare species.

Scientists have proposed that more robust species (e.g., large dispersal range, high fecundity, high survivorship)—usually the more common widespread species—may persist in even the most extensively fragmented systems with only 25 to 50 percent of suitable habitat. In contrast, rare species and habitat specialists like the Northern spotted owl may require up to 80 percent of suitable habitat to persist in a region (Lande 1987, Lande 1988, Lamberson et al. 1992). Land use planners should take into account the more sensitive and rare species within their region to develop critical thresholds for proportions of suitable habitat relevant to their geographic setting (Mönkkönen and Reunanen 1999). Such an approach may also provide for the protection of more common and robust species that depend on similar habitat types.

In addition to the proportion of suitable habitat, other considerations should be factored into land use decisionmak-

Land use planners should strive to conserve at least 20% to 60% of natural habitat in a landscape.

ing, such as the spatial arrangements of remaining habitat patches and the matrix between patches. In landscapes that are highly fragmented—including most urban, suburban, and even rural areas with less than 30 percent of remaining suitable habitat—the spatial arrangement of habitat patches greatly affects species survival (Andrén 1994). For example, wetland bird communities are found to depend not only on their local habitat, but also on the amount of wetlands within a surrounding three kilometer buffer (Fairbairn and Dinsmore 2001).

The condition of the surrounding matrix in which habitat patches are embedded also influences the effective size of the remaining fragments and the degree to which the patches are isolated (Andrén 1994, Lindenmayer and Franklin 2002). In turn, these factors affect whether or not species will be able to successfully disperse among habitat patches and whether important ecosystem processes, such as fire and hydrologic cycling, will occur on the landscape (Fahrig and Merriam 1994) (*see* “Patch location/configuration”).

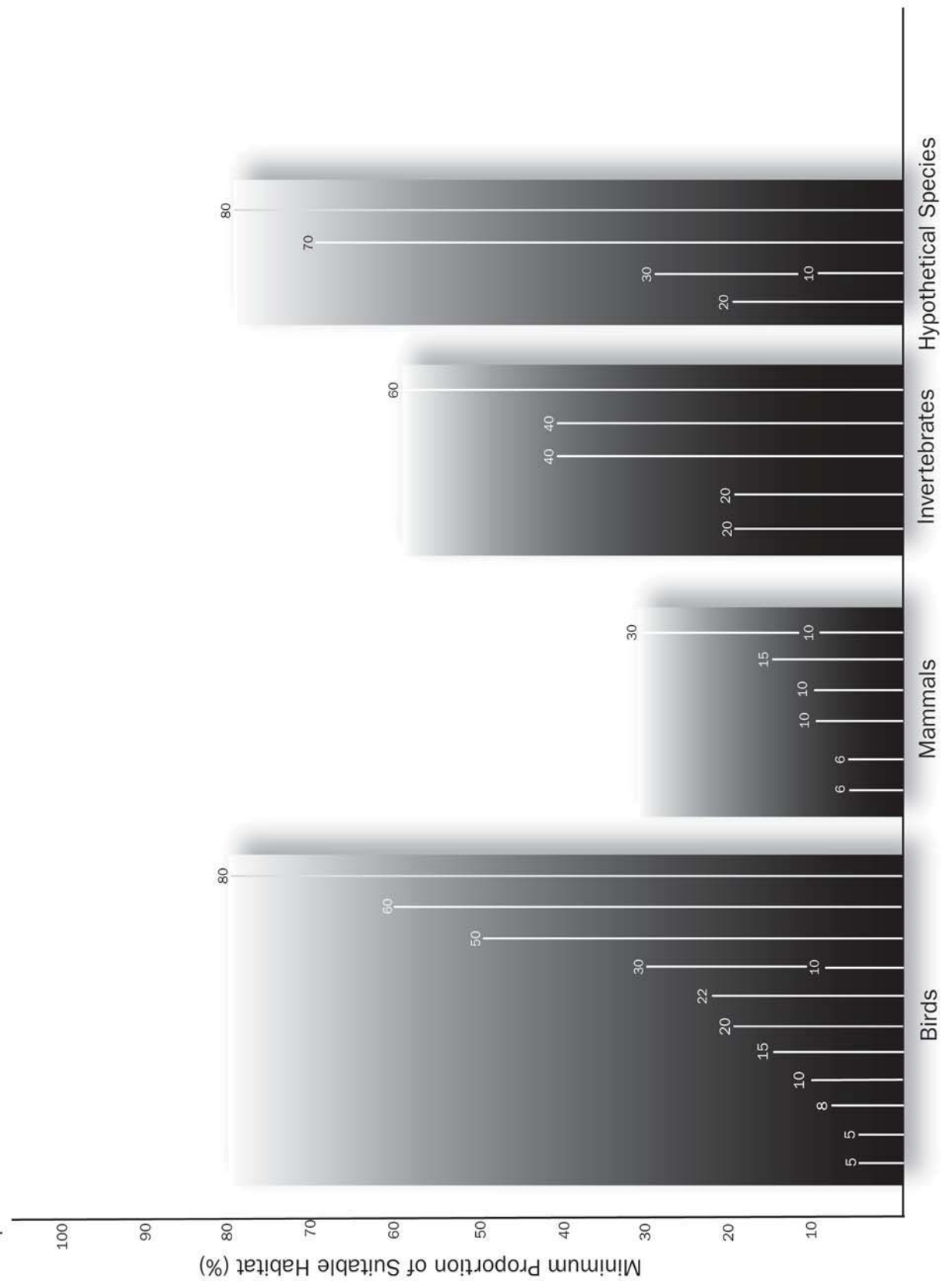


Figure 2. Recommended minimum proportions of suitable habitat (in percentages) needed to maintain populations or communities of birds, mammals, invertebrates, or hypothetical species (as determined by models) in the United States, as cited in the scientific literature. Numbers represent the recommended minimum proportions of habitat; two numbers along one line indicate a recommended range (see Appendix B for specific findings). Lines extend from zero to the recommended proportion to indicate the span of habitat needed for protection.

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EDGE EFFECTS

Habitat fragmentation inevitably results in the creation of edge environments. Edges occur where a habitat—such as a forest, prairie, or wetland—meets a road, clearcut, housing development, or some other natural or artificial transition or boundary (Soulé 1991). Habitat fragments differ from the original contiguous natural habitat in that they have a greater amount of edge per area and the habitat core is closer to an edge environment. Patch edges may have significantly different conditions than the contiguous system or habitat interior, with altered fluxes of wind, sun exposure, water, and nutrients that greatly affect animal and plant communities (Saunders et al. 1991, Murcia 1995). This change in energy, nutrient, or species flow results from increased amounts of edge and reduced interior habitat, and has been termed the “edge effect.”

Increased amounts of edge along habitats create a disturbed environment that allows for the establishment of pest and predator species, which penetrate the fragment interior and adversely affect the diversity and abundance of interior species (Primack 1993). Mammalian predators (e.g., raccoons, foxes, coyotes, feral cats), egg-eating birds (e.g., crows and blue jays), and brood parasitizers (e.g., brown-headed cowbirds) concentrate their hunting along forest edges, thus, increasing the intensities of predation on native species (Soulé 1991).²⁴ Habitat fragmentation also increases the vulnerability of remnant patches to invasion by exotic and pest species (Soulé 1991, Askins 1995). Higher frequency and intensity of disturbances, like fire and wind damage, may also result due to increased edge (Soulé 1991). Edges like roads and trails introduce such disturbances as pedestrian, pet, and vehicular traffic, causing animals to avoid such areas (Duerksen et al. 1997). Each of these edge effects has significant impact on the vitality and composition of the species in the remaining habitat patch.

Information on environmental and species response to edges helps determine how large patch sizes should be designed to provide sufficient interior habitat, as well as how far development, such as roads, trails, and housing, should be from remnant core areas.

MANAGING FOR EDGE INFLUENCE

The intensity of edge effects has been measured by a number of different methods. The influence of an edge (termed “edge influence”) may be defined as the distance between the border to the point where microclimate and vegetation do not significantly differ from the interior conditions of the habitat. From a species perspective, edge influence may be defined as the distance from an edge to the area where species densities, survival rates, or reproductive rates



Creation of edge by deforestation, Willamette National Forest, Oregon. Photo courtesy of Steve Holmer, American Lands Alliance.

do not differ from those in the interior habitat (Forman 1995, Murcia 1995). Edge influence has also been measured by the behavioral response of animal movement, such as flushing distance, from a disturbance associated with edge environments.²⁵

The intensity of edge effects is influenced by many physical factors, such as the shape and size of the patch, the direction the edge faces (i.e., aspect), and the structural contrast of its boundaries (Soulé 1991).

As discussed earlier, larger, circular patches will have more interior habitat and less edge than a rectangular or oblong patch of the same size (Forman and Godron 1981) (*see* “Patch shape”). The orientation of edges affect the amount of exposure to solar radiation, with edges facing the equator tending to have wider edge influence (Forman and Godron 1981, Murcia 1995). The more structurally different the boundaries between different habitat types, the greater the edge effects.

To decrease the influence of edge, buffers are recommended to “soften” the transition between natural and artificial environments (*see* “Boundary zone”). A remnant forest patch directly abutting cropland or urban development will have significant edge effects in contrast to a forest adjacent to a buffer of small shrubs or secondary vegetation. In addition, some habitat types may be more susceptible to negative edge effects; for example, grasslands have been found to exhibit wider edges than forest edges (Forman 1995).

Scientists offer a wide range of findings on the distance edge effects penetrate into ecosystems in the United States, with results ranging from only eight meters up to five kilometers. Based on the response of birds to edge environments, edge effects may penetrate into a habitat patch from about 16 meters up to almost 700 meters; mammals may avoid edge environments from 45 meters up to 900 meters; and microclimate changes may extend from eight meters up to 240 meters into habitat (*see* Appendix E). The majority of the surveyed studies (75 percent) estimates edge influence to be approximately 230 meters or less (*see* Figure 3).

Based on this select review, land use planners should take a conservative approach to mitigating edge effects. To pro-

²⁴ Cowbird females lay their eggs in the nests of other bird species, relying on these hosts to incubate and raise their chicks. Brown-headed cowbirds have been found to parasitize over 220 host species. (*see* <http://www.audubon.org/bird/research/cowbird-info.html>).

²⁵ Flushing distance is the distance that an animal may flee in response to a disturbance, such as in response to pedestrian or pets on a trail or vehicular traffic on roads (Duerksen et al. 1997).

vide for sufficient suitable habitat, land use planners should buffer remnant patches by at least 300 meters from all edge peripheries, particularly for matrix and large patch community remnants; naturally small patch communities may not require such a wide buffer (*see* Box 3). The area within the buffer should not be counted as suitable habitat provided for species conservation. In addition, roads, trails, and other development should be placed at least 300 meters away from interior habitat to minimize impact. Ideally, land use planners and ecologists should

To avoid the negative effects of edges, land use planners should consider buffering up to 230 to 300 meters around edge peripheries.

work collaboratively to determine the intensity of edge effects by the response of species or groups of species that are most sensitive to patch size in the ecosystems or regions of concern (Forman 1995). Measuring edge distance by the most sensitive species—often vertebrates of conservation concern—would mean that the influence of edges may actually be hundreds or thousands of meters, thus, requiring much larger patch sizes to meet habitat requirements.

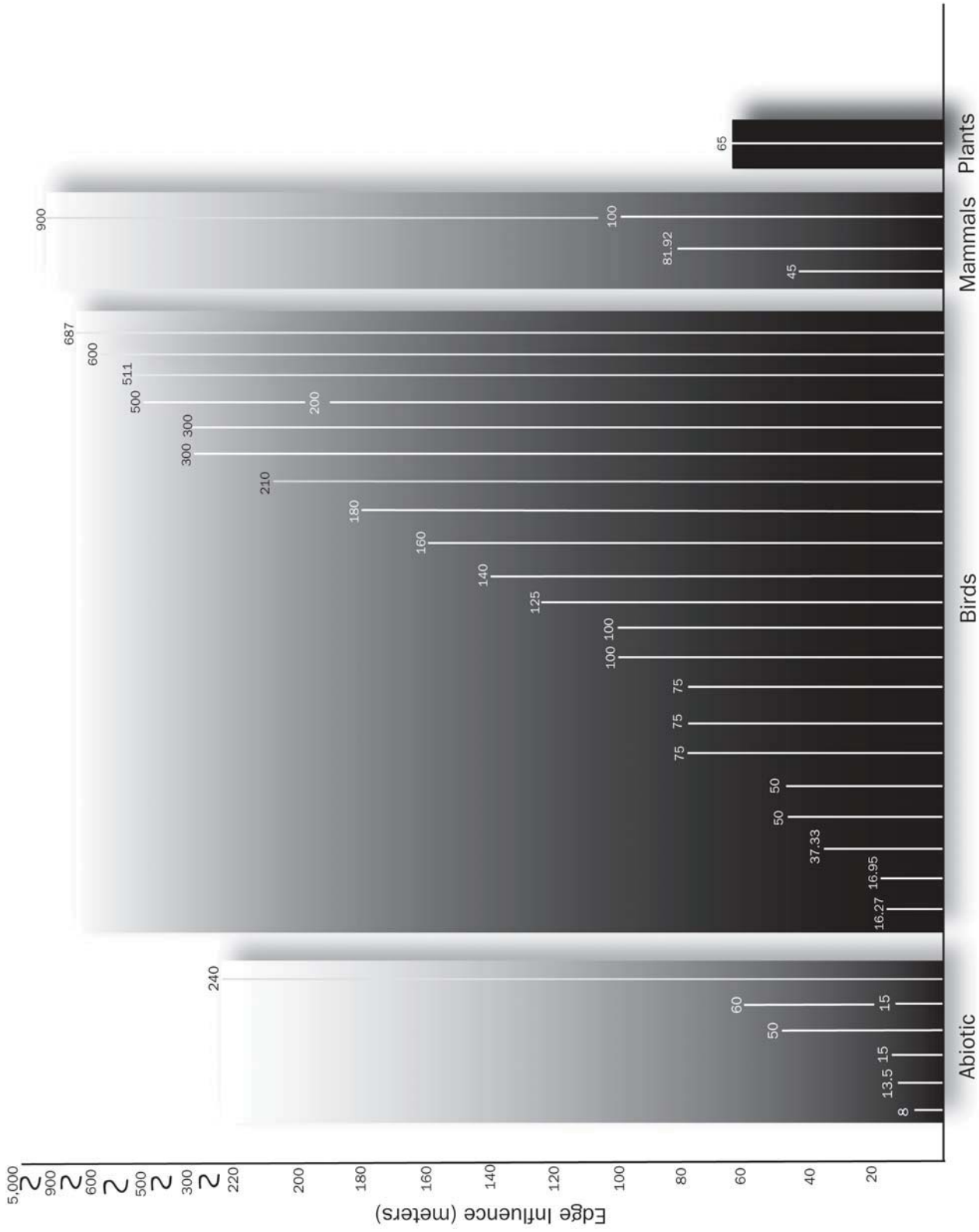


Figure 3. Distances (in meters) that edge effects penetrate into habitats in the United States, as cited in the scientific literature. Edge width is measured by abiotic, bird, mammal, or plant responses; abiotic responses include microclimate changes, such as changes in temperature, humidity and light. Numbers represent edge width distance findings; two numbers along one line indicate a range of edge width distance (see Appendix C for specific findings). Lines extend from zero to the determined edge widths to indicate the span of habitat that is affected by edge effects.

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RIPARIAN BUFFERS

Although generally comprising a small proportion of the landscape—often less than 1 percent—riparian areas are regional hot spots that support a disproportionately high number of wildlife species and provide a wide array of ecological functions and values (Naiman et al. 1993, Fischer and Fischenich 2000, National Research Council 2002). The support of high levels of species diversity and ecological processes in these areas is due in part to regular disturbance events, like floods, as well as to climatic and topographic variation and the availability of water and nutrients (Naiman et al. 1993).

Riparian areas are ecosystems adjacent to or near flowing water, such as rivers, lakes, shorelines, and some wetlands. They are transitional areas between aquatic and upland terrestrial systems and exhibit gradients in environmental conditions, ecological processes, and living organisms (National Research Council 2002). Unfortunately, riparian systems are continuously threatened by adjacent or upstream human activities. For example, agricultural, industrial, or urban development can increase levels of light, temperature, stormwater runoff, sedimentation, pollutant loading, and erosion, which degrade water quality and diminish suitable aquatic habitat (Castelle et al. 1994). In the last 200 years,

over 80 percent of riparian land in North America and Europe has disappeared (Naiman et al. 1993).

To ameliorate the negative impacts of adjacent land uses, a common regulatory and management practice is to establish protected areas, or buffers, around aquatic resources like rivers, streams, lakes, and wetlands. At least 15 states and seven local jurisdictions in the United States have adopted riparian buffer regulations, protecting widths ranging from six meters to over 300 meters in size (Johnson and Ryba 1992).

Buffers are vegetated zones, usually linear bands of permanent vegetation, preferably native species, located between aquatic resources and adjacent areas subject to human alteration (Castelle et al. 1994, Fischer and Fischenich 2000). Buffers can help regulate riparian microclimate and provide necessary shading for the in-stream growth and reproduction of aquatic life; stabilize stream banks and prevent channel erosion; provide organic litter (e.g., leaf litter) and woody debris, which are important sources of food and energy for fish and aquatic invertebrate communities; remove or regulate sediment, nutrients, or other contaminants (e.g., pesticides, herbicides) from runoff; provide flood attenuation and storage to decrease damage to property; and provide wildlife habitat (Castelle et al. 1994, O’Laughlin and Belt 1995, Wenger 1999, Fischer and Fischenich 2000, National Research Council 2002).



Riparian buffer establishment, North Hather Creek, Innoko, Alaska. Courtesy of U.S. Fish and Wildlife Service.

MANAGING FOR ADEQUATE BUFFER WIDTH

Recommended buffer widths are commonly determined by one of two methods: uniform versus variable widths. Uniform-width buffers are commonly adopted because they are easier to enforce, require less specialized knowledge, time, and resources to administer, and allow for greater regulatory predictability (Castelle et al. 1994). Uniform widths are often based on a single resource protection goal, usually related to water quality. In contrast, with variable-width buffers, the size or width of the strip is adjusted along its length to account for multiple functions, adjacent land use, and site and stream conditions. The width of the strip may be adjusted depending on the value of the aquatic resources, the intensity of surrounding land use, and the type and condition of vegetation, topography, soils, or hydrology, among other variables. For example, a larger width may be required for buffers surrounding more pristine or highly valued wetlands or streams; in close proximity to high impact land use activities; or with steep bank slopes, highly erodible soils, or sparse vegetation (Castelle et al. 1994, Fischer and Fischenich 2000).

Although the method of varying buffer width is generally believed to provide more adequate protection for aquatic resources, it may be less efficient because variable strips can retain less material than a uniform-width buffer of equivalent average width (Weller et al. 1998). Thus, providing policymakers with scientific guidance on uniform buffer widths allows for the implementation of practicable land management practices that protect aquatic resources.

For this report, riparian buffer widths are measured from the top of the bank or level of bankfull discharge of one side of a water body;²⁶ therefore, a 50 meter buffer on a 10 meter stream would create a zone at least 110 meters wide (Wenger 1999, Fischer and Fischenich 2000).

As with other conservation thresholds, the scientific literature does not support an ideal buffer width applicable in all circumstances. This survey found recommended buffer widths ranging from one meter up to 1600 meters, with 75 percent of the values extending up to 100 meters (see “A Closer Look at Buffer Width” in Appendix E for further discussion). At minimum, a riparian buffer should encompass “the stream channel and the portion of the terrestrial landscape from the high water mark towards the uplands where vegetation may be influenced by elevated water tables or flooding, and by the ability of soils to hold water” (Naiman et al. 1993).

Land use planners should strive to establish 100-meter wide riparian buffers to enhance water quality and wildlife protection.

The necessary buffer size varies considerably based on the specific management goal. In general, recommended buffer sizes are significantly greater if the intent is to protect ecological functions, such as providing wildlife habitat and supporting species diversity, as opposed to water quality functions.

Based on the majority of scientific findings, land use practitioners should plan for buffer strips that are a minimum of 25 meters in width to provide nutrient and pollutant removal; a minimum of 30 meters to provide temperature and microclimate regulation and sediment removal; a minimum of 50 meters to provide detrital input and bank stabilization; and over 100 meters to provide for wildlife habitat functions.²⁷ To provide water quality and wildlife protection, buffers of at least 100 meters are recommended (see Figure 4).

OTHER BUFFER DESIGN CONSIDERATIONS

The width of any given buffer is just one aspect, albeit important, which determines its ability to provide a variety of functions. Other factors to consider are the linear extent, vegetation composition, and level of protection of buffers. The following is general guidance on the design and development of buffers.

- **Vegetation:** Buffers should have diverse vegetation that is both native and well-adapted to the region. Maintaining a diverse array of species and vegetation structure (e.g., herbaceous ground cover, understory saplings, shrubs, and overstory trees) is recommended to allow for greater tolerance to possible fluctuations in environmental conditions (e.g., water levels, temperature, herbivory), and to provide for greater ecological functions (e.g., wildlife habitat) (see Fischer and Fischenich 2000 for further guidance on vegetation type, diversity, and propagation techniques).
- **Extent:** In part, the effectiveness of a buffer in meeting management objectives is a function of the linear extent of the aquatic system that is protected (Wenger 1999). Protection efforts should prioritize the establishment of continuous buffer strips along the maximum reach of stream, rather than focusing on widening existing buffer fragments (Weller et al. 1998). Protection of the headwater streams as well as the broad floodplains downstream is also recommended. Headwater streams and downstream floodplains generally encompass less than 10 percent of total landmass; thus, this level of protection is practicable (Naiman et al. 1993). Ideally, buffers

²⁶ The bankfull discharge is the maximum level of discharge that a stream channel can convey without flowing onto its floodplain. This stage plays a vital role in forming the physical dimensions of the channel because the flows near the bankfull stage move the most sediment over the long-term and the processes of sediment transport and deposition are the most active in forming the channel (Dunne and Leopold 1978).

²⁷ While a 100-meter buffer is recommended to provide for adequate wildlife values, some natural riparian habitat is too narrow to support such an area. In these cases, land use planners should consider the utility of narrower buffers, especially where they might function as wildlife corridors (see “Habitat Connectivity”).

should extend along all perennial, intermittent, and ephemeral streams, lakes, shorelines, and adjacent wetlands (Weller et al. 1998, Wenger 1999), so long as such buffering would not create detrimental upland habitat fragmentation as might be the case in areas of high stream densities (Lindenmayer and Franklin 2002).

- **Buffer protection:** To ensure that buffers function adequately, all major sources of disturbance and contamination should be excluded from the buffer zone, including dams, stream channelization, water diversions and

extraction, heavy construction, impervious surfaces, logging roads, forest clear cutting, mining, septic tank drain fields, agriculture and livestock, waste disposal sites, and application of pesticides and fertilizers (Wenger 1999, Pringle 2001). Another consideration is the level of legal protection afforded to the area. Whether the buffer is in preservation status or protected under a conservation easement that allows for some level of activity, for example, will also determine its ability to provide desired functions.

BOX 4. UNDERSTANDING THE EFFECTS OF LAND USE

The many different uses of land—whether for agriculture, silviculture, recreation/open space, or commercial or residential development—will have varying impacts on the ecosystems, habitats, and species in a region. The types, extent, and combinations of land uses within a matrix will affect the viability of habitat patch sizes, the amount of suitable habitat, the severity of edge effects, and the utility of buffers and corridors in a given landscape.

Certain land use types are likely to be more compatible with biodiversity conservation in certain landscapes, depending on the natural arrangement of physical features, habitats, and species, and the effect of previous land uses (Forman 1995). A study on breeding bird communities in central Pennsylvania, for example, found that forests within agricultural landscapes had fewer forest-associated species, long-distance migrants, forest-canopy and forest-understory nesting species, and a greater number of edge species than forest landscapes primarily disturbed by silviculture, irrespective of the effect of disturbance (Rodewald and Yahner 2001). In Colorado, ranchlands and protected reserves were found to be more compatible with species of conservation concern (including songbirds, carnivores, and plant communities) than exurban developments, which tended to support only human-adapted species (Maestas et al. *in press*).

To plan for long-term sustainability, land use planners will need more guidance on the level of compatibility of different land uses in various regions and ecosystems. As a general rule, a landscape mosaic should be planned first according to its ecological constraints (e.g., water availability, forest and soil productivity, natural flooding/fire cycles) and natural site potential (e.g., natural potential for productivity and for nutrient and water cycling) (Dale et al. 2000). In terms of hierarchical planning, a general recommendation is for land use planners to first plan “for water and biodiversity; then for cultivation, grazing, and wood products; then for sewage and other wastes; and finally for homes and industry” (Forman 1995 *as cited in* Dale et al. 2000, p.658).

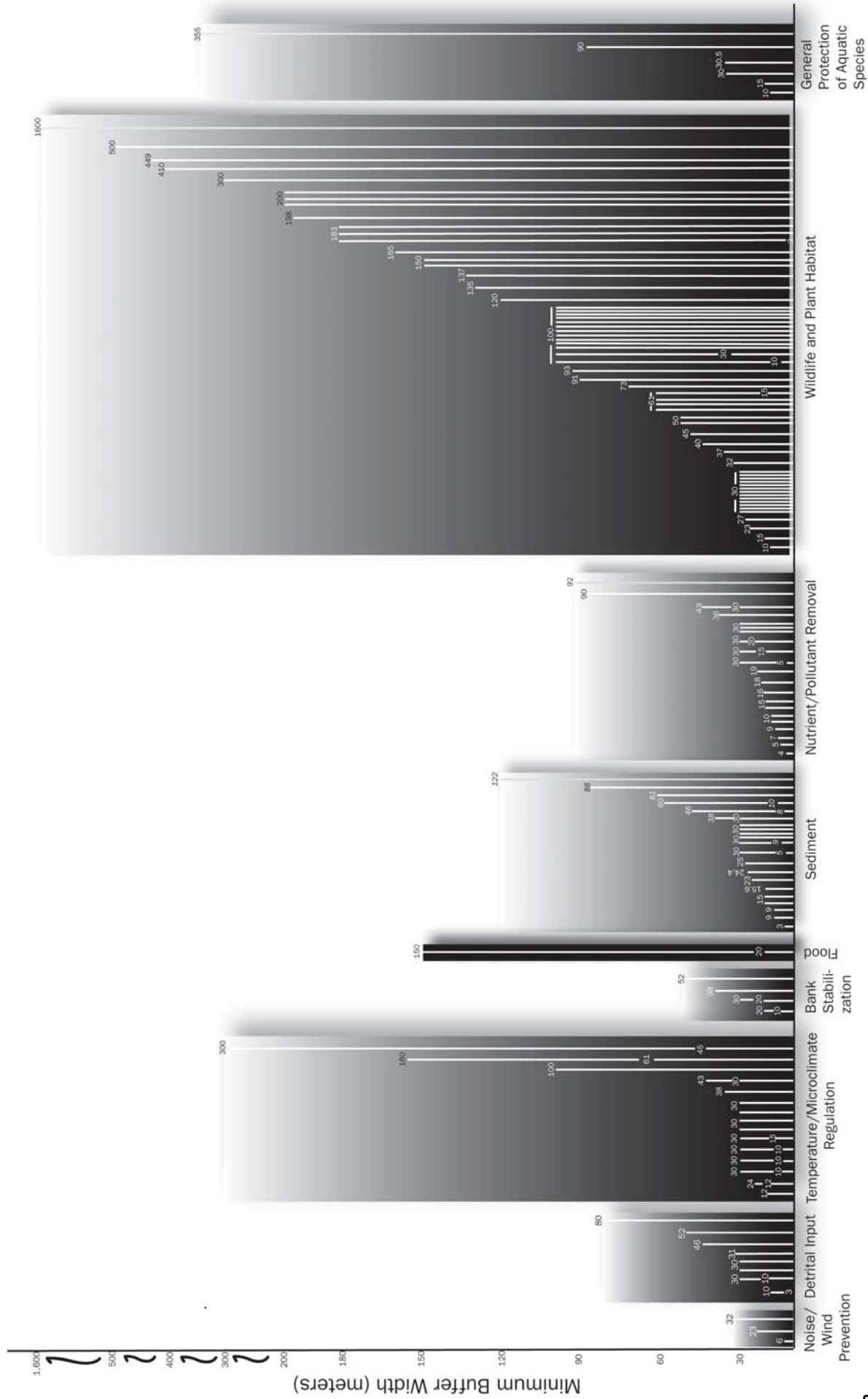


Figure 4. Recommended minimum riparian buffers (in meters) from each side of a water body (e.g. stream bank) needed to prevent noise/wind damage; provide detrital input; moderate temperature/microclimate; stabilize banks; provide flood attenuation; control sediment; reduce nutrients/pollutants; and provide wildlife habitat functions and general protection of aquatic systems in the United States, as cited in the scientific literature. Numbers represent the recommended minimum buffer widths; two numbers along one line indicate a recommended range (see Appendix D for specific findings). Lines extend from zero to the recommended buffer widths to indicate the span of habitat needed for protection.

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HABITAT CONNECTIVITY

Conservation biologists generally agree that species viability and diversity are enhanced by well-connected habitats (Fahrig and Merriam 1985, Gilpin and Soulé 1986, Primack 1993, Noss and Cooperrider 1994, Meffe and Carroll 1997, Beier and Noss 1998, Lehtinen et al. 1999). Because small, isolated reserves are unlikely to maintain viable populations over the long-term, and because climate change and disturbances require that organisms be able to move over large distances, corridors are recommended as one conservation measure to counter the negative effects of habitat fragmentation and patch isolation (Noss 1991).

Not only can riparian buffers help ensure water quality protection and habitat for plants and animals adjacent to waterbodies, but they can also act as dispersal routes for species and connect remnant patches.²⁸ Although riparian corridors are useful for some terrestrial wildlife, linkages outside riparian areas may be required to maintain connectivity for non-associated upland species (McGarigal and McComb 1992).

Corridors (also referred to as conservation corridors, wildlife corridors, or dispersal corridors) are intended to permit the direct spread of many or most taxa from one region to another (Brown and Gibson 1983 as cited in Noss 1991). They should facilitate foraging movements, seasonal migrations, dispersal and recolonization, and escape from disturbance (Saunders et al. 1991, Soulé 1991). Whether or not corridors actually provide connectivity will depend largely on the species in question and its dispersal capabilities and movement patterns across the landscape (Saunders et al. 1991). Given the species-specific nature of this issue, generalizations about the biological value of corridors are under debate among the scientific community (Noss 1987, Simberloff and Cox 1987, Simberloff et al. 1992, Franklin 1993, Beier and Noss 1998) (for further discussion see Appendix A “Further Analysis”).

MANAGING FOR OPTIMAL CORRIDOR WIDTH

An important design consideration when maintaining or establishing habitat corridors is width. Corridor width can influence the dispersal behavior of species, resulting in changes in home range size, shape, and use. In addition, corridor width is positively correlated with the abundance and species richness for birds, mammals, or invertebrates (Lindenmayer and Franklin 2002). As is true for other conservation thresholds, in general, the wider the better. Wider corridor bands are recommended to provide interior habitat conditions, which allows for the movement and/or habitation of interior species. In addition, greater habitat area is

²⁸ A riparian corridor is a strip of vegetation adjacent to an aquatic system that connects two or more larger patches of habitat through which an organism is likely to move (Fischer et al. 2000). Corridors are not only riparian but also can be positioned in upland environments as well.

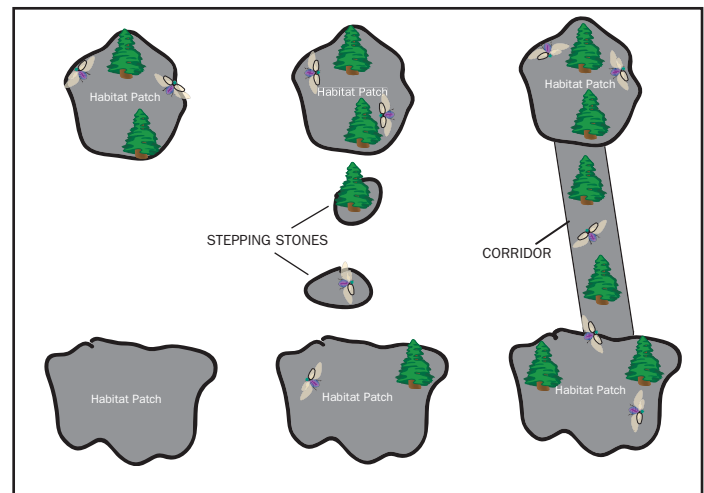


Diagram 6. Habitat Connectivity. Habitat connectivity can be increased by the protection of stepping stone patches or by the establishment of a corridor. Modified from Dramsted et al. (1996), *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning*, p. 37.

more likely to provide sufficient cover for species from predators, domestic animals, or human disturbance (Forman and Godron 1981). Corridors that are too narrow may consist entirely of edge, thus, deterring the use by interior or area-sensitive species or causing an increase in mortality from predation (Wilcove et al. 1986).

Although corridor width has been identified as an important design element, few studies explicitly examined minimum corridor width requirements. This survey found a limited number of studies that provide indirect evidence on effective corridor sizes, however, none of the reviewed studies explicitly tested different corridor widths with the goal of determining an optimal size. Although they did not directly examine recommended corridor width, three studies did find corridor widths of 32 meters and 100 meters to encourage the movement of butterflies and reduce species turnover rates for breeding birds, respectively (Haddad and Baum 1999, Haddad 1999 for butterflies; Schmiegelow et al. 1997 for birds).

Data limitations on the relationship between corridor width and species response prevent the development of recommendations on optimal corridor size. For any given set width, corridor effectiveness will vary with other attributes, such as length, habitat continuity, habitat quality, and topographic position in the landscape, among other factors (Lindenmayer and Franklin 2002) (see “Other Corridor Design Considerations”).

First and foremost, land use planners should strive to limit the degree of isolation between existing habitat patches and optimize the natural connectivity to allow for the dispersal of sensitive native species through the most appropriate means. This may be done by establishing habitat corridors, maintaining specific structural conditions within the landscape, or setting aside stepping stone patches (Lindenmayer and Franklin 2002) (see “Inter-patch distance”).

Simultaneously, land use planners should minimize the connectivity of artificial habitats like clearcuts, agricultural fields, and roadsides that tend to spread exotic and pest species (Noss 1991).

OTHER CORRIDOR DESIGN CONSIDERATIONS

Corridor width is one important factor that determines whether a corridor will enhance landscape connectivity. Other factors to consider are the condition of the landscape matrix, the distances between remnant patches, and the extent and configuration of the corridors themselves.

- **Condition of landscape matrix:** The landscape matrix in which corridors are embedded greatly influences corridor use. If conditions in the matrix are suitable (e.g., sufficient original vegetation cover exists), then species reliance on corridors may be minimized. On the other hand, if matrix conditions are inhospitable or degraded (e.g., are highly developed or fragmented; have disrupted ecological processes or disturbed conditions; or are highly invaded by exotic species), then corridor systems linking remnant patches may be required to retain landscape connectivity (Rosenburg et al. 1997 *as cited in* Lindenmayer and Franklin 2002). Given that land use planners often work in extensively developed or developing areas, the latter case is the most likely. Understanding the relationship between the landscape matrix and the movements of target organisms will be

fundamental in determining the best placement of corridors to enhance connectivity (Lindenmayer and Franklin 2002).

- **Inter-patch distance:** The distance between remnant patches will affect the conservation value of corridors. When distances between remnant patches are short as compared to the movement ability of target species, a stepping stone approach may be the most effective mechanism for promoting dispersal (*see* “Patch location/configuration”). On the other hand, if the distance separating habitat fragments is relatively far, corridors may be the right mechanism to provide landscape connectivity (Haddad 2000).
- **Corridor configuration and extent:** Networks of intersecting corridors may provide for more effective migratory pathways, allowing greater opportunities for animal foraging and predator avoidance (Forman and Godron 1981). Ideally, a corridor would “encompass the entire topographic gradient and habitat spectrum from river to ridgetop” (Noss 1991). Such an expansive corridor network may allow for the representation of different native habitat and land cover types in a region. In addition, having such a broad system of corridors would help enhance overall resiliency in case of the destruction of individual corridors by unexpected disturbances (Noss 1991).

BOX 5. CONSERVATION THRESHOLDS: A STARTING POINT

The following summarizes findings from a select sample of scientific papers pertinent to species and ecosystems in the United States on critical thresholds related to minimum habitat patch area, proportion of suitable habitat, edge influence, and riparian buffer width. Recommendations are based on the goal of capturing 75 percent of the requirements found for species, communities, and habitats surveyed; thus, the third quartile was used by calculating the value for which 75 percent of the threshold values lie below this value (after numerical ranking). These guidelines should be interpreted very cautiously because they are based on a small sample, and may not be applicable for specific species, habitats, and geographic settings of concern. Land use planners and land managers should consider these results as a baseline from which to launch more tailored and in-depth assessments.

Habitat Patch Area

In general, land use planners should strive to maintain and protect habitat patches greater than 55 hectares (137.5 acres). The goal should be to maintain larger parcels greater than 2,500 hectares (or about 6,175 acres) to protect more area-sensitive species.

Proportion of Suitable Habitat

In general, land use planners should strive to conserve at least 20 percent up to 50 percent of the total landscape for wildlife habitat, where possible.* The conservation of greater proportions of habitat—such as a minimum of 60 percent—may be needed to sustain long-term populations of area-sensitive species and rare species.

Edge Influence

In general, to avoid the negative effects of edges on habitats, land use planners should consider establishing buffer zones up to at least 230 to 300 meters from the periphery of edges.

Riparian Buffer Width

In general, land use planners should plan for riparian buffer strips that are a minimum of 25 meters in width to provide for nutrient and pollutant removal; a minimum of 30 meters to provide temperature and microclimate regulation and sediment removal; a minimum of 50 meters to provide detrital input and bank stabilization; and over 100 meters to provide for wildlife habitat functions. To provide water quality and wildlife protection, buffers of at least 100 meters are recommended.

Landscape Connectivity

Land use planners should strive to reduce the distances between habitat patches and to optimize the natural connectivity of the landscape. This may be done by establishing habitat corridors that connect previously isolated patches; by maintaining the natural, structural conditions within the landscape; or by setting aside stepping stone patches. Simultaneously, land use planners should minimize the connectivity of artificial habitats like clearcuts, agricultural fields, and roadsides.

*The 50 percent recommendation is based on capturing 75 percent of the threshold values surveyed; 20 percent is based on capturing 50 percent of threshold values surveyed. The latter recommendation is provided because land use planners are often working in highly developed regions where protecting 50 percent or more of the landscape is impractical.

RECOMMENDATIONS FOR FUTURE RESEARCH AND ACTION

THE ROLE OF THE SCIENTIFIC COMMUNITY

More scientific research is needed to help inform specific land use decisions being made everyday in the United States—decisions that significantly determine the future of domestic biodiversity. This survey of the scientific literature found that out of all land management strategies geared toward reducing the effects of urbanization and sprawl, the most substantial guidance available is on how to best develop riparian buffers. Conversely, science offers very little consensus opinion to land use planners on how to determine which habitat patches to conserve and where; the amount of habitat to protect in a region or conversely the maximum amount of impervious surface to allow; the ways in which to mitigate against the negative consequences of habitat edges; or how best to design and plan for corridors. In addition, because development will continue to occur and because private lands are increasing becoming more important in species conservation, more information is needed on the level of compatibility of the various types and combinations of land uses with biodiversity. To better inform decisionmaking, the scientific community needs to provide more specific information to land use practitioners on how to implement ecologically conscious growth.

In addition, scientists should address the taxonomic bias in the literature. A recent review of 134 papers on habitat fragmentation found that over half of the research focuses on birds, the vast majority being songbirds. Mammals and plants come second, making up about 18 percent; invertebrates and reptiles/amphibians are the most understudied, with only 9 percent and 4 percent, respectively (McGarigal and Cushman 2002). Our survey found similar results. Most of the fragmentation research used for this study looks at the effects of fragmentation on bird species and, to a lesser extent, mammals. Sixty-six percent of the surveyed research on edge effects; 57 percent on patch area; 44 percent on proportion of suitable habitat; and 32 percent of the wildlife papers on buffers measured effects on bird species.

“Fragmentation effects are difficult to translate into management rules-of-thumb for several reasons: (1) they tend to be highly specific to the taxa, spatial scales, and ecological processes considered; (2) they vary according to the landscape type and its structure; and (3) their influence on species distribution and abundance may be obscured by local effects such as changes to certain microhabitat features (e.g., habitat degradation).”

Villard (2002), Ecological Society of America, Ecological Applications 12(2), p.319

Mammals made up 24 percent of the research on proportion of suitable habitat; 21 percent on patch area; 11 percent of research on buffers; and 9 percent on edge effects. Fish, invertebrate, and plant response made up anywhere from zero to 13 percent of the research. This focus has left particularly large gaps in research on reptiles and amphibians, invertebrates, and plants.

If the scientific community wishes to help curtail the loss and endangerment of species, then it will need to start addressing other taxonomic groups. The most at-risk species in the United States are flowering plants and freshwater species. In terms of species numbers, flowering plants have by far the greatest number of at-risk species (over 5,000 species are at-risk). In terms of the proportion, species that rely on freshwater habitats—mussels, crayfishes, stoneflies, amphibians, and fishes—exhibit the highest level of risk. With only 14 percent of bird species being at risk and 16 percent of mammal species, these groups are the least threatened (Master et al. 2000).

Above all else, this literature search reveals the inadequacy of the information currently available for land use planners to use in their day-to-day decisions, which have profound effects on biological diversity. The scientific community should be commended for developing theories, such as metapopulation concepts, which have important implications for applied management like endangered species recovery. However, due to the simplified assumptions implied within metapopulation models, their application to real landscapes is severely limited (Fahrig and Merriam 1994). In addition, whether metapopulations are actually common in real landscapes is largely unknown (Lindenmayer and Franklin 2002). Similarly, the SLOSS debate on whether a single large reserve is better than a group of small ones, which consumed the academic community for many years, failed to produce concrete management recommendations (Forman 1995).²⁹ In order for ecological principles to be put into practice, land use professionals will need general rules of thumb and specific guidelines to implement on-the-ground.

²⁹ SLOSS stands for Single Large Or Several Small, which refers to whether conservation reserves are best designed as one large tract of protected land versus several smaller tracts of the equivalent area (Meffe and Carroll 1997).

Only about 10 percent of the papers reviewed in this survey provided quantitative information useful for developing conservation thresholds relevant to land use planning. Similarly, most of the papers published in the *Journal of Applied Ecology* during a large proportion of the last 30 years have been devoid of practical applications or management recommendations (Pienkowski and Watkinson 1996). Given the complexity surrounding habitat fragmentation, it is understandable that the scientific community is apprehensive about presenting or extrapolating research findings such that they can be easily applied to land use planning and management. Scientists even warn that providing general thresholds “may be more dangerous than useful because many species can be lost if the threshold is determined by averaging over the requirements of many species” (Mönkkönen and Reunanen 1999).

Without adequate information on land use thresholds, land use decisionmaking will continue to be uninformed by the best available science. Although reaching consensus in the scientific community on these thresholds may be an impractical goal, if enough resources are directed to answer specific land use threshold questions, research results may begin coalescing on some general range of values, which would provide useful guidance. Hopefully, this literature review will prompt scientific research that is relevant to and usable by everyday land use practitioners.

THE ROLE OF THE POLICY COMMUNITY

Although more scientific study is needed to provide ecologically-based and scientifically defensible advice on land use planning and land management thresholds, substantial research has already been conducted. The policy community could play a more active role as a conduit between the scientific community and land use planners—to help interpret the available research, help with dissemination, and communicate back to scientists on research gaps and needs. Periodical reviews of the literature, such as this survey, should be conducted to provide land use planners and land management practitioners with the most up-to-date and best available scientific information. In addition, where possible, scientific research will need to be translated into easily applied management recommendations. To ensure that land use decisions are well-informed, mechanisms should be in place to communicate current scientific understanding to the general public. Scientific institutes, such as the National Academy of Sciences, among others, should conduct or commission studies on areas where particular research gaps are found. Clear arguments, particularly those that are economically based, need to be conveyed to the land use community so that they understand why they should make land use decisions with biodiversity in mind.

THE ROLE OF THE LAND USE PLANNING COMMUNITY

The failure of land use planners to communicate their needs to the scientific community may be another reason that science inadequately addresses land use planning concerns. Land use practitioners should be encouraged to better communicate with scientists about the type of information that they need and in what format it would be most useful. An exchange about what is working on-the-ground and what is not, and about public concerns regarding land use alteration and biodiversity, would be of great benefit.

However, given the diverse habitat requirements of species and the great uncertainty and unpredictability of species and ecosystem response to habitat alteration, land use planners should not wait for the development of *the magical threshold value* before applying known general ecological guidelines, such as those presented by the Ecological Society of America’s Land Use Committee. To ensure that our natural resources will be conserved for future generations, spatial planning needs to proceed immediately using the best available information.

Land use planners should err on the side of caution and adopt the most conservative threshold ranges, particularly since factors, such as global climate change, are likely to intensify land use impacts. The future change of our climate—predicted to rise globally by an average about 4° Fahrenheit (2° Celsius) by the year 2100—is likely to alter the level and timing of temperature and precipitation and to increase the frequency of environmental disturbances (like floods, droughts, hurricanes, and fires), causing shifts in suitable ecosystem and species ranges, as well as the composition of species and flows of energy and nutrients (Field et. al. 1999). For species and ecosystems to be able to withstand such drastic environmental perturbations, sufficient intact and well-connected habitat will be essential. Thus, larger patch sizes, greater habitat area, wider buffers, and more corridors are likely required under future global warming than presented in this review.

Land use planners should realize that, ultimately, there is no replacement for site-specific assessments. It is both difficult and often misleading to develop thresholds that generalize across landscapes and across ecoregions (Mönkkönen and Reunanen 1999). Since thresholds will fail to be meaningful when generalized across landscapes, ecosystems, and states, thus unable to capture the unique variation in nature, land use planners and managers need to work in close collaboration with ecologists (Mönkkönen and Reunanen 1999). Land use professionals should use the articles and research highlighted in this review only to the extent that they are appropriate for their region and to launch more in-depth analyses. This review predominately covers thresholds and guidelines for planning at a large (coarse) scale. This report,

however, does not focus on the conservation of rare or localized species or habitat types, and species other than birds and mammals. It does not provide guidance on how to protect lands of greatest biological value. Rather than simply adopting the types of measures discussed in this review, land use planners should collaborate with scientists to better protect small patch communities and local-scale species and to better identify site-specific and regional conservation needs.

Although land use planners are asked to make local, site-specific decisions on a daily basis, it is still vital to maintain a landscape perspective. Numerous, small development projects that independently may not contribute to significant habitat loss, degradation, or fragmentation, may cumulatively have devastating consequences. Site-specific land use decisions would be more ecologically mindful if better informed by scientific information. Yet, to really make a difference for

biodiversity, land use planners will need to begin considering their cumulative and landscape-scale impacts.

Biodiversity needs to be a central component directly considered in all land use and community planning projects. An overarching land use vision with a statewide or county-wide blueprint for protecting ecosystems, representative and rare species, and broader patterns of biodiversity would serve as an important framework to guide the implementation of the specific thresholds outlined in this report. For example, Florida developed a model that identifies areas with priority conservation significance and landscape linkages (i.e., corridors) captures most of the major ecological communities and known occurrences of rare species for the entire state (Hector et al. 2000). Conserving regional biodiversity and accounting for land use impacts over a large scale—both spatially and temporally—will likely require inter-municipal cooperation and state-level leadership, as in the case of Florida.

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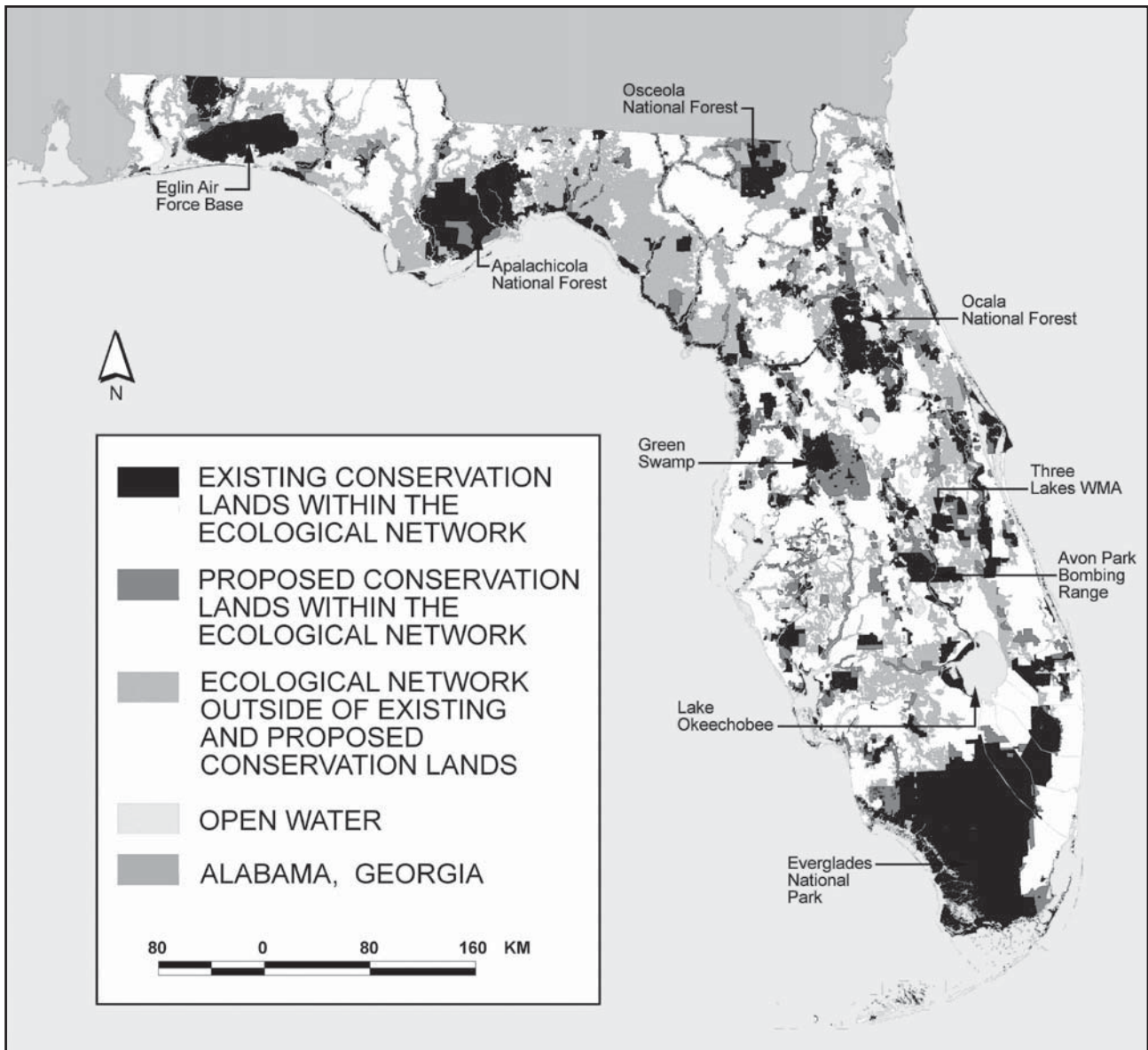


Diagram 7. Florida Ecological Network. Results from the Florida Statewide Greenways GIS decision support model. Courtesy of the University of Florida.

CONCLUSION

Land use decisions have profound effects on biological diversity. Land use planners, however, have many opportunities to tailor their traditional land use tools to better address biodiversity conservation. To the extent possible, planning decisions should be based on the best available science. Although the current scientific literature provides much guidance to land use planners on how to incorporate ecological knowledge into their actions, significant gaps exist in the information provided by the scientific community. The more that is known about how human mediated fragmentation impacts ecosystems, the more it is revealed that species and communities interact in complex,

dynamic, and often unpredictable ways on multiple temporal and spatial scales. For science to meet the needs of local land use planners, on-going and dedicated collaboration needs to exist between the scientific, policy, and land use planning communities. Although a consensus may never develop in the scientific community on broad conservation thresholds, more effective and targeted guidance can be developed to help land use planners make more ecologically informed decisions. Without this information, little incentive exists for land use planners and land managers to factor biodiversity considerations into their decisions at all.

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APPENDIX A. FURTHER ANALYSIS

Titles and abstracts of 1,458 papers within scientific and land use planning journals were reviewed to determine whether they provide specific information on conservation thresholds that could help guide land use planning in the United States. A total of 160 papers (11 percent) were selected for inclusion in this study: 20 papers with quantitative information on minimum patch area; 27 papers on minimum proportion of suitable habitat; 25 papers on edge width distance; and 88 papers on minimum buffer width.³⁰

A CLOSER LOOK AT HABITAT PATCH SIZE

Only 20 papers were found in the scientific literature to provide specific information on minimum patch area requirements pertaining to ecoregions within the United States; these papers provided 28 citations on threshold patch size.³¹ The majority of papers that address habitat patch size focus primarily on estimating the area of habitat needed to sustain specific target species—as measured by species occurrence, population densities, or breeding success—and to a lesser extent species diversity or community assemblages. As reported in previous literature reviews, little is known about the amount of patch area needed to maintain essential ecosystem functions, such as primary productivity, nutrient and hydrologic cycling, or disturbance regimes (Forman 1995).

This survey reveals a taxonomic bias in scientific literature. Out of the total 28 citations, 16 citations (57 percent) pertain to birds and six citations (21 percent) to mammals. Minimum patch area requirements reported in the literature ranged from one hectare to over 2,500 hectares for birds, and from one hectare to over 220,000 hectares for mammals. Only two studies provide three relevant citations on patch size requirements for plant species: an estimated two hectares needed to sustain a representative tree community type (Elfstrom 1974), and at least 10 hectares needed to conserve an old growth forest if surrounded by secondary forest, or 100 hectares if surrounded by clearcuts (Harris 1984). Two additional studies provide patch area information for invertebrates, which indicate that habitat requirements for invertebrates may range from a minimum of 0.0004 hectares (four meters squared) up to one hectare. One study provides

information for fishes, predicting a 50 percent chance of bull trout occurrence in watershed patches larger than 2,500 hectares (Rieman and McIntyre 1995).

Reported habitat patch size thresholds vary widely, even within the same taxonomic group and for the same species. This lack of convergence on minimum critical patch size reflects the large range of habitat needs exhibited by different species across different ecosystems and that species response to habitat fragmentation is very complex. This natural and inherent complexity is compounded by the lack of consistency in methodology researchers used to measure minimum habitat requirements—with differing study designs as well as parameters measured. Minimum patch area is commonly determined for target species by measuring species occurrence on a site, species densities, or nesting/breeding success. To a lesser extent studies evaluate the persistence of species diversity or community assemblages. Since different parameters are measured, different results are produced. For example, according to this survey, neotropical wood thrushes require anywhere from one hectare up to greater than 2,500 hectares of habitat depending on the variable measured (evidence of breeding versus nesting success and occurrence of nesting predation) (Robbins et al. 1989 and Trine 1998).

By in large, this review reiterates a viewpoint expressed by the scientific community several years ago: simply not enough is known about minimum critical size that should be protected in order to maintain species diversity and species composition in any given ecosystem (Lovejoy and Oren 1981 *as cited in* Saunders et al. 1991; Noss and Harris 1986). Given the lack of information on the habitat patch size requirements of species, communities, or ecosystems in the United States, land use planners should work with land and natural resource agencies and local scientists to identify the habitat patches most in need of protection.

A CLOSER LOOK AT PROPORTION OF SUITABLE HABITAT

Twenty-seven papers were encountered within the scientific literature reporting extinction or habitat fragmentation thresholds on the proportion of suitable habitat needed for an array of species. The papers surveyed provide 26 different estimates of the amount of habitat needed, depending on the species and taxa in question, and the parameter measured. The majority of findings—42 percent (11 citations)—relate to the amount of habitat recommended to maintain bird

³⁰These numbers only include papers that provided specific threshold information, which was factored into the assessment (see Appendices). Review papers and background papers are not included in these figures if they failed to provide relevant quantitative information.

³¹ Because papers provide multiple findings/recommendations related to minimum patch area size requirements, the number of papers does not necessarily equal the number of citations.

CLOSER LOOK AT EDGE INFLUENCE

species or populations. Based on this review, bird species in the United States may require anywhere from 5 percent to 80 percent of suitable remaining habitat.

The second most commonly researched group is mammals. About 23 percent of the findings (six citations) pertained to mammalian response to habitat loss and habitat isolation, which suggests that this taxonomic group may require anywhere from 6 percent to 30 percent of suitable habitat. This range, however, should not be considered representative for all mammalian groups, because it only includes small mammals (e.g., chipmunks, rabbits, squirrels) (*see* Appendix C). An important focal group—wide-ranging predators and large-bodied mammals—failed to be represented in this select review, thus, the proportions are skewed to the smaller range relevant to smaller bodied mammals.

Four studies (five citations) provide thresholds for invertebrates, ranging from 20 percent up to 60 percent of required protected habitat. Additionally, four studies base their findings on models predicting response by hypothetical species, which reveal that threshold responses may occur anywhere from as large a range as 20 percent to 90 percent of habitat loss.

As revealed by the diverse range of values offered by scientists, it is clear that no common threshold exists for the amount of habitat needed to support different populations of species or needed to minimize the negative effects of habitat fragmentation in a landscape. The lower range of proportions (e.g., 5 to 30 percent) tend to be habitat fragmentation thresholds, as determined by evidence that species are in some way negatively affected by habitat loss or habitat isolation. A significant proportion of these studies is based on predicted species response to habitat loss and fragmentation by models (at least seven of the citations). The larger proportions (e.g., 60 to 80 percent) tend to be based on models that predict the amount of habitat needed to sustain long-term species persistence or to prevent the consequences of extensive habitat fragmentation in a landscape.

Given the sparse and diverse findings, land use planners should apply these thresholds with great caution. As reported in earlier reviews, most of the habitat fragmentation studies are performed during short time periods (e.g., one or two seasons), and only provide a snap shot of how species may respond to habitat loss and isolation (Andrén 1994). In these studies, the damage to populations resulting from habitat alteration could have occurred previously (Mönkkönen and Reunanen 1999)—particularly for historically modified landscapes like eastern deciduous forests (Meier et al. 1995, Mitchell et al. 2002). Thus, the long-term consequences of fragmentation are likely not revealed in this select review because a time lag often exists between the fragmentation of a landscape and the associated response by species, populations, or systems (Andrén 1994).

Twenty-five studies surveyed provide 32 findings on the distance that edges might affect habitats in the United States. Like the other conservation thresholds, the focal species of choice is birds. Sixty-six percent of the findings (21 citations within 12 articles) measure the influence of edges related to bird response, revealing that edge influence for birds extends anywhere from about 16 meters to up to almost 700 meters. Studies measuring bird or bird nest abundance report that edge effects extend between 180 and 687 meters where as those measuring predation and nesting success range from 50 to beyond 600 meters. Bird response (e.g., flushing distance) to disturbances such as roads and human traffic extends from 16.27 meters to 300 meters.

Secondarily, the influence of edges is measured by abiotic responses. Edge effects based on microclimate conditions—such as changes in light, temperature, humidity, nutrients, and moisture—are found to extend from eight meters up to 240 meters based on five studies (six citations) (Ranney et al. 1981, Laurance and Yensen 1991, Brothers and Spingarn 1992, Matlack 1993, and Chen et al. 1995).

To a lesser extent, the scientific literature provides information on the effects of edges on mammals and plants. Three studies have found that mammals avoid edge environments from at least 45 meters to 900 meters. For example, studies reveal that wide-ranging grizzly bears are displaced from 100 to 900 meters due to traffic along roadways (Mills 1996, Miller et al. 2001, and Weaver et al. 1996). One study provides evidence on the influence of edges on plant communities, finding that almost no recruitment of seedlings occurs within 65 meters of forest clear-cut edges in Oregon (Jules 1998).

Within this review, no single study is found to report edge influence in relation to invertebrate communities in the United States. As is true for the other thresholds, research has been conducted more extensively in tropical forests outside of the United States, and may serve to address knowledge gaps. For example, a study in Brazil reveals that edge effects may be more intense for invertebrate groups. Edge effects may penetrate up to 50 meters as measured by bird density; 80 meters as measured by soil moisture; 100 meters as measured by canopy height, foliage density, and leaf-litter invertebrate abundance and richness; 200 meters as measured by leaf-litter invertebrate species composition and invasion of disturbance adapted beetles; and 250 meters for invasion of disturbance-adapted butterflies (Laurance et al. 1997).

To get a better handle on the intensity of edge influence in the United States and, consequently, the amount of habitat needed to reduce the effects of edges and related disturbances, land use planners will need more site-specific guidance from ecologists. Land use planners and land managers

will also need more information on effective measures that can be taken to better “soften” the many different types of edges affecting the large array of habitat types in the United States.

A CLOSER LOOK AT BUFFER WIDTH

Eighty-eight papers (156 citations) are found to provide recommendations on riparian buffer widths.³² Of all the conservation thresholds surveyed, buffer prescriptions are the most studied and best documented. Substantial research has been conducted on the effective size of buffers, particularly related to water quality considerations, to assist regulatory and land management agencies in developing scientifically sound minimum buffer width (Castelle et al. 1994). Several literature reviews have been conducted to help inform state and local governments in developing riparian protection plans and ordinances (*see* Johnson and Ryba 1992, Furfey et al. 1997, Wenger 1999, Fischer 2000, Fischer et al. 2000, and Metro 2001). In April 2000, the U.S. Army Corp of Engineers released national recommendations for riparian buffer strip and riparian corridor design (Fischer and Fischenich 2000). This baseline research significantly informed the buffer width recommendations in this report.

One review offers the following buffer prescriptions: a three to 10 meter buffer to provide detrital input; 10 to 20 meters for stream stabilization; five to 30 meters for water quality protection; 20 to 150 meters for flood attenuation; and 30 to 500 meters or more for riparian habitat (Fischer and Fischenich 2000). The Institute’s review reveals wider buffer ranges to provide a variety of functions, with a range of six to 32 meters to reduce noise and wind damage; 10 to 52 meters to stabilize stream banks; three to 80 meters to provide detrital input; four to 92 meters to remove nutrients and pollutants; three to 122 meters to remove sediments; 20 to 150 meters to provide flood attenuation; 10 to 300 meters to regulate temperature and microclimate; and three to 1600 meters to provide wildlife habitat (*see* Appendix E).

Findings in this review primarily relate to river and stream systems, however, a small number of papers explicitly address wetlands (*see* Buhlmann 1998 and Joyal et al. 2001). Although not all wetlands lie within riparian zones (e.g., isolated wetlands), they serve as vital resources and provide essential functions, such as flood storage, water purification, sediment trapping, and wildlife habitat (Mitsch and Gosselink 1993). Thus, placing buffers around these areas to protect them from nearby development activities is also advised.

Predicting the adequacy of a buffer strip to provide sufficient wildlife habitat and to protect natural species diversity is quite challenging. The width recommendations primar-

³² Some papers recommend multiple buffer widths, for example, they may suggest different widths for different species or functions of concern. Thus, the number of papers does not equal the number of citations.

ily focus on birds and are based on various methods—ranging from determining species presence or nesting within the area to determining species abundance, diversity, or community assemblages. Few studies attempt to measure species survival over time; thus, it is questionable whether the recommended buffers will ensure persistence of the target species and communities over the long-term.

As mentioned above, the actual effective size and adequacy of any given buffer is determined by the management target, as well as other site-specific factors, such as site and watershed conditions; intensity of adjacent land use; slope steepness; stream order; soil characteristics (depth, texture, erodibility, moisture, pH); floodplain size and frequency of inundation; hydrology; buffer characteristics (e.g., type, density, and structure of vegetation, and buffer length); and landowner/manager objectives (Naiman et al. 1993, Castelle et al. 1994, Wenger 1999, Todd 2000). For example, larger buffers may be necessary when the buffer strip is in poor condition (e.g., comprised of sparse exotic vegetation, disturbed/erodible soils); is located on steep bank slopes (e.g., greater than 10 percent to 15 percent);³³ is surrounded by intense land uses; or is located within watersheds with increased impervious surfaces that results in high nutrient, chemical, and sediment inputs, and runoff (e.g., adjacent to urban/suburban areas or intensive agricultural farmland). Such factors should be considered when evaluating the applicability of the general recommended buffer sizes (*see* Wenger 1999, Fischer and Fischenich 2000, Metro 2001). In addition, management decisions should not only be based on site-specific characteristics but also on basin or watershed level needs to maintain the hydrologic connectivity and natural variability of these systems (Naiman et al. 1993, Pringle 2001).³⁴

A CLOSER LOOK AT CORRIDORS

To determine whether or not corridors are effectively enhancing species conservation, scientists evaluate whether (and how) patch occupancy, species abundance and diversity, colonization, and immigration rates change with and without the presence of corridors (Beier and Noss 1998).

Many studies lend support to the premise that corridors retain important species or provide faunal habitat (Bennett 1998). Few studies, however, provide clear evidence that corridors are required for species movement in landscapes (Hobbs 1992). Many species simply do not respond or require corridors (Rosenburg et al. 1997, Bowne et al. 1999, Hannon and Schmiegelow 2002). For example, male-hooded warblers preferentially travel across open areas, even in

³³ Herson-Jones et al. 1995 (found that greater than 10 percent slopes are steep slopes) and Nieswand et al. 1990 (found that greater than 15 percent slopes are steep) (as cited in Wenger 1999).

³⁴ Hydrologic connectivity refers to water-mediated transfer of matter, energy, or organisms within or between elements of the hydrologic cycle (Pringle 2001).

landscapes with corridors connecting habitat patches (Norris and Stutchbury 2001). For species like the Northern spotted owl, which has been found to disperse randomly, the presence of corridors will likely not enhance its survival (Murphy and Noon 1992 *as cited in* Lindenmayer and Franklin 2002). Because of the complexity of animal behavior, land use planners should not assume that establishing corridors between habitat patches in a region will automatically guarantee enhanced and effective dispersal and recolonization among the separated wildlife populations.

The benefits of corridors should be weighed against their potential repercussions. Scientists warn that corridors may potentially transmit diseases, fires, or other catastrophes among habitats and populations, as well as increase invasions by non-native invasions or exposure to predation (Simberloff and Cox 1987, Noss 1991, Noss and Cooperrider 1994). To add to the complexity of this issue, many corridor studies—

both those that claim corridor benefits and those that claim costs—suffer from design flaws that limit their ability to discern the real conservation value of corridors (Beier and Noss 1998).

A recent scientific review is able to shed some light on the corridor controversy; a review by Beier and Noss (1998) presents evidence from well-designed studies that suggest that corridors seem to be providing sufficient connectivity to enhance the viability of wildlife populations. Conversely, a lack of evidence backs the assertion that the presence of corridors actually has a greater adverse impact than their absence (Beier and Noss 1998, Hobbs 1992). Although wildlife corridors should not be automatically assumed to be an essential component of all land conservation strategies (Lindenmayer and Franklin 2002), planners should consider corridors as one potentially valuable conservation tool (Beier and Noss 1998, Hobbs 1992).

APPENDIX B. MINIMUM PATCH AREA

Minimum patch area requirements (in hectares) found within the scientific literature (as of December 2001) to maintain populations or communities of animal or plant species in the United States. One hectare is about 2.5 acres.

TAXA	PATCH AREA	FINDING	STATE	CITATION
Birds				
	≥ 1 ha	Minimum area requirement for breeding wood thrushes is 1 ha, although nesting success on fragments of that size would be extremely low.	MD, PA, VA, WV	Robbins et al. 1989
	> 1	Five species of chaparral-requiring birds were supported by census plots larger than 1 ha.	CA	Soulé et al. 1992
	≥ 2 ha (seed-eating birds) ≥ 40 ha (insect-eating birds)	The minimum area point ¹ for insect-eating birds was estimated to be at least 40 ha, in contrast to 2 ha for seed-eating birds. This is interpreted as the habitat size needed to support a representative bird community.	NJ	Forman et al. 1976 ² Galli et al. 1976 ²
	≥ 5 ha (marsh)	Ten of the 25 species did not occur in marshes less than 5 ha.	IA	Brown and Dinsmore 1986
	≥ 5, ≥ 30, ≥ 40, ≥ 50, ≥ 55 ha	Estimates of minimal area requirements for five area-sensitive species ranged from 5 to 55 ha.	IL	Herkert 1994
	≥ 6.5 ha, 15.4 -32.6 ha	Black tern required 6.5 ha in heterogeneous landscapes, but required 15.4 - 32.6 ha in homogeneous landscapes.	SD	Naugle et al. 1999
	≥ 10 ha (forest)	Forest patches ≥ 10 ha had much greater bird diversity than patches < 3.25 ha	GA	McIntyre 1995
	> 80 ha	In fragments < 80 ha, nesting success was low (43%), and nest predation was high (56%).	PA	Hoover et al. 1995
	< 20 ha, >2500 ha	Based on a study of cowbird parasitism and nest predation on 3 large forest tracts (1100 - 2200 ha) in southern Illinois, maintaining wood thrush populations in the midwest might require > 2500 ha reserves. In the east even a small woodlot (< 20ha) may sustain a population.	IL	Trine 1998
Mammals				
	> 1 ha	Control plots larger than 1 ha supported most species of rodents.	CA	Soulé et al. 1992
	≥ 5 ha	Cottontails may become vulnerable to extinction if large patches ≥ 5.0 ha are not maintained.	NH	Barbour and Litvaitis 1993
	≥ 10 ha	Fragments < 10 ha did not support populations of native rodents.	CA	Bolger et al. 1997

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TAXA	PATCH AREA	FINDING	STATE	CITATION
	≥ 900 ha (9 km ²)	More than 80% of bear sightings occurred in blocks of undisturbed habitat ≥ 9 km ² .	MT	Mace et al. 1996 ³
	≥ 2800 ha (28 km ²)	Grizzly bears in the Yellowstone ecosystem should have security blocks 28 km ² in size.	MT, ID, WY	Mattson 1990 ³
	≥ 220,000 ha (2200 km ²)	Model predicts low extinction risk for cougars in areas as small as 2200 km ² , but w/ increasing risk with little immigration.	CA	Beier 1993
Fishes				
	> 2500	Found support that suitable patch size (as defined by watersheds above 1600 m elevation) influences the occurrence of bull trout. Predicted probability of occurrence is 0.5 for patches larger than 2500 ha.	ID	Rieman and McIntyre 1995
Invertebrates				
	≥ .0004 ha (4m ²)	Vegetation patches ≥ 4m ² , as well as open areas, were important to the distribution and abundance of carabid beetles.	OH	Crist and Ahern 1999
	≥ 1 ha	Observed minimum patch size for occupancy by populations of 3 butterfly species is 1 ha.	model	Hanski 1994
Plants				
	≥ 2 ha (5 acres)	Minimum area point ¹ for tree communities was estimated to be about 2 ha.	NJ	Elfstrom 1974 ²
	≥ 10, ≥ 100 ha	Conserving an old-growth forest might require 10 ha if surrounded by comparable forest, but 100 ha if surrounded by a clearcut.	—	Harris 1984 ⁴

— Indicates that the geographic location was not determined because the recommendation was cited secondarily from another review article.

model indicates that the research was conducted through modeling and therefore is not specific to any geographic area.

¹ Minimum area point is the point on a species-area curve, which shows the relationship between species number and habitat area, where there is an abrupt change in the slope. The minimum area point has been considered an index of how large a community must be to representative of the community type (Forman 1995).

²As cited in Forman 1995

³As cited in Weaver et al. 1996

⁴As cited in Franklin 1993

APPENDIX C. PROPORTION OF SUITABLE HABITAT

Recommended minimum proportions of suitable habitat found within the scientific literature (as of December 2001) to maintain long-term persistence of viable populations or communities of species or to minimize the negative consequences of habitat fragmentation in the United States.

TAXA	PROPORTION OF SUITABLE HABITAT	FINDING	STATE	CITATION
Birds				
	≥ 5%	When < 5% of area was covered by habitat, there was an effect on bird density.	WI	Ambuel and Temple 1983 ¹
	≥ 5%	When < 5% of area was covered by habitat, there was an effect on bird community.	—	Howe 1984 ¹
	> 8%	When 8% of area was covered by habitat, there was an effect on land bird community.	—	Nilsson 1978 ¹ Nilsson 1986 ¹
	≥ 10%	When < 10% of area was covered by habitat, there was an effect on species richness.	—	Soulé et al. 1988 ¹ Bolger et al. 1991 ¹
	>10-30%	The negative effects of patch size and isolation on native species may not occur until the landscape consists of only 10-30% of the original habitat.	review	Andrén 1994
	> 15%	When 15% of area was covered by habitat, there was an effect on bird density.	—	Askins et al. 1987 ¹
	> 20%	When 20% of area was covered by habitat, there was an effect on bird community.	MD	Lynch and Whigham 1984 ¹
	> 22%	When 22% of area was covered by habitat, there was an effect on land bird community	—	Whitcomb et al. 1981 ¹
	> 50%	Numerous species were more likely to inhabit wetlands in landscapes where less than 50% of the upland matrix was tilled.	SD	Naugle et al. 2001
	≥ 60%	A model assuming 60% suitable habitat suggests a high likelihood for the longterm persistence of Northern spotted owls.	model	Lamberson et al. 1994
	> 80%	Metapopulation model predicted that the Northern spotted owl population would go extinct if the proportion of old-growth forest was reduced to less than 20% of landscape.	model	Lande 1988 ⁴ Lamberson et al. 1992 ⁴
Mammals				
	> 6%	When 6% of area was covered by habitat, there was an effect on chipmunk density.	—	Henderson et al. 1985 ¹
	> 6%	When 6% of area was covered by habitat, there was an effect on pika abundance.	—	Smith 1974 ¹ Smith 1980 ¹
	≥ 10%	When < 10% of area was covered by habitat, there was an effect on mammal species richness.	—	Soulé et al. 1992 ¹
	> 10%	When 10% of area was covered by habitat, there was an effect on Columbian ground squirrel presence/absence.	—	Weddell 1991 ¹
	> 10-30%	The negative effects of patch size and isolation on the native species may not occur until the landscape consists of only 10-30% of the original habitat.	review	Andrén 1994
	> 15%	When 15% of area was covered by habitat, there was an effect on small mammal presence.	—	Lomolino et al. 1989 ¹

TAXA	PROPORTION OF SUITABLE HABITAT	FINDING	STATE	CITATION
Invertebrates				
	≥ 20%	The threshold for changes in movement patterns of beetles occurred at 20% coverage of cells.	CO	Wiens et al. 1997
	≥ 20%	Clover patches became significantly more isolated below 20% habitat, which disrupted the predator foraging behavior of ladybird beetles, decreasing their ability to serve as biocontrol agents of aphids.	model	With et al. 2002
	≥ 40%	Habitat specialists of grasshoppers exhibited limited movement and disjunct populations—which can affect population persistence—when preferred habitat occupied less than 40% of the landscape.	model	With and Crist 1995
	≥ 40, ≥ 60%	Rare species were disproportionately affected by fragmentation and did not occur in patches with less than 40% habitat. Over half of the species were never observed in plots with less than 60% habitat remaining.	OH	Summerville and Crist 2001
Hypothetical Species				
	> 10-30%	As habitat loss continues beyond the threshold (occurring somewhere in the range of 70-90% habitat loss) decline in population performance should become much more severe. But model predicts that habitat fragmentation begins to occur when about 60% of original vegetation remains.	model	Gardner et al. 1987 ²
	≥ 20%	The threshold value of habitat amount is 20% habitat, below which the effects of habitat fragmentation on population persistence may become evident.	—	Andrén 1994 ³ Fahrig 1998 ³
	> 70%	Models of forest landscapes forecast that patches of old-growth forest can become fragmented even when about 70% of the landscape cover remains.	model	Franklin and Forman 1987
	> 80%	Terrestrial species with low demographic potential could not persist in landscape even with 80% of suitable habitat in landscape.	model	Lande 1987 ⁴

— Indicates that the geographic location was not determined because the recommendation was cited secondarily from another review article.

model indicates that the research was conducted through modeling and therefore is not specific to any geographic area.
review indicates papers that base recommendation on a survey of the literature.

¹ As cited in Andrén 1994

² As cited in Dooley and Bowers 1998

³ As cited in Fahrig 2001

⁴ As cited in With and Crist 1995

APPENDIX D. EDGE INFLUENCE

Distances (in meters) that edge effects penetrate into habitats in the United States as found within the scientific literature (as of December 2001), according to abiotic, bird, mammal, and plant response.

TAXA/SUBJECT	EDGE INFLUENCE	FINDING	STATE	CITATION
Abiotic				
	8 m	Microclimatic differences ceased to exist beyond 8 m into forest fragments.	IN	Brothers and Spingarn 1992
	13.3 m	Model indicated that elevated soil temperatures may extend up to 13.3 m from edge.	model	Laurance and Yensen 1991
	≥ 15 m	In deciduous forest patches, microclimate changes were estimated to extend at least 15 m from the forest edge to the interior.	WI	Ranney et al. 1981 ²
	50 m	Significant edge effects were detected in light, temperature, litter moisture, vapor pressure deficit, humidity, and shrub cover, affecting the forest microenvironment up to 50 m from the edge.	PA, DE	Matlack 1993
	15-60 m (solar radiation) > 240 m (humidity and wind speed)	Solar radiation gradients extend 15–60 m into upland old-growth forest and humidity and wind speed gradients at > 240 m.	—	Chen et al. 1995 ⁹
Birds				
	16.27 m, 16.95 m, 37.73 m	Maximum flushing* distance in response to pedestrians and dogs was 16.27 m (American robin), 16.95 m (vesper sparrow), and 37.73 m (western meadowlark).	CO	Miller et al. 2001
	50 m	Predation and parasitism rates are often significantly greater within 50 m of an edge.	—	Paton 1994 ³
	50 m	Murrelet nest success was higher when nests were more than 50 m from the forest edge.	—	Nelson and Hamer 1995 ⁴
	75 m	Estimated that edge-related nest predation extended 75 m into forested buffer strip.	ME	Vander Haegen and Degraaf 1996
	75 m, 100 m	For the majority of species found to have reduced numbers near trails due to nest predation and brood parasitism by brown-headed cowbirds, the zone of influence of trails appears to be around 75 m; however, Townsend's Solitaires exhibited reduced numbers as far as 100 m away from trail.	CO	Miller et al. 1998
	75 m, 125 m, 140 m, 160 m, 210 m, 300 m	Buffer zones that would prevent flushing by approximately 90% of the wintering individuals of a species are: American kestrel, 75 m; merlin, 125 m; prairie falcon, 160 m; rough-legged hawk, 210 m; ferruginous hawk, 140 m; and golden eagle, 300 m.	CO	Holmes et al. 1993
	100 m	Flushing distances of waterbirds in response to pedestrians, all-terrain vehicles, automobiles, and boats, indicate that human disturbance extends up to 100 m.	FL	Rodgers and Smith 1997

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TAXA/SUBJECT	EDGE INFLUENCE	FINDING	STATE	CITATION
	180 m	Avian densities were altered up to 180 m away from homes on the perimeter of ex-urban developments.	CO	Odell and Knight 2001
	200–500 m	The abundance of interior habitat bird species was reduced within 200 to 500 m of an edge.	CA	Bolger et al. 1997b ¹
	≥ 300 m	Nest parasitism by brown-headed cowbirds decreased with distance away from forest edge but extended ≥ 300 m into the forest.	—	Brittingham and Temple 1983 ⁵
	511 m, 687 m	Most Cooper hawk nests occurred 511 m from paved roads and 687 m from human habitation.	Northeast	Bosakowski et al. 1992
	600 m	Effect of increased predation extends 600 m into habitat.	—	Wilcove et al. 1986 ⁴
Mammals				
	≥ 45 m	The influence of a clearcut on small mammals (California red-backed vole and deer mouse) extends at least 45 m into the forest from its edge.	—	Mills 1996 ⁶
	81.92 m	Maximum flushing distance of mule deer in response to pedestrians and dogs was 81.92 meters.	CO	Miller et al. 2001
	100–900 m	Human traffic along open roads displaces most grizzly bears from 100–900 meters.	—	Mattson et al. 1987 ⁷ McLellan and Shackleton 1988 ⁷ Aune and Kasworm 1989 ⁷ Kasworm and Manley 1990 ⁷ Mace et al. 1996 ⁷
Plants				
	65 m	Populations in forest remnants within 65 m of forest clear-cut edges have almost no recruitment of young plants.	OR	Jules 1998
General				
	5000 m	In different habitats and for different taxa, edge effects may penetrate up to 5 km.	—	Janzen, 1986 ⁸

* Flushing distance is the distance that an animal may flee in response to a disturbance, such as in response to pedestrian or pets on a trail or vehicular traffic on roads.

— Indicates that the geographic location was not determined because the recommendation was cited secondarily from another review article.

model indicates that the research was conducted through modeling and therefore is not specific to any geographic area.

¹ As cited in Metro 2001.

² As cited in Collinge 1996

³ As cited in Hartley and Hunter 1998

⁴ As cited in Meyer and Miller 2002

⁵ As cited in Robbins et al. 1989

⁶ As cited in Lidicker 1999

⁷ As cited in Weaver et al. 1996

⁸ As cited in Laurance and Yensen 1991

⁹ As cited in Brososfske et al. 1997

APPENDIX E. RIPARIAN BUFFER WIDTH

Recommended minimum riparian and wetland buffer widths (in meters) to maintain water quality and wildlife functions within ecoregions of the United States, as found within the scientific literature (as of December 2001).

FUNCTION	TAXA/SUBJECT	BUFFER WIDTH	CITATION
Miscellaneous			
	Noise	≥ 6 m (mature evergreen)	Harris 1985 ³
	Wind damage prevention	≥ 23 m	Pollock and Kennard 1998 ³
	Noise	≥ 32 m (heavily forested)	Groffman et al. 1990 ⁵
Detrital Input			
	Organic litterfall	1/2 SPTH	FEMAT 1993 ³
	Large Woody Debris	1 SPTH	FEMAT 1993 ³
	Large Woody Debris	1 SPTH	Spence et al. 1996 ³
	Woody Debris	3–10 m	Fischer and Fischenich 2000
	Woody Debris	10–30 m	Wenger 1999
	Organic litterfall	≥ 30 m	Erman et al. 1977 ³
	Woody Debris	≥ 30 m (forested watersheds)	Pollock and Kennard 1998 ³
	Woody Debris	≥ 31 m	Bottom et al. 1983 ⁴
	Woody Debris	≥ 46 m	McDade et al. 1990 ³
	Organic litterfall	≥ 52 m	Spence et al. 1996 ³
	Woody Debris	≥ 80 m	May 2000 ³
Temperature and microclimate regulation			
	Microclimate	3 SPTH	FEMAT 1993 ³
	Shade	10–30 m	Osborne and Kovacic 1993 ³
	Temperature control	10–30 m	Wenger 1999
	Water temperature	10–30 m	Castelle et al. 1994
	Shade	11–24 m	Brazier and Brown 1973 ⁵
	Water temperature	≥ 12 m	Corbett and Lynch 1985 ⁴
	Water temperature	15–30 m	Hewlett and Fortson 1982 ⁴
	Shade	23–38 m	Steinblums et al. 1984 ⁵
	Shade	≥ 30 m	Spence et al. 1996 ³
	Shade	≥ 30 m	FEMAT 1993 ³
	Shade	≥ 30 m	May 2000 ³
	Maintenance of water temperature within 1°C of former mean	≥ 30 m	Lynch, Corbett, and Mussalem 1985 ¹
	Water temperature	30–43 m	Jones et al. 1988 ⁴
	Air temperature, solar radiation, wind, humidity	≥ 45–300 m	Brosofske et al. 1997
	Microclimate regulation	≥ 100 m	May 2000 ³
	Microclimate regulation	61–160 m	Knutson and Naef 1997 ³
Bank Stabilization			
	Bank Stabilization	1/2 SPTH	FEMAT 1993 ³
	Bank Stabilization	10–20 m	Fischer and Fischenich 2000

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FUNCTION	TAXA/SUBJECT	BUFFER WIDTH	CITATION
	Stream/channel stabilization	20–30 m	Corbett and Lynch 1985 ⁴
	Stream stabilization/sediment control	≥ 38 m	Cederholm 1994 ³
	Bank Stabilization	≥ 52 m	Spence et al. 1996 ³
Flood Attenuation			
	Floodplain storage	20–150 m	Fischer and Fisichenich 2000
Sediment Removal			
	Sediment removal	≥ 3m (sand), ≥ 15 m (silt), ≥ 122m (clay)	Wilson 1967 ⁵
	Sediment removal	5–30 m	Fischer and Fisichenich 2000
	Sediment removal	8–46 m (depending on slope)	SCS 1982 ⁴
	Sediment (85% removal)	≥ 9 m (grass filter strips, 7%, 12% slopes)	Ghaffarzadeh et al. 1992 ⁴
	Suspended solids (84% removal)	≥ 9 m (vegetated filter strip)	Dillaha et al. 1989 ¹
	Sediment removal	9–30 m	Wenger 1999
	Sediment removal	10–60 m	Castelle et al. 1994
	Sediment removal	≥ 15 m	Budd et al. 1987 ⁴
	Sediment removal	≥ 15.6 m	Broderson 1973 ⁴
	Sediment removal	≥ 23 m	Schellinger and Clausen 1992 ⁴
	Suspended sediment (92% removal)	≥ 24.4 m (vegetated buffer)	Young et al. 1980 ⁴
	Sediment removal	≥ 25 m	Desbonnet et al. 1994 ⁴
	Sediment removal	≥ 30 m	Erman et al. 1977 ³
	Sediment removal	≥ 30m	Moring 1982 ³
	Sediment removal	≥ 30 m	May 2000 ³
	Sediment (75% removal)	30–38 m	Karr and Schollosser 1977 ⁴
	Sediment (75–80% removal)	≥ 30 m	Lynch, Corbett, and Mussalem 1985 ¹
	Sediment (80% removal)	≥ 61 m (grass filter strip and vegeated buffers)	Horner and Mar 1982 ¹
	Sediment (50% removal)	≥ 88 m	Gilliam 1988 ⁴
Nutrient/Pollutant Removal			
	Nitrogen, Phosphorus, Potassium, and Fecal Bacteria	≥ 4 m (grass filter strip and forested buffers)	Doyle et al. 1997 ¹
	Nitrates and Phosphates (90% removal)	≥ 5 (grass filter strip)	Madison et al. 1992 ¹
	Nutrient removal	5–30 m	Fischer and Fisichenich 2000
	Nitrates (almost complete removal)	≥ 7 m	Lowrance 1992 ¹
	Removal of Phosphorus (79%) and Nitrogen (73%)	≥ 9 m (vegetated filter strip)	Dillaha et al. 1989 ¹
	Nitrogen and Phosphorus	≥ 10 m	Corley et al 1999 ¹
	Nutrient and Metal	≥ 10 m	Petersen et al. 1992 ⁴
	Nutrient removal	10–90 m	Castelle et al. 1994
	Nitrate Concentrations	15–30 m	Wenger 1999

FUNCTION	TAXA/SUBJECT	BUFFER WIDTH	CITATION
	Nutrient and metal	≥ 15 m	Castelle et al. 1992 ⁴
	Phosphorus	≥ 15 m (hardwood buffer)	Woodard and Rock 1995 ¹
	Nutrient and metal	≥ 16 m	Jacobs and Gilliam 1985 ⁴
	Estradiol (98% decrease)	≥ 18 m (grass filter strip)	Nichols et al. 1998 ¹
	Nitrogen and Phosphorus (80 and 89% removal, respectively)	≥ 19 m (riparian forest buffer)	Shisler, Jordan, and Wargo 1987 ¹
	Nitrates (up to 100%)	20–30 m	Fennessy and Cronk 1997 ³
	Fecal coliform reduction	23–92 m	SCS 1982 ⁵
	Pollutant removal	≥ 30 m	May 2000 ³
	Fecal coliform reduction	≥ 30 m	Grismer 1981 ⁵
	Nutrient reduction to acceptable levels	≥ 30 m	Lynch, Corbett, and Mussalem 1985 ¹
	Nutrient and metal removal	30–43 m	Jones et al. 1988 ⁵
	Nutrient and metal removal	≥ 36 m	Young et al. 1980 ⁴
Wildlife and Plant Species			
	General wildlife	3–183 m	FEMAT 1993 ³
	General wildlife habitat	≥ 10 m	Petersen et al. 1992 ⁵
	General species diversity	10–100 m	Castelle et al. 1994
	General bird habitat	≥ 15 m	Milligan 1985 ⁵
	Fish (Cutthroat trout, rainbow trout, and steelhead)	15–61 m	Knutson and Naef 1997 ³
	Birds	≥ 15–200 m	Stauffer and Best 1980
	Aquatic wildlife habitat	20–150 m	Fischer and Fischenich 2000
	General wildlife habitat	≥ 23 m	Mudd 1975 ⁵
	General wildlife habitat	≥ 27 m	WDOE 1981 ⁵
	Invertebrates (aquatic insects)	≥ 30 m	Erman et al. 1977 ³
	Invertebrates (macroinvertebrate diversity)	≥ 30 m	Gregory et al. 1987 ³
	Fish (cutthroat trout)	≥ 30 m	Hickman and Raleigh 1982 ³
	Invertebrates (benthic communities)	≥ 30 m	Newbold et al. 1980 ⁵
	Amphibians (frogs and salamanders)	≥ 30 m (riparian forest buffer)	NRCS 1995 ³
	Fish (brook trout)	≥ 30 m	Raleigh 1982 ⁵
	Fish (rainbow trout)	≥ 30 m	Raleigh et al. 1984 ³
	Fish (chinook salmon)	≥ 30 m	Raleigh et al. 1986 ⁵
	Invertebrates (benthic communities)	≥ 30 m	Roby et al. 1977 ⁵
	Amphibians, Reptiles, Vertebrates	≥ 30 m (riparian forest buffer)	Rudolph and Dickson 1990 ¹
	Fish (salmonid egg development)	≥ 30 m	Spackman and Hughes 1995 ¹
	Plants (vascular plant diversity)	≥ 30 m	Spackman and Hughes 1995 ¹
	Fish (fish diversity and densities)	≥ 30 m	Stewart et al. 2000
	Mammals (beavers)	30–100 m	Jenkins 1980 ⁹
	General wildlife habitat	≥ 32 m	Groffman et al. 1990 ⁵
	Birds (Willow flycatcher nesting)	≥ 37.5 m	Knutson and Naef 1997 ³

FUNCTION	TAXA/SUBJECT	BUFFER WIDTH	CITATION
	Birds (diversity and assemblages)	≥ 40 m	Hagar 1999
	Birds (assemblages and persistence)	≥ 45 m	Pearson and Manuwal 2001
	Mammal (gray squirrel)	≥ 50 m	Dickson 1989 ¹
	Birds (neotropical migrants, interior species)	≥ 50 m	Tassone 1981 ³
	Birds (raptors)	50–1600 m	Richardson and Miller 1997 ⁷
	Fish (trout, salmon)	≥ 61 m	Castelle et al. 1992 ³
	Mammals (deer)	≥ 61 m	NRCS 1995 ³
	General wildlife	≥ 61 m	Zeigler 1988 ⁵
	Mammals (small)	67–93 m	Jones et al. 1988 ⁵
	Reptiles (gravid mud turtles, Florida cooters, slider turtles)	≥ 73 m (90% protection)	Burke and Gibbons 1995
	Birds	75–200 m	Jones et al. 1988 ³
	Mammal (beaver)	≥ 91 m	NRCS 1995 ³
	Mammals (large)	≥ 100 m	Jones et al. 1988 ⁵
	Birds (neotropical migrants)	≥ 100 m	Fischer 2000
	Wildlife habitat	≥ 100 m	Fischer, Martin, and Fischenich 2000; and Fischer and Fischenich 2000
	Birds (yellow-billed cuckoo breeding habitat)	≥ 100 m	Gaines 1974 ²
	Birds (neotropical migrant diversity and functional assemblages)	≥ 100 m	Hodges and Kremetz 1996
	Birds (forest bird nesting habitat)	≥ 100 m	Keller et al. 1993
	Reptiles (Western pond turtle nesting habitat)	≥ 100 m (stream buffer)	Knutson and Naef 1997 ³
	Aquatic wildlife	≥ 100 m	May 2000 ³
	Birds (red-shouldered hawk and forest bird breeding habitat)	≥ 100 m	Mitchell 1996 ²
	Birds (pileated woodpecker nesting habitat)	≥ 100 m	Small 1982 ³
	Birds (neotropical migrant abundance)	≥ 100 m	Triquet, McPeck, and McComb 1990 ²
	Terrestrial riparian wildlife communities	100–300 m (300 m for forest interior species)	Wenger 1999
	Reptiles (spotted turtles nesting habitat)	120 m (wetland buffer)	Joyal et al. 2001
	Reptiles (turtles)	≥ 135 m (wetland buffer)	Buhlmann 1998 ¹
	Birds (Pileated woodpecker)	≥ 137 m	Castelle et al. 1992 ³
	Birds (species diversity)	≥ 150 m	Spackman and Hughes 1995 ²
	Birds (reduce edge-related nest predation)	≥ 150 m	Vander Haegen and DeGraaf 1996
	Amphibians (salamanders)	≥ 165 m	Semlitsch 1998
	Birds (Bald eagle, nesting ducks, herons, sandhill cranes)	≥ 183 m	Knutson and Naef 1997 ³
	Mammals (fawning of mule deer)	≥ 183 m	Knutson and Naef 1997 ³

FUNCTION	TAXA/SUBJECT	BUFFER WIDTH	CITATION
	Plants (minimize non-native vegetation)	≥ 198 m	Hennings 2001 ³
	Birds (Rufous-sided towhee)	≥ 200 m	Knutson and Naef 1997 ³
	Reptiles (Blanding's turtles nesting habitat)	≥ 410 m (wetland buffer)	Joyal et al. 2001
	Reptiles (False map turtles, slider turtles, lotic turtles dispersal)	≥ 449 m	Bodie and Semlitsch 2000
	Birds (complete assemblages)	≥ 500 m	Kilgo et al. 1998 ⁴
General Protection of Aquatic Systems			
	Multiple functions	1–90 m	Todd 2000
	Multiple functions	≥ 10 m	Fischer and Fischenich 2000
	Multiple functions	≥ 15 m	Fischer, Martin, and Fischenich 2000
	Multiple functions	30 m	Furfey et al. 1997
	Sediment/contaminant control, general water quality maintenance	30.5 m (+0.61 m per 1% slope)	Wenger 1999
	Wetland and river integrity	≥ 335 m	Schaefer et al. 1991 ⁶

SPTH, or site potential tree height, is used as a standard measurement to allow for multiple riparian functions. SPTH is measured in various ways. FEMAT (1993) defines SPTH the height of a site potential tree as the average maximum height of the tallest dominant trees of 200 years or more of age for a given site class (For further discussion, refer to Metro 2001).

¹ As cited in Fischer and Fischenich 2000.

² As cited in Fischer 2000.

³ As cited in Metro 2001.

⁴ As cited in Furfey et al. 1997

⁵ As cited in Johnson and Ryba 1992

⁶ As cited in Burke and Gibbons 1995

⁷ As cited in Fischer, Martin, and Fischenich 2000

⁸ As cited in Hagar 1999

⁹ As cited in Allen 1983

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Attachment D
Additional Documentation
Attachment to Comment Letter
3-F2



California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation

1 BACKGROUND

Under the Cap-and-Trade Program, covered entities may use compliance offset credits to satisfy up to eight percent of their compliance obligation.¹ This limit applies to each individual covered or opt-in covered entity for each compliance period. Compliance offsets are tradable credits that represent verified greenhouse gas (GHG) emissions reductions or removal enhancements from sources not subject to a compliance obligation in the Cap-and-Trade Program and resulting from one of the following: (1) a project undertaken using an Air Resources Board (ARB or Board) approved Compliance Offset Protocol pursuant to Subarticle 13 of the Cap-and-Trade Regulation; (2) an offset credit issued by a linked jurisdiction pursuant to Subarticle 12 of the Cap-and-Trade Regulation; or (3) a sector-based offset credit issued by an approved sector-based crediting program pursuant to Subarticle 14 of the Cap-and-Trade Regulation. In almost all cases, these GHG sources are outside of the industrial, energy, and transportation sectors. This document describes ARB's process for the review and approval of new ARB Compliance Offset Protocols. As an important market feature, offset credits can provide covered entities a source of low-cost emissions reductions for compliance flexibility. The inclusion of offset credits will also support the development of innovative projects and technologies from sources outside capped sectors that can play a key role in reducing emissions both inside and outside California.

As required by Division 25.5 of the Health and Safety Code (Assembly Bill 32 or AB 32), any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code §38562(d)(1) and (2)). Any offsets issued by ARB must be quantified according to Board-approved Compliance Offset Protocols. The Cap-and-Trade Regulation (Regulation) includes provisions for collecting and submitting the appropriate monitoring documentation to support the verification and enforcement of reductions realized through the generation and retirement of Compliance offset credits. The regulatory provisions and the requirements of the Compliance Offset Protocols will ensure that the reductions are quantified accurately, represent real GHG emissions reduction, and are not double-counted within the system. Compliance Offset Protocols are considered regulatory documents and are made publicly available so that anyone interested in

¹ "Compliance obligation" is defined as "the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB." Title 17, California Code of Regulations, section 95802(a).

developing an offset project can do so if their project meets Board-approved standards. Information on existing and proposed protocols can be found here:

<http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

It is important to note that compliance offset credits are only one way to incentivize voluntary GHG reductions outside of the Cap-and-Trade Program. Projects that could reduce GHG reductions could be incentivized through the use of grants, the generation of voluntary offsets, and potentially as regulatory offsets for compliance with the California Environmental Quality Act.

2 COMPLIANCE OFFSET PROTOCOL REQUIREMENTS

2.1 How will ARB determine which protocols to take through the approval process?

Periodically, ARB staff will review offset protocols that are available for use in the voluntary offset programs. These voluntary protocols will be assessed against the protocol criteria listed below. This process will be coordinated with our Western Climate Initiative (WCI) partners. Staff will also consider proposed protocols submitted by stakeholders that include elements to ensure any resulting offsets would meet the AB 32 offset and ARB protocol requirements presented in section 2.2. The specific process and steps prior to Board consideration are provided in section 3 below.

In addition to the ability to generate offsets that meet the AB 32 criteria, there are several other factors that are considered when deciding which project types will be considered for potential development of a Compliance Offset Protocol. These factors include, but are not limited to, the following:

- Potential for projects in California;
- Potential offset supply;
- Cost-effectiveness; and
- Co-benefits.

ARB staff is also working with our WCI partner jurisdictions to identify which offset project types to evaluate next as part of the regional trading program, which may also include a review of existing protocols from voluntary offset programs.² Staff will determine if a proposed protocol for a project type can be applied in California and/or at the regional level, and if it has the potential to meet the criteria listed above. There may be instances where a protocol is not applicable in every jurisdiction of a linked program. In all cases, all linked jurisdictions will have to agree on offset project protocols to

² See: <http://www.westernclimateinitiative.org/component/remository/Offsets-Committee-Documents/> accessed May 3, 2013.

ensure nothing will impact the fungibility of offsets across a regional Cap-and-Trade Program.

ARB staff will continue to meet with stakeholders and consider additional proposed offset project types that meet the AB 32 offset and ARB protocol requirements as we coordinate with WCI partner jurisdictions.

2.2 What criteria will ARB use to evaluate new protocols?

ARB must ensure that all GHG emissions reductions issued as offset credits under a Compliance Offset Protocol meet the AB 32 offset criteria as defined in the Regulation. ARB's decision not to develop a Compliance Offset Protocol does not preclude that project type from being incentivized through grants, development of voluntary offsets, or potentially as mitigation for compliance with the California Environmental Quality Act.

The Regulation also specifies the criteria for Compliance Offset Protocols in section 95972. These requirements will be broadly applied to each offset project type for which ARB is developing a protocol. There may be additional considerations that staff, in collaboration with stakeholders, may look at for specific offset project types.

New protocols can only be considered for project types that meet the following requirements:

- The resulting GHG emission reductions are from sources that are not covered by the cap and that are not subject to a compliance obligation. This is because there is no net reduction (i.e. no "offset") as a result of emissions being shifted from one source under the cap to another source under the cap. As a matter of policy, we do not issue offset credits for reductions from sources that would be covered by the cap but are located outside the State. For example, energy-related projects, such as the installation of solar panels, would not be eligible for offsets as the actual emission reductions are associated with power generation and all electricity generation is already covered under the Cap-and-Trade Program. Similarly, transportation fuels are covered in the program starting in 2015, so ARB will not adopt a Compliance Offset Protocol for cleaner vehicle fleets.
- The GHG emissions reduction must be a direct reduction within a confined project boundary. Recycling activities would not be eligible for offset credit as the recycling activities do not have a direct GHG reduction at the recycling facility, but may have an emissions impact upstream when new materials are extracted or manufactured in lieu of the recycling. Currently, to avoid double counting

issues in the Cap-and-Trade Program, ARB does not plan to adopt protocols that include a lifecycle analysis.

- The GHG emissions reduction must be permanent. For avoided GHG emissions, there must be no opportunity for a reversal of the avoided emissions. An example of this type of permanence is methane flaring in livestock digester projects, which permanently destroys methane. For GHG sequestration, the project must be able to ensure the GHG will not be released into the atmosphere for at least one hundred years. Both the U.S. Forest and Urban Forestry Projects Compliance Offset Protocols require a commitment to keep any credited carbon stocks sequestered for at least 100 years.
- The GHG emissions reduction must be conservatively quantified to ensure that only real reductions are credited. This requires a sound foundation and understanding of the underlying quantification for all sources, sinks, and reservoirs within a project boundary so that the net change from implementing the project represents a real reduction for issuing credit.
- The GHG emissions reduction must be verifiable and enforceable. This requires a Compliance Offset Protocol to have clear monitoring and measurement requirements that can be audited by a verifier and enforced by ARB.
- The GHG emissions reduction must be additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative³ business-as-usual scenario.⁴ In order for ARB to ensure offset credits are additional, ARB would not adopt a protocol for a project type that includes technology or GHG abatement practices that are already widely used. See section 4 for more information.

³ “Conservative,” in the context of offsets, means “utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements.” Title 17, California Code of Regulations, section 95802(a).

⁴ “Business-as-usual scenario” means “the set of conditions reasonably expected to occur within the offset project boundary in the absence of the financial incentives provided by offset credits, taking into account all current laws and regulations, as well as current economic and technological trends.” Title 17, California Code of Regulations, section 95802(a).

3 PROCESS FOR ADOPTION OF COMPLIANCE OFFSET PROTOCOLS

3.1 What are the rulemaking requirements for approving Compliance Offset Protocols?

Compliance Offset Protocols are considered regulatory documents and are subject to the Administrative Procedure Act (APA).⁵ As with any regulation that is considered by the Board, each Compliance Offset Protocol must be developed through a full stakeholder process. As part of this APA process and consistent with ARB's certified regulatory program, staff will also develop an environmental analysis that is included in the staff report prepared for any Compliance Offset Protocol to be considered by the Board. This process satisfies the requirements of the California Environmental Quality Act (CEQA). The primary steps and details of the APA process and how it applies to protocol review and adoption are as follows:

- Offset Protocol Announcements and Timing:** Staff will announce decisions to develop new offset protocols in a public setting, open to all stakeholders. Information related to new offset protocols will be shared in a transparent and public process so as not to give any one entity a potential market information advantage over another entity.
- Informal Development Activities:** During this step, staff will hold public workshops or technical meetings to discuss the development of a potential offset protocol, focusing on areas such as, but not limited to, project specific mitigation methods, defining a project boundary, quantification of baseline conditions, and quantification of actual GHG reductions or removal enhancements. Staff will look at offset supply potential that could be generated under each potential Compliance Offset Protocol, prioritizing those with supply in California and then broadly across the United States. When considering offset supply, staff will be interested not only in the potential supply from a single project and the potential supply if only small projects can occur, but also in whether the mitigation methods or technology(ies) are easily transferrable for a larger volume of reductions. This process would, where appropriate, also include the development of draft protocol text following stakeholder input.

Depending on the complexity of the project type, ARB may hold a series of workshops or technical workgroup meetings. Dates of the workshops or

⁵ Government Code, § 11340 et seq. Although Health and Safety Code section 38571 exempts quantification methodologies from the Administrative Procedure Act (APA), Compliance Offset Protocols and the corresponding adoption through the Cap-and-Trade Regulation would include regulatory components that are subject to APA requirements.

meetings will be posted on the ARB website and posted to the relevant email listservs. When possible, such meetings are webcast for broad public participation.

All workshop presentations will be posted on the ARB website and a protocol-specific development webpage will be posted that contains information about the development of that specific protocol. During the first public workshop, a protocol staff lead for ARB will be identified along with his or her contact information.

- **Issuing the Notice:** This step initiates the APA rulemaking action. When, after completing the preliminary activities described above, ARB determines that it would like to proceed with a formal rulemaking on a proposed Compliance Offset Protocol, ARB will issue a notice of proposed rulemaking, which is included in the California Regulatory Notice Register. This notice will include the Board hearing date when staff will present the proposed Compliance Offset Protocol for Board consideration. This notice is posted at least 45-days prior to the Board hearing.
- **Availability of the Proposed Text and the Initial Statement of Reasons:** At least 45-days prior to the Board hearing, ARB will make available the proposed Compliance Offset Protocol text and a staff report that includes an explanation of why certain decisions were made in the development of the proposed Compliance Offset Protocol, any relevant analyses to support the proposed Compliance Offset Protocol, and an analysis of potential environmental impacts. ARB will post the proposed text and the staff report on its rulemaking website with the 45-day notice. ARB practice is to notify the public of the availability of these documents through the relevant email listservs.
- **45-Day Comment Period:** ARB will provide at least 45 days for the public to review the proposed Compliance Offset Protocol text and staff report and provide written comments to ARB.
- **Public Hearing:** Staff will present the proposed Compliance Offset Protocol to the Board for its consideration. This process usually includes a staff presentation at a regularly scheduled Board hearing. The dates and agendas for each hearing are posted on the rulemaking website. Stakeholders can provide written and oral testimony to the Board before the Board takes any action on the proposed Compliance Offset Protocol text. The Board may choose to adopt the proposed Compliance Offset Protocol text as written or to direct staff to make changes and release amended material for a formal comment period of at least 15-days. ARB will consider all formal comments on its proposed Compliance Offset Protocol as required by the APA and Board policy.

- Summary and Response to Comments:** ARB must summarize and respond to all formal comments submitted during the 45-day comment period, at the Board hearing, and during any subsequent 15-day comment periods on the proposed Compliance Offset Protocol in a document referred to as the Final Statement of Reasons. In this document, ARB will indicate where it made a change in response to a comment, or why a change is not appropriate. When applicable, the written responses to comments addressing the environmental analysis will be considered by the Board prior to making any findings required by the CEQA before a proposed protocol is adopted. This process ensures that ARB has understood and considered all relevant material presented to it before adopting a proposed protocol.
- Submission of a Rulemaking Action to the Office of Administrative Law (OAL) for Review:** Following final ARB approval, the rulemaking record is submitted to OAL for review. ARB also posts a Notice of Decision with the Secretary of Natural Resources in accordance with its CEQA certified program. OAL has 30 working days to review the rulemaking record to determine whether it demonstrates that ARB satisfied the requirements of the APA. Upon OAL approval, the Board-adopted Compliance Offset Protocol is filed with Secretary of State and becomes effective within a quarterly time schedule provided in the APA.

The Administrative Procedures Act mandates that ARB complete a rulemaking within one calendar year from the date the 45-day notice is published in the California Notice Register. If ARB does not submit the final protocol and regulatory amendments to the Office of Administrative Law by that date, ARB must initiate a new rulemaking. This includes a new 45-day comment period and Board hearing.

4 ADDITIONALITY

AB 32 and the Cap-and-Trade Regulation require any reductions used for compliance to be beyond what would otherwise be required by law, regulation, or legally binding mandate, and that exceed what would otherwise occur in a conservative business-as-usual scenario. For each proposed Compliance Offset Protocol, staff will establish whether GHG reductions or removal enhancements that result from the implementation of offset projects under the protocol are already being required by a local, state, or federal regulation. If a specific GHG mitigation method is already required by regulation, any reductions from that mitigation method would not meet the requirements for additionality. In this case the proposed Compliance Offset Protocol could not include

that specific GHG mitigation method and compliance offsets would not be issued for that reduction activity.

To assess if a specific GHG mitigation method may have “otherwise occurred,” staff will establish if that method is common practice in the geographic area in which the proposed Compliance Offset Protocol is applicable. Where possible, this review would include staff’s best estimate of the percent of the technology or mitigation in use for that sector. This can be done through outreach to the sector that would generate potential offsets, discussions with trade organizations, data research, and reviews of technology trends. Staff will take into consideration cost barriers that may prohibit technology or GHG mitigation methods from occurring in the absence of revenues from the generation of offset credits. For each proposed Compliance Offset Protocol, staff will share their findings during a stakeholder process and solicit feedback to determine whether a specific technology or GHG mitigation method is beyond common practice, and if the resulting reductions would meet the requirements for additionality.

5 HOW DOES ENVIRONMENTAL CREDIT STACKING WORK UNDER THE CALIFORNIA COMPLIANCE OFFSET PROGRAM?

Environmental credit stacking refers to a situation where a single activity provides more than one marketable environmental credit. For example, forest projects can result in carbon sequestration and improved watershed quality benefits. ARB believes that environmental co-benefits are a desired result of its Compliance Offset Protocols. The additional incentives such as other environmental credits would not by themselves disqualify a project type from being considered for the development of a Compliance Offset Protocol. ARB’s assessment of additionality will be based on how prevalent a mitigation practice or technology is within a sector, regardless of whether or not the activity could generate other marketable environmental credits.

6 WILL ARB PERIODICALLY REVIEW COMPLIANCE OFFSET PROTOCOLS?

Yes, ARB will continue to monitor the adoption of new or modified regulations that could affect additionality, as well as new developments in scientific data and quantification related to adopted Compliance Offset Protocols that would warrant a change to an existing Compliance Offset Protocol. Staff will propose amendments to Compliance Offset Protocols as necessary through a stakeholder process prior to Board consideration. Staff will weigh the decision to update a protocol against the market desire for certainty to support an active and robust compliance offset program. Any amendments to an existing Compliance Offset Protocol would involve the same APA process as developing a new Compliance Offset Protocol.

Once ARB updates an existing Compliance Offset Protocol, the previous version would no longer be used by new projects from the date that OAL approves the new version. Any existing projects under the previous version of the protocol would be required to use the new version of the protocol once the existing crediting period has ended.

7 HOW CAN I PARTICIPATE IN THE COMPLIANCE OFFSET PROTOCOL DEVELOPMENT PROCESS?

ARB encourages interested parties, including subject matter experts and general members of the public to attend Compliance Offset Protocol development workshops and provide informal and formal written feedback on proposed content during the Compliance Offset Protocol development process. Stakeholders can also request meetings with ARB staff to discuss protocol-related issues. Stakeholders are encouraged to sign up for the Cap-and-Trade listserv to make sure they are notified of any workshops or public information related to Compliance Offset Protocol development:

http://www.arb.ca.gov/listserv/listserv_ind.php?listname=capandtrade.

8 SUBMITTING IDEAS FOR COMPLIANCE OFFSET PROTOCOLS?

8.1 Can a voluntary offset program recommend a protocol for review?

Yes. Voluntary offset programs such as the American Carbon Registry, Climate Action Reserve, Verified Carbon Standard, and others may submit protocols to ARB for review. However, regardless of how the voluntary protocols are developed, ARB staff must determine whether the voluntary protocol should be developed for use in the Cap-and-Trade Program and if so, to conduct its own rulemaking process under the Administrative Procedure Act. As outlined above, under this process ARB would review, modify, and present a proposed Compliance Offset Protocol for Board consideration. This process ensures that any voluntary protocol modified for consideration by the Board demonstrates the resulting reductions meet the offset criteria in AB 32 as defined in the Cap-and-Trade Regulation and the criteria listed earlier in this document.

Protocols developed by the voluntary programs are not Compliance Offset Protocols as they are not developed through a rulemaking process, may not meet the AB 32 and Cap-and-Trade Regulation criteria, and were not approved by the Board.

8.2 Why has ARB not developed Compliance Offset Protocols for all of the existing voluntary offset protocols?

There are many existing voluntary offset protocols for use in the voluntary offset market. However, ARB must ensure any Compliance Offset Protocol it develops will result in

offset credits that meet the AB 32 offset criteria and the general protocol criteria in section 2.2. ARB will periodically review the available voluntary offset protocols and the potential to develop them into Compliance Offset Protocols.

8.3 Why can't we limit offset protocols just to California projects?

An important role for compliance offsets in the Cap-and-Trade Program is to provide cost containment for covered entities in the program. A covered entity can meet up to eight percent of its compliance obligation by using offsets in each compliance period. It is important to note that if all entities under the cap were to maximize the use of offsets up to the eight percent limit, there would still need to be on-site GHG emissions reductions at covered entities to meet the overall cap limits through 2020. Since the Cap-and-Trade Program already covers most sectors of California's economy under the cap, limiting offsets to just projects in California would significantly reduce the offset supply potential available to covered entities. This would increase their cost for compliance under the Cap-and-Trade Program. As stated in section 2.1, ARB will try to identify potential Compliance Offset Protocols that may be applicable in California, as well as across the United States.

8.4 What if I have a good idea for an offset protocol?

ARB encourages stakeholders to engage with staff regarding the development of new Compliance Offset Protocols and potential new project types that may fit the criteria for compliance offsets. Section 2.2 of this document contains the requirements for Compliance Offset Protocols. These requirements can help stakeholders discern if their ideas could potentially be considered for the Compliance Offset Program.

8.5 Will ARB only approve protocols based on a standardized approach?

Yes, approved Compliance Offset Protocols serve as a cornerstone of the Compliance Offset Program to ensure that reductions are appropriately quantified, monitored, reported, and documented. Those protocols taken to the Board for adoption will consist of standardized methods that quantify reductions based on specific criteria and pre-established calculation methods. This approach streamlines the calculation of project baselines and determination of the additionality of projects by using standard eligibility criteria that ensure projects are additional. By establishing the standardized criteria in the Compliance Offset Protocol, there is less subjectivity by verifiers or offset project developers as to whether a project may be additional and this supports consistent quantification rigor in the offset program.

8.6 Will ARB approve protocols developed under a project-based approach?

No, ARB is not planning to accept project-based protocols because each individual project protocol must be approved by the Board and such a process would be lengthy and administratively burdensome.

Additional Information

More information on the Cap-and-Trade Program, compliance offsets, and current rulemaking activities can be found here:

<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

Staff contacts for the Cap-and-Trade Program can be found here:

http://www.arb.ca.gov/cc/capandtrade/contacts/capandtrade_contacts.htm

Chapter 15

Carbon Offsets in California: Science in the Policy Development Process

Barbara Haya, Aaron Strong, Emily Grubert, and Danny Cullenward

Abstract Natural and social scientists are increasingly stepping out of purely academic roles to actively inform science-based climate change policies. This chapter examines a practical example of science and policy interaction. We focus on the implementation of California's global warming law, based on our participation in the public process surrounding the development of two new carbon offset protocols. Most of our work on the protocols focused on strategies for ensuring that the environmental quality of the program remains robust in the face of significant scientific and behavioral uncertainty about protocol outcomes. In addition to responding to technical issues raised by government staff, our contributions—along with those from other outside scientists—helped expand the protocol development discussion to include important scientific issues that would not have otherwise been part of the process. We close by highlighting the need for more scientists to proactively engage the climate policy development process.

Keywords Carbon offsets • Climate change policy • Carbon markets • Science and policy

15.1 Introduction and Background

Natural and social scientists in the field of global climate change are increasingly stepping out of purely academic roles to inform and support policy that is science-based. This chapter explores the roles that science and scientists play in climate policy development using an example from the California climate policy process. Beginning in the spring of 2013, we participated in the public process for

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developing two new carbon offset protocols in California. We relay our experiences as scientists in these processes with two main goals. First, we describe the types of input we and other natural and social scientists provided to regulators, in order to shed light on how scientific issues emerge in policy development and the associated role scientists play in practice. Second, we hope this example will encourage interested scientists to engage the climate policy process more directly. Fundamentally, we believe that scientists' active participation in climate policy development can improve policy outcomes and generate useful research agendas.

The primary theme of our work is supporting the robustness of California's offsets policies, a topic on which most of our efforts focused. As used in discussions of global climate change, another term—*resilience*—most commonly refers to the ability of communities or nature to adapt to the uncertain impacts of climate change. In the context of climate change policy, *robustness* offers a similar framing. It refers to the ability of a policy to reliably meet its goals despite substantial uncertainty in predicting or measuring its outcomes (Lempert and Schlesinger 2000).

The concept of policy robustness is particularly relevant in the context of policies concerning carbon offsets because of the deep scientific and behavioral uncertainties involved in calculating accurate emission reductions from offset projects. Because greenhouse gas emitters in a climate policy system that recognizes offsets—such as California's carbon market—use offset credits to justify increased emissions within the policy system's boundaries, it is critical that offsets accurately represent true emission reductions. Meeting this standard is no simple matter, however, as it requires scientifically complex and inherently uncertain methodologies.

The uncertainty stems from the need to calculate emission reductions by comparing an offset project's emissions against an inherently unknowable counterfactual scenario: the emissions that would have occurred without the offset project. Both estimates are subject to uncertain physical, social, and economic drivers. In light of this uncertainty, ensuring that offset credits represent true emission reductions requires conservative decisions about project and baseline emissions to ensure that protocols actually reduce the credited emissions reductions. Accordingly, our participation in California's public policy development processes focused on ways to preserve the robustness of the two offset protocols on which we worked.

The chapter is organized as follows. We begin with an overview of California's climate mitigation policies, describing how offsets fit into the state policy system, as well as the key challenges offsets pose for policy-makers. Next, we describe our activities as stakeholders in the public process for developing new offset protocols. We illustrate our work with a handful of examples that highlight scientific issues that emerged in the policy process, including issues that the regulatory agency identified for public input, as well as those issues we raised in our independent capacity. In the final section, we offer some concluding thoughts about our experience and the various roles we and other scientists played in these policy processes. Finally, we encourage other environmental scientists to explore proactive models of policy engagement.

15.1.1 *California's Climate Policy*

In 2006, California passed the Global Warming Solutions Act (AB 32), launching the state's comprehensive approach to climate mitigation policy. Its key feature is a legally binding requirement to reduce statewide greenhouse gas (GHG) emissions back to 1990 levels by the year 2020. To accomplish this goal, state law delegated broad authority to the California Air Resources Board (CARB), which developed a suite of climate policy instruments over the last several years (CARB 2008, 2014a). The most prominent is California's cap-and-trade program. This program applies to California's electricity, industrial, and fuels sectors, covering about 85 % of statewide emissions.

Briefly, cap-and-trade carbon markets set an overall limit (or *cap*) on anthropogenic greenhouse gas emissions within the covered sectors. The regulator then issues tradable emissions allowances, with the total number equal to the cap. Each emissions allowance credit confers the right to emit one tonne of GHG pollution (measured in tonnes of CO₂ equivalent, tCO₂e). Covered entities must submit one allowance per tCO₂e of pollution they emit. Since allowances are tradable, if a regulated emitter can reduce emissions more cheaply than the price of a permit, it can do so, freeing up permits to sell to others who face costlier mitigation opportunities. This lowers compliance costs compared to a system in which each emitter must meet an established standard without trading.

Carbon offsets extend the flexibility of this approach by allowing covered entities to seek lower-cost emission reduction opportunities outside of the carbon market—for example, in another state or in an economic sector not covered by the cap—instead of reducing emissions within the capped sectors. The financial benefits to regulated emitters are straightforward: expanding the range of mitigation opportunities outside the capped system through offsets reduces compliance costs. Since climate change is driven by the global stock of GHGs in the atmosphere, reducing one tonne of emissions has the same effect regardless of location.¹ As we discuss below, however, accurately calculating the net emissions reductions raises new challenges.

15.1.2 *Offsets in California*

Companies subject to the cap-and-trade market can use offset credits to cover up to 8 % of their total emissions. This limit on the use of offsets appears significantly more generous when expressed as a percentage of the total mitigation required in the carbon market: if all regulated parties use the maximum amount allowed, offsets

¹Though other pollution impacts that are coincident with the greenhouse gas emissions may have important local and regional effects, including on public health

would contribute about half of the total emission reductions expected under California's climate policy through 2020 (Haya 2013).

Carbon offsets in California work as follows. CARB issues offset credits for projects that follow approved protocols. The protocols themselves determine what project activities are eligible and define the methodologies by which projects estimate their emission reductions. Thus, offset protocols must be designed to anticipate all of the emissions-related drivers that apply in a given sector—a task that typically involves complex issues of environmental and social science.

Although the decision to develop a new protocol lies entirely at CARB's discretion, offset protocol methodologies must meet certain standards. State law and market regulations both require that emission reductions from offsets be “real, additional, quantifiable, permanent, verifiable, and enforceable.”² Each of these terms has a formal legal definition. The most challenging requirement has been *additionality*, defined in AB 32 as crediting only those emission reductions that are made “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.”³ CARB's climate regulations provide more context on how additionality is to be tested, requiring the use of a “conservative, business-as-usual scenario.”⁴

The regulations also directly address uncertainty and risk management, defining conservative scenarios as those whose “project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG emission reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of [net GHG reductions].”⁵

Finally, it is important to recognize that political perspectives on offsets vary widely. Many stakeholders, including most major emitters in the market, are strongly supportive of offsets as a mechanism to keep compliance costs low. After all, the supply of offset credits is widely expected to meaningfully reduce carbon market prices relative to a market without offsets (Borenstein et al. 2014; EPRI 2013). In contrast, several nonprofit stakeholders have expressed concerns about whether California's offsets truly represent reductions in GHG emissions. For example, two environmental groups sued CARB, claiming that the agency's decision to evaluate additionality using a performance standard at the protocol level does not satisfy the requirements of AB 32. The trial court rejected the plaintiffs' claims, finding that CARB had the necessary legal authority to adopt its performance standard approach. The court then applied a highly deferential standard to review CARB's treatment of additionality in each of its existing protocols (*Our Children's Earth Foundation v. CARB* 2015). Beyond highlighting the political opposition to offsets, this decision suggests that future legal challenges to CARB's protocol methodologies would face a difficult legal test under which the regulator is likely to prevail.

² Cal. Code Regs. tit. 17, § 95802(a)(14); see also Cal. Health & Safety Code § 38562(d)(1)-(2).

³ Cal. Health & Safety Code § 38562(d)(2).

⁴ Cal. Code Regs. tit. 17, § 95802(a)(4).

⁵ Cal. Code Regs. tit. 17, § 95802(a)(76).

15.1.3 Critical Issues for Carbon Offsets

Offsets raise a number of technical challenges, and CARB's two new protocols are no exception. A carbon market maintains its environmental integrity only if the offset credits it recognizes represent actual net reductions in greenhouse gas emissions. In practice, however, uncertainty about those reductions requires detailed scientific input and is often the subject of significant controversy.

A critical task for policy-makers is establishing a robust standard for offset additionality. An offset project is considered additional only if it occurred because of the financial investment made in return for offset credits. In other words, an offset program should only credit those emission reductions it causes and should not credit reductions that would otherwise have occurred. This standard is necessary to ensure that any climate policy system that accepts offsets achieves its intended emission reductions. But additionality is difficult to achieve in practice. Several studies have shown that a large portion of credits generated by the Clean Development Mechanism (CDM, the Kyoto Protocol's offsets program) were non-additional projects that would have occurred without the financial incentive of offset credits and thus do not represent net emission reductions (Cullenward and Wara 2014; Haya 2009; Haya and Parekh 2011; Wara 2008). As a result, their use by countries to meet Kyoto Protocol targets came at the expense of real reductions in greenhouse gas emissions.

Two issues further complicate the basic question of establishing whether offset credits represent real additional emission reductions. First, uncertainty analysis is particularly important for offset projects in the land-use and agricultural sectors, where emissions vary widely across location, crop, and ecosystem types. Second, there is the risk that offset program incentives cause emissions to increase outside of offset project boundaries. The most egregious example involves offset credits in the CDM awarded for the destruction of hydrofluorocarbons (HFCs), a potent family of greenhouse gases emitted as byproducts in the production of certain refrigerants. Manufacturers realized they could earn greater profits from destroying HFCs than from the sale of the refrigerant itself. There is strong evidence that they increased their production as a result of this incentive, creating surplus HFC byproducts that they subsequently destroyed to earn offset income (Wara 2008). Beyond enticing non-additional credits, the income from HFC-related offsets might have discouraged national governments from directly regulating HFC emissions, in order to maintain offset project eligibility—an effect that has been documented for a range of other project types (Figueres 2006).

Although the problems observed in past offset systems remain relevant, it is important to recognize that CARB's approach to additionality is different than that of its predecessor, the Kyoto Protocol's CDM. The CDM requires individual offset project applicants to evaluate their counterfactual emissions scenarios and demonstrate additionality for each individual project. In contrast, the California system makes these determinations at the protocol level by defining project eligibility criteria. Once CARB has approved a protocol, a project applicant needs only to

demonstrate compliance with the protocol's eligibility criteria in order to earn credit. Given the use of up-front project eligibility criteria, robust protocol design is particularly critical to ensuring that California's offset credits represent real emission reductions.

Finally, we note the importance of CARB's early offset protocols as institutional precedents in American climate policy. As one of the first legally binding climate policies in the United States, California's cap-and-trade system has already become a standard point of reference for climate policy design. In turn, CARB's treatment of complex and uncertain scientific issues in its offset protocol development process will surely set an important example for others.

15.1.4 Proposed Mine Methane Capture and Rice Cultivation Protocols

By the beginning of 2013, CARB had approved four offset protocols covering projects in the following areas: (1) forestry, (2) urban forestry, (3) livestock waste management, and (4) destruction of ozone-depleting substances. We participated in the policy development process for two new protocols: (1) mine methane capture and (2) rice cultivation, which we describe briefly here for background.

CARB approved the Mine Methane Capture (MMC) protocol in April 2014 (CARB 2014b), following a year of development and stakeholder engagement. The protocol awards credits to projects that capture methane that otherwise would have been released into the atmosphere from coal and trona⁶ mining activities. CARB's MMC protocol recognizes two types of projects. Methane can be captured for use as a fuel, such as by injecting captured gas into natural gas pipelines or using it to fire an on-site power plant. Alternatively, MMC projects can destroy methane without putting it to productive use through flaring or oxidation. In any of these cases, methane (CH₄) is converted to carbon dioxide (CO₂), a much less potent greenhouse gas.

At the time that this chapter was written, CARB was in the process of developing a rice cultivation protocol and responding to comments submitted on a discussion draft of the protocol released in March 2014. This protocol would credit reductions in methane emissions from changes in rice cultivation practice in California and the South Central United States. Rice cultivation produces methane emissions because production fields are submerged under water for a large portion of the year. This causes biomass to decompose without oxygen, producing CH₄ rather than CO₂. Methane emissions can be reduced if the fields are submerged for less time or if less biomass is left on the field to decompose anaerobically.

⁶Trona is a mineral mined as the primary source of sodium carbonate in the United States.

15.2 Science in the Policy Development Process

In April 2013, CARB established technical working groups to bring together stakeholders to inform the development of two new offset protocols. The working groups included offset project developers, project verifiers (who verify that project developers have met the protocol's requirements), representatives from industries facing compliance obligations in the carbon market (i.e., offset buyers), environmental nonprofit staff, academic research scientists, representatives from organizations that develop offsets standards for voluntary carbon markets, and state and federal officials from outside agencies. Each working group convened approximately once every three months, though additional discussion continued between meetings.

15.2.1 The Interdisciplinary Nature of Climate Change Policy Development

As a preliminary matter, we note that the scientific and technical expertise needed to ensure the environmental integrity of carbon offset protocols spans a wide range of disciplines. For example, the MMC and rice cultivation protocols drew on experts—including a number of outside scientists, in addition to our group—who provided advice on statistical uncertainty assessment, biogeochemical and ecological modeling, field measurements of gas fluxes, economic analysis, lifecycle analysis, basic mineralogy, engineering of mine construction, wildlife ecology, insect population dynamics, the sociology of agricultural crop production practices, modeling hydrological connectivity above- and belowground, state and federal water law, land-use law, environmental law, and organizational theory. As this list indicates, there are many opportunities for a variety of scientific experts to proactively engage the climate policy process—no agency has all of the necessary experts on staff.

15.2.2 What Did We Do?

Our participation in the offset protocol development process included a wide range of activities. We interfaced with a variety of stakeholders, including CARB staff, CARB board members, offset project developers, and nonprofit groups. Similarly, our communications ranged from informal conversations in person to formal written comment letters. As members of the technical working groups for each protocol, we attended meetings at the agency's headquarters in Sacramento and brought attention to issues we viewed as critical to the environmental integrity of the draft protocols as they developed, based on detailed independent analysis.

We provided our assessments to CARB staff as informal communications and later submitted formal comment letters during public comment periods in the administrative process. At times when we believed that CARB was not adequately addressing critical concerns, we spoke with individual CARB staff and board members outside of the formal working group process, occasionally with the participation of other stakeholders; we also raised our concerns through public testimony at formal board meetings.

The overarching goal of our involvement was to apply our research team's interdisciplinary expertise to helping ensure the environmental quality of the protocols. We did not use a single set of methods in our contributions, but rather, each of us brought methods from our respective disciplines to our shared goal. Below, we offer examples of scientific issues that highlight the kinds of input we offered in an effort to ensure that California's offset protocols reflect the best available science and are robust in the face of significant uncertainty.

Our examples are organized according to different ways that scientific issues arose in the policy development process—at the agency's request or according to our independent review of the protocols—rather than by protocol or chronology. In this way, we hope to illustrate both how science was used in developing the protocols and what roles scientists can expect (or be expected) to play in such processes.

15.2.3 Scientific Issues Raised by the Agency

Our first category of scientific engagement in the policy development process focuses on those issues that CARB proactively identified, either via agency staff asking stakeholders directly for input or by inclusion on agency-drafted meeting agendas. We review one such example in this section.

15.2.3.1 Scale of Uncertainty Assessment in Model-Estimated Emissions from Rice Cultivation

If the proposed rice cultivation protocol is adopted, it will become the first California protocol to use a computer-based model to estimate emission reductions. Using a model is necessary in this case because direct field measurements of emissions are technically challenging, costly, and time-consuming. The proposed protocol relies on a mechanistic biogeochemical model, the DeNitrification-DeComposition (DNDC) model, originally developed at the University of New Hampshire (2012).

The DNDC model is used to estimate offset project emissions and emission reductions. Through the technical working group, we—along with other scientists, including DNDC model developers, biogeochemists, and agricultural experts—addressed questions about model uncertainty and validation, the model's ability to estimate emissions of the potent GHG nitrous oxide (N₂O), and specific biogeochemical parameters used in the model.

Models are by definition simplifications of complex processes and are not perfectly accurate. Accordingly, the draft protocol applies a *deduction* that reduces the model-estimated emission reductions to conservatively account for any model error. Early drafts of the protocol included this deduction, but applied only one value for all eligible projects. Since DNDC must be field-calibrated to particular crop types, however, we were concerned that a blanket assessment of an uncertainty deduction for model error was too general and would not reflect the uncertainty of the model as it would be applied in the rice cultivation protocol—specifically, to fields in different ecosystems, with different cultivars, and in different regions around the country.

We focused our attention on how finely to parse assessments of model uncertainty, raising this issue in both formal and informal comments. Ultimately, the draft protocol included separate uncertainty deduction calculations for each of the rice-growing regions, rather than a single uncertainty deduction for all applications of the model. Furthermore, CARB decided to update the uncertainty deduction coefficients on an annual basis, a feature that will make the protocol more robust in light of new information. On the other hand, there is no formal mechanism for updating the model itself in response to newly published scientific information that directly affects relevant calculations. In the end, the potential for model structures and inputs to change highlights the profound challenge of integrating active scientific research into a fixed policy structure. Inevitably, there will be trade-offs between the adaptability of the protocol to new information and the stability of compliance rules that offset project developers desire.

15.2.4 Scientific Issues We Raised

A second category of scientific engagement describes our independent evaluation of issues that emerged during the protocol development process, as opposed to the assessment of issues on which CARB specifically requested input. In this section, we discuss examples of issues we raised about the conservative estimation of emission reductions from individual projects, additionality assessment, and the risk of unintended consequences caused by interactions between offset protocols and other policies. In some cases, we raised questions that were not being addressed at the time, and in others, we advanced new perspectives on issues that were already under agency consideration.

15.2.4.1 Statistical Bias in the Rice Cultivation Emissions Model

Statistical bias occurs when a prediction repeatedly over- or underestimates real-world outcomes. A model is unbiased if its outcomes are equally likely to over- and underpredict actual emissions as determined by direct field measurements. An unbiased model may still over- or underestimate the reductions achieved by an

individual offset project, but the uncertainty deduction factor (discussed above) ensures that over-crediting is still avoided with a high degree of certainty. However, a model that has not been validated as statistically unbiased for the project types credited under the protocol may result in an overestimation of the emissions reduced by those project types, even after the uncertainty deduction factor is applied.

During the rice protocol development process, CARB staff referred to hundreds of field measurements that had validated the DNDC model, finding no trend in the estimates. Thus, they concluded that the model was not biased. We were concerned, however, that some of the project types eligible under the protocol were not included in the data used to validate the model. Noting this gap, we argued that an assessment of bias at the level of the entire DNDC model was insufficient, and that project-type specific assessment of model bias was warranted. To avoid over-crediting, we suggested that CARB approve the eligibility of a project type under the protocol only if the DNDC model has been validated to have no statistical bias for the type of activities credited by that project type. As of this writing and to the best of our knowledge, CARB staff provided the technical working group with only a list of published references, not the actual data from the model runs used in the bias assessment.

As CARB continues to collect field data to validate the model, we hope to view the complete dataset on which CARB validates the DNDC model. This example illustrates the important role scientists play in reviewing the technical basis of policy—in this case, the methods used to assess statistical bias in an emissions model, in order to avoid over-crediting. It also illustrates the importance of transparency and access to data, both of which are necessary to enable scientific review.

15.2.4.2 Additionality of Methane Capture at Abandoned Mines

Our second example in this category concerns the treatment of additionality in the MMC protocol. CARB determines the additionality of different project types by assessing whether the project activity is *common practice* among a relevant population; a project type is considered additional if it is not common practice. Applying this approach to methane capture at abandoned mines under the MMC protocol, CARB staff studied abandoned underground mines in the United States, finding that “few currently capture and destroy mine methane. Methane capture and destruction is therefore deemed not to be business-as-usual at these mines” (CARB 2013, p. 7). This language suggests that CARB was prepared to deem all abandoned mine methane control projects additional under the MMC protocol.

The case of methane capture at abandoned mines demonstrates the importance of assessing additionality for subcategories of project types and not just for the entire population of possible projects as a whole. It also highlights the value of performing a conservative quantitative assessment to examine compliance with the protocol level additionality standard. While only 38 of the more than 10,000 abandoned mines in the United States have implemented methane capture projects, these 38 mines emit one third of all methane released from abandoned mines in the country (Ruby Canyon Engineering 2013a). Thus, existing methane capture projects at

abandoned mines are correlated with high rates of methane emissions—exactly as one would expect, given that the costs of capturing methane decrease as the rate and concentration of methane emissions at mines increase.

If all abandoned mines were eligible for MMC offset credits, the protocol could generate non-additional credits from projects that would have proceeded regardless of the financial incentives offsets provide. Indeed, if methane capture project development trends at abandoned mines from the last two decades were to continue, the volume of non-additional credits enabled by CARB's initial common practice assessment would likely far exceed methane capture from truly additional projects enabled by the financial incentive created by the offsets program as assessed by Ruby Canyon Engineering (2013b).

A more detailed analysis of abandoned mines suggested a path forward. Currently, most methane capture at abandoned mines occurs at mines that captured methane for pipeline injection when they were active. In fact, all mines that captured methane and were closed within the last ten years continued to capture methane after being abandoned. Methane capture at this subcategory of mines is undoubtedly common practice. Accordingly, CARB narrowed its eligibility criteria in the final protocol it adopted in April 2014, excluding those abandoned mines where methane had been captured and injected into pipelines when the mine was active (CARB 2014b, p. 14).

Our calculations showed that this approach excludes most, but not all, of the non-additional crediting that would conceivably be generated under CARB's initial definition of common practice at abandoned mines. While most non-additional methane capture is excluded from crediting by the narrowing of CARB's eligibility criteria for abandoned mines, past trends suggest that a smaller amount of methane capture may still be cost-effective on its own. We performed a quantitative analysis on the narrowed pool of eligible projects.

We found that if past trends in the development of new methane capture projects at abandoned mines that never previously captured methane were to continue, the expected generation of credits from non-additional projects is likely to be small compared to the expected effect of the protocol on new project development. Our analysis further indicated that under-crediting from conservative methodologies used to estimate emission reductions from abandoned mines under the protocol can reasonably be expected to counterbalance this non-additional crediting.⁷ In other words, even though it is likely that some abandoned mines that would have chosen to implement methane capture technology regardless of the offset credit could generate credits under the protocol, the total quantity of offset credits generated by the protocol is unlikely to exceed the net emission reductions enabled by the protocol.

⁷For a more detailed description of this assessment, please see comments submitted by Barbara Haya on behalf of our research team dated February 14, 2014, "RE: Comments on the informal draft of the Mine Methane Capture (MMC) Projects Compliance Offset Protocol released 31 January 2014" available on California Air Resources Board's Workshop Comments Log: <http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=discussion-draft-ws>.

As a result, we concluded that the protocol is expected to meet the additionality requirement defined under AB 32.

In addition to describing how the regulator's approach to a particular technical issue evolved during the MMC protocol development process, this example illustrates a methodological issue that speaks to the broader architecture of California's offsets policy. CARB's common practice approach appears to be designed to avoid the subjectivity of other eligibility metrics by referring to objective measurements of the frequency of emission-reducing activities. Nevertheless, we believe that this approach belies a persistent analytical subjectivity. As the abandoned mine issue shows, how CARB defines the population of project types against which it makes its common practice determination has important implications for the additionality of the offset protocol as whole. This example illustrates the importance of performing additionality assessments on subcategories of projects and conservatively excluding subcategories that could be considered common practice. More broadly, it also shows that the decision to use a common practice standard does not avoid the need for careful risk assessments of possible outcomes; these assessments remain necessary to identify appropriate project eligibility criteria that contain the risk of over-crediting.

15.2.4.3 Potential Conflicts with Clean Air Act Implementation

Our final example concerns a prospective impact that could occur beyond offset project boundaries. Here, our analysis focused on the potential for California's MMC protocol to interfere with other states' implementation of regulations under the federal Clean Air Act. The problem is this: although California's offset regulations exclude as ineligible those offset projects whose emission-reducing activities are separately required by law, they do not consider the incentive California's offset protocols create to keep legal standards in other jurisdictions low.

Under the Clean Air Act, any major new source of greenhouse gases is required to apply for a Prevention of Significant Deterioration (PSD) permit from its state environmental agency. In turn, the state agency is required to determine the best available control technology (BACT) for that particular project. State agencies have broad discretion in setting each project's BACT, with limited room for the federal Environmental Protection Agency (EPA) to review their findings. We expressed concern that California's MMC protocol would create incentives for out-of-state agencies to keep GHG BACT standards for mines artificially low. After all, were an out-of-state regulator to require methane destruction under the BACT determination for a PSD permit that methane destruction project would become ineligible for offset credits (and revenues).

In order to mitigate this risk, we recommended a do-no-harm precaution, temporarily excluding from the MMC protocol those mines that would require a PSD permit under the Clean Air Act. Once a specified number of PSD permits were

issued to comparable mines, however, we suggested the MMC protocol could then expand its eligibility to mines that required PSD permits—so long as the early BACT determinations indicate that this course would be appropriate. Ultimately, these issues were not addressed in the adopted protocol and will be monitored informally.

15.3 Conclusions

The development of two new carbon offset protocols in California provides a rich case study in science-based policy-making. As public members of the technical working groups established by the California Air Resources Board, we both observed and contributed to the scientific discussions that arose during the course of protocol development. In addition to responding to the issues and questions raised by CARB directly, we—along with other outside scientists—played an essential role in expanding the protocol development discussion.

Most importantly, our engagement focused extra attention on the robustness of the protocols, providing strategies to avoid over-crediting despite substantial uncertainty in predicting protocol outcomes. Robustness is critical in the development of carbon offset protocols because of the significant scientific and behavioral uncertainty involved in accurately calculating emission reductions from individual projects. Fundamentally, this uncertainty stems from the challenge of estimating emission reductions (and the number of offset credits awarded) against an inherently unknowable counterfactual scenario of what would have happened without the offset program. Because offset credits are used in place of emission reductions within existing climate policy systems, methodological decisions must be made conservatively and guided by scientific risk assessments in order to avoid weakening these systems. Protocols should also be responsive to new scientific information and changes in the socioeconomic drivers of emissions. By conducting independent analyses of these kinds of issues, we aimed to increase the agency's capacity to evaluate key risks and improve the robustness of the offset protocols.

Finally, we hope the examples in this chapter encourage more members of the scientific community to seek ways to actively engage the development of climate policies. Although the offset protocols on which we worked were certainly informed by traditional scientific publications, our experience shows how the full treatment of scientific issues in the policy process occurs more through direct participation than literature reviews. Many of the critical policy questions involving science and uncertainty analysis would be difficult, if not impossible, to anticipate from a detached distance. In addition, their successful resolution depends on professional relationships built through iterative interactions in the policy process. Collectively, these factors suggest the need for more academics to explore ways to actively engage the climate policy process in the future.

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POLICY BRIEF: The California Air Resources Board's U.S. Forest offset protocol underestimates leakage

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SUMMARY

Analysis of projects generating 80% of total offset credits issued by the California Air Resources Board's (ARB) U.S. Forest offset protocol finds that 82% of these credits likely do not represent true emissions reductions due to the protocol's use of lenient leakage accounting methods. The U.S. Forest protocol has generated 80% of the offset credits in California's cap-and-trade program. The total quantity of emissions allowed because of this over-crediting equals approximately 80 million tons of CO₂, which is one third of the total expected effect of California's cap-and-trade program during 2021 to 2030 (ARB 2017).

Leakage, in the context of the protocol, occurs when a reduction in timber harvesting at a project site causes an increase in timber harvesting elsewhere to meet timber demand. The way ARB's protocol accounts for leakage when calculating the number of credits awarded has three serious problems.

First, the protocol uses a 20% leakage rate when a rate of 80% or higher is supported by published studies of leakage rates from reduced timber harvesting in the United States (Gan & McCarl 2007, Wear & Murray 2004). Using an unsupported low rate results in over-crediting.

Second and more importantly, there is an inconsistency between the timing of when increases in on-site carbon storage and releases due to leakage are accounted for in the protocol's methods. Most improved forest management projects assume and credit a large reduction in timber harvesting in the first year of the offset project, but deduct the associated leakage over 100 years. This outcome is physically inconsistent, as it assumes the forest would be harvested in the first year for the purpose of giving credit but assumes harvesting would be spread out over 100 years for the purpose of reducing credits to account for leakage. As a result, most forest offset projects begin in greenhouse gas debt; project landowners generate offset credits that allow emitters in California to emit more than the state's emissions cap today, in exchange for promises that their lands will continue to increase their storage of carbon over 100 years.

Third, it is unclear whether the protocol requires forestland owners to increase carbon stocks to cover leakage for 25 years or for 100 years. The ambiguity relates to whether forestland owners are required to continue to maintain on-site growth to cover the impacts of leakage after the end of the project's 25-year crediting period. If forestland owners are only required to account for leakage for 25 years, participating projects could result in no net increase in carbon storage over 100 years compared to the baseline scenario.

The below table presents the actual emissions reductions achieved by projects under the protocol under different assumptions, reported as proportions of the credits already issued. For example, the cell on the upper left (100%) represents the assumptions underlying current policy. If these

assumptions are accurate, then 100% of the credits issued represent true emissions reductions. On the other hand, if these assumptions are inaccurate, the proportion of credits that represent actual emissions reductions can be much lower. The cell on the lower right (18%) shows that if the true leakage rate is 80% and ARB chose to only credit reductions already achieved, rather than reductions expected in the future, then the real reductions achieved to date by the project add up to only 18% of the credits issued.

This analysis was performed on all credits generated by 36 compliance forest offset projects through March 23, 2019. Collectively, these projects generated offset credits equal to 97 million tons of CO₂ reductions, which is 80% of the total credits that ARB has issued under its U.S. Forest protocol.

**Actual emissions reductions by U.S. Forest offset projects
as percent of credits issued to date**

		Expected over 100 years (ARB's current approach)	Achieved to date (Recommended approach)
If the true leakage rate is:	20%	100%	65%
	40%	99%	49%
	60%	97%	33%
	80%	96%	18%

ARB can avoid the over-crediting discussed here with a few modifications to its protocol. ARB should (1) apply a leakage rate that is 80% or higher; and (2) determine the net benefits of reduced harvesting on an annual basis by accounting for both the increased carbon storage on site and the decreased carbon storage elsewhere due to leakage at the same time. This solution is reflected in the bottom right cell of the above table (18%).

These changes are needed for the protocol to be in accordance with current law and regulation. First, given the uncertainty in true leakage rates from reduced timber harvesting within the United States, using an 80% leakage rate or higher, as is supported by the academic literature, better fulfills the conservativeness principle laid out in ARB's cap-and-trade regulations.¹ Using low rates that are not reflected in published literature is unjustified and does not fulfill the conservativeness principle. Second, generating credits today for expected net reductions over many decades into the future runs contrary to the goals of California's Global Warming Solutions Act (AB32), the 2006 law authorizing California's cap-and-trade and offsets programs. This law states that for any trade in credits using a market-based compliance mechanism, the reductions credited should occur "over the same time period" and be "equivalent in amount to any direct emission reduction required" under California's climate change law.²

¹ " 'Conservative' means, in the context of offsets, utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements." California Code of Regulations, title 17, § 95802.

² California Health & Safety Code § 38562(d)(3).

DETAILED DISCUSSION

How the U.S. Forest offset protocol works

The large majority of U.S. Forest offset projects credit forestland owners for holding more carbon on site per acre than they would have in the business-as-usual baseline scenario. Landowners must commit to maintaining those higher carbon levels for 100 years. Projects can be anywhere in the United States, and to date, approximately 20% of credits generated have been from projects in California, and 80% have been from projects elsewhere in the United States.

Most of these improved forest management projects define a business-as-usual baseline scenario that involves aggressive timber harvesting that brings on-site carbon storage close to the average per acre for forests in their region. The assumption is that these offset projects maintain higher on-site carbon stocks by reducing timber harvesting.

In the first year of an improved forest management offset project, the landowner earns offset credits for the amount of carbon on their land above the business-as-usual baseline scenario minus two factors. First, estimates of carbon released due to leakage are deducted. Second, not all loss of on-site carbon is released into the atmosphere. The protocol accounts for the portion of harvested timber that remains long-term in wood products like in houses and furniture and buried in landfills, which would be reduced if total timber harvesting is reduced by the project. Each subsequent year, the landowner is credited for any incremental increase in carbon sequestration on the participating lands as trees grow and sequester more carbon, minus the same two factors.

Leakage rate

ARB's U.S. Forest offset protocol uses a 20% leakage rate. A 20% leakage rate means that 20% of the reduction in timber harvesting caused an offset project is replaced by an increase in harvesting on other forestlands. The other 80% of the reduction is assumed not to be replaced and simply represents a decrease in timber use (i.e., fewer houses built, less paper produced, etc.)

Published literature suggests the leakage rate from reduced timber harvesting in the United States is at least 80%. Using a computable general equilibrium model, Gan & McCarl (2007) estimate that if timber production were reduced in the United States, 77% of that that timber harvesting would be displaced to other countries. Wear & Murray (2004) use econometric modeling to trace the effects of reductions in federal timber sales in the western United States in the late 1980s through the 1990s. They estimate that 84% of the reduced timber production was displaced to elsewhere within North America. Both articles underrepresent total leakage from conservation on U.S. forestlands. The former only estimates international leakage, ignoring leakage that might occur among forestland within the United States; the latter only estimates leakage in North America, ignoring leakage that could occur elsewhere. The existing academic literature on leakage rates from reduced forest harvesting does not support a 20% leakage rate. A conservative approach to addressing uncertainty in the true leakage rate would apply a leakage rate that is at least 80%.

The Climate Action Reserve, which developed the original U.S. Forest offset protocol on which ARB based its own protocol, revised its leakage rate from 20% to a sliding scale up to 80%,

depending on the amount of timber harvesting performed by the offset project itself. Under this protocol, an 80% leakage rate is applied to offset projects that do not harvest at all.

The timing issue explained

As is typically done with offset projects, emissions reductions are estimated against a baseline scenario representing what would likely have happened without the offset program. Almost all ARB improved forest management offset projects define baseline scenarios that are well below their actual carbon stocks in their first year. On average across all projects analyzed, these baselines equal 70% of current carbon stocks. This means that in the first year of a project, the land owner is issued a quantity of credits equal to, on average, around 30% of the carbon stocks on their project lands, adjusted downward to account for leakage and any reduction in carbon held long-term in harvested wood products and landfills.

To create a baseline, the landowner models the carbon stocks and fluxes associated with a 100-year timber harvest scenario that reflects the harvesting expected to take place without the financial incentives from the offset program. The modeled scenario should be financially feasible and fulfill all legal and contractual obligations. In order for most projects to earn credits under the protocol, the calculated average carbon stocks in the baseline scenario over 100-years should be no less than that of the average forestlands for the project's region and forest type.

This modeled scenario is then abstracted into two key parameters used to calculate emissions reduced and credits generated by the project. Baseline on-site carbon storage and harvesting rates are assumed to equal the average values generated by the modeled scenario over 100 years. This simplified baseline is treated as equivalent, in terms of carbon accounting, to the range of financially feasible timber harvest scenarios that could have happened without the offset program. Flat average baseline values have the advantage of not requiring the landowner to calculate year-to-year increases in carbon storage against the harvest and growth cycles in one specific baseline management regime for each of 100 years. But this approach has one important disadvantage—flat average baseline values for carbon storage and harvest rates are internally contradictory and physically impossible.

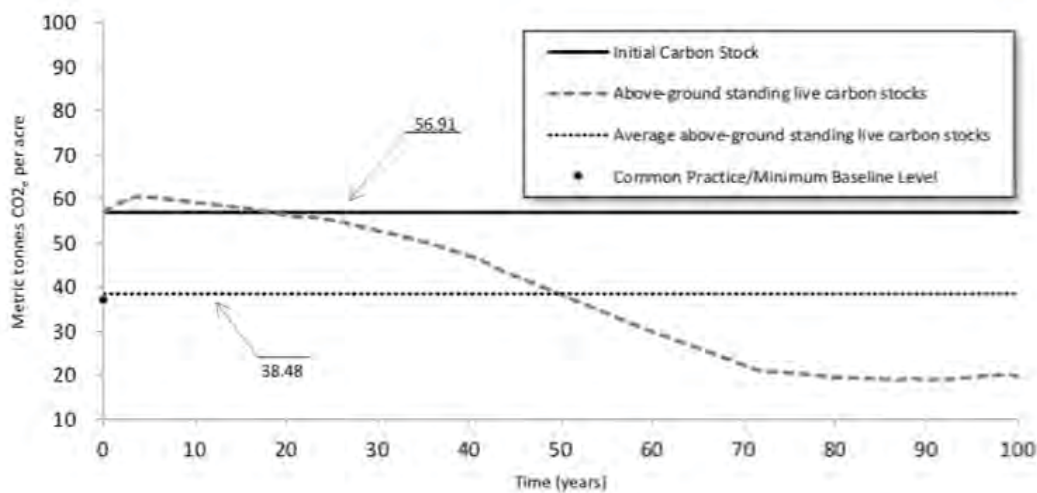
The figure below presents an example of a modeled harvesting scenario used to define the baseline for one large offset project – ACR360, a half million acre project in southern Alaska. The curved dotted line is the modeled business-as-usual scenario for above-ground standing live carbon stocks. The straight dotted line is the baseline used to generate credits, which is the average above-ground standing live carbon stock in the 100-year modeled scenario. The solid line is the actual carbon storage on the project lands at the start of the project.

This simplified baseline scenario suggests that, if the project were not earning offset credits, its lands would be harvested to baseline levels in year 1 and maintained at those carbon stocking levels for 100 years. However, contradicting this assumption, the baseline also assumes that a constant quantity of timber is harvested each year over the project life, equal to the average rate over the 100-year modeled scenario. This second assumption is used to calculate leakage.

These two assumptions are contradictory because it is not possible for both carbon storage and harvesting to simultaneously remain at their respective average values over the project life. Carbon storage and harvesting rates are correlated with one another, and inextricably tied to the actual net growth rate of the project forest. If carbon storage is assumed to drop to the baseline in year 1, that

would happen because of a large amount of timber harvesting. If the harvesting rate is assumed to be constant over 100 years, however, then the carbon storage on the land will also decrease slowly, rather than abruptly in year 1. By mixing these two assumptions into a physically impossible baseline scenario, the protocol maximizes credits generated without reflecting the actual rate at which emissions to the atmosphere are avoided. The protocol calculates gains in carbon against the baseline using the first assumption, and losses in carbon from leakage using the second assumption. As a result, credit generation is frontloaded, and landowners need to continue to increase net carbon storage for decades to make up for the leakage effects associated the reduced harvesting credited at the start of the projects.

Baseline carbon stocks for Finite Carbon – Ahtna Native Improved Forest Management offset project



From: ACR360 “Finite Carbon – Ahtna Native Alaskan IFM” Version 1.3, Attachments G and H: Baseline Carbon Stocks, Submittal Date: 1/19/2018

This over-crediting allows emitters in California to emit more than the state’s emissions cap today in exchange for promises of forest carbon sequestration over 100 years to cover leakage from the start of the project. This is problematic for several reasons. First, emissions today are not equivalent to reductions decades from now given the urgency of climate change mitigation to avoid tipping points. California is designing its cap-and-trade and offset programs as models for other jurisdictions. If California exports a model that trades emissions today with reductions decades from now, California would promote a form of climate policy that fails to reduce emissions in these immediate critical years. Second, these promises can be difficult to keep since productivity slows in ageing forests (Gray et al 2016) and as forests respond to a warming climate. On project lands with less harvesting, fewer older trees will be replaced with younger trees, and the average tree age will increase over the 100 years of the project.

ACR360 generated close to 15 million offset credits in its first year, equal to more than 60% of the expected average annual effect of California’s cap-and-trade program on emissions during 2021-2030.

The 25 year versus 100 year issue explained

If forestland owners are required to increase carbon to cover leakage for 100 years, then there would be no over-crediting over 100 years of the project. Over-crediting in the early years of the project would slowly be compensated as leakage is deducted each year for the project life.

However, it is unclear whether the protocol requires forestland owners to account for the emissions from leakage for 25 or for 100 years. The crediting period of a U.S. Forest offset project is 25 years. After the end of each 25-year crediting period, landowners can choose to renew their offset project for another 25 years but are not required to do so. For each year of a crediting period, landowners must report the net impact of the project on emissions taking into account any change in on-site carbon storage, and any releases due to leakage or reductions in carbon held long-term in harvested wood products and in landfills. If the net impact of the project in any year is negative, a *reversal* is understood to have occurred. The carbon reductions that were previously credited and later released must be replaced with additional procurement of allowance or offset credits.

How a reversal is defined after the last year of crediting is unclear in the protocol. Following the last year of crediting, forestland owners are required to maintain the credited on-site carbon storage for another 100 years. It is unclear if they are also required to ensure their forestland continues to grow to cover off-site releases due to leakage and due to reductions in carbon held long-term in harvested wood projects and landfills.

If forestland owners are only required to account for leakage for 25 years, crediting for reduced harvesting in the first year of the project will be awarded in full, while potentially, as low as only 1% of the leakage associated with that reduced harvest is deducted each year for only 25 years. It would be possible for participating projects to result in a net decrease in carbon storage over 100 years compared to the baseline.³

Methods

Landowners report how they calculate their requested credit issuance in Offset Project Data Reports (OPDRs) based on instructions laid out in the protocol. These reports are made public through the offset registries. We reproduce these calculations for all credits issued to 36 projects as of March 23, 2019. We use data provided by the landowner in their OPDRs and supplemental materials, and adjust the projects' assumptions for leakage and the timing of harvesting in the baseline to investigate the quantity of over-crediting.

Adjusted leakage rate

Using data reported in the OPDRs, we reproduce the calculations of leakage (also called *secondary effects*), carbon in harvested wood products and landfills (HWP&L), and total reductions achieved using leakage rates of 40%, 60%, and 80% instead of 20%.

³ Please see public comments submitted to ARB on May 10, 2018, *Comments on proposed cap-and-trade regulatory amendments*, for a more detailed discussion of this need to clarify and revise how the protocol defines a reversal after the last year of credit issuance, found at <http://bhaya.berkeley.edu>.

Adjusted timing of baseline harvesting

We recalculate the credits that would have been generated if the protocol's leakage calculations matched its assumption that timber is harvested in year 1 of the baseline scenario to bring carbon storage down to baseline levels, and continues to be harvested at smaller rates needed to maintain the baseline carbon storage level for one hundred years.

We do this in the following manner:

First, the baseline harvesting level prior to delivery to the mill (PDM) in the first year of the project is calculated as the difference between standing live carbon in the project compared to the baseline.

Second, we calculate the baseline carbon in trees harvested in years 2 to 100 so that the sum of the baseline PDM over 100 years is the same as the sum using ARB's current methods. We calculate the baseline PDM in years 2 through 100 (99 years) as:

$$PDM_{\text{annual after year 1}} = (PDM_{\text{total}} - PDM_{\text{year 1}}) / 99$$

Third, we recalculate the carbon in baseline HWP&L in a similar manner, by:

- a) using the ratio of HWP&L to PDM in year 1 of the baseline in the OPDR to recalculate carbon in HWP&L in year 1 of the baseline for the revised PDM value;
- b) calculating carbon in HWP&L in years 2 through 100 using the same process as for timber harvesting, so that the sum of carbon in HWP&L over 100 years of the baseline is the same in our estimates as it is in ARB's current estimates over the project life;

Fourth, we recalculate emissions reductions from the project using these revised leakage and carbon in HWP&L figures, and otherwise following the methods defined by the protocol.

When baseline or project PDM figures are missing from any of the OPDRs, we calculate the missing PDMs mathematically from other reported figures when possible, and apply the following assumptions when needed:

- The ratios of carbon in HWP&L to PDM remain the same across reporting periods.
- When the first reporting period does not equal exactly one year, the PDM in the first year is a prorated amount, reflecting what most projects with at least two reporting periods have done.
- The ratio of carbon in HWP&L to PDM is the same in both the baseline and project scenarios.

Other than the changes and assumptions described above, we repeat the methods used in the OPDRs to re-estimate emissions reduced and credits generated.

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Counting California Forest Carbon Offsets

Greenhouse Gas Mitigation Lessons from California's
Cap-and-Trade U.S. Forest Compliance Offset Program

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Cover photo from Flickr Creative Commons, available at <https://goo.gl/6lbL3Q>.

Executive Summary

In 2013, California launched a multisector cap-and-trade market designed to reduce greenhouse gas pollution and meet the greenhouse gas mitigation targets set forth in Assembly Bill 32 (2006). Building on many years of effort and policy deliberation, California included in the cap-and-trade market the ability for covered entities with a compliance obligation to pay actors outside the program to reduce *their* emissions, frequently referred to as purchasing ‘offsets’. Since 2013, California has operated a first-of-its-kind forest carbon offset program, in which 39 forest projects across the United States have earned credits through July 2016.

This research analyzes California’s experience in running a first-ever compliance offset program for forests. To our knowledge, no official program evaluations of the forest offset program have been conducted to date. In the absence of identified and measurable official metrics and goals, this paper takes a more general ‘lessons learned’ approach, asking what the State has gotten from this policy innovation and what insights can be applied to other forest carbon sequestration efforts, like California’s ongoing natural and working lands inventory.

From project design document review, survey responses and interviews with project owners and developers, we have four core findings. First, the California program has gone much further towards assuring additionality than other programs, including most voluntary forest offset programs, though some lingering and perhaps unavoidable questions remain. Second, a wide variety of California compliance entities buy forest offset credits, including some that operate facilities located in areas identified by the State as disadvantaged communities. Third, environmental benefits have been created by the program, though their financial importance may be minimal. Finally, California has taken forest offset protocols and policy to new levels, though the future of the market is quite uncertain given the need for supermajority reauthorization of the cap-and-trade program.

This paper first provides an overview of the forest offset program, its history and development, and some data about the current state of the program. It then describes the methods used in this study, and presents the above findings in detail. It concludes by illustrating several ‘lessons learned’ that should be incorporated by the Air Resources Board and cooperating agencies into the broader natural and working lands effort in California.

Overview and Development of the California Forest Carbon Offset Program

Before presenting the results of our research into the offset program, it is necessary to briefly describe the origins, history, policy design choices, and project performance of the California forest offset program in order to inform readers and put our findings in proper context. As of this writing, no comprehensive program evaluations have been conducted of the forest offset program.

Climate Change, Forests, and California Policy

Forest Carbon History and Potential

Forests have played an integral role in climate forcing emissions throughout American history, though only more recently have they served as a net carbon sink. Historically, American forests served as a significant net source of emissions in the 19th and early 20th Centuries, as old growth forests were harvested and trees were a primary building material and energy source. As fossil fuels replaced wood as a fuel source, and as forests regrew in the middle decades of the 20th Century, American forests became a net carbon sink, reaching their lowest net emissions rate (or, alternatively, highest carbon storage rate) in the 1980s. Since then, increased harvesting has lessened American forests' utility as a carbon sink, however significant carbon storage potential remains if deforestation is avoided in the 21st Century.¹ It has been estimated that forest carbon sequestration is equivalent to 12-19% of US fossil fuel emissions,² and the Obama Administration's Climate Action Plan noted the sequestration role being played by US forests,³ though net carbon sinks from land use and forestry changes have been smaller in recent years than in 1990.⁴

California's Experience

Although the concept of forest offsets and other land use-related policies designed to incentivize carbon sequestration stretch back before the adoption of the

¹ Richard Birdsey et al., *Forest Carbon Management in the United States: 1600-2100*, 35 J. ENVIRON. QUAL. 1461, 1465 (July 2006).

² Michael Ryan et al., *A Synthesis of the Science on Forests and Carbon for U.S. Forests*, ISSUES IN ECOL. 13 (Spring 2010), at 1.

³ Executive Office of the President, THE PRESIDENT'S CLIMATE ACTION PLAN (June 2013), at 11, available at <https://goo.gl/KX1ULM>.

⁴ See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015* (February 2017) (Table 6-3 at 6-3, 6-4), available at <https://goo.gl/GYpaXH>.

Kyoto Protocol,⁶ California’s commitment to forest offsets can be traced to Senate Bill (SB) 1771 (Sher) in 2000.⁷ That bill established the California Climate Action Registry (CCAR), a voluntary emissions inventory established by the state to define, measure and track greenhouse gas emissions. As part of its Climate Change Inventory, CCAR was instructed to acquire and develop data on the “costs, technical feasibility, and demonstrated effectiveness of . . . net reductions through the management of natural forest reservoirs.”⁸

Land trust organizations sought to take this forest carbon data-gathering role at CCAR further, and promoted Senate Bill 812 in 2002 (Sher).⁹ SB 812 directed CCAR to develop procedures and protocols for measuring and crediting the emissions impacts of “conservation and conservation-based management [activities in] . . . native forest reservoirs in California” that went beyond “applicable federal, state, and local land use laws and regulations.”¹⁰ How, exactly, CCAR would implement this measuring and crediting was a policy design task delegated to a state-convened working group that engaged land trusts, state foresters, forest industry representatives and an electric utility.¹¹

This first 2002-2005 working group fleshed out many of the initial policy design questions, which led to the opening of California’s voluntary carbon offset market in 2005. Importantly, from the very beginning, the state focused on a carbon-based payment structure, that is, strict accounting for forest carbon on a per-ton basis that could interface with cap-and-trade programs. The state chose not to take a practice-based or area-based payment approach to offset crediting that would have involved more general and less reliable carbon estimation and impact assumptions.¹² This tradeoff likely resulted in greater carbon sequestration from the projects who participated, perhaps multiple times more, but at the price of increasing project development and monitoring costs and thus a smaller population of potentially eligible projects. Indeed, this initial voluntary protocol (and its update in 2006) drew criticisms from other landowners not involved in conservation or conservation-based

⁶ Cornelis van Kooten et al., *How Costly Are Carbon Offsets? A Meta-Analysis of Carbon Forest Sinks*, 7 ENVIRON. SCI. & POL. 239, 239 (2004); Marissa Schmitz and Erin Kelly, *Ecosystem Service Commodification: Lessons from California*, 16 GLOB. ENVIRON. POLIT. 90, 90 (Nov. 2016). See also Mark Trexler et al., FORESTRY AS A RESPONSE TO GLOBAL WARMING (1989), available at <http://goo.gl/Pwd8sg>.

⁷ 2000 Cal. Stat. 7482 et seq. (Ch. 1018).

⁸ 2000 Cal. Stat. 7493 (Ch. 1018).

⁹ Schmitz and Kelly, *supra* note 6 at 97.

¹⁰ 2002 Cal. Stat. 2406 (Ch. 423).

¹¹ Schmitz and Kelly, *supra* note 6 at 97.

¹² See Ing-Marie Gren and Abenezer Aklilu, *Policy Design for Forest Carbon Sequestration: A Review of the Literature*, 70 FOREST POL. & ECON. 128, 130 (discussing studies of policies that took these approaches, at left).

management, as its stringent environmental and permanence requirements made initial participation rather unattractive for many for-profit private landowners and the California forest industry at the prices offered by voluntary carbon markets.¹³

A second working group, engaging more forest industry participants, followed after passage of California's landmark Assembly Bill (AB) 32 in 2006. From the beginning of planning the cap-and-trade portion of AB 32 compliance, the California Air Resources Board (ARB) signaled that forest offsets would play a cost-containment role in this new market. Cost-containment was an important concern – ARB's expectations for carbon prices in the cap-and-trade market ranged as high as \$50/ton before the market began operating¹⁴ (though in actual program experience, the allowance price has not risen above \$20/ton since market launch¹⁵). Eventually, the State decided that entities could use offsets to meet up to 8% of their compliance burden, though use of offsets was optional and no particular participation goals were set.¹⁶ With all reductions required to be “real, permanent, quantifiable, verifiable, enforceable, and additional” under AB 32,¹⁷ the second protocol working group focused on “revis[ing] the early protocol to make it compliance-ready,” a shift that had never before been attempted in any other jurisdiction.¹⁸ In addition, to serve the goal of maximum participation and lower project costs (thus greater cost-containment for the cap-and-trade market), the new protocol was to be available for use nationwide, not just for projects in California.¹⁹

¹³ Schmitz and Kelly, *supra* note 6 at 92, 97.

¹⁴ Marc Lifisher, *California's First Auction of Greenhouse-Gas Credits Nears*, L.A. TIMES (November 6, 2012), available at <https://goo.gl/hjzu2F>

¹⁵ Danny Cullenward and Andy Coghlan, *Structural Oversupply and Credibility in California's Carbon Market*, 29 ELECTR. J. 7, 9 (2016).

¹⁶ See California Air Resources Board, Resolution 11-32 (October 2011), at 4, available at <https://goo.gl/s3IbTZ>; see also Press Release, CARB, California Air Resources Board Adopts Key Element of State Climate Plan (Release 11-44; October 20, 2011) available at <https://goo.gl/leoq5M>.

¹⁷ CARB, California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation [hereinafter Protocol FAQ], at 1, available at <https://goo.gl/DL8ZoV>; 2006 Cal. Stat. 3427 (Ch. 488), now CAL. HEALTH AND SAFETY CODE § 38562(d) (2017). See also Timothy Fahey et al., *Forest Carbon Storage: Ecology, Management, and Policy*, 8 FRONT. ECOL. ENVIRON. 245, 249 (2010) (providing a more general elaboration on what these terms entail in the forestry context).

¹⁸ Schmitz and Kelly, *supra* note 6 at 100, 101.

¹⁹ Protocol FAQ, *supra* note 17 at 10.

Program History: The Design Challenges of Forest Offsets

Two Key Periods of Policy Design

Throughout this formative period from 2002-2009, when California went through two full rounds of forest offset protocol design, stakeholders grappled with five critical design challenges in creating standards for offset projects. First, three commodification hurdles stemming from the United Nations Framework Convention on Climate Change proceedings had to be navigated: additionality, permanence, and leakage.²⁰ In short, to deliver credible climate mitigation, carbon offset projects must only receive credit for emissions reductions that would not have otherwise happened without program intervention (i.e. be ‘additional’ versus a conservative, business-as-usual scenario), must show that the reductions they deliver will persist over time (be ‘permanent’) and must demonstrate that no other emission-causing land use changes will result (no ‘leakage’). In addition, two other design challenges were present – how to maintain the environmental integrity of forests managed for carbon storage, and how to ensure market availability and acceptance of offsets as a salable commodity. Table 1 below summarizes how the 2002-05 and 2007-09 working group protocol-writing periods addressed these key design questions.²¹

²⁰ Steven Ruddell et al., *The Role for Sustainably Managed Forests in Climate Change Mitigation*, 105 J. OF FORESTRY 314, 316-17 (September 2007). The Kyoto Protocol’s Clean Development Mechanism offset program uses similar, though not exactly the same, terms. See UN Framework Convention on Climate Change, GLOSSARY – CDM TERMS (Version 8.0) (defining “additional”, “leakage”, and “long term certified emissions reduction”), available at <https://goo.gl/rZQCQ3>.

²¹ One update did occur between these dates in 2007, though most of the changes came with respect to more technical details of forest data and verification steps. See Climate Action Reserve, VERSION 2.1 at <https://goo.gl/HpcpJJ> (last visited March 15, 2017).

Table 1. Protocol Evolution on Key Design Questions, 2005 and 2009

<u>Design Challenge</u>	<u>Description</u>	<u>Early Protocol Approach</u> (Version 1.0, 2005) ²²	<u>Compliance-Ready Protocol Approach</u> (Version 3.0, 2009) ²³
Additionality	Proving emissions reductions as compared to a no-project counterfactual (a 'baseline')	<ul style="list-style-type: none"> • Crediting sequestration on project lands up to the maximum allowable harvest under CA forest rules 	<ul style="list-style-type: none"> • Quantifying primary effect, consisting of: Crediting sequestration on project lands above a standardized Common Practice baseline, taking into account growth models, legal obligations and project start date
Permanence	Delivering a long-term guarantee of emissions reductions	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement 	<ul style="list-style-type: none"> • Requiring a 100-year commitment • Percentage contribution to buffer pool of credits depending on project-specific reversal risks • Allowed voluntary termination
Leakage	Preventing concomitant emissions from induced land use change and activities elsewhere	<ul style="list-style-type: none"> • Perform an assessment for activity-shifting leakage (required) and market leakage (optional) 	<ul style="list-style-type: none"> • Quantifying secondary effects, including a project-specific leakage adjustment factor, but not including energy effects of alternate materials. • Market leakage adjustment only for IFM projects
Environmental Integrity	Guaranteeing sustainable and environmentally-conscious management (i.e. avoiding mere 'tree farm' projects)	<ul style="list-style-type: none"> • Requiring a perpetual conservation easement • Maintenance of native forests • Natural forest management (preventing even-aged cutting) 	<ul style="list-style-type: none"> • Requiring adherence to sustainable harvesting practices (certification) • Natural forest management for the project area • Increasing standing live carbon stocks
Market Availability and Acceptance	Ensuring offset credit availability and purchaser confidence for a functioning offset market	<ul style="list-style-type: none"> • Five-year third-party certification of forest project results 	<ul style="list-style-type: none"> • Lifting the conservation easement requirement • Permitting even-aged management (with limits) • Six-year third-party verification, with periodic desk reviews

As Table 1 details, the two California working groups engaged in an intricate policy design process in order to meet AB 32's requirement that offsets be real, permanent, quantifiable, verifiable, enforceable, and additional. Several tradeoffs were made in order to expand the possible pool of projects that could participate across the

²² Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 1.0 (September 2005) at <https://goo.gl/1oyTIs> (last visited March 15, 2017) (see PDF of that name on this webpage).

²³ Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.0 (September 1, 2009) at <https://goo.gl/5clWdB> (last visited March 15, 2017) (same).

program. Changes were made to the additionality, permanence and environmental integrity requirements that facilitated greater program participation.

Analyzing California's Protocol Changes in the Second Working Group

For additionality, California first chose a performance benchmark test in 2005, allowing credit above harvest floors permitted by California regulations.²⁴ Once the program expanded to cover the continental US, however, a new approach was needed rather than one reliant on California regulations.²⁵ The second 2009 working group developed a multi-part approach to additionality that would be applicable across the country. Projects would only receive credit for:

- 1) actions taken after a defined project start date;
- 2) sequestration above all legal, regulatory and financial harvesting and stocking constraints; and,
- 3) credit relative to an area-specific 'Common Practice' baseline developed using US Forest Service Forest Inventory and Analysis Program Data ('FIA data').

This approach combines three types of additionality 'tests'—legal or regulatory, common practice, and timing tests, as identified in Trexler et al (2006). This generally represents a more stringent approach to additionality than in the earlier 2005 protocol. Having multiple additionality screens almost certainly increases the proportion of credited reductions in the program that are truly additional, but at a higher cost of participation and with less supply flexibility.²⁶

Stakeholders also eased the permanence requirement to broaden participation. In order to incentivize lands managed for multiple uses (and not just conservation management), the 2009 protocol no longer required conservation easements. Instead, projects were required to give a 100-year sequestration commitment, and agree to set aside a project-specific proportion of their credits in a 'buffer pool' as insurance against later losses of carbon stock, referred to as 'reversals'.

This permanence policy change no doubt made the program more attractive to for-profit timber companies and family landowners, though it did not eliminate all potential reversal risks program-wide. Buffer pools, later described as the "most commonly used" approach to program impermanence risk, neatly manage the

²⁴ See Mark Trexler et al., *A Statistically-Driven Approach to Offset-Based GHG Additionality Determinations: What Can We Learn?*, 6 SUSTAIN. DEVEL. L. & POL. 30, 31 (Winter 2006) (describing various illustrative types of additionality 'tests').

²⁵ In general, states must be careful about designing state programs that affect out of state entities, since regulations with 'extraterritorial' effect are vulnerable to legal attack under the Commerce Clause of the US Constitution or federal laws. See generally *North Dakota v. Heydinger*, 825 F. 3d 912 (8th Cir. 2016) (finding that a Minnesota clean energy law had impermissible out of state effect).

²⁶ See Trexler et al., *supra* note 24 at 38 (showing tradeoff between flexibility and additionality in Fig. 8).

individual risk of projects by essentially making them insure both themselves and others in the currency of the program – credits. However, this approach to risk does *not* take into account program-level reversal risks, i.e. the fact that individual project risks may under certain circumstances, be correlated.²⁷ The buffer approach essentially assumes that even if one project falls victim to a reversal event (e.g. a wildfire), most others will not. This program-level assumption may not hold if projects share certain common risk-relevant characteristics, like being located in close geographic proximity to one another. Cross-cutting risks, like the increased potential for wildfires as global temperatures rise and climate change progresses, can increase reversal risk across the board, not just for isolated individual projects.

Finally, with respect to environmental integrity, several changes helped make the program more attractive to timber companies and other landowners. Instead of a conservation easement, the 2009 protocol allowed a sustainable forestry certification to suffice as a commitment to environmental integrity. Though natural forest management remained a requirement, this definition was altered to allow some degree of even-aged management over portions of the project area, and in increments less than 40 acres. Projects were also expected to maintain or increase standing live carbon stocks,²⁸ as a way to promote biodiversity and wildlife habitat. In general, the 2009 protocol took several important steps to ensure greater participation while generally not changing the strict verification requirements that help facilitate investor confidence in offset credits.

Administration by ARB and Subsequent Challenges

The 2005 and 2009 protocols had been adopted pursuant to SB 1771 and SB 812, in stakeholder processes run through the CCAR, which was restructured and relaunched as the Climate Action Reserve (Reserve) in 2008. When ARB included forest offsets as part of the broader cap-and-trade program, however, the protocols then became official documents of the ARB, which noted that they had been drawn from version 3.2 of the Reserve's protocol.²⁹ After several years of accepting projects

²⁷ David Cooley et al., *Managing Dependencies in Forest Offset Projects: Toward a More Complete Evaluation of Reversal Risk*, 17 MITIG. ADAPT. STRATEG. GLOB. CHANGE 17, 17 (2011) (describing three different kinds of correlated catastrophic reversal risks – fat tails, micro-correlations, and tail-dependence – that may be present, yet are unaccounted for by buffer pools). See also Christopher Galik and Robert Jackson, *Risks to Forest Carbon Offset Projects in a Changing Climate*, 257 FOREST ECOL. & MGMT. 2209, 2209 (describing systemic climate risks not accounted for in project-by-project analysis).

²⁸ Compare the 2005 protocol, *supra* note 19 at 15-16, with the 2009 protocol, *supra* note 20 at 12.

²⁹ See CARB Resolution 11-32, *supra* note 13 at 10. See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: OCTOBER 20, 2011) [2011 Forest Offset Protocol], at 7 available at <https://goo.gl/OpLQvv>.

designated as Early Action, the compliance portion of the offset market launched in 2013 with the beginning of the cap-and-trade program.³⁰

ARB implemented compliance protocols based on the 2009 protocol and updated the protocol in 2011, 2014, and 2015. Most of the key issues described above have not changed in these updates, including project-level risk assessments.³¹ Some distinctions and developments have occurred across protocol updates, though there has been more consistency than change.³² Since 2011, ARB has mandated higher levels of professional education and skills in verification teams.³³ Also, two updates to the protocol were released in 2014 and then in 2015, along with growing amounts of interpretive guidance and FAQs posted on the ARB website.³⁴

Importantly, ARB's approach to additionality under this protocol and the other offset protocols was upheld as lawful by the California Court of Appeal in 2015 in *Our Children's Earth Foundation v. California Air Resources Board*.³⁵ That case decided that as a legal matter, ARB had the authority under AB 32 to implement the "standards-based approach" it has taken in adopting offset regulations and protocols since 2011, including for the US forest program.³⁶ CARB did not have to take an idiosyncratic project-specific approach to additionality, as the challengers had wanted. Observing that it is "virtually impossible to *know* what otherwise would have occurred in most cases," ARB could not be held to an additionality standard of omniscience and perfection – the legislature had directed ARB to "establish a workable method of

³⁰ CARB, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (updated February 9, 2015) at 2 <https://goo.gl/qxOSqZ>.

³¹ See also CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST PROJECTS (ADOPTED: JUNE 25, 2015) [2015 Forest Offset Protocol], at <https://goo.gl/hJuX8c>. See also CARB, COMPLIANCE OFFSET PROGRAM (updated March 8, 2017) (website with links to the protocols and other details from past iterations) available at <http://goo.gl/WUBm4Y>.

³² For example, starting with the 2011 protocol, ARB has used the language of 'intentional' versus 'unintentional' reversals in dealing with project owner compensation liability, whereas the previous protocols had distinguished between avoidable and unavoidable reversals, though the substantive standards remain the same. Compare 2011 Forest Offset Protocol, supra note 25 at 59 with Climate Action Reserve, FOREST PROJECT PROTOCOL VERSION 3.2 (August 31, 2010) at <http://goo.gl/XX3ubS> (last visited March 15, 2017) at 63. See also CAL. CODE REGS. tit. 17 § 95802(a)(190) (2017) (defining intentional reversal), available at <https://goo.gl/PUMgye>.

³³ See Climate Action Reserve, COMPARISON OF RESERVE FOREST PROJECT PROTOCOL TO ARB COMPLIANCE OFFSET PROTOCOL FOR FOREST PROJECTS (last accessed March 15, 2017), available at <https://goo.gl/jVrLLE> (comparing Version 3.2 to the first CARB protocol).

³⁴ See CARB, COMPLIANCE OFFSET PROTOCOL U.S. FOREST OFFSET PROJECTS: ADOPTED JUNE 25, 2015 (updated December 2, 2015), available at <https://goo.gl/7XiB8G> (website explaining 2015 protocol).

³⁵ 184 Cal Rptr. 3d 365, 378 (2015). See also Alan Ramo, *The California Offset Game: Who Wins and Who Loses?*, 20 J. ENV. L. & POL. 109, 133-43 (Winter 2014), available at <https://goo.gl/eCWrlQ> (providing more background on the case).

³⁶ *Our Children's Earth Foundation*, 184 Cal Rptr.3d at 371, 373, 378.

ensuring additionality with respect to offset credits” in the context of “a market-based compliance mechanism,” which is precisely what ARB did.³⁷

Another important event came in 2014, when ARB recorded its first invalidation of offset credits under any protocol. The Clean Harbors Environmental Services waste incinerator in El Dorado, Arkansas participated in the Ozone Depleting Substances (ODS) protocol up until 2014, when a compliance issue with their hazardous waste environmental permit came to ARB’s attention. For a period in 2012, it was found that Clean Harbors was not in compliance with their hazardous waste permit, though an investigation revealed no environmental integrity concerns with their ODS activities. After investigation, assessment, lobbying from market participants, and a final determination, ARB decided to invalidate 88,955 of the approximately 4.3 million tons of offset credits Clean Harbors had earned, sending ripples of concern through the offset marketplace.³⁸

Though not the precise subject of legal action, or at least not yet, environmental justice concerns have been leveled at the offset program. Offsets are viewed skeptically by environmental justice advocates because they allow facilities located in disadvantaged communities to cover their emissions with offset reductions that happen elsewhere. This has been particularly concerning since several industry sectors have shown increased emissions since the 2013 start of the cap-and-trade market, though to date, the data made available to the public does not permit a very detailed assessment of these equity concerns. A 2016 analysis from scientists at UC Berkeley and several other California universities showed that most compliance entities did not use offsets, though those that did tended to have larger GHG emissions.³⁹ We discuss these environmental justice questions further in the Findings section.

³⁷ *Id.* at 379.

³⁸ See California Air Resources Board, Final Determination: Air Resources Board Compliance Offset Investigation Destruction of Ozone Depleting Substances (November 14, 2014), available at <https://goo.gl/KGeHrr>; Laurel Rosenhall, CalMatters, *A Little Town in Arkansas and its California Connection* 89.3 KPCC (July 26, 2015), available at <https://goo.gl/bnwIu1>; Gloria Gonzalez, *Despite Market Outcry, California Voids Some Carbon Offsets*, ECOSYSTEM MARKETPLACE (November 14, 2014), available at <https://goo.gl/Obv367>.

³⁹ Lara Cushing et al., USC Dornsife Program for Environmental and Regional Equity, A PRELIMINARY ENVIRONMENTAL QUALITY ASSESSMENT OF CALIFORNIA’S CAP-AND-TRADE PROGRAM: RESEARCH BRIEF – SEPTEMBER 2016 [hereinafter Climate Equity Brief] at 7-10, available at <http://goo.gl/2VrnXm>.

Current Status of Today's Forest Offset Market

A Small But Notable Part of the Cap-and-Trade Market

According to the latest ARB Compliance Instrument Report at the time of this writing (up through Q4 2016), 95% of program compliance has been achieved through the use of allowances. Of the remaining 5% of offsets, a majority (3% of the total) comes from US Forest projects, with the remainder primarily coming from the Ozone Depleting Substances protocol and smaller amounts from livestock and mine methane capture projects. The amount of offset credits issued is slightly greater, as seen in Table 2. More credits have been issued than have been retired to-date, and Table 2 includes credits that are held back in the forest buffer pool and those that are held by offset project owners, market participants or compliance entities for future compliance. These figures are presented in Figure 2 and Table 2 below.

Table 2. ARB Offset Credits Issued as of March 11, 2017

Project Type	Ozone Depleting Substances	Livestock	U.S. Forest	Urban Forest	Mine Methane Capture	Rice Cultiv.	Totals
Compliance	7,222,320	1,521,590	21,851,822	--	1,259,314	--	31,855,046
Early Action	6,336,710	1,695,029	13,276,494	--	2,879,684	--	24,187,917
Totals	13,559,030	3,216,619	35,128,316	--	4,138,998	--	56,042,963

Source: ARB, Compliance Offset Program website,⁴⁰ at <https://goo.gl/gBSWoj>

⁴⁰ The text appearing alongside this table on the CARB website is: *Table includes all offset credits issued including offset credits placed in ARB's Forest Buffer Account, offset credits returned to an Early Action Offset Program's forest buffer pool, and offset credits subsequently invalidated.*

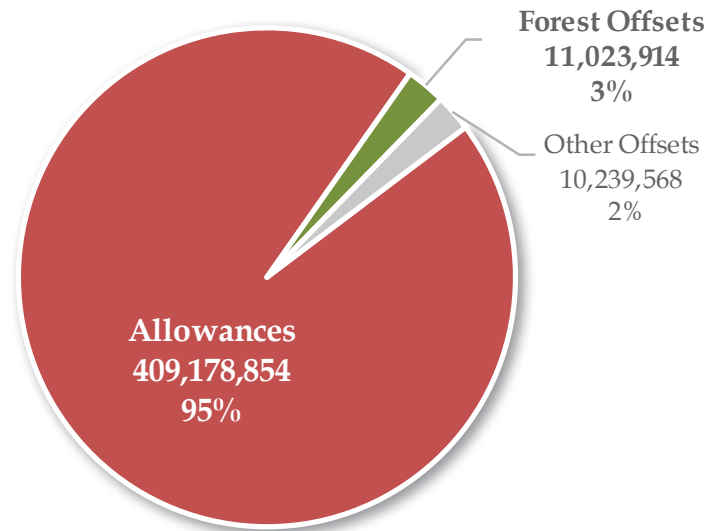


Figure 1. Retired Compliance Instruments Used 2013-16 in the California Cap-and-Trade Program. Source: ARB Compliance Instrument Report, Data through Q4 2016, accessed March 11, 2017, available at <https://goo.gl/Jsj8kf>

Given that offsets account only for 5% of the total compliance instruments used so far in the cap-and-trade program, it would be easy to dismiss their role in the sweep of California’s aggressive climate policies. Indeed, one author likened the cap-and-trade market as a whole to ‘dessert’ after a full meal of other ‘complimentary policies’ for climate action including building energy efficiency standards, tailpipe emission standards, the Low Carbon Fuel Standard and renewable energy mandates. These policies are expected to account for approximately 70% of California’s climate action, with cap-and-trade’s 30% “no ton is left behind” contribution following at the end.⁴¹ In this conception, offsets would be the garnish on that dessert – playing a small role in the last-in-line climate policy. Depending on the future carbon price, of course, offsets could stand to play a much larger role. If carbon prices increase considerably and more entities use closer to their full 8% allotment of offset-based compliance, then it is possible that offsets will exert considerable influence over the overall cap-and-trade program’s economic and environmental outcomes.

Whether a large or small portion of compliance, offsets are somewhat financially beholden to the vagaries of the broader cap-and-trade market. Given that they are substitutes, offset prices according to market participants are generally pegged to the going rate for allowances, though at a small discount likely due to the additional search and transactions costs investing in offsets requires. With market data indicating

⁴¹ Michael Wara, *California’s Energy and Climate Policy: A Full Plate, But Perhaps Not a Model Policy*, 70 BULL. OF THE ATOM. SCI. 26, 27, 28 (2014).

a structural oversupply of compliance instruments in the cap-and-trade market,⁴² the latest allowance price floor⁴³ of \$13.57 may operate as somewhat of a price ceiling on offsets, especially when allowances are abundantly available for purchase from ARB or in the secondary market.

However, as a financial matter offsets should not so easily be dismissed. Both from published data made public by ARB,⁴⁴ and from anonymous survey results collected in this research, offset prices have been in the general vicinity of \$9-13 per ton CO₂e. This price range combined with the information in Table 2 above suggests that the 56 million offsets issued to-date by ARB are in total worth around \$500 million, with about \$300 million of that in forest offsets alone. As a matter of state policy and as an unprecedented experiment in carbon sequestration program design, the forest offset program is certainly worthy of close examination.

Explaining the Distribution of Offset Credits by Project Type

As seen in Table 2 and Figure 2 above, the US Forest offset program accounts for a clear majority of both the credits earned and the offsets surrendered for compliance. This research also draws on project design documents available through the forest offset program, pulled from the climate registry websites as of July 2016. This analysis was conducted for all the projects that had then earned or were earning credits in the program.⁴⁵ Looking at just these projects that had made it all the way through the application process helps show how the project protocols are playing out in practice. From the project document data analyzed for this study, we draw the following project summary statistics in Tables 3 and 4, and the map in Figure 3 below.

Table 3. Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

	Number of Projects	Total Credits	Total Acres
Improved Forest Management	33	24,142,947	854,598
Avoided Conversion	6	1,376,803	8,588
Reforestation	0	0	0
Totals	39	25,519,750	863,186

⁴² Cullenward and Coghlan, *supra* note 15 at 13.

⁴³ CARB, FEBRUARY 2017 JOINT AUCTION #10: SUMMARY RESULTS REPORT (last accessed March 15, 2017), available at <https://goo.gl/MSDdTD>.

⁴⁴ See CARB, 2015 SUMMARY TABLE OF MARKET TRANSFERS (last accessed March 15, 2017), available at <https://goo.gl/qwxFDS>.

⁴⁵ Other analysis has focused on all projects listed in the program, an earlier step in the crediting process. See Erin Kelly and Marissa Schmitz, *Forest Offsets and the California Compliance Market: Bringing an Abstract Ecosystem Good to Market*, 75 GEOFORUM 99, 102 (2016).

Table 4. Credit-Earning Projects in the Offset Program by Protocol Type

	<i>Compliance Program</i>			<i>Early Action Program</i>		
	Number of Projects	Total Credits	Total Acres	Number of Projects	Total Credits	Total Acres
Improved Forest Management	16	16,757,595	691,393	17	7,385,352	163,204
Avoided Conversion	0	0	0	6	1,376,803	8,588
Reforestation	-	-	-	-	-	-
Totals	16	16,757,595	691,393	23	8,762,155	171,792

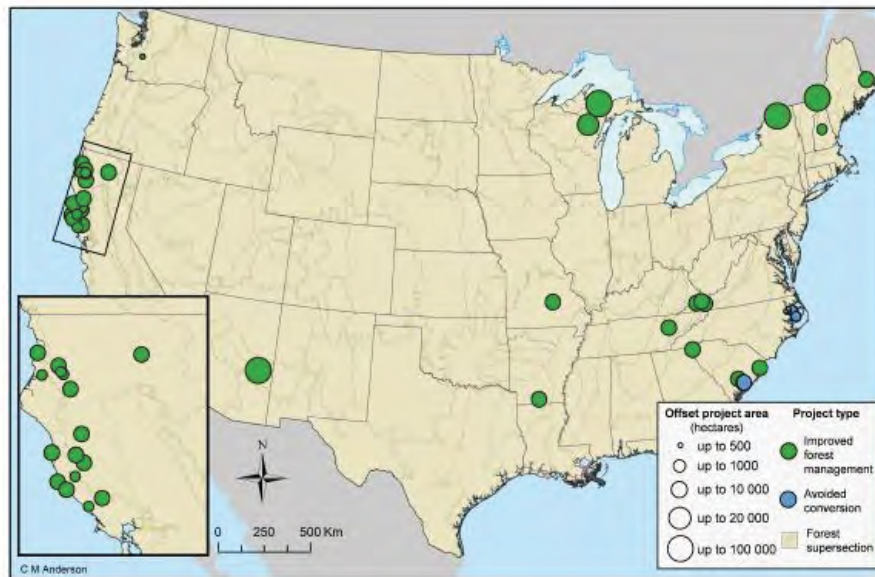


Figure 2. Map of Credit-Earning Projects in the U.S. Forest Offset Program, July 2016

Several trends stand out in the project data presented above. First, improved forest management (IFM) projects dominate the pool of projects that have made it to the crediting phase of the program. The potential reasons for this are several, though interviewees highlighted three important ones. Given that tree growth from plantings does not begin to show financially significant returns in terms of carbon accumulation for 15-20 years, the financial payback period for reforestation projects is simply too

long, explaining why no projects have yet been credited. Second, only a handful of avoided conversion projects have been successfully credited in the program. This may be in part because in ARB's protocol, projects must show that the anticipated alternative land use for the project is more than 80% higher than its current forested value or face credit reductions.⁴⁶ This requirement essentially imposes a property conversion value test whereby converting to another land use must nearly double the value of the land, or face credit erosion by an 'uncertainty discount factor'. The purpose of this discount factor is additionality – only projects with high potential conversion values (i.e. those most likely to actually be converted) can make it into the program and receive full credit. Finally, IFM projects have the benefit of obtaining credit in the first year for the amount of carbon stock above their own modeled harvest baseline and above the Common Practice baseline. Put differently, this means that when an IFM project comes into the program, in the first year they are eligible for an initial crop of carbon offset credits for their current carbon stock that is above both the regional average stock (Common Practice baseline), and above the project-specific modeled baseline that includes financial, legal, and regulatory constraints. In short, above-average forests earn significant credits up front, and multiple interviewees acknowledged that this initial tranche of credits is all but essential for IFM project participation.⁴⁷ Many interviewees note that part of the initial revenue inflow is often used to finance startup costs.

Two additional pieces of evidence reinforce the essential role of up-front revenue. Published research on the potential financial returns from potential small offset projects in the northeastern US found that initial carbon stocking above the Common Practice baseline was the strongest predictive variable of financial returns.⁴⁸ Also, our analysis of project documents for the IFM projects currently earning credits indicates that 4 out of every 5 IFM projects in the program entered with carbon stocking above the Common Practice baseline. The quartile boxplot in Figure 4 below shows that most projects come in above, and many come in significantly above their area's Common Practice baseline. For a project at the median carbon stock (32 tons/acre above) and of a median size (9,753 acres for IFM projects), this means roughly 300,000 credits will be awarded up-front. At approximately \$9 a credit, that amounts to \$2.7 million in year 1 revenue for the project. Figure 5 below shows how IFM projects earn credit over time, demonstrating that about 70% of credits come in the first year and small annual amounts after, reflecting the (slow) net growth of carbon stock after year one.

⁴⁶ 2015 Forest Offset Protocol, *supra* note 31 at 72.

⁴⁷ See also Kelly and Schmitz, *supra* note 45 at 105.

⁴⁸ Charles Kerchner and William Keeton, *California's Regulatory Forest Carbon Market: Viability for Northeast Landowners*, 50 FOREST POL. & ECON. 70, 75 (2015).

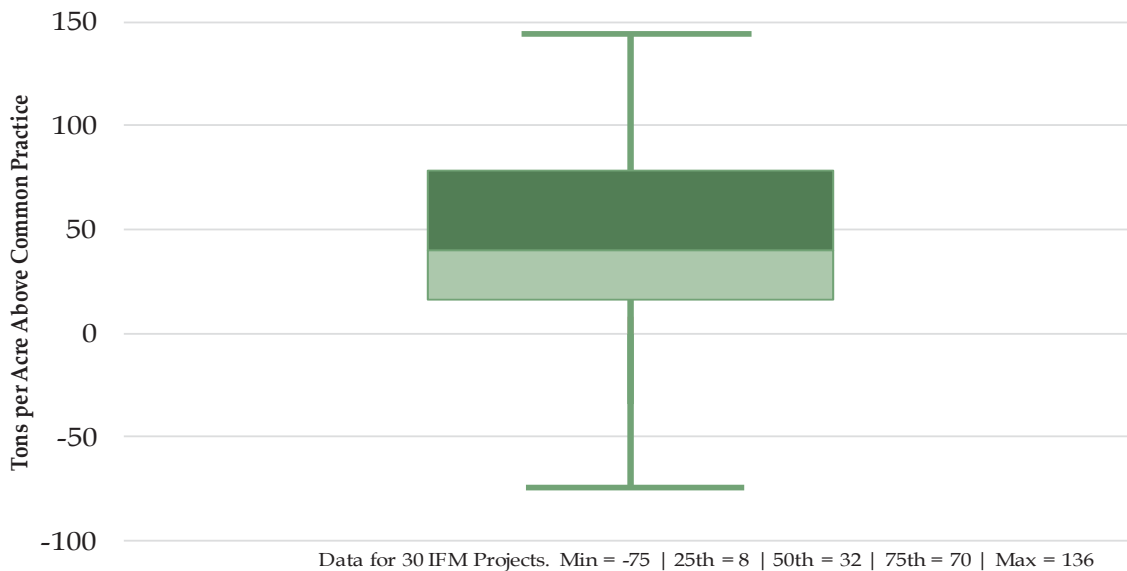


Figure 3. Boxplot of Initial Tons per Acre Above Common Practice from IFM Projects in the US Forest Offset Program as of July 2016.

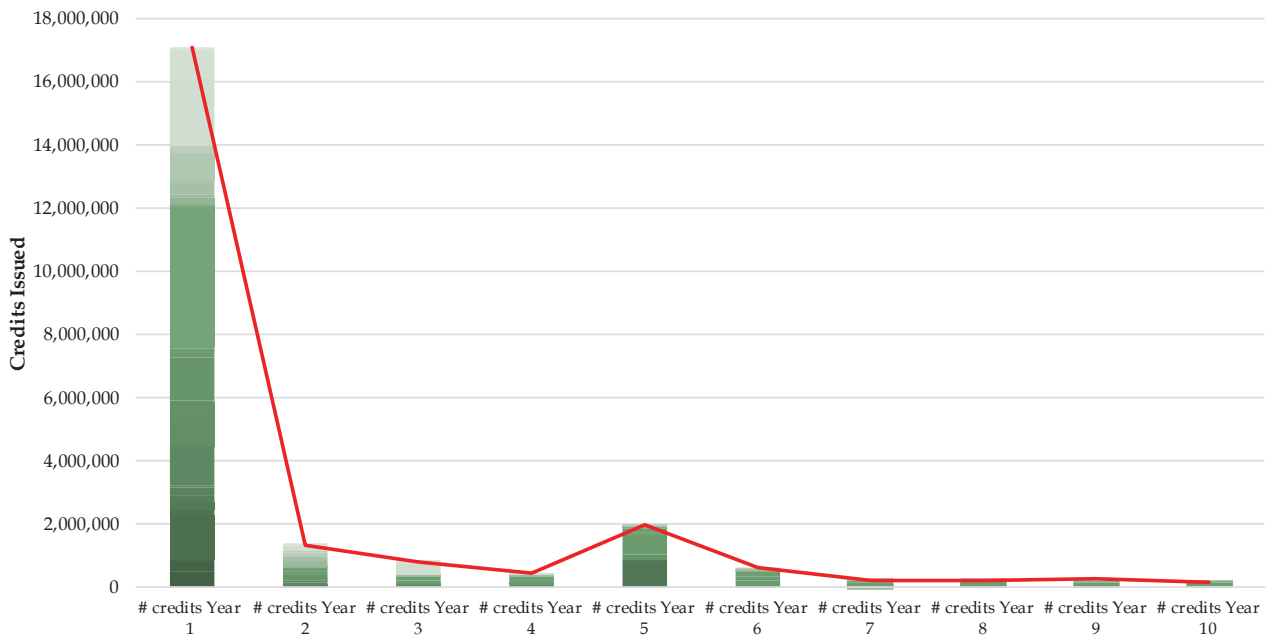


Figure 4. Total Credits per Year Earned by IFM Projects in the US Forest Offset Program as of July 2016.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

Summary

In summary, today's California forest offset market is populated by several dozen projects selected for their exceedingly good fit under the rules of the program as specified in the ARB protocol. With a multifaceted approach to additionality, stringent verification and monitoring expectations and robust carbon accounting rules, the projects in the program reflect ARB's emphasis of quality over quantity in the number of projects that earn credits. Project developers have previously reported that only 5-10% of the projects they initially investigate end up being profitable enough to proceed given these high program hurdles.⁴⁹

However, with over 100 projects listed in the program so far (an initial stage in the application process), it is possible that significantly more projects could complete the process and begin earning credits if the price of carbon increases. Reauthorization of the cap-and-trade program past 2020 could cause such a price spike, which would likely lead to the crediting of many more IFM and avoided conversion projects. These projects would presumably be less financially dependent on returns from crediting their initial stocking over the Common Practice baseline, as future growth would be more remunerative. It remains to be seen whether any plausible market scenario will bring reforestation projects into the program, though. What is clear is that future market dynamics will depend largely on future developments in state policy and carbon prices.

⁴⁹ Kelly and Schmitz, *supra* note 45 at 104.

Methods

This review undertook three approaches to assessing forest offset project and program characteristics. First, we conducted an assessment of all 39 credited forest offset projects (listed in Appendix I) using a text review of the public project documents available for each project. Projects must meet stringent reporting requirements, and must be listed on approved carbon registries with public project documents. For this research, available documents included an offset verification statement, annual offset project data reports, offset project listings, and biennial project emissions reporting, yielding a database of 46 variables for each project.

Second, we administered a survey of forest owners/operators and a separate survey of forest offset project developers to gain information beyond what is reported in project documents. The surveys included questions about participant motivations, forest offset credit sales, and other project characteristics, experiences, and opinions. Online surveys were sent to all 32 identified project owners/operators. Postcard reminders were mailed, seven survey reminders were sent by email, and hard copy surveys were sent to those who did not respond within a week. 17 complete survey responses were collected, with a survey response rate of 53%.⁵⁰ These responses covered 21 of the 39 credited projects, also 53% of the total. The same process was used for the project developer survey. Three of four project developers responded. For context, we estimate that 72% of all projects in the program used a project developer to implement their forest offset project.

Third, we conducted in depth interviews with eight project owners (including four on-site forest visits) and with two project developers. These in depth interviews provided nuanced details for specific projects and corroborated information gained from the document review and survey. Between surveys and interviews, this research obtained detailed data from the owners of 28 of the 39 projects credited in the program (72%). This paper draws on each of these three data sources—documents, survey responses, and interviews—in formulating the following findings and lessons.

Last, we compiled additional data for mapping forest offset use in disadvantaged communities (see Finding 2 below). Using a combination of publicly available data from ARB and other sources, we analyzed the share of forest offsets that were used at facilities in disadvantaged communities (estimated to be a pro-rata share of their parent entity's offset use) as compared to offset-linked facilities not located in disadvantaged communities. This analysis used forest offset data from 2013-2015, and annual emissions from facilities in 2014, as described further in footnote 60 below.

⁵⁰ The majority of projects covered in survey responses were Early Action projects.

Findings

Based on document analysis, interviews, and surveys, we elaborate four primary findings on California's forest offset program below.

Finding #1: Additionality is Much Stronger than in Other Forest Offset Programs, But Questions Remain

Project 'additionality' refers to the idea that a forest offset project earns credits for changing practices from what would have happened without the project. For example, forest owners can earn credits by cutting less timber than they would have otherwise, or by keeping forest land standing that they would have otherwise converted to agriculture. The challenge with credit accounting under this approach is that it is never possible to know the counterfactual (what would have happened in the absence of the forest offset project) for certain. By definition, all counterfactuals are hypothetical exercises. Many forest offset programs have been plagued by difficulty in determining the appropriate counterfactual or 'baseline' activity level. California's program continues to face this challenge as well, but it has gone several steps further than prior efforts on forest offsets.

Efforts to Ensure Additionality

This analysis finds that California's forest offset program has incorporated several accounting and protocol elements in an effort to ensure project additionality. First, projects entail rigorous carbon accounting with standardized baselines across the country which are established with long-term forest data from the US Forest Service Forest Inventory and Analysis program.⁵²

Second, forests are required to provide data showing that the project-specific harvest baseline against which their project will be credited would have been financially viable.⁵³ That is, when forests set counterfactual timber harvest levels or forest conversion rates, they are required to provide a net present value analysis or recent sales records from neighboring forests showing that the proposed baseline timber harvest is financially viable for the duration of the offset project.

Third, projects are required to exclude any forest carbon that is already legally protected by another mechanism.⁵⁴ Forest carbon that is already legally protected from harvest would by definition not be harvested, and any crediting for such carbon would

⁵² 2015 Forest Offset Protocol, Appendix F, *supra* note 31 at 139.

⁵³ 2015 Forest Offset Protocol, *supra* note 31 at 28, 62.

⁵⁴ 2015 Forest Offset Protocol, *supra* note 31 at 27.

clearly not be additional. Common legally protected forest carbon in offset projects, for which projects do not receive credits, include legal prohibitions from harvest near streams, on steep slopes, or near endangered species. Another common legal prohibition that prevents some forests from participating in the offset program is the presence of a longstanding conservation easement that prohibits timber harvest on the forest land in question.⁵⁵ The rigor of these requirements is new to the California offset program; preceding voluntary forest offset programs have not generally required this level of scrupulousness.

The Views of Forest Owners and Operators on Additionality

Our survey asked forest owners and project developers to assess their confidence in the additionality of both their forest offset project and other projects. Not surprisingly, the majority of respondents were confident that both their project and other projects in the program are additional (Figure 5).

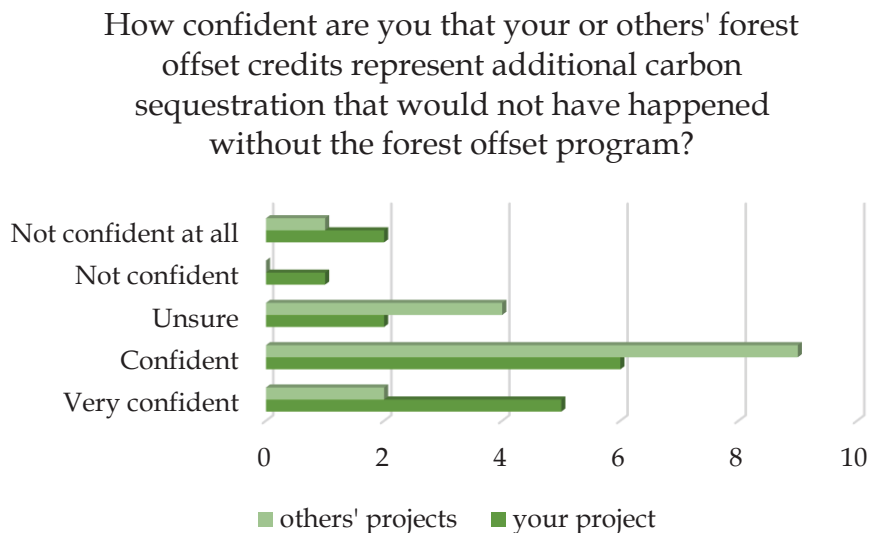


Figure 5. Survey responses from 17 forest owners re: confidence in additionality.

In more detailed narrative survey responses there were two types of information that stood out on additionality. First, some project owners and operators shared that as long as they maintained property ownership, they were unlikely to have harvested timber at the baseline level calculated in project documents. This would be a concern for project additionality. Second, in both interview and survey responses, project owners and operators emphasized that the *commitment* to carbon sequestration was

⁵⁵ For early action projects which started prior to the compliance market start, projects that already had conservation easements were grandfathered in to the program.

additional. In other words, projects were thought to be additional regardless of the counterfactual because they ensured a 100-year commitment to maintaining forest carbon. The counterfactual would be no *commitment* to maintaining carbon and thus an uncertain future for the forest carbon in question.

Our survey also asked forest owners and operators whether participation in the forest offset program changed their forest management practices. A change in forest management practices would signify a change from the baseline activity and would serve as another indicator for project additionality. Of survey respondents, 4 reported that starting a forest offset project changed their forest managed practices, an additional 6 reported that practices changed somewhat, and 6 reported that practices did not change (Figure 6). Management changes reported by project operators included decreasing harvest levels, adding a forest certification, and purchasing additional forest land.

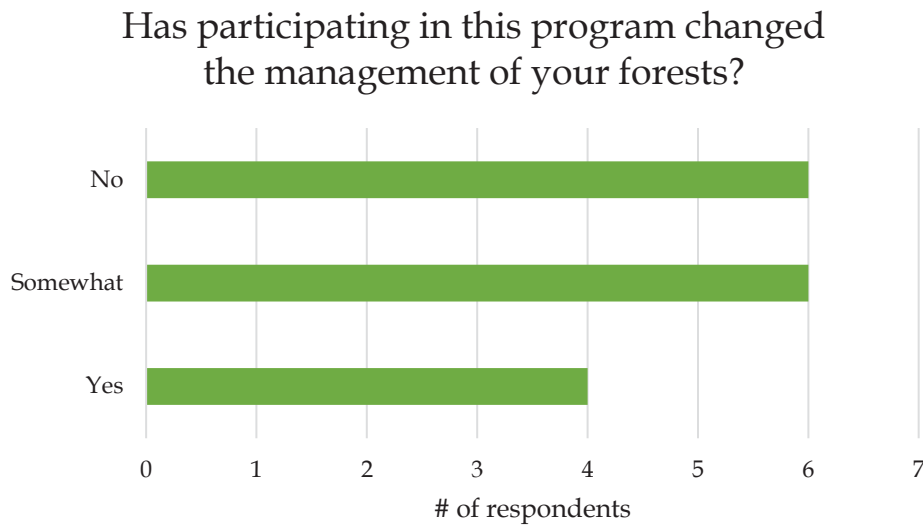


Figure 6. Survey responses from 16 forest owners re: forest management.

Concerns about Project Additionality

One of the most commonly voiced concerns about additionality in the forest offset program concerns conservation easements. California’s forest offset protocol allows projects to simultaneously implement a conservation easement together with a forest offset program, and this is a common occurrence in the program. This type of joint implementation of an easement and offsets would be considered additional under a ‘barriers test’ of additionality, which assumes that a project would not be possible (i.e. would face insurmountable barriers) without implementing both the offset project

and the easement jointly.⁵⁶ However, in the initial Early Action period of the forest offset program, projects were able to join the program even if they had long standing conservation easements already in place. Any easement stipulations prohibiting timber harvest still had to be excluded from crediting, but this early period included multiple projects with long-standing conservation easements already in place. It is an important positive amendment that such projects are no longer permitted to join the offset program.

Finding #2: A Wide Variety of Entities Purchase Offset Credits

Forest Offset Credit Buyers

In the California cap-and-trade market as of 2015, 272 entities and 438 facilities fall under the cap. (Each ‘entity’ may have multiple facility sites.) According to data from CARB⁵⁷ analyzed in this study, 150 facilities purchased offsets and 79 have used forest offsets from 2013 through 2015. The cap-and-trade policy limits each entity to covering a maximum of 8% of its obligations by using offsets. As discussed earlier, the total rate of use falls well below the 8% maximum at present.

Among forest project owners surveyed, 53% of project owners sell their forest offsets directly to entities with a California offset obligation. The remainder of owners sell their credits to brokers and intermediaries who in turn sell credits to entities in the cap-and-trade program. Offsets were initially included in California’s cap-and-trade program to serve as a cost containment mechanism. Capped facilities could avoid or delay the most expensive emissions reductions investments by purchasing offsets. However, since the carbon price in the California market has remained very low through the duration of the market to date,⁵⁸ offsets have not served as a cost containment mechanism, and the cost of offset credits has also remained low. 11 survey respondents anonymously reported on their average carbon sales price. The average price from this data is \$10.20/ton, with a range of \$9-\$13/ton. As shown below in Figures 13 and 14, most respondents anticipated that prices would increase slightly or stay about the same up to 2020. Estimations were similar for prices after 2020, with the addition of a few respondents anticipating prices to increase significantly (more than a 25% increase).

⁵⁶ See Trexler et al., *supra* note 24 at 31.

⁵⁷ See explanation in footnote 60 below.

⁵⁸ Cullenward and Coghlan, *supra* note 42 at 13.

Forest Offset Credits and Environmental Justice

The environmental justice community in California has voiced concern that use of offsets disproportionately impacts disadvantaged communities in the state. Environmental justice advocates have argued that facilities that buy offsets are likely located in disadvantaged communities, and if emissions were reduced onsite instead of through offsets, those communities would gain health benefits from reduced pollution, especially of non-GHG co-pollutants such as particulate matter and air toxics.⁵⁹ We used offsets sales data and facility emissions data from CARB to construct a first-order approximation of the connection between offsets and emissions in disadvantaged communities and to assess whether forest offsets have been used disproportionately in disadvantaged communities.⁶⁰

Forest offsets account for a small share of facility emissions across all facilities. 79 of 438 facilities in the cap-and-trade program (total as of 2015) used forest offsets. Of these facilities, 43% (34) are located in disadvantaged communities (see Figure 7). In 2014, facilities in disadvantaged communities on average offset 2.2% of their emissions with forest offsets, whereas facilities not in disadvantaged communities used offsets slightly more, covering 3.2% of their emissions. As with the rate of use, the total *number* of estimated forest offsets used is also higher outside of disadvantaged communities. Where facilities in disadvantaged communities used close to 70,000 forest offset credits on average, facilities outside of disadvantaged communities used

⁵⁹ See Climate Equity Brief, *supra* note 39 at 7-10.

⁶⁰ This analysis weaves together the forest offsets information reported in the CARB Compliance Reports (available for 2013-14 and 2015) and compares it to facility information made available in CARB's the Integrated Emissions Visualization Tool, with an overlay of the OEHHA's CalEnviroScreen 3.0 shapefile for disadvantaged community location (defined here as a score of 75 or above). We first downloaded all data for the facilities listed as subject to cap-and-trade as of 2013 in the Integrated Emissions Visualization Tool (324 facilities). Then we matched that facility information with the forest offset usage data reported in the Compliance Report's Compliance Offsets Detail tab by entity ID. This matching used the Entity ID data, and ARB GHG ID info reported in the Compliance Summary tab of the Compliance Reports to link entities, and the facilities they own, with offsets usage. Unfortunately, because CARB does not report offset usage down to the facility level, our analysis at that point had to use a pro-rata estimate for each entity; that is, if a particular entity had purchased and retired 100,000 offsets, and owned four facilities subject to cap-and-trade, we have assumed that they retired 25,000 offsets for compliance at each facility. More detailed information would need to be made public about both offset purchase and retirement as well as about facility location and emissions in order for finer and more instructive sets of analyses to be conducted. We recommend that CARB at a minimum commission a program evaluation of the environmental and equity impacts of the offsets program using more finely grained data than what has been made publicly available. For data sources, please visit CARB, INTEGRATED EMISSIONS VISUALIZATION TOOL (last accessed March 15, 2017), available at <http://goo.gl/WJGiVF>; CARB, CAP-AND-TRADE PROGRAM (last accessed March 15, 2017), available at <http://goo.gl/4qeAfj> (specifically, under Publicly Available Market Information, the 2013-14 and 2015 Compliance Reports); Office of Environmental Health Hazard Assessment, CALENVIROSCREEN 3.0 (last accessed March 15, 2017), available at <http://goo.gl/K9Foqg> (specifically the CalEnviroScreen 3.0 Results Shapefile).

more than 130,000 forest offset credits on average. Initial analysis suggests that trends are similar when all offsets, not just forest offsets, are considered. Facilities in disadvantaged communities used 6.4 million offsets cumulatively, while facilities outside of disadvantaged communities used 10.2 million offsets cumulatively. Further analysis and more finely-grained data are needed to more precisely compare the effects of offsets on emissions in and out of disadvantaged communities.

Though any lessening of the incentive to reduce pollution in disadvantaged communities is concerning, and though offset data alone cannot tell us precisely what would have happened in the absence of offset availability, it appears that the use of offsets to date affects but does not appear to disproportionately impact disadvantaged communities. As compared to other areas, fewer facilities in disadvantaged communities purchase offsets, and those that do use a smaller share of offsets. But, this trend could change over time and should continue to be monitored.

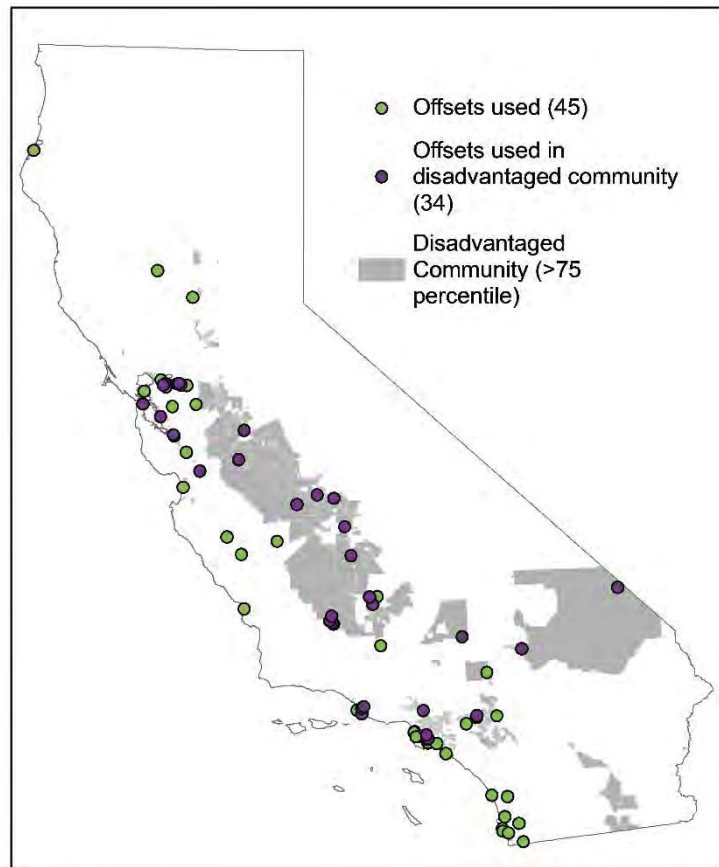


Figure 7. Location of Cap-and-Trade Facilities whose Parent Entities Retired Offsets to Meet Compliance Obligations.

Finding #3: Project Co-Benefits Are Not Monetized

Project document review, interviews, and surveys all corroborate that forest offset projects convey co-benefits for conservation and sustainable forest management. However, delivery of these project co-benefits is a decidedly secondary concern to the financial success of projects, which is conveyed by carbon credits. Project co-benefits may be of greater interest in the long run, and several projects report potential for ‘benefit stacking,’ or deriving financial benefit from co-benefits alongside carbon revenues from participating forest land.

From our analysis of project design documents, 92% of credited offset projects report having at least one environmental co-benefit. In the survey data, however, most respondents report that co-benefits are not important in the sale of their offset credits (11 of 16, 69%). This indicates that while forest owners are aware of the existence of co-benefits, these co-benefits are not financially relevant to the sale of offset credits, though they may be relevant to other ecosystem services markets. Similarly, interviewees often noted their co-benefits with interest, and enjoyed telling stories about them, but generally acknowledged that carbon credit buyers do not ascribe monetary value to co-benefits.

Survey respondents report that their projects provide a number of co-benefits. Most respondents also report that co-benefits are present, but few expend resources to measure these benefits.

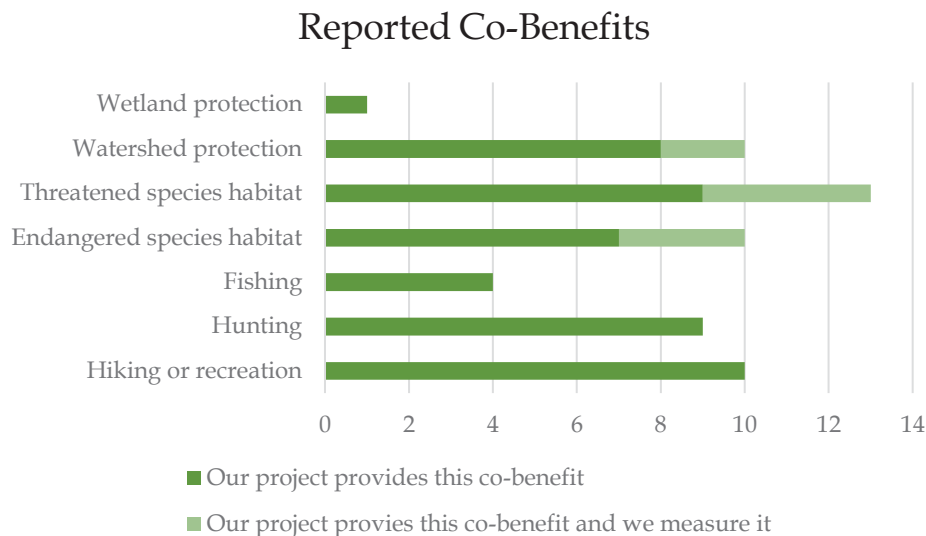


Figure 8. Survey Responses from 17 Forest Owners on project co-benefits.

No project operators or developers that we interviewed or surveyed were interested in additional reporting requirements, on co-benefits or otherwise, although at least one noted that if nationally standardized tracking metrics were developed, the reporting burden to California would be manageable. Respondents were concerned that reporting requirements are already onerous, so any future co-benefit reporting would likely need to have clear benefits for project operators and the state. We note that higher expected carbon prices might alter these assessments.

Finding #4: California Offsets Have Broken New Ground, but Regulatory Risks Hamper Further Development

Transitioning Into a More Mature Policy and Marketplace

The California forest offset program is currently in somewhat of an interstitial period, having traveled far up the learning curve of forest carbon policy experimentation, but still beset with uncertainty about the future. Unlike some other protocols the IFM and avoided conversion portions of the forest offset program have experienced notable project uptake. These areas have delivered emissions reductions and credits used by compliance entities and stand ready to deliver more in the future. Yet judging by the lengthy project listings and the persistently low price of offsets beneath an already low allowance price floor, the offset market seems to be in somewhat of a holding pattern while market participants wait to see how California policymakers chart a climate policy course past 2020.

Survey and interview results tend to confirm these indications. As detailed below, although ARB generally receives good marks in its program implementation thus far, market participants do not have the policy certainty they need to continue growing the program with more participating projects.

Bright Spots: Readiness and Program Experience

Although the price of allowances since 2013 has never risen high enough to necessitate the use of offsets as a cost-containment mechanism,⁶¹ California's unprecedented innovation in developing a compliance-quality program and protocol for forest carbon offsets has resulted in a marketplace with dozens of credited projects. It is possible that many more could participate in the future. Projects that are now marginally economic at a carbon price of around \$10/ton could be brought into the program in the future if the price rises. If the carbon price rises significantly, it is

⁶¹ Cullenward and Coghlan, *supra* note 15 at 7.

possible that whole project types that are not currently financially attractive, such as reforestation projects and urban forest projects, may become economically viable.

In addition, ARB has received generally encouraging reviews in both survey and interview responses collected for this study. Of 17 responses, only three project owners expressed dissatisfaction with ARB’s handling of the program overall, and only two expressed dissatisfaction with individual project application handling. Only two owners expressed that they would not consider expanding or bringing new land into the program in the future, while more than half of respondents expressed interest in the possibility. These results are conveyed in Figures 9, 10 and 11 below. When asked a narrative question about whether their satisfaction levels with ARB had changed over time though, responses were mixed. Some project owners remarked that ARB’s project application reviews had become less predictable and more cautious, and others hypothesized that application interactions had become more frustrating because of an increase in application volume without an increase in ARB processing capacity. (Interestingly, no project owner expressed dissatisfaction with their developer or their registry, although at least one interviewee did indicate having markedly different impressions of two developer entities, one negative and one positive.)

How satisfied have you been with CARB's handling of the program overall?

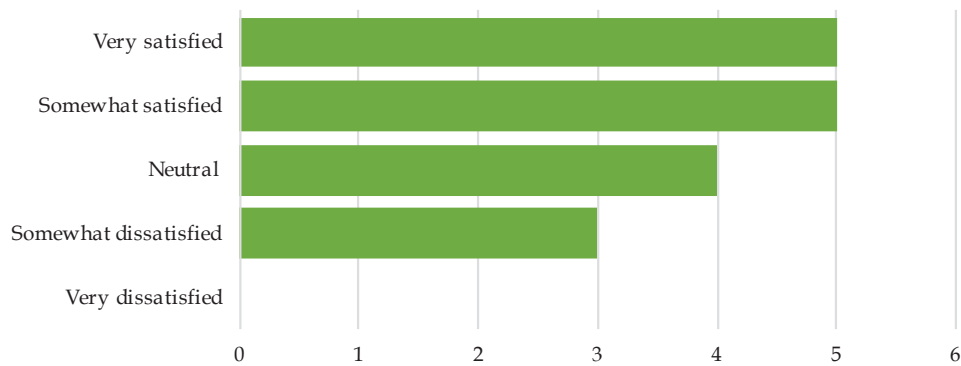


Figure 9. Survey Responses from 17 Forest Owners on CARB’s performance.

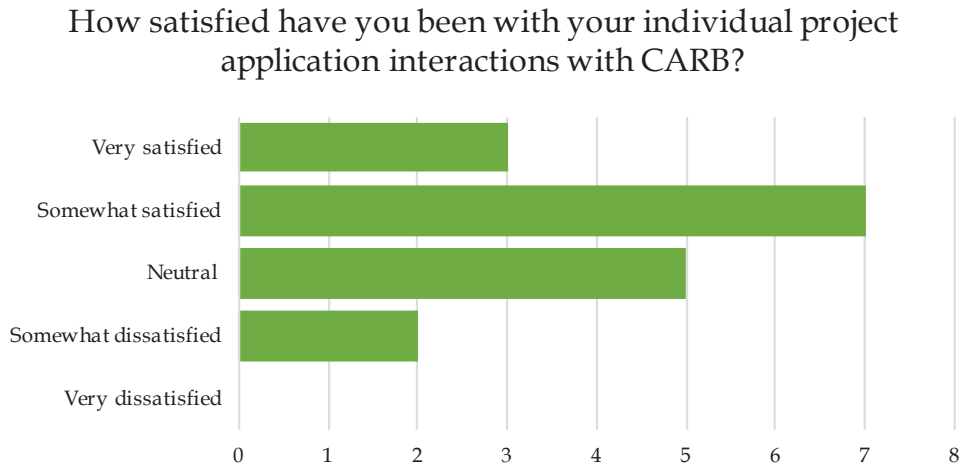


Figure 10. Survey Responses from 17 Forest Owners on CARB’s application handling.

Additional Participation: Would you consider expanding an existing project or starting a new project on other forests?

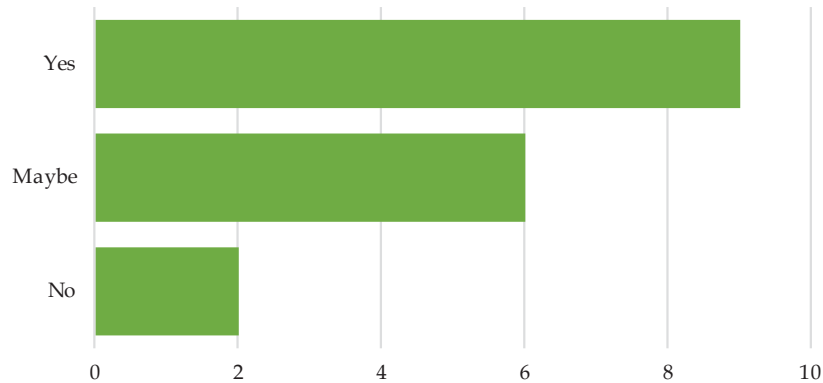


Figure 11. Survey Responses from 17 Forest Owners on additional participation.

Project developers were less sanguine in their appraisal, however. Only one respondent indicated satisfaction with the program (the others had neutral feelings), and divergent satisfied/unsatisfied opinions were reported about individual project interactions. All expressed that their satisfaction had changed over time, with two voicing concern that inefficiencies and the expense of meeting program requirements had not improved.

Both project developers and owners agreed in their general praise for CARB's approach to project risks. Two of three developers and 16 of 17 project owners reported that CARB has been appropriately accounting for project risks through the individualized project assessment and buffer pool requirements. The lonely dissenters took issue with 20% as the standard buffer pool credit contribution and advocated an individualized fire risk assessment for a particular project, respectively, but generally speaking ARB's approach to risk was reportedly appropriate in the eyes of market participants. Although the subject came up in some interviews, only one developer and one project owner reported being concerned about invalidation risks in their surveys.

Concerns: Instability, Carbon Price Uncertainty and Rising Verifier Costs

Project owners have much more divergent opinions about what the future may hold for the offset program, reflecting the general uncertainty about state policy and carbon prices that have the offset program in somewhat of a holding pattern. Although the state has committed to continuing climate programs in some form after the year 2020 with the passage and signing of Senate Bill 32 in 2016,⁶² program participants report not being sure yet whether this new policy commitment will impact the return from their current projects. Figure 12 below presents the results from a survey question asked of offset project owners, reflecting their unresolved uncertainty in the wake of SB 32. This uncertainty may help explain the six 'maybe' answers reported above with respect to additional participation in the program – so much depends on the next few steps state policymakers take in extending the cap-and-trade program (or not), that possible future projects may simply wait until there is more certainty about the future of the program.

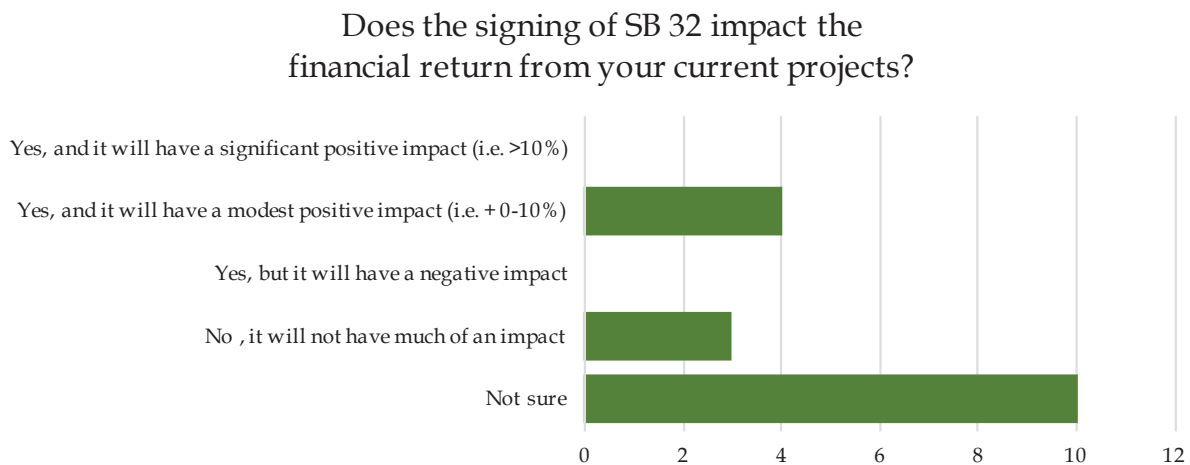


Figure 12. Survey Responses from 17 Forest Owners on the impact of Senate Bill 32.

⁶² See Chris Megerian and Liam Dillon, *Gov. Brown Signs Sweeping Legislation to Combat Climate Change* L.A. TIMES (September 8, 2016), available at <https://goo.gl/ewXwbN> (describing SB 32).

Project owners generally seem optimistic about future price trends, assuming policy stability is provided. An open-ended narrative question on the project owner survey elicited many responses that cited program complexity, changing regulations and future policy uncertainty as major barriers in the program. But, when asked in an anonymous portion of the survey for their opinions about future price trends, project owners in general expressed bullishness and confidence about both near and longer term price trends. As seen in Figures 13 and 14 below, a 60% majority of respondents thought average sale prices for offsets would increase slightly in the time before 2020, and a majority believed they would rise slightly or significantly after 2020 as compared to today. However, when read together with the more cautious additional participation responses and concerns about policy certainty and complexity, this optimism may not translate to deeper program participation without more stability.

Expected Price Trend Between Now and 2020

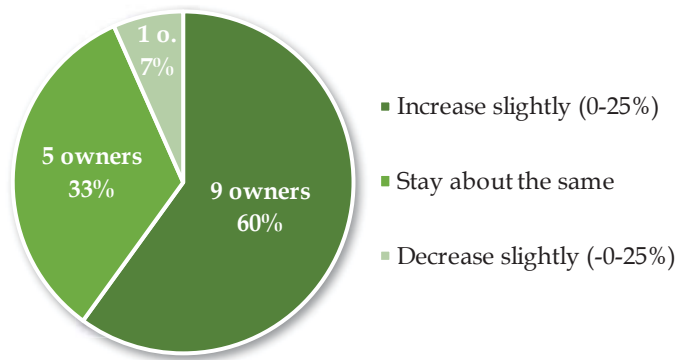


Figure 13. Survey Responses from 15 project owners re: near term price trend expectations

Expected Price Trend After 2020

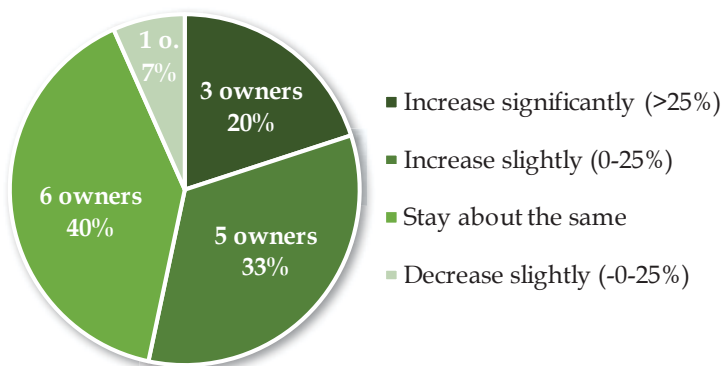


Figure 14. Survey Responses from 15 project owners re: longer term price trend expectations

While owners were conditionally bullish about future price trends, a worry that was repeatedly raised in multiple interviews and in survey data as well was rising verification costs. Other answers to the barriers question cited the steep and rising costs of monitoring and verification. In response to a question asking for their opinion of published verification and monitoring costs appearing in Kerchner and Keeton,⁶³ several respondents with recent verification cost experience stated that the published verification costs were much lower than actual costs. While opinions on that question were somewhat mixed and included five ‘I don’t know’ answers, multiple interviewees expressed the same concern about rising verification costs. Some speculated that invalidation risk concerns had increased the length of verifications and financial exposure of the verifiers. However, most interviewees who mentioned the subject indicated that the likely causes are a short supply of verifiers and verification bodies, and large demands of verification in a compliance program as compared to in the voluntary market. ARB staff have reported that expanded training opportunities for verifiers are on the way to address this shortage. But, these efforts may need to bear fruit in the nearer term in order to keep pending projects from being dissuaded from joining the program at current carbon prices.

⁶³ See Kerchner and Keeton, *supra* note 49 at 75 (reporting ~\$8,000 annual monitoring costs plus \$15,000 costs incurred every six and \$27,000 every 12 years).

Lessons for Natural and Working Lands

The State of California is in the process of updating its climate scoping plan, which sets goals for GHG emissions in each state sector. For the first time, the scoping plan will cover the period to 2030 and will include goals for carbon on natural and working lands, including agricultural lands and forests.⁶⁴ The draft scoping plan sets as an overarching goal that natural and working lands would be an overall emissions sink rather than a source. There are a number of activities and plans associated with this goal. We offer several recommendations for the state's goals in natural and working lands based on its experience thus far managing land-based carbon through the forest offset program:

- **Lesson #1:** Rigor of approach to carbon accounting drives implementation cost

The Forest Offset Program requires a very rigorous approach to carbon accounting, estimating the exact tonnage of forest carbon present on individual project lands. This is currently achieved at the project level through forest inventory, growth and yield modeling, and third party verification.⁶⁵ Detailed accounting through these methods cannot be scaled statewide. This level of detailed accounting is appropriate and feasible when dealing with compact and contiguous project lands, but costly and infeasible to conduct on a statewide basis. The State should and does consider methods of carbon accounting on Natural and Working Lands that are significantly less onerous than the Forest Offset Program, but that are still meaningful in terms of measuring changes in emissions and carbon sinks.⁶⁶ This is a case in which the Forest Offset Program uses a method that works well, but cannot be used at the scale of Natural and Working Lands.

The Proposed Plan offers a scale-appropriate method for carbon accounting on lands in California. It indicates that an updated Natural and Working Lands emissions inventory presently underway “applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon.”⁶⁷ Combining remotely-sensed data with ground-based data is a good approach to take at the scale of the state-wide inventory, and should be continued as the inventory is expanded in the coming years.

⁶⁴ California Air Resources Board, THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET (January 20, 2017), at 107-17, available at <https://goo.gl/ZBkyCN>. Hereafter 'Proposed Plan'.

⁶⁵ See generally 2015 Forest Offset Protocol, *supra* note 31.

⁶⁶ See Proposed Plan at 108.

⁶⁷ Proposed Plan at 108.

➤ **Lesson #2:** Transparency and Accessibility of Program Information

The Forest Offset Program produces voluminous data about carbon accounting, project details, and offset usage, and much of it is available to the public through CARB’s website and project registries. However, these data are not easy to locate or interpret. Data sheets can be difficult to find online, and reporting categories change over time, making consistent comparison over time difficult. In this case, the Forest Offset Program is not using best practices, and based on this experience we recommend a more coordinated approach for Natural and Working Lands data transparency and accessibility.

A clear and pre-designed framework for reporting on Natural and Working Lands should be devised as a part of the Integrated Natural and Working Lands Climate Change Action Plan (“Action Plan”).⁶⁸ This will avoid difficulty in reporting and evaluation later on. The Proposed Plan states that the California will “develop implementation tracking and performance monitoring systems for the Action Plan.”⁶⁹ This is especially important and should be a high priority as reporting in the Natural and Working Lands sector requires complex multi-agency efforts.

➤ **Lesson #3:** Approaches to Uncertainty and Risk

Uncertainty: Emissions accounting on Natural and Working Lands, like that for forests, comes with fundamental risks and uncertainties. The designers of the Forest Offset Program developed a number of notable mechanisms to deal with risk and uncertainty in carbon accounting and carbon crediting. For uncertainty, the Forest Offset Program reduces credits earned proportional to the sampling error of an on-the-ground forest inventory.⁷⁰ A similar approach could be applied to data used for carbon accounting on Natural and Working Lands.

At present neither the Proposed Plan nor Appendix G refer to estimation of uncertainty in developing goals or in developing the Action Plan for Natural and Working Lands.⁷¹ Including uncertainty estimates in ongoing modeling and in the Action Plan will help ensure that the State accomplishes its carbon sink goal for Natural and Working Lands. Including uncertainty estimates is also consistent with

⁶⁸ Proposed Plan at 114.

⁶⁹ Proposed Plan at 117.

⁷⁰ 2015 Forest Offset Protocol at 112.

⁷¹ See Proposed Plan at 117; see also California Air Resources Board, PROPOSED PLAN: APPENDIX G, NATURAL AND WORKING LANDS MODELING (January 2017), available at <https://goo.gl/axN6vS>.

IPCC Good Practice Guidance.⁷² This is a case in which the Forest Offset Program is using a successful practice that can be adapted for use on Natural and Working Lands.

Risk: For risk, the Forest Offset Program also reduces carbon crediting based on the estimated risk of fire, pests, and other ‘reversal’ risks – the risk of releasing forest carbon to the atmosphere over the life of the project.⁷³ Carbon credits deducted based on a project’s risk rating are allocated to a buffer pool of credits, which can be used in case of carbon loss due to fire, disease, or other unintentional losses.

The Natural and Working Lands sector does not need an explicit buffer account because of its more general carbon sink goals (discussed below), but it does need to plan for unavoidable carbon reversals. The Proposed Plan rightly acknowledges that “recent trends indicate that significant pools of carbon [are at] risk [of] reversal,” and that climate change may exacerbate these risks, especially for wildland fire.⁷⁴ Risk should be explicitly incorporated into ongoing Natural and Working Lands modeling to ensure that the State meets its goals for the sector. We recommend adapting the buffer pool approach used in the Forest Offset Program and ‘buffer’ the Action Plan with activities that would exceed the State’s carbon sink goal. This would ensure a ‘contingency fund’ of emissions reductions and enhanced sinks in case of ‘reversal’. Risk estimations could be improved over time as improved data and modeling are available. At present, the Proposed Plan and Appendix G do not discuss accounting for risk in GHG emissions goal-setting for Natural and Working Lands.

➤ **Lesson #4:** Setting a Broad Carbon Sink Goal is Advisable

The experience of the Forest Offset Program shows that modeling future carbon stock, even at the project scale, is a difficult task. Land-based carbon stocks carry risk and uncertainty, as discussed above. The Forest Offset Program dealt with risk by carefully measuring carbon and creating a forest buffer pool—a sort of insurance pool or contingency fund of carbon credits to be used in case of unintentional loss of carbon. The Forest Offset Program further ensures accuracy by requiring multiple levels of verification. While measurement methods for Natural and Working Lands should continue to take advantage of improvements in remote sensing and ground-based data, the method of detailed ton-by-ton carbon accounting used by the Forest Offset Program is not currently feasible at a statewide scale.

⁷² See generally Intergovernmental Panel on Climate Change, 2013 REVISED SUPPLEMENTARY METHODS AND GOOD PRACTICE GUIDANCE ARISING FROM THE KYOTO PROTOCOL at 2.57-2.60 (Section 2.4.3 ‘Uncertainty Assessment’), available at <https://goo.gl/bJWwZW>.

⁷³ 2015 Forest Offset Protocol, *supra* note 31 at 131-36.

⁷⁴ Proposed Plan at 108.

The Proposed Plan states that “California’s climate objective of natural and working lands is to maintain them as a carbon sink (i.e., net zero or even negative GHG emissions).”⁷⁵ The Proposed Plan rightly acknowledges that “the State’s lands, as well as sub-tidal waters, can be both a source and a sink for GHG emissions.”⁷⁶ The State’s goal of maintaining Natural and Working Lands as a carbon sink is an appropriate one. An alternative goal would be to specify a particular percentage or numerical decrease in emissions and/or increase in sinks on Natural and Working Lands. Such an exact goal would be inappropriate because it would necessitate many of the onerous measurements and verification activities pursued under project-based programs like the Forest Offset Program, which are impractical for statewide inventories, as mentioned above. Also, measuring carbon in some sectors of Natural and Working Lands (such as soils) remains quite difficult. The overall ‘carbon sink’ goal is less precise but is also therefore feasible to both measure and attain in a statewide inventory.

While we support the overall ‘carbon sink’ goal for Natural and Working Lands, we recommend that the Proposed Plan clarify whether this is a cumulative or annual goal covering the years between now and 2030. There is likely to be considerable year-to-year variability in emissions from Natural and Working Lands, due to fire and other natural causes. The goal is referred to as cumulative on page 109 of the Proposed Plan, but the measure is not specified in the initial statement of the goal.⁷⁷ The Initial Scoping Plan (2008) set a specific annual goal for forest carbon sequestration,⁷⁸ and this goal has been difficult to measure and attain on an annual basis.

- **Lesson #5:** The Offsets Program Does Not Measure Co-Benefits, But Many Are Clearly Delivered

In part because the Forest Offset Program has stringent and detailed carbon accounting requirements, it was not practical, at least in initial years of the program, to require additional accounting of individual project co-benefits. As detailed in the attached report, we advise that the Forest Offset Program now take up ‘no cost’ opportunities for co-benefits reporting. Co-benefits reporting is even more feasible and important for Natural and Working Lands. Because the Natural and Working Lands goals and accounting can take advantage of remotely sensed data, and can tolerate

⁷⁵ Proposed Plan at 107.

⁷⁶ Proposed Plan at 108.

⁷⁷ Proposed Plan at ES5, 107.

⁷⁸ California Air Resources Board, CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE (December 2008) at 64-65, available at <https://goo.gl/UFhkyT>.

greater uncertainty in acre-level carbon data, state agencies should be able to collect data and account for carbon *and* co-benefits.

The Proposed Plan rightly notes that policies must advance both carbon sequestration and co-benefits⁷⁹ and states that “strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors.”⁸⁰ Accounting for these co-benefits will allow the state to measure the synergies and efficiency gains it is earning by implementing policies that have win-win benefits for carbon, water, agriculture, biomass utilization, land restoration, and conservation. As the State develops tracking and monitoring systems for Natural and Working Lands, these co-benefits should be included. In the Proposed Plan section for ‘Scoping and Tracking Progress’,⁸¹ the text should be amended to read, “develop implementation tracking and performance monitoring systems for the Action Plan, *[including accounting of carbon and other co-benefits]*.”⁸²

⁷⁹ Proposed Plan at 107.

⁸⁰ Proposed Plan at 110.

⁸¹ Proposed Plan at 116-17.

⁸² Proposed insertion in brackets. See Proposed Plan at 117.

Appendixes

Below are two appendixes that provide more information about the sources, methods, and findings of this analysis. The first appendix presents a list of the 39 projects for whom we compiled and analyzed project design document information. The second appendix presents the list of entities who were reported as retiring forest offsets from 2013-15, and the forest offset projects those offsets came from.

Appendix I – Projects Included in Design Document Analysis

	ARB Project ID #	Project Name	State	Type of Protocol	Registry⁸³	Project Documentation Locator
1	CAFR0030	Blue Source – Francis Beidler Improved Forest Management Project	SC	Early Action	CAR	CAR683
2	CAFR0087	Finite Carbon – Brosnan Forest	SC	Early Action	CAR	CAR658
3	CAFR0063	Green Assets – Middleton <u>Avoided Conversion</u>	SC	Early Action	CAR	CAR749
4	CAFR5034	Finite Carbon – The Forestland Group CT Lakes	NH	Compliance	ACR	ACR199
5	CAFR0088	Finite Carbon – Shannondale Tree Farm	MO	Early Action	CAR	CAR780
6	CAFR5089	Finite Carbon – The Forestland Group Champion Property IFM	NY	Compliance	CAR	CAR1088
7	CAFR5029	Green Assets- Brookgreen Gardens Improved Forest Management Project	SC	Compliance	ACR	ACR192
8	CAFR5016	Miller Forest	CA	Compliance	ACR	ACR189

⁸³ CAR = Climate Action Reserve; ACR = American Carbon Registry

9	CAFR0070	Finite Carbon – Berry Summit	CA	Early Action	CAR	CAR1004
10	CAFR0049	The Van Eck Forest	CA	Early Action	CAR	CAR101
11	CAFR0064	Yurok Tribe Sustainable Forest Project	CA	Early Action	CAR	CAR777
12	CAFR0029	Blue Source – Alligator River <u>Avoided Conversion</u>	NC	Early Action	CAR	CAR497
13	CAFR5043	Blue Source – Goodman Improved Forest Management Project (Michael Hart)	WI	Compliance	ACR	ACR202
14	CAFR5028	Round Valley Indian Tribes Improved Forest Management Project	CA	Compliance	ACR	ACR173
15	CAFR0040	Garcia River Forest	CA	Early Action	CAR	CAR102
16	CAFR5096	Brushy Mountain	CA	Compliance	CAR	CAR1095
17	CAFR0041	Big River / Salmon Creek Forests	CA	Early Action	CAR	CAR408
18	CAFR0042	Gualala River Forest	CA	Early Action	CAR	CAR660
19	CAFR0001	Willits Woods	CA	Early Action	CAR	CAR661
20	CAFR0116	Finite Carbon – NEFF (New England Forestry Foundation)	NH	Early Action	CAR	CAR672
21	CAFR5072	White Mountain Apache Tribe Forest Carbon Project	AZ	Compliance	ACR	ACR211

22	CAFR5095	Ashford III	WA	Compliance	CAR	CAR1094
23	CAFR0058	Virginia Conservation Forestry Program – Clifton Farm	VA	Early Action	CAR	CAR686
24	CAFR0057	Virginia Conservation Forestry Program – Rich Mountain	VA	Early Action	CAR	CAR696
25	CAFR5037	Virginia Highlands I	VA	Compliance	CAR	CAR1032
26	CAFR0103	Finite Carbon – MWF Brimstone IFM Project I	TN	Early Action	CAR	CAR582
27	CAFR0073	McCloud River	CA	Early Action	CAR	CAR429
28	CAFR5055	Buckeye Forest Project	CA	Compliance	CAR	CAR1013
29	CAFR0100	Rips Redwoods	CA	Early Action	CAR	CAR1015
30	CAFR5076	Trinity Timberlands University Hill Improved Forest Management Project	CA	Compliance	CAR	CAR1046
31	CAFR0031	Blue Source – Pocosin Lakes Forest Conservation Project (<u>Avoided Conversion</u>)	NC	Early Action	CAR	CAR676
32	CAFR5084	Finite Carbon – Potlatch Moro Big Pine CE IFM	AR	Compliance	CAR	CAR1086
33	CAFR0002	Finite Carbon Farm Cove Community Forest Project	ME	Early Action	CAR	CAR657
34	CAFR0026	Blue Source – Pungo River Forest Conservation	NC	Early Action	CAR	CAR659

		Project (<u>Avoided Conversion</u>)				
35	CAFR0027	Blue Source – Noles South <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR802
36	CAFR0028	Blue Source – Noles North <u>Avoided Conversion</u> Forest Project	NC	Early Action	CAR	CAR688
37	CAFR5003	Blue Source-Bishop Improved Forest Management Project	MI	Compliance	CAR	CAR973
38	CAFR5011	Yuork Tribe/Forest Carbon Partners CKGG Improved Forest Management Project	CA	Compliance	CAR	CAR993
39	CAFR5012	Hanes Ranch Forest Carbon Project	CA	Compliance	ACR	ACR182

Appendix II – Compliance Entities Using Offset Credits

This information is drawn from the Compliance Reports available on the CARB website at <https://goo.gl/m61Kj1>, and matched with data from project design documents for the projects listed in Appendix I above.

Compliance Entities Retiring Forest Offsets, 2013-15

California Cap-and-Trade Compliance Offset Program: Retired Forest Offsets by Compliance Obligation Entity			
For Offsets Redeemed 2013-2015			
<u>CARB Entity ID</u>	<u>Compliance Obligation Entity</u>	<u># of Forest Projects Obtained From</u>	<u>Number of Retired Credits</u>
CA1248	AES Alamos, LLC	2	100,105
CA1089	Air Products and Chemicals, Inc.	1	96,601
CA1281	Algonquin Power Sanger, LLC	1	1,620
CA1328	Applied Energy, LLC - NAS North Island	3	16,605
CA1406	California Dairies, Inc.	1	10,140
CA1119	Calpine Energy Services, LP	4	686,178
CA1592	Carson Cogeneration Company	1	1,378
CA2039	Chevron Power Holdings, Inc.	1	49,187
CA1075	Chevron U.S.A., Inc.	10	4,019,283
CA1101	City of Glendale	1	17,649
CA1370	Coalinga Cogeneration Company	1	30,730
CA1311	Double C Limited	1	347
CA1183	Dynegy Moss Landing, LLC	2	165,460
CA1742	Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
CA1234	Fresno Cogeneration Partners, LP	1	1,298
CA1070	GenOn Energy Management, LLC	1	7,667
CA1116	GWF Energy, LLC	1	20,867
CA1291	High Desert Power Project, LLC	1	125,000
CA1307	High Sierra Limited	1	353
CA1253	Ingomar Packing Company, LLC	1	5,841
CA1312	Kern Front Limited	1	318
CA1343	Kern River Cogeneration Company	2	102,040
CA1017	La Paloma Generating Company, LLC	4	74,356

CA1552	Macpherson Oil Company	1	17,516
CA1077	Mariposa Energy, LLC	1	3,344
CA1476	Martinez Cogen Limited Partnership	1	9,630
CA1367	Mid-Set Cogeneration Company	1	32,547
CA1107	Midway Sunset Cogeneration Company	1	39,478
CA1138	NRG Power Marketing, LLC	1	245,756
CA1137	OLS Energy - Chino	1	19,960
CA1046	Pacific Gas and Electric Company	1	61,495
CA2106	PBF Energy Western Region, LLC	3	140,179
CA1326	Praxair, Inc.	1	5,000
CA1925	Pro Petroleum, Inc.	1	35,000
CA1204	Rio Tinto Minerals Inc.	1	26,532
CA1136	Russell City Energy Company, LLC	1	39,964
CA1371	Salinas River Cogeneration Company	1	32,244
CA1085	San Diego Gas & Electric Company	1	27,602
CA1372	Sargent Canyon Cogeneration Company	1	32,987
CA1762	SEI Fuel Services, Inc.	3	103,840
CA1251	Shell Energy North America (US), LP	2	209,000
CA1029	Southern California Edison Company	5	501,170
CA1338	Sycamore Cogeneration Company	1	100,608
CA1165	Tesoro Refining & Marketing Company, LLC	10	1,488,172
CA1325	The Procter & Gamble Paper Products Company	1	25,691
CA1195	TransAlta Energy Marketing (U.S.), Inc.	1	6,773
CA1057	Ultramar, Inc.	1	13,857
CA1419	Union Pacific Railroad Company	1	38,184
CA1056	Valero Refining Company-California, Benicia Refinery and Asphalt Plant	3	103,112
CA1590	Valley Electric Association, Inc.	2	813
Grand Total			8,903,291

Compliance Entities and The Forest Offsets They Buy

Forest Offsets -- Retired Credits by Compliance Obligation Entity and Project Name

Compliance Entities and Forest Offset Projects	# of Listings in Compliance Report	Total Quantity
AES Alamos, LLC	2	100,105
Blue Source – Francis Beidler IFM Project	1	94,705
Hanes Ranch Forest Carbon Project	1	5,400
Air Products and Chemicals, Inc.	1	96,601
Blue Source-Bishop IFM Project	1	96,601
Algonquin Power Sanger, LLC	1	1,620
Blue Source – Pungo River Forest Conservation Project	1	1,620
Applied Energy, LLC - NAS North Island	5	16,605
Finite Carbon – Shannondale Tree Farm	1	2,077
Green Assets – Middleton Avoided Conversion	3	11,687
Round Valley Indian Tribes IFM Project	1	2,841
California Dairies, Inc.	1	10,140
Garcia River Forest	1	10,140
Calpine Energy Services, LP	8	686,178
Finite Carbon – The Forestland Group CT Lakes	1	275,000
Hanes Ranch Forest Carbon Project	1	70,349
Trinity Timberlands University Hill IFM Project	1	222,398
Willits Woods	5	118,431
Carson Cogeneration Company	1	1,378
Green Assets – Middleton Avoided Conversion	1	1,378
Chevron Power Holdings, Inc.	1	49,187
Blue Source-Bishop IFM Project	1	49,187
Chevron U.S.A., Inc.	38	4,019,283
Blue Source – Francis Beidler IFM Project	3	250,000
Blue Source – Goodman IFM Project	1	693,615
Blue Source – Noles North Avoided Conversion Forest Project	6	14,795
Blue Source – Noles South Avoided Conversion Forest Project	6	14,090
Blue Source – Pungo River Forest Conservation Project	6	21,115
Blue Source-Bishop IFM Project	2	379,649

Brushy Mountain	2	1,250,441
Finite Carbon – The Forestland Group Champion Property IFM	1	678,550
Finite Carbon Farm Cove Community Forest Project	1	146,666
Willits Woods	10	570,362
City of Glendale	1	17,649
Big River / Salmon Creek Forests	1	17,649
Coalinga Cogeneration Company	2	30,730
Blue Source-Bishop IFM Project	2	30,730
Double C Limited	1	347
Willits Woods	1	347
Dynergy Moss Landing, LLC	4	165,460
Buckeye Forest Project	1	100,000
Willits Woods	3	65,460
Energia Azteca X, S.A. de C.V. and Energia de Baja California S. de R.L. de C.V. (La Rosita Power Marketing)	1	9,814
Garcia River Forest	1	9,814
Fresno Cogeneration Partners, LP	1	1,298
Willits Woods	1	1,298
GenOn Energy Management, LLC	2	7,667
Willits Woods	2	7,667
GWF Energy, LLC	3	20,867
Willits Woods	3	20,867
High Desert Power Project, LLC	2	125,000
Finite Carbon – The Forestland Group CT Lakes	2	125,000
High Sierra Limited	1	353
Willits Woods	1	353
Ingomar Packing Company, LLC	1	5,841
Green Assets – Middleton Avoided Conversion	1	5,841
Kern Front Limited	1	318
Willits Woods	1	318
Kern River Cogeneration Company	4	102,040
Blue Source-Bishop IFM Project	2	86,918
Willits Woods	2	15,122
La Paloma Generating Company, LLC	4	74,356
Finite Carbon – Brosnan Forest	1	1,314

McCloud River	1	15,038
Trinity Timberlands University Hill IFM Project	1	10,473
Willits Woods	1	47,531
Macpherson Oil Company	1	17,516
Green Assets – Middleton Avoided Conversion	1	17,516
Mariposa Energy, LLC	1	3,344
Willits Woods	1	3,344
Martinez Cogen Limited Partnership	1	9,630
The Van Eck Forest	1	9,630
Mid-Set Cogeneration Company	2	32,547
Blue Source-Bishop IFM Project	2	32,547
Midway Sunset Cogeneration Company	1	39,478
Willits Woods	1	39,478
NRG Power Marketing, LLC	4	245,756
Gualala River Forest	4	245,756
OLS Energy - Chino	2	19,960
Blue Source – Francis Beidler IFM Project	2	19,960
Pacific Gas and Electric Company	1	61,495
Willits Woods	1	61,495
PBF Energy Western Region, LLC	9	140,179
Big River / Salmon Creek Forests	3	52,762
Garcia River Forest	1	48,456
The Van Eck Forest	5	38,961
Praxair, Inc.	1	5,000
Virginia Conservation Forestry Program – Clifton Farm	1	5,000
Pro Petroleum, Inc.	1	35,000
Big River / Salmon Creek Forests	1	35,000
Rio Tinto Minerals Inc.	1	26,532
Big River / Salmon Creek Forests	1	26,532
Russell City Energy Company, LLC	1	39,964
Willits Woods	1	39,964
Salinas River Cogeneration Company	2	32,244
Blue Source-Bishop IFM Project	2	32,244

San Diego Gas & Electric Company	2	27,602
Trinity Timberlands University Hill IFM Project	2	27,602
Sargent Canyon Cogeneration Company	2	32,987
Blue Source-Bishop IFM Project	2	32,987
SEI Fuel Services, Inc	1	28,756
Finite Carbon – MWF Brimstone IFM Project I	1	28,756
SEI Fuel Services, Inc.	2	75,084
Finite Carbon – Shannondale Tree Farm	1	35,084
Green Assets – Middleton Avoided Conversion	1	40,000
Shell Energy North America (US), LP	2	209,000
Blue Source-Bishop IFM Project	1	84,000
Miller Forest	1	125,000
Southern California Edison Company	5	501,170
Blue Source – Francis Beidler IFM Project	1	30,295
Finite Carbon – The Forestland Group CT Lakes	1	125,000
Hanes Ranch Forest Carbon Project	1	6,548
Round Valley Indian Tribes IFM Project	1	241,164
Trinity Timberlands University Hill IFM Project	1	98,163
Sycamore Cogeneration Company	2	100,608
Blue Source-Bishop IFM Project	2	100,608
Tesoro Refining & Marketing Company, LLC	11	1,488,172
Blue Source – Francis Beidler IFM Project	1	908
Finite Carbon – Berry Summit	1	193,277
Finite Carbon – Shannondale Tree Farm	1	50,000
Finite Carbon – The Forestland Group CT Lakes	1	316,601
Green Assets – Middleton Avoided Conversion	2	50,000
Green Assets-Brookgreen Gardens IFM Project	1	160,000
McCloud River	1	65,000
Miller Forest	1	94,084
Trinity Timberlands University Hill IFM Project	1	13,209
White Mountain Apache Tribe Forest Carbon Project	1	545,093
The Procter & Gamble Paper Products Company	1	25,691
Blue Source-Bishop IFM Project	1	25,691

TransAlta Energy Marketing (U.S.), Inc.	1	6,773
McCloud River	1	6,773
Ultramar, Inc.	1	13,857
Blue Source – Francis Beidler IFM Project	1	13,857
Union Pacific Railroad Company	1	38,184
Finite Carbon – Brosnan Forest	1	38,184
Valero Refining Company-California, Benicia Refin. and Asphalt Plant	3	103,112
Blue Source – Francis Beidler IFM Project	1	36,143
Finite Carbon Farm Cove Community Forest Project	1	48,888
Willits Woods	1	18,081
Valley Electric Association, Inc.	2	813
Blue Source-Bishop IFM Project	1	5
The Van Eck Forest	1	808
Grand Total		8,903,291

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

The Promise and Problems of Pricing Carbon: Theory and Experience

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Abstract

Because of the global commons nature of climate change, international cooperation among nations will likely be necessary for meaningful action at the global level. At the same time, it will inevitably be up to the actions of sovereign nations to put in place policies that bring about meaningful reductions in the emissions of greenhouse gases. Due to the ubiquity and diversity of emissions of greenhouse gases in most economies, as well as the variation in abatement costs among individual sources, conventional environmental policy approaches, such as uniform technology and performance standards, are unlikely to be sufficient to the task. Therefore, attention has increasingly turned to market-based instruments in the form of carbon-pricing mechanisms. We examine the opportunities and challenges associated with the major options for carbon pricing—carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reductions—and provide a review of the experiences, drawn primarily from developed countries, in implementing these instruments. Our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing in the context of developing countries.

Keywords

global climate change, market-based instruments, carbon pricing, carbon taxes, cap-and-trade, emission reduction credits, energy subsidies, clean energy standards

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Introduction

In a modern economy, nearly all aspects of economic activity affect greenhouse gas—in particular, carbon dioxide (CO₂)—emissions, and hence the global climate. To be effective, climate change policy must affect decisions regarding these activities. This can be done in one of three ways: (a) mandate businesses and individuals to change their behavior regarding technology choice and emissions; (b) subsidize businesses and individuals to invest in and use lower emitting goods and services; or (c) price the greenhouse gas externality, so that decisions take account of this external cost.

By internalizing the externalities associated with CO₂ emissions, carbon pricing can promote cost-effective abatement, deliver powerful innovation incentives, and ameliorate rather than exacerbate government fiscal problems. By pricing CO₂ emissions (or, equivalently, by pricing the carbon content of the three fossil fuels—coal, petroleum, and natural gas), governments defer to private firms and individuals to find and exploit the lowest cost ways to reduce emissions and invest in the development of new technologies, processes, and ideas that could further mitigate emissions. A range of policy instruments can facilitate carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction.

Some of these instruments have been used with success in other environmental domains as well as for pricing CO₂ emissions. The U.S. sulfur dioxide (SO₂) cap-and-trade program cut U.S. power plant SO₂ emissions more than 50% after 1990 and resulted in compliance costs one half of what they would have been under conventional regulatory mandates (Carlson, Burtaw, Cropper, & Palmer, 2000).¹ The success of the SO₂ allowance trading program motivated the design and implementation of the European Union's Emission Trading Scheme (EU ETS), the world's largest cap-and-trade program, focused on cutting CO₂ emissions from power plants and large manufacturing facilities throughout Europe (Ellerman & Buchner, 2007). The U.S. lead phase-down of gasoline in the 1980s, by reducing the lead content per gallon of fuel, served as an early, effective example of a tradable performance standard (Stavins, 2003). These positive experiences provide motivation for considering market-based instruments as potential approaches to mitigating greenhouse gas emissions. This article focuses on the experience in industrialized countries that have implemented these instruments extensively. We hope that our summary of relevant theory and survey of experience from industrialized nations may be helpful to those who wish to examine the potential applicability of carbon pricing for developing countries.

Climate Change Policy Instruments for the Regional, National, or Subnational Level

We consider five generic policy instruments that could conceivably be employed by regional, national, or even subnational governments for carbon pricing, including carbon taxes, cap-and-trade, emission reduction credits, clean energy standards, and fossil fuel subsidy reduction. First, however, we examine the possibility of relying

on conventional environmental policy approaches, namely, command-and-control instruments, which have dominated environmental policy in virtually all countries over the past four decades.²

Command-and-Control Regulations

Conventional approaches to environmental policy employ uniform standards to protect environmental quality. Such command-and-control regulatory standards are either *technology based* or *performance based*. Technology-based standards typically require the use of specified equipment, processes, or procedures. In the climate policy context, these could require firms to use particular types of energy-efficient motors, combustion processes, or landfill-gas collection technologies.

Performance-based standards are more flexible than technology-based standards, specifying allowable levels of pollutant emissions or allowable emission rates, but leaving the specific methods of achieving those levels up to regulated entities. Examples of uniform performance standards for greenhouse gas abatement would include maximum allowable levels of CO₂ emissions from combustion (e.g., the grams-of-CO₂-per-mile requirement for cars and light-duty vehicles recently promulgated as part of U.S. tailpipe emission standards) and maximum levels of methane emissions from landfills.

Uniform technology and performance standards can—in principle—be effective in achieving some environmental purposes. But, given the ubiquitous nature of greenhouse gas emissions from diverse sources in an economy, it is unlikely that technology or ordinary performance standards could form the centerpiece of a meaningful climate policy.

Furthermore, these command-and-control mechanisms lead to non-cost-effective outcomes in which some firms use unduly expensive means to control pollution. Since performance standards give firms some flexibility in how they comply, performance-based standards will generally be more cost-effective than technology-based standards, but neither tends to achieve the cost-effective solution.

Beyond considerations of static cost-effectiveness, conventional standards would not provide dynamic incentives for the development, adoption, and diffusion of environmentally and economically superior control technologies. Once a firm satisfies a performance standard, it has little incentive to develop or adopt cleaner technology. Regulated firms may fear that if they adopt a superior technology, the government may tighten the performance standard. Technology standards are worse than performance standards in inhibiting innovation since, by their very nature, they constrain the technological choices available.

The substantially higher cost of a standards-based policy may undermine support for such an approach, and securing political support may require a weakening of standards and hence lower environmental benefits.³

The key limitations of command-and-control regulations can be avoided through the use of market-based policy instruments. In the context of climate change, this essentially means carbon pricing.

Carbon Taxes

In principle, the simplest approach to carbon pricing would be through government imposition of a carbon tax (Metcalf, 2007). The government could set a tax in terms of dollars per ton of CO₂ emissions (or CO₂-equivalent on greenhouse gas emissions) by sources covered by the tax, or—more likely—a tax on the carbon content of the three fossil fuels (coal, petroleum, and natural gas) as they enter the economy. To be cost-effective, such a tax would cover all sources, and to be efficient, the carbon price would be set equal to the marginal benefits of emission reduction, represented by estimates of the social cost of carbon (Interagency Working Group on Social Cost of Carbon, 2010). Over time, an efficient carbon tax would increase to reflect the fact that as more greenhouse gas emissions accumulate in the atmosphere, the greater is the incremental damage from one more ton of CO₂. Imposing a carbon tax would provide certainty about the marginal cost of compliance, which reduces uncertainty about returns to investment decisions, but would leave uncertain economy-wide emission levels (Weitzman, 1974).

The government could apply the carbon tax at a variety of points in the product cycle of fossil fuels, from fossil fuel suppliers based on the carbon content of fuel sales (“upstream” taxation/regulation) to final emitters at the point of energy generation (“downstream” taxation/regulation). Under an upstream approach, refineries and importers of petroleum products would pay a tax based on the carbon content of their gasoline, diesel fuel, or heating oil. Coal-mine operators would pay a tax reflecting the carbon content of the tons extracted at the mine mouth. Natural-gas companies would pay a tax reflecting the carbon content of the gas they bring to surface at the wellhead or import via pipelines or liquefied natural gas (LNG) terminals. Focusing on the carbon content of fuels would enable the policy to capture about 98% of U.S. CO₂ emissions, for example, with a relatively small number of covered firms—on the order of a few thousand—as opposed to the hundreds of millions of smokestacks, tailpipes, and so forth, that emit CO₂ after fossil fuel combustion.

A carbon tax would be administratively simple and straightforward to implement in most industrialized countries, since the tax could incorporate existing methods for fuel-supply monitoring and reporting to the regulatory authority. Some developing countries with effective tax systems, including monitoring and enforcement regimes to minimize tax evasion, could also implement carbon taxes in a relatively straightforward manner. Given the molecular properties of fossil fuels, monitoring the physical quantities of these fuels yields a precise estimate of the emissions that would occur during their combustion.

In the event that carbon capture and storage technologies become commercially available, a crediting system for downstream sequestration could complement the emission tax system. A firm that captures and stores CO₂ through geological sequestration, thereby preventing the gas from entering the atmosphere, could generate tradable CO₂ tax credits and sell these to firms that would otherwise have to pay the emission tax.⁴

As fuel suppliers face the emission tax, they will increase the cost of the fuels they sell. This will effectively pass the tax down through the energy system, creating incentives for fuel-switching and investments in more energy-efficient technologies that reduce CO₂ emissions.

The effects of a carbon tax on emission mitigation and the economy will depend in part on the amount and use of the tax revenue. For example, an economy-wide U.S. carbon tax of US\$20 per ton of CO₂ would likely raise more than US\$100 billion per year. The carbon tax revenue could be put toward a variety of uses. It could allow for reductions in existing distortionary taxes on labor and capital, thereby stimulating economic activity and offsetting some of a policy's social costs (Goulder, 1995; Goulder & Parry, 2008). Other socially valuable uses of revenue include reduction of debt, and funding desirable public programs, such as research and development of climate-friendly technology. The tax receipts could also be used to compensate low-income households for the burden of higher energy prices as well as compensating others bearing a disproportionate cost of the policy.

The implementation of a carbon tax (or any other meaningful climate policy instrument) will increase the cost of consuming energy and could adversely affect the competitiveness of energy-intensive industries. This competitiveness effect can result in negative economic and environmental outcomes: firms may relocate facilities to countries without meaningful climate change policies, thereby increasing emissions in these new locations and offsetting some of the environmental benefits of the policy. Such "emission leakage" may actually be relatively modest, because a majority of the emissions in developed countries occur in nontraded sectors, such as electricity, transportation, and residential buildings. However, energy-intensive manufacturing industries that produce goods competing in international markets may face incentives to relocate and advocate for a variety of policies to mitigate these impacts (Aldy & Pizer, 2011).

Additional emission leakage may occur through international energy markets—as countries with climate policies reduce their consumption of fossil fuels and drive down fuel prices, those countries without emission mitigation policies increase their fuel consumption in response to the lower prices. Since leakage undermines the environmental effectiveness of any unilateral effort to mitigate emissions, international cooperation and coordination becomes all the more important. These competitiveness impacts on energy-intensive manufacturing could be mitigated through policy designs we discuss below. Also, it is important to keep in mind that these emission leakage effects exist with any meaningful climate policy, whether carbon pricing or command-and-control.

Real-world experience with energy pricing demonstrates the power of markets to drive changes in the investment and use of emission-intensive technologies. The run-up in gasoline prices in 2008 resulted in a shift in the composition of new cars and trucks sold toward more fuel-efficient vehicles, while reducing vehicle miles traveled by the existing fleet (Ramey & Vine, 2010). Likewise, electric utilities responded to the dramatic decline in natural gas prices (and decline in the relative

gas-coal price) in 2009 and 2010 by dispatching more electricity from gas plants that resulted in lower carbon dioxide (CO₂) emissions and the lowest share of U.S. power generation by coal in some four decades (U.S. Energy Information Administration, 2009). Longer term evaluations of the impacts of energy prices on markets have found that higher prices have induced more innovation—measured by frequency and importance of patents—and increased the commercial availability of more energy-efficient products, especially among energy-intensive goods such as air conditioners and water heaters (Newell, Jaffe, & Stavins, 1999; Popp, 2002).

Cap-and-Trade Systems

A cap-and-trade system constrains the aggregate emissions of regulated sources by creating a limited number of tradable emission allowances—in sum equal to the overall cap—and requiring those sources to surrender allowances to cover their emissions (Stavins, 2007). Faced with the choice of surrendering an allowance or reducing emissions, firms place a value on an allowance that reflects the cost of the emission reductions that can be avoided by surrendering an allowance. Regardless of the initial allowance distribution, trading can lead allowances to be put to their highest valued use: covering those emissions that are the most costly to reduce and providing the incentive to undertake the least costly reductions (Hahn & Stavins, in press; Montgomery, 1972). Cap-and-trade sets an aggregate quantity, and through trading, yields a price on emissions, and is effectively the dual of a carbon tax that prices emissions and yields a quantity of emissions as firms respond to the tax's mitigation incentives. Uncertainty in the costs of abatement leads to uncertainty regarding the allowance price in a cap-and-trade system and uncertainty regarding emissions under a tax. This has potentially important economic and political implications, which we discuss below.

In developing a cap-and-trade system, policy makers must decide on several elements of the system's design. Policy makers must determine how many allowances to issue—the size or level of the emission cap. Policy makers must determine the scope of the cap's coverage: identify the types of greenhouse gas emissions and sources covered by the cap, including whether to regulate upstream (based on carbon content of fuels) or downstream (based on monitored emissions).

After determining the amount of allowances and scope of coverage, policy makers must determine whether to freely distribute or sell (auction) allowances. Free allocation of allowances to firms could reflect some historical record (“grandfathering”), such as recent fossil fuel sales. Such grandfathering involves a transfer of wealth, equal to the value of the allowances, to existing firms, whereas, with an auction, this same wealth is transferred to the government. With an auction, the government would, in theory, collect revenue identical to that from a tax producing the same amount of emission abatement. As with tax receipts, auction revenues could be used to reduce distortionary taxes or finance other programs.

In an emission trading program, cost uncertainty—unexpectedly high or volatile allowance prices—can undermine political support for climate policy and discourage

investment in new technologies and research and development. Therefore, attention has turned to incorporating “cost-containment” measures in cap-and-trade systems, including offsets, allowance banking and borrowing, safety valves, and price collars.

An offset provision allows regulated entities to offset some of their emissions with credits from emission reduction measures lying outside the cap-and-trade system’s scope of coverage. An offset provision can link a cap-and-trade system with an emission-reduction-credit system (see below). Allowance banking and borrowing effectively permit emission trading across time. The flexibility to save an allowance for future use (banking) or to bring a future period allowance forward for current use (borrowing) can promote cost-effective abatement. Systems that allow banking and borrowing redefine the emission cap as a cap on cumulative emissions over a period of years, rather than a cap on annual emissions. This makes sense in the case of climate change, because it is a function of cumulative emissions of gases that remain in the atmosphere for decades to centuries.

A safety valve puts an upper bound on the costs that firms will incur to meet an emission cap by offering the option of purchasing additional allowances at a predetermined fee (the safety valve “trigger price”). This effective price ceiling in the emission allowance market reflects a hybrid approach to climate policy: a cap-and-trade system that transitions to a tax in the presence of unexpectedly high mitigation costs. When firms exercise a safety valve, their aggregate emissions exceed the emission cap. A price collar combines the ceiling of a safety valve with a price floor created by a minimum price in auction markets or a government commitment to purchase allowances at a specific price.

Increasing certainty about mitigation cost—through a carbon tax, safety valve, or price collar—reduces certainty about the quantity of emissions allowed.⁵ Smoothing allowance prices over time through banking and borrowing reduces the certainty over emissions in any given year, but maintains certainty of aggregate emissions over a longer time period. A cost-effective policy with a mechanism insuring against unexpectedly high costs—either through cap-and-trade or a carbon tax—increases the likelihood that firms will comply with their obligations and can facilitate a country’s participation and compliance in a global climate agreement.

In a similar fashion as under a carbon tax, domestic cap-and-trade programs could include some variant of a border tax to mitigate some of the adverse competitiveness impacts of a unilateral domestic climate policy and encourage trade partners to take on mitigation policies with comparable stringency. In the case of a cap-and-trade regime, the border adjustment would take the form of an import allowance requirement, so that imports would face the same regulatory costs as domestically produced goods. However, border measures under a carbon tax or cap-and-trade raise questions about the application of trade sanctions to encourage broader and more extensive emission mitigation actions globally as well as questions about their legality under the World Trade Organization (Brainard & Sorking, 2009; Frankel, 2010).

Emission-Reduction-Credit Systems

An emission-reduction-credit (ERC) system delivers emission mitigation by awarding tradable credits for “certified” reductions. Generally, firms that are not covered by some set of regulations—be they command-and-control or market-based—may voluntarily participate in such systems, which serve as a source of credits that entities facing compliance obligations under the regulations may use. Individual countries can implement an ERC system without having a corresponding cap-and-trade program.

For example, as we discuss below, the Clean Development Mechanism (CDM) under the Kyoto Protocol provides credits used by firms covered by the EU ETS. A firm earns credits for projects that reduce emissions relative to a hypothetical “no project” baseline. In determining the number of credits to grant a firm for a project, calculation of the appropriate baseline is therefore as important as measuring emissions. Dealing with this unobserved and fundamentally unobservable hypothetical baseline is at the heart of the so-called “additionality” problem.

While ERC systems can be self-standing, as in the case of the CDM, governments can also establish them as elements of domestic cap-and-trade or other regulatory systems. These ERC systems—often referred to as offset programs—serve as a source of credits that can be used by regulated entities to meet compliance obligations under the primary system. For example, the Regional Greenhouse Gas Initiative (RGGI) in the northeast United States, which regulates CO₂ emissions from electric power plants (and which we discuss below), recognizes offsets from activities such as landfill methane capture and destruction, reductions in emissions of sulfur hexafluoride from the electric power sector, and afforestation. Electricity generators covered by RGGI can use these offset credits to cover part of their emissions. Other cap-and-trade systems that we discuss below also contain offset provisions.

Clean Energy Standards

The purpose of a clean energy standard is to establish a technology-oriented goal for the electricity sector that can be implemented cost-effectively (Aldy, 2011). Under such standards, power plants generating electricity with technologies that satisfy the standard create tradable credits that they can sell to power plants that fail to meet the standard, thereby minimizing the costs of meeting the standard’s goal in a manner analogous to cap-and-trade.

In the United States, for example, state renewable electricity standards (RESs), a restricted type of a clean energy standard, typically establish the objective of the standard as a specific renewable share of total power generation that increases over time (U.S. Congressional Budget Office, 2011). A few states have implemented alternative energy standards in their power sector that target renewables, new nuclear power generating capacity, and advanced fossil fuel power generating technologies.

The European Union and China have promoted renewable power through renewable electricity mandates that include tradable renewable energy credits.

Clean energy standards that focus on technology targets do not explicitly price the greenhouse gas externality and thus impose a higher cost for a given amount of emission reductions than a carbon tax or cap-and-trade program. A renewable mandate treats coal-fired power, gas-fired power, and nuclear power as equivalent—none of these technologies create credits necessary for compliance—despite the fact that a natural gas combined cycle power plant typically produces a unit of generation with half the CO₂ emissions of a conventional coal power plant, and a nuclear plant produces zero-emission power, as do wind, solar, and geothermal. Thus, mandating power from a limited portfolio of technologies can result in higher costs by providing no incentive to switch from emission-intensive coal to emission-lean gas or emission-free nuclear.

A more cost-effective approach to a clean energy standard would employ a technology-neutral performance standard, such as tons of CO₂ per megawatt hour of generation. All power sources, from fossil fuels to renewables, could be eligible under such a performance standard. This has the advantage over the portfolio approach of providing better innovation incentives and of enabling all possible ways of reducing the emissions intensity of power generation. The Canadian province of Alberta has employed such a tradable carbon performance standard for most large sources of CO₂ emissions and has required a 12% improvement in the emission intensity of these sources since 2007.

Power plants would be awarded credits for generating cleaner (less emission-intensive) electricity than the standard. These clean power plants could sell credits to other power plants or save them for future use. Tradable credits promote cost-effectiveness by encouraging the greatest deployment of clean energy from those plants that can lower their emission intensity at lowest cost. Those power plants could then sell their extra credits to other power plants that face higher costs for deploying clean energy. The creation and sale of clean energy credits would provide a revenue stream that could conceivably enable the financing of low- and zero-emission power plant projects.

Eligible technologies for the standard could extend beyond generation technologies and also permit improvements in energy efficiency, or a broad set of emission offset activities, to create tradable credits. Extending the price on carbon to a broader set of activities could improve cost-effectiveness, but allowing for energy efficiency and other offsets poses risks. As emphasized above, estimating offsets is complex, requires extensive review and monitoring by third parties or regulatory agencies, and risks undermining the objective of a policy because of the additionality problem.

Monitoring and enforcement could be relatively straightforward under either a portfolio or performance standard approach. For example, in the United States, electricity generation, generating technology type, and CO₂ emissions are already tracked at power plants by state and Federal regulators.

A clean energy standard represents a de facto free allocation of the right to emit greenhouse gases to the power sector. Suppose that the U.S. government created a clean energy performance standard of 0.5 tons of CO₂ per megawatt hour (the 2010 U.S. power sector emission intensity was 0.56 tons of CO₂/MWh); this is roughly comparable to a 50% clean energy standard that allows all technologies with lower emission intensity than conventional coal to qualify (with partial crediting for low- but non-zero-emitting facilities). As a result, a clean energy standard could not generate the revenues that a carbon tax or a cap-and-trade program with an allowance auction could.

Eliminating Fossil Fuel Subsidies

Phasing out fossil fuel subsidies can represent significant progress toward “getting prices right” for fossil fuel consumption, especially in some developing countries, where subsidies are particularly large. Imposing a carbon price on top of a fuel subsidy will not lead to the socially optimal price for the fuel, but removing such subsidies can deliver incentives for efficiency and fuel switching comparable to implementing an explicit carbon price. In sharp contrast with our discussion above of other policy instruments, in which we focused on ways to price externalities to correct a market failure, our overview of eliminating fossil fuel subsidies addresses the removal of policy interventions that represent “government failures” and thereby exacerbate a market failure.

At the 2009 G20 Summit in Pittsburgh, Pennsylvania, the leaders of 20 of the largest developed and developing countries agreed to phase out fossil fuel subsidies over the “medium term,” and encouraged all other nations to eliminate such subsidies. The agreement called for phasing out these subsidies while targeting support for the poor, and noted that “inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change” (G20 Leaders, 2009). Soon thereafter, leaders of the APEC nations⁶ reached agreement on fossil fuel subsidy elimination at the 2009 Singapore Summit.

The economic and climate benefits of fossil fuel subsidy reform could be significant. In 2008, fossil fuel consumption subsidies exceeded US\$500 billion globally and could exceed US\$660 billion by 2020 without policy reforms (International Energy Agency [IEA], 2011). In at least 10 countries, fossil fuel subsidies exceeded 5% of GDP, and constituted substantial fractions of government budgets (IEA, 2010). Eliminating fossil fuel subsidies could reduce global oil consumption by about 4.7 million barrels per day by 2020, representing a decline of about 5% of current consumption. The International Energy Agency (2010) estimates that eliminating all fossil fuel subsidies would reduce global CO₂ emissions by about two gigatons per year by 2020. To put this in perspective, the UN Environmental Programme (2010) estimates that the Copenhagen Accord emission pledges will reduce greenhouse gas emissions by three to seven gigatons relative to business as usual in 2020.

The vast majority of fossil fuel subsidies suppress the prices for petrol, diesel, electricity, natural gas, and coal that consumers face, primarily in developing countries.⁷ Some developing country governments have been historically reticent to let fuel and electricity prices rise to market-determined levels because of concerns of public opposition. For example, protests over reducing petrol subsidies contributed to President Suharto's downfall in Indonesia in 1998 (Beaton & Lontoh, 2010). Interestingly, Indonesia successfully reduced their fossil fuel subsidies—doubling consumers' prices for petrol and diesel and tripling consumers' prices for kerosene—in 2005 by coupling the change in the fuel price regime with a targeted, means-tested program to transfer government resources from fuel subsidies to income support. Before its late 2010 subsidy reform that significantly raised petrol and diesel prices in exchange for lump-sum cash transfers, Iran priced diesel fuel at about 10 cents per gallon (Coady et al., 2010).

Critics of subsidy reform claim it will harm low-income households, but most fossil fuel subsidies disproportionately benefit the relatively wealthy in developing countries. Indeed, about 40% of the benefits of petroleum subsidies accrue to the wealthiest quintile, while the lowest income quintile enjoys less than 10% of the subsidy benefits, on average globally (Coady et al., 2010).⁸

To promote implementation and cooperation on the G20 fossil fuel subsidies commitment, the leaders established two processes that enable a *de facto* "pledge and review" process. First, the leaders tasked their energy and finance ministers to compile a list of their own country's fossil fuel subsidies and present their strategies for eliminating them. After a series of staff- and ministerial-level consultations among the G20, the energy and finance ministers presented their plans in 2010 (G20 Leaders, 2010a). Second, the leaders tasked the Organization of Economic Cooperation and Development (OECD), International Energy Agency (IEA), World Bank, and the Organization of Petroleum Exporting Countries (OPEC) to evaluate fossil fuel subsidies (G20 Leaders, 2009). These international organizations subsequently produced joint reports that serve as independent benchmarks of fossil pricing policies by which countries may evaluate others' subsidy elimination plans (IEA, OPEC, OECD, & World Bank, 2010).

In 2010, the G20 leaders explicitly called on these international organizations to "further assess and review the progress made in implementing the Pittsburgh and Toronto commitments" (G20 Leaders, 2010b). While the G20 has no formal compliance mechanism to explicitly enforce the leaders' commitment, it does establish a goal, an implementation process, and what can effectively be a third-party expert review. This combination provides transparency for governments and stakeholders to assess whether nations are delivering on their leaders' commitments. This can promote credibility and trust for future international cooperation and may provide some lessons for the design of bottom-up international climate policy (see more on this below in our discussion of international coordination of carbon pricing policies).

Regional, National, and Subnational Experiences With Carbon Pricing

We briefly examine the few explicit carbon pricing policy regimes that are currently in place: the European Union's Emission Trading Scheme; New Zealand's cap-and-trade system; the Kyoto Protocol's Clean Development Mechanism; northern European carbon tax policies; British Columbia's carbon tax; and Alberta's tradable carbon performance standard (similar to a clean energy standard).⁹

European Union Emission Trading Scheme

By far the world's largest carbon pricing regime is the European Union Emission Trading Scheme (EU ETS), a cap-and-trade system of CO₂ allowances. Adopted in 2003 with a pilot phase that became active in 2005, the EU ETS covers about half of EU CO₂ emissions in 30 countries in a region of the world that accounts for about 20% of global GDP and 17% of world energy-related CO₂ emissions (Ellerman & Buchner, 2007).¹⁰ The 11,500 emitters regulated by the *downstream* program include large sources such as oil refineries, combustion installations over 20 MWth, coke ovens, cement factories, ferrous metal production, glass and ceramics production, and pulp and paper production. Up until now, the program has not covered sources in the transportation, commercial, or residential sectors (Ellerman & Buchner, 2007) although the EU plans to extend the ETS to cover aviation sector emissions starting in 2012.

The EU ETS was designed to be implemented in phases: a pilot or learning phase from 2005 to 2007, a Kyoto phase from 2008 to 2012,¹¹ and a series of subsequent phases. Penalties for violations increase from 40 Euros per ton of CO₂ in the first phase to 100 Euros in the second phase. Although the first phase allowed trading only in carbon dioxide, the second phase broadened the program to include other GHGs, such as nitrous oxide emissions.

The process for setting caps and allowances in member states was initially decentralized (Kruger, Oates, & Pizer, 2007), with each member state responsible for proposing its own national carbon cap, subject to review by the European Commission. This created incentives for individual countries to try to be generous with their allowances to protect their economic competitiveness (Convery & Redmond, 2007). Not surprisingly, the result was an aggregate cap that exceeded business-as-usual emissions.

In the spring of 2006, it became clear that the allocation of allowances in 2005 on net had exceeded emissions by about 4% of the overall cap. This led, as would be anticipated, to a dramatic fall in allowance prices. In January, 2005, the price per ton was approximately €8/tCO₂; by early 2006, it exceeded €30/tCO₂, then fell by about half in one week of April, 2006, before fluctuating and returning to about €8/tCO₂ (Convery & Redmond, 2007). This volatility was attributed to the absence of transparent, precise emissions data at the beginning of the program, a surplus of allowances, energy price volatility, and a program feature that *prevents banking* of allowances

from the first phase to the second phase (Market Advisory Committee, 2007). In truth, the “overallocation” was concentrated in a few countries, particularly in Eastern Europe, and in the nonpower sectors (Ellerman & Buchner, 2007).

The first and second phases of the EU ETS require member states to distribute almost all of the emissions allowances (a minimum of 95% and 90%, respectively) freely to regulated sources, but beginning in 2013, member states will be allowed to auction larger shares of their allowances. The initial free distribution of allowances led to complaints from energy-intensive industrial firms about “windfall profits” among electricity generators, when energy prices increased significantly in 2005. But the higher electricity prices were only partly due to allowance prices, higher fuel prices also having played a role; and it is unclear whether the large profits reported by electricity generators were due mainly to their allowance holdings or to having low-cost nuclear or coal generation in areas where the (marginal) electricity price was set by higher cost natural gas (Ellerman & Buchner, 2007).

The system’s cap was tightened for Phase 2 (2008-2012), and its scope expanded to cover new sources in countries that participated in Phase 1 plus sources in Bulgaria and Romania, which acceded to the European Union in 2007. Liechtenstein, Iceland, and Norway joined the EU ETS in 2008 although sources in Iceland are not yet subject to an emissions cap. Allowance prices in Phase 2 increased to over €20/tCO₂ in the first half of 2008, averaged €22/tCO₂ in the second half of 2008, and then fell to €13/tCO₂ in the first half of 2009, and down to €10/tCO₂ in the fall of 2011, as the economic recession brought decreased demand for allowances due to reduced output in the energy-intensive sectors and lower electricity consumption.

The European Union plans to extend the EU ETS through Phase 3, 2013-2020, with a centralized cap becoming increasingly stringent (20% below 1990 emissions), a larger share of the allowances subject to auctioning, tighter limits on the use of offsets, and unlimited banking of allowances between Phases 2 and 3.

Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is a *downstream* cap-and-trade program that was originally intended to limit CO₂ emissions in the United States from power sector sources in 10 northeastern states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey,¹² New York, Rhode Island, and Vermont).¹³ The system is both narrow in its sectoral coverage and unambitious in terms of its emissions reduction objectives.

The program took effect in 2009, after approval by individual state legislatures, and set a goal of limiting emissions from regulated sources to then current levels in the period from 2009 to 2014. Beginning in 2015, the emissions cap is set to decrease by 2.5% each year until it reaches an ultimate level 10% below 2009 emissions in 2019. It was originally anticipated that meeting this goal would require a reduction approximately 35% below business-as-usual emissions (13% below 1990 emissions levels). However, due to the combined effects of the economic recession and drastic

declines in natural gas prices relative to coal prices, the program is no longer binding and is unlikely to become binding through 2020, unless the targets are revised.¹⁴

Because RGGI only limits emissions from the power sector, incremental monitoring costs are low, because U.S. power plants are already required to report their hourly CO₂ emissions to the Federal government (under provisions for continuous emissions monitoring as part of the SO₂ allowance trading program). The system sets standards for certain categories of CO₂ offsets, and limits the number and geographic distribution of offsets. The program requires participating states to auction at least 25% of their allowances and to use the proceeds for energy efficiency and consumer-related improvements.¹⁵ The remaining 75% of allowances may be auctioned or distributed freely. In practice, states have auctioned virtually all allowances.

Several problems with the program's design can be noted. First is the leakage problem, which is potentially severe for any state or regional program, particularly given the interconnected nature of electricity markets (Burtraw, Kahn, & Palmer, 2005). Second, the program is downstream for just one sector of the economy and so very limited in scope. Third, despite considerable cost uncertainty, a true firm safety valve mechanism was not adopted. Instead, there are trigger price that allow greater reliance on offsets and external credits in the expectation that these can increase supply. The program does impose a price floor in the allowance auctions, without which the allowance prices would have approached zero (when the combined forces of the economic recession and lower natural gas prices caused emissions to fall below the declining cap). Fourth, as mentioned above, the program limits the number and geographic origin of offsets.

New Zealand Emissions Trading Scheme

In January, 2008, the New Zealand Emissions Trading Scheme (NZ ETS) was launched. Under this system, the intention is to include all sectors of the economy and all greenhouse gases by 2015, using free allocation of allowances, with special protections (output-based updating allocations) for emission-intensive, trade-sensitive sectors. The forestry sector entered the program first, in 2008; and stationary energy, industrial, and liquid fuel fossil fuel sectors joined in 2010. The waste (landfills) sector is scheduled to enter in 2013, and agriculture—which accounts for nearly half of New Zealand's gross emissions—is scheduled to enter in 2015.¹⁶

Covered sources have the option of paying a fixed fee of NZUS\$25 per ton of emissions, and until 2013, all sectors other than forestry require only one unit of allowances for each two units of emissions. Thus, although the NZ allowances are indirectly linked with the EU ETS through the CDM, the current effective price is very low while the system becomes established. Early evidence suggests that the forestry component has deterred deforestation and may be encouraging new planting, although international policy and consequent price uncertainty are major problems for investment (Karpas & Kerr, 2010).

The Climate Change Response Act of 2002, which provided for the creation of the emissions trading scheme for the purpose of meeting the country's Kyoto obligations,

required a review of the NZ ETS by an independent review panel every 5 years. The first review (Emissions Trading Scheme Review Panel, 2011) was released by the government in September, 2011. While most of the scheme was upheld, it recommended that the agriculture sector face a lower price as it enters the system and that the government should review the wisdom of allowing offsets from HFC-23 destruction projects under the Clean Development Mechanism (see below). The government hopes to link with Australia's emissions trading program, scheduled to be launched in 2015.

Clean Development Mechanism

The most significant GHG emission-reduction-credit system to date is the Kyoto Protocol's Clean Development Mechanism (CDM). Under the CDM, certified emission reduction (CER) credits are awarded for voluntary emission reduction projects in non-Annex I countries (largely, developing countries) that ratified the Protocol, but are not among the Annex I countries subject to the Protocol's emission limitation commitments—also known as the Annex B countries.¹⁷ CDM projects can potentially take the form of building new wind farms, investing in more energy efficient equipment in a manufacturing facility, and capturing methane from landfills. While CERs can be used by the Annex I countries to meet their emission commitments, they could also be used for compliance purposes by entities covered by other cap-and-trade systems, including systems in countries that are not Parties to the Protocol, such as the United States.

From the perspective of the industrialized countries, the CDM provides a means to engage developing countries in the control of GHG emissions, while from the perspective of the developing countries, the CDM provides an avenue for the financing of "sustainable development." Essentially, the purchase of CERs by industrialized country entities to offset their own emissions can reduce the aggregate cost of compliance with the Kyoto Protocol, because it tends to be much less expensive to construct new low-carbon energy infrastructure in developing nations than to modify or replace existing infrastructure in industrialized countries (Wara, 2007).

Of the six GHGs covered by the Kyoto Protocol,¹⁸ approximately 38% of projects in the CDM pipeline as of 2007 were for CO₂, 28% for HFC-23, 23% for methane, and 11% for nitrous oxide (Wara, 2007). In terms of CO₂-equivalent reductions, the CDM has accounted for annual reductions of 278 million tons, about 1% of annual global emissions of CO₂ (U.S. Energy Information Administration, 2011).¹⁹ The largest shares of CERs have been generated in China (52%) and India (16%), with Latin America and the Caribbean making up another 15% of the total, Brazil (at 7%) being the largest producer in that region (World Bank, 2010).

Because the CDM is an ERC system, it is subject to concerns about the additionality of emission-reductions associated with its projects (see generic discussion above regarding ERC systems). Empirical analysis has validated these concerns, with estimates that up to 75% of claimed reductions would have occurred in the absence of the program (Zhang & Wang, 2011).

A particular concern has centered on the fact that nearly 30% of average annual CERs have come from the destruction of HFC-23, a potent GHG that is a by-product of the manufacture of certain refrigerant gases. It is very inexpensive to destroy HFC-23, and companies can earn nearly twice as much from sale of CDM credits as they can from selling respective refrigerant gases. As a result, it has been argued that plants are being built simply for the purpose of generating CERs from destruction of HFC-23. Because of this, beginning in 2013, CERs from HFC-23 destruction will not be valid for purposes of compliance with the EU ETS.

As debate continues regarding a possible second commitment period for the Kyoto Protocol, it appears that the CDM will continue to function, in any event (Bodansky, 2011). A variety of proposals have been put forward to improve its structure and implementation, many targeted at increasing the additionality of approved projects (Hall, Levi, Pizer, & Ueno, 2010). In the meantime, as we discuss below, the CDM may provide a significant function by facilitating indirect linkages among diverse national cap-and-trade systems.

*Northern European Experience With Carbon Taxes*²⁰

In the 1990s, a number of northern European countries imposed carbon taxes to limit their greenhouse gas emissions. In 1991, Norway implemented a carbon tax that varied in its level across sectors of the economy, despite the fact that cost-effective abatement would call for a uniform tax. In the transportation sector, by 2009, the Norwegian carbon tax had increased to about US\$58/tCO₂ on gasoline, but only US\$34/tCO₂ on diesel (Government of Norway, 2009). Natural gas faced a carbon tax of US\$31/tCO₂ to US\$33/tCO₂ in 2009, depending on use. By 1999, facilities using coal paid US\$24/tCO₂ for coal for energy purposes and US\$19/tCO₂ for coal for coking purposes (Bruvold & Larsen, 2004), but the Government of Norway exempted these activities from the carbon tax starting in 2003 (Government of Norway, 2009). In 2009, the carbon tax applied to about 55% of Norwegian greenhouse gas emissions, while the emission trading scheme that is linked to the EU ETS covered an additional 13% of emissions.²¹ In 2003, Norway also introduced a tax of about US\$33/tCO₂-equivalent on HFCs and PFCs, which slowed the growth rate of these potent greenhouse gases (Government of Norway, 2009).

Likewise in 1991, Sweden implemented a carbon tax of about US\$33/tCO₂ as a part of a fiscal reform that lowered high income tax rates (Speck, 2008). The carbon tax has since increased to more than US\$135/tCO₂ by 2009 (Government of Sweden, 2009). At the same time, Sweden reduced its general energy tax on many of the sources bearing the carbon tax. Refineries, steel, and other primary metal industries received an exemption from the carbon tax (Daugjberg & Pedersen, 2004). In addition, those industries covered by the EU ETS were exempted from the carbon tax (Government of Sweden, 2009). About 33% of Sweden's greenhouse gas emissions are covered by the EU ETS, a smaller fraction than the norm in the EU (Government of Sweden, 2009).

In 1992, Denmark implemented a carbon tax of about US\$18/tCO₂, and reduced this tax modestly to a level of about US\$17/tCO₂ in 2005, where it remained through 2009 (Speck, 2008; Government of Denmark, 2009). Manufacturing industries bear discounted tax rates of more than 90% depending on their energy intensity and participation in a voluntary agreement (Government of Denmark, 2009). The carbon tax on gasoline amounted to about 16 cents per gallon in 2009.

Since 1997, Finland has imposed a general tax on energy coupled with a surtax based on the carbon content of the energy. Like other northern European nations, Finland reduced its carbon tax for some industries covered by the EU ETS, reflecting concerns about adverse competitiveness impacts on trade-exposed manufacturing. Since 2008, the carbon surtax has been about US\$28/tCO₂ although natural gas faces half this rate (Government of Finland, 2009).

Obviously, implementation of carbon taxes in northern Europe have yielded significant variations in the effective tax per unit CO₂ across fuels and industries within each country, contrary to the cost-effective prescription of a common price on carbon among all sources. In addition, fiscal cushioning to carbon taxes—by adjustments to preexisting energy taxes—and to the EU ETS—by adjustments to then preexisting carbon taxes—was common, especially for those industries expressing concerns about their international competitiveness. Nonetheless, these nations have demonstrated that carbon taxes can deliver greenhouse gas emission reductions and raise revenues to finance government spending and lower income tax rates (OECD, 2001; Government of Denmark, 2009; Government of Finland, 2009; Government of Norway, 2009).

British Columbia Carbon Tax

Since 2008, the Canadian province of British Columbia has had in place a carbon tax as one part of its plan to reduce provincial GHG emissions by 33% by 2020 (British Columbia, 2007). The carbon tax is intended to be economy-wide, with a tax of C\$10 per ton of CO₂-equivalent emissions in 2008, increasing by C\$5 per year for 4 years, and reaching C\$30/ton in 2012. The tax is collected “upstream” at the wholesale level (fuel distributors) based on the carbon content of fuels to facilitate administration (Duff, 2008). By law, 100% of the tax revenue must be refunded through tax cuts to businesses and individuals, and low-income individuals are further protected through a Low Income Climate Action Tax Credit.

During 2008 and 2009, the tax generated C\$846 million in revenue. This was accompanied by reductions in a variety of personal and corporate income taxes, plus tax credits for low-income individuals. These cuts totaled approximately C\$1.1 billion, so that the policy yielded significant net tax reductions (Plumer, 2010). A similar pattern occurred in 2010. The government estimates that by 2020, the carbon tax will reduce British Columbia’s CO₂ emissions by approximately 3 million tons annually.

Interestingly, another part of the province’s Climate Action Plan is a provincial cap-and-trade system, which is to be linked with a similar systems planned in

California (under Assembly Bill 32), Ontario, and Quebec through the Western Climate Initiative. The province's plans have not addressed how the carbon tax and cap-and-trade system will be coordinated.²²

Alberta Tradable Carbon Performance Standard

In 2007, the Canadian province of Alberta designed a market-based policy to reduce the carbon intensity of its large sources of greenhouse gas emissions. This program established a rate-based performance standard for emission sources exceeding 100,000 metric tons of CO₂ annually. Building on emission inventories dating to 2003, each large source covered by the program was required to reduce the emission intensity of its production 12% below a base year intensity drawn from the 2003-2006 period.²³ The program covers about 100 sources from the power sector, pulp and paper, cement, and fertilizer industries, and oil sands development. The unit of measure is emissions of CO₂ per unit of physical production from that industry, for example, per barrel of oil from oil sands development (Sass, 2010).

Covered firms have four options for complying with the performance standard. First, they can reduce the emission intensity of production to meet the standard. Second, they may purchase credits from other covered firms with emission intensities below the standard. Third, they may purchase Alberta-based emission offset credits through an emission-reduction credit program. Finally, they may pay the provincial government C\$15 for every metric ton they exceed the standard by, which serves as a safety valve on the cost of compliance with the program (Province of Alberta, 2008).

In 2010, covered sources employed all four options to comply with the performance standard. These sources reduced their emissions relative to baseline by about 2.7 million tons of CO₂ (with a majority of this effort traded from low mitigation cost facilities to high mitigation cost facilities), purchased about 3.9 million tons emission offset credits, and satisfied the remaining 4.7 million ton emission reduction obligation through the C\$15/tCO₂ safety valve. This last option generated about C\$70 million of revenue directed to the Climate Change and Emissions Management Fund, which invests in emission-lean technologies and projects (Province of Alberta, 2011).

International Coordination of Carbon Pricing Policies

Climate change is truly a global commons problem: the location of greenhouse gas emissions has no effect on the global distribution of damages. Hence free-riding problems plague unilateral and multilateral approaches. Furthermore, nations will not benefit proportionately from greenhouse gas mitigation policies. Thus mitigation costs are likely to exceed direct benefits for virtually all countries. Cost-effective international policies—insuring that countries get the most environmental benefit out of their mitigation investments—will help promote participation in an international climate policy regime.

In principle, internationally employed market-based instruments can achieve overall cost effectiveness. Three basic routes stand out. First, countries could agree to apply the same tax on carbon (*harmonized domestic taxes*) or adopt a *uniform international tax*. Second, the international policy community could establish a system of *international tradable permits*—effectively a nation-state level cap-and-trade program. In its simplest form, this represents the Kyoto Protocol's Annex B emission targets and the Article 17 trading mechanism. Third, a more decentralized system of internationally linked domestic cap-and-trade programs could ensure internationally cost-effective emission mitigation.

International Taxes and Harmonized Domestic Taxes

In principle, a carbon tax could be imposed on nation states by an international agency. The supporting agreement would have to specify both tax rates and a formula for allocating the tax revenues. Cost-effectiveness would require a uniform tax rate across all countries. It is unclear, however, what international agency could impose and enforce such a tax, and so an alternative more frequently considered has been a set of harmonized domestic carbon taxes (Cooper, 2010). In this case, an agreement would stipulate that all countries are to levy the same domestic carbon taxes and retain their revenues.

The uniformity of tax rates is necessary for cost-effectiveness. But some developing countries may argue that the resulting distribution of costs does not conform to principles of distributional equity and call for significant resource transfers. Under a harmonized tax system, an agreement could include fixed lump-sum payments from developed to developing countries, and under an international tax system, an agreement could specify shares of the total international tax revenues that go to participating countries.

As an alternative to these explicit transfers, developed countries could commit to constrain the use of their tax revenues in ways that produce global benefits. For example, carbon tax revenues in developed countries could, in part, finance major research and development programs on zero-carbon technologies and adaptation efforts in developing countries, while developing countries could freely use their tax revenues in ways that best facilitate their development.

In some developing countries reluctant to implement a carbon tax, an initial cost-effective contribution to combat climate change could take the form of reducing fossil fuel subsidies. For example, a developing country cutting a petrol subsidy equal to 10% of its price is approximately equivalent to a rich country imposing a carbon tax on petrol that raises its price 10%. Well-planned, broad fossil fuel price reforms in a developing country could deliver substantial emission mitigation just as a carbon tax in a developed country (IEA, 2010). The energy prices are higher in both countries, providing the incentive to invest in energy-efficient technologies and nonfossil energy sources, but the relative prices remain unchanged, so that energy-intensive firms do not face the incentive to relocate to the developing country.

Lowering energy subsidies can free up government revenues that could be directed to other beneficial uses and improve the allocation of resources in the economy to promote faster economic growth. Of course, some energy subsidies in developing countries address pressing, basic energy needs, and efforts to combat climate change may need to account for these social objectives.

International Tradable Permits: Cap-and-Trade and Emission-Reduction-Credits

Under an international tradable permit scheme, all participating countries would be allocated permits for “net emissions,” that is, emissions minus sequestration. A permit would define a right to emit a given volume over some time period, such as a year. In each period, countries would be free to buy and sell permits on an international exchange.

Initial permit allocations could reflect a variety of criteria, such as previous emissions, gross domestic product, population, and fossil fuel production. Whatever the initial allocation, subsequent trading can, in theory, lead to a cost-effective outcome (Montgomery, 1972), if transaction costs are not significant (Stavins, 1995). This potential for pursuing distributional objectives while assuring cost-effectiveness is an important attribute of the tradable permit approach.

Providing large initial permits to developing countries (for reasons of distributional equity) implies that they would sell permits primarily to developed countries. Since permit prices represent an implicit tax on all participating countries, the terms of trade within the coalition for countries with the same carbon intensities in production would remain unaffected. From a distributional point of view, developing countries would receive compensation, whereas developed countries would have to pay for their own emission abatement and for permit purchases from abroad to cover the balance of their emissions (Olmstead & Stavins, 2012).

An important obstacle to the successful operation of such a system is that by its very nature, the trading would be among nations (Hahn & Stavins, 1999). Nation-states are hardly simple cost-minimizers, like private firms, so there is no reason to anticipate that competitive pressures would lead to equating of marginal abatement costs across countries. The system would not have the cost-effectiveness property ordinarily associated with a domestic tradable permit system among firms. Even if nations were cost-minimizers, they do not have sufficient information about the marginal abatement costs of firms within their jurisdiction to define their own aggregate marginal costs. The notion of a simple trading program among countries may be more of a metaphor than a practical policy.

If every country participating in such a system were to devolve the tradable permits to firms within its jurisdiction, that is, if each country instituted a domestic tradable permit system as its means of achieving its national target, then the trading could be among firms, not governments, both within countries and internationally (Hahn & Stavins, 1999). Such a system could indeed be cost-effective. In the near term, this

trading system could be integrated with an emission-reduction-credit system, such as the CDM, for countries that do not take on emission caps.

The current design of the CDM does not secure all low-cost mitigation opportunities in developing countries. The project basis for credits under the CDM increases transaction costs and excludes policy reforms that undermine the cost-effectiveness of the mechanism. Modifying the CDM along several lines could improve its cost-effectiveness, increase the investment in low-carbon technologies in developing countries, and address concerns about whether CDM activities truly reflect additional emission mitigation effort (Hall et al., 2010).

First, the CDM could be expanded to cover mitigation policies. Some of the potentially low-hanging fruit in developing countries—from reducing energy subsidies to designing and enforcing building codes—do not neatly fall within a “project” under the CDM. A policy-oriented CDM could deliver price signals to a greater share of a developing country’s economy that can yield more emission mitigation and reduce the potential for emission leakage. This could also serve as a mechanism for transfers to developing countries that pursue a carbon tax. The obvious challenge lies in setting baseline emissions to assess the emission reduction benefits for any given policy. This effort may be substantial, but when spread over all of the potential emission reductions, the transaction costs may be minor in comparison to the costs of a project-based approach resulting in the same abatement.

Second, the CDM could be expanded to cover sectors as an alternative to projects. A sectoral CDM could establish emission baselines for entire sectors (such as the power sector or the steel sector), and allow countries to implement mitigation policies in those sectors to generate credits. Integrating these policies into the international regime—such as pegging a sectoral carbon tax to the international tradable permit price, or implementing a sectoral cap-and-trade system linked to the international regime—could promote cost-effectiveness. Focusing on the most energy-intensive sectors could also address concerns about competitiveness and emission leakage in developed countries. It would also provide developing countries with the experience to inform their consideration of taking on broader emission or policy commitments in future agreements.²⁴

Decentralized, Bottom-Up Architectures

Cap-and-trade systems seem to have emerged as the preferred national and regional instrument for reducing emissions of greenhouse gases throughout much of the industrialized world, and the CDM has developed a substantial constituency, despite concerns about its performance. Because linkage between tradable permit systems (that is, unilateral or bilateral recognition of allowances from one system for use in another) can reduce compliance costs and improve market liquidity, there is great interest in linking cap-and-trade systems with each other.

There are not only benefits but also concerns associated with various types of linkages (Jaffe, Ranson, & Stavins, 2010). A major concern is that when two

cap-and-trade systems are directly linked (that is, allow bilateral recognition of allowances in the two jurisdictions), key cost-containment mechanisms, such as safety valves, are automatically propagated from one system to the other. Because some jurisdictions (such as the European Union) are opposed to the notion of a safety valve, whereas other jurisdictions (such as the United States) seem very favorably predisposed to the use of a safety valve, challenging harmonization would be required.

This problem can be avoided by the use of indirect linkage, whereby two cap-and-trade systems accept offsets from a common emission-reduction-credit system, such as the Clean Development Mechanism. As a result, the allowance prices of the two cap-and-trade systems converge (as long as the ERC market is sufficiently deep), and all the benefits of direct linkage are achieved (lower aggregate cost, reduced market power, decreased price volatility), but without the propagation from one system to another of cost-containment mechanisms. Such indirect linkage may already be evolving as a key element of the *de facto* post-2012 international climate policy architecture.

Despite the apparent current popularity of cap-and-trade as a national policy approach in many parts of the world, in reality, there are a variety of policy instruments—both market based and conventional command-and-control—that countries can employ to reduce their GHG emissions. Hence it is important to ask whether a diverse set of heterogeneous national, subnational, or regional climate policy instruments can be linked in productive ways. The basic answer is that such a set of instruments can be linked, but the linkage is considerably more difficult than it is with a set of more homogeneous tradable permit systems (Hahn & Stavins, 1999). In fact, the basic approach behind emission reduction credit systems such as the CDM and Joint Implementation (JI) can be extended to foster linkage opportunities among diverse policy instruments, including cap-and-trade, taxes, and certain regulatory systems (Metcalf & Weisbach, 2010).

Another form of coordination can be unilateral instruments of economic protection, that is, border adjustments. In the case of a national carbon tax, this would take the form of a tax on imports that was equivalent to the implicit tax on the same domestically produced goods. In the case of a cap-and-trade system, this would take the form of an import-allowance-requirement. Such border adjustments are found as part of most existing, planned, and proposed national climate policies.

The Future of Carbon Pricing

The political responses to possible market-based approaches to climate policy in most countries have been and will continue to be largely a function of issues and structural factors that transcend the scope of environmental and climate policy. Because a truly meaningful climate policy—whether market based or conventional in design—will have significant impacts on economic activity in a wide variety of sectors (because of the pervasiveness of energy use in a modern economy) and in every region of a country, it is

not surprising that proposals for such policies bring forth significant opposition, particularly during difficult economic times.

In the United States, political polarization—which began some four decades ago, and accelerated during the economic downturn—has decimated what had long been the key political constituency in the Congress for environmental (and energy) action, namely, the middle, including both moderate Republicans and moderate Democrats (Stavins, 2011). Whereas Congressional debates about environmental and energy policy had long featured regional politics, they are now fully and simply partisan. In this political maelstrom, the failure of cap-and-trade climate policy in the U.S. Senate in 2010 was essentially collateral damage in a much larger political war.

It is possible that better economic times will reduce the pace—if not the direction—of political polarization. Furthermore, it is also possible that the ongoing challenge of large budgetary deficits in many countries will increase the political feasibility of new sources of revenue. When and if this happens, consumption taxes (as opposed to traditional taxes on income and investment) could receive heightened attention, and primary among these might be energy taxes, which can be significant climate policy instruments, depending on their design.

It is much too soon to speculate on what the future will hold for the use of market-based policy instruments for climate change. It is conceivable that two decades of relatively high receptivity in the United States, Europe, and other parts of the world to cap-and-trade and offset mechanisms will turn out to be no more than a relatively brief departure from a long-term trend of reliance on conventional means of regulation. On the other hand, it is also possible that the recent tarnishing of cap-and-trade in U.S. political dialogue will itself turn out to be a temporary departure from a long-term trend of increasing reliance on market-based environmental policy instruments. It is too soon to say.

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Notes

1. In the developing country context, refer to Coria and Sterner (2010) and Coria, Löfgren, and Sterner (2010) for an assessment of air pollutant emission trading in Chile.
2. Where market-based policy instruments have been employed, they have typically complimented rather than substituted for command-and-control regulations. Green taxes have been employed in some contexts for the purpose of raising revenue, with little concern for their impacts on environmental outcomes. The OECD (2001) provides an assessment of environmental taxes in a variety of pollution contexts. Beyond the OECD, Máca, Melichar, and

- Ščasný (in press) evaluate environmental taxes and subsidies in central and eastern European countries, Cao, Ho, and Jorgenson (2009) assess green taxes in China, and Blackman (2010) and Sterner and Coria (2012) review a variety of policy instruments in developing countries.
3. However, in special cases where emission monitoring and enforcement is particularly costly—such as for methane emissions in agriculture—a standards-based approach may be appropriate.
 4. Similar approaches could be undertaken to promote biological sequestration in forestry and agriculture and potentially emission-reduction projects (“offsets”) in other countries. See discussion of Emission Reduction Credit programs below.
 5. From a political perspective, environmentalists have expressed concerns about “emission certainty,” as an alternative to “cost certainty.” From an economic welfare perspective, cost certainty is more important than emission certainty if the slope of estimated marginal abatement costs is relatively steeper than the slope of estimated marginal benefits of abatement (Pizer, 2002; Weitzman, 1974).
 6. The 21 “member economies” of APEC (Asia-Pacific Economic Cooperation) are Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taipei, Thailand, United States, and Viet Nam.
 7. Refer to Badiani, Jessoe, and Plant (in press) for a detailed discussion of electricity subsidies in the agricultural sector in India.
 8. The G20 agreement permits exclusion for subsidies that are explicitly targeted to low-income households. For example, the U.S. government has indicated that it considers the Low Income Home Energy Assistance Program to be exempt from the subsidy elimination commitment for this reason.
 9. In addition to the EU ETS and the New Zealand cap-and-trade system, the Japanese Voluntary Emissions Trading System has operated since 2006, and Norway operated its own emissions trading system for several years before joining the EU ETS in 2008. Legislation to establish cap-and-trade systems is under debate in Australia (combined with a carbon tax for an initial 3-year period) and in the Canadian provinces of Ontario and Quebec. Japan is considering a compulsory emissions trading system.
 10. The EU ETS covers all 27 member states plus Iceland, Liechtenstein, and Norway.
 11. This is the first commitment period of the Kyoto Protocol, 2008-2012.
 12. In May of 2011, New Jersey Governor Chris Christie announced that his state would withdraw from the system.
 13. In addition to RGGI, other regional and state efforts to limit GHGs in the United States have begun. One of the most prominent is California’s enactment of the Global Warming Solutions Act of 2006, which set a statewide GHG emissions limit for 2020 equal to California’s 1990 emissions level. In 2008, the California Air Resources Board proposed the use of a cap-and-trade program as a primary policy for achieving this target. The cap initially would cover electric generators and large industrial facilities, and its scope would later be expanded to include smaller facilities and the transportation sector. The cap-and-trade system is scheduled to commence operations in 2012.

14. Allowance prices have reflected these realities, falling from approximately US\$3 per ton of CO₂ at the first auction in September, 2008, to the floor price of US\$1.89 per ton in 2011.
15. Three states have used some of their auction revenue to help balance their overall state budgets.
16. See <http://www.climatechange.govt.nz/emissions-trading-scheme/>
17. Parties include 37 industrialized countries and emerging market economies of central and eastern Europe. Like the CDM, Joint Implementation (JI) was established as a project-based flexibility mechanism under the Kyoto Protocol. Unlike the CDM, JI applies to emission reduction projects carried out in an Annex I country (the host country) that has a national emissions target under the Protocol. JI projects generate credits, referred to as emission reduction units (ERUs), which can be used to cover increased emissions in other countries.
18. These are CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
19. Note that carbon sequestration projects of forestation and reduced deforestation are not included in the CDM under the Kyoto Protocol's first commitment period, 2008-2012.
20. All carbon taxes reported in this subsection are in 2009 U.S. dollars, based on market exchange rates.
21. Greenhouse gas emissions in the offshore oil sector, representing 24% of the nation's emissions, are covered by both a (lower) carbon tax and the emission trading scheme (Government of Norway, 2009).
22. An important issue for national and subnational climate policies is the potential for interactions—some problematic and some positive—among overlapping policy instruments. On this, see McGuinness and Ellerman (2008); Fischer and Preonas (2010); Levinson (2010); Goulder and Stavins (2011); and Organization for Economic Cooperation and Development (2011).
23. New sources covered by the program initially bear less stringent performance standards that converge to the 12% objective over time (Province of Alberta, 2007).
24. Such an approach could be superior to some calls for sectoral policies that effectively set industry-specific performance standards common across participating developed and developing countries. This standard approach establishes walls between sectors that can increase the total mitigation cost for any given emission goal and eliminates opportunities to raise revenues, either through a carbon tax or an allowance auction, to benefit other social objectives.

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How additional is the Clean Development Mechanism?

Analysis of the application of current tools and proposed alternatives

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Abbreviations

CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CO₂	Carbon Dioxide
CORSIA	Carbon Offset and Reduction Scheme for International Aviation
CP	Crediting Period
CPA	Component Project Activity of a PoA
DOE	Designated Operational Entity
EB	Executive Board of the CDM
ETS	Emissions Trading Scheme/System
f_{NRB}	Fraction of non-renewable biomass
GHG	Greenhouse Gas
GS	Gold Standard
JCM	Joint Crediting Mechanism
LED	Light Emitting Diode
MP	Methodologies Panel under the CDM EB
MRV	Monitoring, Reporting & Verification
NDC	Nationally Determined Contribution
NRB	Non-renewable Biomass
OECD	Organisation for Economic Co-operation and Development
PDD	Project Design Document
PMR	Partnership for Market Readiness (Initiative of the World Bank)
PoA	Programme of Activities
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VCS	Verified Carbon Standard

Executive summary

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the Clean Development Mechanism (CDM) as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the CDM certainly forms an important basis for the elaboration and design of future international crediting mechanisms.

While this study provides important insights to **improve the CDM up to 2020**, the approach taken in this study could **also be applied more generally both to assess the environmental integrity of other compliance offset mechanisms**, as well as to avoid flaws in the design of new mechanisms being used or established for compliance. Many of the shortcomings identified in this study are inherent to crediting mechanisms in general, not least the considerable uncertainty involved in the assessment of additionality and the information asymmetry between project developers and regulators.

A fundamental feature of both the CDM and the mechanism under Article 6.4 is that they aim to achieve environmental integrity by ensuring that only real, measurable and additional emission reductions are generated. This study analyzes the opportunities and limits of the current CDM framework for ensuring environmental integrity, i.e. that projects are additional and that emission reductions are not overestimated. It looks at the way in which the CDM framework has evolved over time, assesses the likelihood that emission reductions credited under the CDM ensure environmental integrity and provides findings on the overall and project-type-specific environmental integrity of the CDM. In addition, it provides lessons learned and recommendations for improving additionality assessment that can be applied to crediting mechanisms generally, including to mechanisms to be used for compliance under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), and to mechanisms to be implemented under Article 6 of the Paris Agreement.

To ensure robust judgements, we have systematically analyzed the determination of additionality, the determination of baseline emissions and other issues that are key for environmental integrity. Towards this goal, we have evaluated those general CDM rules that are particularly relevant for environmental integrity and assessed in the case of specific project types the likelihood that they deliver real, measurable and additional emission reductions. Based on our analysis **key findings** include the following:

- Most **energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, energy efficiency improvements or fossil fuel switch.
- **Industrial gas projects** (HFC-23, adipic acid, nitric acid) are **likely to be additional** as long as the mitigation is not otherwise promoted or mandated through policies.
- **Methane projects** (landfill gas, coal mine methane) have a **high likelihood of being additional**.
- **Biomass power projects** have a **medium likelihood of being additional** overall because the assessment of additionality very much depends on the local conditions of individual projects.
- The additionality of the current pipeline of **efficient lighting projects** using small-scale methodologies is **highly unlikely** because in many host countries the move away from incandescent bulbs is well underway.

- In the case of **cook stove projects**, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Cook stove projects are also likely to considerably **over-estimate the emission reductions** due to a number of unrealistic assumptions and default values.

Overall, our results suggest that 85% of the projects covered in this analysis and 73% of the potential 2013-2020 Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated. Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated.

Our analysis suggests that the **CDM still has fundamental flaws in terms of overall environmental integrity**. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions.

When considering the Paris Framework, the most important change from the Kyoto architecture is that all countries have made mitigation pledges in the form of Nationally Determined Contributions (NDC). An important implication is that host countries with ambitious and economy-wide mitigation pledges have **incentives to limit international transfers of credits** to activities with a **high likelihood of delivering additional emission reductions**, so that transferred credits do not compromise the host country's ability to reach their own mitigation targets. A second important implication is that countries should **only transfer emission reductions where this is consistent with their NDC**, implying that baselines may have to be determined in relation to the host country's mitigation pledges rather than using a 'counterfactual' business as usual scenario as a default.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either **existing projects which risk discontinuing GHG abatement** when the incentive from the CDM ceases, such as landfill gas flaring or to new **projects among** the few project types identified that **have a high likelihood of ensuring environmental integrity**.
- Buyers should **accompany purchase of CERs with support for a transition of host countries to broader and more effective climate policies**. In the short-term, where offsetting is used, it should only be on the basis that purchase of CERs does not undermine the ability of host countries to achieve their mitigation pledges.
- Given the inherent shortcomings of crediting mechanisms, we recommend focusing **climate mitigation efforts** on forms of carbon pricing **that do not rely extensively on credits** and on measures such as results-based climate finance that does not result in the transfer of credits or offsetting the purchasing country's emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement alternative climate policies.
- To enhance the environmental integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We also recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report.
- We also recommend provisions that provide strong incentives to the Parties involved to ensure the integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission reductions, but could also extend to other elements, such as im-

plementation of **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche role** focusing on those project types for which additionality can be relatively assured. Crediting should serve as a stepping-stone to other, more effective policies to achieve cost-effective mitigation. Continued support to developing countries will be key. We recommend using new innovative sources of climate finance, such as revenues from auctioning of emission trading scheme allowances, rather than crediting for compliance, to support developing countries in implementing their NDCs.

Summary

Aim of the study

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the **CDM** certainly forms an **important basis** for the elaboration and design of future mechanisms for international carbon markets. One key feature of both the CDM and the mechanism under Article 6.4 is that they should generate **real and additional** emission reductions. In other words, emission reductions that are credited and transferred should not have occurred in the absence of the mechanism and should not be overestimated. This study analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides findings on the **overall and project-type-specific environmental performance of the CDM** in the form of estimates of the **likelihood that the CDM results in real and additional emission reductions**. In addition, it provides lessons and recommendations for improving additionality assessment that can be applied to future crediting mechanisms.

Methodological approach

The main focus of this study is to assess the extent to which the CDM meets its objective to deliver “real, measurable and additional” emission reductions. In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, we systematically analyze CDM rules and how they have been applied to real projects in practice. We examined the rules for 1) **additionality assessment**, for 2) the **determination of baseline emissions** and 3) a number of **other issues** including the length of crediting period, leakage effects, perverse incentives, double counting, non-permanence, monitoring provisions and third party validation and verification. We approach these aspects from two different perspectives: we evaluate 1) **general CDM rules** that are particularly relevant for the delivery of real, measurable and additional emission reductions and we evaluate 2) **specific project types** with a view to assessing how likely these project types deliver additional emission reductions. To assess the impacts of our analysis, we further estimate the **potential 2013-2020 CER supply** from different project types.

Project-types-specific results

Table 1-1 (p. 13) below provides an overview of the findings on environmental integrity based on the detailed analysis of individual project types. **Most energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, efficiency improvements or

fossil fuel switch. An important reason why these projects types are unlikely to be additional is that the revenue from the CDM for these project types is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. Moreover, many projects are economically attractive, partially due to cost savings from project implementation (e.g. fossil fuel switch, waste heat recovery) or domestic support schemes (renewable power generation).

Table 1-1: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
... likelihood of emission reductions being real, measurable, additional						
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered **likely to be additional** as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and do not generate significant revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-23 and nitric acid projects, perverse incentives have been adequately addressed. With regard to **adipic acid** projects, the risks for **carbon leakage have not yet been addressed**.

Methane projects (landfill gas, coal mine methane) also have a **high likelihood of being additional**. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face **issues with regard to baseline emissions and perverse incentives** and may thus lead to over-crediting.

Biomass power projects have a **medium likelihood of being additional** since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects **can be additional**, particularly if CER revenues for **methane avoidance can be claimed**. Biomass projects also face other issues, in particular with regard to demonstrating that the **biomass used is renewable**.

The additionality of **efficient lighting** projects using small-scale methodologies is **highly problematic** because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The **new methodologies** address these problems but they are **not mandatory** and the small-scale methodologies are, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For **cook stove** projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Particularly in urban areas, the additionality of these project types is questionable. Cook stove projects are also likely to considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Overall environmental assessment

Based on these considerations, we estimate that **85% of the covered projects and 73% of the potential 2013-2020 CER supply have a low likelihood** of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only **2% of the projects and 7% of potential CER supply have a high likelihood** of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity (Table 1-1, p. 13).

Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's **performance as a whole has anything but improved**, despite improvements of a number of CDM standards. The main reason for this is a **shift in the project portfolio towards projects with more questionable additionality**. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential of these project types is only less than a quarter. A second reason is that the **CDM Executive Board (EB)** has not only improved rules but also **made simplifications** that undermined the integrity. For example, positive lists have been introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). A third reason is that the **CDM EB** did not take effective means to **exclude project types** with a low likelihood of additionality. While positive lists have been introduced, project types with more questionable additionality have not been excluded from the CDM. Standardized baselines provide a further avenue to demonstrating additionality but do not reduce the number of projects wrongly claiming additionality. The improvements to the CDM mainly aimed at **simplifying requirements and reducing the number of false negatives** but did not address the false positives.

The result of our analysis therefore suggests that the **CDM has still fundamental flaws in terms of environmental integrity**. It is likely that the large majority of the projects registered and CER issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC.

Recommendations for improving general additionality rules

For an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. **Information asymmetry** between project developers and regulators, combined with the economic incentives for project developers to have their project recognised as additional, are a major challenge. We carefully scrutinised the **four main approaches** used to determine additionality. Our analysis shows that **prior consideration** is a necessary and important but not sufficient step for ensuring additionality of CDM projects and that this step largely

works as intended. The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. Especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters, such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio. The **barrier analysis** has lost importance as a stand-alone approach of demonstrating additionality. Non-monetized barriers remain subjective and are often difficult to verify by the DOEs. In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. However, the way in which common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality; it is important to reflect that market penetration is not for all project types a good proxy for the likelihood of additionality.

Against this background, we recommend that the **common practice analysis** is given a **more prominent role in additionality determination** though only after a significant reform:

- The 'one-size-fits-all' approach of determining common practice should be replaced by **sector- or project-type-specific guidance**, particularly with regard to distinguishing between different and similar technologies and with regard to the threshold for market penetration.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country.
- The common practice analysis should at least cover the **entire country**. However, if the absolute number of activities in the host country does not ensure statistical confidence, the scope needs to be extended to other countries.
- As a default, all CDM projects should be included in the common practice analysis, unless a methodology includes different requirements.

We further recommend that the **investment analysis** is excluded as an approach for demonstrating additionality for projects types in which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence. For those project types in which the investment analysis would still be eligible, the project participant must confirm the all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders. The **barrier analysis** should be abolished entirely as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types). Barriers that can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

In addition, we recommend improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period the validity of the baseline scenario should be assessed for CDM project types for which the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex should be limited to one single crediting period. Moreover, generally abolishing the renewal of crediting periods while allowing a somewhat longer single crediting period for project types that require a continuous stream of CER revenues to continue operation may be considered.
- **Positive Lists:** The review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of na-

tional policies and measures to support low emission technologies (so-called E- policies). To maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists.

- **Standardized baselines:** Once established in a country, their use should be made mandatory and all CDM facilities should be included in the peer group used for the establishment of standardized baselines.
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity by over-crediting emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by being excluded from the crediting baseline where possible.
- **Suppressed demand:** An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand could be restricted to countries where development needs are highest and the potential for over-crediting is the smallest.

Recommendations to improve project type specific rules

Industrial gas projects: Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. Therefore, a global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects would provide for a high degree of environmental integrity. However, industrial gas projects provide for low-cost mitigation options. These emission sources could therefore also be addressed through domestic policies, such as regulations, or by including the emission sources in domestic or regional ETS, and help countries achieve their Nationally Determined Contributions (NDCs) under the Paris Agreement. Parties to the Montreal Protocol are also considering regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM.

Energy-related project types: We recommend that these project types should, in principle, no longer be eligible under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers. These project types may thus remain **eligible in least developed countries**. In cases in which **biomass power generation** is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM, provided that the corresponding provisions in the applicable methodologies are revised appropriately.

With regard to **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass and if approaches for determining the penetration rate of efficient lighting technologies were made mandatory for all new projects and CPAs while the older methodologies are withdrawn, we recommend that these project types should remain eligible.

Methane projects: Landfill gas and coal mine methane projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and requesting DOEs to verify that landfilling practices are not changed. With regard to landfill gas, we recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Implication for the future use of international carbon markets

The **CDM has provided many benefits**. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer, may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures and created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of gathering considerable experience, the **enduring limitations** of GHG crediting mechanisms are apparent.

Firstly and most notably, the **elusiveness of additionality** for all but a limited set of project types is very difficult, if not impossible, to address. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is **difficult to address through improvements of rules**. Secondly, international crediting mechanisms involve an **inherent and unsolvable dilemma**: either they might create **perverse incentives for policy makers** in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they **credit activities that are not additional** because they are implemented due to policies or regulations. Thirdly, for many project types, the **uncertainty of emission reductions** is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain for how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules. A further overarching shortcoming of crediting mechanisms is that they do **not make all polluters pay but rather they make them subsidize the reduction of emissions**. Most of these shortcomings are inherent to using crediting mechanisms, which **questions the effectiveness of international crediting mechanisms as a key policy tool** for climate mitigation.

The future role of crediting mechanisms should therefore be revisited in the light of the Paris Agreement. Several **elements of the CDM could be used** when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. The Paris Agreement therefore requires countries to **adjust their reported GHG emissions** for international transfers of mitigation outcomes, in order to **avoid double counting** of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond what they had pledged under their NDC. A second important implication relates to the incentives for host countries to ensure integrity. Host countries with ambitious and economy-wide mitigation pledges would have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. In combination, this suggests that the

future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries. A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules in assessing the additionality of projects considered for funding.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either existing **projects that are at risk of stopping GHG abatement** or the few project types that have a **high likelihood of ensuring environmental integrity**. Continued purchase of CERs should be accompanied with a plan and support to host countries to **transition to broader and more effective climate policies**. We further recommend to pursue the purchase and cancellation of CERs as a form of **results-based climate finance** rather than using CERs for compliance towards meeting mitigation targets.
- Given the inherent shortcomings of crediting mechanisms, we recommend **focusing climate mitigation efforts** on forms of carbon pricing that do **not rely extensively on credits**, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement broader climate policies.
- To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend **limiting** such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches. We also recommend curtailing the length of the crediting periods with no renewal.
- Given the high integrity risks of crediting mechanisms, we recommend provisions that provide strong incentives to the Parties involved to ensure integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission re-

ductions, but could also extend to other elements, such as **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM has had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment confirms, alongside other evaluations, the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche-specific role** in which additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

1. Introduction

With almost 7,700 Clean Development Mechanism (CDM) projects and almost 300 programmes of activities (PoAs) registered and more than 1.6 billion Certified Emissions Reductions (CER) issued, the CDM has developed into an important component of the global carbon market. However, its role in the future remains uncertain. With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end, most likely soon after 2020.

However, in terms of its standards, procedures and institutional arrangements, the CDM forms certainly an important base for the elaboration and design of future mechanisms for international carbon markets. The mechanism established under Article 6.4 of the Paris Agreement includes several provisions that are similar to the CDM. Parties also decided that the rules, modalities and procedures of the new mechanism should be adopted on the basis of the “experience gained with and lessons learned from existing mechanisms”. Moreover, experiences gained from the CDM can also be used for the development of domestic baseline and credit policies both in developed and developing countries.

One key feature of both the mechanism under the Paris Agreement (Article 6.4) and domestic baseline and credit policies is that they should generate real and additional emission reductions, in other words: the credited and transferred emission reductions should not have occurred in the absence of the mechanism and or policy. The ability to deliver such a result depends heavily on having a reasonably effective way to assess additionality both for specific project types and on an aggregate basis, and to set a baseline such that the number of credits issued does, in total, not exceed actual reductions.

Demonstrating additionality and setting baselines are the areas in which the most concerns have been raised with the CDM, in particular regarding the investment, barrier and common practice analysis and the assessment of prior consideration. Given its counterfactual nature, asymmetries of information regarding costs, financing, barriers and local project conditions, and signal-to-noise issue, it has been difficult to implement a reliable method for assessing additionality and setting baselines. Other factors that also affect the overall mitigation outcome are the length of the crediting period used, how leakage concerns are dealt with and whether any perverse incentives are addressed, among others.

The difficulties with these traditional approaches have resulted in further refinement and revision of these approaches as well as the introduction of several alternative approaches to setting of baselines and testing additionality. Examples include the use of default values, performance benchmarks or penetration rates and discounting approaches. More fundamental changes include the use of highly standardized baselines and additionality tests at the sectoral level. It remains to be seen whether the methodological difficulties with highly standardized approaches can be solved to make them operational, and whether they will result in a lower likelihood of non-additional credits being issued.

The additionality of CDM projects has been assessed in the past in several general and project-specific studies. Much of the research was conducted before the improvement of rules and the introduction of new approaches, such as standardized baselines. This study aims to assess whether and how these changes have affected the quality of CDM projects, focusing on the project portfolio available in the second commitment period of the Kyoto Protocol and taking due account of the improvements implemented over time.

In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, a systematic assessment is required of the CDM rules and how they have been applied to real projects in practice. A similar exercise should be carried out for the different reforms suggested to the existing rules. This study therefore analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides robust and quantified conclusions on the overall and project-type-specific environmental performance of the CDM in the form of estimates of the likelihood that the CDM results in real and additional emission reductions.

2. Methodological approach

2.1. General research approach

The main focus of this study is to assess the extent to which the CDM meets its objective stipulated in Article 12.5(c) of the Kyoto Protocol to deliver “real, measurable and additional” emission reductions. Based on the findings, concrete recommendations are made for further reform of the CDM and implications for the future role of the CDM are discussed.

There are two principal challenges to evaluating of the ability of the CDM to deliver additional emission reductions: the inherent uncertainty of a counter-factual baseline and the uncertainty and bias associated with project and baseline data. Therefore, any assessment of the extent of non-additional or otherwise under- or over-credited CDM activity can therefore only provide rough and directional estimates. Project design documents (PDDs) and monitoring reports provide substantial data and assumptions. However, these data and assumptions are often limited (they may not cover all relevant activity, especially non-CDM activity) and can involve considerable judgment by parties that have an interest in the outcome (e.g. selecting among alternative projections of future fuel prices) made for the purpose of meeting CDM requirements.

We examine the three main aspects as regards whether the CDM delivers additional emission reductions:

1. **Additionality assessment:** The assessment of additionality refers to the question of whether a project was implemented due to the CDM. Additionality is the most important prerequisite to providing an emissions benefit. If a project would have been implemented in the absence of the CDM incentives, the emission reductions would have occurred anyway. If a Party uses non-additional CERs rather than reducing its own emissions to meet its emission reduction commitments, global GHG emissions would be higher than they would have otherwise been. Because errors in additionally determination affect the validity of an entire project’s CERs, additionality assessment forms the main focus of this study.
2. **Determination of baseline emissions:** A second important aspect is how the baseline emissions are determined. Determining baseline emissions is associated with considerable uncertainty. A crediting baseline that is above the emissions that would most likely occur in the absence of the project can lead to significant over-crediting. Vice versa, ambitious baselines that are below the emissions that would most likely occur in the absence of the project, can result in under-crediting.
3. **Other issues:** A number of other issues are important to deliver additional emission reductions, including:
 - the length of crediting period,
 - criteria for the renewal of the crediting period,

- approaches for determining indirect emission effects, such as leakage effects,
- the way in which perverse incentives for both project developers and policy makers are addressed,
- the extent to which double counting of emission reductions within the mechanism and with other mechanisms and pledges is avoided,
- whether potential non-permanence of emission reductions is sufficiently addressed,
- whether monitoring provisions are appropriate, and
- the effectiveness of the regulatory framework for third party validation and verification.

We also touch upon these issues, in particular when they raise concerns with regard to the integrity of the CDM. They do not, however, form the focus of this study.

In our examination, we approach these aspects from two different perspectives:

- **General CDM rules:** In Chapter 3, we evaluate approaches for determining general CDM additionality rules that are particularly relevant for the delivery of real, measurable and additional emission reductions. This includes an assessment of innovative and potentially more objective approaches for setting baselines and determining additionality and an analysis of whether and how these approaches could improve the determination of additionality under the CDM.
- **Specific project types:** In Chapter 4, we evaluate specific project types with a view to assessing how likely these project types deliver additional emission reductions. A separate evaluation by project type is important as the likelihood of additional emission reductions can differ significantly among project types. This evaluation covers the major project types contributing to a large share of the emission reductions in the CDM portfolio.

Drawing on findings from Chapters 3 and 4, we provide an overall assessment of the additionality of the CDM project portfolio in Chapter 5. In Chapter 6, we provide a summary of key recommendations for further reform of the CDM. Finally, we discuss the implications for the future use of the CDM in Chapter 7.

The study employs several analytical methodologies and approaches:

- **Literature analysis** forms the basis for our evaluation of general CDM rules, specific project types, and innovative approaches towards baseline setting and additionality assessment.
- **Qualitative assessment of relevant CDM rules** with a view to their ability for ensuring additional emission reductions. We identify potential shortcomings in the current rules and propose options for addressing them.
- **Empirical, quantitative evaluation of how the CDM rules are applied** through analysis of a representative random sample of projects. The analysis will be based on information in PDDs and validation reports and, where necessary, also monitoring and verification reports. The projects will be identified through stratified random sampling, aiming to ensure representativeness of host countries and project types. This empirical analysis aims to identify possible shortcomings in the application of general CDM rules. The information and data to be evaluated is specific for each of the identified general CDM rules and the questions identified. The methodological approach of the empirical evaluation is further specified in Section 2.2 below.
- **Economic assessment** of the feasibility of different project types is another important building block of the study. The economic assessment is conducted for the evaluation of

specific project types in Chapter 4. The methodological approach of the empirical evaluation is further specified in Section 2.3 below.

- **Sectoral analysis** of the market situation for specific project types to assess whether the technology has often already been implemented without the CDM and whether an observed market uptake occurs due to the CDM. The sectoral analysis is conducted for the evaluation of specific project types in Chapter 4. The methodological approaches are further specified in the corresponding sections.

We use the CDM rules and the CDM project portfolio as of 1 January 2014 as the basis for the assessment.

To assess the impacts of our analysis, we further estimate the potential 2013-2020 CER supply for different project types. The method used to estimate the potential CER volume is described in Section 2.3.

2.2. Empirical evaluation of CDM projects

The assessment of key CDM rules for additionality demonstration in Chapter 3 is based on an in-depth evaluation of PDDs, validation reports, etc. of randomly selected CDM projects. The project samples were randomly drawn from the so-called CDM project pipeline as of 1 January 2014 (UNEP DTU 2014). This pipeline is a compilation of certain information and data provided in the project design document (PDD) of each CDM project. For this assessment, only registered CDM projects were taken into account as the PDDs usually undergo significant changes during the validation period. To ensure representativeness, the samples were stratified by the following characteristics and strata:

- Location (host country/region)
 - China
 - India
 - Asia & Pacific
 - Brazil
 - Latin America
 - Rest of the World
- Technology
 - Industry (HFC-23, N₂O, cement, energy efficiency, energy distribution, etc.)
 - Electricity generation from hydro
 - Electricity generation from wind
 - Electricity generation from renewable energy (solar, tidal, etc.)
 - Other renewable energy (biomass, geothermal, mixed renewable energy, etc.)
 - Waste sector (landfill gas, methane avoidance, etc.)
 - Other (afforestation, reforestation, agriculture, transport, etc.)
- Scale
 - Large-scale projects
 - Small-scale projects
- Time (registration year)
 - Pre 2010
 - In 2010 or 2011
 - Post 2011.

The in-depth assessment of project samples was conducted for the key additionality determination rules: investment analysis (Section 3.2), barrier analysis (Section 3.3) and common practice analy-

sis (Section 3.3). For each of these rules a separate sample of 30 randomly selected CDM projects was drawn.

Since the CDM project pipeline did not include information about which option of additionality determination was applied in the PDD, we had to conduct a two-step sampling: In the first step, we drew a representative sample of 300 projects. For each of the projects of this sample we identified which additionality determination rules were applied so that we could use this sample as population for the second sampling step in which we drew the samples for each of the additionality determination rules.¹

2.3. Estimation of the potential CER supply

We estimate the potential CER supply² for the purpose of assessing the overall integrity of the CDM based on our findings for specific project types or specific additionality tests. The potential CER supply is estimated mainly on the basis of the CDM pipeline as of 1 January 2014 (UNEP DTU 2014). Moreover, we included additional information from a similar pipeline which is provided by IGES (2014). All CDM projects which were registered by 1 January 2014 are taken into account (7,418). In the case of industrial gas projects (HFC-23, adipic acid, nitric acid), some baseline and monitoring methodologies were significantly revised, which has a major impact on the potential CER supply in the second and third crediting periods. For these projects, we use specific bottom-up estimates derived from project-specific information (Schneider & Cames 2014).

We distinguish the CER supply potential considering the duration of the commitment periods under the Kyoto Protocol:

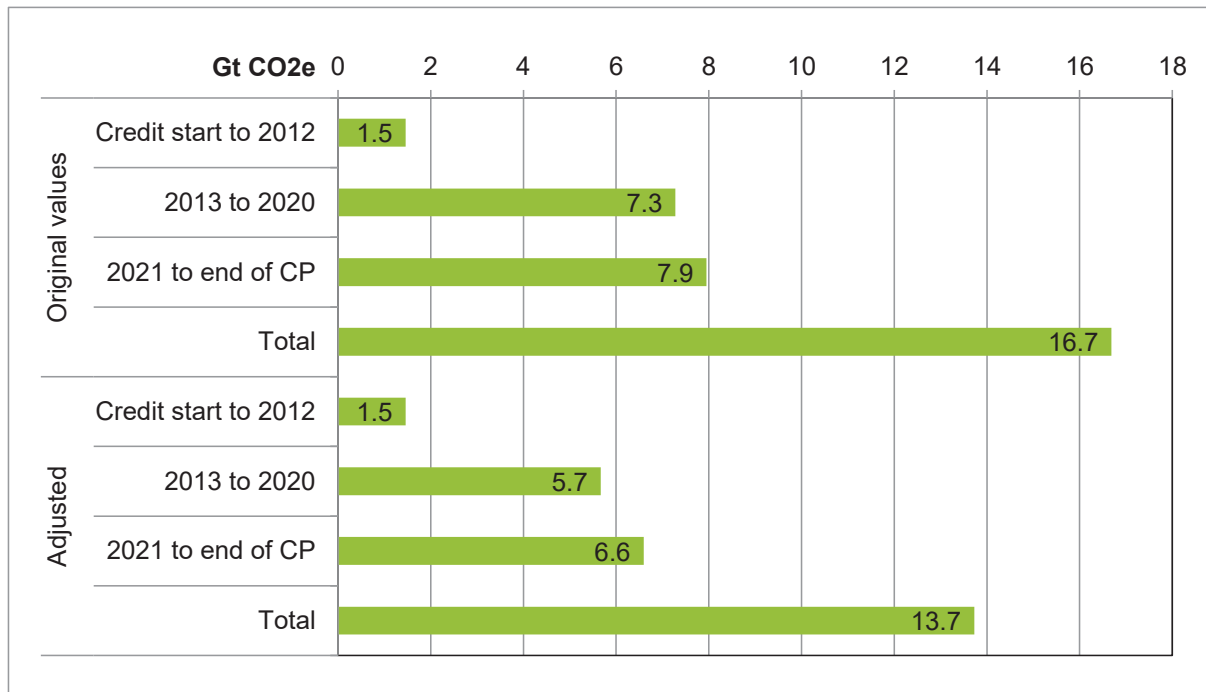
- from credit start to the end of 2012,
- from the beginning of 2013 to the end of 2020 and
- from the beginning of 2021 to the end of the crediting periods (CP).

Our study is focused on the period of 2013 to 2020.

Figures for the period from credit start to the end of 2012 reflect the actual CER issuance rather than the potential supply (UNFCCC 2015a). For the latter two periods, we take into account the issuance success rate provided in the CDM pipeline and adjust the expected CER supply accordingly. For some projects, more CERs were issued than projected while for most of the CDM projects less CERs were issued. Several projects had not issued any CERs (4,913). For those projects we assume either the average issuance rate for the respective project type or – if no CERs have been issued for that project type so far – the overall average of the issuance success rate. Figure 2-1 provides an overview of the potential CER supply.

¹ A more detailed description of the sampling approach, the code used for drawing the samples and the reference numbers of the projects drawn into each of the samples can be found in Section 8.1 of the Annex.

² The actual CER supply depends on various conditions of the global carbon market and particularly on price expectations. However, also under normal market conditions, price forecasts are very uncertain. Under post-2012 market conditions, prices are even more uncertain. We therefore only estimate the potential CER supply which is derived from information in PDDs and other project specific or general documents but ignore any interaction with the global carbon market. At price levels of less than \$1/CER, the estimated volumes will not be achieved in practice.

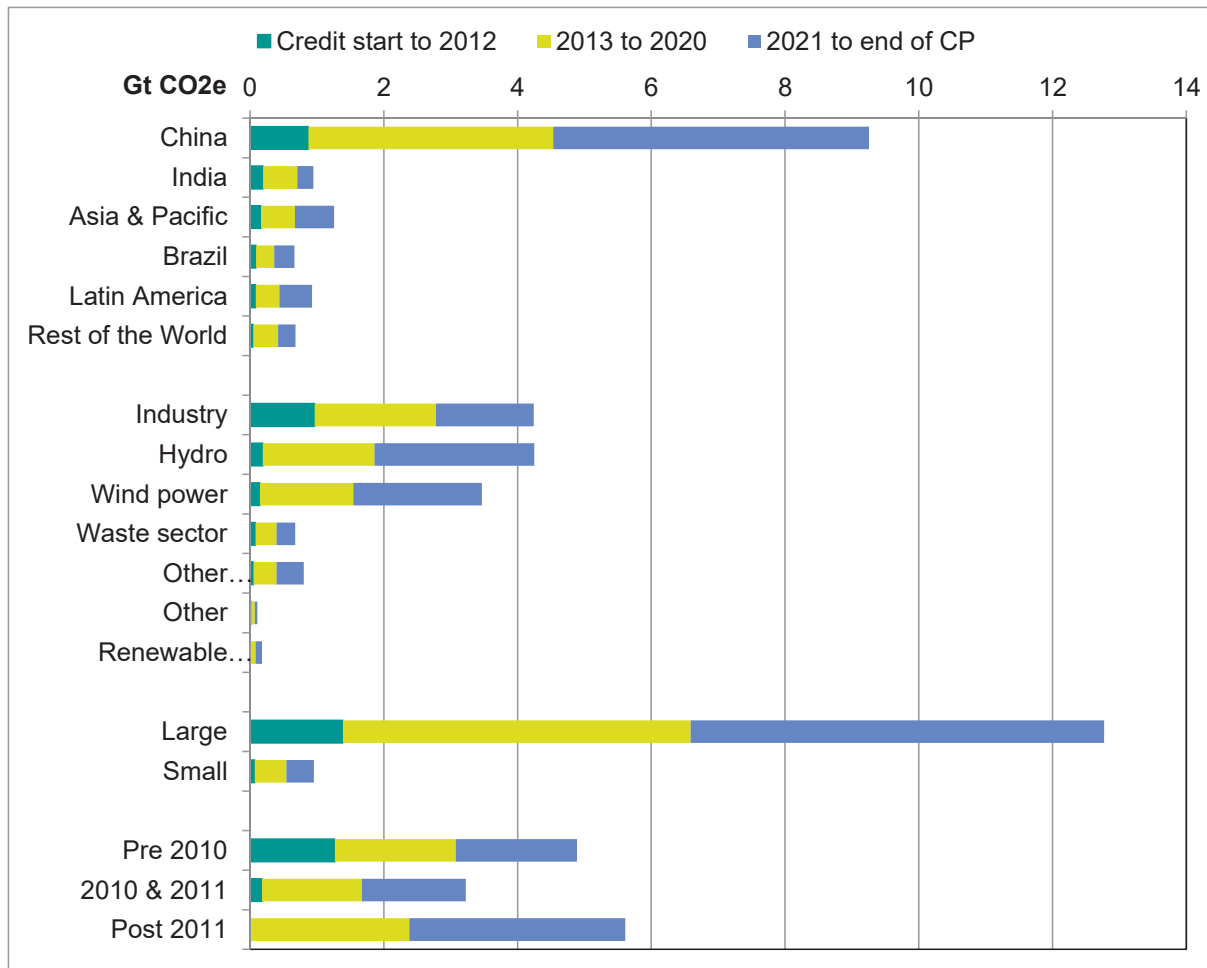
Figure 2-1: Potential CER supply, original and adjusted values

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The average adjustment factor is -22% though it ranges from -4% for N₂O projects to some -67% for transport projects. The adjusted CER supply for the period of 2013 to 2020 amounts to almost 5.7 billion CERs, almost 4 times the volume issued for the first crediting period.

Figure 2-2 illustrates where the potential CER supply stems from. Obviously China was and will remain the largest potential supplier of CERs. Almost two thirds (64.5%) of the potential CER supply in 2013 to 2020 are expected to be provided by Chinese CDM projects. In terms of project types, the large majority of supply stems from industry (32.0%), hydro (29.4%) and wind (24.6%) projects. Not surprisingly, the large majority (91.3%) of CERs stems from large scale projects while the breakdown in terms of registration period is more even: 31.8% stems from projects registered before 2010, 26.3% from projects registered in 2010 and 2011 while 41.8% of the potential CER supply in the period of 2013 to 2020 can be generated from CDM projects registered after 2011.

Figure 2-2: Potential CER supply by stratification categories



Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

In Chapter 4 we analyze the extent to which the likelihood of projects and CERs being additional depends on the project type. We look at 12 different project types, which together cover a broad range of activities and technologies. In terms of CER supply, these 12 project types amount to 85% of the potential supply in the period of 2013 to 2020 (Table 2-1). The largest supply potential is provided by hydro and wind power projects (29.4% and 24.6%, respectively). Industrial gas projects amount to almost 15% of the supply potential while biomass power, landfill gas, waste heat recovery and fossil fuel switch projects could each generate some 3-4% of the supply potential. Compared to these project types the supply potential of cook stoves (0.04%) and efficient lighting (0.07%) are almost negligible. However, since these project types are often included in government purchase programs or voluntary offset schemes and since their share among projects registered after 2012 is significant, we consider it worthwhile to examine these two project types in greater depth and to assess their likelihood of being additional and of generating additional CERs.

Table 2-1: Potential CER supply by project type

	No. of projects	Credit start to 2012	2013 to 2020	2021 to end of CP Adjusted	Total
			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production	19	507	375	547	1,429
Adipic acid	4	201	257	269	727
Nitric acid	97	57	175	172	404
Hydro power	2,010	191	1,669	2,388	4,249
Wind power	2,362	148	1,397	1,929	3,475
Biomass power	342	25	162	169	355
Landfill gas	284	57	163	159	380
Coal mine methane	83	34	170	123	327
Waste heat recovery	277	63	222	62	346
Fossil fuel switch	96	51	232	175	458
Cook stoves	38	0.1	2.3	0.4	2.7
Efficient lighting	43	0.4	3.8	0.2	4.5
Not covered	1,763	124	842	603	1,569
Total	7,418	1,459	5,671	6,596	13,726

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The first Programme of Activities (PoA) was registered in July 2009. From then until the end of 2013, 243 PoAs were registered in total, the large majority of them in 2012 (193). While cook stoves and efficient lighting account for only a small share in the CDM project pipeline, they are quite relevant in the context of PoAs. By the end of 2013, they account together for a quarter of the registered PoAs. Table 2-2 provides a breakdown of the potential CER supply from PoAs by project types.

Table 2-2: Potential CER supply from PoAs

	No. of programs	Credit start to 2012	2013 to 2020	2021 to end of CP	Total
			Mt CO ₂ e		
Hydro power	26		5	13	17
Wind power	24		18	45	63
Landfill gas	4	0	12	27	40
Coal mine methane	2		5	10	15
Fossil fuel switch	2		0	0	0
Cook stoves	31	0	33	82	115
Efficient lighting	30	2	17	63	82
Not covered	124	0	70	144	214
Total	243	2	161	385	547

Sources: UNEP DTU 2014, UNFCCC 2015b, authors' own calculations

The main difference of PoAs compared to projects bundles is that PoAs can – once registered – be extended over time by an unlimited number of so-called component project activities (CPA). An estimate of the CER supply potential is thus less reliable than the estimate for the project pipeline.

However, taking into account all CPAs included in PoAs by the end of 2013, the potential CER supply can roughly be estimated, though it is obvious that the actual supply could be much higher. PoA volumes are much more difficult to estimate, because a PoA might be registered with only one CPA that has 1,000 tCO₂ per year emissions reductions but which may ultimately include CPAs that reduce hundreds of thousands of tCO₂ per year.

Noting these limitations, all PoAs could supply some 0.16 billion CERs in total in the period of 2013 to 2020. The final volume of these PoAs could be many times this amount. Almost a third (31.4%) of this supply would be provided by cook stove or efficient lighting PoAs. CERs from renewable power generation programmes amount to 14% of the supply potential of PoAs. Interestingly, almost half of the PoAs do not fall into the project type categories which together account for 85% of the potential CER supply from CDM projects. This supports the hypothesis that PoAs address project categories or technologies that cannot be adequately addressed by individual CDM projects.

2.4. Economic assessment of CER impact

The demonstration of additionality has been a key issue in the CDM since the beginning of the Kyoto mechanisms (Chapter 3). While most researchers agree that there is no simple and objective approach to determining additionality, several authors argue that the impact of CER revenues on the economic feasibility of projects is an important indicator for the likelihood for projects to be additional (for example Sutter 2003, Schneider 2007, Spalding-Fecher et al. 2012). This builds on the assumption that project proponents are more likely to implement a project due to the CDM if CER revenues have a significant impact on the economic performance of the project. While other benefits from the CDM (e.g. the public relation aspect of registering a project under the UNFCCC) may in some cases help projects to go ahead that would not be implemented in the absence of the CDM, the economic benefit of CER revenues may be considered the main driver to implement CDM projects on a larger scale.

A high economic benefit resulting from CER revenues does not guarantee additionality, because some projects may already be economically viable without CER revenues and may only become more profitable with the CDM. However, low CER revenues are an indicator of a lower likelihood that the project is additional, because with low CER revenues it also becomes more likely that the project would be implemented in the absence of the CER revenues.

In 2005, the CDM Executive Board (EB) decided that, in order to be additional, projects have to demonstrate that they are economically unattractive; however, they are not required to demonstrate that with CER revenues they would become economically viable. Schneider (2007) highlighted that this leads to the situation in which projects with very low CER revenues can prove additionality even though the CER revenues contribute only marginally to closing the profitability gap.

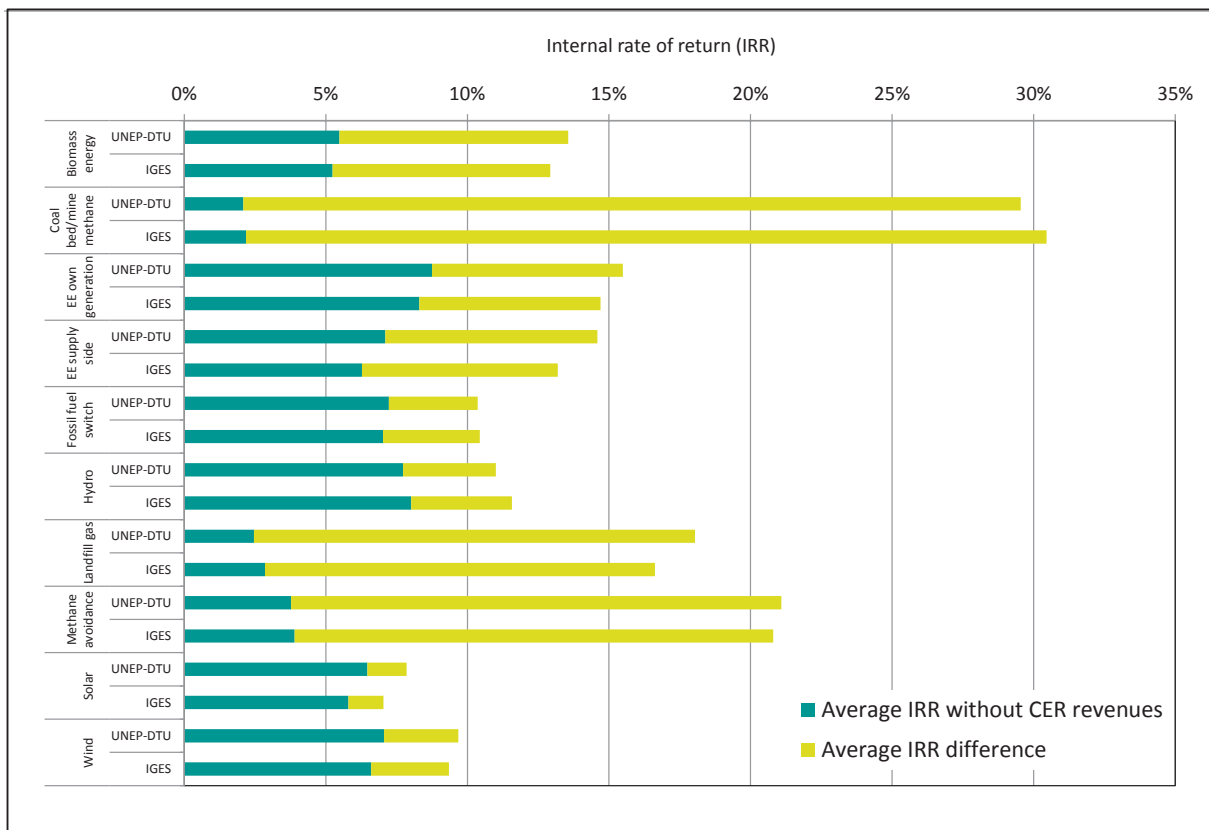
It is difficult to define a minimum required level of contribution from CER revenues that is needed to trigger an investment decision. An important concept in this context is the *signal-to-noise ratio* issue for investment analysis, as mentioned by, for example, Spalding-Fecher et al. (2012): The generally high variability and uncertainty of key parameters that determine the profitability of a mitigation project is often considerably higher than the expected economic benefit of CERs. If the economic impact of the CERs is lower than key uncertainties in the investment analysis, it is rather unlikely that the registration under the CER was the conclusive trigger for the investment and, hence, it is likely that the project is non-additional.

Table 2-3: Impact of CER revenues on the profitability of different project types

Type	Source	Projects with available IRR information	Average IRR without CER revenues	Average IRR with CER revenues	Average IRR difference
Biomass energy	UNEP-DTU	271	5.5%	13.6%	8.1%
	IGES	216	5.2%	12.9%	7.7%
Coal bed/mine methane	UNEP-DTU	70	2.1%	29.5%	27.5%
	IGES	75	2.2%	30.5%	28.3%
EE own generation	UNEP-DTU	205	8.8%	15.5%	6.7%
	IGES	202	8.3%	14.7%	6.4%
EE supply side	UNEP-DTU	36	7.1%	14.6%	7.5%
	IGES	23	6.3%	13.2%	6.9%
Fossil fuel switch	UNEP-DTU	47	7.2%	10.4%	3.1%
	IGES	39	7.0%	10.4%	3.4%
Hydro	UNEP-DTU	1,753	7.7%	11.0%	3.3%
	IGES	1,635	8.0%	11.6%	3.6%
Landfill gas	UNEP-DTU	183	2.5%	18.0%	15.6%
	IGES	165	2.8%	16.6%	13.8%
Methane avoidance	UNEP-DTU	203	3.8%	21.1%	17.3%
	IGES	204	3.9%	20.8%	16.9%
Solar	UNEP-DTU	154	6.5%	7.9%	1.4%
	IGES	122	5.8%	7.0%	1.2%
Wind	UNEP-DTU	2,162	7.1%	9.7%	2.6%
	IGES	1,804	6.6%	9.4%	2.8%

Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Figure 2-3: Impact of CER revenues on the profitability of different project types



Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Information on the impact of CER revenues on economic profitability is available from different sources. Table 2-3 and Figure 2-3 show the impact based on data included in project design documents and as documented in the databases by UNEP DTU (2014) and IGES (2014). In addition, Lütken (2012) has analyzed the annual CER revenues in relation to the capital investment and observed for some project types a (very) limited impact stemming from CER revenues. Spalding-Fecher et al. (2012) analyze the impact of CER revenues on the project IRR for different project types in the IGES database. They conclude that the CER impact on the project IRR is the lowest for renewables including hydro and wind (increase of IRR by 2-3%), fuel switch (4%), and supply-side efficiency (5%). They also provide an overview of more studies analysing the impact of CER revenues for different project types. The relatively low impact of CER revenues compared to other cash flows that are relevant for investment decisions is shown for energy efficiency projects below (Box 2-1).

Overall, the available information shows that the impact of CER revenues on the economic performance of projects varies considerably between project types:

- **Non-CO₂ projects**, such as industrial gas abatement, manure management, waste water treatment, landfill gas utilisation and coal mine methane capture, are characterised by a medium to high impact of CER revenues. For several of these project types, CER revenues increase the IRR by more than 10 percentage points, and for coal mine methane projects even by more than 25 percentage points. For these project types, the CER revenues clearly make a difference, which indicates a higher likelihood of additionality.

- CO₂ projects in renewable energy** such as wind and hydro projects are characterised by a relatively low impact of CER revenues: for wind power, the IRR increases by about 2.5% to 3%, for hydropower by about 3% to 4%, and for solar by about 1% to 1.5%. According to Lütken (2012), the annual CER revenues in relation to investment costs (median) amounted to 1.84% for wind and 3.5% for hydro. Given the typical uncertainties surrounding costs and load factor in renewable projects, this level of CER contributions seems relatively low to justify that the project would not have been implemented in the absence of the CDM. Therefore, in many cases, the additionality of projects within these types may seem rather unlikely (though in some cases it may not be ruled out that additional CER revenues of +3.5% may be the decisive factor rendering a project attractive – though it may not be possible to prove this in an objective way). In addition, many renewable energy projects – in particular hydropower – show a relatively high economic performance without CER revenues (e.g. an IRR of nearly 8% for hydropower without CER revenues), compared to non-CO₂ projects (e.g. landfill gas, coal mine methane and methane avoidance with an IRR of about 2% to 4% without CER revenues).
- CO₂ projects in fuel switch, energy efficiency, and waste heat utilisation** are typically characterised by relatively low investment costs. Thus, CER revenues are higher compared to investment costs (5% for waste heat and 20% for fuel switch – median value). The impact of CER revenues on the internal rate of return is about 3 to 8 percentage points. However, in this project type, fuel prices are the decisive element determining its profitability. Box 2-1 compares the impact of typical fuel costs and CER revenues for energy efficiency projects. Our analysis indicates that CER revenues tend to have a low impact on project profitability. In addition, these project types show a relatively good economic performance without CER revenues, compared to non-CO₂ projects.

Lütken's analysis was based on a CER price of €12. Our analysis in Table 2-3 and Spalding-Fetcher's build on PDD data with similar CER price assumptions. With today's much lower CER prices, the low impact of CER revenues on CO₂ projects and therefore their high risk of non-additionality is further aggravated.

In conclusion, non-CO₂ projects are characterised by a medium-to-high impact of CER revenues and a relatively low economic performance without CER revenues, while for most CO₂ project types the impact of CER revenues is much smaller and the performance without CER revenues higher. Overall, this indicates that on average non-CO₂ projects have a higher likelihood of additionality.

Box 2-1: An analysis of the impact of CER revenues for energy efficiency projects

Another way of assessing the relevance of CER revenues in investment decisions is to compare them to other important revenues or savings in the investment analysis. For instance, for energy efficiency projects to become profitable, they have to (i) save sufficient costs for fossil fuels and (ii) earn sufficient CERs to pay back the investment costs for new equipment improving the energy efficiency. Figure 2-1, Figure 2-2 and Figure 2-4 illustrate the order of magnitude of fuel cost savings in relation to one tonne of CO₂ reduced or CERs generated in the case of projects saving natural gas, light fuel oil and steam coal. For instance, if an installation implements new equipment that reduces the specific consumption of natural gas and the related GHG emissions by one tonne of CO₂, then the related reduction in fuel costs in 2010 would amount to approx. 150 USD/tCO₂ (at OECD average prices in 2010). For light fuel oil, the fuel cost reduction amounts to over 250 USD/tCO₂ and for steam coal, the savings still amount to 37 USD/tCO₂ (in 2010). With this, it becomes obvious that the impact of fuel cost savings on the project cash flow is much higher than contribution from CER revenues.

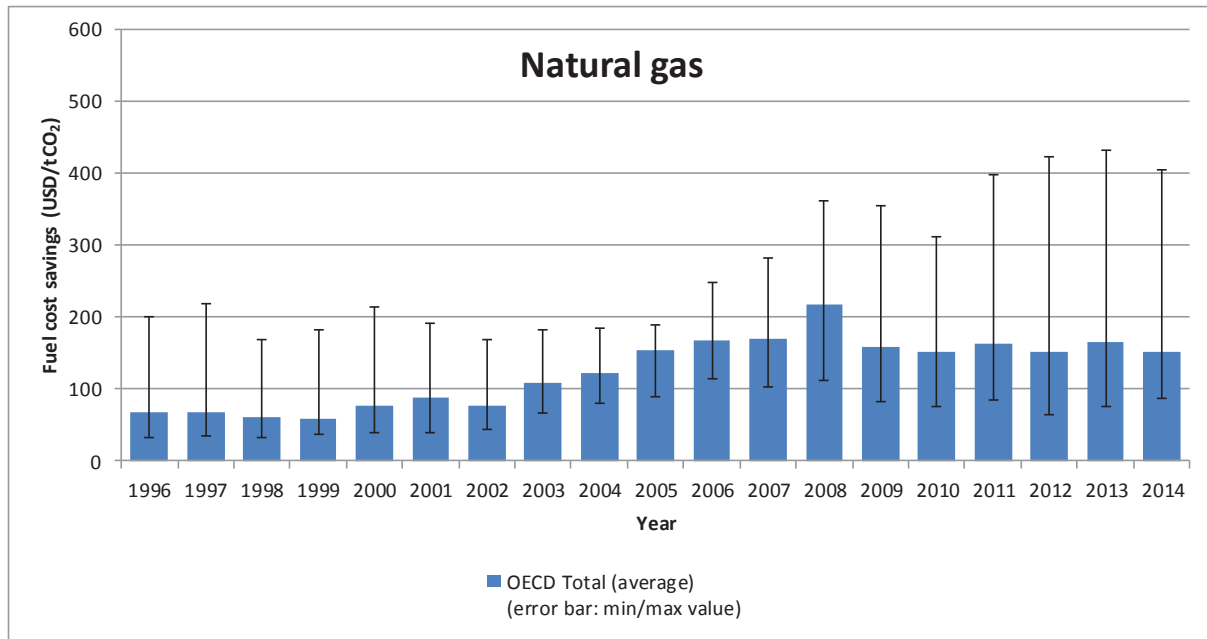
Figure 2-1, Figure 2-2 and Figure 2-4 also show the development of average (and min. and max.) OECD prices over time, which illustrates the high variability of energy prices since 1996. Average specific energy prices have fluctuated in the order of 20 USD/tCO₂ (steam coal) to 200 USD/tCO₂ (light fuel oil). Also compared to the historic fuel price variability, typical CER revenues are low to negligible compared to fuel cost savings.

Please note that because of limitations in data availability, the figures are based on fuel prices in OECD countries, which in many cases also include taxes and may not be representative for all developing countries. In particular, in some developed and developing countries fossil fuel subsidies are very high. In these cases, because of the low prices, the fuel cost savings are low and may be on a similarly low level as the contribution from CER revenues to the positive project cash flow. However, in such a low price situation, the total positive cash flow may in any case be far too small to justify investments in energy efficiency equipment and the scope for CDM may become rather limited.

Overall, it may be argued that for projects to have a high likelihood of additionality the impact of CER revenues should at least be comparable to the main contributor to a positive cash flow, the related fuel savings. This would indicate that in such project types CER prices for energy efficiency projects would need to reach a level of at least 10-20 USD/tCO₂ for steam coal, 30-50 USD/tCO₂ for natural gas and 100-200 USD/tCO₂ for light fuel oil based systems (if prices on the level of OECD countries are assumed). With such CER prices, the economic contribution from CER revenues to positive cash flow reaches a level that may be considered significant (i.e. in the order of ¼ to ½ of fuel cost savings).

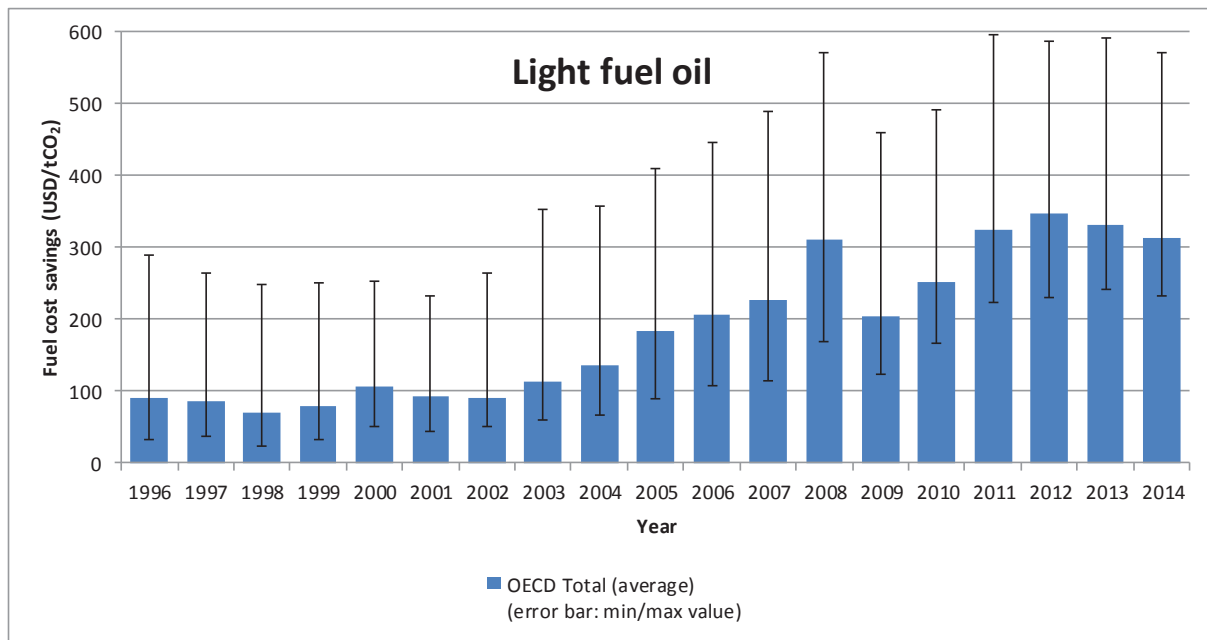
At prices significantly below this level, the economic impact of CERs is insignificant and the risk of non-additionality is very high.

Figure 2-4: Natural gas cost savings per tonne of CO₂ reduced in energy efficiency projects



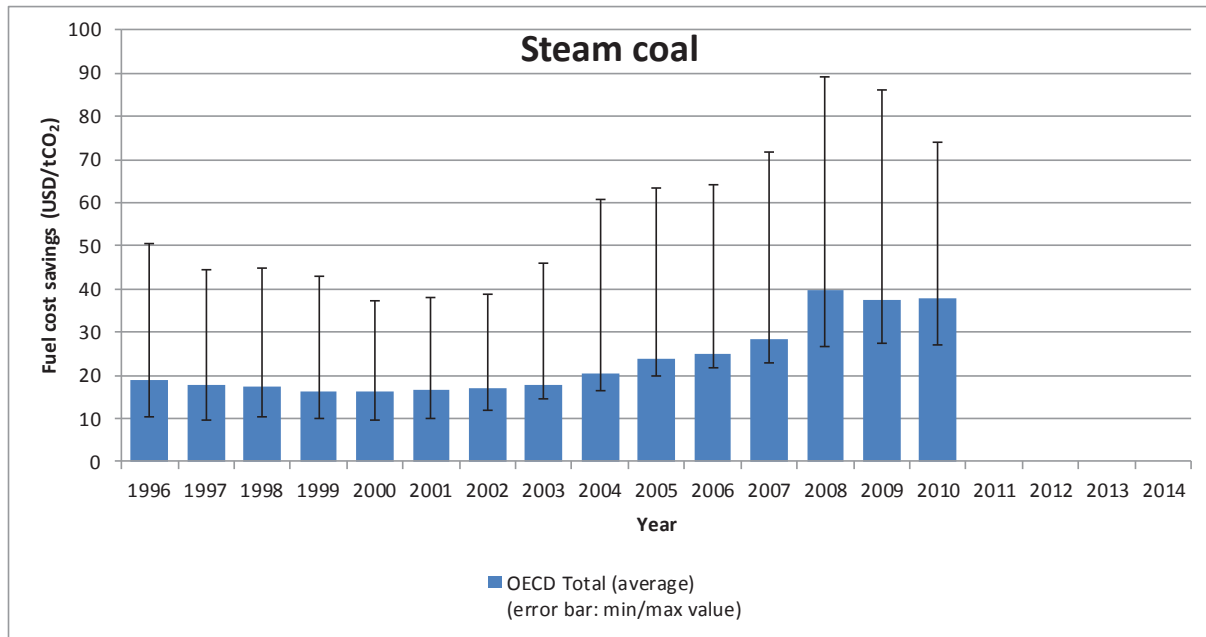
Notes: Average fuel prices of OECD countries (in USD/TJ).
Sources: IEA 2015, IPCC 2006, authors' own calculations

Figure 2-5: Light fuel oil cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).
Sources: IEA 2015, IPCC 2006, authors' own calculations

Figure 2-6: Steam coal cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

3. Assessment of approaches for determining additionality and rules relevant towards additionality

3.1. Prior consideration

3.1.1. Overview

Prior consideration is a key requirement in the CDM. It aims to ensure that only projects are registered in which the CDM was seriously considered when the decision to proceed with the investment was made.

In the first version of the additionality tool prepared in 2004³, a provision was introduced for projects with a crediting period starting prior to registration, which stipulated that evidence has to be provided “that the incentive from the CDM was seriously considered in the decision to proceed with the project activity” and that the “evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available to third parties at, or prior to, the start of the project activity.” The provision remained almost unchanged in the second version of the additionality tool in 2005.

In the third version of the additionality tool in 2007, the provision was removed and then included in the Guidelines for completing the PDD, which are applicable to all projects and not only those applying the additionality tool. These guidelines stipulated that “project proponents shall provide an implementation timeline of the proposed CDM project activity” and that “the timeline should include, where applicable, the date when the investment decision was made, the date when construction

³ EB 16, Annex 1: Tool for the demonstration and assessment of additionality.

works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started)". Also, according to the guidelines, "project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions"⁴.

In 2008, the CDM EB introduced general guidance on the demonstration and assessment of prior consideration⁵. The guidance was subsequently revised twice⁶, including further guidance for DOEs on how to validate real and continuing actions; in 2011 it was incorporated in the project standard (PS)⁷. According to the latest version of the project standard⁸, "if the start date of a proposed CDM project activity ... is prior to the date of publication of the PDD for the global stakeholder consultation, project participants shall demonstrate that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity". More specifically, project participants of project activities with a starting date on or after 2 August 2008 "*shall inform the host Party's designated national authority (DNA) and the secretariat of their intention to seek CDM status in accordance with the Project cycle procedure*", while "for a proposed CDM project activity with a start date before 2 August 2008 and prior to the date of publication of the PDD for global stakeholder consultation, project participants shall demonstrate that the CDM was seriously considered in the decision to implement the proposed project activity". For this purpose, "project participants shall provide evidence of their awareness of the CDM prior to the start date of the proposed project activity, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project"⁹, "*provide evidence that continuing and real actions were taken to secure CDM status for the proposed project activity in parallel with its implementation*"¹⁰ and "provide an implementation timeline of the proposed CDM project activity. The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). Project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions".

The CDM project cycle procedure¹¹ includes details about the notification process related to prior consideration (i.e. forms to be used, etc.). According to this procedure, for project activities with a start date on or after 2 August 2008, notification to the DNA of the host country and to the Secretariat must be made "within 180 days of the start date of the project activity". A list of notifications received by the Secretariat is available on the UNFCCC website.¹²

The requirements for demonstrating prior consideration set out in the project standard are generally applicable with the exception of programmes of activities (PoAs).

⁴ EB 41, Annex 12: Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM) (Version 07).

⁵ EB 41, Annex 46: Guidance on the Demonstration and Assessment of Prior Consideration of the CDM.

⁶ EB 48, Annex 61 and EB 49, Annex 22.

⁷ EB 65, Annex 5.

⁸ CDM project standard, Version 07.0, EB 79, Annex 3.

⁹ Relevant evidence could, for instance, relate to "minutes and/or notes related to the consideration of the decision by the EB of Directors, or equivalent, of the project participants, to undertake the project as a CDM project activity".

¹⁰ Relevant evidences "should include one or more of the following: contracts with consultants for CDM / PDD / methodology / standardized baseline services; draft versions of PDDs and underlying documents such as letters of authorization, and if available, letters of intent; emission reduction purchase agreement (ERPA) term sheets, ERPAs, or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds); evidence of agreements or negotiations with a DOE for validation services; submission of a new methodology or standardized baseline, or requests for clarification or revision of existing methodologies or standardized baselines to the EB; publication in a newspaper; interviews with DNA; earlier correspondence on the project with the DNA or the secretariat".

¹¹ Current version 07.0, EB 65, Annex 32.

¹² <https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>.

With regard to PoAs, the project cycle procedure includes the non-binding provision that “*the coordinating/managing entity may notify to the DNA(s) of the host Party(ies) of the PoA and the secretariat in writing of the intention to seek the CDM status for the PoA, using the [corresponding form] for the purpose of determining the start date of the PoA*”. According to the CDM project standard, the start date of a PoA is either “*the date of notification of the intention to seek the CDM status by the coordinating/managing entity to the secretariat and the DNA*” or “*the date of publication of the PoA-DD for global stakeholder consultation*”. With regard to CPAs, “*the start date of a CPA is the earliest date at which either the implementation or construction or real action of the CPA begins*” and it shall be confirmed that “*the start date of any proposed CPA is on or after the start date of the PoA*”. The only exception to this rule relates to afforestation and reforestation (A/R) PoAs, which allows “*the inclusion of any A/R project activity that started after 1 January 2000 but has not been registered as a CDM project activity as a CPA in an A/R PoA*”.¹³

3.1.2. Assessment

The issue of projects obtaining registration as CDM projects without serious consideration of the CDM benefits at the time of the investment decision was especially a concern during the first years of the CDM. The requirement to demonstrate prior consideration was only gradually introduced over time and became generally applicable only in 2007. Also, as pointed out by Schneider (2007), the requirement was also not always followed: only 36% of the projects seeking retroactive crediting provided evidence that the CDM was considered in the decision to proceed with the project and it is reported that relevant documentation has been backdated. It can, therefore, be concluded that for early CDM projects, the demonstration of prior consideration was questionable.

The approach applied as of August 2008 (i.e. for the bulk of projects and generated CERs) requires notification of the prior consideration of the CDM as well as, in situations of delay, evidence of continued interest in the CDM using a form designed for this purpose. This requirement addresses the issue of prior consideration in a more objective and appropriate manner, avoiding the risk of back-dating of company-internal information or subjective claims of prior consideration. In this regard, the rules have improved over time and there is no evident flaw in the current rules and therefore no need for the current practice to be changed.

However, it should be noted that the notification of prior consideration ensures that projects cannot claim CDM registration retroactively, but does not demonstrate whether or not a project is additional. In this regard, this rule does not provide any information on the additionality of projects since both truly additional projects and free riders may apply for the CDM status. This rule is therefore important to exclude projects which did not consider the CDM at all and are therefore clearly not additional, but it is not sufficient for assessing whether a project can be considered additional or not.

With regard to the practical implementation, a period of 180 days for notification of prior consideration can be considered quite generous. While a certain grace period is certainly reasonable due to the administrative process of making the PDDs available for global stakeholder consultation, a period of six months could mean that the project is already quite advanced, which would then call into question whether CDM benefits were actually necessary for the project to proceed. A long grace period could therefore be regarded as allowing retroactive crediting.

The requirements regarding the start date of PoAs and CPAs are sufficiently strict to avoid any project activity that has already started being registered as CPAs under a PoA. The only rule that cannot be considered adequate relates to the inclusion of old A/R activities in a newly registered

¹³ Clarification "Start date and crediting period of component project activities under an afforestation and reforestation programme of activities", EB 73, Annex 16.

A/R PoA (see above). For these A/R activities, CDM rules do not require demonstrating prior consideration of the CDM.

3.1.3. Summary of findings

There is no evident flaw in the general design of this rule with the exception of the inclusion of old A/R activities in a newly registered A/R PoA. Also, as outlined above, the time frame for notification of prior consideration appears to be quite generous.

3.1.4. Recommendations for reform of CDM rules

The only rule that needs to be changed relates to the inclusion of old A/R activities in a newly registered A/R PoA (see above). It is therefore recommended that the corresponding rule be withdrawn.

Furthermore, it is recommended that the time frame for notification of prior consideration be shortened in order to reduce the risk that projects apply for the CDM having only learned of the possibility after the project has started. The grace period for notification to the secretariat should therefore be reduced in general, e.g. to a maximum of 30 days after the project start.

3.2. Investment analysis

3.2.1. Overview

The CDM's *additionality tool* requires demonstration that a prospective project is either not financially viable without the CDM (using investment analysis) or that there is at least one barrier preventing the proposed project without the CDM (using barrier analysis). Though both methods are common (and some projects use both), investment analysis is the most widely used, by over three-quarters of all projects and over 90% of the renewable energy (especially hydro and wind) projects that are expected to dominate future CER supplies (Spalding-Fecher & Michaelowa 2013). Investment analysis (or a variation of it) is also used in the *combined tool* and in some CDM baseline and monitoring methodologies that refer neither to the *additionality tool* nor to the *combined tool* for demonstrating additionality.

The additionality tool provides three alternative options for conducting investment analysis:

- For projects with costs but no revenues (other than CERs), a **simple cost analysis** can be used to demonstrate that at least one scenario (other than the project) is less costly. This approach is quite common for a few project types (e.g. projects that capture N₂O from adipic acid plants, or methane from landfills), but it is not common overall.
- The **investment comparison analysis** compares the economic attractiveness of the project without revenues from CERs to other investment alternatives that provide similar outputs or services; this approach is common for just a few project types (e.g. higher-efficiency fossil power), and is not common overall.
- The **benchmark analysis** is used to demonstrate that a proposed project is, without revenues from CERs, economically not attractive (i.e. it does not meet a stated financial benchmark); this approach is, by far, the most common form of investment analysis.

In all cases, investment analysis relies on the premise that, if a project is not a better investment (or less costly) than an alternative or a financial benchmark, then it would not have proceeded but for the existence of the CDM. Exactly how the CDM causes it to proceed, whether through CER revenue or otherwise, does not need to be specified.

The approach to investment analysis has also been refined over time. In particular, in 2008 the CDM EB adopted “Guidelines on the assessment of investment analysis”, which aimed to provide further clarity and reduce ambiguity by, for example, clarifying how to calculate the common financial benchmarks net present value (NPV) and internal rate of return (IRR) and suggested ranges for conducting sensitivity analysis in these parameters. In 2011, this guidance was further revised to introduce default values for the expected return on equity for different project types and host countries, which can (but are not required to) be used by project developers as benchmarks for the benchmark analysis.

3.2.2. Assessment

The expected financial performance of a project is clearly one important factor in determining whether or not it will proceed (see further discussion of this in Section 2.3). For example, unless mandated by an (enforced) government policy, there is little reason for projects with no revenue (other than CER values) to proceed, simplifying the assessment of additionality.

For projects that do collect revenue other than CER values, such as by selling electricity, the CDM rules seek to determine whether the project would not have been financially attractive (and therefore not have proceeded) without the CDM. Researchers have raised several critiques of this approach, which we address in this report under two broad themes.

The first is perhaps the most fundamental, and is whether investment analysis is appropriate for investments that may be driven largely by other (non-economic) factors. This critique asserts that many investments in common CDM activities – e.g. power generation – are undertaken for a host of political, social, and strategic reasons that extend beyond simple project-level economics and may not be designed to maximise economic return. Such critics argue that a market-based test such as investment analysis is not applicable in what is largely a non-market environment, perhaps especially so in centrally planned countries such as China (He & Morse 2010). For example, Bogner & Schneider (2011) and Haya & Parekh (2011) have argued that governments have already subsidized and developed large hydroelectricity projects in developing countries well before the CDM, making them financially viable and therefore raising questions about the extent to which investment analysis can credibly determine that they would not proceed but for the incentive provided by the CDM. For investment analysis to function properly – indeed, for any additionality test to function properly – it must be able to demonstrate, with high confidence, that the CDM was the deciding factor for the project investment. For project types that are routinely constructed outside the CDM, including (but not exclusively) for broader economic, energy security, or political reasons, it remains highly difficult to determine with confidence that, in any particular case, a project’s financial returns are the reason it is not proceeding and that the financial incentive provided by the CDM is the reason for it proceeding (Dechezleprêtre et al. 2014).

Table 4-5 provides an example of how the decision of selecting a certain fuel (coal, fuel oil or natural gas) may depend on many factors that are not only insufficiently covered in an investment analysis, such as level of initial investment or flexibility in operation that may lead, for example, in investment in a natural-gas-fired boiler rather than a coal-based one, even though natural gas may be more costly than coal in terms of direct costs.

The second critique is concerned with transparency, subjectivity, and information asymmetry, such as whether project developers provide sufficient and credible information to allow replication of their calculations and justification of their conclusions, as well as the inherent information asymmetry between project developers and those, especially the CDM EB, tasked with reviewing the information. For example, early research found that project developers regularly provided investment analyzes that were opaque, relied on proprietary company information, or were incomplete (Schneider 2009).

This analysis takes a new look at several aspects of this second critique, including:

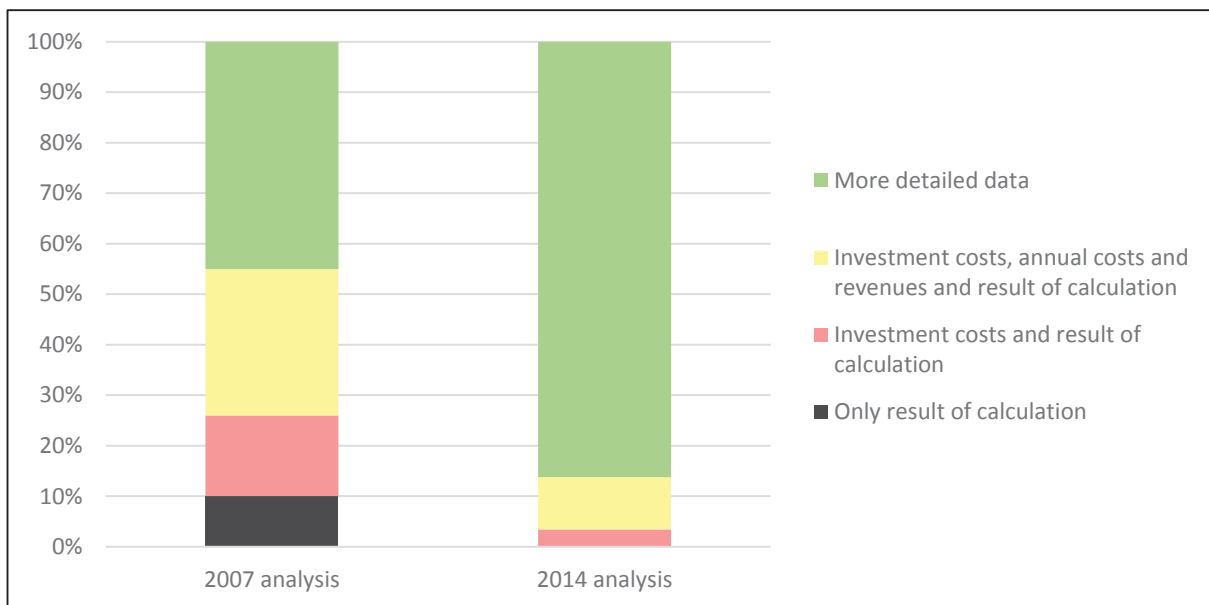
- Transparency, by re-visiting the prior work of Schneider (2009) to gauge how transparently developers conduct the investment analysis.
- Subjectivity and asymmetry, with a new exploration of benchmark rates and CER prices.

These two broad topics are addressed in turn below.

Transparency

To explore transparency in investment analyzes, Figure 3-1 updates the analysis of Schneider (2009) who reviewed a randomly selected group of PDDs for the level of information provided. In our updated analysis, 29 registered projects using the investment analysis were selected at random.¹⁴ Over 90% of the projects selected were registered after 2007, the year of Schneider's prior analysis, so this sample can indicate how practices have changed. In particular, over 80% of the 29 projects in this new analysis provided detailed input data to support their calculations of capital and operating costs and revenues, compared to 2007, when fewer than half did. Furthermore, no projects provided only the result of their calculation in this analysis, with no input data to support their findings. These findings suggest that investment analysis has become more transparent.

Figure 3-1: Level of information provided in PDDs on the investment analysis



Notes: 2007: n=31, 2014: n=29.

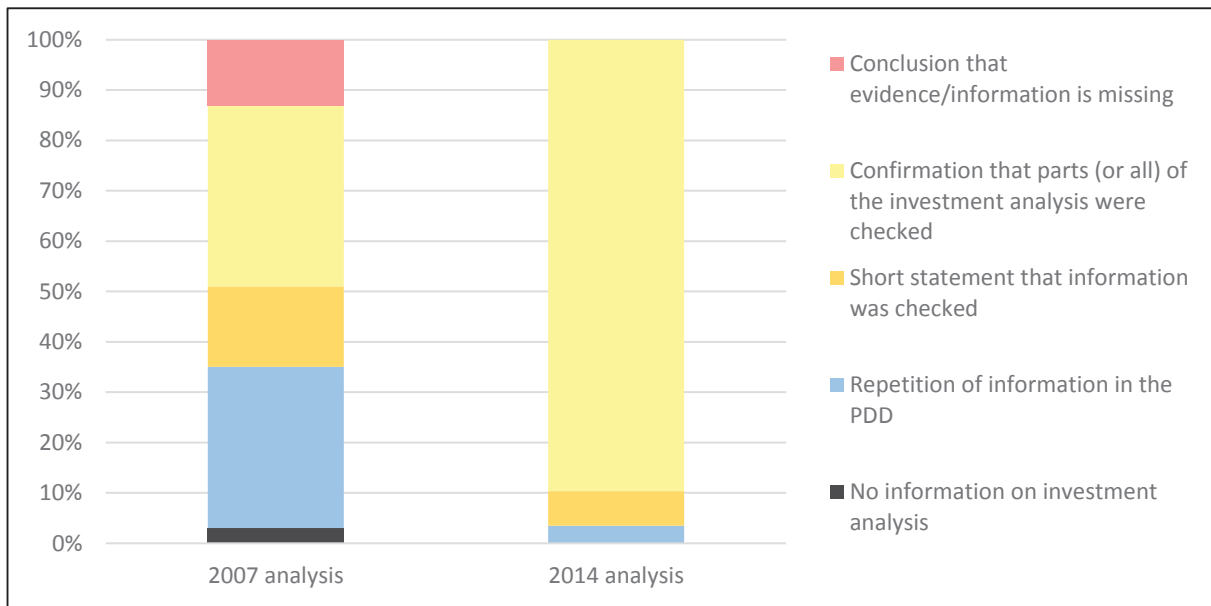
Sources: Schneider (2009), authors' own calculations

Validation reports that review the investment analyzes also appear to have become more thorough. Figure 3-2 also returns to Schneider's prior analysis to update it based on the same randomly selected group of projects as in Figure 3-1. As seen in Figure 3-2, more than 80% of the validation reports confirm that validators checked some or all of the key assumptions of the investment analyzes. The validation reports often review each of several of the most critical investment analy-

¹⁴ According to the sampling design, 30 projects using investment analysis were to be selected. Upon further examination, one of the thirty projects selected, a small-scale, run-of-river hydropower plant, had demonstrated additionality using other methods, as outlined in the "Guidelines for Demonstration Additionality of microscale project activities" and so was not considered in this analysis.

sis inputs and describe that the inputs are reasonable, in many cases citing contract or other documents reviewed to support the choice of inputs.

Figure 3-2: Information in validation reports on the investment analysis



Notes: 2007: n=31, 2014: n=29.

Sources: Schneider (2009), authors' own calculations

Subjectivity and information asymmetry

Despite the findings above, transparency and validator review of the input parameters do not remove subjectivity or choice of alternate input parameters in different contexts. For example, in some cases, project proponents have used different values for key input parameters when submitting applications to financial institutions (Haya 2009), suggesting that the metrics used (and choice of inputs therein) and reliability of such may vary. Indeed, project developers will always have much more information on the project's local conditions – including costs and technical parameters – than will outside parties, whether validators or CDM administrators, and therefore have an incentive to provide biased or inaccurate information to increase the chance of a successful additionality determination and, therefore, the eventual awarding of credits to their project (Gillenwater 2011). This phenomenon is widely referred to as '*information asymmetry*'. As shown above, validators do have more information at their disposal now than in the past, but still lack an objective basis for determining that the investment would not have been undertaken and that inputs provided are the same as they would have been had CDM credits not been sought. Small changes in a number of input parameters – even if individually well within the range of other similar projects (CDM or not), could lead to significant changes in the overall stated financial return of the project. Interestingly, under the CDM, project participants do not need to provide any confirmation that they are submitting truthful information. Some project developers reported that different versions of investment analysis were used for CDM purposes and for the purpose of securing other funding for a project (e.g. loans). Other crediting mechanisms, such as the VCS and CAR, require declaration or attestations from project developers that all information is accurate and presents the truth. To explore further the issue of subjectivity and information asymmetry in input parameters, we take a deeper look at two particular inputs: benchmark rates and CER prices.

Closer examination of benchmark rates

This critique concerns appropriate levels for financial benchmarks (e.g., IRR) (Michaelowa 2009). To explore this question, we reviewed data on IRR benchmarks used by wind, hydro, biomass, and waste gas or heat projects in China, wind and hydro projects in India, and hydropower projects in Vietnam.¹⁵

Nearly all projects in China use standard, government-issued IRR benchmarks. By far the most common benchmark used is 8%, which is applied for most power projects, and derives from a 2002/2003 Chinese government source, *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. Other common benchmarks based on government rules include 10% for small hydro projects, and 12-13% for waste gas/heat projects.

Table 3-1: Summary of most common benchmark rates used in IRR analysis in Chinese CDM projects

Project type	Common IRR benchmark	Fraction of projects using this benchmark	Source of this benchmark
Wind	8.0%	99%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	10.0%	71%	Government's <i>Economic Evaluation Code for Small Hydro-power Projects</i> (1995)
Hydro	8.0%	29%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	12.0%	30%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
Waste gas / heat	8.0%	98%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
	13.0%	17%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
	18.0%	16%	Conch Cement Company internal WACC

Notes: In this table, and throughout this section, we report IRR benchmarks and values based on analysis of IGES's investment analysis database. We believe that most of the benchmarks, and values reported in the database, are in real terms, based on a review of a small number of PDDs and the assumption in the CDM's Guidelines on the Assessment of Investment Analysis that is conducted in real terms. We make no attempt to identify or convert values in the database that may be in nominal terms.

Sources: IGES 2014, authors' own calculations

Despite the ubiquity of the 8% government-set threshold in China, it is not clear how or why it matches the internal thresholds used by actual project inventors, who may themselves demand returns either higher or lower. (For example, benchmarks for wind power projects in India, where they are determined to a greater extent by investor hurdle rates, are more variable and, on average, higher). For this reason, it is not clear why 8% is the 'correct' benchmark for a test intended to gauge the attractiveness of an investment. Furthermore, it is not clear why common benchmarks used for hydro or waste gas are higher (10% or at least 12%, respectively), and whether these

¹⁵ These project type / country combinations were selected because each of them represents at least 1% of the registered projects in the CDM that use investment analysis (IGES 2012). Though this 1% threshold is arbitrary, it provided us with a basis for focusing the analysis.

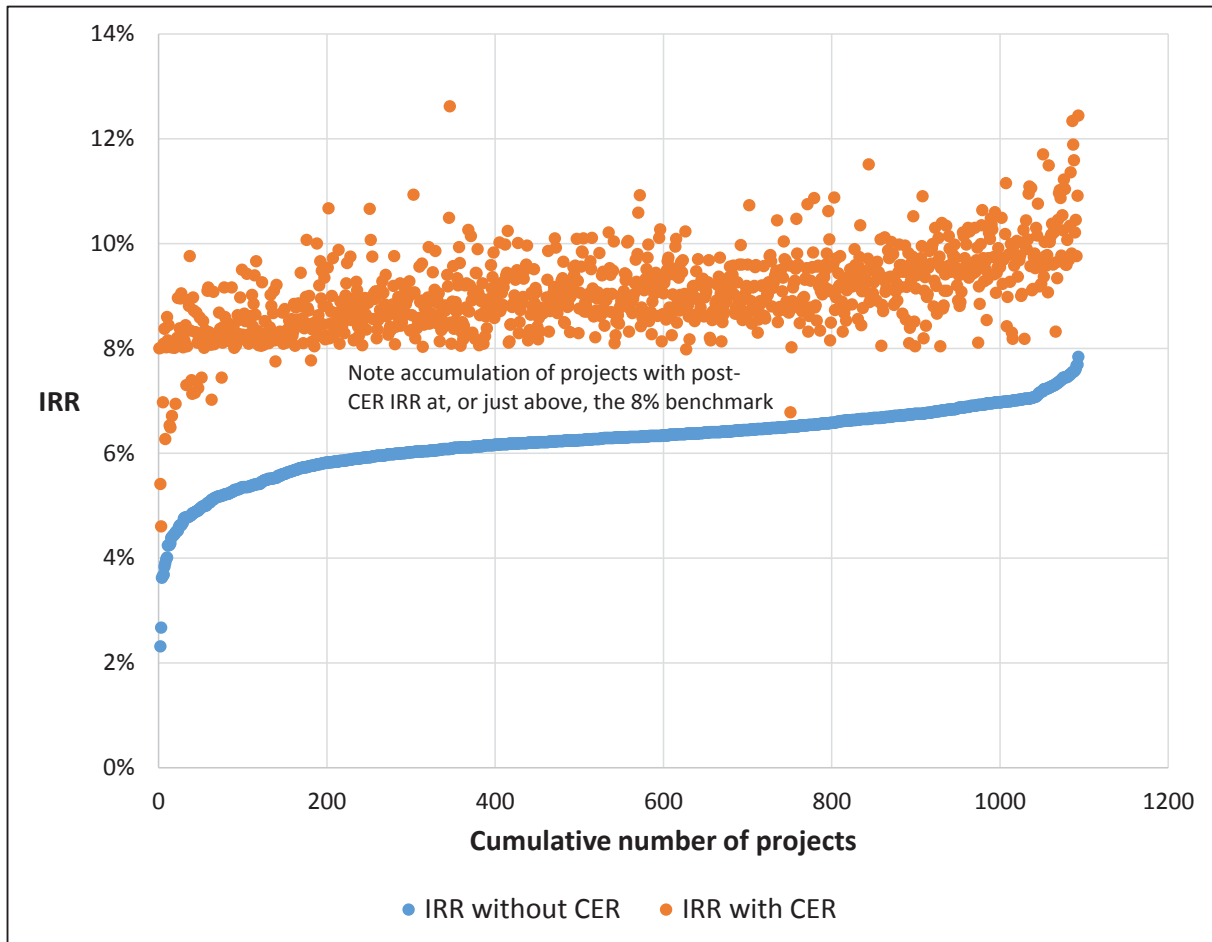
rates accurately capture the risk and expected financial returns in these types of projects. Further analysis of this issue may be warranted, e.g. by comparing it with other sources of equity rates for different investments in China or for similar projects in other countries. A source of such data for projects within China was not immediately known, however.

In principal, the logic of investment analysis is that the project would not have proceeded but for the financial incentive provided by the CDM. That financial incentive is the value of CERs. Many project developers conduct an analysis to show that, at assumed CER prices, the financial return of the project is expected to clear the financial benchmark used. However, this is not actually required by the additionality tool. (In the first versions of additionality, a step 5 'impact of the CDM' was included, which was interpreted by many project developers as an obligation to show that the project is made economically attractive through the CDM. This was later removed).

The above discussion investigated benchmarks used in China, with special attention paid to the widely used 8% benchmark. Because of its ubiquity, this 8% benchmark provides an opportunity to investigate the extent to which CER values indeed bring about expected project returns above this value and therefore, in the logic of the investment analysis, enable the project to proceed. As stated above, though projects are not required to actually show that CER values would push the project above its stated threshold, most do report results of expected return.

The following chart (Figure 3-3) shows the stated IRRs before and after CERs for all wind projects in China that use a benchmark of 8%. As seen in the figure, most of these projects state an IRR without CERs of between 6% and 7%, and an IRR after CER value of 8% to 10%. Note in particular the sharp line at 8%, at which very few projects claim an after-CER IRR of just under 8%, but a large number of projects find a post-CER IRR of just barely more than 8%.

Figure 3-3: Stated IRRs of Chinese wind projects using a benchmark of 8% before and after assumed CER value



Sources: IGES 2014, authors' own calculations

In principle, one explanation for this distribution is that projects in which the 8% threshold is not reached with CER revenues are not implemented, do not apply for CDM registration, and are therefore not represented in this graph. The fact that so many projects just barely meet the 8% threshold (even though they are not required to do so), and so few do not meet it, may instead indicate, however, that project developers are eager to claim that the CER value has allowed the project to clear the benchmark rate.

In contrast to the situation in China where standard government benchmarks are provided, most projects in India use internal, company-specific required rates of return as their IRR benchmarks. However, as in China, the CER value tends to provide a similar increase in expected return (e.g., an increase in IRR of two to three percentage points), just clearing the stated benchmark.

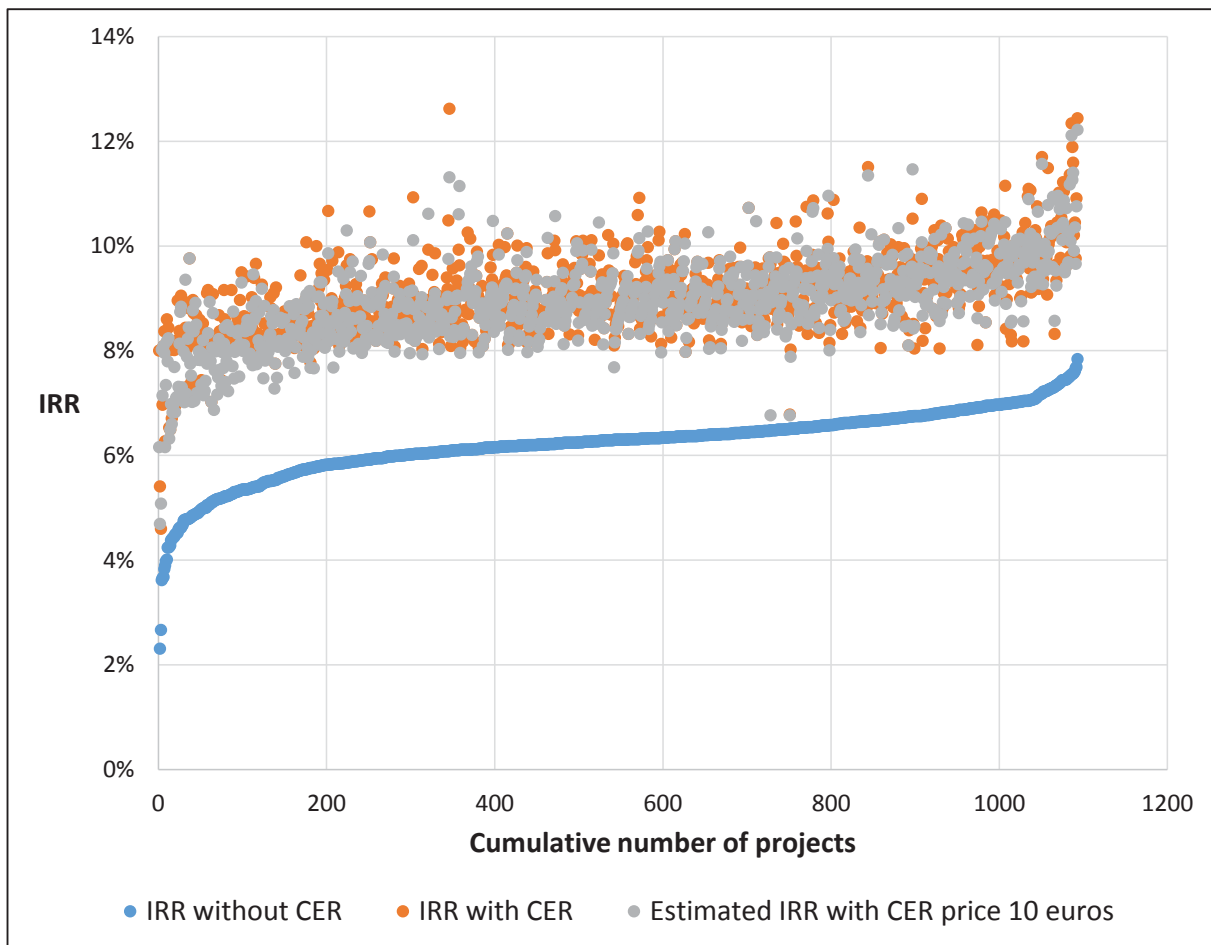
To demonstrate that projects just clear the benchmarks, project developers could select project input parameters so that the benchmark is achieved. These parameters could include CER price, load factor, electricity tariff, or a number of other inputs required in calculating an IRR.

One such parameter that could be adjusted is the expected CER price, which rose consistently through mid-2008, then fell precipitously, and for which forecasts have varied widely since, providing a potentially broad scope for selecting possible future CER prices.

Closer examination of selection of the CER price

To explore the potential effect of the CER price in more detail, Figure 3-4 adjusts the post-CER values stated in the PDDs (as displayed in Figure 3-3) to use a common CER value of €10 for all projects. (€10 is the median value used across all registered projects.) In this example, a large number of projects no longer meet the 8% benchmark. In particular, about 70 projects with pre-CER IRRs of 4% to 6% used CER prices as high as €17 in order to claim they would meet the 8% benchmark. Though this represents just a small share (about 1%) of wind power projects in China, it strongly suggests that input parameters (CER values) have been chosen to achieve the desired result of the 8% government-set IRR benchmark.

Figure 3-4: Estimated IRRs of Chinese wind projects using a benchmark of 8% before and after CER value of €10



Sources: IGES 2014, authors' own calculations

Similar to the situation for Chinese wind power projects discussed above, a number of Indian wind projects that claimed that CER values (median price assumed: €14) would lead them to exceed their benchmark would not have been able to claim that their benchmarks are met if they had used

a lower, and more common, CER price of €10. This suggests that, as found in the case of wind power projects in China, project developers in some instances may select CER values that depart from values used by their peers in order to claim that CDM revenues will make the projects financially attractive.

A similar pattern emerges for hydropower projects in Vietnam, where benchmarks (averaging 13.1%) were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate.¹⁶ Of the projects analyzed¹⁷, over half of the hydro projects would not have met their benchmarks if they had used a CER price of €10 instead of higher prices (median price assumed: €15.5, and as high as €30, in contrast to the remainder of Vietnamese hydro projects with median price assumed of €10). As above, while this is not definitive evidence of gaming, it suggests that project developers tend to invoke higher CER prices than their peers when needed to claim that their projects become economically viable under the CDM.

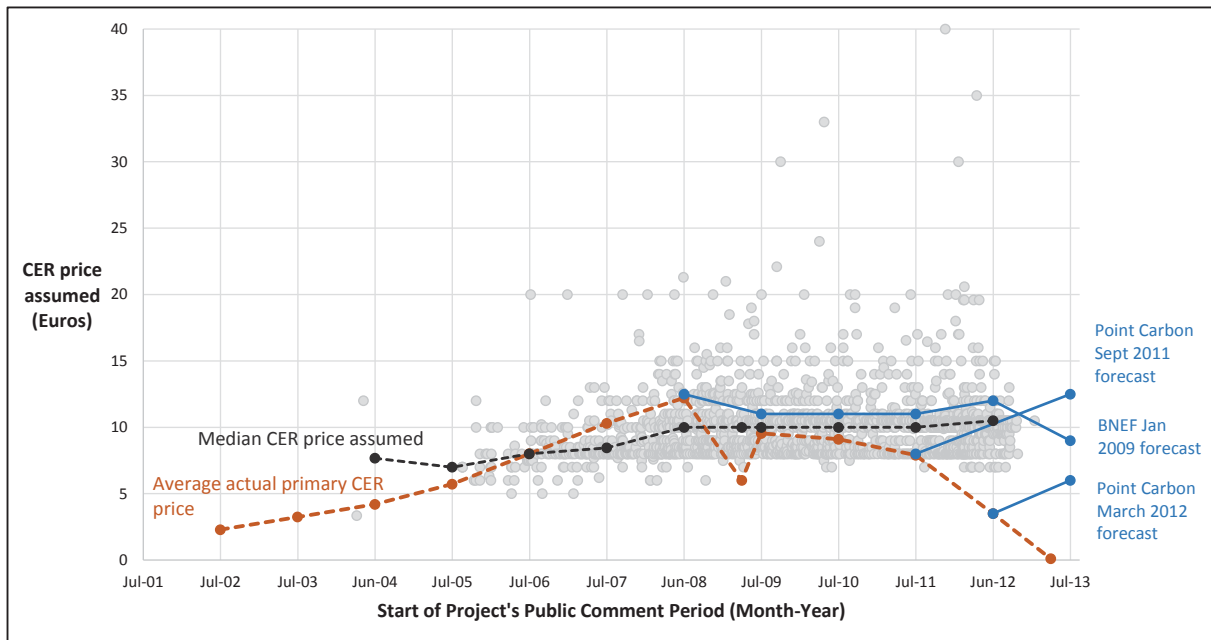
This raises the question of the plausibility of CER prices used by project developers. Looking at all registered projects (Figure 3-5), it appears that the CER prices used by project developers, though highly variable, tended to track then-current primary CER prices, through 2010, when CER prices began a steady decline. Project developers did not then use lower prices, but neither did industry analysts, who forecasted that higher prices would return.

These trends therefore display little evidence that project developers have systematically over- or under-estimated expected CER prices, at least as judged by the median (black line) values. However, the distribution of prices around that median displays a skew wherein a small fraction of projects use very high prices, perhaps because, as shown above, such high prices may be needed to demonstrate that these projects have met benchmarks.

¹⁶ In Vietnam, the median IRR benchmark used by projects in Vietnam was 13.1%, and most benchmarks were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate. The default expected return on equity for power projects in Vietnam, per the CDM's *Guidelines on the Assessment of Investment Analysis*, is 12.75%; 60% of power projects in Vietnam use an IRR benchmark higher than this rate; 5% have an IRR without a CER value exceeding this.

¹⁷ From the IGES investment analysis database, all hydro projects in Vietnam were selected that reported CER price assumptions in € as well as pre- and post-CER IRR values.

Figure 3-5: CER prices – assumed and estimated



Notes: CER prices assumed by project developers (grey dots) have been relatively consistent with industry forecasts made at the time (blue lines), even though they have been higher than market prices (orange line) since 2008.

Sources: IGES 2014, Point Carbon 2011, Point Carbon 2012

Sensitivity analysis: can it help address subjectivity?

The CDM addresses the subjectivity of input parameters, in part, through the use of sensitivity analysis required in investment analysis. As specified in the *Guidelines on the assessment of investment analysis*, “variables...that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation ... and the results of this variation should be presented.” However, the guidelines do not require that parameters be varied simultaneously, and few project developers do so. For example, in calculating project IRRs (in the PDDs), no project developer of the 30 randomly selected projects assessed the possibility that more than one of the key input variables could vary simultaneously. Furthermore, nearly all claim that even the standard variations of as much as 10% in the individual parameters are implausible, despite evidence (as presented here) that variation in the input values used is quite common. Accordingly, because the possibility that individual parameters could vary widely is discounted, and the possibility that multiple inputs could vary is not considered, the sensitivity analysis as currently applied is not sufficient to address the subjectivity in these parameters.

3.2.3. Summary of findings

Investment analysis is designed to determine whether a project would be uneconomical or less attractive than an alternative in the absence of the CDM. The premise is that if the project is not economical (most often as compared to a particular investment threshold), it would not have proceeded. From a strictly financial perspective, this may well be the case. However, researchers have pointed out that several types of projects in the CDM – especially large power projects that dominate the CDM pipeline – are pursued for reasons that extend beyond simple financial return, particularly in the largely non-market regulatory environments that are found in some of the largest CDM countries. This may be the most fundamental critique of investment analysis, and yet it is also the most analytically challenging to prove or disprove. Projects may proceed for a variety of

factors – economic, strategic, and social – that defy attempts to attribute the viability, or failure, to any one factor. Complicated statistical tests have been proposed – and some statistical research has been attempted – but few compelling approaches have yet emerged.

This research has further explored the issues of information asymmetry, transparency, and subjectivity of input assumptions. Regarding information asymmetry, project developers have considerably more information about their own project than do those – likely including validators – that are charged with reviewing and assessing their additionality. Regarding transparency, this research finds that, since 2007, the transparency of both project design documents and validator assessments has increased markedly, such that the strong majority of projects now include detailed information on input assumptions that their investment analysis could be replicated.

In some cases, there is little reason to question the validity of these input assumptions, as they are based on contract documents (e.g. with equipment providers that would seem to reflect actual prices paid). In other cases, the input assumptions are highly subjective, as in estimates of future fuel prices (e.g. for biomass), electricity tariffs that may be adjusted, or CER prices. In particular, this research has identified dozens of cases in China, India, and Vietnam in which it appears that project developers have used CER prices higher (in some cases, much higher) than their peers in order to claim that the CDM would make their project exceed the chosen financial benchmark. This demonstrates how eager some project developers may be to select input values to give results that would give the appearance of additionality.

3.2.4. Recommendations for reform of CDM rules

As stated above, for an additionality test to function properly, it must be able to demonstrate with high confidence that the CDM was the deciding factor in project implementation. This analysis has demonstrated that the subjective nature of the investment analysis limits its ability to provide that confidence. It is possible that improvements could decrease this subjectivity, such as by applying more complicated tests to assess the true motivations and financial performance of the project. Still, doubts may remain, especially for project types for which the financial impact of CERs is insufficiently large relative to variations in other potential inputs to provide a strong ‘signal-to-noise’ ratio, such as for large power projects. CDM administrators may therefore want to consider whether certain project types, if they cannot be confidently deemed additional by other tests (e.g. barrier analysis, common practice analysis, as in the next sections of this report), might be phased out of the CDM. If the investment analysis continues to be applied, we recommend further improving the guidance to reduce subjectivity. CDM rules could also require formal declarations by the project participants that information is true and accurate. Such declarations may discourage project participants from providing false information, as a violation of such a declaration may have consequences under national legislation. An even stronger form could be a declaration in lieu of an oath.

3.3. First of its kind and common practice analysis

3.3.1. Overview

The CDM uses two approaches to assess additionality based on the market penetration of technologies: the first-of-its-kind approach and the common practice analysis. Under the first-of-its-kind approach, a project is deemed automatically additional if certain conditions apply. The common practice analysis often complements the investment or barrier analysis. It requires an assessment of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. It is a credibility check to demonstrate that a project is not common practice in the region or country in which it is implemented. The common practice analysis can also be used to demonstrate that the baseline technology or practice is frequently implemented and is hence a realistic scenario. The common practice analysis is only relevant for large-scale

projects. Small-scale projects are entitled to use simplified modalities and procedures for small-scale CDM project activities, which do not require common practice analysis.

The first-of-its-kind approach was initially applied as part of the barrier analysis; it was sometimes also referred to as the barrier of lack of 'prevailing practice'. In 2011, the EB adopted guidelines specifying how first-of-its-kind should be demonstrated. The guidelines were further revised in 2012 and reclassified as a tool in 2015.¹⁸ Showing that a project is the first-of-its-kind is the first step in the additionality tool and combined tool, which stipulate that if a project is the first-of-its-kind, it is considered additional. The steps to be followed for demonstrating first-of-its-kind are further specified in the corresponding guidelines and, since 2015, the methodological tool. According to version 03.0 of the tool, a project activity is "first of its kind in the applicable geographical area" if

- "the project is the first in the applicable geographical area that applies a technology that is different from technologies that are implemented by any other project" with the same output and that "have started commercial operation in the applicable geographical area before" the PDD "is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier", if
- "the project implements one or more of the measures" and
- "the project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal".

The common practice test was first introduced in the additionality tool in 2004 to complement the investment and barrier analyzes, as a safeguard to ensure the environmental integrity of the CDM. In a first step, other previous or current projects which are similar to the project activity were analyzed. Projects were considered similar "if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc." Other CDM projects were excluded from this analysis. In case similar activities were identified, it was necessary to justify why these exist, while the project activity is considered to be financially unattractive or as facing barriers. 'Essential distinctions' had to be identified which may for instance be due to the fact that new barriers have arisen or promotional policies have ended.

For both the first-of-its-kind approach and the common practice analysis, the key issues are defining what is regarded as a comparable technology, what the appropriate geographical scale is and what threshold should be used for a technology to be regarded as first-of-its-kind or common practice. Critics pointed out that no clear definitions of when a project activity should be regarded as common practice were given in the early versions of the additionality tool (Schneider 2009). Another criticism was that the common practice test allows project developers to claim that a frequently implemented project type is not deemed common practice if they can justify 'essential distinctions' from other projects. Yet the key terms 'similar' and 'essentially distinct' were defined so vaguely that any project could be argued to be not common practice, simply by defining 'similar' very narrowly or 'distinct' very broadly (Schneider 2009; Spalding-Fecher et al. 2012).

The requirements for the common practice analysis in the additionality tool remained largely unchanged until September 2011 when the "Guidelines on Common Practice" were introduced, incorporating elements from the additionality tool and providing additional guidance¹⁹. In parallel to the revision of the "Guidelines on first-of-its-kind", the "Guidelines on Common Practice" were further revised in 2012 and reclassified as a tool in 2015.

¹⁸ Methodological tool. Additionality of first-of-its-kind project activities (version 03.0).

¹⁹ The new requirements of the Guidelines on Common Practice were then also incorporated in the additionality tool in the same year.

Both guidelines or tools are applicable to four GHG reduction activities, namely, “fuel and feedstock switch, switch of technology with or without change of energy source (including energy efficiency improvement), methane destruction” and “methane formation avoidance”²⁰. Both also use similar approaches for defining similar or different technologies and the appropriate geographical area.

In the 2011 version of the common practice guidelines, the first step was to calculate the applicable output range as +/-50% of the capacity of the project activity. In the next step, all existing plants in the geographical area within this capacity range needed to be identified (with the exception of registered CDM projects). The default applicable geographical area was the entire host country. If the technology was not country-specific, the geographical area should be extended to other countries. If projects differ significantly between locations, the geographical area could also be smaller than the host country. In the next step, among the identified projects, those with different technologies from the project activity were identified. A technology was considered different if it has a different energy source/fuel, feedstock, installation size (micro, small, large), investment climate at the time of the investment decision²¹ or other features.²² Eventually, if the share of plants using similar technology as in the project activity in all plants with the same capacity as the project activity is greater than 20% and if the absolute number of projects using a similar technology is larger than three, then the project activity is considered common practice.

In revising the Guidelines on Common Practice in September 2012, the rules and definitions were further clarified. It is now mandatory to provide a justification for using a geographical area smaller than the entire host country (e.g. province, region). The reference to extending the geographical area was removed from the guidelines. The exclusion of CDM activities was broadened to include registered projects, those requesting registration and those at validation. Furthermore, several definitions and the step-wise approach were better explained (without change in substance). Minor changes to the common practice analysis were made in subsequent versions of the additionality tool.

The definition of different technologies in the first-of-its-kind approach corresponds to the common practice analysis, with the exception that investment climate at the time of the investment decision and other features are not included.

3.3.2. Assessment

The general strength of using market penetration approaches for assessing additionality is that they do not assess the motivation or intent of project developers, but provide a more objective approach to evaluating additionality, based on the extent to which the project activity is already being implemented in the host country or region (Schneider 2009).

The initial criticism of the lack of clear definitions of similar projects and essential distinctions for common practice was addressed by the introduction and further refinement of the common practice guidelines, which clearly outline steps to follow and provide a definition of terms for a common understanding between project developers. Especially, the introduction of a threshold for common practice (20% and at least three similar projects) constitutes a significant improvement since it requires a quantitative assessment against a clear threshold. Clarity about the rules related to common practice analysis has therefore improved considerably over time. Also, from the sampled projects, it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs.

²⁰ For other types of GHG reduction activities, the more general rules of the additionality tool continue to apply.

²¹ “Inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations.”

²² Such as a difference in unit cost of output by at least 20%.

However, several unresolved issues still exist. In the following, different aspects of the common practice analysis and the first-of-its-kind approach are discussed and assessed. The assessment is based on an analysis of the common practice provisions and on the findings of an empirical evaluation of 30 representatively selected projects (i.e. the review of PDDs and validation reports) (Section 2.2).²³

When defining similar projects in the common practice tool, the applicable output range is defined as “+/-50% of the design output or capacity of the proposed project activity”. This definition does not always reflect the scales of a technology, between which meaningful technological differences occur. For instance, in the case of a power plant with a size of 400 MW, power plants between 200 MW and 600 MW would need to be considered in the analysis. However, there may be smaller (e.g. 100 MW) or larger (e.g. 800 MW) power plants which still feature similar technical, economic characteristics (e.g. efficiency), a similar regulatory environment, or which are used in a similar manner (e.g. provision of electricity to the public grid). At the same time, a small power plant (e.g. 5 MW), may be significantly different in terms of technology or use. Also, when several plants are grouped to form a project (e.g. wind farm consisting of several wind generators), an output of +/- 50% may be misleading. For instance, for a wind farm with 20 wind generators of 1 MW capacity, the output range would be 10 to 30 MW. However, a smaller wind farm with only 10 wind generators of 1 MW capacity has similar characteristics since the wind generator is identical. For wind power, the test may provide more meaningful results if there was no scale at all since wind parks are usually composed of different wind generators of the same size. However, small internal combustion engines may well differ, from a technological perspective, from a large combined cycle power plant. In conclusion, the definition in the common practice guidelines (+/- 50%) does not allow for a meaningful classification of scale for different technology types. This definition can therefore be considered arbitrary and may lead to the erroneous exclusion of similar plants from the analysis. In contrast to the common practice tool, the first-of-its-kind tool does not use an output range to define similar technologies. This approach seems more appropriate.

When identifying similar projects, the common practice tool excludes CDM projects (registered, submitted for registration or undergoing validation) from the analysis. In the empirical analysis, of the 30 sampled projects, only three identified similar non-CDM projects. All other projects only identified projects under the CDM. A commonly used rationale (i.e. used by 9 of the 30 projects) is that, because all other comparable facilities are either CDM projects or are awaiting registration as CDM projects, the proposed project would also be non-viable without the CDM (i.e. not common practice). However, it could be argued that the general viability of projects is assessed as part of the barriers and/or investment analyzes and should therefore not be used as a pre-emptive argument for excluding CDM projects from the common practice analysis. The exclusion of CDM projects from the common practice analysis is particularly problematic if most or all new facilities in a sector use the CDM. For example, if all new wind power plants in a country register under the CDM, wind power could never become common practice, even if it reached a market share of more than 50% and was highly economically attractive. In contrast to the common practice tool, the first-of-its-kind tool does not have provisions to exclude CDM projects, which suggests that all existing projects, including CDM projects, are considered.

²³ Of the 30 projects sampled for the evaluation of the common practice analysis, the majority stem from China (20 projects), followed by India (3), Egypt (2), Pakistan (2), Brazil (1), Nicaragua (1) and Israel (1). Ten projects were registered before 2010, eight in the 2010-2011 period and twelve after 2011. Technology types in the sample are wind power (17 projects), hydropower (5), industrial projects such as coal mine methane utilisation or waste heat recovery (3), waste projects such as landfill gas capture (4) and other renewable energies such as biomass (1). Most projects (28 of 30) are classified as large-scale. Although the sampled two small-scale projects are not required to conduct a common practice analysis, some information on common practice was given in the corresponding PDDs.

The common practice tool and the first-of-its-kind tool use the same definition of the geographical area, which should be the entire host country, unless justification can be provided for a smaller geographical area. In the common practice analysis sample, 24 of 30 projects limited the applicable geographical area to a specific area smaller than the host country (such as province, region, state, municipality, etc.). All sampled wind projects from China (11)²⁴ and from India (3) selected an area smaller than the host country as the applicable geographical area. The most commonly used justification in the corresponding PDDs for limiting the geographical area is that investment conditions, especially in terms of electricity tariffs, available resources and labour costs, differ from province to province, making provincial/state level comparison necessary.

At first sight, this appears to be plausible since China and India are large countries with regions/states being important players in infrastructure development. Notwithstanding this, the size of the country and the political structure may not be sufficient to justify the choice of the regional/state level. In China, a nationwide feed-in tariff for wind power generation was introduced in 2009, establishing four different tariff categories, ranging from 0.51 CNY/kWh (0.08 USD/kWh) to 0.61 CNY/kWh (0.10 USD/kWh), depending on the region's wind resources (International Renewable Energy Agency 2012). For projects in India, the Electricity Act of 2003 and the resulting new tariff regulations were cited as the cause of different investment climates in various states. In fact, for wind power, the tariff varies based on local wind resources. Four bands of wind power density in W/m^2 determine the level of the feed-in tariff (International Energy Agency 2012). This means that the feed-in tariff may differ even between project locations in the same province if these feature different wind conditions. Therefore, the fact that there are different feed-in tariffs between provinces alone does not explain fundamentally different investment conditions in the different regions, as claimed in many PDDs, but rather only accounts for locally different wind resources, while the general support scheme is national²⁵. Based on these considerations, the rationale used by many projects for limiting the geographical area to a level below the entire country seems questionable. It can also be problematic to consider only the host country as the geographical area. If no or only a very few plants providing the same service exist in the host country, market penetration approaches do not give reasonable results. For example, the first aluminium plant in a country would always automatically be deemed additional, even if it used a technology that is clearly business-as-usual.

While the introduction of the common practice guidelines aimed to address the criticism of a vague definition of what constitutes 'different' technologies, several concerns remain. The possibility of defining a technology "as being different if there is a difference with regard to energy source/fuel, feed stock, installation size (micro, small, large), investment climate at the time of the investment decision (including, "inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations") or other features (such as difference in unit cost of output by at least 20%)" still allows for significant possibilities to claim that rather similar projects are very different. This allows for the project to be defined rather narrowly and other plants very broadly, so that the threshold of 20% is not reached. With regard to the installation size, the same issue as for the output range (above) applies. Also, the criterion 'energy source/fuel' may be misleading. For instance, if a country has been using light fuel oil as a basis for its power plants, a switch to natural gas constitutes a different fuel, but does not explain a significant difference since the same generation technology can be used for both fuels. The same holds true for different solid fuels. Finally, 'other features' is a very broad term allowing for arbitrary interpretations. For example, a difference in unit cost of output does not constitute a plausible difference per se²⁶. For instance, higher unit costs

²⁴ Also all other Chinese (non-wind) projects included in the sample use a sub-national geographical area with a similar rationale as that for wind projects.

²⁵ A differentiation of the feed-in tariff depending on local wind resources is common practice in other countries as well.

²⁶ Two sampled hydro projects used this rationale.

may be required for technical or other reasons and may be compensated for by higher yields²⁷. Also, according to this interpretation, a proposed CDM project with *lower* unit costs would be considered different from projects already implemented without CDM, even though it is more profitable than other projects. Although in some cases, 'differences' may be well justified (e.g. by explaining that the investment climate was significantly different due to a change from a state-controlled to a more private investment-oriented power market), overall, the review of arguments presented in the sampled PDDs indicate that the term 'different' allows for significant room for interpretation.

The threshold of 20% market diffusion in the common practice tool cannot be considered robust if applied to all technologies and sectors. The stringency of the 20% is highly dependent on the number of technologies in a sector. In a sector with only two technologies, both available technologies could easily exceed the threshold, whereas none of the technologies may ever reach the 20% threshold in sectors with many different technologies. For instance, in a country with several fuels and technologies available for power generation (e.g. natural gas, coal, wind, hydro, biomass, PV), a low market diffusion may still constitute common practice due to the abundance of options and due to the (potentially) limited potential of some technologies. For instance, hydro electricity generation may constitute only 5% of overall electricity generation. Nevertheless, hydropower could still be considered common practice due to the fact that hydro resources are limited and most of the resources have already been exploited. In contrast, in a sector in which there are only a few technologies (e.g. for a certain industrial process) a market diffusion of 20% may constitute a reasonable value for determining common practice. Also, even though a technology may not be considered common practice considering all existing plants in a sector (i.e. considering the market saturation), it may be common practice considering the recent trend (i.e. considering the market share in a certain year)²⁸. For instance, electricity generation from wind may constitute only a small share of the overall electricity generation in a country (e.g. 1%). However, capacity additions in recent years may constitute a significant share of overall new capacity built. In the former case, wind power would not be considered common practice, whereas in the latter, trend-oriented, perspective wind power would constitute common practice. This issue is especially relevant in the case of long-lived capital stock such as in the power sector (Kantha et al. 2005). Similarly, the provision that at least three plants with a similar technology must have been constructed to consider a project common practice may not be appropriate in all situations. For example, if only four plants exist in a country and three use the same technology, thus constituting a market share of 75%, the construction of a fifth plant with the same technology would still not be regarded as common practice. In conclusion, a one-fits-all value as threshold for market diffusion cannot be considered appropriate.

With regard to the quality of evidence used for the demonstration that a project is not common practice, almost all PDDs provided anecdotal evidence to support their claims. Commonly made statements are that there is no evidence to suggest that a similar project has been, is being or will be implemented in this area and that all other projects use CDM financing as well. To support these claims, publicly available external documents such as energy statistics were used in the majority of projects (20 of 30 projects). Yet, these public documents do not provide information about different investment climates in terms of labour costs, available resources and feed-in tariffs.

As regards the validation of common practice, in 21 of 30 sampled projects, the DOE reviewed documents such as the World Bank website or energy statistics. Other means of validation were conducting interviews with stakeholders such as personnel with knowledge of the project design and implementation, local residents and officials.²⁹ However, the DOEs did not evaluate claims

²⁷ E.g. higher units costs may be required for certain equipment for small hydro in a mountainous area, which may be compensated for by higher yields due to a higher head of water.

²⁸ See Kantha/Lazarus/LeFranc (2005) for a definition of market saturation vs. market share.

²⁹ There is no further information available in the PDDs on the content of the interviews with the stakeholders.

made in the PDDs about different investment climates. In nine cases, the DOE in its validation report just repeated the claims made by the PDD.

3.3.3. Summary of findings

Overall, clarity about the rules related to first-of-its-kind and common practice analysis have improved considerably over time. In addition, from the sampled projects it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs. However, several flaws remain:

- The definition of the output range in the common practice tool is arbitrary and not linked to actual differences in scale of technologies or use.
- The exclusion of CDM projects from the analysis is questionable in a market situation in which most projects are implemented as CDM projects and significant technological changes and cost reductions occur.
- The rationale for limiting the geographical area to a level below the entire country is questionable. In some instances, limiting the geographical area to the host country can be problematic.
- The definition of a project as 'different' in the current common practice guidelines is still too vague and corresponding rules still leave significant room for interpretation.
- The share of 20% market diffusion and absolute number of three similar projects, across all sectors, cannot be considered robust since the appropriateness of these values depends on the number of available technologies in the sector. Additionally, the result of the common practice analysis is highly sensitive to whether all plants of a sector are considered or whether the recent trend (new plants built) is considered. This is especially relevant for sectors with long-lived capital stock.
- Generally, evidence used for the common practice analysis was not adequate in the sampled projects since relevant information for the determination of common practice (e.g. on different investment climates, available resources or feed-in tariffs) was not provided in the PDDs. Also, the validation by DOEs was not adequate in the sampled projects since claims on investment climates were not evaluated and since in several cases the DOE only repeated the claims made by the project participants.

3.3.4. Recommendations for reform of CDM rules

In general, the first-of-its-kind approach and the common practice analysis can be considered more objective approaches than the barrier or investment analysis due to the fact that information on the sector as a whole is taken into account rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis. In this regard, expanding the use of market penetration approaches could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way in which first-of-its-kind and common practice are currently assessed needs to be reformed in order to provide a reasonable means of demonstrating additionality. In the following, several recommendations are made for the reform of the current rules.

We identified several issues with the approach of using the same generic approach in the context of rather different sectors or project types. We therefore recommend abandoning this 'one-size-fits-all' approach and introducing specific approaches for specific project types, which adequately reflect the circumstances of the sector, in particular with regard to the definition of what is considered

a different technology and the threshold used to define common practice. A practical means of implementing this is including specific guidance in each methodology.

- Due to the inherently vague concept of ‘different’ technologies, it is recommended that the common practice rules are revised in such a way that methodologies or overarching guidance provide clearer guidance on how to support the claim of a ‘different’ technology including the evidence required (including evidence to demonstrate credible differences in the investment climate). Corresponding provisions in the VVS should also be amended in such a way to provide more specific guidance on how DOEs should assess the claim of ‘essential distinctions’ for different projects types. With regard to the above-mentioned arbitrary definition of the applicable output range, it is recommended that the common practice guidelines are revised in such a way to provide general guidance on how meaningful differences according to scale can be identified for different technologies. More specific guidance on how to define a range of capacity/output should then be defined in the corresponding methodology. In the absence of any definition of capacity/output range in the methodologies, the whole spectrum of plants or activities (from very small to very large) should be covered by the analysis.
- With regard to the exclusion of CDM projects from the common practice analysis, the rules should be amended in such a way that all CDM projects are to be included in the analysis as a general rule, unless specified otherwise by the methodology. Methodologies could specify that CDM projects are excluded to a certain extent and then gradually introduce them in the analysis. This is especially relevant if all projects of a certain technology use the CDM. As Schneider (2009) points out “other CDM projects could be included in the common practice analysis after a certain period or after a specific number of CDM projects have been implemented”. Another criterion for inclusion of CDM could be their market penetration. (International Rivers 2011) suggest that “after 3 years of full operation, a CDM project should be included in the common practice analysis”. Furthermore, a “list of project types that are not eligible for the CDM because they are common practice” (ibid.) (negative list) could also be helpful in this regard.
- Due to our finding that the selection of an area below the host country level as the applicable geographical area is a questionable assumption, it is recommended that the rules be revised to define the appropriate geographical area in the context of the specific circumstances, such as the number of projects or installations in the host country. A level below the host country level should not be used.
- The threshold for common practice should be defined depending on the type of technology and sector. Corresponding guidance should be provided in the methodologies. In sectors with long-lived capital stock (e.g. power sector), the common practice analysis could consider two different perspectives: a) common practice in the sector (e.g. power sector) as a whole (market saturation) and b) common practice in more recent investments (market share) (i.e. similar to the operating and build margin approach for projects displacing electricity). If common practice is established according to at least one of these perspectives, the project should be considered common practice. Since data availability for determining market diffusion may not be sufficient in each country and in order to ensure consistency in determining market diffusion, efforts (e.g. multilateral) for collecting this data and for providing this information to project developers could be helpful. Several global datasets already exist (e.g. UNEP DTU 2014, statistics by the World Bank, sectoral statistics, Platts database on power plants or cement statistics by Cembureau), which could be used to estimate market diffusion in different countries in a consistent manner. An extensive discussion of

the usefulness of market penetration for establishing common practice for certain projects types is included in (Kartha et al. 2005).

Due to the fact that several DOEs repeated the claims made by the project participants without documenting the way in which they actually assessed the appropriateness of the claims, we recommend strengthening efforts to ensure that all DOEs effectively comply with the reporting requirements related to the common practice analysis outlined in the VVS. For this purpose, no change in rules has to be applied, but the accreditation system may need to be strengthened to ensure compliance of all DOEs with applicable CDM requirements.

Another option for improving the analysis of common practice is to consider the overall potential available in a country. For instance, a small share of hydro in overall electricity generation may, on the one hand, be due to barriers, risks or economic unfeasibility of hydro construction (hydro electricity generation would therefore not be common practice). On the other hand, the small share of electricity generation from hydro may be due to the very limited hydro potential in the country. Most of the (small) potential may already have been exploited. Any additional hydro capacity could then be considered common practice since it has been exploited before. However, this approach would bring about the problem of defining ways to establish the potential (e.g. technical vs. economic potential, etc.), and the practicalities and transaction costs of evaluating this for many different technologies.

Furthermore, the common practice analysis could “be the first step in the additionality tool rather than the last” (International Rivers 2011). This way, instead of using often vague arguments for establishing common practice *after* the investment analysis, project developers would need to discuss common practice explicitly at the beginning of the analysis.

3.4. Barrier analysis

3.4.1. Overview

Historically, barrier analysis has been used as an important alternative or complement to the investment analysis analyzed above in Section 3.2. The barrier analysis is used to demonstrate that a project faces barriers that impede the project’s implementation in the absence of the incentives from the CDM. It is applicable to both small- and large-scale CDM projects:

Small-scale projects

According to Attachment A to Appendix B to Annex II of 4/CMP.1 the following barriers may be considered for small-scale projects:

- **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions; this includes “the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis”.³⁰ In essence, this barrier allows an investment analysis to be conducted, as described in Section 3.2, but without providing any guidance on how the investment analysis should be conducted. In practice, however, it appears that guidance for investment analysis for large-scale projects (e.g. justification of benchmark IRR or sensitivity analysis) is, in most cases, also applied to small-scale projects.
- **Access-to-finance barrier:** the project activity could not access appropriate capital without consideration of the CDM revenues;

³⁰ See “Non-binding best practice examples to demonstrate additionality for small-scale projects” (EB 35, Annex 34).

- **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- Barrier due to **prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- **Other barriers** such as institutional barriers or limited information, managerial resources, organisational capacity, or capacity to absorb new technologies.

Large-scale projects

In large-scale projects, the barrier analysis is part of the additionality tool and the combined tool. It is applied in two steps:

1. Identify barriers that would prevent the implementation of the proposed CDM project activity. Here, the eligible barriers are similar to the barriers relevant for small-scale projects, with the following differences:
 - The ‘investment barrier’ of the small-scale guidance is, in the large-scale guidance, referred to as ‘investment analysis’ (Section 3.2); a separate option for demonstrating additionality besides ‘barrier analysis’;
 - The ‘access-to-finance barriers’ of the small-scale guidance is called ‘investment barriers’ in the large-scale guidance; and
 - ‘prevailing practice’ of the small-scale guidance is, in the large-scale guidance, usually a mandatory additional step termed ‘common practice analysis’ that is required but is not sufficient in itself to prove additionality.
2. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

Another important requirement of the two tools is the following: “If the CDM does not alleviate the identified barriers that prevent the proposed project activity from occurring, then the project activity is not additional.”

If these steps are satisfied, the project is potentially additional (pending passing of the common practice analysis).

In late 2009 (EB50), the CDM EB adopted the “Guidelines for objective demonstration and assessment of barriers” with a view to improving the objectivity of the barrier analysis. The document provides guidance on the objective demonstration of different types of barriers. For instance, it requires that “barriers that can be mitigated by additional financial means can be quantified and represented as costs and should not be identified as a barrier for implementation of project while conducting the barrier analysis, but rather should be considered in the framework of investment analysis” (Guideline 4 in EB50 A13).

In addition, methodologies may – instead of using one of the tools – provide their own combination of steps from the tools.

3.4.2. Assessment

The concept of barriers preventing investments and mitigation activities is an important element of the research and discussion on technology diffusion and low carbon pathways. From this, it seems reasonable that the additionality test could also take barriers into account and not only be based on

investment analysis. However, the barrier analysis faces multiple challenges in practice that strongly limit its usefulness in the context of the CDM.

Objectivity in barrier analysis

In earlier phases of the CDM, the claim for barriers preventing the implementation of projects was often based on anecdotal evidence, and it was very difficult to provide objective proof of why a barrier is sufficient to “prevent the implementation” (Schneider 2009). In practice, the concept of barriers per se as proof for additionality is problematic, as all investment projects in all countries faces some sort of barriers to its implementation, be they financial, technical or other. In earlier CDM projects, it was sufficient for PDD consultants to state barriers without providing objective and verifiable evidence that they actually *prevent* the implementation of the project. This led to some market participants claiming that with good PDD consultants you could have any project registered based on barriers.

Guidance on objective barriers

In late 2009 (EB50), these problems with barrier analysis led to the adoption of the “Guidelines for objective demonstration and assessment of barriers” by the CDM EB (Section 3.4.1). With their requirement to monetize barriers, the guidelines aim to assess the role of barriers in preventing the implementation of projects in a more transparent way. The monetization of barriers and their inclusion in the investment analysis provide a framework that allows an objective balancing of higher barriers and associated costs with the need for higher revenues. This may be one of the reasons why investment analysis (with or without monetized barriers) has largely replaced the use of the barrier analysis without application of investment analysis in demonstrating additionality (see below).

How much alleviation is necessary to overcome a barrier?

Another weakness of the barrier analysis lies in the application of the requirement to demonstrate that the CDM “alleviates the identified barriers that prevent the proposed project activity from occurring”. The fulfilment of this requirement was not often (explicitly) provided in PDDs nor checked by DOEs. Moreover, the tools do not require that the degree of ‘alleviation’ should be at least comparable to the strengths of the barrier under consideration. To demonstrate the viability of the project with the CDM, one would need to make the case as to why, for example, €x of CER revenues are sufficient to alleviate the risk of damage to a wind farm due to severe sand storms.

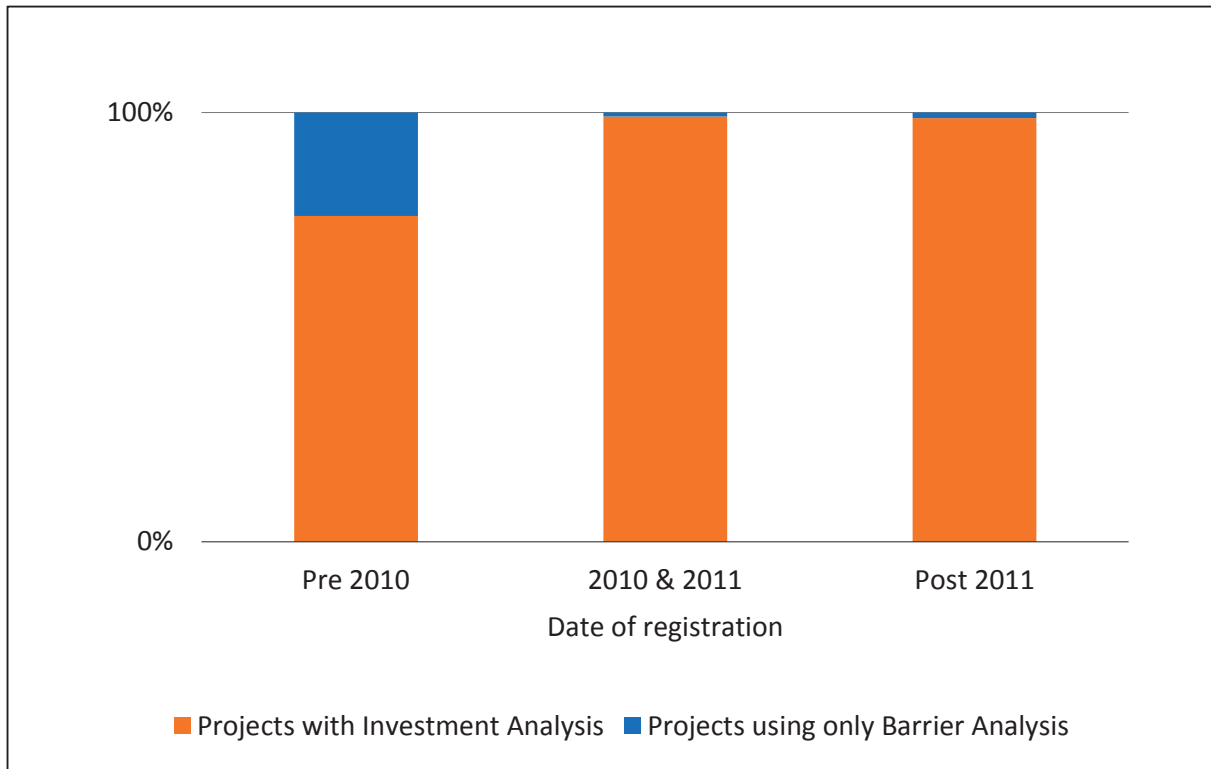
Also with regard to this requirement, the Guidelines provide greater specificity: “Demonstrate in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers” (Guideline 2 in EB50 A13).

The vanishing role of barrier analysis in the CDM

The role of barrier analysis in demonstrating additionality in the CDM has been dramatically reduced from 2010 onwards (Figure 3-6). While in the period before 2010 approx. 24% of registered projects used the barrier analysis *without applying an investment analysis in parallel*, this share was reduced to approx. 1-2% of registered projects from 2010 onwards. Since then, the barrier analysis plays a certain role in reinforcing the additionality argument made in the investment analysis, but has largely lost its role as the main approach for demonstrating additionality.

This development might be explained by the introduction of the guidelines for objective demonstration and assessment of barriers.

Figure 3-6: Share of projects using the barrier analysis without applying the investment analysis in total projects



Notes: Own research based on a representative sample of PDDs from 30 stratified and randomly sampled projects that were labelled Investment Analysis option 'none' by the IGES (2014) database revealed that a certain percentage of these PDDs used an approach that in essence follows the Investment Analysis approach of the additionality tool, but was labelled 'Barrier Analysis'. The confusion in terminology was most prominent in small-scale project PDDs, which have the option to demonstrate 'financial barriers' which includes and is often an Investment Analysis. In the representative sample, the fraction of PDDs using actually an Investment Analysis while being labelled Investment Analysis option 'none' by IGES was 36.4% pre 2010 and 90% afterwards. The share of projects using Investment Analysis from the IGES database has, therefore, been increased by these shares from the sample analysis. Without this correction, the share of projects without investment analysis in the IGES database are 38%, 10% and 14%, respectively, for the three considered time periods of registration.

Sources: IGES 2014, authors' own PDD research

With the adoption of the guidelines, the barrier analysis has largely lost its role as the main argument for demonstrating additionality. After 2010, non-financial barriers are quoted in some projects, but merely as additional information to reinforce the main case for additionality, which tends to be based almost uniformly on investment analysis. Potentially, this development may have been supported by an improved performance of DOEs in validating barrier analysis in PDDs, due to an improved accreditation system.

3.4.3. Summary of findings

In early CDM projects, the routine use of anecdotal and often subjective evidence for claiming barriers has led to the registration of projects with questionable claims for additionality, which cannot be objectively assessed by DOEs. With the adoption of the Guidelines and possibly the improved performance of DOEs, the barrier analysis has largely lost its role as the main line of argument for demonstrating additionality. Rather, barriers are monetized and reflected in the investment analysis.

In the CDM, barrier analysis has lost importance as a stand-alone approach to demonstrating additionality because of the subjectivity of the approach. With the guideline, if barriers are claimed, they are monetized and integrated as costs in the investment analysis.

3.4.4. Recommendations for reform of CDM rules

Non-financial barriers can be important factors preventing the implementation of projects even though they may be profitable. Therefore, considering barriers in approaches for additionality determination is a valid approach.

However, the objective demonstration of barriers (as required in the Guidance) has turned out to be very difficult to operationalise without the reflection and monetization in an investment analysis.

Given the de facto non-application of the barrier analysis without investment analysis approaches in the current CDM practice, we recommend removing the barrier analysis from the additionality and combined tools. In return, key aspects of the Guideline related to the monetization of barriers³¹ may be included in the investment analysis step in the additionality and combined tools.

In order to demonstrate additionality of projects with high (non-financial) barriers that may not be monetized, a comprehensive ‘common practice’ analysis or in small-scale projects ‘prevailing practice’ analysis shall be carried out (Section 3.3). Here, objective data on market shares of technologies/project types may be collected that may serve as objective proxy information for the extent to which barriers actually prevent the implementation of projects.

On another note, the approval of “Guideline on objective demonstration and assessment of barriers” by the CDM EB may be seen as a positive example of how the CDM regulator, under the right conditions, can react to an obvious flaw in the rules and practice, and rectify the system.

3.5. Crediting period and their renewal

3.5.1. Overview

Project participants can choose between one crediting period of 10 years without renewal or a crediting period of seven years for their project, which is due for renewal every 7 years for a maximum of two renewals (a total of 21 years for normal CDM projects). (For afforestation and reforestation projects, the choice is between one period of 30 years and three periods of 20 years). The Marrakesh Accords state that for each renewal, a designated operational entity shall determine that “the original project baseline is still valid or has been updated taking account of new data where applicable”.

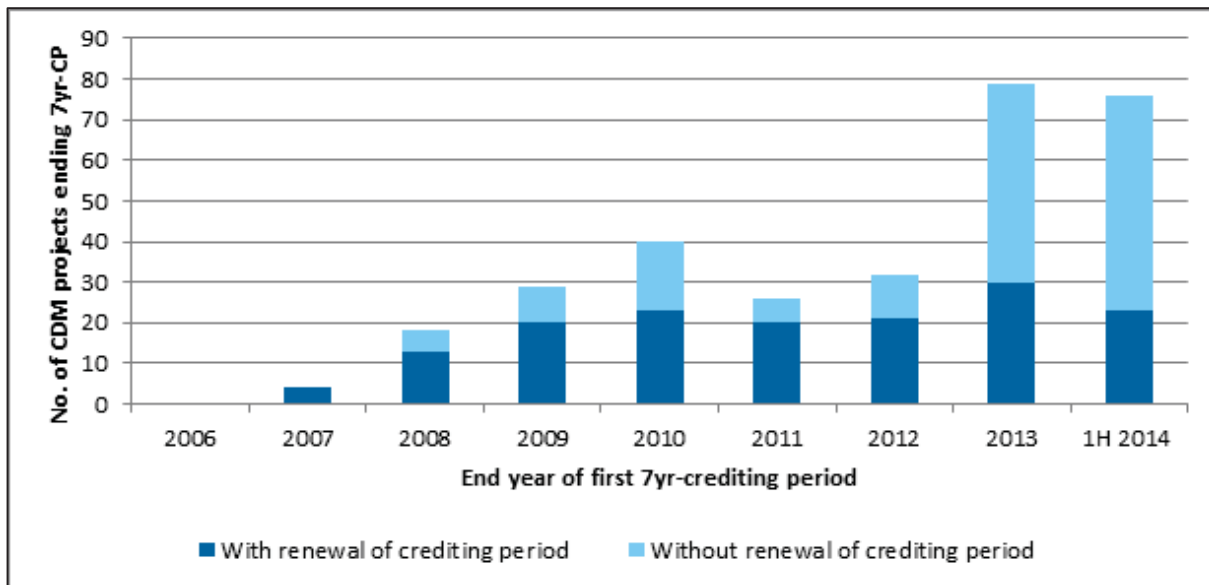
Requirements regarding the renewal of the crediting period were initially adopted in 2006 (EB28, Annex 40), subsequently revised several times (EB33, EB36, EB43, EB46, EB63, EB65, EB66), and partially incorporated in the project standard. At the renewal of crediting period, the latest valid version of a methodology must be used. If a methodology has been withdrawn or is no longer applicable, the project developers may use another methodology or request deviation from an applicable methodology. The CDM EB interpreted the ‘validity test’ in the Marrakech Accords in such a way that neither additionality nor the baseline scenario needs to be reassessed during the renewal of the crediting period. “The demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the emissions which would have resulted from that scenario” (Project Standard, Version 07.0, paragraph 289). The current rules mainly require an assessment of the regulatory framework, an assessment of

³¹ This relates to Guidelines no. 4 and 5 of EB50 Annex 13 that may be integrated as cost items related to barriers/risks in the investment analysis of the additionality and combined tool. Guideline 2 may also be implemented in the context of the investment analysis in the tools, in that the CER revenues should be sufficient to overcome the financial gap in project finance that is due to the barrier.

circumstances, an assessment of the remaining lifetime of technical equipment to be used in the baseline, and an update of data and parameters, such as emission factors.

Figure 3-7 plots the number of projects that have chosen a 7-year crediting period and that end their first crediting period in a given year and are therefore potentially entering a process of crediting period renewal. The increase in project registrations with the maturing of the CDM market from 2005 is mirrored by a steep increase in candidate projects for renewal seven years later, after 2012. The graph also indicates that the fraction of these candidate projects that actually underwent renewal significantly declines after 2012: While before 2012 roughly two thirds of all candidate projects underwent renewal on average, the rate dropped to roughly one third after 2012. This may be explained by the collapse in pricing and the petering out of the classical CDM market in 2011-2012, whereby CER prices below marginal transaction costs make renewal of crediting economically non-viable for most projects that do not benefit from long-term futures contracts with higher prices.

Figure 3-7: Number of CDM projects ending first seven-year-crediting period – with and without renewals



Sources: UNFCCC 2014, authors' own analysis

3.5.2. Assessment

The requirements to use the latest approved version of a methodology is a very important rule to assure that changes in the methodological ruling are also implemented in CDM projects within a reasonable timeframe and therefore seem appropriate. At the same time, it provides some certainty for investors that rules regarding the calculation of emission reductions are not changed within their crediting period.

The CDM EB's decision to interpret the Marrakesh requirement of assessing that "the original project baseline is still valid" in such a way that that only baseline emissions must be updated but that neither additionality nor the baseline scenario needs to be re-assessed could constitute a major risk for the environmental integrity of some project types. In 2011, the Meth Panel highlighted cer-

tain issues with this approach in an Information note to the EB (MP51 Annex 21³²), but the rules were not changed in response. In the following, we briefly analyze two main issues:

- The case of the baseline scenario changing over the course of the crediting period in a way that is not captured by the baseline methodology;
- The case of limited 'lifetime' of a baseline scenario.

Baseline scenario changing over of the course of crediting periods

In a number of instances, a baseline scenario could change over time during crediting periods and deviate from the assumptions in the underlying methodology. One example is a CDM project consisting of the conversion of an existing open cycle power plant to a closed cycle system. Assuming that after the first crediting period, new and lower cost technologies for the conversion would become available that would make the project economically viable, the implementation of the project activity after the first crediting period might be the most probable baseline scenario in the absence of the CDM. We are not referring here to the concept of dynamic baselines, e.g. the fact that baseline emissions are calculated based on the project output (e.g. in tons of steel or MWh per year). Rather, the scenario is changing, i.e. this refers to projects (or another low carbon activity) which, in the absence of the CDM project, would have been implemented at a later date due to changing circumstances.

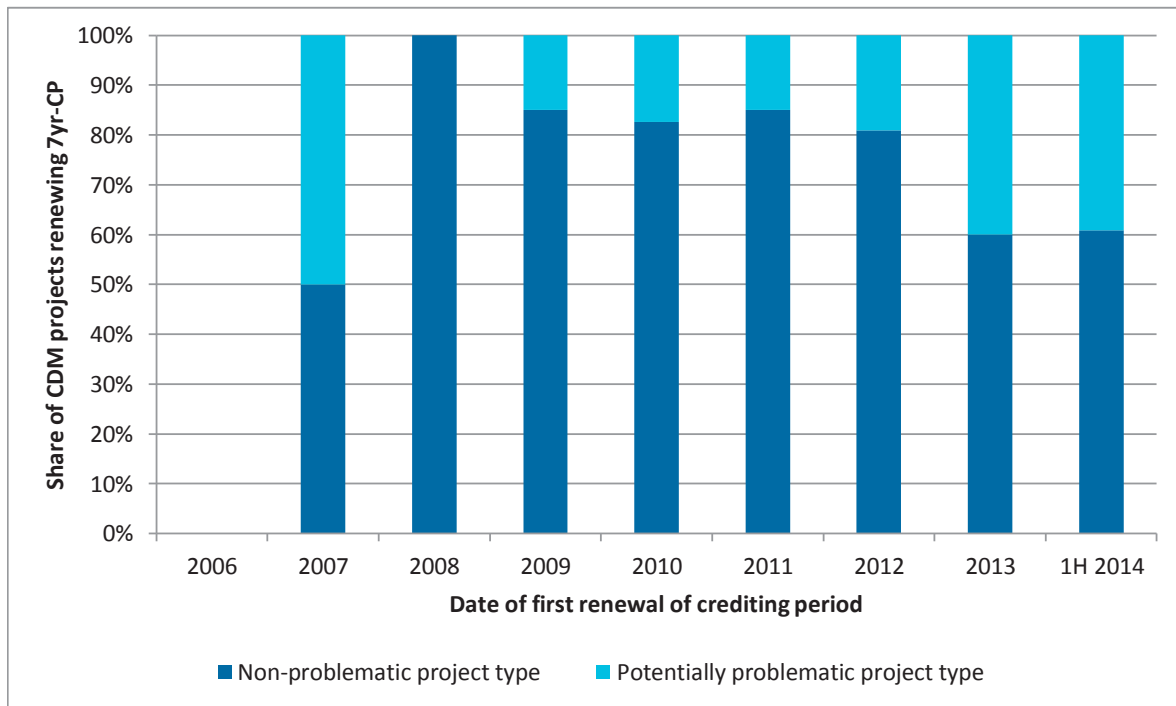
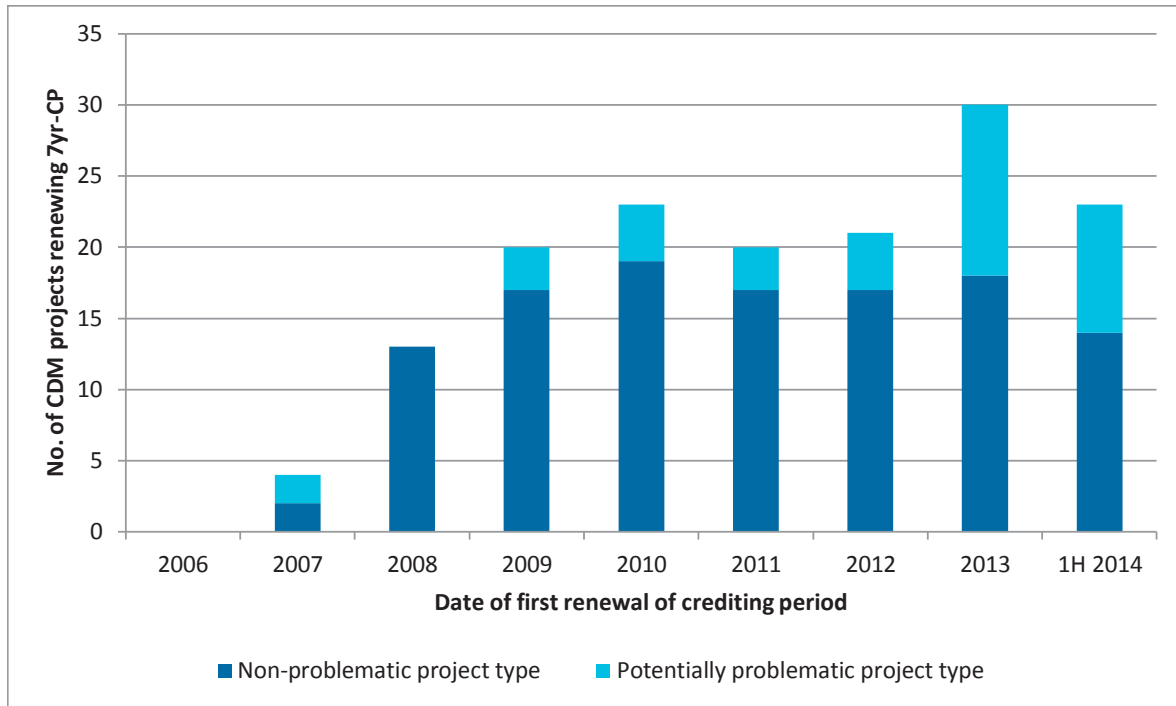
However, it is important to note that not all CDM project types are prone to changing baseline scenarios. Baseline scenarios typically change over time if they are the 'continuation of the current practice'. In such cases, changes such as retrofits could also be implemented at a later stage. In contrast, baseline scenarios do not change over time when they include a significant investment at project start in an alternative that provides similar services. This is the case if, for example, an industry can choose to fulfill their heat demand by either a new biomass boiler (project activity) or a new coal boiler (baseline). If one assumes that the project participant carries out a significant investment at the beginning of the baseline (e.g. to build the new coal boiler), it may be assumed that this investment is used until the end of its operational lifetime; replacing the coal boiler by a biomass boiler after seven years is economically not viable in general.

However, because CDM requirements explicitly rule out the re-assessment of the baseline scenario, cases with a change in baseline scenario cannot be taken into account, which leads to potential over-crediting in the second and third crediting periods in the case that the activity would have been implemented after the first crediting period due to changing circumstances.

Practical examples of such changing circumstances and related potential over-crediting can be found in Purdon (2014) for the co-generation sector. The paper provides an overview of how a change in external influence factors (e.g. sugar price) can influence the additionality and how a baseline scenario that is kept constant over several crediting periods can result in over-crediting.

³² https://cdm.unfccc.int/Panels/meth/meeting/11/051/mp51_an21.pdf.

Figure 3-8: Share of CDM projects renewing their seven year crediting period that is deemed non-problematic



Notes: Potentially non-problematic project types have been selected according to the criteria of having a lower risk of changes in the baseline scenario over several crediting periods.

Sources: UNFCCC 2014, authors' own analysis

Assessment of the scale of the issue

In the following, we make a very rough assessment of the scale of this issue. As mentioned above, not all project types are in danger of undergoing changes in baseline scenarios that are not foreseen in the underlying methodology. In order to arrive at a preliminary estimate of the scale of the potential issue, a list of 'potentially problematic' project types was identified that have a higher risk of changes in the baseline scenario over several crediting periods than those categorised as 'unproblematic'.³³

Please note that 'potentially problematic' does not mean that all projects in that project type have issues with the renewal of the crediting period, it simply means that the projects are in a sub-type that may contain potentially problematic projects. Figure 3-8 depicts the number of projects of a non-problematic project type in the total number of projects that actually underwent renewal of the 7-year crediting period in a given year.

The graph indicates that the number of projects renewing their crediting periods increased in 2007-2009. Until 2012, non-problematic projects made up the large majority of renewals. However, from 2013 the share of non-problematic projects dropped to approx. 60% of renewed projects. With such a low share, the issue may become more important in the future with a further increase in renewals (although the increase may be somewhat muted by the unfavourable market conditions).

In this context, it is important to note that CDM projects do not need to renew immediately, but may wait until market conditions are more favourable. Given the high number of projects that may undergo renewal at a later point in time combined with the lowering in the share of non-problematic project types may lead to considerable over-crediting.

Lifetime of baseline scenario

Another, also related, issue is that in more complex and very dynamic systems, such as the transport sector, the determination of a counterfactual baseline scenario is exposed to fundamental limitations in the ability to predict future developments. These limitations can lead to very high uncertainties in the baseline determination. In some instances even after a very few years, the actual baseline emissions could be significantly higher (or lower) than the calculated baseline emissions. For example, while it may be relatively certain that a project proponent choosing in the baseline situation to build a coal-fired boiler will continue to operate this boiler over its lifetime to meet its heat demand, the development of a city's transport system in the absence of a specific urban rail project could be very difficult and uncertain to predict: over some years one may assume that an increase in transport demand is catered for by increased use of private cars; however, street capacities may be limited and the municipalities may have to find solutions to their transport problems anyway, also in the absence of a specific project activity.

It therefore might be considered that for some project types in complex and dynamic environments, such as transport systems, the baseline scenario cannot be reasonably extended over a period of

³³ For a preliminary screening, the following projects sub-types (according to the classification of UNEP DTU) have been classified as "potentially problematic", i.e. it cannot be ruled out that the projects would be implemented later in time without the CDM under changing circumstances (please note that the sub-types may also contain projects which clearly do not have an issue): Adipic acid, Aerobic treatment of waste water, Agricultural residues: mustard crop, Air conditioning, Appliances, Biodiesel from waste oil, Biogas from MSW, Bus Rapid Transit, Cable cars, Caprolactam, Carbon black gas, EE industry – Cement, Cement heat, Charcoal production, EE industry - Chemicals, EE own generation - Chemicals heat, Clinker replacement, CMM & Ventilation Air Methane, CO₂ recycling, Coal Mine Methane, Coal to natural gas, Coke oven gas, Combustion of MSW, Composting, Domestic manure, EE public buildings, Existing dam, Food, Glass, Glass heat, HFC134a, HFC23, Industrial waste, Iron & steel, Landfill composting, Landfill aeration, Landfill flaring, Landfill power, Lighting, Machinery, Manure, Mode shift - road to rail, Natural gas pipelines, Nitric acid, EE industry - Non-ferrous metals, EE own generation - Non-ferrous metals heat, Non-hydrocarbon mining, Oil and gas processing flaring, Oil field flaring reduction, Oil to natural gas, EE industry – Paper, EE industry – Petrochemicals, PFCs, Power plant rehabilitation, Rail: regenerative braking, Solar water heating, Stoves, EE industry – Textiles, Ventilation Air Methane, Waste water. All other project types are deemed "non-problematic".

ten years and a renewal of crediting periods should not be allowed, given the risks of inadequate and very uncertain baseline scenarios for later time periods.

It was for this reason that the crediting period was initially limited to a single crediting period for some project types, including:

- PFC emissions from manufacturing in the semi-conductor industry (e.g. AM0092). This is an industry in which manufacturing technologies and composition of materials etc. change frequently compared to the duration of a 7-year crediting period
- Power saving from efficient management of data centers. Technologies and operating systems also typically have short lifespans compared to a 7-year crediting period.
- Complex transport systems such as the introduction of Bus Rapid Transport (BRT) systems in cities. In this context, the uncertainty in the baseline scenario and the resulting baseline emissions grows very rapidly, because development of transport systems over 5-10 years is difficult to predict with accuracy.

For these project types, the maximum crediting period has been set to 10 years in earlier versions of the methodology, because the uncertainty in the baseline scenario after 10 years did not allow for an objective determination of the emission reduction.

This limit in the crediting period to 10 years also allowed the methodology to be simplified, as the projection of baseline emissions over a limited period allows for simpler approaches and requires less monitoring provisions, thus reducing transaction costs.

Subsequently, however, the CDM EB took the decision (EB67, Para 107) that for each project type and methodology multiple crediting periods can be used (independent of any methodological limitations and uncertainty issues for the baseline setting as discussed above). This decision has been taken based on para 49 of the Modalities and Procedures for the CDM (decision 3/CMP.1, annex) that mentions alternative approaches. The paragraph was interpreted in such a way that both options shall be allowed in *each and every* methodology.

Since then, the relevant methodologies have been revised, allowing crediting for up to 21 years for all methodologies, without providing for further safeguards that would reduce the uncertainty in baseline scenario projection and potential over-crediting.

The issue of renewal of crediting period and more generally the updating of baseline scenarios is further discussed in Schneider et al. (2014).

3.5.3. Summary of findings

When the crediting period of a CDM project is to be renewed, the Marrakesh Accords require that the DOE check the validity of the original project baseline. A subsequent EB ruling (EB 43, Annex 13, paragraph 3) limited this check to an assessment of the regulatory framework, an assessment of the remaining lifetime of technical equipment that would be used in the baseline and an update of data and parameters, such as emission factors. The EB clarified that the validity of the baseline scenario should not be re-assessed.

With CDM project types for which the baseline scenario does not require a significant investment at the beginning of the crediting period (that would determine the baseline technology over the lifetime) this may lead to potential over-crediting. A preliminary analysis of projects that underwent renewal of the crediting period in recent years reveals that from 2013 onwards the share of potentially problematic project types (that might have issues of changing baseline scenarios leading to

over-crediting) increases to approx. 40% of projects with renewal. It is therefore recommended that this issue is resolved.

A subsequent ruling by the EB to remove the limit in the crediting period that some project types had in their methodology in sectors especially prone to baseline uncertainty over one crediting period (e.g. semi-conductor manufacturing, information technology, transport) further exacerbated the issue.

3.5.4. Recommendations for reform of CDM rules

We recommend two reforms to the current rules:

- Reassessing the baseline scenario at the renewal of the crediting period: The issue of potential over-crediting arising from inadequate checking of the validity of the baseline at the renewal of the crediting period could be addressed by expanding the assessment to the validity of the baseline scenario for CDM projects that are potentially problematic in this regard. For this, clear criteria for problematic project types should be formulated and guidance should be provided on how to test the validity of baseline scenarios for specific CDM methodologies.
- Limitation of the overall length of crediting for specific project types: Project types in sectors or systems that are highly dynamic and complex, and in which the determination of baselines is notoriously difficult (e.g. urban transport systems) should be limited to a single 10 year CDM crediting period or should be supported by other (non-crediting) finance sources.
- A further step that may be considered is a general limitation of projects to one 7 years crediting period. This may also build on the observation that when discounting future streams of CER revenue beyond 7 (or 10) years at typical hurdle rates longer crediting periods do not really matter for the NPV calculation. Longer crediting periods would only be allowed for project types that require a continuous stream of CER revenues to continue operation such as landfill gas utilization/flaring etc.

3.6. Additionality of PoAs

The advent of CDM Programmes of Activities (PoA) in 2007, and the subsequent refinement of related additionality approaches, changed the nature of additionality testing for many project types. Additionality assessment for PoAs is simplified compared to the requirements for the registration of individual projects. Project developers can establish eligibility criteria to assess additionality, including eligibility criteria, which identify project types that may be automatically additional. More importantly, because the thresholds for identifying small-scale and microscale activities with simplified additionality procedures are set at the level of the Component Project Activity (CPA) and not the level of the PoA, the overall PoA could be far larger than these thresholds. For example, the registered PoA “Installation of Solar Home Systems in Bangladesh” (Ref. 2765) has so far installed 123 MW of solar power and has estimated emissions reductions of 569,000 tCO₂ per year, or almost ten times the small-scale CDM threshold.

In the period of 2013 to 2020, PoAs potentially could supply 0.16 billion CERs. However, as discussed in Section 2.3, the eventual volume for these PoAs could be many times this amount.

3.6.1. Assessment

There are three principle issues with the demonstration of additionality in PoAs: specific additionality concerns about the technology areas covered by PoAs, the robustness of eligibility criteria to check additionality, and the use of small and microscale thresholds for PoAs that are much larger

in total than these thresholds. The first point is largely addressed in Chapter 4, because it is related to the mitigation technologies used in PoAs. As shown in Table 2-2, the majority of PoAs are in technology areas that are analyzed in this report (e.g. efficient cook stoves, efficient lighting, wind, hydropower, biomass), so these chapters should be consulted for an assessment of those technologies.

The second point concerns eligibility criteria, namely that the PoA rules require that the project participants develop a set of eligibility criteria that should guide the inclusion of CPAs. The criteria should be constructed so that, for each new CPA, simply confirming that the CPA meets the criteria is enough to ensure that the CPA is additional. These criteria should be based on approaches used in the relevant methodology or other additionality approach that is relevant for the PoA. In other words, there is not a detailed additionality assessment for each CPA in the way that project activities submitted for registration are evaluated. Instead, the eligibility criteria in the registered PoA design document (PoA-DD) should ensure that the CPA meets the relevant additionality test. For example, if part of demonstrating additionality in the relevant methodology is proving that the project is a particular scale or uses a particular technology, then the scale and technology specification would be listed as eligibility criteria against which each new CPA was checked. A possible concern could be that, if the project participants proposed eligibility criteria in the PoA-DD that did not fully capture the additionality requirements of the underlying methodology, there would be a risk that future CPAs could be included even if they were not additional. Although there was some confusion during the early days of PoAs on how to formulate eligibility criteria, this has not been the case since late 2011 when the EB published a standard for eligibility criteria. This was later replaced by the standard for “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” (CDM-EB65-A03-STAN, version 3.0). This standard provides not only the full list of issues that must be covered in the eligibility criteria, but also clear rules on how additionality may be assessed for PoAs.

The third point is perhaps the most important – whether allowing PoAs that are, in total, much larger than the size thresholds for small and microscale projects could increase the risks of non-additionality among PoAs. The small-scale CDM thresholds are 15 MW for renewable energy, 60 GWh savings for energy efficiency, and 60,000 tCO₂ per year emissions reductions for other project types with approved small-scale methodologies. The scale limits for the microscale additionality rules are 5 MW for renewable energy, 20 GWh savings for energy efficiency projects, and 20,000 tCO₂ for other project types, and are then combined with other criteria (described in detail in Chapter 4, e.g. country type, size of individual units, or even designation by a national authority), to qualify as automatically additional. However, the EB decided at their 86th meeting that microscale technologies using unit size as the basis of automatic additionality (i.e. independent units of < 1500 kW for renewables, < 600 MWh for energy efficiency and < 600 tCO₂ for other projects, all serving households and communities) would have no limit of the total scale of the project or CPA. In other words, an efficient cook stove project activity or CPA could have total emission reductions of greater than 20, or even 60, ktCO₂ per year.

Projects (in this case, CPAs) that qualify as small-scale CDM (SSC) then have access to the technology-based ‘positive list’ in the tool for “Demonstration of additionality of small-scale project activities” (Tool21, version 10.0). CPAs below the micro-scale thresholds would all be automatically additional as long as they meet both the scale and other requirements (e.g. technology, location, etc.). For small-scale CDM, the list of technologies considered automatically additional includes the following:

- Certain technologies whether grid-connected or off-grid: solar (PV and thermal), off-shore wind, marine (wave and tidal), and building-integrated wind turbines or household rooftop wind turbines up to 100 kW;

- Additional off-grid technologies below the SSC thresholds: micro/pico-hydro (with power plant size up to 100 kW), micro/pico-wind turbine (up to 100 kW), PV-wind hybrid (up to 100 kW), geothermal (up to 200 kW), biomass gasification/biogas (up to 100 kW);
- Technologies with isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;
- Rural electrification projects using renewable energy in countries with rural electrification rates less than 20%.

Both microscale additionality and the small-scale CDM positive list approaches have been used extensively by PoAs. As shown in Table 3-2, 33% of the CPAs in registered PoAs, representing 27% of expected CERs, have applied the microscale or small-scale positive list approaches ('first of its kind' is discussed in Chapter 4). An analysis by the UNFCCC Secretariat³⁴ also shows that 142 of the 282 registered PoAs use microscale or small-scale rules for automatic additionality, with 65% of PoAs targeting households utilising one of these tools (Table 3-3). Many of these PoAs have already exceeded the microscale and small-scale thresholds at an aggregate level, as allowed in the CDM PoA rules. In contrast, the 120 CDM project activities that have used small-scale positive lists or microscale guidelines comprise only 0.8% of projects and 0.1% of expected emissions reductions (UNEP DTU 2015a).

Table 3-2: Use of automatic additionality approaches in CPAs within registered PoAs

Approach for automatic additionality	Annual CERs (ktCO ₂ /yr)	CPAs	CERs	CPAs
Microscale tool: country, unit size or DNA selection	3,520	188	11%	23%
Microscale tool: SUZ	60	9	0%	0%
SSC positive list	5,078	91	16%	10%
None	21,279	551	70%	65%
Total	29,936	839	100%	100%

Notes: A more recent version of the PoA pipeline was used here because of a revision of how the use of automatic additionality is classified.

Sources: UNEP DTU 2015b

³⁴ "Concept note: Thresholds for microscale activities under programmes of activities" (CDM-EB85-AA-A09)

Table 3-3: Technology and end-user types in registered PoAs that applied microscale and/or small-scale positive list criteria

Technology type	PoAs	Share of this type of PoA
End use type: Households	92	65%
Household biogas digesters	13	
Energy efficiency - household	2	
Energy-efficient lighting (LED and CFL)	28	
Improved cookstoves	36	
Solar water heaters	7	
Water purifiers	5	
Renewable-based rural electrification	1	
End use type: Others	50	35%
Energy efficiency – industrial	2	
Fuel switch	3	
Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)	35	
Waste treatment (e.g. Wastewater, animal waste)	10	
Total	142	100%

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

Whether granting automatic additionality to PoAs that are over the small and microscale thresholds poses a risk for additionality testing depends on the *reason* for the positive list designations. One of the main issues raised by the positive list is the *unit size* of the technology, with the argument being that the unit size on its own may be sufficient to identify a project type with a high likelihood of additionality (in combination with the other microscale criteria, where relevant). On this basis, the EB recently agreed that the size criterion for the microscale additionality tool should be *only* unit size, and not total project size.³⁵ This means that even a PoA using a large-scale methodology and have a total size beyond the SSC thresholds can still apply microscale additionality guidelines, as long as the unit size and other criteria are met.

The SCC positive list sets unit size limits for most categories of eligibility, although not for rural electrification or the grid-connected technologies (other than the 15 MW limit). The microscale guidelines also include the option of using a unit size less than 1% of the SSC threshold as a justification for applying these guidelines even if the projects are not located in Least Developed Countries (LDCs) or Special Underdeveloped Zone (SUZs).

The most important categories of PoAs (in terms of their contribution to expected CERs) utilising these tools are improved cook stoves, energy efficient lighting, biogas and small unit size solar power³⁶. For the first three technologies, the unit size is inherently small, so the size of the total project or PoA should not, by itself, determine the viability of the technology (bearing in mind, however, that overhead programme costs are obviously lower per unit for larger programmes). The additionality issues with improved cook stoves and energy efficient lighting are reviewed in Sections 4.12 and 4.13, respectively. These sections raise important questions about the additionality

³⁵ The changes to the Tools for “Demonstration of additionality of small-scale activities” (version 22) and “Demonstration of additionality of microscale project activities” (version 07) were approved at EB86 (October 2015), as were changes in the Project Standard, Project Cycle Procedure, and standard on standard on “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities.”

³⁶ Although the table from the UNFCCC Secretariat refers to “Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)”, our analysis has not identified any wind or geothermal PoAs using the small-scale positive list or the microscale guidelines.

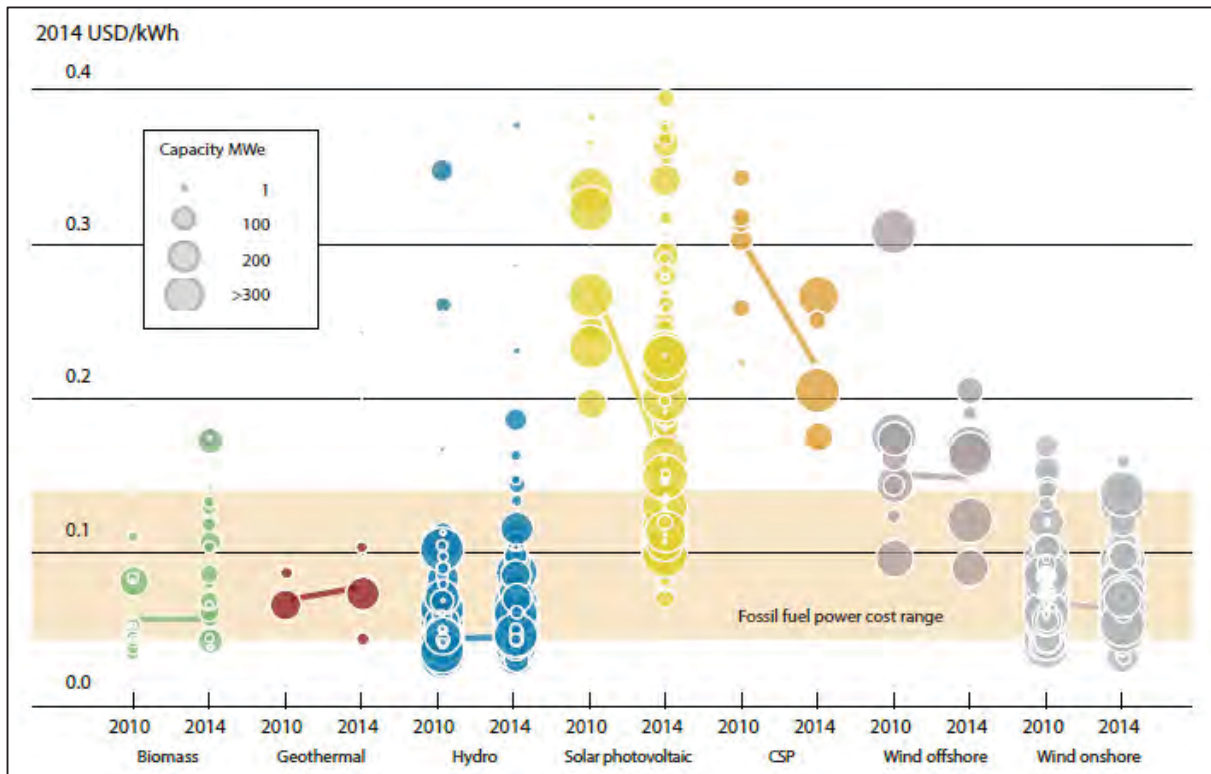
of these project types, despite their small unit size, particularly because of the role of other support programmes in promoting these technologies and possible over-crediting for cook stoves, for example. On the other hand, the extensive literature on household energy access technologies and carbon markets also points to numerous well documented barriers, and the high unit transaction costs associated with small unit size technologies (e.g. Gatti & Bryan 2013; IFC 2012; Warnecke et al. 2015, 2013). In addition, the analysis from the UNFCCC Secretariat mentioned earlier also shows that the average unit size of PoAs using the small-scale and microscale positive lists is, in fact, far below even the microscale unit size of 1% of the SSC threshold (Table 3-4).

Table 3-4: Size of individual units in microscale and small-scale PoAs using positive lists

Unit size as % of SSC threshold	Type I (kW)	Type II (MWh)	Type III (tCO ₂)
1%	150	600	600
PoAs applying microscale criteria			
Average – 0.022%	3.3	13.3	13.2
Std deviation – 0.054%	8.1	32.4	32.4
PoAs applying small-scale criteria			
Average – 0.23%	34	136	137
Std deviation – 0.34%	51	204	204

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

For renewable power technologies, even if the total capacity of a PoA was over 15 MW, the unit size could not be larger than 5 MW for most technologies (15 MW for solar PV or solar thermal) to qualify for automatic additionality. Given the economies of scale in renewable energy power generation (Pryma 2012), small unit sizes would be expected to have higher capital costs, and would therefore be more likely to face investment barriers than larger scale plants. Project-level analysis by the International Renewable Energy Agency (IRENA) also suggests that smaller renewable energy plants not only have higher costs (i.e. because the smaller dots, representing smaller scale projects, are generally higher up in the figure), but that for solar PV and solar thermal these costs are still considerably higher than for fossil fuels (Figure 3-9). Analysis by EPRI has also shown that solar power at the several MW scale is considerably more expensive than conventional alternatives (EPRI 2012). This suggests that a solar PV (grid connected or off-grid) programme of any total size would not be economically viable if the units were below the small-scale thresholds. However, the challenge with solar technologies is that they are so expensive that carbon revenue is unlikely to close the financial viability gap, so they may be more driven by national policies than carbon markets (Section 3.7).

Figure 3-9: Levelized cost of electricity from renewable technologies, 2010 and 2014

Notes: Size of the diameter of the circle represents the size of the project. The centre of each circle is the value for the cost of each project on the Y axis. The LCOE of a given technology is the ratio of lifetime costs to lifetime electricity generation, both of which are discounted back to a common year using a discount rate that reflects the average cost of capital.

Sources: IRENA (2015)

On the basis of the unit size analysis shown in Table 3-4, the Secretariat prepared a concept note with recommendations to the EB using on unit size, and not total project or CPA size, as the basis for determining microscale additionality (CDM-EB85-AA-A09). The EB agreed to begin to implement an approach of using only a unit size threshold to determine if the size of the project qualifies for microscale (EB85 report, paragraph 42). The other requirements for microscale (e.g. location in an LDC or SUZ, if the unit size is greater than 1% of the SSC threshold) would remain unchanged. This means that the CPAs comprised of technologies that were below the unit size threshold would not be limited in their total size. For example, a CFL PoA in an LDC could have a CPA with 100,000 MWh savings and still apply the microscale additionality guidelines.

3.6.2. Summary of findings

While the PoA rules do allow programmes with a total size greater than the small-scale and microscale thresholds to utilise the automatic additionality provisions for these scales of projects, there is no evidence that this increases the risk of non-additional projects on its own (i.e. the share of projects that could be non-additional). In other words, the PoA rules do not fundamentally change the additionality risks for a given category of project technologies. The PoA process could, of course, increase the overall *scale* of the risk because they were designed to facilitate the large scale dissemination of small, distributed technologies. For example, there are 40 registered 'improved stove' project activities with expected CERs of 1 million tCO₂ per year, but there are 46 registered 'improved stove' PoAs that already have expected CERs of 8.1 million tCO₂ per year.

3.6.3. Recommendations for reform of CDM rules

Reform of the CDM rules related to additionality for particular project types and positive lists will address any concerns about additionality of PoAs.

3.7. Positive lists

The concept of ‘positive lists’ means that specific project types are considered automatically additional. Positive lists are one option to reduce transaction costs and increase the certainty of the CDM system from the perspective of project developers. Similar to standardized baselines, creating a positive list requires an upfront evaluation of technologies and their economic and regulatory environment, independent of the assessment of a particular CDM project proposal, to establish certain objective criteria that, if met, will result in a high likelihood of additionality. Once a positive list is established, a specific CDM project only needs to show that the pre-defined criteria are met, and does not have to apply other tools to justify additionality.

3.7.1. Positive lists in the CDM and impact on CER supply

Positive lists were introduced in the CDM through various routes. As briefly mentioned in Section 3.6, the CDM EB adopted the “Guidelines for demonstrating additionality of micro-scale project activities” in 2010, which were subsequently converted to a methodological tool, which first established automatic additionality for certain project types regardless of the type of methodology used (i.e. small-scale or large scale). Table 3-5 shows the technologies covered under version 7 of that tool, and the criteria they must meet in order to be deemed automatically additional. In addition to total project size (or, in the case of PoAs, the size of an individual CPA), the technologies must meet a further criterion such as location, unit size and/or consumer group.

Table 3-5: Projects considered automatically additional under the tool “Demonstration of additionality of microscale project activities”

<p>1 Based on country (LDCs, SIDSs)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>2 Based on unit size and consumer (households, communities, SMEs) (i.e. any country)</p> <ul style="list-style-type: none"> • Renewable energy of any size as long as unit size is less than 1500 kW • Energy efficiency of any size as long as unit savings are less than 600 MWh per year • Other small-scale CDM projects (Type III) of any size as long as unit savings are less than 600 tCO₂ per year
<p>3 Based on host country designation of special underdeveloped zone (SUZ)</p> <ul style="list-style-type: none"> • Renewable energy up to 5 MW • Energy efficiency up to 20 GWh savings per year • Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
<p>4 Based on designation of a technology by the host country</p> <ul style="list-style-type: none"> • Grid connected renewable energy specified by DNA, up to 5 MW, which comprises less than 3% of total grid connected capacity
<p>5 Based on other technical criteria</p> <ul style="list-style-type: none"> • Off-grid renewable energy up to 5 MW supplying households/communities (less than 12 hours grid availability per 24 hours is also considered ‘off-grid’)

Notes: LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SME = Small and micro enterprises, DNA = Designated National Authority.

Sources: Tool for “Demonstration of additionality for microscale activities”

In 2011, the “Guidelines on the demonstration of additionality of small scale project activities”, which later were similarly converted to a methodological tool, also included for the first time a list of technologies that would be considered automatically additional for any project meeting the small-scale CDM thresholds. This initially only included a list of grid and off-grid renewable energy technologies (i.e. the first two blocks in Table 3-6), but was expanded in 2012 to include small isolated units serving communities and renewable energy-based rural electrification.

Table 3-6: Technologies considered automatically additional under the tool “Demonstration of additionality of small-scale project activities”

6	Renewable energy (up to 15 MW, grid or off-grid, all end users) <ul style="list-style-type: none"> • Solar PV and solar-thermal electricity generation • Offshore wind • Marine technologies (e.g. wave and tidal) • Building integrated wind turbines or household roof top wind turbines (unit size =< 100 kW)
7	Renewable energy (up to 15 MW, off-grid only) <ul style="list-style-type: none"> • Micro/pico-hydro (unit size =< 100 kW) • Micro/pico-wind turbine (unit size =< 100 kW) • PV-wind hybrid (unit size =< 100 kW) • Geothermal (unit size =< 200 kW) • Biomass gasification/biogas (unit size =<100 kW)
8	Distributed technologies for households/communities/SMEs (off-grid only) <ul style="list-style-type: none"> • Aggregate size up to SSC threshold (15 MW, 60 GWh or 60 ktCO₂ emission reductions) with unit size =< 5 per cent of SSC thresholds (i.e. =< 750 kW, =< 3 GWh/y or 3 ktCO₂e/y)
9	Rural electrification using renewable energy <ul style="list-style-type: none"> • In countries with rural electrification rates less than 20%

Notes: Numbers in left hand column continue from previous table.

Sources: Tool for “Demonstration of additionality of small-scale activities” (version 10.0)

In addition to these tools, which apply across many methodologies, some individual methodologies have provided for automatic additionality for certain project types, often related to regulations. The most widely used is ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0), which was revised in November 2014 to include a two-part positive list for grid connected technologies. The first part is a list of technologies that are considered automatically additional: solar PV, solar thermal, offshore wind, marine wave and marine tidal (i.e. the technologies included in the first part of the small-scale CDM additionality tool, except at larger scale). The second part says that any technology with less than 2% of the total grid-connected capacity or less than 50 MW total capacity in the country is considered automatically additional. Since the revision of ACM0002, ten new project activities have requested and completed registration (no new PoAs have been registered). Of these, only one project has applied the new positive list provisions – a 141 MW solar PV facility in Chile. This is the largest solar facility to be granted automatic additionality.

Another important methodology with automatic additionality provisions includes ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” (version 15.0), which was revised in late 2013 to consider the following technologies automatically additional if, prior to the project activity, landfill gas was only vented and/or flared:

- electricity generation in one or several power plants with a total nameplate capacity that equals or is below 10 MW;
- heat generation for internal or external consumption;
- flaring (assuming no flaring prior to the project).

AM0113 “Distribution of compact fluorescent lamps (CFL) and light-emitting diode (LED) lamps to households” (version 01.0) provides for automatic additionality for any project distributing self-ballasted LED lamps to households. Projects distributing CFLs are only considered automatically additional if they are in a country with “no or only limited lighting efficiency regulations” reported by the UNEP en.lighten initiative’s Efficient Lighting Policy Status Map. AM0086 “Distribution of zero energy water purification systems for safe drinking water” (version 04.0) considers projects automatically additional if less than 60 percent of the population has access to improved drinking water sources or if the project proponents can demonstrate that more than half of the improved drinking water delivered does not actually meet the appropriate health standards. AMS-III.D “Methane recovery in animal manure management systems” (version 19.0) considers projects automatically additional when there is no regulation that requires the collection and destruction of methane from livestock manure. In addition to these, AM0001 “Decomposition of fluorocarbon (HFC-23) waste streams” (version 6.0), the first approved large-scale methodology, essentially uses a positive list approach based on regulation, because any project that does not face a regulatory requirement to abate HFC-23 emissions is considered additional. The same is true for ACM0019 “N₂O abatement from nitric acid production” (version 02.0).

While the positive lists presented above have not been used widely by CDM project activities (e.g. only 121 registered projects), PoAs have utilised the lists in the small-scale and microscale additionality tools (Table 3-2), with a third of CPAs in registered PoAs using these additionality approaches. Whether this growing group of PoAs presents concerns for the additionality depends on the strength of the justification for the original positive lists and for how long this justification is likely to be valid (i.e. how often the lists should be updated).

The criteria used to select the positive lists as well as the validity of these lists are presented in an information note prepared by the Small-scale Working Group in November 2014 called “Criteria for graduation and expansion of positive list of technologies under the small-scale CDM” (CDM-SSCWG46-A23). Table 3-7 summarises all of the positive list approaches, and shows the range of criteria used. The individual methodologies often refer to regulations to determine automatic additionality, or current penetration rates. The small-scale and microscale additionality tools use a mix of end-users, location, cost of service and penetration rates, depending on the specific technology group. This also highlights the similarity between positive lists discussed here and standardized baselines (Section 3.8), which also define a list of automatically additional technologies based on penetration rates and comparative costs.

Table 3-7: Criteria used for determining positive lists

	End-user	Regulation	Location	LCOS	Penetration	Capital cost
1	Microscale based on country (LDCs, SIDSs)					
			x			
2	Microscale based on unit size and consumer (households, communities, SMEs) (i.e. any country)					
	x					x
3	Microscale based on host country designation of special underdeveloped zone (SUZ)					
			x			
4	Microscale based on designation of a technology by the host country					
					x	
5	Microscale based on other technical criteria					
	x					
6	Small-scale renewable energy (up to 15 MW, grid or off-grid, all end users)					
				x		
7	Small-scale renewable energy (up to 15 MW, off grid only)					
						x
8	Small-scale off-grid distributed technologies for communities					
	x					
9	Rural electrification using renewable energy					
10	AM0086 water purification					
					x	
11	AM0113 energy efficient lighting					
		x			x	
12	ACM1 landfill gas utilisation					
					x	x
13	AMS III.D methane and manure management					
		x				
14	AMS III.C electric and hybrid vehicles					
					x	

Notes: LCOS = Levelized cost of service, LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SMEs = Small and micro enterprises, DNA = Designated National Authority.

Sources: UNFCCC documents as cited in text

In terms of the duration of validity of the positive lists, the small-scale and microscale additionality tools did not originally include a time limit, although many of the methodologies specify a three-year duration of validity. The EB (EB81, paragraph 72) accepted a Small-Scale Working Group recommendation in late 2014 to set a three-year limit on validity for the small-scale CDM positive lists. In addition, the EB agreed on thresholds for ‘levelized cost of service’, ‘penetration rate’, and ‘capital cost’, as shown in Table 3-8. Note that these new rules only apply to the positive lists under the tool for “Demonstration of additionality of small-scale project activities”, and not to microscale activities or any other positive lists.

Table 3-8: Graduation criteria for technologies under the tool for “Demonstration of additionality of small-scale project activities”

	End-user	LCOS	Penetration	Capital cost
Grid connected renewable electricity generation				
All renewable energy technologies in the current positive list		>= 50% higher than all fossil fuels	Global average penetration <3%	
Off-grid renewable electricity generation				
All off-grid renewable technologies in the current positive list				>= 3 times the cost of all fossil fuels
Distributed technologies for households/communities/SMEs				
All distributed technologies eligible under Type I/II/III and providing services of households/communities/SMEs	Assess appropriateness of user groups		Global average penetration rate < 3%	>= 3 times cost of all plausible baseline technologies

Sources: Information note “Criteria for graduation and expansion of positive list of technologies under the small-scale CDM” (CDM-SSCWG46-A23)

3.7.2. Assessment of current positive lists

The positive lists developed under the CDM to date are based on specific criteria such as penetration rate, costs, regulatory environment, and location. While these lists have not been used widely for automatic additionality among CDM project activities, their use among PoAs is widespread and growing. Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. **This review of validity should also be extended to other project types, in particular those covered by the microscale additionality tool or approaches used in relevant methodologies (e.g. ACM002).**

An important challenge with the current positive lists, however, is that the basis upon which they are established varies widely, without a clear rationale for the choice or level of the indicator (e.g. why penetration might be used for some technologies but levelized cost of service for others). **A consistent approach to determining technology eligibility is needed** to ensure that existing and new positive lists do not pose risks of non-additionality. The criteria and indicators used should have clear justification for how they influence project implementation. For example, while low market penetration or high capital costs could be strong indicators of prohibitive barriers for some technologies, it is not clear how the concept of ‘special underdeveloped zones’ (SUZ), which may

be defined differently by each DNA according to UNFCCC guidelines, is a reliable indicator of barriers.

As part of the justification of project types and technology choices, **positive lists must address the impact of national policies and measures to support low emissions technologies** (so-called, E- policies). As discussed in Section 3.9 and many of the sections within Chapter 4, national policies may be the primary driving factor for the implementation of certain technologies, rather than their underlying economics, market position or location. In fact, one of the criticisms of allowing renewable technologies to be considered automatically additional is that their costs are so high that carbon revenue alone cannot possibly make them financially viable, and so other incentives and policies are the real determining factor (Lazarus et al. 2012; Spalding-Fecher et al. 2012). This is even truer with smaller scale technologies. For example, in a study in Southern Africa, the levelized cost of roof-top solar PV was 20% more expensive than utility scale solar PV, while small hydropower was 70% more expensive than large scale (Miketa & Merven 2013). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. An example of this would be the REN21 renewable energy global overview and interactive map,³⁷ which provides a comprehensive technology-specific database of the policies in place to support renewables. A positive list that included renewables could therefore be qualified by restricting its applicability to countries that did not have any support policies in place for that technology. Having support policies in place does *not*, on its own, mean that those technologies would not be additional, but only that there is a greater risk of this and so applying a positive list approach in that country would not be appropriate. Projects in those countries could still use the other tools available for demonstrating additionality for small- and large-scale projects – they would only not have access to automatic additionality based on the positive list. As an example, the positive list in the tool for “Demonstration of additionality of small-scale project activities” includes all solar PV and solar thermal technologies in all CDM-eligible countries. According to the REN21 policy database, however, the following countries have support policies³⁸ in place for solar PV: Algeria, Argentina, Brazil, Cape Verde, China, Côte d'Ivoire, Ecuador, Egypt, Gambia, Ghana, India, Jordan, Lebanon, Malaysia, Mauritius, Nepal, Nigeria, Republic of Korea, Senegal, Thailand, Uruguay, Uzbekistan, and Venezuela. For these countries, therefore, it might be more appropriate to require an analysis of barriers to solar PV rather than considering them automatically additional. This approach could be refined based on additional research into publicly available and up-to-date databases of renewable energy policies.

Finally, to maintain environmental integrity of the CDM overall, **positive lists should be accompanied by negative lists**. This is because the introduction of a positive list without any negative list could, by definition, only lower environmental integrity compared to the traditional approaches. Projects that do not fall within the positive list can still apply the traditional approaches. So, the positive list will lead to more ‘false negatives’ passing the test, but will not rule out any projects that are not additional. Overall, environmental integrity is thus lowered (albeit with the positive element of reducing transaction costs). An exception to this could be the few methodologies that deem projects as ineligible if they reach a market penetration threshold above a certain level, because they, in essence, include both a positive and negative list.

³⁷ The interactive map is shown at: <http://www.ren21.net/status-of-renewables/ren21-interactive-map/>. The full database of policies is available at <http://www.ren21.net/wp-content/uploads/2015/09/Downloadable-Consolidatedv1.2.1.xlsx>.

³⁸ Support policies may include, for example, feed-in tariffs, electric utility quota obligation, capital subsidies, tax credits, and net metering, but exclude renewable energy targets not accompanied by other incentives.

3.8. Standardized baselines

Project developers have repeatedly complained about the expensive and time-consuming process for formally registering a project under the CDM. The setting of the baseline for the greenhouse gas emission reductions associated with a project has required project developers to apply project specific methodologies in order to calculate baseline emission levels. The project developers take on significant costs before the approval of their project when collecting the data necessary to set the baseline and demonstrate additionality. In some cases the risks associated with these upfront costs may be too high for developers of smaller projects in poorer countries (Spalding-Fecher & Michaelowa 2013) – impacting the regional distribution of projects under the CDM. Apart from high transaction costs, the project-specific determination of baselines and assessment of additionality has been criticised in the past for being subjective (Schneider 2009). Due to the information asymmetry between project developers and DOEs subjective assumptions may be difficult to verify, which could result in non-additional projects or over-crediting, which both undermine the environmental integrity of the CDM.

The Cancun Agreements in 2010 provided for the use of *standardized baselines* in the CDM to address these limitations with the aim “to reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism, particularly with regard to under-represented project types and regions, and scale up the abatement of greenhouse gas emissions, while ensuring environmental integrity” (UNFCCC 2011c). In contrast to the project-by-project approach to setting baselines and demonstrating additionality, standardized baselines are established for a project type or sector in one or several CDM host countries. Standardized baselines can address any or all of three areas for standardization: demonstrating additionality, determining the baseline scenario or determining baseline emissions. In the latter case, standardization can include emission factors or individual parameters needed to calculate emission reductions.

Standardized baselines require host country approval and are submitted through the DNA of the host Party. They can cover one or several Parties. Once approved, project developers can use a standardized baseline when submitting a project for registration. In 2014, the EB further decided that it is up to the host Parties to decide whether projects must use an approved standardized baseline or whether they may alternatively use a project-specific approach, but noted that the EB could reject standardized baselines if this poses a risk to environmental integrity (CDM-EB78, para 24). In practice, all approved standardized baselines have so far been voluntary, except for a multi-country grid emission factor in the Southern African region.

The CDM allows standardized baselines to be derived either from suitable methodologies, from tools such as the ‘*Tool to calculate the emission factor for an electricity system*’³⁹ or from a generic framework that is applicable to all project types and sectors such as the ‘*Guidelines for the establishment of sector specific standardized baselines*’⁴⁰ adopted by the EB in 2011. Further regulatory documents include a procedure for submission of standardized baselines, a standard on the coverage and vintage of data, and guidelines for quality assurance and quality control.

The ‘*Guidelines for the establishment of sector specific standardized baselines*’ combine elements of market penetration, performance benchmarks, investment and barrier analysis. Under this framework, the standardized baseline results in a positive list of fuels, feedstocks and/or technologies for a given sector. The least emission-intensive fuel/feedstock/technology needed to produce

³⁹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.pdf>.

⁴⁰ https://cdm.unfccc.int/filestorage/4/1/Y/4IY1RB7DMKLWPGF59XC3UE6JNH8Q2A/eb62_repan08.pdf?t=N2d8bnRoeHN3fDDSYyp3xU9Kx6IMk5Ho1yFw.

a certain percentage of the sector's output (i.e. defined by the CDM EB)⁴¹ is selected as the baseline fuel/feedstock/technology. All fuels/feedstocks/technologies that are associated with lower emission intensities than the baseline technology are candidates for inclusion in a positive list of fuels/feedstocks/technologies that are automatically deemed additional. The DNA of the host country also needs to demonstrate for each of the candidates for the positive list that they are either less economically attractive than the non-candidates or face barriers to entry (Schneider et al. 2012). The baseline technology is also used to determine the baseline against which emission reductions are calculated (Hermwille et al. 2013).

Table 3-9: Approaches for deriving grid emission factors

DNAs could use either the standardized baseline guidelines or the grid emission factor tool to determine the grid emission factor and submit the value as a standardized baseline. The weaknesses of this opportunity to choose between two alternative approaches are explained below:

- 1) **Pick and choose issue:** The two approaches will provide two different values for the grid emission factor. Thus, the DNA could pick and choose between two completely different methodological approaches for determining the grid emission factor. Countries for which the guidelines result in higher values will use that approach, whereas countries for which the tool results in higher values will use that approach. Overall, having two parallel approaches could undermine the environmental integrity compared to the current situation in which only one approach is available.
- 2) **Vintage of data issue:** The standardized baseline guidelines consider all plants, whether they were recently constructed or decades ago. This could result in a situation in which coal power is determined as the baseline fuel, even if no coal power plant has been constructed or been under construction for a decade. In contrast, the grid emission factor tool aims to consider recent developments by observing which plant types were recently added to the system or are under construction or which plants actually operate at the margin.
- 3) **'One size fits all' issue:** The grid emission factor tool uses a methodologically approach that considers the particularities of the electricity system, considering different possible effects of displacing grid electricity (marginal plants not being dispatched/the construction of other power plants avoided or delayed). In contrast, the guidelines do not consider the characteristics of the sector and make generalised assumptions, which have little meaning in the power sector. The guidelines therefore result in less accurate grid emission factors than the grid emission factor tool.

Sources: Own compilation

The environmental impact of standardized baselines will be affected by how stringently the standardized baseline is set for a given project type. The stringency of standardized baselines needs to safeguard the environmental integrity of the CDM whilst also striking the right balance between accuracy and transactions costs in order to ensure that there is an incentive for developing new CDM projects.

The implications of standardized baselines on environmental integrity will also vary depending upon the sector that they are applied to, as the approach relies considerably upon the assumption that the penetration of a fuel/feedstock/technology is negatively correlated with its cost and/or with barriers that impede their deployment (Hermwille et al. 2013). For certain sectors there will undoubtedly be a strong correlation, i.e. energy efficient lighting and efficient electrical appliances.

⁴¹ In its guidance, the EB has defined a preliminary additionality/crediting threshold of 80 % in priority sectors and 90% in other sectors.

However for other sectors, i.e. with multiple products or with strongly varying circumstances among installations, the correlation will be weaker or absent and alternative approaches for setting baselines and demonstrating additionality may be more suitable (Hermwille et al. 2013). Applying the current framework to sectors for which such a correlation is lacking could broaden the positive lists for technologies that are unlikely to be additional. In the power sector, for example, the guidelines do not reflect the particular features of an electricity system. The Methodologies Panel recommended that the EB limits the applicability of the SB standard to sectors other than the power sector (MP65, paragraph 38 and 39). In response, the EB requested the Methodologies Panel to assess the applicability of the proposed framework to different project types (EB81, paragraph 41). However, as of January 2016, the current guidelines are still applicable to all sectors. In 2015, a standardized baseline was finalized for consideration by the EB, which includes grid emission factors for different islands of Cape Verde and applies for some islands the “*Guidelines for the establishment of sector specific standardized baseline*” and for others the grid emission factor tool. The issues arising from the application of the guidelines to the power sector are highlighted in Table 3-9.

The following issues may pose further environmental risks through the implementation of standardized baselines in the future:

- **Mandatory versus voluntary use of standardized baselines:** The current CDM EB framework does not make the use of standardized baselines mandatory (CDM-EB74, para 24). It is the discretion of the DNA to decide whether project participants can select between project-specific or standardized baselines. In this regard, the DNA can make their use voluntary or mandatory. This may have two consequences:
 - Standardized baselines open an alternative route towards positive lists (Section 3.7), while keeping the approach of demonstrating additionality through the current means. By definition, this can only increase the number of false positives. Hence, the likelihood for additionality is lower, compared to a situation in which there would be no standardized baselines.
 - The voluntary use of standardized baselines could lead to project developers picking and choosing between baseline emission factors which could result in over-crediting (Table 3-9, bullet point 1). Indeed, Spalding-Fecher & Michaelowa (2013) argue that the CMP should make standardized baselines mandatory.

The degree of these risks depends on how conservative the standardized baselines are set. The more conservatively that they are set, the lower the risk is. An example of how picking and choosing between project-specific and standardized baselines can undermine environmental integrity is the approved standardized baseline ASB0018 for cook stove projects in Burundi. The approved standardized baseline provides default values for the amount of non-renewable biomass consumed in the baseline (1.5 tonnes per person and year for households in urban areas and 1.1 tonnes per person and year for households in rural areas). However, at the same time, a PoA (9634) is registered in Burundi with project-specific baseline values based on data from a more recent survey. The project-specific baseline is more ambitious (1.21 tonnes per person and year for households in urban areas and 0.83 tonnes per person and year for households in rural areas). Had the standardized baseline been approved prior to the registration of the project, the project could have opted for the less ambitious standardized baseline. At the same time, projects with higher project-specific baseline values could opt for their project-specific baseline and not use the standardized baseline.

- **Quality assurance and quality control (QA/QC) of standardized baselines:** Version 04.0 of the procedure ‘*Development, revision, clarification and update of standardized baselines*’

(CDM-EB84-A10) sets out how a project developer can submit a proposal for a standardized baseline to the CDM EB following first the approval of the relevant DNA. It is necessary for the project developer to provide a list of documents when submitting a standardized baseline proposal, which includes the Form F-CDM-PSB, supporting documents and an Assessment Report of QA/QC. The CDM EB clarified only in 2015 that DOEs not only need to verify whether the required documents were submitted and that the data were collected according to guidelines for quality assurance and quality control but that they also need to check that the standardized baseline has been calculated in accordance with the relevant standards (CDM-EB85-A10). However, this decision still needs to be adequately reflected in the latest version of the *'CDM validation and verification standard'* (CDM-EB82-A14). Moreover, stakeholders expressed concerns that if the requirements for QA/QC are too stringent, it may prevent the approval of standardized baselines from LDCs (Hermwille et al. 2013). Therefore, the QA/QC Assessment Report is currently not compulsory for countries with 10 or fewer registered CDM projects as of 31 December 2010 for the first 3 submissions (CDM-EB84-A10, Para. 18), even though countries can request financial support from the UNFCCC for the development of Assessment Reports. These exemptions from applying the QA/QC guidelines could undermine the environmental integrity of the CDM.

- **Development of country-specific thresholds:** CMP9 requested the EB *"to prioritise the development of top-down thresholds for baseline and additionality for the underrepresented countries in CDM"* (CDM-EB82-AA-A10, Para. 3). Many stakeholders regard the currently approved default thresholds for additionality and baseline as *'unattractive'* and *'not suitable'* for specific national/regional/sectoral circumstances (CDM-EB82-AA-A10). However, the adoption of country-specific thresholds could be a difficult process as such thresholds are a policy choice rather than a methodological choice. It is uncertain whether or not the development of country-specific thresholds would undermine the environmental integrity of the CDM. However, it would likely result in the incomparability of emission reductions from different standardized baselines within the same project type or technology.
- **Exclusion or inclusion of CDM facilities in the peer group to determine standardized baselines:** The development of certain standardized baselines relies upon the performance and actual output from the facilities of a sector of the host country. Some of these facilities may already have registered CDM projects (i.e. referred to as CDM facilities) that would have improved performance due to the incentives provided by the CDM. Given that it is difficult to determine the performance and outputs of these facilities in the absence of the CDM, it is necessary to take a decision on whether to include CDM facilities in the calculation of a standardized baseline or not. Exclusion of CDM facilities could undermine the environmental integrity of the CDM (CDM-EB78-AA-A05). As a default all CDM projects need to be included in the respective cohort unless the DNA can demonstrate that the cost of fuels/feedstocks/technologies exceed those of certain comparable projects (CDM-EB79, para 41).
- **Vintage of standardized baselines and static versus dynamic standardized baselines:** Standardized baselines are often constructed based on plants for which the investment decision was taken many years in the past. If a standardized baseline is static and not frequently updated, it can mean that additionality is established and baselines are determined based on a market situation that is ten or twenty years old (i.e. failing to take into account technological breakthroughs). This could result in significant crediting of BAU (Table 3-9, bullet point 2). The high-level CDM Policy Dialogue has therefore recommended that in order to drive technological change, the standardized baseline framework must ensure *"that the focus of incentives constantly shifts to the next generation of technologies"* (CDM Policy Dialogue 2012, p. 6). As a consequence, the current standardized baseline framework specified interim data vintages and

update frequencies of 3 years respectively (CDM-EB77-A05). For example, sectors associated with slow dynamic developments in the past may allow for a relaxation in the frequency of updates without compromising the environmental integrity of the CDM.

- **Level of disaggregation:** The level of disaggregation is an important factor to consider in the development of a standardized baseline, which can enable a DNA with limited resources to prioritise which mitigation measures to incentivise within a sector. For example, Hermwille et al. (2013) refer to a case study of the rice mill sector in Cambodia where only a small number of large scale rice mills account for approximately 60% of the total output. Given that the remaining output is provided by thousands of small-scale rice mills with very varied use of technologies that are associated with different emission intensities, it was necessary to disaggregate the standardized baseline on the basis of plant size (i.e. focus standardisation on the large-scale mills). The importance of disaggregation of standardized baselines is further demonstrated in the power sector. If a standardized baseline is based upon the entire power sector of a country, it is likely that the use of renewables and possibly of the most efficient fossil fuel technologies would be encouraged. However, if the standardized baseline was disaggregated further to consider fossil fuel consumption only – different mitigation options such as fossil fuel switching would be encouraged instead (Hermwille et al. 2013). The appropriate level of disaggregation depends very much on the project type and the actual circumstances. With the current approach, DNAs can determine the level of disaggregation, though there is no EB guidance on how the appropriate level can be determined. In addition, such guidance would hardly be compatible with the ‘one size fits all’ approach pursued in the standardized baseline guidance.

In light of all of these challenges, the implementation of standardized baselines may not be suitable for all sectors, project types or countries. The development of a standardized baseline can achieve the objective of simplification in certain sectors associated with more homogenous products. However, standardized baselines will be more difficult to apply to sectors associated with a range of products and strongly varied circumstances amongst installations. Therefore, it should be carefully checked for which purposes, sectors, project types and baseline emission sources standardized baselines are appropriate. Applying one single approach to establish standardized baselines for different sectors, project types and locations, as currently pursued under the CDM, is likely to undermine the environmental integrity of the CDM. Standardized baselines should be developed from actual projects and reflect the particular circumstances of the sector, project type and location. Once approved within a country or region, standardized baselines need to be mandatory for all new CDM projects to prevent that more CERs are issued as if the standardized baseline was not established (Schneider et al. 2012).

To ensure that the concept of standardized baselines provides what it was established for, particularly “to reduce transaction costs, ... while ensuring environmental integrity” (UNFCCC 2011c), the EB should review the standardized baseline framework. This review should ensure that

- stringent QA/QC procedures are applied to all standardized baselines,
- all CDM facilities without any exemptions are included in the peer group for the standardized baseline,
- DNAs can build their decision on the appropriate disaggregation level on a clear guidance document which aims to determine the level of disaggregation in a way that covers the mitigation activity of the standardized baseline as accurately as possible and includes as few external factors (‘noise’) as possible;
- the practice of using the same methodological approach to establish standardized baselines for all the different sectors, project types and locations is replaced by the development

- of project-specific standards derived from actual projects and reflect the particular circumstances of the sector, project type and location, and last but not least,
- standardized baselines are mandatory for new projects once they are approved for a country.

If these improvements were introduced, standardized baselines could be a valuable tool to improve the environmental integrity of the CDM while lowering transaction costs.

3.9. Consideration of policies and regulations

The consideration of policies and regulations in demonstrating additionality and establishing emissions baseline has been a controversial issue for project-based mechanisms as the CDM. Policies and regulations adopted by the host country can have a significant impact upon future emission pathways. For example, the introduction of air quality regulations for power plants impacts their CO₂ emissions while fossil fuel subsidies reduce the viability of less emission-intensive technologies (Schneider et al. 2014). When setting the baseline and demonstrating additionality there have been concerns raised about both perverse incentives for policy makers (i.e. host countries not implementing policies and measures that reduce emissions so that they can secure greater carbon revenues) and about environmental integrity, by either over-crediting of emission reductions (i.e. inflating the baseline by excluding policies and measures that reduce emissions) or non-additional projects (i.e. registering projects that are economically viable and do not face barriers by allowing the exclusion of subsidies in the investment analysis).

The modalities and procedures for the CDM require that *"a baseline shall be established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector"* (decision 3/CMP.1, para 45(e)). However, in order to avoid the creation of perverse incentives for policy makers, the CDM EB adopted, at its 22nd meeting, the following rules with regard to the consideration of policies in setting baselines:

- **E+ policies:** to not consider policies adopted after 1997 which *"give comparative advantages to more emissions intensive technologies or fuels over less emissions intensive technologies or fuels"* in setting the baseline;
- **E- policies:** to not consider policies adopted after 2001 which *"give comparative advantages to less emissions intensive technologies over more emissions intensive technologies"* in setting the baseline.⁴²

These rules failed, however, to fully address perverse incentives for policy makers, as host countries would continue to have incentives to maintain existing E+ policies such as fossil fuel subsidies. Furthermore, although host countries will not be discouraged from implementing national policies and measures that reduce emissions (E- policies), the rules are likely to result in over-crediting of emission reductions.

Overall, in the case of E- policies it seems difficult to reconcile the two policy objectives: avoiding perverse incentives for policy makers and ensuring environmental integrity. If E- policies were excluded when demonstrating additionality or setting baselines, perverse incentives would be addressed but environmental integrity would be undermined, since projects that are financially viable could claim they are not, and emissions baselines would be inflated. If E- policies were included, environmental integrity would be ensured but perverse incentives not addressed.

⁴² EB 22 report, Annex 3: Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline Scenarios (Version 02), https://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

In 2013, the EB reviewed its E- policy guidelines with a view to balancing these two conflicting policy objectives and *“agreed to pursue an approach by which, for the first seven years from the effective implementation date of the relevant E- policy, the benefit of that E- policy does not need to be considered by project participants in the additionality demonstration through investment analysis”* (CDM-EB73, para. 70). The approach would thus ignore new E- policies but for a limited time period. Initially allowing the exclusion of E- policies could be seen as addressing perverse incentives for policy makers, while ensuring environmental integrity in the longer term. It would also expand the approach of ignoring E- policies from baseline setting to demonstrating additionality. However, the EB has not yet been able to agree on a revision of its E+/- policy guidelines.

Based upon an econometric analysis, Lui (2014) raises questions about the decline of feed-in tariffs in China⁴³ that may imply a gaming to ensure wind projects are not economically attractive for the purpose of demonstrating additionality under the CDM. Schneider et al. (2014) argue that with regards to E- policies it is simply not feasible to achieve both a robust crediting baseline and avoid the creation of perverse incentives at the same time. Striking a balance between the two objectives is therefore required when setting the crediting baseline, which is likely to vary depending upon the sector, project type and type of policy.

Given the contrasting objectives, the decision on whether to include E- policies in the baseline or not and the determination of additionality of a project-based mitigation activity should depend upon the potential risk of either creating perverse incentives or over-crediting. Schneider et al. (2014) recommend that the following approach should be pursued when setting baselines and determining additionality:

- If the **risk of creating perverse incentives** is judged to be considerably larger than the risk of over-crediting, then E- policies should not be considered (for a certain period) in setting the baseline;
- If the **risk of over-crediting** is deemed to be considerably greater than the risk of creating perverse incentives, then E- policies should be considered in setting the baseline.

The extent to which the setting of baseline and determination of additionality for a project-based mitigation activity is more liable to either the risks of perverse incentives or over-crediting depends upon the wider co-benefits associated with a policy other than simply climate change mitigation. For example, the deployment of renewables is associated with multiple co-benefits such as employment opportunities, energy security and air quality improvements. Given the additional benefits associated with such E- policies, it is less likely that these policies would not be adopted as a consequence of changes to an international crediting mechanism. Schneider et al. (2014) and Spalding-Fecher (2013) therefore both argue that the risk of creating perverse incentives (i.e. delaying policies and regulations to secure more CER revenues) may be lower than the risks of setting a less robust baseline (i.e. by not including E- policies in the baseline) that leads to the over-crediting of emission reductions. Spalding-Fecher (2013) also points out that such co-benefits are likely to occur with electricity generation, energy efficiency and agriculture projects.

However, the risk of creating perverse incentives is likely to be greater from mitigation activities such as the capture of HFC-23, which reduce GHG emissions but do not lead to significant co-benefits. In such a case, preventing the creation of perverse incentives (i.e. host country delaying regulation on the capture of HFC-23) could be given priority over additionality and environmental integrity by not considering such E- policies when setting the baseline. Nevertheless, CERs resulting from such projects would be used to offset GHG emissions in other capped systems and, since

⁴³ Spalding-Fecher (2013) discusses the uncertainty within the CDM EB on how such a policy change should be classified under the E+/- policy guidance.

they are not truly additional, result in globally higher emissions. Therefore, it would be more appropriate to support such technologies by other means such as ODA or climate finance or by addressing these mitigation potentials as own contribution under the ADP negotiations.

From a more practical perspective, Spalding-Fecher (2013) emphasises the difficulty of accurately accounting for the effects of E- policies when setting either the baseline or demonstrating additionality. The level of difficulty depends upon the policy type. For example, the impact of direct financial incentives such as mandatory feed-in tariffs can be removed more easily from an emissions baseline than indirect sectoral incentives such as renewable energy portfolio standards or economy-wide policies such as domestic emissions trading schemes. Furthermore, defining the date of policy implementation and the effectiveness of enforcement may sometimes represent additional challenges (Spalding-Fecher 2013). If the guidance provided by the CDM EB – given the difficulty in isolating the impact of multiple (and sometimes conflicting) policies when setting emission baselines or demonstrating additionality – would only relate to direct financial incentives this could lead to the unequal treatment of host countries under the CDM based upon the types of policies implemented (Spalding-Fecher 2013). For example, it would be easier to determine the additionality of a renewable energy project in a host country with direct financial incentives such as feed-in tariffs compared to a host country that adopted a domestic emissions trading scheme. This practical problem could not only undermine the environmental integrity of the CDM but also mean that excluding E+ or E- policies may simply not be practical.

Taking into account the various challenges to strike the right balance between avoiding perverse incentives for policy makers and ensuring environmental integrity, Spalding-Fecher (2013) concludes that the risk of perverse incentives is not as high as previously assumed in many countries and sectors, while the risk of over-crediting is substantial. He therefore suggests that as a general rule all E- policies should be considered in both baseline-setting and additionality determination. Schneider et al. (2014) outline the following options in relation to E- policies:⁴⁴

- No consideration of E- policies: No perverse incentives would be created if both existing and planned E- policies were not considered when setting the crediting baseline. In fact, host countries would be encouraged to introduce further E- policies to further reduce emissions below the baseline. However, the disadvantage of this option would be that the emission baseline would most likely be inflated above BAU.
- Consideration of existing E- policies, exclusion of future E- policies: A more balanced approach could involve the introduction of a cut-off date for excluding future E- policies from being considered in the setting of the crediting baseline. However the setting of a cut-off date is problematic. For example, if the cut-off point is set too early it may inflate the crediting baseline by considering E- policies that have already been adopted. Nevertheless, the option provides a positive incentive for host countries to adopt new E- policies (after the cut-off point) to reduce emissions.
- Consideration of existing and future E- policies: A robust crediting baseline would be established if both existing and future E- policies were considered (either ex-ante or ex-post), however this would most likely create disincentives to introduce E- policies as their introduction could lower the potential for credits. In addition, this option would provide greater uncertainty for investors as to when a crediting baseline would be updated.

In order to prevent the over-crediting of emission reductions, it would be a sensible approach to include current E- policies in the crediting baseline. However, accounting for future E- policies is

⁴⁴ These options are outlined in the context of a sector based crediting mechanism though they also apply to the CDM.

more problematic and warrants further research to ensure that a reasonable balance is achieved between limiting the over-crediting of emission reductions and preventing the creation of perverse incentives. Schneider et al. (2014) and Spalding-Fecher (2013) conclude that the balance should be more in favour of limiting over-crediting in the CDM or future mechanisms as they judge this risk to be greater to undermining environment integrity than from the creation of perverse incentives. Therefore, as a general rule Schneider et al. (2014) recommend that adopted policies and regulations reducing GHG emissions should be included when setting crediting baselines and policies that increase GHG emissions should be discouraged by their exclusion from the crediting baseline where possible.

3.10. Suppressed demand

One of the challenges of applying GHG accounting approaches in poor communities is that the current consumption of many household services (e.g. heating and cooking energy, lighting and potable water) may not reflect the real demand for those services. This could be a result of lack of infrastructure, lack of natural resources or poverty, particularly the high costs of these services relative to household incomes. The situation of 'suppressed demand' creates a problem for setting baselines, because the CDM rules say that the baseline scenario selected for a project should provide the same level of service and quality as the project scenario (Gavaldão et al. 2012; Michaelowa et al. 2014; Spalding-Fecher 2015; Winkler & Thorne 2002). This is clearly not the case if the project scenario provides a much higher service level, owing to low historical consumption. At the same time, the CDM rules state that "the baseline may include a scenario in which future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party" (UNFCCC 2006a para. 46). This section analyzes how the concept of suppressed demand has been implemented in CDM methodologies and what the potential impacts on CER issuance as a result of the revised and new methodologies. For a more detailed conceptual explanation of suppressed demand, as well as background on previous EB decisions and guidance, see Chapter 9 of Spalding-Fecher et al. (2012).

3.10.1. Treatment of suppressed demand in approved methodologies

Table 3-10 below shows the methodologies in which suppressed demand has been explicitly considered, in three different categories. The first group is from a work plan agreed by the EB at their 67th meeting, when the EB requested that the Secretariat and relevant support panels explore how to incorporate suppressed demand. The second group is methodology revisions for which the proponent of the revision motivated the change based on the Suppressed Demand guidance. The final group is new methodologies that were developed after the approvals of the Suppressed Demand guidance and incorporated those ideas, as documented in the UNFCCC Methodology Guidebook. Of the original 10 methodologies in the EB work plan, 5 were revised or replaced, while an additional 8 methodologies fall into the second and third categories.

Note that a group of methodologies not listed here, but that implicitly recognise suppressed demand, are those addressing new large-scale power generation or industrial development. New renewable energy, natural gas or high-efficiency coal power plants are not required to show that they actually replace an existing power plant. Given that most developing countries have shortages in power supply, building a new natural-gas-fired power plant, for example, could potentially increase emissions compared to current levels. However, the accepted principle on baseline development across the CDM is that the baseline is not necessarily the same as historical emissions, but should reflect the most likely development scenario for the sector. Even in countries with chronic power shortages, it would be difficult to argue that there would be *no* capacity increases under the baseline scenario. This means that, even in these cases, CDM projects – if properly justified –

would potentially displace another alternative new plant. The determination of the alternative plant is then the subject of the methodology's baseline scenario analysis.

Table 3-10: Methodologies explicitly addressing suppressed demand or part of EB work plan on suppressed demand

Meth No.	Meth Name	Revised?	When	Pipeline ¹⁾	
				Projects	PoAs
From EB67 work plan List of Methodologies					
AM0025	Alternative waste treatment processes	ACM22	EB69	127	5
AM0046	Distribution of efficient light bulbs to households	No		2	0
AM0086	Installation of zero energy water purifier for safe drinking water application	No	EB70	1	0
AM0094	Distribution of biomass based stove and/or heater for household or institution	No	EB70	0	0
ACM0014	Treatment of wastewater	Yes	EB77	47	1
ACM0016	Mass Rapid Transit Projects	No		16	1
AMS I.A	Electricity generation by the user	Yes	EB69	50	17
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	Not necessary	EB70	24	58
AMS II.E	Energy efficiency and fuel switching measures for buildings	No		44	5
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	Yes	EB68	4	14
Additional revisions referring to Suppressed Demand					
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	Yes	EB77	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	Yes	EB70	45	62
AMS III.F	Avoidance of methane emissions through composting	Yes	EB67	103	20
New methodologies where EB noted Suppressed Demand					
ACM0022	Alternative waste treatment processes	New	EB69	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	New	EB73	0	0
AMS I.L	Electrification of rural communities using renewable energy	New	EB66	0	1
AMS III.BB	Electrification of communities through grid extension or new mini-grids	New	EB67	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	New	EB60/62	0	10
Total with revisions or new related to suppressed demand				473	194
Total pipeline				11,990	446²⁾

Notes: ¹⁾ Pipeline is as of 1 January 2014. ²⁾ PoA DD's submitted, which may include multiple methodologies and include 23 PoAs replaced by new versions. Total number of methodology citations in all PoAs submitted is 874.

Sources: Authors' own compilation

While the proportion of project activities influenced by these methodologies is very small, a significant share of PoAs are utilising the revised or new methodologies. In terms of the quantitative impact of the revisions to methodologies to incorporate suppressed demand; however, this may only relate to projects or PoAs entering the pipeline after the revision. While project participants are allowed to update the version of the methodology that they use prior to the renewal of the crediting period, this should not make the emission reduction calculations less conservative. Given that the suppressed demand revisions could increase the baseline significantly, it is not entirely clear whether the EB would approve this revision for existing projects prior to the renewable of the crediting period (when the latest version of the methodology must be used). Because AM00025 was replaced by ACM0022 in order to address suppressed demand, none of the projects or PoAs under AM0025 (which was not used after October 2012) would be able to utilise the new suppressed

demand approach embodied in ACM0022. Table 3-11 below shows the number of PoAs and Projects in the pipeline both before and after the revisions.

Table 3-11: CDM pipeline affected by suppressed demand methodologies

Meth No.	Meth Name	Total pipeline		New pipeline since revision	
		Projects	PoAs	Projects	PoAs
Revised methodologies					
ACM0014	Treatment of wastewater	47	1	0	0
AMS I.A	Electricity generation by the user	50	17	0	13
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	4	14	3	1
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	0	0	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	45	62	2	18
AMS III.F	Avoidance of methane emissions through composting	103	20	7	8
New methodologies that incorporate suppressed demand					
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	24	58	24	58
ACM0022	Alternative waste treatment processes	10	0	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	0	0	0	0
AMS I.L	Electrification of rural communities using renewable energy	0	1	0	1
AMS III.BB	Electrification of communities through grid extension or construction of new mini-grids	0	0	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	0	10	0	10
Total		283	183	46	109

Sources: Authors' own compilation

How the suppressed demand concepts and guidance are implemented varies significantly by methodology. With the exception of AMS III.AR, all of the methodologies use the project activity level as the baseline activity level. Only AMS III.AR defines a quantitative Minimum Service Level that is used to calculate baseline emissions. AMS I.L and AMS III.BB define an MSL, but it is only used to adjust the emissions factor for the baseline, rather than to directly calculate baseline activity levels or emissions. For AMS III.F and ACM0022, the minimum service level is qualitatively defined as having a solid waste disposal site (i.e. rather than considering the quantity of waste processed per household). What the methodologies all do, however, is to define a baseline technology that may have higher emissions than the actual current technology. For example, households may currently only use candles and kerosene hurricane lamps, and therefore have very low lighting services, but the methodologies use a kerosene pressure lamps for the baseline technology, because this can deliver the MSL for lighting services.

For the revised methodologies, the resulting baselines emissions could be substantially higher per household (Annex 8.2, Table 8-1). For example, under ACM0014, baseline methane emissions may still be considered even if the wastewater is currently not treated or stored in a way that would necessarily produce emissions (e.g. lagoons with depth less than 1 m). ACM0022 and AMS III.F have emissions factors that could be double the current practices, while for AMS I.L and AMS

III.BB, the emission factor for very small users (e.g. 50 kWh/yr) is almost 7 times the emissions factor originally used in AMS I.A for these projects.

3.10.2. Impact on CER supply

If current energy service demand is suppressed by lack of income, relatively high energy prices and/or lack of physical access, how quickly might this change without the CDM project? In other words, how long might it take for the current emissions to reach the suppressed baseline emissions? This depends on many factors, including income growth in the host communities and changes in access. Data from the World Bank's World Development Indicators (World Bank 2014), for example, shows that, at a highly aggregated level, per capita incomes in most developing regions have, indeed, increased substantially, but this is slower in low income countries. Electricity consumption per capita, however, has not shown such consistent growth in Africa, largely due to population growth outstripping energy supply growth and electrification programmes (World Bank 2014). This data cannot necessarily be applied to specific sub-regions or project areas, but does show that significant increases in energy consumption are possible in a relatively short time frame. In terms of electrification rates, these have increased relatively rapidly for key countries, rising from 25% or 30% to 60% to 80% in as little as 10 or as many as 30 years (Bazilian et al. 2011). Clearly, the level at which the minimum service level is set will also influence the risk of over-crediting, with lower service levels being more likely to reflect potential consumption in the shorter term without the CDM.

Even if the households were not to reach the minimum service levels in the near term and the emissions factors used in these methodologies is substantially higher than in traditional methodologies, the overall impact on CER generation is likely to be very small. The total CERs projected to 2020 for the methodologies in Table 3-11 after the revisions to those methodologies is approximately 17 million. Even if all of the CERs for those methodologies are considered (i.e. before and after revision), at approximately 112 million, this is still less than 1% of the entire CDM pipeline, and so does not represent a significant impact on emissions.

3.10.3. Additionality concerns

In summary, while the introduction of the concept of suppressed demand in CDM methodologies is expanding, and will have important development impacts, it is unlikely to have a major impact on the overall additionality of CDM projects. In many project areas, it is likely that the communities could reach the Minimum Service Levels during the course of the CDM project life, although this is uncertain and will depend on local circumstances. Creating an open and transparent process of setting minimum service levels, with expert input as well as input from other stakeholders, could also help to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to certain country groups (e.g. LDCs, under-represented countries), in which development needs are highest and the potential for over-crediting it the smallest. Even if the suppressed demand does lead to some over-crediting, the overall impact is very small, particularly if restricted geographically. More importantly, the increased contribution to sustainable development provides a strong justification for this approach to project types that address poverty and development issues.

4. Assessment of specific CDM project types

The relevant literature highlights that the likelihood of CERs representing real, measurable and additional emission reductions varies considerably among project types. Some project types do not generate revenues other than CERs. These projects have a high likelihood of being additional. Other project types are heavily promoted and/or subsidized by governments, generate significant

other revenues, or their economic feasibility is hardly impacted by CER revenues. For these projects, additionality is more questionable.

Other aspects affecting the quality of CERs also vary among project types. Perverse incentives are particularly relevant for projects that generate large CER revenues compared to the cost structure of their main business (e.g. HFC-23 projects). Baselines are particularly challenging to determine in dynamic sectors with high rates of learning and innovation and penetration of new technologies over relatively short periods of time. The length of crediting is critical for project types which are implemented earlier due to the CDM incentives.

For these reasons, this chapter evaluates the ability to deliver real, measurable and additional emissions reductions for specific CDM project types. In the following, we select important project types in Section 4.1 and assess these project types in the subsequent sections.

4.1. Project types selected for evaluation

We select the project types for evaluation mostly based on their potential CER volume in the period of 2013 to 2020 according to the current CDM project portfolio. Focusing on the period of 2013 to 2020 and on the largest CDM project types in terms of potential CER volume allows the best estimation of the quality of the overall CDM project portfolio for future new demand for CERs. Moreover, the project types with the largest market share are most critical for the overall quality of the CDM.

The specific project types selected for evaluation are provided in Table 4-1. The table also shows that these project types cover a potential CER volume of 4.8 billion CERs, which corresponds to 85% of the overall CER supply potential for the period of 2013 to 2020 (Section 2.3). This ensures a large representativeness.

Table 4-1: Project types selected for evaluation

Project type	Potential CER supply 2013 to 2020 [million]	Focus areas analyzed
Wind power	1,397	Additionality, baselines
Hydropower	1,669	Additionality, baselines
Biomass power	162	Additionality, baselines, leakage
HFC-23	375	Perverse incentive, baselines
Adipic acid	257	Perverse incentives (leakage)
Nitric acid	175	Perverse incentives, baselines
Landfill gas	163	Additionality, baselines, perverse incentives
Coal mine methane	170	Additionality, baselines
Waste heat recovery	222	Additionality, baselines
Fossil fuel switch	232	Additionality, baselines
Efficient cook stoves	2.3	Additionality, baselines
Efficient lighting	3.8	Additionality
Total of all selected project types	4,829	
Total of all projects in the CDM portfolio	5,671	

Source: Authors' own compilation and calculations

4.2. HFC-23 abatement from HCFC-22 production

4.2.1. Overview

Hydrofluorocarbon-23 (HFC-23) is a waste gas from the production of hydrochlorofluorocarbon-22 (HCFC-22), which is a GHG and an ozone-depleting substance (ODS) regulated under the Montreal Protocol on Substances that Deplete the Ozone Layer. HCFCs were introduced as an alternative to the highly ozone-depleting chloro-fluorocarbons (CFCs) because of their lower ozone-depleting potential. HCFC-22 is mainly used for two purposes: as a refrigerant in refrigeration and air-conditioning appliances and as a feedstock in the production of polytetrafluoroethylene (PTFE). The production for the refrigeration and air-conditioning industry is regulated under the Montreal Protocol, whereas the production for feedstock purposes is not.

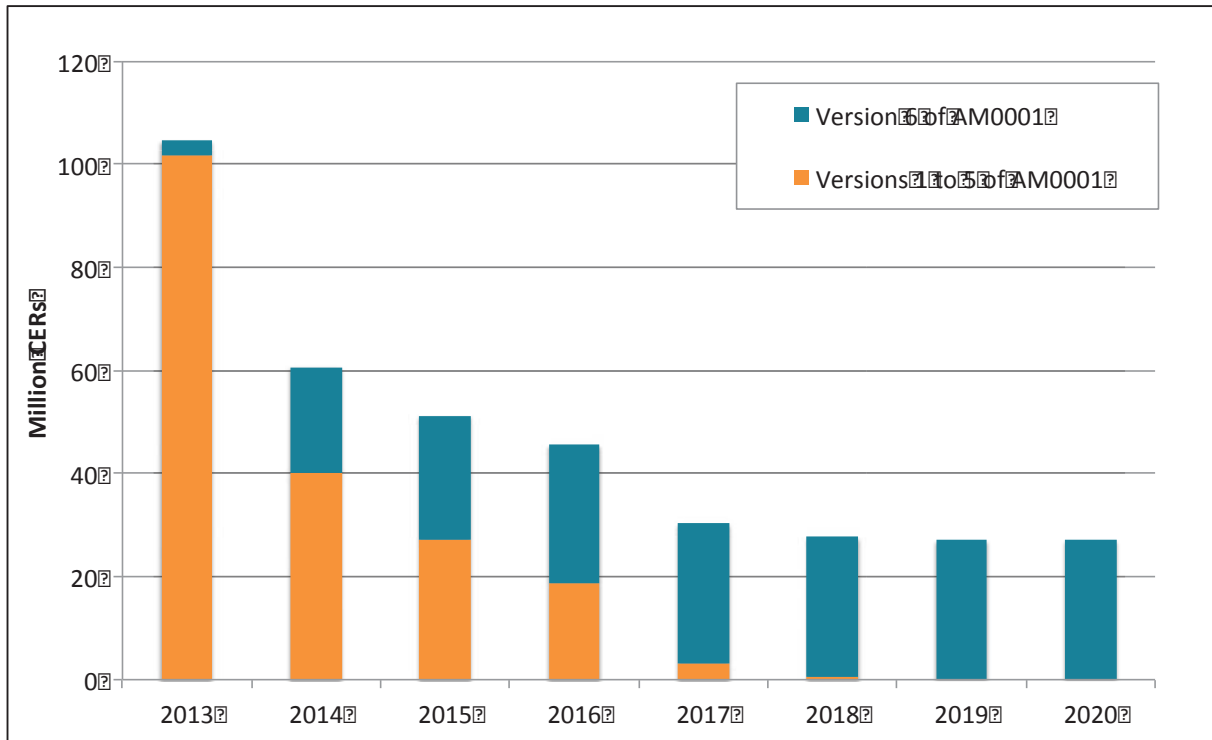
HFC-23 is a potent greenhouse gas; its global warming potential (GWP) is estimated at 14,800 for the second commitment period of the Kyoto Protocol. Emissions of HFC-23 from HCFC-22 production can be abated in two ways: a) by reducing the rate of waste gas generation (by-product rate) through process optimization and b) by capturing and destroying HFC-23 through installation and operation of high temperature incinerators. In the absence of regulations, incentives, or voluntary commitments by the industry, HFC-23 is usually vented to the atmosphere (Schneider & Games 2014).

4.2.2. Potential CER volume

Under the CDM, 19 HFC-23 projects have been registered. Eleven projects are located in China, five in India; South Korea, Argentina and Mexico each host one project. All projects apply the baseline and monitoring methodology AM0001. In the first commitment period of the Kyoto Protocol, the abatement of HFC-23 has been the project type with the largest CER issuance: 516 million HFC-

23 CERs or 36% were issued of a total of 1.4 billion CERs by the end of 2013. The potential CER supply for the period of 2013 to 2020 is estimated using a bottom-up model based on a detailed evaluation of the information in PDDs and monitoring reports from all 19 projects (Schneider & Cames 2014). In estimating the potential CER supply we differentiate between CERs from the application of versions 1 to 5 and version 6 of the applicable baseline and monitoring methodology AM0001 due to the significant differences between these methodology versions. The potential CER supply for the period of 2013 to 2020 is illustrated in Figure 4-1; it amounts to approx. 375 million CERs for the entire period, with 191 million from the application of version 1 to 5 and 184 million from the application of version 6 of the methodology AM0001.

Figure 4-1: CER supply potential of HFC-23 projects



Sources: Authors' own compilation

4.2.3. Additionality

All versions of the applicable baseline and monitoring methodology AM0001 consider HFC-23 projects to be automatically additional, as long as no regulations to abate HFC-23 are in place in the host country. This rule seems appropriate. Prior to the CDM, none of the plants in developing countries had equipment to destruct destroy HFC-23; HFC-23 generated in the production process was vented to the atmosphere. The same holds for plants that are not eligible for crediting under the CDM because they started commercial operation after 31 December 2001. Plant operators do not have economic incentives to install HFC-23 destruction equipment, as the installation and operation does not reduce costs or generate any significant revenues other than from CERs.⁴⁵ Based on these considerations, we assess that this project type is very likely to be additional.

⁴⁵ Schneider & Cames (2014) report that plant operators could sell HF which is a by-product from flue gas treatment. However, these revenues are likely lower than the costs for HFC-23 destruction.

4.2.4. Baseline emissions

HFC-23 generation from HCFC-22 production depends on two factors: the amount of HCFC-22 production and the ratio between HFC-23 generation and HCFC-22 production, which is often referred to as 'waste generation rate'. The applicable methodology AM0001 determines baseline emissions of HFC-23 based on these two factors, by multiplying the baseline HCFC-22 production with the baseline waste generation rate.⁴⁶ How these two parameters are calculated, has evolved over time.

The approaches changed over time with a view to addressing perverse incentives which are a particular concern for the crediting of HFC-23, due to the low technical abatement costs⁴⁷ and significant profits which can accrue from CER revenues and could exceed the costs of HCFC-22 production (Schneider 2011, UNFCCC 2011b, TEAP 2005). Significant perverse incentives were observed in two JI projects in which plant operators increased the waste generation rate to unprecedented levels once methodological safeguards were abandoned (Schneider & Kollmuss 2015). Perverse incentives can arise from the CDM in the following ways:

- HCFC-22 plants could operate at a higher waste generation rate than they would in the absence of the CER revenues, leading to over-crediting;
- The amount of HCFC-22 produced at CDM plants could be higher than in the absence of the CER revenues. This could lead to over-crediting if
 - HCFC-22 production is displaced at non-CDM plants that have a lower waste generation rate than the baseline rate used at the CDM plants;
 - HCFC-22 production is displaced at plants located in Annex I countries that already are required to abate HFC-23 emissions;
 - HCFC-22 is not produced for use in applications but is vented to the atmosphere;
 - The use of HCFC-22 becomes economically more attractive due to the CDM and is increasingly used compared to other less GHG-intensive alternatives;
 - The base year emissions (2009-2010) under the accelerated phase-out under the 2007 amendment to the Montreal Protocol are higher due to the CDM;
 - The implementation of the accelerated phase-out of HCFC-22 is delayed due to the CDM.
- The HCFC-22 plants could operate longer than they would in the absence of CDM revenues. This could lead to over-crediting under the same circumstances as a higher HCFC-22 production at the plants.

Robustness and conservativeness of the methodology has significantly increased over time. Perverse incentives constitute a major challenge in versions 1 to 5, whereas the conservative approach in version 6 largely avoids and compensates for perverse incentives.

For CERs issued to projects under versions 1 to 5, the amount of over-crediting is uncertain, since it hinges strongly on assumptions on HCFC-22 production levels, HFC-23 waste generation rates and the indirect effects noted above. Munnings et al. (2016) suggest that under-crediting due to conservative baselines may have more than compensated for the potential over-crediting from perverse incentives that these baselines were intended to curb. However, Munnings et al. (2016) make several assumptions that seem rather implausible. For example, they assume that in the absence of the CDM, some plants would have produced more HCFC-22 than they did under the CDM. As a result, we do not find their arguments persuasive.

⁴⁶ Versions 1 to 5 of methodology AM0001 do not explicitly calculate baseline emissions but directly calculate the emission reductions.

⁴⁷ Schneider & Cames (2014), Appendix, provide an overview of technical abatement costs for HFC-23 destruction.

Under version 6, on the other hand, net under-crediting (or net emissions benefit) is very likely since the methodology uses an ambitious default value of 1.0% for the baseline waste generation rate and caps the amount of HCFC-22 production that is eligible for crediting in a more conservative manner (Erickson et al. 2014). However, as of 1 January 2016, no credits have been issued under version 6.

4.2.5. Other issues

Continued low CER prices could jeopardize continued abatement activities at CDM HFC-23 project sites, an unfortunate outcome given the very inexpensive abatement opportunities they provide. At the same time, the failure of the CDM market to ensure continued abatement creates the opportunity for other policies that could yield even greater net emission benefits, especially if no credits are generated that could be also used to increase emissions elsewhere. For example, China recently launched a results-based finance programme that supports HFC-23 abatement in CDM and non-CDM plants (NDRC 2015). This programme helps support HFC-23 abatement across the sector in China. However, continued abatement in other CDM-eligible countries is less certain.

There are also other means to ensure these important abatement opportunities are not lost. Emissions of HFC-23 from HCFC-22 production can be regulated through the Montreal Protocol and for new facilities that have not yet installed GHG abatement, the Protocol's Multilateral Fund (MLF) for GHG abatement can provide financial support (Schneider & Cames 2014).

Note also that continued crediting under the CDM could also create perverse incentives for policy makers not to pursue alternative policies such as these, which address emissions without yielding CERs.

4.2.6. Summary of findings

Past changes to methodologies have now improved the integrity of these projects. If they are operated they are likely to yield more emissions reductions than CERs – i.e. a net mitigation benefit. However, continued low CER prices jeopardize their continued operation in some countries.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed in most recent methodology (version 6). Version 6 could lead to under-crediting (net mitigation benefit)
Other issues	<ul style="list-style-type: none"> Low CER prices jeopardizes continued operation Emissions could be addressed through Montreal Protocol Perverse incentives to avoid domestic regulation

4.2.7. Recommendations for reform of CDM rules

The necessary changes in AM0001 have been implemented in recent years. No changes in CDM rules are needed.

4.3. Adipic acid

4.3.1. Overview

Adipic acid is an organic chemical that is used as a building block in a range of different products, most importantly polyamide, often referred to as 'nylon'. Other applications include the production of polyurethanes and plasticizers. Adipic acid is a globally traded commodity, with more than one-third of the production traded internationally. Nitrous oxide (N₂O) is an unwanted by-product of adipic acid production. The formation of N₂O cannot be avoided; it is the result of using nitric acid

to oxidize cyclohexanone and/or cyclohexanol. Generally, the amount of N₂O generated varies very little over time and among plants.

N₂O in the waste gas stream can be abated in different ways: by catalytic destruction, by thermal decomposition, by using the N₂O for nitric acid production, or by recycling the N₂O as feedstock for adipic acid production (Schneider, L. et al. 2010). These methods typically reach an abatement level of about 90% (IPCC 2006, p. 3.30, Ecofys et al. 2009, p. 44). However, plants implemented under CDM and JI achieved significantly higher abatement levels of approx. 99% in the case of CDM and 92% to 99% in the case of JI, apparently through the strong economic incentives from the CDM and JI (Schneider, L. et al. 2010).

4.3.2. Potential CER volume

Under the CDM, four projects were registered. Two projects are located in China, one is in Brazil and one in South Korea. All four CDM plants had no abatement installed before project implementation and applied either thermal or catalytic abatement. The four implemented CDM plants cover only a part of the adipic acid production in developing countries because the applicable CDM methodology AM0021 is limited to plants that started commercial operation before 2005. Since then, five new plants are known to have started commercial operation in China; none of them abates N₂O emissions (Schneider & Cames 2014). Based on a bottom-up model used by Schneider & Cames (2014), the four CDM projects could generate about 257 million CERs in the period of 2013 to 2020.

4.3.3. Additionality

The applicable methodology AM0021 combines the approaches included in the different approaches to demonstrate additionality. Version 1 establishes three criteria for additionality demonstration: no regulations should require N₂O abatement, the project should not be common practice and it should not be economically viable. Versions 2 and 3 refer to the additionality tool and hence the investment analysis is not mandatory for additionality demonstration, as compared to version 1. Nevertheless, all four registered projects conduct an investment analysis and determine the net present value (NPV). Versions 2 and 3 also require reassessment of additionality during the crediting period if new NO_x regulations were introduced.

N₂O abatement from adipic acid production can be regarded as highly likely to be additional, for several reasons. Firstly, none of the non-Annex I countries in which adipic acid is produced have regulations in place to abate N₂O. Secondly, for thermal or catalytic destruction of N₂O, plant operators have no economic incentives to abate N₂O emissions. The abatement generates steam as a by-product; however, the cost savings or revenues are lower than the investment and operation and maintenance costs. Based on a review of PDDs and literature information, the technical abatement costs are estimated at €0.3/t CO₂e, with a range from €0.1/t CO₂e to €1.2/t CO₂e (Schneider & Cames 2014).

Thirdly, the abatement of N₂O from adipic acid production is not common practice in non-Annex I countries. In Western industrialized countries, N₂O has been abated voluntarily since the 1990s. In non-Annex I countries, only one plant in Singapore had abatement technology installed prior to the CDM (Schneider, L. et al. 2010). None of the plants commissioned after 2004, which are not eligible for crediting under the CDM, installed N₂O abatement technology.

4.3.4. Baseline emissions

Baseline emissions of N₂O are determined by multiplying the amount of adipic acid production eligible for crediting with a baseline emission factor. The methodology further estimates baseline

emissions from steam generated during the catalytic or thermal destruction of N_2O . Baseline emissions from steam generation are very small compared to baseline emissions of N_2O .

The baseline emission factor is determined as the lower value between the actual rate of N_2O formation and a default value of 270 kg N_2O / t adipic acid, which corresponds to the lower end of the uncertainty range of the IPCC default value of 300 kg / t adipic acid (IPCC 2006). This approach is used in all three methodology versions and intends to exclude the possibility of manipulating the production process to increase the rate of N_2O formation. Versions 2 and 3 require the actual N_2O formation rate to be determined in two ways: 1) based on the consumption of nitric acid and the ratio of N_2O to N_2 in the off-gas, and 2) based on direct measurements of N_2O in the off-gas adjusted by a 5% discount factor to account for measurement uncertainty. As a conservative approach, the lower resulting value of the two ways is used to determine the baseline emission factor. Overall, the methodology ensures that the baseline emission factor is determined in a conservative manner. The rate of N_2O formation typically observed is higher than the default value of 270 kg / t adipic acid, which could potentially lead to under-crediting of few percentage points.

The amount of adipic acid production that is eligible for crediting is capped in all three methodology versions with a view to avoiding incentives to expand the production as a result of the CDM. Version 2 and 3 establish the cap as the highest annual production in the three years prior to the implementation of the project activity. Version 1 does not provide a procedure to determine a cap but specifies that the methodology is “only applicable for installed capacity (measured in tons of adipic acid per year) that exists by the end of the year 2004”. There has been controversy about how this requirement is to be interpreted. Following a request for clarification (AM_CLA_0148), the Methodologies Panel recommended using production data from three historical years, similar to Versions 2 and 3. However, the CDM EB concluded that the panels' clarification “provides too extensive interpretation to an older version of methodology” and clarified instead that the cap should be determined as the “validated maximum daily production of adipic acid multiplied by 365 days multiplied by the operational rate”.⁴⁸ This was further interpreted in a way that allowed plants to seek credits beyond their annual design capacity specified in PDDs. All four CDM projects were registered with Version 1 of the methodology. Two projects (0099 and 0116) recently renewed their crediting period, applying Version 3 of the methodology, which lead to caps that are 14.8% and 13.9% lower than the caps applicable in their first crediting period.

While the methodology intended to avoid production shifts through caps on the amount of production that is eligible for crediting, data on adipic acid production, plant utilisation and international trade patterns suggest that carbon leakage, i.e. a shift of production from non-CDM plants to CDM plants, occurred during the economic downturn in 2008 and 2009 (Schneider, L. et al. 2010). Such production shifts do not only lead to distortions in the adipic acid market but can also lead to over-crediting if N_2O is abated in the non-CDM plants. Schneider, L. et al. (2010) estimate that carbon leakage leads to over-crediting of approx. 6.3 MtCO₂e or about 17% of the CERs from adipic acid projects issued in 2008 and approx. 7.2 MtCO₂e or about 21% of the CERs from adipic acid projects in 2009. These effects could thus outweigh the conservative determination of the baseline emission factor.

The lenient interpretation of historical production capacity in version 1 of the methodology considerably contributed to the carbon leakage. However, the more conservative approach for the establishment of the cap on adipic acid production in versions 2 and 3 of the methodology addresses this issue only partially. In a global economic recession, adipic acid production could fall well below historical rates of plant utilisation. Depending on the CER prices, CDM plants operators would then have significant competitive advantage over non-CDM plants, which could lead to similar produc-

⁴⁸ Report of the 48th meeting of the EB, paragraph 24.

tion shifts as observed in 2008 and 2009. As for HCFC-22 production, the underlying issue is that carbon market revenues can have a strong impact on adipic acid production costs. Carbon leakage is unlikely to occur at current market prices for CERs, but could become an issue again if CER prices increased.

4.3.5. Other issues

No other issues were identified.

4.3.6. Summary of findings

Adipic acid projects have a very high likelihood of additionality. The baseline emission factor is determined in a conservative manner that could lead to a few percentage points of under-crediting. The methodology does not include sufficient provisions to address carbon leakage. This could lead to significant over-crediting in times of higher CERs prices and when the adipic acid production capacity significantly exceeds demand.

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices
Other issues	<ul style="list-style-type: none"> None

4.3.7. Recommendations for reform of CDM rules

Based on the considerations above, we recommend revising the applicable CDM methodology as follows:

- The provisions for additionality demonstration could be simplified, as this project type can be considered to be very likely additional. We recommend considering this project type as automatically additional, as long as no regulations require N₂O abatement.
- The potential for carbon leakage should be addressed. We recommend introducing a standardized ambitious emission benchmark to determine baseline emissions. Carbon leakage would be avoided most effectively if a consistent emissions benchmark is used for all plants around the world, including plants under ETSS, and if it is set at or below the abatement level typically achieved in the industry. A standardized global emission benchmark for all adipic acid plants, regardless of policy approach or specific emission trading mechanism, could provide a level playing field for the adipic acid industry and eliminate potential economic distortions. Adipic acid production is particularly amenable to a standardized global benchmark because it is a highly globalized industry, and all plants are very similar in structure and technology (Schneider, L. et al. 2010). We recommend a level at or below 30 kg/t adipic acid, which reflects the abatement level achieved by the large majority of producers world-wide.
- If a standardized ambitious emissions benchmark is introduced, the methodology could be further simplified as measurements and calculations of the rate of N₂O formation would not be necessary.

4.4. Nitric acid

4.4.1. Overview

Nitric acid is mainly used for the production of synthetic fertilizers and explosives. In the industrial production of nitric acid, ammonia (NH_3) is oxidized over precious metal gauzes (primary catalyst) to produce nitrogen monoxide (NO), which then reacts with oxygen and water to form nitric acid. N_2O is an unwanted by-product generated at the primary catalyst. The better a primary catalyst functions, the lower the N_2O emissions. Nitric acid is produced during production campaigns of typically 3-12 months (Kollmuss & Lazarus 2010).

N_2O emissions from nitric acid production can be abated in three ways (Schneider & Cames 2014):

- **Primary abatement** prevents the formation of N_2O at the primary catalyst. According to gauze suppliers, improved gauzes could potentially lead to a 30-40% reduction of N_2O formation (Ecofys et al. 2009).
- **Secondary abatement** removes N_2O through the installation of a secondary N_2O destruction catalyst in the oxidation reactor. The abatement efficiency of the secondary catalyst is often estimated as ranging from 80% to 90%. However, in practice it varies in CDM plants from about 50% to more than 90%. Registered CDM projects achieved an average abatement efficiency of 70% (Kollmuss & Lazarus 2010, Debor et al. 2010).
- **Tertiary abatement** removes N_2O from the tail gas through either thermal or catalytic decomposition. Tertiary abatement can reduce N_2O emissions by more than 90% but involves larger investment and operating costs and more demanding technical requirements than secondary abatement. Registered CDM projects achieved an average abatement efficiency of 86% (Kollmuss & Lazarus 2010, Debor et al. 2010).

Four methodologies have been approved for N_2O abatement from nitric acid production:

- **AM0028** is applicable to tertiary abatement in plants that started commercial operation before 2006. 19 projects used the methodology. In 2013, the methodology was limited to caprolactam production in 2013, and replaced by amending the methodology ACM0019.
- **AM0034** is applicable to secondary abatement in plants that started commercial operation before 2006. 56 projects used the methodology. In 2013, the methodology was withdrawn and replaced by amending the methodology ACM0019.
- **AM0051** is also applicable to secondary abatement in plants that started commercial operation before 2006. The methodology was never used and was withdrawn in 2013. It is therefore not considered in detail in this study.
- **ACM0019** is applicable to both secondary and tertiary abatement and both existing and new plants. 26 projects used the methodology. Since 2013, this is the only valid methodology for nitric acid projects.

Table 4-2 provides an overview of the main features of and differences between the methodologies.

Table 4-2: Overview of methodologies for nitric acid projects

	AM0028	AM0034	AM0051	ACM0019
Projects	19	56	None	26
Technology	Tertiary	Secondary		Secondary and tertiary
Validity	Limited to caprolactam in 2013	Withdrawn in 2013		Valid
Applicability	Plants that started operation before 2006			Existing and new plants
Additionality demonstration	Additionality tool			Automatically additional
Baseline emission factor	Ex-post measurements	Ex-ante measurement campaign	Ex-post measurements	Emission benchmark
Cap on baseline production	Design capacity			No cap
Re-assessment of baseline scenario or additionality	In case of new NO _x regulations			Not applicable

Sources: Authors' own compilation

4.4.2. Potential CER volume

Under the CDM, 97 projects were registered and another four projects were submitted for validation as of January 2014. China is the most important host country with 44 projects. Other important countries are India (5 projects), Uzbekistan (6 projects), South Africa (5 projects), and Brazil, Egypt, Israel and South Korea which host each four projects. Among the 97 registered CDM projects, only 51 have issued CERs as of January 2014. In the current market situation, it is likely that most of the remaining 47 projects have not been implemented. Based on a bottom-up model developed by Schneider & Cames (2014), the 101 published CDM projects could generate approx. 175 million CERs in the period of 2013 to 2020. Potential new projects that have not yet been developed or published are estimated to have a potential of approx. 31 million CERs over the same period.

4.4.3. Additionality

Up to 2011, all three approved methodologies (AM0028, AM0034, AM0051) used the additionality tool to demonstrate additionality. In 2011, ACM0019 was adopted, which deems projects to be automatically additional and employs a dynamic emission benchmark to determine baseline emissions.

N₂O abatement from nitric acid production can be regarded as highly likely to be additional, for similar reasons as for HFC-23 abatement from HCFC-22 production and N₂O abatement from adipic acid production. Non-Annex I countries usually do not have regulations which address N₂O emissions from nitric acid production. Prior to the CDM, secondary or tertiary abatement is not known to have been used in non-Annex I countries and N₂O is usually released to the atmosphere. While plant operators have economic incentives to take primary abatement measures to reduce the rate of N₂O formation, they do not save any costs or generate any revenues – other than car-

bon market revenues – from the installation of secondary or tertiary abatement. Based on a review from PDDs and literature information, the average technical abatement costs are estimated at €0.9/t CO₂e for secondary abatement and at €3.2/t CO₂e for tertiary abatement (Schneider & Cames 2014). For these reasons, in our assessment, the approach in ACM0019 of assuming this project type automatically additional seems reasonable.

4.4.4. Baseline emissions

Baseline emissions are determined by multiplying the amount of nitric acid production with a baseline emission factor. The methodologies AM0028, AM0034 and AM0051 limit the amount of nitric acid production eligible for claiming emission reductions to the design capacity of the plant in 2005; ACM0019 has no such cap. The baseline emissions factor is determined in three different ways in CDM methodologies: through measurement campaigns conducted prior to the installation of the abatement technology (AM0034), through measurements during the crediting period (AM0028 and AM0051), and by using an emissions benchmark (ACM0019).

All three methodologies using measurements (AM0028, AM0034 and AM0051) aim to provide safeguards to avoid perverse incentives to artificially increase the rate of N₂O formation in order to increase CDM revenues (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). In AM0028, the baseline emission factor is capped to the level of previous monitoring periods if project participants do not use a primary catalyst that is common practice in the region or has been used in the nitric acid plant during the last three years and if they cannot justify the use of a different catalyst. In addition, key operating conditions of the plants cannot be changed during project implementation. In AM0034, the methodology requires a new baseline measurement campaign to be conducted if the chemical composition of the primary catalyst is changed after project implementation. While these provisions aimed to avoid perverse incentives to increase the N₂O formation due to the CDM, they provide economic disincentives to plant operators to use primary catalysts that reduce the formation of N₂O, as this would lower their CER revenues and could involve additional costs for conducting a new baseline campaign (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). However, advanced primary catalysts that increase the NO yield and lower the generation of the by-product N₂O are emerging in the industry. They have become widespread in Europe, are gaining market shares in other parts of the world, and have been used in a number of CDM projects prior to their start (UNFCCC 2012b). It is thus possible that some CDM projects applying the AM0034 or AM0028 methodology would, in the absence of the CDM incentives, employ more advanced primary catalysts, in particular over the time frame of three crediting periods, leading to over-crediting (UNFCCC 2012b).

The Methodologies Panel further identified that some plants using the AM0034 methodology had established baseline emission factors which are significantly above the uncertainty range of the IPCC default values and which would result in considerable economic losses for the plant operators (UNFCCC 2012b). The highest reported value from a baseline measurement campaign is 37.0 kg N₂O / t nitric acid, while the highest IPCC default value is 9.0 kg N₂O/t nitric acid, with an uncertainty range of ±40% (IPCC 2006). Such high emission factors indicate that these plants are operated at a high specific ammonia consumption. Plant operators could intentionally reduce the production efficiency during the baseline campaign in order to achieve a higher CDM baseline emission factor (UNFCCC 2012b). Moreover, while inefficient plant operation can be observed in Non-Annex I countries, it seems questionable whether the observed levels of nitrogen loss would continue over the course of three crediting periods. On the other hand, it is important to take into account that the IPCC default emission factors were estimated at times when much less information was available on N₂O formation from nitric acid plants. In particular, continuous measurements over the length of a production campaign, with increasing N₂O emissions towards the end of the

campaign, were not available. The values and their assigned uncertainty should therefore not be outweighed.

To address these two issues, the CDM EB withdrew the AM0034 and AM0051 methodologies and limited the applicability of the AM0028 methodology to caprolactam plants in 2013. At the same time, the EB revised the methodology ACM0019, distinguishing the approach between plants that used AM0028 or AM0034 in their first crediting period and other (mostly newer) plants. For AM0028 and AM0034 plants up to their design capacity, the methodology uses the lower value between the historical baseline emissions during the first crediting period under AM0028 and AM0034 and a default value set at the upper end of the uncertainty range of the IPCC default value and declining by 0.2 kg N₂O/t nitric acid per year to reflect technological innovation in primary catalysts that may reduce emissions over time. This approach caps the baseline emissions particularly for those plants that have established baseline emission factors above the IPCC uncertainty range. It also reduces the maximum amount of baseline emissions that can be claimed over time to account for technological innovations in primary catalysts. For production above the design capacity and other (mostly newer) plants, the methodology uses a more ambitious emissions benchmark set at 3.7 kg N₂O/t nitric acid in 2013 and declining by 0.2 kg N₂O/t nitric acid per year, up to a level of 2.5 kg N₂O/t nitric acid in 2020 which is maintained in subsequent years.

The new approach has several advantages but also some shortcomings:

- Importantly, using default emission benchmarks – whatever the real baseline emissions from a specific plant are – fully avoids perverse incentives for plant operators not to use advanced primary catalysts that reduce the formation of N₂O. Plant operators have incentives to innovate, as this lowers their project emissions and increases the number of CERs issued;
- Using default emission benchmarks further fully avoids the risk that plant operators could intentionally increase the rate of N₂O formation during a baseline campaign in order to maximize CER revenues;
- Using default emission benchmarks can lead to over-crediting in plants that actually have lower N₂O formation rates and to under-crediting in plants that actually have higher N₂O formation rates. Both under- and over-crediting is likely to occur since the N₂O formation rate observed in CDM projects varies by a factor of 10 from 3.5 to 37.0 kg N₂O/t nitric acid, with an average value of 8.6 kg N₂O/t nitric acid (UNFCCC 2012b). Significant over- and under-crediting can have several unintended consequences (Schneider et al. 2014). Plants with a high N₂O formation rate may not be able to reduce their project emissions significantly below the emissions benchmark and may thus not be implemented – although their implementation would be possible with a project-specific baseline. Such 'lost opportunities' could increase the global cost of GHG abatement.

The overall impact on environmental integrity depends on the methodology and plant type (Table 4-3). For newer plants, the emission benchmark declining from 3.7 to 2.5 kg N₂O / t nitric acid is rather conservative and will likely lead to under-crediting for most – if not all – plants. For plants that used AM0028 or AM0034 in the first crediting period, the declining project-specific benchmark in ACM0019 is a reasonable baseline on average over all projects in our assessment; projects with higher baseline emission rates than the IPCC range will receive less CERs, while some over-crediting could occur for projects that adopt more advanced catalysts at a faster rate than the decrease of 0.2 kg N₂O / t nitric acid per year foreseen in the methodology. The use of AM0028 and AM0034 could lead to over-crediting in some instances, due to the issues identified above. Considering all plant types and methodology versions together, it seems likely that the approaches for

baseline emissions overall reasonably provide for environmental integrity; the low or moderate levels of over-crediting that could occur under AM0028 and AM0034 could be compensated by significant under-crediting for newer plants applying ACM0019. Over time, the quality of CERs will increase due to the increased phase-in of ACM0019.

Table 4-3: Assessment of environmental integrity of nitric acid projects

Plant type	Methodology	Identified environmental integrity issues	2013-2020 CER potential	Potential for under- or over-crediting
Plants that started operation before 2006: 1 st CP	AM0028 AM0034	<ul style="list-style-type: none"> Perverse incentives not to adopt technologies that reduce the rate of N₂O formation Risk of manipulation of the production process during the baseline campaign 	73 million	Low or moderate over-crediting
Plants that started operation before 2006: 2 nd and 3 rd CP	ACM 0019	<ul style="list-style-type: none"> Under-crediting for plants with higher N₂O formation rates than the IPCC range Over-crediting for plants that adopt advanced primary catalyst technologies at faster rates 	70 million	Neutral / Low over- or under-crediting
Newer plants or plants that did not use AM0028/AM0034	ACM 0019	<ul style="list-style-type: none"> None 	32 million	Moderate to significant under-crediting

Sources: Authors' own compilation

4.4.5. Other issues

No other issues were identified.

4.4.6. Summary of findings

Nitric acid projects have a very high likelihood of additionality. Baseline emissions can be over- or under-credited; overall, they are likely to reasonably ensure environmental integrity for 2013-2020 CERs, with the average quality of CERs improving over time.

An important lesson learned from this project type is that the potential for technological innovation and perverse incentives was not sufficiently considered when approving the initial methodologies. For sectors that could undergo significant technological innovation, using historic data or measurement campaigns to establish a baseline for up to 21 years is debatable. The more recent ACM0019 methodology accounts for technological innovation by using an emission benchmark that declines over time.

Additio- nality	<ul style="list-style-type: none"> • Likely to be additional
Over- crediting	<ul style="list-style-type: none"> • Most recent methodologies lead to under-crediting • Overall, little risks of overall over-crediting
Other issues	<ul style="list-style-type: none"> • None

4.4.7. Recommendations for reform of CDM rules

No recommendations.

4.5. Wind power

4.5.1. Overview

CDM wind power projects mainly use four methodologies.⁴⁹ The vast majority of projects (more than 99% of all CDM wind projects) feed electricity into the grid.⁵⁰

According to the UNEP DTU (2014), by the end of 2013, an overall wind power capacity of 111 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (83 GW), India (10 GW), Mexico and Brazil (both 4 GW). The other 36 countries with CDM wind power projects account for 10 GW of installed capacity in total.

Figure 4-2, Figure 4-3 and Figure 4-4 illustrate the development of wind power capacity and the use of the CDM in China, India and Brazil.⁵¹ In China, installation of wind power capacity accelerated from 2005 onwards. A comparison of the total wind power capacity installed and the capacity installed by projects using the CDM⁵² over the 2005 to 2012 period (Figure 4-2) shows that CDM projects accounted for about 90% of the total cumulated installed capacity as of 2012 (about 75 GW). In the case of India (Figure 4-3), installed capacity increased significantly between 2005 and 2012 from 1.4 GW in 2005 to more than 15 GW in 2012. CDM projects accounted for about half (51%) of the total cumulated capacity installed as of 2012. In the case of Brazil (Figure 4-4), the total cumulated installed capacity as of 2012 was much smaller (2.5 GW). The share of CDM projects in cumulative capacity was 43% as of 2012.

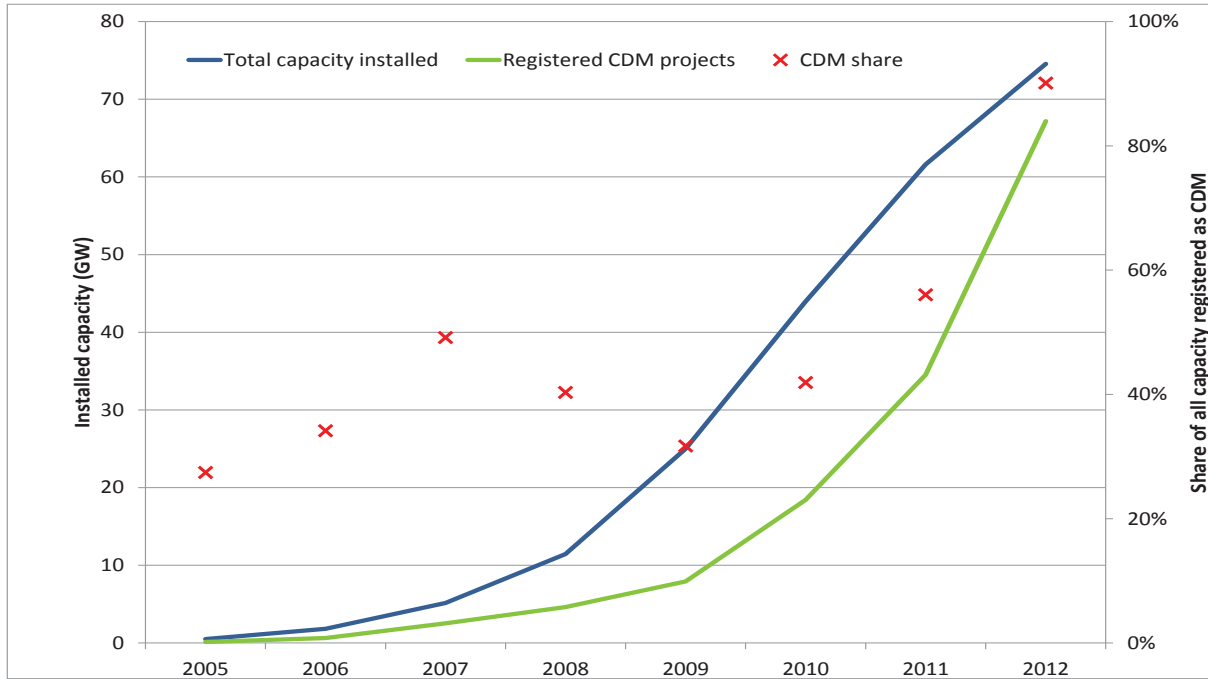
⁴⁹ ACM0002, AMS-I.A, AMS-I.D, AMS-I.F.

⁵⁰ ACM0002 (large scale), AMS-I.D (small scale).

⁵¹ China, India and Brazil are selected for the graphs in order to ensure comparability across chapters on renewable power generation since they are important CDM countries for hydropower and biomass power, too.

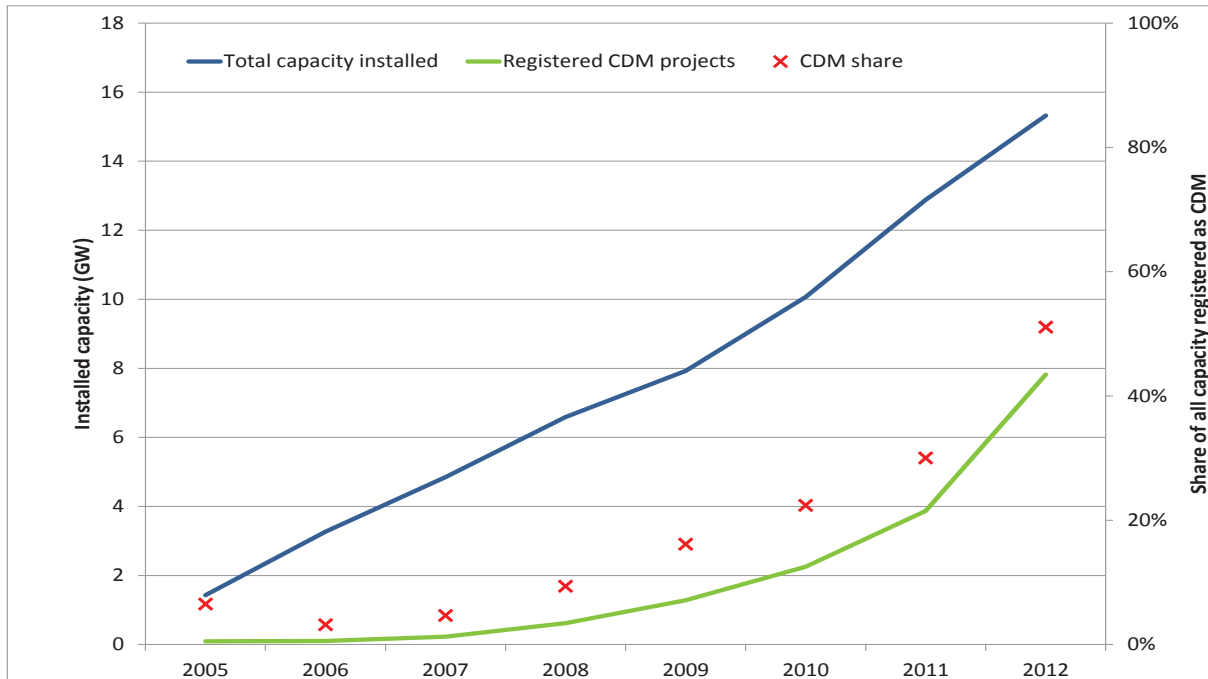
⁵² The total installed capacity between 2005 and 2012 is taken from the World Wind Energy Association statistics (WWEA 2015) and accumulated across the years. The installed capacity of projects using the CDM is taken from UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. Cumulative values were used to illustrate the contribution of the CDM since annual values are misleading due to potential differences between the year of construction and the year in which the crediting period starts. Therefore, cumulative values provide a better picture of the general trend of the CDM share in total capacity installed.

Figure 4-2: Total cumulated wind power capacity installed in China between 2005 and 2012



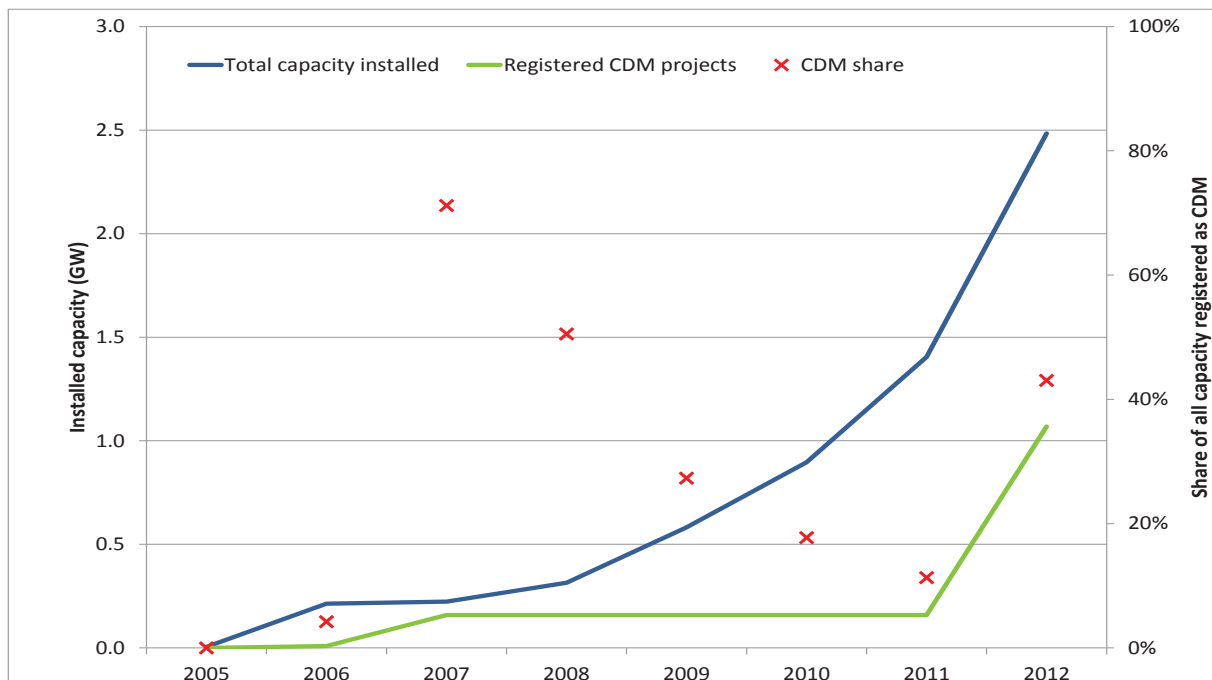
Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Figure 4-3: Total cumulated wind power capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Figure 4-4: Total cumulated wind power capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

4.5.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 3.5 billion CERs by the end of their respective crediting periods, of which 1.4 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about one quarter of the total CER issuance potential.

4.5.3. Additionality

Large-scale wind power projects apply the methodology ACM0002 which requires using the “Tool for the demonstration and assessment of additionality” to demonstrate additionality.⁵³ In this tool, the investment analysis is one of the approaches for demonstrating additionality. Most CDM wind power projects use investment analysis. The tool for small-scale projects (“Methodological tool. Demonstration of additionality of small-scale project activities”⁵⁴) requires “an explanation to show that the project activity would not have occurred anyway due [...] to barriers”, among which one of the most important barriers is the so-called ‘investment barrier’, which generally features a similar rationale as for the investment analysis of large-scale projects.

Section 3.2 describes the general criticism associated with the investment analysis and Section 2.4 assesses for different project types the impact of CER revenues on their economic performance. According to these analyzes, for wind power projects, CER revenues lead to an increase in the internal rate of return (IRR) of two to three percentage points. An analysis by the World Bank finds that “the incremental IRR from future carbon revenues in renewable energy projects, taking the World Bank’s projects as an example, is quite low” (Carbon Finance at the World Bank 2010). In

⁵³ Current version 07.0.0 (EB 70, Annex 8).

⁵⁴ Current version 10.0 (EB 83, Annex 14).

this analysis, the incremental IRR for renewable energy projects amounts to 1.7% for a purchase period of 10 years and an assumed CER price of \$10/t. Another analysis finds that “wind, hydro and biomass projects experience only a small increase in profitability through CDM” and that “the change in profitability caused by regional variables is greater than the CDM’s impact for wind, hydro and biomass”⁵⁵ (Schneider, M. et al. 2010). From these analyzes, it can be concluded that the CDM impact in the profitability of wind power plants is generally relatively low and that the ‘signal’ provided by the CDM is usually much smaller than the ‘noise’ of national and regional variations in other parameters.

In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables. Spalding-Fecher et al. (2012) provide an overview of several important support incentives for renewable energy generation in major CDM countries (such as China and India) and find “that national policies on electricity tariffs for renewable power could be a more important driver of the viability of wind, hydropower and biomass projects than the CDM is.” In the case of wind power plants in China, Bogner & Schneider (2011) point out that “the wind power boom in China is mainly driven by favourable policies and not by the CDM” and that “the majority of projects would most likely have been implemented without the CDM”. Liu (2014) elaborates on the links between the CDM and national policy in the case of wind power development in China. He finds that a decreasing national feed-in tariff can increase “CDM-supported installed capacity because more projects may comply with CDM requirements as their financial returns remain below the predefined additionality threshold”, which indicates that there is a clear interference between national policy development and the additionality requirements of the CDM. He also finds that “the reduction of technology costs combined with an increasing local manufacturing capacity has paved the way for a scaled-up deployment of wind capacity” (ibid.), which indicates that other factors than the CDM were important in the significant growth of wind power in China. However, he concludes that the CDM “effect on wind technology diffusion [...] is more than twice as high as that of technology cost and industrial policy” (ibid.). He also finds that “while domestic policies must be the engine for large-scale clean energy investments in developing countries, the international carbon offset policy can help that engine run faster, but only if the engine is running” (ibid.). For India, in comparing wind power projects registered under the CDM with those without such support, Dechezleprêtre et al. (2014) find that, “all other things being equal, CDM wind farms tend to be larger, to benefit from higher feed-in-tariffs, and to be located in windier areas, three factors which increase profitability.” According to this analysis, there is “serious evidence of non-additionality of the CDM” (ibid.). He & Morse (2013) find that “Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs)” and this leads to the conclusion that “IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime”.

Furthermore, investment costs for wind power generators have decreased significantly in recent years, which results in wind power featuring (in many cases) competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013). In addition, IRENA (2015) also shows that specific investments costs for onshore wind power plants are significantly lower in China and India than in OECD and ‘rest of the world’ countries. Similarly, Schmidt (2014) finds that the risk associated with low-carbon investment is higher in some parts of the world than in others. In an analysis for industrialised and low-income countries (using typical values for costs of capital in these countries), he finds that due to the higher cost of capital in low-income countries, levelized costs of electricity for onshore wind power plants could be as much as 46% higher than in low-risk countries. Altogether, the available information indicates that the profitability of wind power

⁵⁵ In this analysis, regional factors are the electricity tariff, the load factor and the discount rate.

plants has generally improved. However, there is also a significant dependence of the profitability on regional circumstances.

Overall, due to the limited impact of CER revenues on the profitability of wind power plants, the widespread introduction of domestic support schemes and the significant decrease of wind power costs, we consider the additionality of wind power projects as generally questionable in the context of the CDM, at least for countries with support schemes, low investment costs for wind power and low investment risks.

4.5.4. Baseline emissions

Baseline emissions of CDM wind power projects feeding electricity into the grid include CO₂ emissions from fossil-fired power plants that are displaced due to the project activity. In most cases, the corresponding baseline CO₂ emission factor is estimated using the “Tool to calculate the emission factor of an electricity system”⁵⁶ (Box 4-1).

Box 4-1: The grid emission factor tool

The grid emission factor is calculated as the “combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM)”.⁵⁷ According to the tool, “the operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed CDM project activity. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.”

In the tool, several approaches for estimating the combined margin are presented, depending on the specific conditions of the project and data available. In general, the approach of using a combination of OM and BM, depending on the type of project, is appropriate. It suitably reflects that CDM projects could have short-term impacts on the dispatch of power plants and long-term impacts on the power plants built, and different weights for the OM and the BM can be applied (depending on the crediting period and on whether it relates to a project using intermittent or non-intermittent sources), which also can be considered appropriate. A number of specific issues arise from the tool:

In many cases, so-called low-cost and must-run power plants are not considered in the calculation of the CO₂ grid emission factor, which may lead to higher baseline emissions per amount of electricity produced. Neglecting low-cost/must-run power plants, such as renewables or nuclear power, may generally be considered adequate for the estimation of the operating margin (since low-cost/must-run power plants can be expected to be running irrespective of any other power plant in the system). However, an increasing share of renewables (e.g. wind or solar) in the system may lead to a situation in which renewable power generation is at the margin in some hours, i.e. an additional kilowatt hour of renewable electricity does not displace fossil fuels in that hour. In some countries, for example, wind power plants are switched off when electricity supply exceeds demand in order to ensure a stable electricity system. Furthermore, ‘low-cost’ power plants are not clearly defined and some of them may be dispatchable (such as biomass). Overall, the provision of excluding low-cost/must-run power plants may lead to an overestimation of baseline emissions.⁵⁸

⁵⁶ Current version 04.0 (EB 75, Annex 15).

⁵⁷ AMS-I.D, version 17 (EB 61, Annex 17).

⁵⁸ It has to be noted, however, that in the case the country has a large share of low-cost/must-run power plants (more than 50%), e.g. hydro, the simple adjusted operating margin has to be used. In that case, whenever hydro electricity provides sufficient electricity to cover the load demand in a certain hour, this hour is counted as not emitting. This leads to lower baseline emission factors overall than the simple operating margin. The implicit assumption is that water would be spilled in that hour if additional (i.e. CDM) power

Also, both the operating and the build margin approaches are based on historical production and installation data if the option of determining the grid emission factor at the validation stage (ex-ante) is chosen. The resulting baseline grid emission factor is then kept constant throughout the crediting period and only updated at the renewal of the crediting period. This approach does not reflect the general trend towards an increasing share of less-emitting power sources in the electricity mix of many countries. It is oriented to past power systems (backward-looking perspective) rather than to the actual power systems during the crediting period with a higher penetration of renewables (forward-looking perspective). This is especially problematic in countries with a rapidly changing or expanding electricity system. In countries with a growing share of renewable energy capacities, this approach may lead to an overestimation of baseline emissions. However, due to the long-lived capital stock in the electricity sector, changes of the grid emission factor are only gradual (i.e. take several years) in case the power system as a whole is not expanding fast. An advantage of using historical data is that it relies on observed and objective information, whereas scenarios for the future development of the power system may be prone to uncertainty and use of unrealistic assumptions.⁵⁹ Therefore, the determination of the grid emission factor based on historical data is not considered problematic per se but should be adjusted to account for trends in the sector.⁶⁰ Another option for determining the grid emission factor is the ex-post determination during monitoring. This approach is certainly adequate since it reflects the current state of the power sector.

With regard to the build margin, CDM projects are generally excluded from the estimation of the CO₂ emission factor. CDM projects only need to be gradually included if they comprise a significant share of power plants built in the last ten years. This approach can generally be considered adequate, especially in countries with an already significant share of renewable electricity generation or promotional policies for renewables in place, in which case a neglect of CDM projects in the build margin would not be a plausible representation of what would have happened in the absence of the project. This approach therefore addresses the risk of over-estimating baseline emissions in countries with a large share of CDM projects.

The quality of input data in calculating the grid emission factor is also important. In analysing grid emission factors provided by different DNAs, Michaelowa (2011) finds “that most of the documents provided by the DNAs do not allow an external observer to judge whether the data has been collected correctly” and that “there are clear indications that the grid emission factors, as well as the coal power plant benchmarks, have been overestimated both in China and India.” In some countries, the governments established grid emission factors, and DOEs apparently used the values without validating whether they comply with the methodological requirements under the CDM. In order to address this issue, Michaelowa (2011) recommends, inter alia, an “independent validation of grid EF”. Recently, few grid emission factors are submitted as standardized baselines which ensures independent validation by a DOE or the UNFCCC secretariat.

Furthermore, the tool provides several default values for parameters such as the electric efficiency of power plants. The values provided can be considered quite conservative, i.e. they assume rather high electric efficiencies. For those countries using the default values, this may lead to an under-estimation of baseline emissions.

generation is available. However, some countries do not only have run-of-river hydro power plants (for which case, the assumption of spilling water may be reasonable), but water may also be stored in large reservoirs and thus used at a later stage. In this regard, the estimation of baseline grid emissions for countries with a large share of low-cost/must-run power plants can be considered conservative, i.e. tending to under-estimate baseline emissions. However, it has to be noted that less than 5% of CDM projects used this approach for estimating the grid emission factor.

⁵⁹ E.g. assuming that there would be a significant increase of coal-fired power generation without straightforward evidence.

⁶⁰ For example, trends in a changing composition of the electricity grid or the grid emission factor observed in recent years could be considered and extrapolated for future years. Similar approaches are used in a number of other CDM methodologies.

The overall emissions impact of wind power plants also depends on other factors. Firstly, the upstream emissions from wind power, such as for construction, are relatively low (about 10 g CO₂e/kWh (IPCC 2014)); for most countries they are likely to be lower than upstream emissions from fossil fuel use displaced in grid power plants. Ignoring upstream emissions is therefore a conservative assumption. Secondly, an increasing uptake of wind power plants due to the CDM may lead to decreasing costs for wind power generation, which in turn could contribute to a higher uptake of wind power. This positive spillover effect is, however, difficult to estimate, in particular with regard to any emissions outcome. Thirdly, the length of the crediting period may lead to under-crediting if wind power plants are operated longer than the crediting periods.⁶¹ However, many wind power plants are expected to operate for about 20 years and about three quarter of wind power projects have selected a renewable crediting period of up to 21 years. Further aspects of potential over- and underestimation of baseline emissions are described in (Erickson et al. 2014).

Overall, we conclude that the current approach for estimating emission reductions from CDM wind projects is largely suitable. Methodological assumptions lead to both over- and under-estimation of emission reductions but can be considered appropriate for estimating baseline emissions of CDM wind projects.

4.5.5. Other issues

No other issues were identified.

4.5.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenue has only a limited impact on profitability of wind power plants • Support schemes often exist and are a main driver for wind power development • Investment costs have decreased significantly in recent years, making wind power in some cases competitive with fossil generation (LCOE) • Wind power is already widely used in large CDM countries (e.g. China, India)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; no clear-cut conclusion on whether over- or under-crediting occurs overall
Other issues	<ul style="list-style-type: none"> • None

4.5.7. Recommendations for reform of CDM rules

Due to our finding of an overall questionable additionality of wind power projects, we recommend that this project type is generally no longer eligible for new projects under the CDM. As an exception to this rule, countries with significant technological and cost barriers⁶² may be allowed to further use the CDM for implementing wind power plants.

With regard to the estimation of baseline emissions, we recommend the following:

- The CDM EB should ensure that grid emission factors are always verified by designated operational entities (DOEs);

⁶¹ For a discussion of the effects of the crediting period, refer to Section 3.5.

⁶² Such as transaction costs, e.g. due to the non-availability of technical knowledge in the country, or risk premiums in low-income countries. Least-developed countries could, for instance, be included in the list of eligible countries. Furthermore, the market share of wind power could be used to establish eligibility since it could be considered an indicator for barriers in the country.

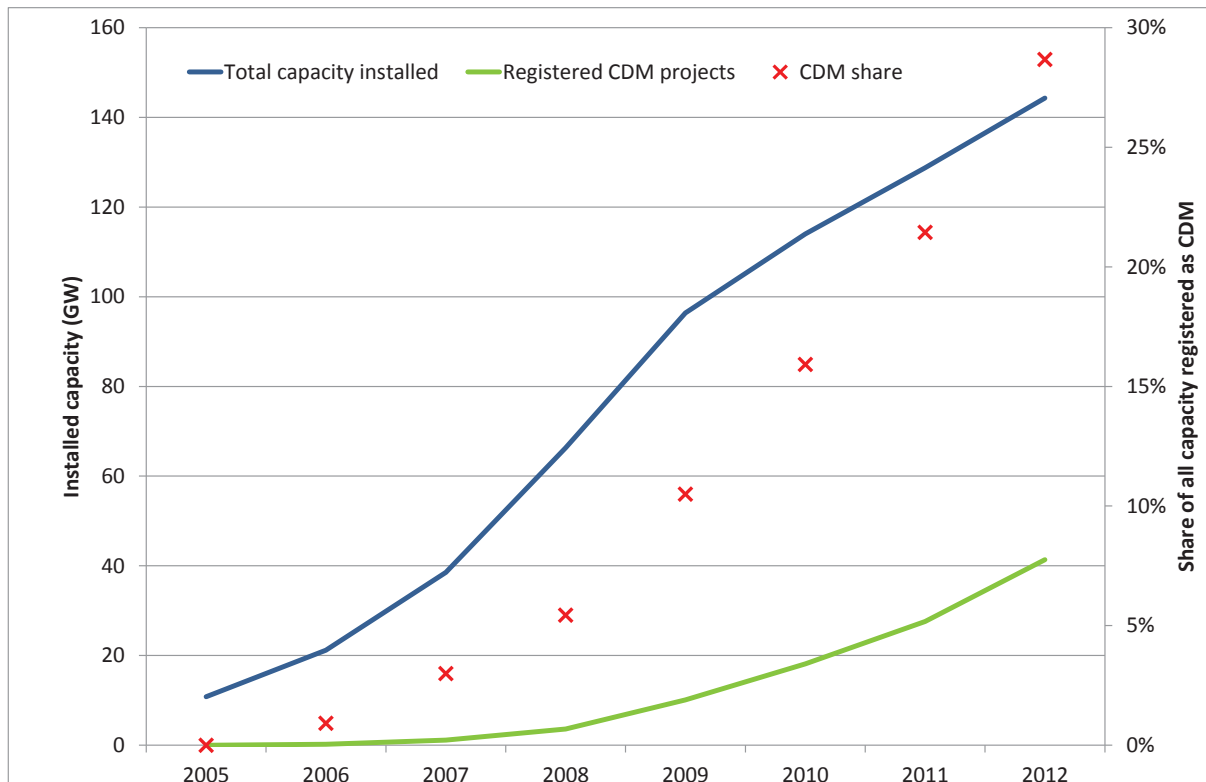
- The provisions for low-cost/must-run plants should be reviewed, including a clear definition of such plants and provisions which ensure that such plants are included in the operating margin if they are at the margin of the dispatch at any time;
- The grid emission factor tool should be revised to reflect trends in the composition of the power sector over time.

4.6. Hydropower

4.6.1. Overview

CDM hydropower projects mainly use two methodologies.⁶³ According to the UNEP DTU (2014), by the end of 2013, an overall hydropower capacity of 92 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (58 GW), Brazil (12 GW), followed by Vietnam and India (6 GW each). The other 44 countries with CDM hydropower projects account for 11 GW of installed capacity in total.

Figure 4-5: Total cumulated hydropower capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

As for wind power, Figure 4-5, Figure 4-6 and Figure 4-7⁶⁴ illustrate the development of hydropower capacity and the use of the CDM in China, India and Brazil. In all three countries, hydropower has played an important role for many decades. Significant capacity has been installed without the CDM. Hydropower may therefore be considered common practice in all three countries.

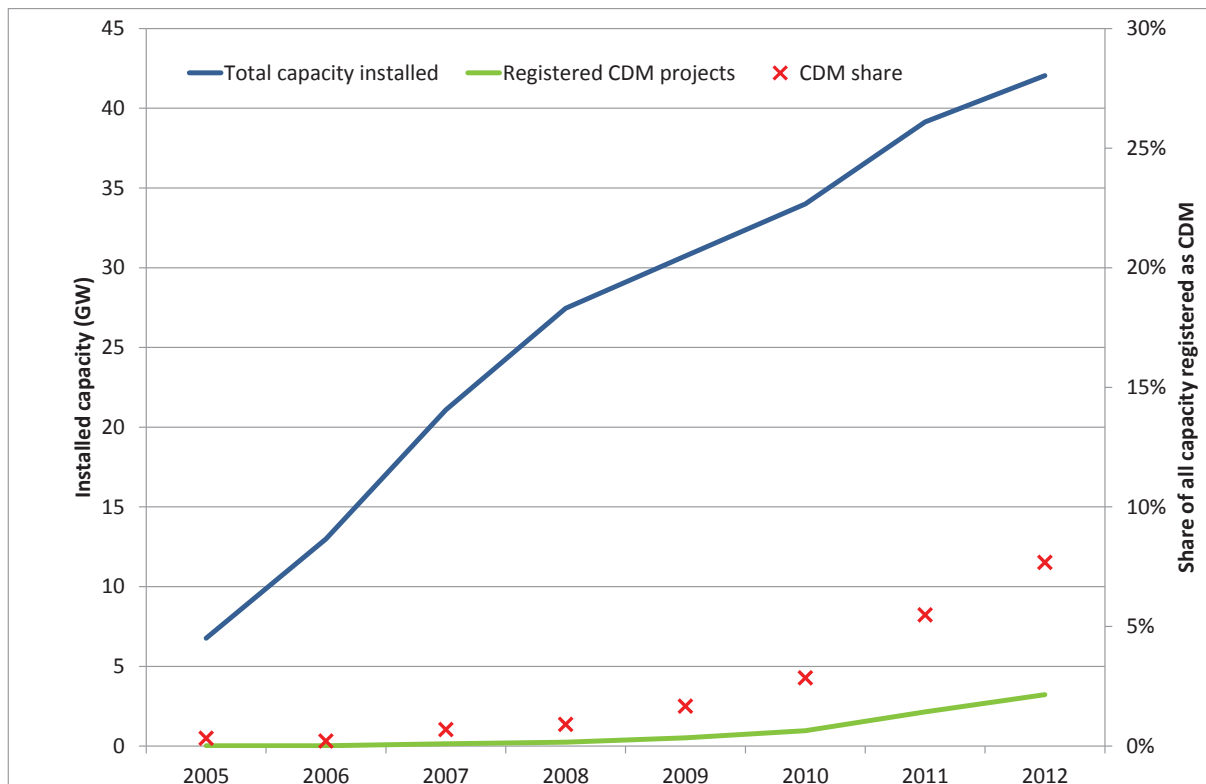
⁶³ ACM0002, AMS-I.D.

⁶⁴ Cf. footnote 51.

In China, the cumulated installed capacity in 1990 amounted to approx. 25 GW. A comparison of total hydro capacity installed and the capacity installed by projects using the CDM⁶⁵ over the 2005-2012 period (Figure 4-5) shows that there were no CDM projects until 2005, even though capacity additions in that year amounted to 11 GW. As of 2012, the share of CDM projects was 29% of total installed capacity.

In the case of India (Figure 4-6), the cumulated installed capacity in 1990 amounted to approx. 19 GW. Almost 7 GW of capacity was added in 2005 alone, with the CDM covering only a negligible share. After the introduction of the CDM, only a small share of hydropower projects used the CDM, with the CDM accounting for about 8% of total cumulated installed capacity⁶⁶ as of 2012.

Figure 4-6: Total cumulated hydropower capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

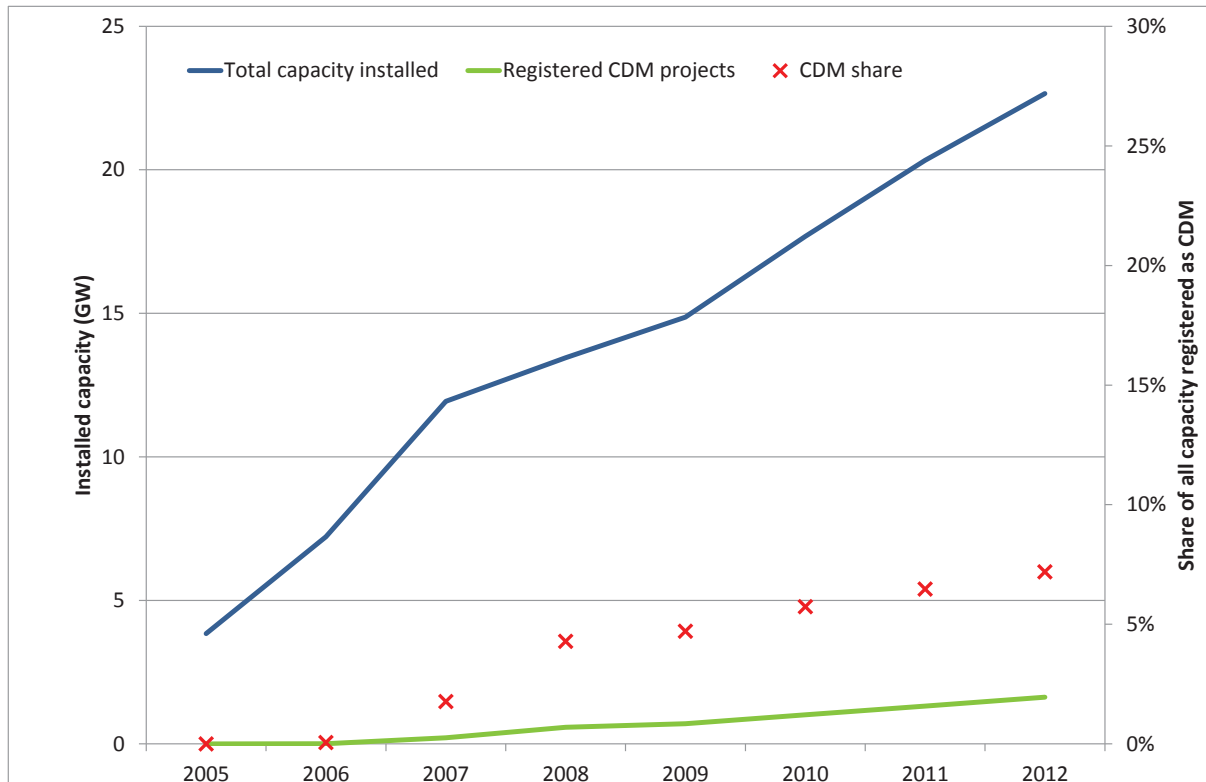
In the case of Brazil (Figure 4-7), the cumulated installed capacity in 1990 amounted to approx. 53 GW. Almost 4 GW of capacity was added in 2005, with no CDM projects being registered in that year. Even after the introduction of the CDM, only a small share of hydropower projects used the CDM (approx. 7% of total cumulated installed capacity⁶⁷ as of 2012).

⁶⁵ The total installed capacity between 2005 and 2012 is taken from the Platts database and accumulated across the years. The installed capacity of projects using the CDM is taken from the UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. See Section 4.5 for the rationale of using cumulative data.

⁶⁶ Between 2005 and 2012.

⁶⁷ Between 2005 and 2012.

Figure 4-7: Total cumulated hydropower capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

4.6.2. Potential CER volume

According to our own estimates, registered CDM hydropower projects have the potential to issue 4.2 billion CERs by the end of their respective crediting periods, of which 1.7 billion CERs fall in the 2013-2020 period (Table 2-1). CERs from hydropower account for approx. 30% of the total CER issuance potential.

4.6.3. Additionality

Generally, the same methodologies and additionality rules apply as for wind power (Section 4.5.2). Hydropower CDM projects primarily use investment analysis to demonstrate additionality.

The analysis in Section 4.6.1 demonstrates that hydropower plants have been constructed for a long time in many countries, which suggests that the technology may be regarded as common practice in many countries. In many cases, especially large hydropower plants were established without subsidies, which is demonstrated by the uptake of hydropower many years ago (Section 4.6.1). In the case of small hydropower (SHP) plants in China, Bogner & Schneider (2011) find that “apparently, smaller SHP plants face stronger barriers despite the government’s commitment to SHP development” and that “an especially remote location, an inappropriate feed-in tariff or banks that deny loans can be possible barriers”. Therefore, they conclude that “the CDM may have played a certain role for some SHP project developments” (ibid.). However, they argue that “investment in SHP stations between 20 and 50 MW appear more feasible without the CDM” (ibid.). Moreover, according to their analysis “medium and large hydropower has witnessed considerable growth a long time before the CDM even existed, which makes it difficult to justify that new projects

can only be implemented with the help of the CDM. In conclusion, our analysis suggests that the CDM is for most projects not an important factor for investment decisions in the medium and large hydropower plants. It appears likely that most projects would have been implemented in any case, i.e. without the CDM⁶⁸.

The impact of CER revenues on profitability is, at three to four percentage points, somewhat larger than for wind power (Section 2.4), mostly due to a higher plant utilization than for wind power. However, the increase in profitability due to CDM revenues is still relatively small compared to other project types⁶⁸. Also, in many cases, hydropower generally features competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Overall, due to the fact that hydropower is common practice in many countries, the limited impact of CER revenues on the profitability of hydropower plants and the competitiveness of hydropower with fossil electricity generation in many cases, we consider additionality of hydropower projects as questionable in the context of the CDM, especially for large hydropower.

4.6.4. Baseline emissions

Hydropower projects largely use the same methodological approaches for baseline emissions as wind power plants, and hence the same conclusions apply with regard to different aspects of over- or under-crediting. Few differences should be noted with regard to the emission impacts: Hydropower projects have, on average, somewhat higher upstream emissions for their construction (approx. 20 g CO₂e/kWh related to the “infrastructure & supply chain emissions” according to (IPCC 2014)), which, however, are still lower than typical upstream emissions from fossil use in the baseline. Thus, ignoring upstream emissions is still conservative. More importantly, the lifetime of hydropower can be significantly longer than the maximum crediting period under the CDM (21 years), which adds to the conservatism of the estimation of emission reductions for hydropower plants. In this regard, over the plants' lifetime, overall emission reductions may be rather under-estimated than over-estimated.

4.6.5. Other issues

In addition to baseline emissions, project CH₄ emissions ensuing from hydro reservoirs are considered under the CDM. The ACM0002 methodology uses the power density, which is defined as the installed hydro capacity divided by the reservoir surface, as an indicator of whether CH₄ emissions from reservoirs need to be considered. CDM projects with a power density below 4 W / m² are not eligible and projects with a power density between 4 and 10 W / m² have to estimate methane emissions, using a default emission factor of 90 g CO₂e/kWh. According to (IPCC 2014), methane emissions from “currently commercially available technologies” amount to 88 g CO₂e/kWh, however, the bandwidth is quite large. However, according to (Fearnside 2015), the default emission factor of 90 g CO₂e/kWh refers “only to bubbling and diffusion from the reservoir surface and” is an underestimate “of hydropower impact because these values ignore the main sources of methane release: the turbines and spillways”. Overall, he finds that “tropical hydroelectric dams themselves emit more greenhouse gases than are recognized in CDM procedures”. It can therefore be concluded that the current methodological rules under the CDM may lead to a potential underestimation of methane emissions from hydropower.

⁶⁸ It has to be noted, however, that the range of operating hours and investment costs of hydro power plants depends quite strongly on plant-specific conditions, for which reason the contribution of the CDM to overall profitability may be higher in some cases and lower in others.

4.6.6. Summary of findings

Additio- nality	<ul style="list-style-type: none"> • Common practice in many countries • CERs have only a moderate impact on profitability • In many cases competitive with fossil generation (LCOE)
Over- crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project, emission reductions are likely to be underestimated
Other issues	<ul style="list-style-type: none"> • Potentially significant methane emissions from reservoirs which may not be fully reflected by CDM methodologies

4.6.7. Recommendations for reform of CDM rules

We recommend excluding large scale hydropower projects from being eligible under the CDM, due to the overall questionable additionality. A similar recommendation is made by (Erickson et al. 2014), who, in an analysis of the net mitigation impact of the CDM conclude “that excluding large scale power supply projects from the CDM could help increase the net mitigation impact of the CDM, as well as steer investment towards projects that are truly dependent on CER revenues”. We recommend that small-scale hydropower projects with significant technological or cost barriers⁶⁹ may be allowed under the CDM.

With regard to the estimation of baseline emissions, our recommendations for wind power plants (Section 4.5.7) also apply here. In addition, the provisions with regard to the estimation of methane emission from hydropower should be revised to address the potentially significant magnitude of these emissions.

4.7. Biomass power

4.7.1. Overview

CDM biomass power projects mainly use four methodologies.⁷⁰ According to the UNEP DTU (2014), by the end of 2013, an overall biomass energy⁷¹ capacity of 8.5 GW was installed by projects using the CDM. The main contributors to this overall capacity are China (3.7 GW) and India (2.1 GW), followed by Brazil (0.9 GW). The other 36 countries with CDM biomass projects account for 1.8 GW of installed capacity in total.

Generally, data availability is not sufficient to judge the magnitude of biomass capacity installed prior to the introduction of the CDM. Moreover, due to inconsistencies in the data, no meaningful comparisons can be made between projects installed with and without the use of the CDM.

4.7.2. Potential CER volume

According to our own estimates, all registered CDM biomass power projects have the potential to issue 0.36 billion CERs by the end of their respective crediting periods, of which 0.16 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from biomass power account for about 3% of the total CER issuance potential.

⁶⁹ The criteria need to be further specified. See also footnote 62.

⁷⁰ ACM0006, AM0015, AMS-I.C, AMS-I.D. It has to be noted, however, that the AM0015 methodology was only used for CDM projects registered in the early phase of the CDM.

⁷¹ Including different energy forms from biogenic sources.

4.7.3. Additionality

For large-scale projects (according to ACM0006), the identification of the baseline scenario and the demonstration of additionality are conducted in parallel.⁷²

With regard to the investment analysis, due to the diversity of project types, no overall conclusions can be drawn. Also, analysis available in the literature is quite limited, in contrast to wind and hydropower. On average, the impact of CER revenues on the profitability of projects is with about eight percentage points considerably larger than for wind or hydropower plants, making additionality claims more plausible (Section 2.4). The profitability of projects without CER revenues is, with an average IRR of approx. 5%, also lower than for wind (approx. 7%) and hydro (approx. 8%). The higher impact of the CDM is mostly due to the claiming of avoided methane emissions in many projects, which significantly improves the profitability of CDM biomass projects.

The investment analysis, which is applied by many projects, involves considerable uncertainty due to the variability of the biomass price, which strongly affects the profitability of biomass plants. In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables, including ones for biomass power generation. In addition, biomass power is not a completely new technology, but is rather based on the technology of thermal power plants in general and has been used extensively in some industries and countries before (e.g. in the sugar cane industry in Brazil), which indicates that the technology has been profitable in the past in some instances. This is underpinned by the fact that biomass power features competitive leveled costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Only a few scholars explicitly deal with the additionality of CDM biomass power projects. Stua (2013) finds that, in the case of China, the national feed-in tariff made “most of the biomass-fuelled power plants [cost-competitive] against [...] coal-fired plants”.

Overall, based on the information presented above, we cannot clearly conclude on the likelihood of the additionality of biomass power plants.

4.7.4. Baseline emissions

As outlined in Section 4.7.2, the identification of the baseline scenario and the demonstration of additionality are conducted in parallel, considering a wealth of different options.

One key requirement in methodologies for using biomass residues is that the biomass residues would not be used in the absence of the project and would be left to decay (sometimes aerobically, sometimes anaerobically also claiming CH₄ baseline emissions). This requirement is appropriate and important due to potential competing uses for the biomass. If the biomass residues were used in the absence of the project for other purposes, there may be no emission reductions, since the diversion of biomass from one use to another due to the CDM may lead to increased emissions elsewhere. If CDM projects only divert the use of biomass residues but do not result in more biomass residues being collected which would otherwise decay, this may also lead to indirect land-use change, i.e. due to the increased use of biomass (residues), previous demand may be covered by drawing on biomass from other areas, thus leading to decreasing carbon stocks there.

Methodologies vary with regard to how they assess that the biomass residues are indeed ‘available in abundance’ and that decay is a likely scenario. In older versions, the abundance of biomass residues had to be monitored annually, while in newer versions this is only checked once at the project start and at the renewal of the crediting period.

⁷² For small-scale biomass projects, the same additionality rules as for wind power apply (Section 4.5.2).

In general terms, there is an increasing demand of biomass for different uses (food, raw materials, energy) worldwide. This means that biomass residues (in many cases) either already have or will likely have a price in the future. As a consequence, the demonstration that biomass residues would otherwise be (completely) left to decay needs to take current market developments into account. For this reason, a regular checking of the abundance of biomass residues through monitoring may be more appropriate than a simple check once at the project start.

Furthermore, in many cases, anaerobic decay of biomass is claimed by project developers. However, this assumption may be contested depending on the circumstances. For instance, if biomass waste is spread on fields, biomass decay is rather aerobic than anaerobic, thus producing little or no methane emissions. In many instances, the amount of methane emissions claimed appears very large; it may be questionable whether truly anaerobic conditions prevail in the typical circumstances in which biomass residues are left to decay. We therefore conclude that the current approach of demonstrating the abundance of biomass residues may lead to a risk of over-crediting as no adequate monitoring of availability of biomass residues is in place. In addition, exaggerated claims of anaerobic decay of biomass may lead to further over-crediting.

With regard to the baseline emissions from displacing power plants in the grid, the same conclusions apply as discussed in Section 4.5.4.

4.7.5. Other issues

No other issues were identified.

4.7.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Significant impact of CER revenues on plant profitability due to claims of methane emission reductions • In many cases competitive with fossil generation (LCOE) • Support schemes exist
Over-crediting	<ul style="list-style-type: none"> • Demonstration that biomass is left to decay or available in abundance is only conducted once at the start of the project activity • Risk of exaggerated claims of anaerobic decay
Other issues	<ul style="list-style-type: none"> • None

4.7.7. Recommendations for reform of CDM rules

Due to our finding that the demonstration of abundance of biomass as well as of the claim that biomass is left to decay (under potentially anaerobic conditions) is key for avoiding any over-crediting of emissions, it is recommended that corresponding provisions in the applicable methodologies are reviewed, with a view to ensuring that this demonstration considers current trends of biomass use and disposal and that any claims for anaerobic conditions of biomass decay are realistic. In particular, the monitoring of biomass abundance should be carried out more frequently (e.g. annually).

4.8. Landfill gas

4.8.1. Overview

Decomposition of solid waste in landfills generates carbon dioxide (CO₂) and methane (CH₄). This landfill gas can be captured and flared or captured and utilised for electricity production or as a fuel. GHG emission reductions are achieved through the destruction of methane, and in the case of

energy production, displacement of a more GHG-intensive energy source. Global estimates suggest that 50 Mt of methane are generated annually from landfills (IPCC 2014).

The composition of landfill gas is usually approx. 50% CO₂ and 50% CH₄ (Hoorweg & Bhada-Tata 2012; US EPA 2013). It varies by climate and waste composition. In general, methane generation increases in wetter versus arid climates and warmer versus cooler climates. Warmer climates increase the growth of methane-producing bacteria (US EPA 2013). Waste composition with a higher percentage of organic material generates more methane and degrades more quickly (US EPA 2013). Waste in lower income countries often includes a higher percentage of organic material than higher income countries (Hoorweg & Bhada-Tata 2012).

4.8.2. Potential CER volume

The potential to capture landfill gas varies by landfill management type. Gas collection rates can be as high as 75% for basic landfills in which waste is compacted and covered and up to 85 - 95% for engineered sanitary landfills whereby landfills are lined or capped to prevent leakage or contamination from the waste (US EPA 2013). Landfill management practices vary by region. While the majority of landfills in developed countries are engineered landfills, in developing countries mitigation opportunities are more limited because the majority of landfills are basic landfills or open dumps (US EPA 2013). In open dumpsites, decomposition is predominantly aerobic; as a result methane generation rates are relatively low and gas recovery rates are limited (~10%) (US EPA 2013). Because there is often a high concentration of food waste and wet condition in developing country sites, waste decays quickly and the methane gas is released quickly. As a result, mitigation activities to capture methane must be implemented on active open dumpsites, since after a lag of even 1-2 years most of the methane will have already been generated⁷³ (US EPA et al. 2012).

There are two primary landfill gas methodologies under the CDM. ACM0001 is the consolidated large-scale methodology and AMS-III.G is the small-scale methodology. As of 1 July 2015, there were 364 registered landfill gas projects. Predominantly these are large-scale projects located in Latin America and Asia/Pacific regions, though there are also projects in Africa, Europe/Central Asia and the Middle East. Of the 364, 149 projects have issued a total of 69 million CERs. As of 1 August 2015, the average issuance success rate amounted to 58% (UNEP DTU 2015a).

4.8.3. Additionality

Prior to 2013, large-scale landfill gas projects assessed additionality according to the CDM "Combined tool to identify the baseline scenario and demonstrate additionality". This tool, similar to the CDM 'additionality tool' requires that projects demonstrate that they are additional based on either an investment or a barrier analysis, complemented by a common practice analysis. Similarly, prior to 2014, small-scale projects applied the general guidelines or tool for small-scale activities. Most projects used investment analysis to demonstrate additionality, predominantly benchmark analysis or simple cost analysis (IGES 2014, similar to earlier results from Spalding-Fecher et al. 2012).

A standardized approach to additionality assessment was incorporated into Version 15 of ACM0001, eligible as of 8 November 2013, and version 9 of AMS-III.G, eligible as of 28 November 2014. This revision established a positive list for additionality of landfill gas projects. All landfill gas projects are automatically considered additional if prior to the implementation of the project they only vented or flared methane, and if under the project activity they either flare the methane, or use methane to generate heat, or use the methane to generate power with a capacity of less than 10 MW. As of 1 May 2014, only one landfill gas project had been registered using this methodology

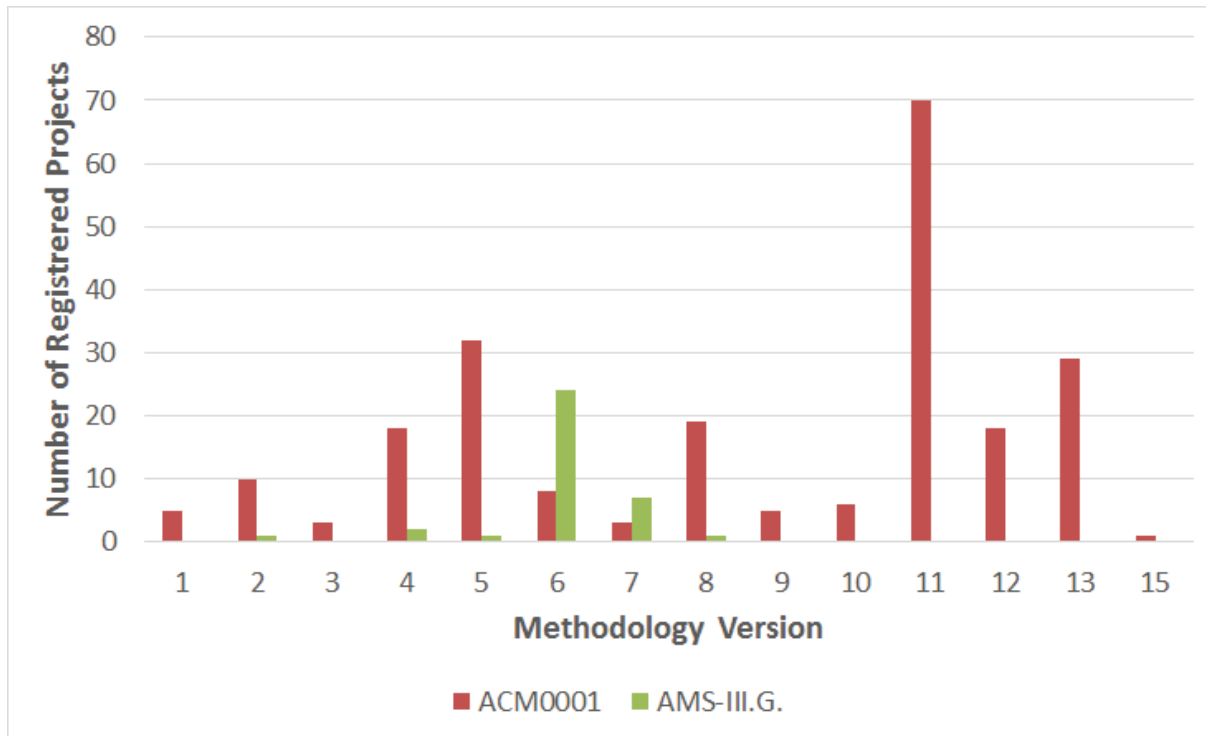
⁷³ While not applicable for the landfill gas methodology (ACM0001), the rapid decay rates may have implications on the applicability of the first order decay model used in the CDM "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" and included in the avoided landfilling via composting methodologies.

Version 15, as shown in Figure 4-8. The CDM EB will review the validity of these standardized procedures after a three-year time period.

CDM projects can only claim emission reductions for methane capture that exceeds any applicable regulations. In regions in which a regulation is in place but it can be demonstrated that it is not enforced, projects can still claim emission reductions for implementing the regulation. This has raised concerns that enforcement may be discouraged by constituencies receiving CER revenues. One such example is in the Philippines, where regulation has been established requiring gas capture and destruction, but it has not been enforced. Concerns have been raised that CER revenue has led to a pressure to discourage enforcement (Docena 2010).

Projects that capture and flare methane have no independent revenue source (US EPA et al. 2012). Flaring projects are therefore very likely to be additional. For projects using landfill gas for energy generation, additionality seems likely. As shown in Section 2.4, the available data from CDM projects indicates that the IRR is rather low without CER revenues (approx. 2.5-2.8% on average) but increase substantially with CER revenues (to approx. 16.6-18% on average). Indeed, collection and flaring of landfill gas is not common practice in developing countries without carbon finance, though it may be possible to implement projects economically where there are renewable portfolio standards (RPS) or feed-in tariffs, to allow energy production revenue to cover costs and provide capital investment for methane collection systems. For projects that supply heat, electricity, or methane to natural gas pipelines, the price and revenue from energy generation are a primary driver of the economics of the project. With economies of scale, the larger the landfill gas project, the more energy can be generated and the more likely the project is profitable.

Overall there are no substantial concerns with the approach to assess additionality for large- and small-scale landfill gas projects. The primary lingering concern is the potential for CDM projects to discourage the implementation of regulations that require capture and destruction of landfill gas.

Figure 4-8: Number of registered landfill gas projects by methodology

Source: IGES 2014

4.8.4. Baseline emissions

The baseline scenario for ACM0001 and AMS-III.G is assumed to be the atmospheric release of methane, unless capture and flaring is required by regulation or unless capture occurred to some extent prior to the implementation of the project. Baseline emissions are determined based on the amount of methane flared or used under the project activity (less any methane gas that was flared under the baseline). The overall volume of emission reductions generated is based on the baseline emissions minus any combustion efficiency losses and minus any methane that would have been destroyed under the baseline via soil oxidation. ACM0001 considers four different cases for how to account for regulation and existing landfill gas capture systems. These include no regulation/no existing capture system, no regulation with existing capture, regulation without existing capture, and regulation with existing capture. The small-scale methodology uses, in principle, the same approach but is less specific; the baseline emissions must take into account the volume of landfill gas required to be collected by regulation and the presence of pre-existing landfill gas collection and combustion systems. The overall approach of estimating the baseline emissions based on the amount of captured gas seems reasonable. However, there are concerns related to the default assumptions for pre-existing systems and regulations, and the accounting for soil oxidation.

If a regulation requires the collection of landfill gas or if a landfill gas collection system was pre-existing, but the regulation does not specify the amount to be collected or the historical amount collected is not known precisely, then both methodologies assume that 20% of the amount captured under the project scenario would be captured in the baseline. The methodology explains that this default value is based on assumptions that the capture efficiency of the project system is 50% and under the baseline 20%, and that in the baseline the methane was flared using an open flare with an efficiency of 50%. Despite the explanation, it remains unclear how the overall default value

of 20% of project emissions is derived. While a 50% destruction efficiency for an open flare is conservative when considering project emissions, used in the context of baseline emissions it has the potential to actually overestimate the emission reductions. The methodologies implicitly assume that the CDM project captures five times the amount of methane than would be captured under a regulation. This assumption seems rather optimistic and likely leads to a significant over-estimation of emission reductions.

There are two types of soil oxidation that can occur at a landfill. Top-layer soil oxidation refers to soil oxidation under baseline conditions when methane oxidizes as it passes through the top layers of the landfill. The second type of oxidation can occur when additional air is introduced into the landfill due to suction from the LFG capture system under the project scenario.

Early versions of ACM0001 and AMS-III.G did not account for these two effects. This likely led to an overestimation of baseline emissions for projects that were registered up to version 11 of ACM0001 (valid until 25 July 2012) and up to version 7 of AMS-III.G (valid for registrations until 28 May 2013). This shortcoming was recognised and, in principle, addressed from version 12 of ACM0001 and version 8 of AMS-III.G onwards, by introducing a default factor for the amount of methane that would oxidize in the baseline, using 10% for “managed solid waste disposal sites that are covered with oxidizing material such as soil or compost” and 0 “for other types of solid waste disposal sites”.

Concerns have been raised about the default values applied for the soil oxidation factor. Methane oxidation in covered landfills occurs mainly through bacterial degradation, primarily by methanotroph bacteria, resulting in production of carbon dioxide, water, and biomass. The rate of oxidation is influenced by a variety of physical factors, including different soil cover types (Chanton et al. 2009). Methane oxidation generally increases with temperature up to around 40°C and is also influenced by moisture, where either too dry or too wet conditions can inhibit methane oxidation (Chanton et al. 2009; Spokas & Bogner 2011). Soil oxidation further depends on the type of soil cover and the thickness of soil cover. Higher soil oxidation rates occur in landfills that are well managed with a thick soil cover. In a study of landfills with similar operational characteristics in different climate zones of the United States, methane oxidation was lowest in humid subtropical regions and highest in arid regions (Chanton et al. 2011). This research suggests that for poorly managed landfills in humid sub-tropical and tropical regions the soil oxidation rates may be very low.

The IPCC sets default values for landfill cover methane oxidation are typically between 0% and 10% of generated CH₄ (IPCC 2006), possibly derived from one early study of a New Hampshire landfill. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories indicate that:

“The use of the oxidation value of 10% is justified for covered, well-managed solid waste disposal sites to estimate both diffusion through the cap and escape by cracks/fissures. The use of an oxidation value higher than 10%, should be clearly documented, referenced and supported by data relevant to national circumstances.”

This highlights that the 2006 IPCC Guidelines consider a soil oxidation value of 10% as justified only for covered and well-managed sites. However, more recent literature surveys and experimental studies indicate that oxidation rates for covered landfills are higher, amounting on average to approx. 30% (Chanton et al. 2009; Chanton et al. 2011), although the 2009 paper indicates that the data may over-represent warmer conditions when oxidation rates would be higher.

Some stakeholders have raised concerns that the soil oxidation factor was not adjusted upwards in the CDM methodologies when more recent research indicated that an average value of 30% may be more representative (Chanton et al. 2009). However, the higher soil oxidation rates reported by

(Chanton et al. 2009) may not be fully appropriate for the context of developing countries, given that both an intermediate and final cap would have to be in place to a certain engineering standard. In most developing countries, landfills are rarely well managed with a thick soil cover required for this level of soil oxidation. This suggests that the higher soil oxidation rates may not be applicable to the conditions for some CDM projects. Nevertheless, having a default factor for both managed and unmanaged landfills avoids creating a disincentive for covering and managing landfills. The use of the soil oxidation rates as a standard default for all projects runs the risk of underestimating the volume of credits generated in some sub-tropical and tropical regions with unmanaged landfills for which soil oxidation rates under the baseline would have been very low or zero.

4.8.5. Other issues

Stakeholders have commented in public submissions to the UNFCCC with regard to revisions of ACM0001 that different types of perverse incentives can arise from landfill gas projects. Two main perverse incentives can be of concern, which both lead to an over-estimation of emission reductions.

Firstly, project developers can have an incentive to store the waste in a manner that generates more methane. For example, a 'flat' landfill with low methane generation potential could be changed to store waste at a greater height. Moreover, project proponents can have an incentive to maximise methane generation through other means, such as pulling water in the landfill to create anaerobic conditions. On a site visit to a landfill gas project in China in 2005, engineers proudly explained how they had found a way to generate more methane by stacking waste higher in one section of the landfill rather than spreading it evenly across the landfill site. While this is just one anecdotal example, there is reason to believe that some landfill projects may be altering management practices to do so. Based on these observations, in 2012 more recent versions of both the large- (version 13.0) and small-scale methodologies (version 8.0) included an applicability criterion that excludes projects in which the management is changed in order to increase methane generation. However, verifying this requirement may be difficult in practice and it has not been included as an explicit provision for DOEs to assess after the project implementation.

Secondly, there could be perverse incentives for policy makers and private actors not to engage in recycling or other ways of preventing waste generation, as this could lower the potential for CDM landfill gas projects. Similarly, there could also be perverse incentives to continue landfilling instead of introducing other waste treatment methods (incineration, composting).

Public comments received on behalf of waste picker organizations have raised concerns that development of a project limits access of waste pickers who, through the informal economy, contribute significantly to the recycling of materials (Global Alliance for Incinerator Alternatives, GAIA). Project developers who were interviewed acknowledged that sites need to be secured for project installation, to avoid having equipment tampered with or material stolen. For certain projects, including examples in Latin America and Thailand, agreements have been made for waste pickers to pick through waste before it is transferred into the secure site. However, in other cases there has not been any cooperation between the project developers and waste pickers, which has resulted in conflict and loss of livelihoods. There is evidence that the development of landfill gas projects is limiting the access of waste pickers and thereby reducing the reuse and recycling of waste through the informal economy. Given the success of collaborative agreements with waste pickers, this may be a model which new projects should be required to incorporate.

Pursuing landfilling instead of other waste treatment methods, such as recycling, incineration or composting, is likely to result in overall higher GHG emissions, even if the landfill gas is captured, because landfill gas collection systems are not able to capture all of the methane. The CDM may thus provide perverse incentives for policy makers or project owners to continue pursuing a waste

treatment method that is more GHG-intensive. If in the absence of the CDM, other waste treatment methods would be pursued, it would lead to an over-estimation of emission reductions.

Early versions of CDM methodologies did not include any provisions to address this issue. Regarding the potential perverse incentive to reduce recycling, starting with version 12 of ACM0001, an applicability criterion requires that “the implementation of the project activity does not reduce the amount of organic waste that would be recycled in the absence of the project activity”. However, there is no reference to how this should be assessed. Moreover, this applicability condition does not address the broader concern that the CDM provides incentives to continue pursuing landfilling and not composting or waste incineration. In public comments submitted by non-governmental organisations, such as the GAIA, there have been calls for eligibility requirements that would allow projects only on closed landfills in order to prevent the potential for this perverse incentive of reducing recycling and composting. Project developers argued that in developing country contexts, with warmer climates and higher percentage of organics in the waste stream, the capture of methane must take place while the landfill is actively being used, otherwise the methane will have already been released once it is closed. This is in contrast to landfills in more temperate climates, where methane production happens more slowly and where it is more common to develop a project at a closed landfill.

Overall, there is reason to believe that landfill gas projects are contributing to perverse incentives to manage landfills in ways that generate more methane and to reduce reuse and recycling or avoid a shift towards composting or waste incineration. In addition, it appears there are cases in which project participants increase methane production – an issue which may deserve particular attention in the validation and verification auditing processes.

4.8.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Likely to be additional
Over-crediting	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured under pre-existing collection systems or regulations are unjustified and have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid sub-tropical and tropical regions with very low soil oxidation rates; nevertheless, requiring the use of a default soil oxidation rate for baseline emissions avoids creating a perverse incentive to avoid covering landfills Potential for perverse incentives for policy makers not to regulate landfills or enforcing regulations in place Perverse incentives for project developers to manage landfills in ways that increase methane generation
Other issues	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG-intensive waste treatment methods, such as composting or incineration Some landfill gas projects exclude waste pickers and informal sector recycling, reducing overall rates of reuse and recycling

4.8.7. Recommendations for reform of CDM rules

We recommend several revisions to the CDM landfill gas methodologies to address the potential over-crediting, in particular the perverse incentives for both project owners and policy makers:

- Instead of applying one value for the soil oxidation factor to all projects, different values could be applied to different regions based on the climatic conditions and practices in that region.

- The approach of the default factors used for estimating methane capture from pre-existing collection system or landfills with regulations should be revisited. Assumptions in the default factor could be revised to be more conservative by assuming that more (rather than less) methane was captured and destroyed.
- Include specific requirements for DOEs to verify that the landfilling practice was not changed with a view to generating more methane.
- To avoid the reduction in recycling by excluding waste pickers access to the site, the methodology could be revised to be more specific about how projects should provide waste pickers with access to solid waste before it is deposited in the secure dumpsite.
- Given the long-term need to transition away from landfilling and increase composting and recycling, there could be a sunset clause considered for CDM landfill projects.

4.9. Coal mine methane

4.9.1. Overview

Methane is stored within coal as part of the coal formation process. During coal mining activities some of the methane is released. The build-up of methane in coal mines creates a potential explosive hazard and efforts before, during, and after mining are taken to reduce the safety risk by releasing methane into the atmosphere. Methane released from coal mines makes up approx. 8% of global anthropogenic methane emissions (Global Methane Initiative 2011). Methane originating in coal seams that is drained prior to mining is known as coal bed methane (CBM). Through a process of pre-mining drainage, this methane can be extracted to reduce the safety risk. During coal mining, methane can be vented from coal mines, which is known as ventilation air methane (VAM). After mining has ceased, methane can be extracted, which is known as post mining or post drainage coal mine methane (CMM). Coal mine methane projects involve installation of control technologies to collect and destroy and/or utilise methane from existing and abandoned mines, instead of releasing it to the atmosphere. Under the ACM0008 methodology of the CDM, capturing methane is eligible from pre-mining via underground boreholes and surface drainage of CBM, during mining from VAM that would normally be vented, as well as post mining from abandoned/decommissioned mines.

4.9.2. Potential CER volume

Of the 84 CMM projects that have been registered under the CDM, all are located in China, except for one project in Mexico. Projects from other countries, including India, Indonesia, Philippines and South Africa have been submitted to the UNFCCC but not registered.⁷⁴ As of 1 May 2014, 34 million CERs have been issued from 37 projects located in China. The total volume of credits expected from the credit start dates up to 2020 is 170 million CERs (Section 2.3).

The best conditions for CMM projects are deep coal mines with high methane concentrations. Under these conditions, methane is concentrated and easy to collect. For geographic and regulatory reasons, coal mines in China have been well suited for CMM projects to date. In India, for example, most coal mines are surface mines, where methane concentrations are lower and it is harder to collect the methane. Another barrier in India is national regulation that divides permits for using coal and gas. This means that coal mines do not have a permit to utilise the methane gas generated and would be unable to authorise a CMM project. A CMM project would require an additional permit process, an added administrative barrier.

⁷⁴ There are two projects under validation from India and one from the Philippines. Projects in Indonesia and South Africa have had their validation terminated or validation replaced.

4.9.3. Additionality

All of the registered CMM projects use the large-scale ACM0008 methodology. The most recent ACM0008 Version 8 requires use of the “Combined tool to identify the baseline scenario and demonstrate additionality” and provides further guidance on the application of the tool in the context of CMM projects. As of May 2014, no projects had been registered under version 8, which was approved in February 2014. The majority of projects are registered under versions 6 and 7. In these prior versions, the CDM additionality tool was applied, and a separate procedure was used to select the baseline scenario. Starting with version 6, the methodology was changed to allow for benchmark analysis as part of investment analysis for projects where no investment would occur in the baseline scenario.

Most CDM CMM projects apply a benchmark analysis to demonstrate additionality, as shown in Table 4-4. Benchmark analysis compares the financial performance of the project, often expressed as IRR, to a relevant benchmark or investment ‘hurdle rate’. In contrast to some other project types, CER revenue for CMM projects does make up a large portion of the return on investment on capital expenditures for projects. According to information from PDDs, the IRR without CER revenue is approx. 2% on average and increases to approx. 28% with CER revenues, the largest increase among all project types (Section 2.4). When we derive a simple indicator that puts the capital investment in relation to the number of CERs generated over ten years, as referenced in Section 2.4 in this report, we find an average ratio of about USD 4 / CER for all CMM projects. These calculations show that CMM projects have a high likelihood of additionality. They support reports from technical experts and project developers that abatement costs for CMM co-generation plants are approximately USD 3 - 5 per tCO₂ during 10 years of operation. Other reports indicate that CMM projects are usually not economically viable; according to United Nations (2010) power generation from CMM only becomes economically viable for coal mines with very large methane sources exceeding 20 m³/t (United Nations 2010).

Table 4-4: Additionality approaches used by CDM CMM project activities

Additionality approach	Number of project	Average Annual CERs (1,000)
Benchmark Analysis	76	33,465
Investment Comparison Analysis	4	1,557
Investment Comparison Analysis and Benchmark Analysis	1	266
Simple Cost Analysis	4	1,883

Sources: IGES 2014

A high likelihood of additionality is also supported by observation of common practice in the sector. Coal mines are very averse to having any combustion on-site. Combustion of any kind increases the potential risk of a methane gas explosion. Venting methane is the safest approach to avoid combustion, and miners and management are very familiar with this approach. Coal mine operators are generally averse to having a methane combustion system onsite as a result in order to avoid the risk of mine closures due to concerns around worker safety. Global Methane Initiative staff reported that in China, prior to the presence of the carbon market, efforts by the Global Methane Initiative were wholly unsuccessful in implementing CMM projects. No pilot projects or sponsored projects were able to get off the ground. Technical barriers were significant and persistent. The equipment used was unable to cope with the difficulties of the coal mine system, including the concentrations of volatile methane and the gas volumes. Only with the revenue from CERs were there sufficient incentives to develop technologies that worked well for these conditions. Now, in

China, it has become common practice for large coal mines to capture methane with revenue from a CDM project. As of 2014, there were still 2 projects in China at the validation stage; however since the technology for developing CMM projects in China is now proven, it can no longer be claimed to be first of its kind or a technology barrier. Although the CMM projects have become common practice, this has only been the case with CDM revenue. Overall, the risk for non-additionality is low for VAM projects.

4.9.4. Baseline emissions

Baseline emissions are calculated as the sum of CO₂ emissions from destruction of methane that would occur in the baseline scenario, emissions from the production of power, heat, or use of gas replaced by the project activity, and release of methane into the atmosphere that is avoided by the project activity. The baseline scenario is selected based on an examination of all the options that are technically feasible and comply with applicable regulations and elimination of all baseline scenario alternatives that face prohibitive investment, technological and/or prevailing practice barriers.

There is some concern that mines may take part in marginally more pre-mining drainage than they would have done without incentives from the CDM; however, the drained methane would likely have been emitted upon mining (and likely would have been emitted through ventilation later on). So these concerns seem limited, given that there are provisions in the methodology that emission reductions may only be credited once mining starts, ensuring that CERs are not issued in cases in which mining may not have occurred under the baseline. Our review has not identified any other concerns related to the determination of baseline emissions.

4.9.5. Other issues

The methodology includes a requirement that methane collection must exceed that which is required by applicable regulations, with the exception of cases in which it can be shown that the regulation is not enforced. A regulation was put in place in China requiring that methane captured from coal mines that exceeds 30% methane concentration must be captured and used. It has been suggested by project proponents that the Chinese government actually put this regulation in place as a result of the success of the CDM, to support the use of CDM financing to capture methane as best practice and to stimulate more CDM project development. However, interpretations vary and it has led to questions around the additionality of projects and whether or not they would have been required by regulation. As a consequence, project developers focused on projects where the methane concentration was below 30%. These projects would be avoided for safety reasons in North America or Europe, because this gets close to the explosive range of methane concentrations of 15-25%. It is better practice and safer to improve the capture rate and increase the concentration of methane, however this could run the risk of exceeding the 30% concentration regulatory requirement in China, and hence not meeting the CDM additionality requirements. This raises the risk of perverse incentives for project developers to diluting methane gas to reduce the concentration below 30% in order to be eligible for the CDM. However, no evidence is available whether this happened.

4.9.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Likely to be additional • CDM revenue makes up a large portion of return on capital investment • Technology for CMM in China is now well demonstrated, no longer technical barriers
Over-crediting	<ul style="list-style-type: none"> • Potential concerns regarding increased mining and/or pre drainage of coal mine methane but no evidence whether or not this occurs
Other issues	<ul style="list-style-type: none"> • Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations

4.9.7. Recommendations for reform of CDM rules

There are no recommendations regarding reforming the CDM rules for CMM projects. Further investigation of China's regulations for methane capture are warranted to ensure that perverse incentives are avoided.

4.10. Waste heat recovery

4.10.1. Overview

Waste heat utilization includes generally energy efficiency measures, where the thermal content of hot waste gases that would be vented in the absence of the CDM project activity is used for heating purposes, replacing fossil fuel use. For example, hot exhaust gases from cement kilns can be used to pre-heat the raw material before entering into the kiln.

A related category of projects is waste gas utilization where the calorific value of waste gases that contain a certain fraction of hydrocarbons or hydrogen that would be flared in the absence of the CDM project activity is used to replace regular fossil fuels. For example, waste gases with a high content of carbon monoxide and hydrogen can be used as fuel for steam production in industry. This second project category has similar features than the 'thermal' recovery of waste gases, but the present chapter focusses on the first category.

4.10.2. Potential CER volume

According to our own estimates, registered CDM projects have the potential to issue 0.35 billion CERs by the end of their respective crediting periods, of which 0.22 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from these projects account for about 2.5% of the total CER issuance potential.

4.10.3. Additionality

The methodologies for waste heat utilization (AM58, AM66, AM95, AM98, ACM12, AMS-II.I., AMS-III.P.AMS-III.Q., AMS-III.BI.) generally use standard CDM additionality tests based on barrier and/or investment analysis.

The general issue with this project type is that the use of waste heat is a standard practice in many integrated industrial facilities, in particular where energy costs represent a larger fraction of production costs such as in cement production, refineries, iron and steel and chemicals. However, the extent of the use of waste heat and energy efficiency may vary significantly even within a country, as energy costs, financial resources and engineering and management skills may differ between sectors and plants. While one steel plant may define its competitive edge in systematically using all waste heat and reducing heat loss along the steelmaking process because of competitive steel markets and relatively high fuel costs, a refinery plant may vent significant amounts of waste heat and experience severe heat losses all over the refinery because its cost of fuel is very low.

In the use of investment analysis for demonstrating additionality for waste heat recovery projects involves several uncertainties: the highest uncertainties are in the assumptions on future fuel prices which show high variability over time (Figure 2-4 to Figure 2-6). In addition, the considerable uncertainties in investment cost for equipment and construction and the often uncertain impact of the considered measure on efficiency makes it difficult to objectively determine the profitability of the measure and the relevant hurdle rate (Section 3.2).

For projects implemented in existing plants, the methodologies require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation. This is an important safeguard to assure at least some degree of additionality.

Some methodologies, such as ACM0012, also allow waste heat recovery projects in greenfield plants. This is very problematic, as it is very difficult to demonstrate that the waste heat utilization would not have been implemented in the absence of the CDM (Section 3.2). The methodology ACM0012 (V.5) provides for two options for demonstration additionality in the case of greenfield plants. Option 1 requires to identify similar plants; the project is deemed as additional “if *more than 80 per cent of the analyzed facilities in the list do not use waste energy, it can be decided that the proposed Greenfield facility also would have wasted the energy in the absence of waste energy recovery CDM project*”. While the methodology tries to be descriptive on how to identify baseline waste energy use, there remain large uncertainties and most importantly, data on the degree of waste energy usage in plants from competitors may be very difficult to obtain. Under option 2, project participants can submit a (hypothetical) *alternative design* without or with a lower level of waste heat recovery and demonstrate using investment analysis that the alternative design would be the baseline scenario for the waste energy generated in the greenfield facility. Given the high uncertainties in price data and hypothetical level of waste heat utilization in the absence of the CDM, this leads to significant risks of non-additionality.

The economic impact of CERs on the profitability of the waste heat recovery project is usually rather small compared to related fuel cost saving. I.e. a change in fuel costs of a few percent may have the same impact as the CER revenues (Sections 2.4 and 3.2).

Overall, the risk for non-additionality of greenfield plants seems higher than for existing plants, where the requirement for a minimum of three years of generation of waste heat prior to the start of operation of the CDM project has to be demonstrated.

4.10.4. Baseline emissions

Baseline emissions are usually derived from the amount of waste heat used in the project case. It is assumed, that this heat would be generated by fossil fuels in the baseline scenario.

However, even though the methodologies for existing facilities require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation, in practice it may be very difficult to rule out that waste heat has not been used in some form in existing facilities before project implementation, which may inflate baseline emissions.

Also, waste heat recovery may lead to a different operation of the plant than in the baseline scenario. For example, if waste heat is used for pre-heating of a product, the plant may be run in such a way that more waste heat is generated to assure a certain temperature level of the pre-heated product, which leads to a higher fuel consumption in the boiler generating the waste heat. Therefore the amount of heat wasted in the baseline may be overestimated. Moreover, baseline usually do not capture any other autonomous energy efficiency improvements that might be implemented in the absence of the project.

In greenfield projects, the emission reduction is based on the difference in emissions in modelling a baseline and project scenario. The models build on many assumptions that are difficult to validate objectively. The results are therefore prone to high uncertainty and may lead to over-crediting.

Lastly, the methodologies do not consider emission reductions from the reduction in upstream emissions (such as from the production of natural gas or coal) which leads to a slight under-crediting, if upstream emissions occur in a non-annex I country.

4.10.5. Other issues

None.

4.10.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are very small compared to cost reduction from fuel savings • Ex-ante estimation of key parameters including investment costs and fuel savings has large uncertainties • Waste heat recovery is common practice in many countries and sectors (though not in all)
Over-crediting	<ul style="list-style-type: none"> • In existing facilities: It is very difficult to rule out that waste heat has not been used in some form before project implementation, which may inflate baseline emissions • In greenfield projects: Modelling of amount of waste heat lost in baseline is subject to very high uncertainties. • Waste heat recovery may lead to a different operation of the plant than in the baseline case, e.g. to assure a certain temperature level of the heat medium or to NCV level of waste gas, therefore the amount of gas wasted in the baseline may be overestimated
Other issues	<ul style="list-style-type: none"> • None

4.10.7. Recommendations for reform of CDM rules

Waste heat recovery is standard practice in many energy intensive industrial sectors, though there exist barriers to the implementation of waste to energy measures. The high uncertainty in additionality demonstration make it less suitable for the CDM, the project type may be taken out of the CDM or restricted to cases with clear additionality demonstration, e.g. of a very low uptake of waste heat recovery can be demonstrated in a specific industrial sector. We recommend that option 1 in Appendix 1 of ACM0012 be maintained as it provides a more objective way of assessing the practice in the sector and country and that option 2 not be used.

4.11. Fossil fuel switch

4.11.1. Overview

Fossil fuel switch includes the switching from a fuel with higher carbon intensity (such as coal or petroleum) to a fossil fuel with lower carbon intensity (such as natural gas) in the generation of heat for industrial processes or in power plants. In this section we do not consider switching from fossil fuels to biomass. Methodologies are for existing installations only (e.g. ACM0009, ACM0011, AMS-III.AH., AMS-III.AN) or for both existing and greenfield installations (AMS-III.B and AMS-III.AG – power only).

4.11.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 0.46 billion CERs by the end of their respective crediting periods, of which 0.23 billion CERs fall in

the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about 3.3% of the total CER issuance potential.

4.11.3. Additionality

Both fossil fuels with higher carbon intensity such as hard coal, lignite or fuel oil and fuels with lower carbon intensity such as natural gas are widely used in stationary installations in energy and manufacturing industries as well as in the buildings sector. In existing facilities, the choice of fuel is often determined by the existing fuel, because fuel changes may be costly, though there are also multi-fuel systems. In greenfield plants, the fuel choice usually depends on the economic viability of each fuel option.

Table 4-5: Examples of differences in characteristics between the use of coal and fuel oil compared to natural gas

Characteristics	Hard coal, lignite (fuel with high carbon intensity)	Natural gas (fuel with lower carbon intensity)	Considered in investment analysis
Initial investment for burner/ boilers etc.	Higher	Lower ¹⁾	Yes
Fuel cost per energy unit	Lower	Higher	Yes
Non-fuel operation costs	Higher	Lower	Yes
Flexibility in operation ²⁾	Lower	Higher	No
Means of distribution to end- user	Vehicle-based: by trucks, train i.e. requires access roads or rails	Network based: by distribution lines ³⁾	No
Price building mechanisms	In many countries based on world market price	In many countries price is based on local long term contracts, often taking into account a price index, e.g. based on oil price	No
Dependence on specific supplier	Lower	Higher	No
Compliance with local air quality standards (if any)	More difficult: Coal based furnaces may require expensive exhaust cleaning systems	Less difficult: Natural gas based furnaces have generally lower air pollutant emission levels ⁴⁾	No
Need of space for local fuel storage	Yes	No ⁵⁾	No

Notes: ¹⁾This is the case if the (higher) investment for distribution lines necessary to connect to the natural gas grid is borne by a different entity, e.g. the natural gas supplier. In case of LNG initial investment costs may be somewhat higher for LNG terminals, local storage facilities etc. ²⁾E.g. shorter time lag to start-up operation of power plant if dispatching system in a grid requires more power. ³⁾Or Vehicle based in case of LNG. ⁴⁾Please note that this may hold true even though local air quality standards may be stricter for natural gas than for coal-based systems. ⁵⁾Except for LNG.

Sources: Author's own research

The large-scale methodologies ACM0009 and ACM0011 require an investment analysis for demonstrating additionality, a barrier analysis (Section 3.2) is not deemed sufficient.⁷⁵ This makes sense as the economic viability may be seen as one of the key aspects when deciding on a specific fuel. Requiring investment analysis may reduce the risk of non-additionality, because using this

⁷⁵ Though e.g. ACM0009 allows for the additionality to be proven by claiming „prohibitive barriers“ for the project (natural gas) scenario applying step 3 of the additionality tool.

test may be more difficult in the case of very lucrative fuel switches (e.g. if cheap natural gas becomes newly available in a project site).

In general, fuel prices per energy unit are generally lower for coal than for natural gas. This is offset to a certain degree by higher initial investment and non-fuel operation costs for coal furnaces (Table 4-5). However, while the investment analysis takes these cost factors into account, there could be other factors that may lead to the choice of natural gas as a fuel, even though it may be economically somewhat less attractive than lignite or hard coal.

An issue that contributes to the high uncertainty in investment analysis are the assumptions made about future developments of fuel prices. In the investment analysis, the fossil fuel switch methodologies allow to choose between (i) keeping fuel prices at present levels for future years, or (ii) to use future prices that *“have to be substantiated by a public and official publication from a governmental body or an intergovernmental institution”* (ACM0009 V.5, Section 5.2.4).

For small-scale projects, however, the barrier analysis is deemed sufficient, which may considerably increase the risk of non-additionality (Section 3.3). This risk is only somewhat mitigated by some small-scale methodologies requiring that the CDM project involves at least some capital investments⁷⁶, ruling out projects where fuel switch can be carried out without any investment in additional fuel switching equipment, e.g. in natural gas burners. Still, small-scale fuel switching methodologies have the full set of issues that have been identified for barrier analysis (Section 3.3).

In addition, similar to other energy related project types, with fuel switch projects CER revenues are very small compared to typical fluctuations of price differences between fuels (dark-spark spread), which increases the risk of non-additionality.

4.11.4. Baseline emissions

The exploitation, transport, processing and distribution of fossil fuels results in upstream emissions, many of which may originate in non-Annex I countries. In most CDM project types, the amount of fossil fuel used is *reduced* with the project; therefore, it may be assumed that also upstream emissions are reduced. As a conservative simplification, the relevant methodologies usually do not consider upstream emissions. In the case of fossil fuel switch, however, upstream emissions from fossil fuels could either increase or decrease. In general, upstream emissions from natural gas tend to be higher than upstream emissions from lignite, hard coal or fuel oil (depending on source of fuel).

With fuel switch activities the amount of fuel used in terms of energy content remains more or less constant (or may slightly be reduced because of higher efficiency of natural gas burners). Because of the potentially higher upstream emissions of natural gas, switching from coal/oil to natural gas may result in an increase in upstream emissions, the so-called ‘upstream leakage’ emissions. For this reason, CDM methodologies for fossil fuel switch projects consider upstream emissions.

The procedures for estimating upstream emissions are included in the methodological Tool “Upstream leakage emissions associated with fossil fuel use” (V.1, EB69 Annex12). The tool allows project developers to use default values for upstream emissions or to come forward with their own values derived from relevant data. The default values have been substantially revised with the tool (e.g. from the values included in Table 3 of methodology ACM0009 V.4 (EB68 Annex 12)).

For instance, according to the latest version of the tool, default upstream emissions values from natural gas are 2.9 tCO₂/TJ, based on data from the US. This is comparable to the 2.6 tCO₂/TJ

⁷⁶ For example, as in the applicability requirements of small-scale methodology AMS-III.B (V.18): “The methodology is limited to fuel switching measures which require capital investments. Examples of capital investment include creating infrastructure required to use project fuel or retrofitting existing installations.”

(105 tCH₄/PJ; total) default upstream emissions in Western Europe in ACM0009 V.4 (based on IPCC), but is much lower than in e.g. the former values for Eastern Europe and former Soviet Union (23 tCO₂/TJ) or Rest of the World (7.4 tCO₂/TJ).

Also, the revised aggregated default values for natural gas (Table 1 in the tool) of 2.9 appears much lower than the sum of the default values for the different elements in the upstream chain of natural gas (Table 3 in the tool), including exploration and production (3.4 tCO₂/TJ), processing (4 tCO₂/TJ), storage (1.6) and distribution (2.2). The latter are all based on the US Department of Energy's GREET model, which may not necessarily be representative for upstream emissions of natural gas in developing countries.

With this, the revised values become comparable to those from (underground) coal. It is unclear whether this is a reasonable assumption or an artefact because of the origin of the natural gas upstream emissions data. If the values in the upstream tool are not conservative, i.e. provide too low default values for natural gas upstream emissions, this would lead to an increased risk of over-crediting of fuel switch projects.

An additional issue is the assumptions for the default values on the share of upstream emissions that are covered by caps of Annex-I countries – and how effective these caps are in limiting upstream emissions.

Table 4-6: Default emission factors for upstream emissions for different types of fuels reproduced from upstream tool (Version 01.0.0)

Fossil fuel type x	Default emission factor (tCO ₂ e/TJ)	
Natural Gas (NG)	2.9	
Natural Gas Liquids (NGL)	2.2	
Liquefied Natural Gas (LNG)	16.2	
Compressed Natural Gas (CNG)	10	
Light Fuel Oil (Diesel)	16.7	
Heavy Fuel Oil (Bunker or Marine Type)	9.4	
Gasoline	13.5	
Kerosene (household and aviation)	8.5	
LPG (including butane and propane)	8.7	
Coal/lignite (unknown mine location(s) or coal/lignite not 100%)	Lignite	2.9
	Surface mine, or any other situation	2.8
	Underground (100% source)	10.4
Coal/lignite (coal/lignite 100% sourced from within host country)	Lignite	6
	Surface mine, or any other situation	5.8
	Underground (100% source)	21.4

Notes: The detailed table 3 in tool does not seem to provide data for conventional NG upstream emissions.

Sources: EB69, Annex 12, <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-15-v1.pdf>

Table 4-7: Former default emission factors for upstream emissions for different types of fuels

Activity	Unit	Default emission factor	Reference for the underlying emission factor range in Volume 3 of the 1996 Revised IPCC Guidelines
Coal			
Underground mining	t CH ₄ / kt coal	13.4	Equations 1 and 4, p. 1.105 and 1.110
Surface mining	t CH ₄ / kt coal	0.8	Equations 2 and 4, p.1.108 and 1.110
Oil			
Production	t CH ₄ / PJ	2.5	Tables 1-60 to 1-64, p. 1.129 - 1.131
Transport, refining and storage	t CH ₄ / PJ	1.6	Tables 1-60 to 1-64, p. 1.129 - 1.131
Total	t CH ₄ / PJ	4.1	
Natural gas			
<i>USA and Canada</i>			
Production	t CH ₄ / PJ	72	Table 1-60, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	88	Table 1-60, p. 1.129
Total	t CH ₄ / PJ	160	
<i>Eastern Europe and former USSR</i>			
Production	t CH ₄ / PJ	393	Table 1-61, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	528	Table 1-61, p. 1.129
Total	t CH ₄ / PJ	921	
<i>Western Europe</i>			
Production	t CH ₄ / PJ	21	Table 1-62, p. 1.130
Processing, transport and distribution	t CH ₄ / PJ	85	Table 1-62, p. 1.130
Total	t CH ₄ / PJ	105	
<i>Other oil exporting countries / Rest of world</i>			
Production	t CH ₄ / PJ	68	Table 1-63 and 1-64, p. 1.130 and 1.131
Processing, transport and distribution	t CH ₄ / PJ	228	Table 1-63 and 1-64, p. 1.130 and 1.131
Total	t CH ₄ / PJ	296	
Note: The emission factors in this table have been derived from IPCC default Tier 1 emission factors provided in Volume 3 of the 1996 Revised IPCC Guidelines, by calculating the average of the provided default emission factor range.			

Sources: EB68 Annex 12, ACM0009, V.4, Table 3, http://cdm.unfccc.int/filestorage/r/t/4M2I7TA9GRCU5QDB0JLNHK6PY1ZOWE.pdf/eb68_repan12.pdf?t=Z0p8bzJ3YnExfDBVPWpbmqO_k-sMZsZlso1q

4.11.5. Other issues

None.

4.11.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Small-scale methodologies for fuel switching do not require investment analysis but may build only on barrier analysis, which provides a high risk for non-additionality • Even in large scale methodologies, modelling of fuel choice depends not only on prices, but also on availability/reliability, need for diversification, and operational needs (e.g. NG power plants for covering peak demand); this may imply that the investment analysis may not be sufficient to determining additionality • CER revenues are very small compared to typical fluctuations of the price difference between fuels (dark-spark spread)
Over-crediting	<ul style="list-style-type: none"> • Upstream emissions need to be taken into account, but with the revised default values of the tool they may not be addressed in an adequate way anymore
Other issues	<ul style="list-style-type: none"> • None

4.11.7. Recommendations for reform of CDM rules

In sum, the revision of upstream default values as documented in the tool practically eliminates the consideration of upstream emission in a fuel switch e.g. from (underground) coal to natural gas. The assumptions behind the revisions (mostly data from the US may not be representative for the situation with natural gas used in developing countries and require urgent independent analysis and revision.

4.12. Efficient cook stoves

4.12.1. Overview

Under the CDM, there are two methodologies applicable to efficient cook stoves. AMS-II.G⁷⁷ applies to cases where inefficient existing cook stoves are replaced by improved-efficiency cook stoves to reduce the demand for non-renewable biomass. AMS-I.E⁷⁸ applies to cases where a renewable technology, such as biogas or solar cookers, is introduced to displace existing cook stoves using non-renewable biomass. The number of projects has increased quickly since the introduction of these methodologies in 2008/2009. Most notably the introduction of PoAs, enabling multiple project activities to be registered through a single approval process, has lowered the transaction costs and increased scalability for projects like efficient cook stoves.

4.12.2. Potential CER Volume

As of 1 July 2015, a total of 102 cook stove projects have been registered under the CDM, 37 as individual CDM project activities and 65 as PoAs (along with a total of 180 individual CDM Program Activities (CPAs)).

Table 4-8: Number of efficient cook stove single CDM project activities by country

Country	Number of CDM project activities	Annual CERs (1,000)	Avg. CERs per CDM project activity (1,000)
China	1	12	12
India	29	469	16
Lesotho	1	34	34
Malawi	2	71	35
Mozambique	1	192	192
Nepal	1	20	20
Nigeria	1	31	31
Zambia	1	130	130
Total	37	960	

Sources: UNEP DTU 2015a

Project activity under the CDM peaked in 2012 and dropped sharply in 2013. As of 1 July 2015, single CDM cook stove projects are mostly located in the Asia and Pacific regions (Table 4-8), while component project activities developed under PoAs are predominantly located in Africa, as shown in Table 4-9. The annual volume of CERs estimated by project developers from PoA projects is 9.2 million, nearly 10 times the annual volume of CERs projected from single CDM project

⁷⁷ AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass, <https://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLVO7LJN8XD1O2RKHEK>.

⁷⁸ AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user, <https://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S>.

activities of 0.96 million. Many of the registered PoAs have only 1 or a few CPAs associated with them (Table 4-9), so there is potential to scale up CPAs in these cases. In Bangladesh and Madagascar, many individual CPAs have already been developed under the one PoA registered in each of these countries (Table 4-9).

Table 4-9: Number of efficient cook stove PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/ CPA (1,000)
Bangladesh	1	543	11	49
Burkina Faso	2	68	1	68
Burundi	2	452	4	113
China	1	10	1	10
Congo DR	3	124	1	124
Côte d'Ivoire	2	160	2	80
El Salvador	2	90	1	90
Ethiopia	3	201	2	121
Ghana	2	377	4	108
Guatemala	1	43	1	43
Haiti	2	68	1	68
Honduras	1	34	1	34
India	5	543	2	302
Kenya	4	319	2	159
Madagascar	1	4,198	59	71
Malawi	6	299	1	257
Mali	1	33	1	33
Mexico	1	40	1	40
Mozambique	1	28	1	28
Myanmar	1	43	1	43
Nepal	4	204	2	136
Nigeria	2	226	4	56
Rwanda	3	229	2	114
Senegal	3	209	1	209
South Africa	1	32	1	32
Tanzania	1	63	1	63
Togo	3	48		144
Uganda	3	265	2	132
Zambia	3	345	3	129
AMS-I.E	7	4,657	9	509
AMS-II.G	57	4,535	2	2,371
AMS-I.E + AMS II.G	1	100	1	100
Total	65	9,292		

Sources: UNEP DTU 2015a

4.12.3. Additionality

Improved cook stove methodologies under the CDM fall under one of two types: improved energy efficiency (AMS-II.G) or fuel switching to renewable energy (AMS-I.E). Under both methodologies projects must apply the CDM “Guidelines on the demonstrating of additionality of SSC project activities” (Methodological Tool: Demonstration of additionality of small-scale project activities. Version 10.0). Following these CDM guidelines, projects using either of these methodologies are on

the positive list of project types and automatically considered additional so long as each unit is no larger than 5% of the small-scale CDM threshold (750 kW installed capacity or 3000MWh energy savings per year or 3,000 metric tons emission reductions per year), and end users are households/communities.

Lambe et al. (2015) reviewed PDDs for cook stove projects in Kenya and India. Although projects are considered automatically additional and were thus not required to document barriers, the study found that several did include a discussion of barriers in the PDDs. The most-cited barrier was household poverty, which makes improved stoves unaffordable. The study found that several PDDs for projects in Kenya include simple cost analysis to assess the ability of households to purchase an efficient cook stove based on their income and their costs for food and fuel; the calculations suggest that households would need to save 22–30% of their remaining income for a year to purchase a stove. This claim was supported in the pricing models the authors found used by projects in rural areas, which nearly exclusively distributed stoves for a free or subsidized price. In an urban setting, the study found that many projects were selling stoves at the retail price with micro-finance options. The study noted that these PDDs suggest that since urban households are already purchasing charcoal, they have an incentive to buy an improved cook stove to reduce their fuel costs. The study authors also found that many projects also cited the lack of access to credit for working capital, low profit margins, high upfront capital costs, lack of sufficient consumer outreach and support for program operations, reduced consumer demand resulting from failure of past efforts, need for ongoing improvement and modifications of stoves to suit user needs as barriers to project implementation.

Lambe et al. (2015) also investigated what contribution offset revenues make to the overall project revenue. The study reviewed claims made in PDDs regarding the use of offset revenue and found that a majority of projects planned to use offset sale revenues to subsidize the price of improved cook stoves, as well as to cover operational costs, including maintenance and replacement of stoves, training of cook stove users, outreach and marketing to households, microcredit systems and distribution. Interviews of market actors affiliated with these projects by the authors found that while some projects were entirely dependent on offset revenue, others admitted that given the uncertainty in revenue from offsets it was advantageous not to depend on carbon revenues.

These conclusions raise substantial concerns about the additionality of improve cook stove projects under the CDM. Carbon revenues are more likely to be a primary financial enabler of projects in rural areas, where revenues are needed to subsidize the price of stoves. In urban areas, where households have a financial incentive to reduce their fuel purchasing costs, business models without carbon financing may be more viable. While these factors may reduce confidence in the additionality of cook stove projects in urban areas, low income urban households are unlikely to be able to afford more efficient and more costly cook stoves with a payback period of more than a few months.

4.12.4. Baseline emissions

In both types of cook stove projects – improved efficiency and fuel substitution – emission reductions are calculated as the product of the amount of woody biomass saved, the fraction that is considered non-renewable biomass, the net calorific value (NCV) of the biomass, and an emission factor for the fuel used. The net calorific value of the non-renewable biomass ($NCV_{biomass}$) is relatively straightforward – it is empirically measurable and a default value from the Intergovernmental Panel on Climate Change (IPCC) exists. However, Lee et al. (2013) concluded that there is uncertainty in the approaches to estimating the other parameters: biomass fuel consumption (B_y), fraction of non-renewable biomass (f_{NRB}), and emission factors for fuel combustion ($EF_{projected_fossilfuel}$). A study by Johnson et al. (2010) assessed the relative contributions of these three variables to the overall uncertainty in

carbon offset estimation for an improved cook stove project in Mexico and found that fuel consumption (B_y) contributed to 28% of the uncertainty, fraction of non-renewable biomass (f_{NRB}) contributed 47%, and emission factors ($EF_{\text{projected_fossilfuel}}$) accounted for 25%.

The CDM methodology AMS-II.G presents project developers with three options for quantifying biomass fuel savings from improved stoves: the Kitchen Performance Test (KPT), the Water Boiling Test (WBT), and the Controlled Cooking Test (CCT). The WBT and CCT are laboratory-based methods, whereas the **Kitchen Performance Test** is done in the field, and can thus better represent stove users' actual cooking behaviour. The primary advantage of the **Water Boiling Test** is its simplicity and reduced costs; the laboratory-based method is standardized and replicable. However, the laboratory results on stove performance do not necessarily translate to cooking actual meals in households, and thus the accuracy of this method is frequently called into question (Abeliotis & Pakula 2013; Johnson et al. 2007). Meanwhile, the **Controlled Cooking Test** protocol provides a compromise, better representing local cooking while being conducted in a controlled environment. Berrueta et al. (2008), which evaluated the performance of a stove designed primarily for tortilla-making by using all three tests and found that the WBT "gave little indication of the overall performance of the stove in rural communities", while the CCT was somewhat more predictive of the fuel savings found by the KPT (44-65% for CCT vs. 67% for KPT). There may be options for reducing costs associated with the KPT, such as having local NGOs perform the tests rather than hiring expensive international consultants, as well as opportunities to improve the WBT. In recent years, more comprehensive and appropriate testing methods and performance standards are under development through both ANSI and ISO standardisation organisations. The CDM methodology provides default efficiency values for two traditional stove types – a three-stone fire, or a conventional system with no improved combustion – as well as a default efficiency value for devices with improved combustion air supply or flue gas ventilation. Experts interviewed by Lee et al. (2013) noted that these limited defaults do not cover the range of cook stoves in most countries. The CDM Small-Scale Working Group (CDM SSC WG) considered this in the past, but made the determination not to proceed with developing regional default efficiency values for traditional cook stoves because of the huge variability in values among the available data (UNFCCC 2012a). Lee et al. (2013) conclude that although the KPT is more logistically complicated, and time- and resource-intensive, testing stoves outside of a controlled laboratory setting and using a variety of typical cooking activities appears to be an important factor in ensuring accurate and credible results in the baseline or default analysis. Overall, evidence suggests the Water Boiling Test is not an appropriate tool for assessing baseline fuel consumption and should be removed from the CDM methodology. The methodology should require the use of either the Kitchen or Controlled Cooking Tests. AMS-I.E follows a similar approach for calculating baseline emissions from fuel substitution of cook stoves.

The factor f_{NRB} represents the fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass and is a key variable in all current cook stove offset methodologies

Based on its definition of renewable biomass (UNFCCC 2006b), the EB has identified several indicators of scarcity to help identify non-renewable biomass. Woody biomass is considered non-renewable if at least two of the following indicators are shown to exist:

- A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuelwood suppliers) or alternatively, a trend showing an increase in the distance the fuelwood is transported to the project area;
- Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

- Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;
- Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass (UNFCCC 2011a).

In 2012, the EB issued national default factors for f_{NRB} based on a highly aggregated approach, balancing the mean annual increment in biomass growth (MAI), the annual change in living forest biomass stocks (ΔF) and biomass growth in protected forest areas (UNFCCC 2012a). Under this approach, f_{NRB} values were calculated for nearly 100 countries, based on the total annual national biomass removals minus the portion of demonstrably renewable biomass from growth in protected reserve areas. The large majority (over four-fifths) of default values exceed 80%, with the remainder ranging from 40% to 77%. While Lee et al. (2013) noted that market actors interviewed characterize development of default f_{NRB} values as a 'huge triumph', there was also recognition by market actors and researchers interviewed that national-level forest growth and total forest harvest removal data alone do not necessarily capture the impact of fuelwood harvesting on carbon stocks. First, the approach does not distinguish removals for timber harvesting from those for fuelwood. Furthermore, there is no justification or validation of whether the change in national carbon stocks has any correlation to fuelwood harvesting. Second, according to this method, high values of f_{NRB} are calculated for countries with significant deforestation. However, deforestation could occur in different geographical areas and be driven by entirely other factors than fuel wood collection. In practice, renewable biomass may be extracted both from plantations and natural forests that are not under protection. The MAI approach is better suited to assess the fraction of harvested wood products that are renewable, rather than fuelwood. Using the change in carbon stocks due to harvested wood products has the potential to significantly overestimate the fraction of non-renewable biomass. Estimates published by de Miranda Carneiro et al. (2013), based on the use of a spatially-explicit land use model to examine the availability of fuelwood, suggest default values for f_{NRB} of wood-fuel on the order of 20-30%, much lower than the prior estimates. Bailis et al. (2015) estimate that 27–34% of woodfuel harvested was unsustainable, with large geographic variations, and conclude that cookstove methodologies probably overstate the climate benefits.

Under the CDM methodology AMS-II.G and AMS-I.E, the quantification of project emission reductions relies on the factor $EF_{projected_fossilfuel}$, representing the fossil fuel emission factor of "substitution fuels likely to be used by similar users". Since emission reductions from the LULUCF sector can only be claimed from afforestation and reforestation under the CDM, the use of fossil fuel emission factors for baseline fuels represents something of a workaround. While the short-term emission reductions actually occur from avoiding the depletion of carbon stocks, such as avoiding deforestation, emission reductions are calculated using fossil fuel emission factors. One possible argument for this approach is that kerosene or LPG cook stoves might be used by the households if they had a higher income. In this regard, the consideration of emissions from fossil fuel based cooking devices might be regarded as a suppressed demand baseline. However, the approach combines the efficiency of fuel-wood cook stoves with the CO₂ emission factor of fossil fuels. This approach has been roundly criticized. Johnson et al. (2010) say it has "no scientific basis, given that wood emits approximately double the CO₂ per unit fuel energy compared to LPG or kerosene thus halving possible offsets from non-renewable harvesting of fuel". One could also argue that it leads to overestimating baseline emissions if one would assume the long-term suppressed demand baseline of using kerosene or LPG cook stoves. By combining the efficiency from inefficient fuel-wood cook stoves with the CO₂ emission factors from fossil fuels, the claimed baseline emissions are higher than if the households would use kerosene or LPG cook stoves. The CDM methodology AMS-II.G. suggests the use of a weighted average value of 81.6 tCO₂/TJ², representing a mix of 50% coal, 25% kerosene, and 25% LPG. However, no justification for this fuel mix provided. Coal is not commonly used as a cooking fuel for households transitioning from traditional to modern biomass.

LPG is the dominant fossil fuel used in households transitioning to modern energy for household cooking. Assuming that households would use coal vs. LPG overestimates the emissions factor. For example, if we compare the emissions factor if the fuel mix was LPG vs. the current emission factor we find that the emissions are overestimated by 23%. For charcoal production, the simplification is stretched even further beyond reality. The methodologies permit calculating wood use by charcoal stoves by multiplying the charcoal volume by six, following the 1996 IPCC accounting guidelines to estimate total biomass consumed (IPCC/OECD/IEA 1996, p. 1.42). Then baseline emissions are estimated by applying the projected fossil fuel use emissions factor, which in effect assumes that the project displaces fossil fuel use for charcoal production, which likely significantly overestimates the baseline emissions (Lee et al. 2013).

4.12.5. Other issues

Improved cook stove projects are dependent on end users to achieve emission reductions: households must actually use the improved cook stoves instead of their traditional stoves. Carbon finance monitoring requirements include checking the efficiency of the stove and confirming at least every two years that the stove is still in use. Additional stove monitoring of the efficiency and usage rate is required annually or biannually. Monitoring requirements furthermore include sampling and surveying as specified in the applicable offset protocol. This has been a significant challenge. Carbon finance project monitoring requirements further specify that projects must either ensure that the improved stoves completely replace traditional stoves, or else the traditional stoves must be monitored and accounted for under the project calculations for emission reductions. Lambe et al. (2014) found in their review of projects in Kenya and India that this presented several challenges. In Kenya, where the predominant mode of traditional cooking is with a three-stone fire, the study found that many PDDs acknowledged that this form of traditional stove cannot really be removed or destroyed. In India, traditional stoves in several regions are known as chulhas. These stoves often have a religious significance and households often build the stoves themselves from locally available materials such as mud, brick, or cement (Lambe & Atteridge 2012). This form and construction makes it difficult to guarantee that a new chulha will not be made following the destruction of the old one. Lambe et al. (2014) found that many projects required households to destroy these existing cook stoves. In some cases, photographic evidence is used to demonstrate that the existing stoves have been destroyed. However, because of the challenges with removing traditional stoves and the barriers to ensuring adoption and sustained use of improved cook stoves, more often a stacking of stoves and fuels occurs where traditional and improved cook stoves are both used for different types of cooking (Ruiz-Mercado et al. 2011). While the methodologies contain monitoring guidance for adjusting the baseline fuel consumption if the traditional stove continues to be used, this adds further uncertainty to quantification of changes in fuel consumption. Use of temperature sensors to monitor usage of traditional and improved cook stoves have shown promising signs of helping to address this issue, but are not yet in widespread use in carbon market projects (Ruiz-Mercado et al. 2011).

There is a broader concern about crediting emission reductions from displacement of non-renewable biomass since the increased carbon storage from changes in carbon stocks may only lead to temporary reductions. The risk of non-permanence of emission reductions is addressed through appropriate accounting approaches for afforestation, reforestation, and carbon capture and storage project activities, but it is not addressed for improved cook stove project types. Under the CDM, there are projects promoting the use of biomass energy to displace fossil fuel, as well as improved cook stove projects aimed at decreasing biomass energy use. In theory, this does not present a conflict, assuming that biomass power projects are based in regions with increasing or stable carbon stocks and improved cook stove projects are located in regions with declining carbon stocks. However, looking at registered CDM projects there are several examples of provinces in which there are both biomass power and cook stove projects. This means that in the same prov-

ince, there are simultaneously CDM projects getting credit for increasing the use of biomass, as well as reducing the use of biomass. For example, in the Henei province in China there are 9 biomass energy projects fuelled by agricultural residues (rice husk and other kinds) as well as 4 improved cook stove projects.

4.12.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs, confidence in additionality may be low in urban settings where households are paying for improved stoves at the retail price
Over-crediting	<ul style="list-style-type: none"> • Uncertainty in some widely used approaches for estimating biomass savings • Significant uncertainty around the fraction of non-renewable biomass values, recent research suggests this parameter may be significantly overestimated. • Emissions intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline. • Emissions factor for suppressed demand use of fossil fuel overestimate emissions; LPG is the appropriate substitute used by similar consumers, including coal and kerosene overestimate emission reductions.
Other issues	<ul style="list-style-type: none"> • Challenges in ensuring adoption and sustained use of improved cook stoves result can lead to over-crediting if traditional stoves continue to be used. • The use of biomass as a renewable energy sources is inconsistently accounted for under the CDM; the same region can have biomass power projects receiving credit for increasing biomass use and improved cook stove projects receiving credit for decreasing biomass use.

4.12.7. Recommendations for reform of CDM rules

We recommend revising the current methodologies as follows:

- Eliminate the use of the Water Boiling Test as a means of determining baseline emissions.
- Reconsider the use of default f_{NRB} factors based on the MAI approach.
- Revise the emission factor for the substitution of non-renewable biomass by similar consumers to one based solely on LPG.
- Explore options for incorporating temperature sensors in monitoring plans to improve reliable assessment of the adoption and sustained use of improved vs. traditional cook stoves in households.
- Review the use of biomass as an energy source under the CDM to ensure consistent accounting across project types and regions. The f_{NRB} should be considered in improved cook stove projects, as well as modern biomass energy projects to confirm that projects are not contributing to loss of carbon stocks. The CDM EB needs to provide justification for how both biomass energy and improved cook stove projects can be approved within a sub-region.

4.13. Efficient lighting

4.13.1. Overview

For energy efficient lighting, we focus our analysis on the replacement of incandescent electrical bulbs with more efficient electric lighting, such as Compact Fluorescent Lamps (CFLs) or Light Emitting Diode (LED) lamps. This includes all projects registered under AM0046⁷⁹ and AMS II.J⁸⁰

⁷⁹ [Distribution of efficient light bulbs to households --- Version 2.0.](#)

⁸⁰ [Demand-side activities for efficient lighting technologies --- Version 6.0.](#)

methodologies as well as projects registered under AMS II.C⁸¹ that are labelled as 'lighting' and 'lighting in service' in UNEP DTU (2014).⁸² This technology category was a late starter in the CDM – in mid-2010 there were only half a dozen registered projects and 3 registered PoAs. Recent growth in PoAs, particularly with larger PoAs, indicates a higher potential in the future – even beyond the current project activity and PoA pipeline. Energy efficient lighting projects are typically implemented by an entity (often public sector or linked to a utility) that distributes energy efficient lamps for free or for a nominal fee, and collects and disposes of the incandescent bulbs that have been displaced.

4.13.2. Potential CER volume

For CDM project activities, the 40 projects registered by the end of 2013 state that they will produce 1.4 million CERs per year. This would be 10.3 million CERs in the period of 2013 to 2020. However, the issuance success for the largest project activity, which is the only project using the large-scale methodology, amounted to only 12% in the first monitoring period. This could be related to the time required for the CFL distribution programme to reach full scale, however, and does not necessarily mean that other projects will have similar issuance rates (or that this rate will not increase over time). Other projects have been much more successful, but are considerably smaller. Project activities are dominated by a stream of small-scale projects in India and a single large-scale project in Ecuador – the only registered large-scale energy efficient lighting project – which account for almost 80% of the expected CERs. More than 80% of the small-scale projects use AMS II.J, which was designed specifically as a simplified approach to energy efficient lighting.

The largest volume of CERs for energy efficient lighting, however, could come from PoAs. Twenty-six PoAs had been registered for energy efficiency lighting by the end of 2013. Just from the CPAs already included in these registered PoAs as of the end of 2013, the volume of CERs is estimated by the project developers at 3.4 million per year, or two and a half times greater than for project activities. This could continue to grow, given that only four PoAs have more than one CPA. For PoAs, the main players are China, India, Mexico and Pakistan, with South Africa also hosting multiple PoAs (Table 4-10). The four PoAs with more than one CPA have large numbers of CPAs (e.g. 9 to 53). For some PoAs, the CPAs are delineated to have very similar emission reductions in each CPA (e.g. in Mexico, India, Bangladesh).

⁸¹ [Demand-side energy efficiency activities for specific technologies --- Version 14.0.](#)

⁸² This excludes one registered PoA under AMS II.C that focuses on street lighting and is labelled as sub-type "Street lighting".

Table 4-10: Number of energy efficient lighting PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)	PoAs with >1 CPA
Bangladesh	1	124	9	14	1
China	14	443	1	32	
India	3	1,555	17	30	1
Kenya	1	31	1	31	
Mexico	1	607	25	24	1
Nigeria	1	29	1	29	
Pakistan	1	557	53	11	1
Senegal	1	4	1	4	
South Africa	3	80	1	27	
AMS-II.C.	6	668	5	22	
AMS-II.J.	20	2,762	6	21	
Total	26	3,431			4

Sources: UNEP DTU 2015b

All of the PoAs for lighting efficiency upgrades have moved to the newer methodology AMS II.J rather than AMS II.C (Table 4-10). No new energy efficient lighting PoAs have entered the pipeline since October 2012, and the new project activity pipeline largely stopped in January 2012, with only one new project activity starting validation in 2013 (in The Gambia).

4.13.3. Additionality

Because only one project activity uses the large-scale methodology, this entire technology area essentially uses SSC methodologies and additionality rules. For SSC projects and PoAs, additionality can be determined through several different routes: All SSC projects (or SSC CPAs within PoAs) must refer to the tool for “Demonstration of additionality of small-scale project activities” (Tool21, ver10.0). This includes the choice of using several different barriers to justify additionality (i.e. investment barrier, technology barrier, prevailing practice barrier, or other barriers). In addition, from July 2012, projects comprised entirely of units below 5% of the small-scale CDM threshold (i.e. 3000 MWh savings for energy efficiency) were considered automatically additional without any further justification. This new ‘positive list’ additionality argument has not been used by CDM project activities but has been used extensively by PoAs, as discussed further below. Most CDM project activities applying the SSC additionality tool cite investment barriers and use simple cost analysis to prove additionality (Table 4-11). This is because the organisations distributing the efficient lamps do not receive the energy savings, so they incur only costs without any revenue (other than a nominal fee from consumers in some cases).⁸³

As mentioned above, since July 2012, the tool for additionality of SSC activities has allowed automatic additionality based on a ‘unit threshold’ described as “project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-

⁸³ The organisations that charge a nominal fee would be receiving less than the wholesale cost of the CFL, so would lose money on each bulb even though there is nominal revenue. In theory, any programme implemented by an electric utility should not be able to use simple cost analysis because the utility has avoided power generation costs (and deferred capital costs) that are a benefit stream to the project. Even where the project is implemented by a utility (e.g. South Africa’s Eskom), this is not addressed because the unit threshold positive list is used to justify additionality.

scale CDM thresholds.” For energy efficiency, this threshold of 3000 MWh is roughly 46,000 CFLs. All projects and PoAs applying SSC methodologies may use this rule to qualify for automatic additionality.

Table 4-11: Additionality approaches used by efficient lighting CDM project activities

Additionality approach	Number of PAs	Total Annual CERs (1,000)
Investment barrier: Benchmark Analysis	2	71
Investment barrier: Investment Comparison Analysis	2	60
Investment barrier: Simple Cost Analysis	33	1.079
Investment barrier: Other	1	18
Positive list	2	44
Total	40	1.272

Sources: Authors' own compilation

Lighting PoAs have also made extensive use of this unit threshold for automatic additionality. A report by the UNFCCC Secretariat in mid-2014 (CDM-EB85-AA-A09) found that 28 of the registered lighting-related PoAs at that time had used either micro-scale or unit thresholds to qualify for automatic additionality. As an example, all 12 of the Chinese PoAs registered in December 2012 used the unit threshold for automatic additionality.

As one of the first ‘top-down’ large-scale methodologies, the EB published an energy efficiency lighting methodology in November 2013, which included a new approach for additionality demonstration:

- In countries with limited or no regulations supporting energy efficient lighting, as evidenced by a UNEP Global Lighting Map⁸⁴ survey of regulations and support for energy efficient lighting, CFLs are automatically additional.⁸⁵
- For other countries (i.e. those with more regulatory support), the “Tool for the demonstration and assessment of additionality” must be used, with an investment analysis and common practice analysis. While the investment analysis may still use simple cost analysis (which would mean that almost all projects would be additional), any country with a higher than 20% penetration of CFLs is not additional under the common practice test.

This new approach essentially restricted CFL CDM projects to countries with limited regulatory support or low market penetration. Given that there are no new projects or PoAs entering the pipeline, however, this more recent methodology has not yet had an impact.

In November 2014, AMS II.J was also revised to only allow for automatic additionality for CFLs when there were limited or no regulations to support energy efficient lighting. However, for countries in which there is significant support for energy efficient lighting, the methodology says that additionality should be demonstrated using the latest version of the “Guidelines on the demonstration of additionality of small-scale project activities”. This difference is critical, however, because any project participant may simply use the unit threshold in the “Guidelines on the demonstration of

⁸⁴ <http://map.enlighten-initiative.org/>.

⁸⁵ Countries coloured red on the map have limited or no support for energy efficient lighting.

additionality of small-scale project activities” to guarantee automatic additionality, whatever the market penetration in the host country.

The main concern with the additionality of energy efficient lighting in the CDM is whether some activities – at least projects involving CFLs and fluorescent tubes – were already common practice at the time of registration and therefore not additional. The use of micro-scale or unit threshold positive lists means that project activities and PoAs do not have to address this common practice issue at all when using the SSC methodologies. In other words, using the SSC methodologies would be a way of circumventing the higher stringency of the new large-scale methodology. Projects could simply define the size of each CPA in a way that they qualify as automatically additional, whatever the regulations and market penetration in the host country. To evaluate the additionality of the existing pipeline, it is useful to consider the two criteria from AM0113 and the revised AMS II.J: regulatory support and market penetration.

According to the ‘en.lighten’ initiative’s Global Lighting Map referenced in the methodologies, regulatory support for efficient lighting is widespread, but varies greatly by country (Figure 4-9). For the countries with the most CDM PoA activity, the level of support is generally strong:

- China has already banned incandescent lighting⁸⁶ and implemented large state subsidy programmes since 2006.⁸⁷
- India does not have a ban on incandescent bulbs, but does have awareness-raising programmes, energy service company initiatives, and consumer financing options.
- Pakistan’s minimum energy performance standards also still allow incandescent bulbs, but the country has awareness-raising programmes, bulk procurement and tax incentives.
- South Africa has announced that incandescent bulbs will be phased out by 2016⁸⁸, and has testing and certification facilities. More importantly, the national utility, Eskom, distributed 30 million free CFLs between 2002 and 2010.⁸⁹
- A regional report for Latin America on the en.lighten initiative’s website notes that a Mexican regulation was passed in December 2010 prohibiting the sale of 100 watt and higher incandescent lamps for the residential sector after December 2011, and similar bans for 75 watt as of December 2012 and 40-60 watt as of December 2013.⁹⁰ The Mexican PoA was registered in July 2009, which preceded the passing of these regulations.
- In terms of their rating on minimum energy performance standards by the Global Lighting map, all of the countries with PoAs except Kenya and Malawi are orange (some/in progress) or green (advanced). This means that, in terms of the new large-scale methodology (AM0113), projects in all of the countries except Kenya and Malawi would not be automatically additional, but require the use of the additionality tool with investment analysis and the common practice threshold of 20%.

⁸⁶ Imports and sales of 100-watt-and-higher incandescent lamps are banned from 1 October 2012, 60-watt-and-above from 1 October 2014, and 15 watts or higher from 1 October 2016 http://www.chinadaily.com.cn/china/2011-11/04/content_14039321.htm.

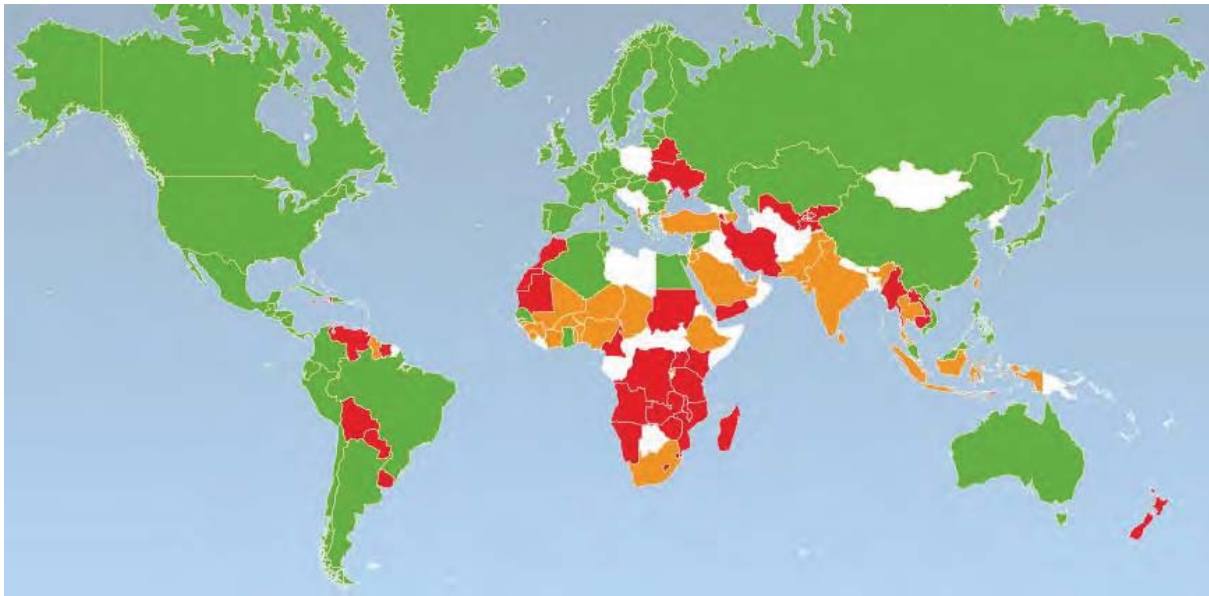
⁸⁷ http://www.sdpc.gov.cn/zjgx/t20080508_210093.htm.

⁸⁸ <http://www.thegef.org/gef/content/phasing-out-inefficient-lighting-combat-climate-change-south-africa-announces-national-phase>.

⁸⁹ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

⁹⁰ <http://www.enlighten-initiative.org/portals/0/documents/country-support/regional-workshops/Regional%20Report%20LA%20&%20C%20Final%20Eng.pdf>. The reference is to regulation “NOM- 028 – ENER – 2010 Energy Efficiency of Lamps for General Use”.

Figure 4-9: Minimum energy performance standards for lighting technologies



Notes: Green = Advanced/in place, Orange=In progress, Red=few/limited, white=no information available

Sources: <http://map.enlighten-initiative.org/>

In terms of assessing common practice, the available evidence suggested that CFLs are likely already common practice in most key CDM countries, and LEDs may be so in the next few years, though not in the poorest countries. The main CDM countries have the following market information:

- According to the “Regional Report on the Transition to Efficient Lighting in South Asia”⁹¹ prepared by the Tata Energy Research Institute in 2014, the market share of CFLs in India amounted to 29% in 2012-2013. Three of the four Indian PoAs were registered in late 2012, while one was registered in early 2010. In addition, for the largest PoA – which was registered in 2010 and has 50 CPAs – the PoA DD states that, “[t]he penetration share of incandescent lamps for lighting in commercial and residential sector put together is thus nearly 80% in India.”⁹² The market share for CFLs, therefore, was almost certainly above 20% when the PoAs were registered.
- In China, a 2012 McKinsey & Company report estimates the penetration of LEDs (the more expensive alternative to CFLs) as 12% in 2011, rising to 46% by 2016. The report also notes that, “CFL is still the dominant technology in the residential segment.”⁹³ This means that, at the time of registration of the PoAs, the market share of CFLs was almost certainly above 20%. China does not have any LED PoAs yet. If they were proposed, AMS II.J and AM0113 both consider LED lamps automatically additional in all countries until at least the end of 2016. Given the McKinsey projections presented above, automatic additionality for LEDs in China would not be appropriate.

⁹¹ <http://www.enlighten-initiative.org/Portals/0/documents/country-support/Regional%20Report%20on%20the%20Transition%20to%20Efficient%20Lighting%20in%20South%20Asia.pdf>.

⁹² <http://cdm.unfccc.int/ProgrammeOfActivities/gotoPoA?id=CZ59J1XMR8K4ELUS6WY3BA0IVTGQ2F>.

⁹³ http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/lighting_the_way_perspectives_on_global_lighting_market_2012.ashx.

- The large PoA in Mexico states in the PoA DD that CFL penetration in 2007 was already at 20%, while the PoA was registered in June 2009.⁹⁴
- In South Africa, even before the start of the Eskom free CFL distribution programme, the market share of CFLs was estimated at 7% in 2002 (Nkomo 2005). With 30 million CFLs distributed after this time,⁹⁵ in a country with less than 10 million households, the penetration of efficient lighting was almost certainly well above 20% when Eskom registered their CDM project activity and PoAs in 2012.
- For Pakistan, the “Regional Report on the Transition to Efficient Lighting in South Asia” cited above estimates the CFL market share at 8%, but also notes that linear fluorescent lamps make up 32% of the market.
- For Bangladesh, the same report puts the CFL market share at 25%, with linear tube fluorescent lamps at 18%. This market share could be for 2013 and the PoA was registered in May 2011, so there is a reasonable likelihood that the market share of CFLs was 20% at the time of registration.

This information suggests that the largest CDM PoA countries for energy efficient lighting would not pass the common practice test if the large-scale AM0013 methodology were applied, and so these PoAs would not qualify as additional. Bangladesh, China, India, South Africa and Mexico account for almost 80% of the expected CERs from PoAs, and yet these countries were likely above the 20% market share for CFLs when the PoAs were registered.

For off-grid lighting (AMS III.AR), the situation is quite different. Access to electricity in rural households in Sub-Saharan Africa, for example, is less than 10% (IEA et al. 2010; Legros et al. 2009). Between 2010 and 2015, the estimated number of unelectrified households in Africa was estimated to grow from 110 million to 120 million (Dalberg Global Development Adv. 2010). The off-grid solar lamp market is expanding to address the 1.5 billion people who do not (and, in many cases, will not) have access to electricity (IFC 2012). While solar lantern and solar kit prices are decreasing, they still face major barriers in terms of distribution challenge, upfront costs (and lack of consumer financing), and successful business models for scaling up (ESMAP 2013; IFC 2012).

Assessing the economics of energy efficient lighting faces the classic problem of ‘split incentives’ (Spalding-Fecher et al. 2004). From an economic point of view, upgrades to energy efficient electric lighting are unquestionably economically beneficial (i.e. have large positive IRRs) (McKinsey & Company 2009) but the benefits do not accrue to those who pay for the additional costs if the project is funded by outside agencies. The economics of efficient lighting are more likely to be driven by electricity prices than carbon prices. For example, a 15 W CFL replacing a 60W incandescent lamp operated 3.5 hours per day could save 57 kWh per year. With a relatively carbon-intensive grid (e.g. 0.8 tCO₂/MWh), this would be 0.05 tCO₂e savings per year. Electricity prices to the consumer in developing countries vary widely, from \$50/MWh in heavily subsidized economies to more than \$170/MWh in more competitive emerging economies (EIA 2010; Winkler et al. 2011). This means an energy savings of \$2.87 to \$9.77/year. CFL costs have also declined rapidly, with current costs of \$1.50-\$2.50 in many countries (UNEP 2012). This would mean a typical payback period of much less than one year, before any carbon revenue was received. At current CER prices, carbon revenue would be less than two cents per year only, while at \$3-5/CER, revenue would be \$0.15-0.25, or less than 5% of energy savings.

⁹⁴ http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/17BH6AJX524TYQUZF8KGCWV3OIPSE9/view Annex 3.

⁹⁵ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

In summary, CDM rules on additionality of efficient lighting projects vary considerably. Using market penetration and regulatory support as indicators for the likelihood seems a reasonable approach. The large-scale AM0113 methodology uses market penetration and regulatory support as indicators for demonstrating additionality; this approach seems reasonable and reflects the varying circumstances of host countries. AM0046 may provide for a suitable alternative by monitoring the market penetration of CFLs and LEDs in a control group outside the project boundary; however, the complexity and cost of monitoring under this methodology means that only one project has even chosen to utilise it – so the additionality approaches may not be relevant for the overall impact of this project category. In contrast, under small-scale methodologies, including the revised AMS II.J, this project type is, in practice, considered automatically additional, even if the use of CFLs is required by regulations and is widespread. However, for countries with regulations that have phased out incandescent bulbs or large subsidy programmes for CFLs, these existing registered projects are unlikely to be additional. If we take the 20% market share used in AM0113 as the point at which CFL programmes are no longer likely to be additional, then this would apply to most of the current CDM pipeline for energy efficient lighting.

4.13.4. Baseline emissions

In AMS II.J, AM0113 and AMS II.C (when used for lighting) the baseline is simply the use of the existing incandescent lamps – those which are collected and replaced within the project boundary.⁹⁶ Both AMS II.J and AM0113 take similar approaches, where emissions reductions are related to the difference in power between a CFL and baseline bulb, operating hours, lamp failure rates, a 'net-to-gross' adjustment, and the grid emissions factor (taking technical losses into account).⁹⁷ As a default, 3.5 operating hours per day are assumed. If project participants want to use operating hours greater than 3.5 per day, they must conduct a once-off survey at the start of the project to justify this. The lamp failure rates are also based on periodic surveys of the first group of bulbs installed, up to the end of their rated life. The methodologies require project participants to explain how they will collect and destroy baseline lamps. For off-grid lighting, an innovative 'deemed consumption' approach assigns a standard emissions reduction to each off-grid lighting unit, based on the fossil fuel alternative. The parameters and assumptions are conservative. Overall, the approaches to baseline emissions for efficient lighting are straightforward and conservative, and the improvements over the last two years have also simplified or clarified many of the sampling procedures.

4.13.5. Other issues

At 3-5 hours of use per day, a typical CFL would last anywhere from 3 to 10 years. This means that a crediting period of 10 years is almost certainly too long, unless the CDM project guarantees free replacements throughout the programme or restricts crediting to the measured life. The latter approach has been adopted under the CDM. Emission reductions do not accrue once the lamp failure rate reaches 100%, so if all lamps fail before the end of the crediting period and are not replaced, then no CERs would be issued. These provisions seem appropriate.

⁹⁶ AM46 also includes the possibility of some efficient lighting in the baseline, as a form of "autonomous efficiency improvement", but this methodology has only been used once and is unlikely to be used in the future.

⁹⁷ AMS II.C is not so specific, because the guidance was for all energy efficiency technologies, but the approach elaborated by the project participant would essentially be the same.

4.13.6. Summary of findings

Additio- nality	<ul style="list-style-type: none"> • Granting automatic additionality under small-scale methodologies to all energy efficient lighting programmes in the past was highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway; the new large-scale AM0113 methodology appropriately addresses these problems but is not mandatory, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes, so it is unlikely that the large-scale methodology will be used. • In many countries with lower income or less regulatory support, however, efficient lighting still faces major barriers, even if it is potentially economic beneficial, and so projects may need the support of the CDM to be implemented; these projects currently form a very small part of the project pipeline but could grow in the future.
Over- crediting	<ul style="list-style-type: none"> • Over-crediting is unlikely, given the robust monitoring procedures.
Other issues	<ul style="list-style-type: none"> • None

4.13.7. Recommendations for reform of CDM rules

AMS II.J should be revised so that CFL programmes in countries with significant regulatory support may use the tool for “Demonstration of additionality of small-scale project activities” but may not use the paragraph referring to automatic additionality based on small unit size.

5. How additional is the CDM?

Based on the detailed analysis of individual project types in the previous chapter, this chapter provides an overall assessment of the environmental integrity of the CDM project portfolio available for the second commitment period of the Kyoto Protocol. Table 5-1 provides an overview of the summary of findings for each of the analyzed project types.

Table 5-1: Evaluation of project types

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
HFC-23 (up to version 5)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives 	<ul style="list-style-type: none"> None 	Medium
HFC-23 (version 6)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed Ambitious baseline could lead to under-crediting (net mitigation benefit) 	<ul style="list-style-type: none"> Low CER prices could jeopardize continued operation Emissions could be addressed through Montreal Protocol 	High
Adipic acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices 	<ul style="list-style-type: none"> None 	Medium
Nitric acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of overall over-crediting 	<ul style="list-style-type: none"> None 	High
Wind power	<ul style="list-style-type: none"> CER revenue has only limited impact on profitability Investment costs decreased significantly in last years In some cases competitive with fossil generation Support schemes Widespread in many countries 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting 	<ul style="list-style-type: none"> None 	Low
Hydro power	<ul style="list-style-type: none"> Common practice in many countries CERs have only moderate impact on profitability Competitive with fossil generation in many cases 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project likely under-crediting 	<ul style="list-style-type: none"> Methane emissions from reservoirs may be important and may not be fully reflected by CDM methodologies 	Low
Biomass power	<ul style="list-style-type: none"> Significant impact of CER revenues on profitability for projects claiming methane avoidance Competitive with fossil generation in many cases Support schemes 	<ul style="list-style-type: none"> Demonstration of biomass decay/abundance of biomass is key Risk of exaggerated claims of anaerobic decay 	<ul style="list-style-type: none"> None 	Medium

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Landfill gas	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured historically have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid subtropical and tropical regions Perverse incentives for project developers to increase methane generation 	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG intensive waste treatment methods 	Medium
Coal mine methane	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Potential concerns regarding increased mining 	<ul style="list-style-type: none"> Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations 	Medium
Waste heat recovery	<ul style="list-style-type: none"> CER revenues small compared to fossil fuel cost savings Future fuel cost savings uncertain Widespread in many countries 	<ul style="list-style-type: none"> Brownfield: risks for inflated baselines Greenfield: modelling uncertain Plant operation under the project different to baseline 	<ul style="list-style-type: none"> None 	Low
Fossil fuel switch	<ul style="list-style-type: none"> Use of barrier analysis allowed for small-scale projects not appropriate Investment analysis insufficient as choice of fuel depends not only on prices CER revenues have a small impact 	<ul style="list-style-type: none"> Default values for upstream emissions not appropriate 	<ul style="list-style-type: none"> None 	Low

Efficient cook stoves	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs • Additionality questionable in urban areas 	<ul style="list-style-type: none"> • Fraction of NRB likely to be overestimated • Water boiling test not appropriate • Emission intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline • Emissions factors used for suppressed demand are unrealistic • Unrealistic assumptions for charcoal use • Over-crediting if traditional stoves continue to be used 	<ul style="list-style-type: none"> • Inconsistent accounting: CDM credits in the same region both reduction and increase of biomass use 	Low
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Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Efficient lighting (AMS II.C AMS II.J)	<ul style="list-style-type: none"> • Shift to EE lighting well underway and/or mandates in most common PoA countries, and PoAs allowed to use SSC additionality 'loophole' 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	Low
Efficient lighting (AM0113, AM0046)	<ul style="list-style-type: none"> • Likely to be additional 	<ul style="list-style-type: none"> • Unlikely 	<ul style="list-style-type: none"> • None 	High

Notes:
 1) High/medium/low likelihood of projects being additional under current rules;
 2) High/medium/low likelihood of avoiding over-crediting under current rules;
 3) High/medium/low likelihood of emission reductions being additional and not over-credited under current rules.

Sources: Authors' own compilation

Overall, the table shows considerable differences between project types. Most energy-related project types (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are unlikely to be additional, irrespectively of whether they involve the increase of renewable energy, efficiency improvements or fossil fuel switch. An important reason that these projects types are unlikely to be additional is that for them the revenue from the CDM is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. In addition, technological progress was much faster than expected, so that investment and generation costs have fallen considerably. Moreover, some project types are, in many instances, economically attractive (e.g. waste heat recovery, fossil fuel switch, hydropower), or supported through policies (e.g. wind power, efficient lighting), or mandatory due to regulations (e.g. efficient lighting). Some of these project types also have a medium likelihood of overestimating emission reductions, mainly due to risks of inflated baselines.

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered likely to be additional as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and thus do not generate revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-

23, perverse incentives were addressed with the adoption of version 6 of AM0001, which uses an ambitious baseline that could lead to a net mitigation benefit. Similarly, concerns with perverse incentives for nitric acid plant operators not to use less GHG-intensive technologies were addressed. With regard to adipic acid projects, the risks of carbon leakage were not addressed.

Methane projects (landfill gas, coal mine methane) also have a high likelihood of being additional. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face issues with regard to baseline emissions and perverse incentives and may thus lead to over-crediting.

Biomass power projects have a medium likelihood of being additional since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects can be additional, particularly if CER revenues for methane avoidance can be claimed. Biomass projects also face other issues, in particular with regard to demonstrating that the biomass used is renewable.

The additionality efficient lighting project using small-scale methodologies is highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The new methodologies address these problems but they are not mandatory and the small-scale methodologies are while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For cook stove projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. In urban areas, however, the additionality of these project types is questionable. Cook stove projects are also likely considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Based on these considerations we can estimate to which extent the CDM is likely to deliver additional emission reductions during the period of 2013 to 2020 (Table 5-2).

Table 5-2: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Our analysis covers three quarters (76%) of the CDM projects and 85% of the potential CER supply during that period. 85% of the covered projects and 73% of the potential CER supply have a low likelihood of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity.

Has the performance of the CDM in terms of additionality improved over time? Several EB decisions have certainly improved the performance, particularly those which introduced ambitious baselines and/or addressed perverse incentives. However, Schneider (2007) estimated, "that additionality is unlikely or questionable for roughly 40% of the registered projects. These projects are expected to generate about 20% of the CERs". Schneider's methodological approach is not identical with the approach applied in this study but is, nevertheless, similar enough for a comparison of the overall results. Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's performance as a whole has anything but improved, despite improvements of a number of CDM standards. There are several reasons for this:

- The main reason is a shift in the project portfolio towards projects with more questionable additionality. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential from these project types is only less than a quarter. This is mainly due the registration of many energy projects between 2011 and 2013, including both fossil and renewable projects, which represent the largest share of CDM projects and of potential CER supply today, many of which are unlikely to be additional. It can therefore be questioned whether the CDM is the appropriate incentive scheme for those project types, or more generally, whether these project types are appropriate for crediting schemes at all.

- A second reason is that the CDM EB not only improved rules but also made simplifications that undermined the integrity. For example, positive lists were introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). Another example is biomass residue projects, for which requirements to demonstrate that the biomass is available in abundance were strongly simplified, making an over-estimation of emission reductions more likely.
- A third reason is that the CDM EB did not take effective steps to exclude project types with a low likelihood of additionality. While positive lists were introduced, project types with more questionable additionality were not excluded from the CDM. The common practice test is not effective as it stands. Standardized baselines can be optionally used as an alternative to project-specific baselines, which provides a further avenue for demonstrating additionality but does not reduce the number of projects wrongly claiming additionality. In conclusion, the improvements to the CDM mainly aimed at simplifying requirements and reducing the number of false negatives (projects that are additional but do not qualify under the CDM) but did not address the false positives (projects that are not additional but qualify under the CDM).

Our analysis of the environmental integrity of the CDM has focused on the quality of CERs in terms of ensuring emission reductions that are additional and not over-credited. The overall environmental outcome of the CDM is, however, also influenced by several overarching and indirect effects:

- **Awareness raising and capacity building:** The CDM has drawn attention to climate change and to options of how it can be mitigated and thus contributed to the issue of climate change being better understood and taken more seriously in many parts of the world. In this way it has helped to pave the way towards the global agreement achieved at COP 21 in Paris in December 2015.
- **Technological innovation:** The CDM has helped to spread and reduce costs of many GHG mitigation technologies such as renewable energy technologies or technologies to avoid methane emissions in many developing countries. This may have helped developing countries to avoid locking in carbon-intensive technologies. The increased application of these technologies has contributed to reducing their total cost, and the CDM has contributed to building the capacity on how these technologies can domestically be applied in many developing countries.
- **Length of crediting periods:** Certain projects may continue their operation beyond their crediting period and will not receive credits for the respective GHG reductions. This effect has been estimated to have a significant potential for under-crediting (Spalding-Fecher et al. 2012). However, over time the respective technologies often become economically viable without support and thus the common practice in many circumstances. The CDM may thus have contributed to advancing an investment, which would anyhow be conducted some years later, so that even the additionality of CERs generated in the late years of a crediting period could be questioned.
- **Rebound effects:** For CDM project developers and host countries, CER revenues are similar to subsidies, which often lower the cost of the product or service provided (e.g. electricity, cement, transportation), thereby inducing greater demand for the product or service. In contrast, carbon taxes or auctioning of allowances under the ETS generally provide incentives to reduce the demand for products or services. Calvin et al. (2015) show that ignoring such system-wide rebound effects in the power sector can lead to significant over-

crediting compared to the actual reductions at system level. The overall mitigation outcome of crediting could be systematically over-estimated, even if projects are fully additional and the direct GHG emission impact of a project is quantified appropriately. This is mainly because credits subsidize the deployment of technologies with lower emissions instead of penalising the use of more emitting technologies and because CDM methodologies draw the boundary around a project and do not consider the wider rebound effects.

- **Perverse policy incentives:** In some instances, the CDM may provide an incentive to governments not to implement domestic policies to address emissions. For example, policy makers may have disincentives to introduce regulations requiring the capture of landfill gas or to further pursue landfilling instead of less GHG-intensive waste treatment methods, since they would otherwise lose revenues from CERs.

All these effects somehow influence the environmental outcome of the CDM, partly for the better and partly for the worse. The overall effect can hardly be determined. However, it is unlikely that these overarching and indirect effects fully compensate for the overall low environmental integrity of many projects and CERs. On the contrary, in a forward-looking perspective, comparing the situation in which the CDM continues to be used with a situation in which this would not be the case, it is rather likely that these overarching effects further undermine the environmental outcome of the CDM overall.

The result of our analysis suggests that the CDM still has fundamental flaws in terms of environmental integrity. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC. In the following chapters we summarise how the existing CDM should be improved (Chapter 6) and what can be learned from the CDM experience for the future of market mechanisms in general (Chapter 7).

6. Summary of recommendations for further reform of the CDM

The recommendations for the further reform of the CDM can be distinguished according to improvements of the general rules and approaches how to determine additionality and to project type-related recommendations.

6.1. General rules and approaches for determining additionality

As mentioned above, for an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. They cannot fully reflect the complexity of investment decisions. Additionality tests always look at part of the full picture and use simplified indicators, such as economic performance or market penetration, to make a judgment on whether or not a project is truly additional. Information asymmetry between project developers and regulators, combined with the economic incentives for project developers to qualify their project as additional, are a major challenge. The key policy question is how confident regulators should be that a project is additional. In other words, how should the number of false positives (projects that qualify as additional but are not) and false negatives (projects that are additional but do not pass the test) be balanced? We assessed the current additionality tests from the perspective that a high degree of confidence is required. The main reason is that the implications of false positives are much more severe than the implications of false negatives. A false positive leads to both an increase in global

GHG emissions and higher global costs of mitigating climate change, whereas a false negative does not affect global GHG emissions but only leads to higher costs of mitigating climate change (Schneider et al. 2014).

In Chapter 3 we thoroughly scrutinised the four main approaches used to determine additionality. Our analysis shows:

- **Prior consideration** is a necessary and important but insufficient step for ensuring additionality of CDM projects. This step works largely as intended (Section 3.1.4).
- The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. It is possible that improvements could further decrease this subjectivity, e.g. by applying more complicated tests to assess the financial performance of the project. However, especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio (Section 3.2.4).
- To reduce the subjectivity of the **barrier analysis**, the '*Guidelines for objective demonstration and assessment of barriers*' require that barriers are monetized to the extent possible and integrated in the investment analysis. As a result of this, the barrier analysis has lost importance as a stand-alone approach of demonstrating additionality. However, barriers which are not monetized remain subjective and often difficult to verify by the DOEs (Section 3.4.4).
- In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis (Section 3.3.4). In this regard, expanding the use of common practice analysis could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality. Moreover, when expanding its use, it is important to reflect that market penetration is not a good proxy for all project types for the likelihood of additionality. The fact that few others have implemented the same project type is only an indication of the actual attractiveness. It should thus be only applied to those project types for which market penetration is a reasonable indicator.

Against this background we recommend that

- the **prior consideration** grace period for notification after the start of a CDM project should be shortened from 180 to 30 days to reduce the risk that projects apply for the CDM having only learned about this option after the start of the project,
- the **common practice analysis** is significantly reformed and receives a more prominent role in additionality determination,
- the **investment analysis** is excluded as an approach for demonstrating additionality for projects types for which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence; while for those project types for which investment analysis would still be eligible, project participants must confirm that all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders, and

- the **barrier analysis** is entirely abolished as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types); barriers which can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

A prerequisite for expanding the use of the common practice analysis is significant improvements of its current shortcomings, most notably with regard to the following issues (Section 3.3.4):

- The project types and sectors covered by the CDM are very different in their technological and market structure. Determining what is deemed to be common practice must take into account these differences. Therefore, the 'one-size-fits-all' approach of determining common practice should be abandoned and be replaced by **sector or project-type specific guidance**, particularly with regard to distinguishing between different and similar technologies (appropriate level of dis-/aggregation) and with regard to the threshold for market penetration, which can have very different implications for the number of projects passing the test, depending on the features of the sectors or project types.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country. However, results of studies on the technological potential depend strongly on their assumptions and may thus vary significantly. The exploitation rate should therefore only be considered one criterion among others in determining whether a technology is common practice; it should not form the only decisive criterion.
- The common practice analysis should at least cover the **entire country**. However, to ensure statistical confidence, the control group needs a minimum absolute number of activities or installations. If the observations in the host country do not exceed that minimum threshold, the scope needs to be extended to other countries (e.g. the neighbouring countries or the entire continent).
- Last but not least, all CDM projects should be included into the common practice analysis as a default, unless a methodology includes different requirements.

In addition to the above-mentioned improvements of general approaches for determining additionality, we recommend further improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period, not merely the validity of the baseline but the validity of the baseline scenario should be assessed for CDM projects that are potentially problematic in this regard. This is the case if the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex such as urban transport systems or data centres should be limited to one single period of 10 years maximum. Moreover, generally abolishing the renewal of crediting periods but allowing a somewhat longer single crediting period for project types which require a continuous stream of CER revenues to continue operation (e.g. landfill gas flaring) may also be considered (Section 3.5.4).
- **Positive Lists:** Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. This review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of national policies and measures to

support low emissions technologies (so-called E- policies). For positive lists to avoid the possibility of 'false positives' driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. A positive list that included renewables, for example, could be qualified by restricting its applicability to countries that did not have any support policies in place for that specific technology. Finally, to maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists (Section 3.7).

- **Programmes of activities:** PoA rules allow that the total project size exceeds the small-scale or micro-scale thresholds while using the automatic additionality provision established for small-scale and micro-scale projects. This may increase the risk of registering non-additional projects. Reform of the CDM rules related to additionality for particular project types (Chapter 4) and positive lists (Section 3.7) will address any concerns about additionality of PoAs (Section 3.6.3). However, as long as these rules are not reformed accordingly, PoA have the potential to boost the number of non-additional project activities and CERs.
- **Standardized baselines:** These were introduced to reduce transaction costs while ensuring environmental integrity. In contrast to the general expectation, they do not increase the environmental integrity of the CDM. On the contrary, as long as they are not mandatory, once established, they lower the environmental integrity because they allow for increasing the number false positive projects. Therefore, their use should be made mandatory. Moreover, all CDM facilities should be included in the peer group used for the establishment of standardized baselines and clearer guidance needs to be provided for DNAs on how to determine the appropriate level for disaggregation. Finally, the practice of using the same methodological approach for the establishment of standardized baselines for all sectors, project types and locations should be abolished (Section 3.8).
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity through over-crediting of emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by their exclusion from the crediting baseline where possible (Section 3.9).
- **Suppressed demand:** In many cases, the Minimum Service Levels may be reached during the lifetime of CDM project. However, even if the suppressed demand does lead to some over-crediting, the overall impact is very small. An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to countries in which development needs are highest and the potential for over-crediting is the smallest, such as LDCs (Section 3.10).

6.2. Project types

We note that even with 'perfect' rules for determining additionality as recommended in Section 6.1, many project types have fundamental problems with this determination. Drawing upon our findings for specific project types (Section 4), this section provides recommendations of which project types should remain eligible in the CDM. In doing so, we not only consider the environmental integrity under current rules, but also whether improvements of general or project type-specific rules could be implemented to ensure overall environmental integrity. We also include other considerations, such as whether the emission sources can be addressed more effectively by other policies.

Industrial gas projects: In contrast to conventional wisdom and their perception in the general public, our analysis shows that industrial gas projects provide for a high or medium environmental integrity. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects now provide for a high degree of environmental integrity. They are very likely to be additional because they involve so-called 'end-of-the-pipe' technologies and do not have significant income other than CERs and because revenues from CERs have a large impact on the economic feasibility. Moreover, they partially use emission benchmarks as baselines which underestimate the actual emission reductions. The methodologies for HFC-23 and nitric acid projects have already been improved in the past and do not require further improvements (Sections 4.2.7 and 4.4.7). For **adipic acid**, the situation is different; this project type is also likely to be additional but concerns about carbon leakage due to high CER revenues have never been addressed. Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. A global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate (Section 4.3.7). Industrial gas projects provide for low cost mitigation options. Under current rules, HFC-23 and adipic acid projects may generate large rents for plant operators. These emission sources could therefore also be addressed through domestic policies, such as regulations or by including the emission sources in domestic or regional ETS, and help countries achieve their NDCs under the Paris Agreement. For example, China is introducing a domestic results-based finance policy aiming at incentivising HFC-23 emissions reductions. Parties to the Montreal Protocol also consider regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM. A transition to address these emissions domestically may also be supported by bilateral or multilateral initiatives of (results-based) carbon finance.

Energy-related project types: Our analysis suggests that many energy-related project types provide for a low likelihood of overall environmental integrity, particularly **wind and hydropower** (Sections 4.5.7 and 4.6.7), **fossil fuel switch** (Section 4.11.7) and **supply-side energy efficiency project** types such as **waste heat recovery** (Section 4.10.7). The main reason for this assessment is that CER benefits are often relatively small compared to fuel cost savings, so that the impact of CER revenues on the economic feasibility is marginal (Section 2.4). Many projects are also supported through other policies, such as feed-in tariffs for renewable electricity or emerging ETSs. The costs for renewable power technologies are decreasing rapidly. In our assessment, the potential for addressing additionality concerns through improved tests are rather limited for these project types. Many projects are economically viable and even an improved investment analysis or common practice test may not be suitable to clearly distinguish additional from non-additional projects. We therefore recommend **that these project types should be no longer eligible in principle** under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers (Section 4.5.3). These project types may thus remain eligible in least developed countries.

We recommend that some other energy-related project remain eligible if methodologies are improved. **Biomass power projects** can be competitive with fossil generation technologies under certain but not all circumstances. In cases in which power generation from biomass is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. In these cases, the demonstration of abundance of biomass as well as of the claim that biomass is left to decay is key for avoiding any over-crediting of emissions. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM provided that the corresponding provisions in the applicable methodologies are revised appropriately (Section 4.7.7).

With regard **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, environmental integrity concerns could be addressed if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass (Section 4.12.7), and if approaches for determining the penetration rate of efficient lighting technologies as already established in AM0113 were made mandatory for all new projects and CPAs under these project types and the older methodologies were withdrawn (Section 4.13.7). As CER revenues can have a considerable impact and as barriers persist these projects, we recommend that they should remain eligible, subject to the improvements recommended.

Methane projects: Landfill gas and **coal mine methane** projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and by requesting DOEs to verify that landfilling practices are not changed (Sections 4.8.7 and 4.9.7). For both project types, the CER revenues have a considerable impact on their economic performance. With regard to landfill gas, an important concern is that continued incentives for landfilling could delay the implementation of more sustainable waste management practices, such as recycling or composting. We therefore recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Table 6-1 summarises our recommendations for the specific project types assessed above.

Table 6-1: CDM eligibility of project types

Project type	Environmental integrity under current rules	Environmental integrity if rules were improved	Recommendations
HFC-23	Medium / High	High	Not eligible
Adipic acid	Medium	High	Eligible (with benchmark of 30 kg / t AA)
Nitric acid	High	High	Eligible
Wind power	Low	Low	Not eligible
Hydropower	Low	Low	Not eligible
Biomass power	Medium	Medium / High	Eligible (projects avoiding methane emissions)
Landfill gas	Medium	Medium / High	Eligible (subject to transition arrangements)
Coal mine methane	Medium	Medium / High	Eligible
Waste heat recovery	Low	Low	Not eligible
Fossil fuel switch	Low	Low	Not eligible
Efficient cook stoves	Low	Medium / High	Eligible
Efficient lighting	Low / High	Medium / High	Eligible

Sources: Authors' own compilation

7. Implications for the future role of the CDM and crediting mechanisms

In this section, we consider the implications of our analysis for the future role of the CDM and crediting mechanisms generally. We situate these implications not only in the context of the CDM but also the Paris Agreement and draw general conclusions for the design of international crediting mechanisms under the Paris Agreement as well as crediting policies established at national level.

The CDM has provided many benefits. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer and may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures. The CDM has also helped to build capacity and to raise awareness on climate change. It also created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects have provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of considerable experience, the enduring limitations of GHG crediting mechanisms are apparent.

- Firstly, and most notably, the elusiveness of additionality for all but a limited set of project types is very difficult, if not impossible, to address. Our analysis shows that many CDM project types are unlikely to be additional. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is difficult to address through improvements of rules. Further standardisation can be helpful for reducing transaction costs but has a limited scope, particularly within the CDM, for resolving additionality concerns. The scope for added standardisation is limited by the number of amenable project types and the wide variation of conditions across CDM host countries. Standardisation approaches have been most successful in regional crediting programs such as California or

Australia, where they have focused on a limited number of suitable and largely non-energy project types, such as landfills or coal mines.⁹⁸ The overall integrity of the CDM could only be improved significantly if the mechanism were limited to those project types that have a high likelihood of providing additional emission reductions. In our assessment, this would require excluding most of the current CDM project types and focusing mainly on projects that abate other GHGs than CO₂.

- Secondly, international crediting mechanisms involve an inherent and unsolvable dilemma: either they might create perverse incentives for policy makers in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they credit activities that are not additional because they are implemented due to policies or regulations. This well-known dilemma has been discussed by the CDM EB without a resolution.
- Thirdly, for many project types, the uncertainty of emission reductions is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules.
- A further overarching shortcoming of crediting mechanisms is that they do not make all polluters pay but rather subsidize the reduction of emissions. This lowers the cost of the product or service, inducing rebound effects that are not considered under CDM rules and that lead to over-crediting. Most of these shortcomings are inherent to using crediting mechanisms, which questions the effectiveness of international crediting mechanisms as a key policy tool for climate mitigation.

It should be noted that the results of the analysis provided here for the CDM are to a large extent also relevant and valid for other international carbon offset or crediting programs, such as the Japanese Joint Crediting Mechanism (JCM), the Climate Action Reserve (CAR), the Verified Carbon Standard (VCS) or the Gold Standard (GS). The results are also relevant for the mechanisms to be implemented under Article 6 of the Paris Agreement, any mechanism to be used for compliance under the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) and to a certain extent for the Joint implementation (for an overview see Kollmuss et al. 2015a). Even though the programs differ in many aspects, generally speaking, the CDM has been the origin and the role model for these offset programs. In particular, the CDM's approaches to additionality testing and baseline setting have served as the main blueprint for most other programs. With the aim of reducing transaction costs, rules and methodologies for additionality that have been borrowed from the CDM have been simplified, which did not generally strengthen their environmental integrity. Therefore, the issues raised here in the context of the CDM will remain relevant for other international offset programs.

The future role of crediting mechanisms should be revisited in the light of the Paris Agreement. The CDM in its current form will end with the conclusion of the second commitment period of the Kyoto Protocol. Several elements of the CDM could, nevertheless, be used when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. As of 15 December 2015, 187

⁹⁸ <http://wupperinst.org/en/projects/details/wi/p/s/pd/377/>.

countries, covering around 95% of global emissions in 2010 and 98% of global population, have submitted NDCs (CAT 2015). Many mitigation pledges in NDCs cover economy-wide emissions or large parts of the economy. This implies that much of the current CDM project portfolio will fall within the scope of NDCs.

The Paris Agreement requires countries to adjust their reported GHG emissions for international transfers of mitigation outcomes in order to avoid double counting of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond that which they had pledged under their NDCs. Double counting can occur, inter alia, if the same emission reductions are accounted by both the host country – as reflected in its GHG inventory – and the country using these credits towards achieving its mitigation pledge. Avoiding such double counting could imply that host countries will have to add internationally transferred credits to their reported GHG emissions if the emission reductions fall within the scope of their mitigation pledges. This has several important implications.

Firstly, issuing and transferring credits that do not represent additional emission reductions or are under- or over-credited has other implications for global GHG emissions. Under the Kyoto Protocol, non-additional CDM projects or over-crediting increase global GHG emissions, whereas under-crediting from additional projects provides a net mitigation benefit. The implications are different and more complex when the emission reductions fall within the scope of the NDC of the host country: they depend on whether the credited activities are additional, whether they are over- or under-credited, the ambition of the mitigation pledge of the host country, i.e. whether or not it is below BAU emissions, and whether the emission reductions are reflected in the host country's GHG inventory⁹⁹ (Kollmuss et al. 2015b). Compared to the situation in which international transfers of credits would not be allowed, global GHG emissions could not be affected, decrease or increase due to the transfer of credits, depending on the circumstances. For example, if the host country has an ambitious NDC, non-additionality and over-crediting may not necessarily increase global GHG emissions because the country would have to reduce other GHG emissions to compensate for the adjustments to its reported GHG emissions. For the same reasons, under-crediting would not necessarily lead to a global net mitigation benefit. Additionality and over-crediting mainly matter when host countries have weak mitigation pledges above BAU emissions.

A second important implication relates to the incentives for host countries to ensure integrity and participate in international crediting mechanisms. If mitigation pledges are ambitious, host countries might be cautious to 'give away' non-additional credits. To achieve its mitigation pledge, the host country would need to compensate for exports of non-additional credits, by further reducing its emissions. Host countries with ambitious and economy-wide mitigation pledges would thus have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. For those project types with a high likelihood of additionality, the potential for further emission reductions is limited and it is unclear whether host countries would be willing to engage in crediting for this 'low-hanging fruit' mitigation potential. The experience with Joint Implementation showed that most credits originated from countries with 'hot air', i.e. where the emission pledge is less ambitious than BAU emissions, while the potential for crediting was quite limited in countries

⁹⁹ Some emissions reductions may not be reflected in the country-wide GHG inventory, for example, because the country uses simple Tier 1 methods to estimate an emissions source which do not account for the emission reductions achieved through CDM projects or because the reductions occur in a sector that is not covered by the host country's GHG inventory.

with ambitious mitigation targets, also due to overlap with other climate policies (Kollmuss et al. 2015b). In conclusion, this suggests that the future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries, including Japan, Norway and Switzerland, have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries.

A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance, which could indirectly increase global GHG emissions compared to using the available resources more effectively. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. They need to show that their investments *'make a difference'*. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules to assess the additionality of projects considered for funding.

Some countries pursue domestic crediting policies. South Korea allows companies to convert CERs from Korean projects into units eligible under its domestic emissions trading system. The Chinese and California-Quebec ETS allow the use of credits from domestic offsetting projects. Mexico, South Africa and Switzerland are pursuing policies that allow using domestic credits to meet tax or other obligations (see also the paragraph above on other offsetting programs). In these cases, using non-additional credits has no direct implication on global GHG emissions but will increase the country's costs towards achieving its NDC. In the long run, this provides incentives for these countries to limit crediting to project types with a high likelihood of additionality. However, meeting the ambitious long-term climate change mitigation goals of the UNFCCC and the Paris Agreement requires much stronger action and a rapid bridging of the emissions gap (UNEP 2015). It is hard to imagine that such ambitious goals could be achieved on a global level in a timely manner without a sharing of effort or burdens that could encompass some form of transfer of mitigation outcomes and/or results-based climate finance.

Taking into account this context and the findings of our analysis as well as other evaluations, we recommend that policy makers revisit the role of crediting in future climate policy:

- **Moving towards more effective climate policies:** We recommend focusing climate mitigation efforts on forms of carbon pricing that do not rely extensively on credits, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. If well designed, emission trading systems and carbon taxes have several advantages over crediting mechanisms: they do not require additionality to be assessed or hypothetical baselines to be set but rather rely on information on actual emissions for which information asymmetry is more manageable; in principle, they make the polluter pay rather than providing subsidies; and they expose all regulated entities to a carbon price, enabling

up-scaled, sector-wide emission reductions. We recommend that international crediting mechanisms play a limited role after 2020 to address specific emission sources in countries that do not have the capacity to implement broader climate policies. Crediting should not be further pursued as a main tool for GHG mitigation.

- **Fundamental and far-ranging changes to the CDM:** To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting the mechanism to project types that have a high likelihood of delivering additional emission reductions. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches where possible. We also recommend curtailing the length of the crediting periods with no renewal. A larger question is whether the UNFCCC and CDM processes can create the consensus needed to make the fundamental changes needed to improve the integrity of the CDM in significant ways.
- **Purchase of CERs:** We recommend potential buyers of CERs to limit any purchase of CERs to either existing projects that are at risk of stopping GHG abatement ('vulnerable projects') or the few project types that have a high likelihood of ensuring environmental integrity. Continued purchase of CERs should be accompanied with a plan and support to host countries to transition to broader and more effective climate policies that ensure GHG abatement in the long-run. Purchase of CERs could also be used to deliver results-based finance in this context. Further, we recommend pursuing the purchase and cancellation of CERs, as a form of results-based climate finance, rather than using CERs for compliance towards meeting mitigation targets.
- **Mechanisms under Article 6 of the Paris Agreement:** Given the high integrity risks of crediting mechanisms, we recommend that Parties consider provisions that provide strong incentives to the Parties involved to ensure integrity of international transfers of mitigation outcomes. This includes robust accounting provisions, inter alia, to avoid double counting of emission reductions, but should also extend to other elements, such as comprehensive, transparent and ambitious mitigation pledges as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment and other evaluations confirm the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies including international cooperative actions becomes key to bringing down emissions quickly to a pathway consistent with well below 2°C. Our findings suggest that crediting approaches should play a time-limited and niche-specific role, where additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

8. Annex

8.1. Representative samples of CDM projects

8.1.1. Task

The population consists of 7,418 CDM projects which have 4 characteristics (location, technology, size, time), from which representative samples for three additionality approaches (investment analysis, barrier analysis and common practice analysis) should be drawn. One challenge consists of the fact that the additionality approaches are not directly known before the analysis. After some preliminary analyzes, we decided on a two-step approach.

1. Draw a representative sample with regard to all strata of the 4 characteristics of size 300. The additionality approaches are determined for the projects in this sample.
2. Draw sub-samples from the projects belonging to each of the three additionality approaches, which are representative for the strata of the 4 characteristics, as they occur for the projects of each additionality approach. The sub-samples shall consist of 50 projects each, which are to be further divided into one 30-project sample and two 10-project samples. The 30- and 10-project sample should each be representative of the strata and combine to the 50-project sample.

8.1.2. Approach

The challenge consists of the fact that the small sample sizes lead to less than one draw for many strata. In a first step, therefore, a randomised procedure is necessary to identify the strata from which to draw, such that the frequencies of the strata are best preserved from the population to the samples.

Drawing the 300-project sample

1. Randomly select strata from which to draw
 - a) Calculate the target number of draws for each stratum as (stratum frequency) (population size) (sample size). These are decimal numbers and often below.

In order to obtain an integer number of draws for a stratum, discretise its corresponding target number to the enclosing integers, e.g. 2.1 is randomly assigned either 2 or 3, where the probability of the assignment of the higher enclosing integer is weighted with $(\text{target number})^{(\text{lower enclosing integer})}$. In the example, the probability that 2.1 becomes 3 is therefore weighted with $2.1^2 = 0.441$. The number of target numbers assigned to the higher enclosing integer is determined such that the sum of all assigned lower enclosing integer and all assigned higher enclosing integer is as close as possible to the rounded sum of all respective target numbers.

For example, assume 3 target numbers between 2 and 3, namely (2.1, 2.3, 2.9). Their rounded sum is 7. Drawing twice from two strata and three times from one strata yields the targeted 7 total draws. The third strata with the target number 2.9 has the highest chance of being chosen for the three draws.

- b) Strata with 0 frequency in the population have of course 0 frequency in the samples as well.
2. Randomly draw from the strata with the discretised target numbers of the previous steps.

Drawing sub-samples of the 300-project sample with the added additionality approach information

From the 300-project sample, we extract the projects that belong to each additionality approach, yielding three sub-samples. From each of these sub-samples, we draw samples of 50 projects, which are representative with regard to the strata of the 4 characteristics in the respective sub-sample. We employ the same approach as for drawing the 300-project sample (Section 2.1).

These three samples of 50 projects are ordered with respect to the strata of the 4 characteristics. Then we extract two sub-sets of 10 projects, one consisting of the 1st, 6th, 11th, 15th... project, the second consisting of the 3rd, 8th, 13th, 18th... project of the ordered sample. The 30-project sample consists of the remaining projects. This ensures that the strata within the 50-project sample are preserved in the smaller samples as well as possible.

8.1.3. Samples

Investment analysis: 69, 544, 1436, 1906, 2007, 2075, 2229, 2525, 3068, 3490, 3703, 4042, 4317, 4657, 5047, 5659, 5661, 5707, 5757, 6052, 6899, 7073, 7185, 7843, 7974, 8057, 8523, 8615, 8801, 9002

1875, 2315, 3033, 3186, 3799, 4600, 4687, 5843, 7024, 7551, 8903

1795, 2931, 4817, 5555, 6173, 6440, 7540, 8291, 8818, 8821

Barrier analysis: 244, 348, 582, 644, 1053, 1408, 1578, 1738, 2180, 2561, 3174, 3191, 3639, 3739, 3856, 4468, 4478, 4508, 4748, 5099, 5749, 5961, 6012, 6302, 6636, 7242, 7392, 7651, 8680, 9419

534, 831, 937, 1151, 1827, 2098, 4147, 5234, 7595, 8319

544, 2077, 2975, 3393, 4089, 5888, 6246, 7578, 8927, 9100

Common practice analysis: 69, 1227, 1602, 1737, 2007, 2075, 2098, 2109, 2302, 2315, 3068, 3186, 3642, 3670, 3799, 4687, 5006, 5359, 5659, 5843, 6173, 6553, 6899, 7648, 7936, 8125, 8140, 8506, 8636, 9699

588, 2486, 3994, 4317, 6440, 7400, 8093, 8505, 8523, 8879

366, 544, 1661, 1875, 3703, 4042, 4310, 5487, 7494, 8818

8.2. Information on suppressed demand in CDM methodologies

Table 8-1: Information on suppressed demand in CDM methodologies

Meth No.	Definition of baseline technology	Definition of MSL	Definition of baseline activity level
ACM0014	Methane Correction Factor of 0.4 for domestic wastewater	None	Project activity level (i.e. quantity of wastewater treated)
AMS I.A	Allows AMS I.L approach	Allows AMS I.L approach	Project activity level (i.e. quantity of electricity consumed)
AMS III.AR	Fossil fuel powered lamp	3.5 hrs per day x 2 CFL lamps (240 lux)	Deemed savings with fossil fuel lamp to match MSL, with annual growth in kerosene consumption
AMS II.G	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of biomass saved)
AMS III.F	Unmanaged waste disposal with > 5m depth (methane Correction Factor of 0.8)	MSL is having a waste disposal site	Project activity level (i.e. quantity of waste converted to compost)
AMS I.E	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of renewable energy used)
ACM0022	Unmanaged waste disposal with < 5m depth (methane correction factor of 0.4)	MSL is having a waste disposal site	Project activity level, although project proponent may propose another baseline
AMS I.L	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.BB	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.AV	Fossil fuel or non-renewable biomass to boil water (only requires justification if share of total population without access to improved drinking water is > 60%)	No minimum, but sets maximum level of 5.5 litres per person-day for crediting	Project activity level (i.e. quantity of water purified by project), but capped at 5.5 litres per person per day

Sources: Authors' own compilation

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**Measuring Emissions Against an Alternative Future:
Fundamental Flaws in the Structure of the Kyoto Protocol's
Clean Development Mechanism**

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Executive Summary

The Kyoto Protocol's Clean Development Mechanism (CDM) enables industrialized countries to partially meet their emissions reduction targets by reducing emissions in developing countries. An appeal of the CDM is its perceived efficiency as a market mechanism. The CDM theoretically creates value for carbon reductions and allows the market to find the cheapest reductions anywhere in the world. A key challenge to the environmental integrity of the CDM is filtering out business-as-usual, or "non-additional," projects. The CDM should only generate carbon credits from activities beyond business-as-usual. Each business-as-usual project that is allowed to generate carbon credits under the CDM will permit an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway rather than actually reducing emissions. The poor quality of the arguments and evidence used to prove project additionality in CDM application documents, and the resulting large-scale registration of non-additional projects, have been well documented. Proposals for reforming the CDM range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting.

This paper examines the possibility of improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism by studying how the CDM is working in practice in the Indian power sector. It is based on interviews conducted in India during 2004 and 2009 with over 80 CDM and renewable energy professionals involved in CDM project development, including project developers, consultants, validators (hired to audit each project applying for CDM registration), carbon traders, bank employees, government officials, members of the CDM governance panels, and others involved in renewable energy and hydropower development in India. It also draws on analysis of the UNEP Risoe CDM project database, and analysis of documents from 70 CDM projects comprising all of the large (over 15 megawatt) wind, hydro, and biomass projects registered in India since 2007 and the 20 most recently registered hydro projects in China. This paper presents the following findings:

- The majority of CDM projects are "non-additional" and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- The large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

The following is a section-by-section summary of the analysis in this paper on which these findings are based.

Widespread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable

energy development in the country. At least twelve developers and consultants told me that the CDM projects that they proposed would have been built regardless of the CDM. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. Validators, tasked with auditing CDM additionality claims, believe that additionality testing procedures are subjective and can be manipulated, with many “knobs you can turn.” Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions due to the uncertainties associated with CDM registration and carbon credit revenues. Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms” rather than based on the small and uncertain financial benefit from carbon credit sales; and “any project can be registered under the CDM.”

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find. A murmur of agreement went through the audience at a carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in decisions to build projects are being forged and post-dated. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own. Only one of the seventeen large wind CDM projects in India that make their financial assessments publicly available uses and correctly calculates the tax benefits offered to wind power developers by the Indian government.

An accurate project-by-project additionality test is infeasible

The “investment analysis” is the means for demonstrating project additionality that is viewed as having the most potential to accurately test project additionality if it is made more rigorous. The investment analysis presumes that it is possible to accurately predict whether a project would be built based on the sign (positive or negative) of a single number – the difference between the expected financial returns from the proposed CDM project and a benchmark defining the boundary between viability and lack of viability for that project type. If the returns are below the benchmark, the project would not likely be built; above it, it would. One indication that the investment analysis has been inaccurate is that just under half of the 29 Indian projects examined in this analysis that make their financial assessments publicly available calculate financial returns below the benchmark even with carbon credit income. This predicts that the projects would not have been built even with income from carbon credit sales. Yet all of these projects were still built.

The main challenge to implementing an accurate investment analysis is that developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM project is additional, so that when a range of values is possible, the values are suspect. Analysis of financial assessments for wind and biomass projects in India reveals assumptions that can be varied within reasonable ranges to change the expected financial returns

of the projects more than the amount that the returns are above or below the benchmark. Even the best cases for an investment analysis – wind projects in India in which all of the main inputs into the financial assessment are typically documented in formal agreements before project construction starts – still have room to vary assumptions (for example the tariff after the end of the power purchasing agreement) within ranges equivalent to the effect of the carbon credit sales. For the investment analysis to be accurate even at this level, supply and loan agreements would need to be signed before the start of the CDM application process. For most other project types there is even more room for manipulation of cost inputs. For example, assumptions about future biomass prices affect the expected financial returns much more than carbon credits do for biomass projects purchasing biomass from neighboring farms.

Large hydropower in India is inappropriate for additionality testing for several reasons. First, large hydropower development is decided by a government planning process and involves a wide range of considerations that are not easily predicted. Second, the per-kilowatt hour tariff provided to large hydropower producers is calculated periodically on a cost-plus basis to ensure that the producer receives a pre-agreed return on their equity investment. The investment analysis is meaningless in this context. Third, financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs. Affecting most project types is the lack of a single accurate benchmark since project development decisions can be based on multiple factors and project risk assessment is inherently subjective. This analysis suggests that an accurate project-by-project additionality test is infeasible for most projects and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

The CDM has little influence on project development

While additionality testing is not very effective in preventing non-additional projects from registering under the CDM, the need to conduct a test that is inherently imprecise and subjective limits the ability of the CDM to support truly additional projects. The CDM's ability to influence the decisions of developers, lenders and investors is compromised by a combination of the length of time it takes to validate and register a proposed CDM project (seventeen and a half months on average for projects registered over the last two years) and the uncertainties associated with CDM validation and registration and carbon credit issuance.

Developers are not waiting to make sure that their projects are successfully validated or registered under the CDM before deciding whether to build their projects. Three-quarters of all registered CDM projects were operational by the time they were registered as CDM projects. Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. Two of these projects were registered within the last year. Developers do not seem to view a positive validation or CDM registration as helpful in acquiring project financing. Developers of 66 of the 70 projects started the CDM validation process around the time of or after the beginning of project construction.

It is likely that most of these developers did not make their decisions to go forward with their projects based on the expectation of CDM income because of the substantial uncertainties

associated with CDM revenues. Uncertainties include the possibility that the project would not pass validation or be accepted for CDM registration, fluctuating carbon credit prices, and uncertainties about the value carbon credits will have post-2012. A large proportion of the risk, time and complexity of the CDM application process is because of additionality testing.

Beyond additionality, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, the structure of project-based offsetting in a number of other ways contributes to the generation of more credits than actual reductions and limits its influence on emissions. The CDM should result in reductions in emissions in developing countries at least as large as the credits it generates. Therefore, since each CDM project is allowed to produce carbon credits for its full lifetime, defined either as a single 10-year period or 21 years (3 consecutive 7-year periods) without retesting additionality, the CDM should only support projects that would not have been built for 10 or 21 years without the CDM.

Hydropower, wind and other low-carbon electricity generation technologies are generally developed in order of their cost effectiveness. A preferred support mechanism would accelerate the development of all of these plants rather than change the order in which they are built. The CDM as it is currently structured could work in one of two ways. It could support a portfolio of projects that would not otherwise have been built for more than a decade, a portfolio of unattractive projects, enabling less attractive projects to be built before more attractive ones. Alternatively, the CDM could accelerate the building of all plants, generating more credits than the emissions actually avoided. Neither is a good option.

The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated. Therefore, the CDM is unable to support many measures that are needed or are more cost effective for the deployment of technologies and the decarbonization of sectors but for which it is especially difficult to measure emissions reductions, such as policy, research and development, demonstration projects, and information dissemination. A long-standing criticism of the CDM is that it may create perverse incentives for governments not to implement climate-friendly policy in order to maintain a high baseline against which domestic facilities can prove additionality and generate carbon credits.

The large-scale use of offsetting credits hinders global efforts to mitigate climate change

Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in carbon emissions in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, will still result in a 2.0-2.4 degree Celsius temperature increase. The large quantities of offsets being proposed for use by industrialized countries post-2012 would put them far away from these reduction pathways, hindering global mitigation efforts in the coming decades.

Any offsetting mechanism in developing countries, whether it is project- or sector-based, involves measuring emissions against an alternative business-as-usual growth scenario and therefore the quantity of emissions reduced is inherently uncertain. Further, the use of large quantities of offsets in one commitment period makes it harder for industrialized countries to

accept meaningful reductions in the next, since industrialized countries will be more dependent on the uncertain availability of credits through the carbon market to meet deepening targets. If industrialized countries are to use the quantities of offset credits they propose post-2012, the majority of global reductions over the next ten years will occur in developing countries. Industrialized countries are therefore committing either to steeper annual reductions in the future, or to long-term inequalities in emissions between the North and the South. Both options make future cooperation more difficult. Major shifts in high emitting sectors in industrialized countries require time to allow for changes in behavior and in support industries, for experimentation and learning, adapting technologies to diverse local contexts, research, development and deployment. The use of offsets postpones these processes in industrialized countries. We live in a globalized world with a widely shared linear view of development and progress. Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of lifestyles in the global North. In a world dominated by a single vision of progress, the vision of progress that we are striving towards must be sustainable. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

The way forward

Our inability to accurately measure the emissions reduced by individual projects, compounded by the large-scale use of offsetting credits by industrialized countries to meet their reduction commitments, risk substantially undermining the effectiveness of the post-2012 climate change regime and our ability to control global greenhouse gas emissions. Any offsetting mechanism included post-2012 will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

The first point is practically difficult, the third, politically difficult. We have seen little indication that countries will agree to an offsetting mechanism that is small enough and targeted enough, with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. Attention must be refocused on reductions in countries with emissions caps, with non-credited support for mitigation efforts in developing countries.

Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism

Abstract

Proposals for reforming the Clean Development Mechanism (CDM) range in scope, from making the CDM's rules stricter and/or more objective, to a more fundamental shift away from project-based offsetting. Interviews conducted in India during 2004-2009 on how the CDM is working in practice in India's electricity sector, an analysis of the project documents from 70 registered CDM projects in India and China, and analysis of the UNEP Risoe CDM project database together indicate fundamental limitations to improving the outcomes of the CDM within its basic structure as a project-base offsetting mechanism. I find: (1) The majority of CDM projects are "non-additional" (would have gone ahead regardless of support from the CDM) and therefore do not represent real emissions reductions; (2) Due to the subjectivity inherent in project development decisions, a reasonably accurate filter for non-additional projects is infeasible; (3) The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects; (4) Beyond the problems with additionality testing, the fundamental structure of the CDM leads to the over-generation of credits and limits its ability to reduce emissions; (5) Taking a step back, the large-scale use of carbon credits generated in developing countries by industrialized countries to meet their emissions targets hinders global efforts to mitigate climate change over the next decades. Both the large-scale use of offsetting to meet industrialized country targets and the continuation of project-based offsetting risk undermining the ability of global climate change agreements to control greenhouse gas emissions.

1. Introduction

Industrialized countries have two sets of obligations under current international climate change agreements: to reduce their own emissions, and to support climate change mitigation and adaptation in developing countries. The Kyoto Protocol's Clean Development Mechanism (CDM) is critical for meeting both sets of obligations. The CDM in principle allows industrialized countries to invest in projects in developing countries that reduce emissions, and use the resulting emissions reduction credits towards their Kyoto Protocol targets. Any project registered under the CDM is able to produce carbon credits, called certified emissions reductions, or CERs, totaling the estimated tons of CO₂-equivalent emissions avoided by the CDM project. The CDM is the most used of the Kyoto Protocol's "flexibility mechanisms," which are meant to lower compliance costs by allowing industrialized countries to partially meet their emissions targets through reductions outside of their own borders. It is also the main instrument under current climate agreements supporting climate change mitigation in developing

countries, currently passing around three billion Euros per year to developers of low-emitting projects in developing countries.¹

A key regulatory challenge of the CDM is calculating the emissions reduced by a single project. This requires comparing the emissions from the project with emissions from a counterfactual scenario of what would likely have happened without the CDM project. The biggest challenge in determining the counterfactual baseline scenario is assessing whether the project itself is in that counterfactual scenario, or in other words, if the proposed CDM project would have gone ahead anyway, without the expected revenues from the CDM. The CDM should only generate credits from activities beyond business-as-usual (BAU), since any carbon credits generated by BAU CDM projects allows an industrialized country to emit more than their Kyoto targets by paying developers in developing countries to do what they were doing anyway, rather than actually reducing emissions. Each project applying for CDM registration must demonstrate their “additionality,” that the project would not likely have gone forward had it not been for the expected CDM income.

Another key regulatory challenge of the CDM relates to the nature of the market it creates. A common appeal of the CDM is that it is a market mechanism meant to create a global market for emissions reductions, lowering the cost of compliance by allowing industrialized countries to reduce emissions wherever in the world it is least expensive to do so. In practice, the CDM does not create a market for emissions reductions. It creates a market for emissions permits, since it is the permit to emit that is the primary interest of most CER buyers, as they seek low cost options of complying with domestic climate regulations. For the most part, neither the buyer nor the seller of CDM credits is primarily concerned with emissions reductions, such that neither have a strong interest in ensuring the environmental benefit represented by the permits sold. In addition, these permits to emit are wholly human created, numbers in databases, such that no extra cost is incurred from producing more permits. CDM project proponents not only have little incentive to protect the environmental integrity of the permits, they have a financial interest to exaggerate the number of carbon credits generated by CDM projects. Therefore, the integrity of this market in terms of emissions reductions relies almost entirely on effective regulation. These features – the buyer is unconcerned with the quality of the underlying physical thing represented by the wholly human-made tradable asset – are also features of many of the financial instruments whose deregulation in the US caused the current global financial crisis, reminding us of the importance of regulation for markets to function. As mentioned above, the market in CDM credits is especially difficult to regulate because it involves calculating emissions reductions against a hypothetical scenario, and most importantly, determining if the project itself is a part of that scenario.

The poor quality of the arguments and evidence used to prove project additionality under the CDM have been well documented (Michaelowa & Purohit 2007, Schneider 2007). Schneider (2007) concludes that “for about 40% of the registered CDM projects additionality is unlikely or questionable.” Wara and Victor (2008) estimate that bona fide emissions reductions compose “only a fraction of the real offsets market,” based on a range of evidence including the high proportions of hydropower, wind and natural gas power plants being built in China that are in the CDM pipeline, despite China’s active promotion of these technologies. Various proposals have been put forward for controlling the number of carbon credits generated by business-as-usual

¹ The CDM projects currently registered under the CDM would produce 319 million tons of CERs a year if they meet the expectations in their PDDs (Fenhann J. 2009. October 1, CDM Pipeline Overview. UNEP Risø Centre. <http://www.cdmpipeline.org/>). Primary CER prices are currently around 10 Euro per CER.

projects. Many of these involve continuing the CDM in its current form, and improving the rigor of its additionality test (some of the ideas put forward by Schneider 2009, and by Wara & Victor 2008).

This paper explores how the CDM is working in practice in the Indian power sector. It examines the proportion of CDM projects that are non-additional, and how effective the CDM is at supporting truly additional projects. It also considers whether it is possible to substantially improve the outcomes of the CDM within its current structure as a project-based offsetting mechanism. This paper also explores how the substantial use of offsets purchased from reductions made in developing countries currently being proposed by most industrialized countries post-2012 might help or hinder global efforts to control greenhouse gases to levels needed over the next forty years.

This paper presents the following findings:

- The majority of CDM projects are “non-additional” and therefore do not represent real emissions reductions.
- A reasonably accurate project-by-project filter for non-additional projects is infeasible.
- The need to test project additionality, which is inherently difficult and inaccurate, adds uncertainty and time to the CDM application process, compromising its effectiveness in supporting truly additional projects.
- Beyond the problems with additionality testing, the structure of project-based offsetting leads to the over-generation of credits and limits its ability to reduce emissions.
- Taking a step back, the large-scale use of offsetting hinders global efforts to mitigate climate change in the coming decades.

In what follows, section 2 provides background information on the current state of the CDM and how it works, as well as why our ability to effectively filter out non-additional CDM projects has implications for the success of the global climate change regime. Section 3 describes the methods used in this analysis. Section 4 delves into the analysis with stories from my research interviews indicating widespread skepticism among CDM and renewable energy professionals in India regarding the impacts the CDM is having and describing instances of fraud used to demonstrate project additionality. This is followed by analyses of the feasibility of substantially improving the CDM’s additionality testing procedures (section 5) and how effective the CDM is in supporting truly additional projects (section 6). Stepping away from additionality testing, section 7 presents a number of other ways that the CDM structure leads to the over-generation of credits and compromises the CDM’s ability to reduce emissions. Taking one more step back, section 8 asks if it is helpful or harmful to long-term international cooperation for industrialized countries to use large amounts of offset credits towards their near-term targets. Finally, I discuss alternatives to the current CDM in a post-2012 climate change regime.

2. Background

2.1 How the CDM works

Developers of low-carbon projects in developing countries can submit their projects to the CDM Executive Board (EB) for CDM registration. An application for CDM registration includes a Project Design Document (PDD), a validation report from an independent validator, and a letter of approval from the host country government. The PDD gives a detailed description

of the project, including an estimation of the emissions that it will reduce following an accepted “methodology” for doing the estimation, and evidence that the project is additional. The developer must hire a certified third party auditor, called a validator,² to validate that the project meets all of the requirements of the CDM. After a project is approved by the CDM Executive Board, the developer chooses how often to submit requests for the issuance of CERs. Typical end buyers of CERs are governments of and regulated facilities in countries that have Kyoto Protocol targets. Often the first buyers of CERs from the developer are intermediary companies that trade in carbon credits. The developer can choose to enter into a CER purchasing agreement with a buyer before or after credits are generated. Figure A-1 in the Appendix presents the key steps in the process of registering a project under the CDM and applying for CER issuance.

2.2 The current state of the CDM

As of October 1, 2009 there were a little over 1,800 registered CDM projects, and another 2,800 proposed CDM projects in the validation process. The total number of registered CDM projects is presented by country in Figure 1, and by type in Figure 2. China and India host 60% of all registered CDM projects, with few projects registered in Africa and in many other smaller developing countries. 31% of all registered CDM projects are renewable energy projects and 27% are hydropower projects. Non-CO₂ gas projects make up 4% of all registered CDM projects but are expected to produce 61% of the credits generated through 2012 because of their relatively high potency as greenhouse gases, if all projects were to produce the amount of credits predicted in their PDDs (see Figure 3).

2.3 The *Additionality Tool*

The “Tool for the demonstration and assessment of additionality,”³ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* requires developers to demonstrate the additionality of their proposed CDM project by an investment analysis, a barrier analysis, or a combination of both.

- The investment analysis is based on the idea that that carbon credit revenues improve the financial returns of projects, making losing or marginally profitable projects viable. It assesses the financial returns of the proposed project, most commonly in terms of project or equity internal rate of return (IRR).⁴ A benchmark is defined that represents the threshold financial returns, or hurdle rate, defining whether the project would go forward. If the expected financial returns are below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. It is optional to show that CERs bring the financial returns of the project above the benchmark.
- The barrier analysis describes and presents evidence for the existence of one or several barriers that prevent the proposed CDM project from going forward without the additional income from carbon credit sales.

² A validator is also called a Designated Operational Entity, or DOE.

³ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

⁴ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial returns.

Figure 1: Registered CDM projects by host country

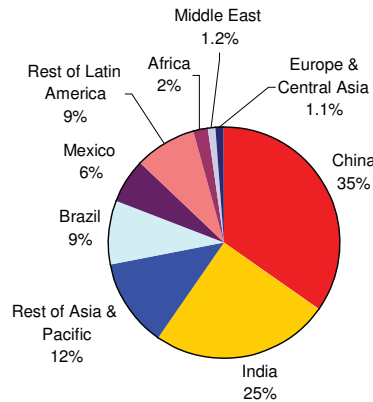


Figure 2: Registered CDM projects by type

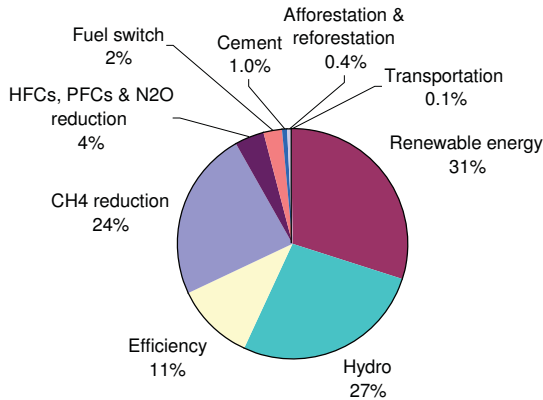
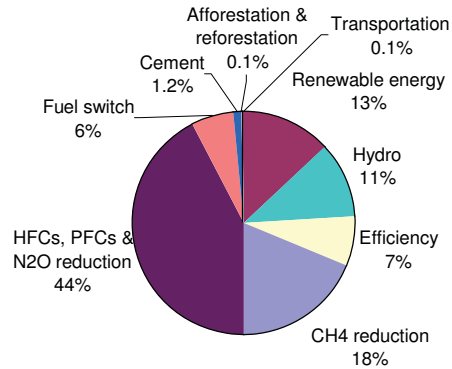


Figure 3: Expected CERs through 2012 from registered CDM projects by type



2.4 Why we should be concerned about additionality

Certainly additionality is a challenge for any climate mitigation program. Estimation of emissions reduced by policies, programs, and projects is often highly inexact in a complex world in which there are multiple influences on behavior and industrial and consumer choices. International funds that pool contributions to support emissions reduction projects in developing countries, the main alternative to crediting mechanisms, could also end up supporting activities that would have happened anyway. There is an important difference between crediting mechanisms and funds in this regard. When a fund supports a BAU project, it fails to reduce emissions through that project; when the CDM supports a BAU project, it also, in effect, weakens an industrialized country target by the amount it claimed to have reduced in the developing country. Secondly, the various risks involved with distributing funds to projects is more transparent. Proponents of project-based offsets commonly assume that emissions

reductions from individual projects can be measured accurately enough. The complex and technical nature of the CDM, and a general trust in the efficiency of market mechanisms, masks the uncertain nature of measuring emissions reductions in an offset program. To have a high likelihood of keeping global temperatures below a two degrees increase, substantial efforts are needed in both industrialized and developing countries. Industrialized countries need to both substantially reduce their own emissions and support mitigation in developing countries. To the extent that CERs are over-credited to CDM projects, the CDM fails in both regards at the same time.

3. Methods

The analysis in this paper is based on over 80 interviews conducted in India during 2004 to 2009, an analysis of project documents from 70 CDM projects registered in India and China, and analysis of the UNEP Risoe CDM project database containing information about all projects currently registered under the CDM and in the application process.⁵ I interviewed individuals involved in CDM project development in various capacities (mostly in India), including project developers, CDM consultants, validators (hired to audit projects applying for CDM registration), carbon traders, employees from banks lending to renewable energy projects, government officials, and members of the CDM governance panels, as well as others involved in renewable energy and hydropower development in India. Some interviews were carried out in the interviewees' offices, and some involved less formal discussions in carbon and climate conferences.

I also analyzed the additionality arguments used to register 70 projects. These projects comprise all of the large (over 15 megawatt (MW)) wind, biomass, and hydro projects registered in India since 2007 and the 20 most recently registered hydro projects in China. The specific analyses performed are described below in the paper sections alongside their results. These four projects types are among the most numerous in the CDM pipeline (see Table 1) and together represent one third of projects (registered and in the validation process). I chose to review only "large" projects since the additionality testing procedures for projects above 15 MW are more rigorous than for "small" projects. I chose to review only projects registered from 2007 because additionality testing was weaker in 2005-6, and has gradually been strengthened with various guidances.

Table 1: Projects analyzed

	Projects analyzed	Total projects in CDM pipeline	
Wind in India	20	320	7%
Biomass in India	16	297	6%
Hydro in India	14	130	3%
Hydro in China	20	819	18%
TOTAL	70	1566	33%

⁵ UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009 <http://www.cdmpipeline.org/>

This paper focuses on CO₂ reduction projects, for which CDM credits are typically one among several project benefits, and improve project financial returns by a relatively small amount. Renewable energy, hydropower, coal and natural gas projects, and many efficiency projects are all CO₂ reductions projects, which compose approximately 72% of all registered CDM projects (see Figure 3). In contrast, CERs are often the sole revenue source from HFC and N₂O reduction projects, making these projects more likely to be additional. However, these industrial gas projects pose other problems documented elsewhere (Wara 2007, Wara & Victor 2008) and discussed in brief with the fourth finding of this paper.

4. Wide-spread opinion in India that the CDM is not working

It is the widely held belief among CDM and renewable energy professionals in India that many if not most CDM projects are non-additional and that the CDM is having little effect on renewable energy development in the country. Research for this paper started in the summer of 2004 when I was told by managers of three sugar factories in India that their sugar mill cogeneration plants, being proposed as CDM projects, would be or would have been, built without the CDM. Each manager told the arguments they were using to demonstrate that their projects were additional, even though they had told me they were planning to build the projects regardless of CDM funding. They treated the additionality proof as a bureaucratic hoop they had to jump through to access this funding source, a sentiment repeated often in later interviews.

Since those early interviews, at least nine more developers and consultants told me that the CDM projects that they proposed would have been built anyway, without the CDM. It was surprising how easy it was to find developers who would say this, given their interest in defending the additionality claims in their CDM application documents. Many more developers and consultants responded to my probings with general statements that very few CDM projects are additional. The strongest evidence that a project is non-additional is the admission of developers themselves.

Interviewees commonly made statements such as: CDM revenues are just “cream on the top”; developers decide to build projects “on their own terms,” not based on the small and uncertain change in IRR from carbon credit sales; “any project can be registered under the CDM.” Validators, tasked with auditing CDM additionality claims, believe that current additionality testing procedures are subjective and can be manipulated. One validator described the many “knobs you can turn” to change the results of the financial analysis. Several validators suggested ways to lessen the manipulation, but did not believe that it is possible to prevent it. It is commonly understood in India that banks are not taking carbon credits into account in their lending decisions, due to the uncertainties associated with CDM registration and CER revenues. Representatives from three banks that lend to renewable energy projects confirmed that the CDM is having no or very little effect on their lending decisions. At a carbon markets conference in 2007 in Mumbai, a carbon buyer in the audience criticized a panelist for saying that it is possible to prove the additionality of just about any project. The buyer went on to say that he could agree to the panelist’s statement if they were chatting at a bar, but that the panelist should not make such statements in a public forum where he could be quoted.

If business-as-usual projects are registering under the CDM, we would expect to see evidence of manipulation and fraud as developers seek to prove that their projects require CDM

revenues to go forward when in fact they do not. Indeed, evidence of fraud was surprisingly easy to find in project documents and to hear about in the halls of carbon conferences and workshops.

A murmur of agreement went through the audience at the carbon markets conference in Mumbai when a panelist mentioned that board minutes documenting early consideration of the CDM in the decision to build proposed CDM projects are being forged and post-dated. One validator proudly told me how he discovered one of these forged documents. One CDM consultant told me that he presented two sets of investment analyses to a bank for a single project – one for the CDM application showing that the project would not be financially viable without carbon credits, and a second for the loan application showing that the project is financially viable on its own.

In India, wind power is generally considered a good investment, due in large part to tax benefits offered by the central government. India offers wind power developers the ability to take 80% depreciation for wind project capital costs in the first year of operation along with a 10-year tax holiday. 25 large wind projects totaling 1,600 MW of wind power in India are registered under the CDM. 17 of these use an investment analysis to prove additionality, make the analysis spreadsheet publicly available, and were registered since 2007. The project design documents for each of these 17 projects proves additionality by showing that the project is not financially viable without CER sales revenues. Only one of these projects includes the full tax benefits provided by the government in their financial assessments. This one project uses an unrealistically low estimate of the amount of electricity to be generated by the project.⁶ Only 6 of the other 16 projects justify their failure to account for the full tax benefits offered by the government. They claim that the depreciation benefits are not useful to the developer because of their low profits.⁷ But this claim is not credible for all of these projects.⁸

5. An accurate project-by-project additionality test is infeasible

The poor quality of the *CDM Additionality Tool's* barrier analysis and investment analyses being used to prove project additionality has been well documented (Michaelowa & Purohit 2007, Schneider 2009). These two studies describe how barriers used are highly subjective, not credible, poorly documented, or are so general that they are common to a wide range of CDM and non-CDM projects. Investment analyses leave out or do not document important values affecting the feasibility of the project. Another example of the poor quality of additionality testing is how IRR analyses for wind projects in India commonly leave out or incorrectly calculate the tax benefits provided to these projects described above. Many of these problems could be avoided by stricter standards for additionality arguments and evidence and more rigorous validation requirements. But the question still remains, could additionality testing be made substantially more accurate with stricter standards? That is, are there reasonably accurate and auditable indicators of the decisions of developers, lenders and investors? I

⁶ CDM project titled *22.5 MW grid connected wind farm project by RSMML in Jaisalmer* uses a plant load factor of 16% when the average plant load factor in the state was later determined to be 19% according to a wind project consultant.

⁷ I learned about this problem from Axel Michaelowa.

⁸ For example, the largest of the projects is a 468 mw wind project on three wind sites in Tamil Nadu state in southern India, with 209 separate owners. The investment analyses for this set of projects does not include depreciation benefits. It is very likely that at least some, if not all, of the owners chose to invest in wind in part to avail of the depreciation tax benefits.

examine the ability to test the additionality of wind, biomass and hydropower projects in India. This analysis starts with a brief discussion of the barrier analysis but focuses on the investment analysis, considered to have the higher potential for being accurate, if made more rigorous.

5.1 Barrier analysis

The CDM *Additionality Tool's* barrier analysis presents barriers, often described in terms of risks, which prevent a project from going forward. The CDM can offset those risks by improving the expected returns from the project. The PDDs reviewed that use the barrier analysis, either alone or with the investment analysis, list barriers facing the project, and then as required by the *Additionality Tool*, describe an alternative to the project is not prevented by those barriers.

The most common barriers cited in the reviewed PDDs by project category are: Hydro in India: water flow uncertainty, difficult terrain, small private sector developer new to the power industry; Wind in India: regulatory uncertainty regarding the amount and timing of tariff payments; Biomass in India: technological risks due to little experience in India with the technology, lack of skilled manpower, risk that the electricity utility would lower the tariff; Hydro in China: water flow uncertainty, electricity demand uncertainty during the flooding season, tariff uncertainty, increased investment cost due to new government rehabilitation policies.

It is certainly feasible that any of these risks could be important enough to prevent the developer from going forward with the project without the ability to sell carbon credits. It is also completely feasible that such project risk would not prevent the project from being built. Certainly many projects have been developed with these barriers, but without the help of the CDM.

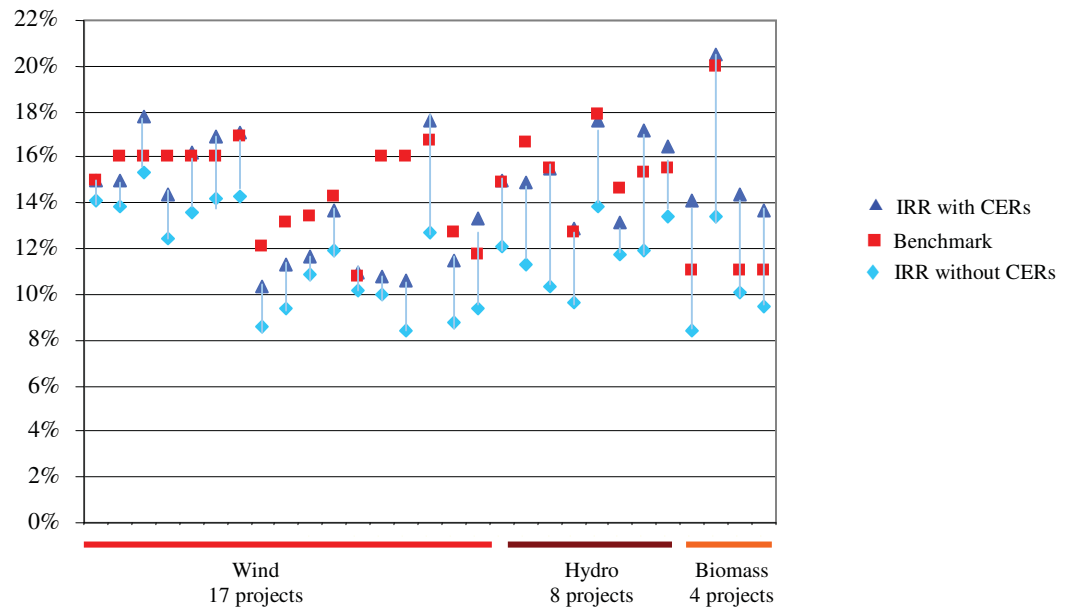
Typically the validator positively validates the project if there is documented evidence that (1) the stated barrier exists and (2) it is significant. They judge if it is feasible that the barrier could have prevented the project from going forward, not that there is a high likelihood that it actually did.

An example might illustrate the subjectivity inherent to the barrier analysis. One of the barriers used to prove the additionality of Patikari Hydro Electric Power Project in India was the difficult terrain where the project is developed posing challenges to project construction. The validation report notes that the validator asked the developer to “provide documentary evidence that these investment barriers are particular to this project activity and not general risks associated with all hydro projects in mountainous regions.” The developer provided a geo-technical report depicting the poor nature of the terrain that might result in the caving in of the tunnel. This report was accepted by the validator as evidence of the existence of this barrier. It is certainly feasible that the risk of tunnel collapse could be important enough to prevent the developer from going forward with the project at its without-CER returns. Or it could be possibly that this risk did not affect the final decision. The validator does not seek to answer that question, for there is little evidence that could document the deliberations of the project developer. Such evidence would be needed for the barrier analysis to be accurate.

5.2 Investment analysis

The investment analysis presumes that it is possible to accurately predict whether a project would be built from the sign (positive or negative) of a single number – the difference between the expected returns from the proposed CDM project and the benchmark. If the returns are below the benchmark, the project would not be built, above it, it would. For illustration, Figure 4 shows the results of the benchmark analysis all of the Indian projects examined for this paper that use the investment analysis to prove additionality and which estimate both with- and without-CER financial returns. Most of the projects analyzed for this paper that use the investment analysis use project or equity IRR as the financial indicator and show with- and without-CER IRRs sitting on either side of the benchmark.

Figure 4: Benchmark investment analysis for all Indian projects analyzed
In chronological order of registration date for each type



It is important to keep in mind that the financial assessment is of a proposed project for which many of the costs and revenues are future projections. The investment analysis indicates additionality only to the extent that developers are unable to choose values to get the desired result – a without-CER result below the benchmark, and a with-CER result above it. That is, it is accurate to the extent that each expected cost and revenue input into the financial returns calculation for the proposed project is a unique and determinable value; and it is accurate to the extent that there is a single benchmark that verifiably tests a decision to go forward with a project. Developers have incentives to choose the benchmark and project cost and revenue inputs that show that their proposed CDM projects are additional, so when a range of values is possible, the values are suspect.

In India, CERs improve the IRRs of wind projects by 0.8% - 4.9% with most between 1.7% and 2.7%. For hydropower the gain is 3% - 5.2%, and the four biomass projects that use the investment analysis show an increase in IRR of 4.2%, 4.3%, 5.7% and 7.1%. These

investment analyses argue that by improving project IRRs by these amounts, the CDM is able to make non-viable projects viable. Therefore, if a developer is able to vary the assumptions that go into the investment analysis enough to lower the expected IRR or raise the benchmark by these amounts, they can show that some viable projects are non-viable in order to demonstrate that they are additional. The rest of this section examines the extent to which the benchmark and IRR assessments can be manipulated by amounts similar to the expected CDM benefits.

Notable in the above Figure 4 are fourteen projects (just under half) that have with-CER IRRs below the benchmark, some by several percentage points. Yet each of these projects was built. This means that the investment analysis was wrong for each of these projects, since it predicted that these projects would not be built even with CDM revenues. This indicates that something is wrong with the investment analysis or the way it is being performed.

Wind projects

Wind in India is a best case for an accurate investment analysis because of the structure of the industry. As described above, wind power is generally considered a good investment in India in large part because of the tax benefits offered by the central government. As a result of these benefits, a common organizational arrangement for wind development involves an agreement between two sets of actors: a wind manufacturer who identifies and secures a site with good wind resources, and single or multiple investors, most often profitable businesses and wealthy individuals who are relatively unfamiliar with the energy industry but wish to avail of the depreciation tax benefits. The manufacturer typically takes full technical responsibility for the project, signing a supply agreement with the investor for the sale of the wind turbines and land, plant construction, and operations and maintenance.

All of the main costs of the project to the investor are typically well documented in the formal supply agreement prior to construction. In addition, this supply agreement often contains a high-end estimate for the amount of electricity the wind turbine is expected to generate to make the project look attractive to the investor. This high-end figure provides a good conservative choice from the perspective of additionality testing. Also, the tariff for the first ten, thirteen or twenty years of the project is signed into a power purchasing agreement with the utility buying the power. The loan interest rate would be documented in a loan agreement.

An analysis of the seventeen available investment analysis spreadsheets for large registered wind projects in India reveals several undocumented assumption that the developer can include from within a range of reasonable values. Most wind developers sign power purchasing agreements (PPAs) with a state electricity utility for ten or thirteen years, leaving the per kilowatt-hour (kwh) tariff unknown after the end of the PPA period. Most of the seventeen wind investment analyses analyzed here assume that the post-PPA tariff will remain the same after the last year of the PPA. Four assume a substantial drop in the post-PPA tariff. If these projects had instead assumed the post-PPA tariff remained constant after the end of the PPA their IRRs would have been 0.7%, 0.9%, 2.0% and 2.2% higher. Lowering the post-PPA tariffs of the other projects by one rupee per kwh, less than three of the four projects that assume a drop, lowers the IRRs of the projects by 0.5% to 2.2%. Table A-1 in the Appendix describes this analysis in more detail.

Second, one project was validated and registered with a deration rate on the assumed production of electricity. The deration rate represents a decline in the amount of electricity generated by the turbine over time as the turbine ages. Without the deration rate the IRR of this project would have been 0.31% higher.

Third, I describe above how almost all large wind developers in India do not account for the full tax benefits available to them in their CDM investment analysis. Several of the PDDs for these projects explain that the investor is unable to avail of the full depreciation tax benefits because they do not expect to earn enough personal income or profits in other parts of their business to absorb the tax benefits. In some cases this claim too can be difficult to audit because it involves assessing an expectation of future profits in another part of the investor's business or personal income. The ability to take 80% depreciation in the first year of the project changes project IRR by 4-5%.

Together these assumptions can alter expected wind project IRRs by amounts comparable with the 1.7%-2.7% expected effect of CERs, or more in cases with uncertain tax benefits. This analysis indicates that some projects whose expected financial returns are already one or two percentage points above the benchmark could vary these assumptions so to bring the expected financial returns to below the benchmark, and then show that CERs bring the returns back up. The investment analysis would prevent the more viable wind projects in India from registering under the CDM, such as those that are able to take the full tax benefits offered by the government, by requiring cost and revenue values to be taken from the supply, loan, and power purchase agreements, and enforcing the correct application of tax benefits. But this means that in order for the investment analysis to be accurate at this level, the decision to build the project would need to be taken before the start of the CDM application process. That is, the supply, loan and PPA agreements should in place before the PDD is finalized, preventing developers from making sure their project is successfully registered under the CDM before making the decision to build it.

Biomass projects

Developers of biomass cogeneration projects typically manage the projects themselves, rather than contracting out project implementation and operations and maintenance through supply agreements as is commonly done for wind projects. The IRR analysis for biomass projects includes many more undocumented or poorly documented values. Biomass prices in particular have been erratic over the past years due to an absence of a developed supply market (Ghosh et al 2006), rainfall variability year-to-year⁹ and rising demand for biomass from pulp and paper mills and for electricity generation.¹⁰ Assumptions about future biomass prices affect the IRRs of biomass projects that purchase all or part of the biomass used for electricity generation from near-by farms.

I examine the effect of the assumed future price of biomass on the project IRRs of biomass projects in India.¹¹ Three registered and one proposed biomass projects purchase biomass from outside their facilities and make their investment analysis spreadsheets publicly available. These four projects use rice husk purchased on the market to supplement the biomass generated by each facility's own rice or sugar processing, and all are in Uttar Pradesh, the Indian state with the most large biomass CDM projects.

The investment analyses of these four projects forecast that future rice husk prices will be 2650, 1200, 1150 and 700 rupees per metric ton with annual escalation rates of 0%, 4%, 2% and 0% respectively. Increasing biomass prices by 300 rupees and increasing the escalation rate by

⁹ Raised in a number of interviews with developers and consultants of bagasse (sugar cane waste) cogeneration projects.

¹⁰ *ibid.*

¹¹ The idea for doing an analysis of biomass prices comes from Sivan Kartha from the Stockholm Energy Institute.

2%, relatively small changes compared to the variation of prices in these PDDs and those documented in various tariff orders and petitions,¹² decreases project IRR by more than CERs increase it in each of these four projects (see Table A-2 in the Appendix for the details of this analysis). These projects all started construction within a year and a half of one another, and the PDDs were written within a year of one another. So the timing of the project development decision and PDD submission does not explain the large variation in their assumptions about future rice husk prices. Biomass price is only one of many assumptions that can be varied by a developer who wishes to show a lower project IRR in their PDDs.

Hydropower projects

Additionality testing is inappropriate for large hydropower in India for three reasons: the development of hydropower is a government decision, large hydropower developers are guaranteed a specified return on their equity investment making an IRR analysis meaningless, and financial assessments have not been a good predictor of hydropower development in the past, nor have they been a good predictor of actual project costs.

Hydropower development is largely a government decision - The Government of India employs a central decision-making process to determine the development of its rivers, in recognition of rivers as a national resource with multiple competing uses – electricity, irrigation, flood control, fishing, etc. River development is determined through a government planning process involving a range of public and private actors. This planning process identifies potential hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private. The private sector participates in hydropower development mainly by responding to bids put out by state and central state-owned companies.

Additionality testing requires predictable indicators that a project would be built. The investment analysis is appropriate when a project would only be built if its financial returns are above a certain benchmark. The barrier analysis assumes that the building of a project could be predicted by the presence of a prohibitive barrier. Additionality testing is not meant to predict the decision-making of governments involving multiple considerations.

Developers of large hydropower projects in India are guaranteed a certain return on their equity investment - Developers of large hydropower projects (over 25 MW) in India are guaranteed a pre-determined return on their equity investment, typically 14% or 15.5%.¹³ The

¹² Uttar Pradesh's 2009 tariff order for biomass cogeneration projects assumes a 6% annual escalation rate in biomass prices (Uttar Pradesh Electricity Regulatory Commission. 2009. Draft "(Terms and Conditions of supply of power from Captive and Non-conventional Energy Generating Plants) Regulations, 09". , http://www.uperc.org/UPERC%20CNCE%20Order%20%20_Final.pdf and the biomass tariff suggested by the Central Electricity Regulatory Commission uses a 5% annual escalation rate (Central Electricity Regulatory Commission. 2009. (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations. The expected bagasse prices in Uttar Pradesh in these and other tariff orders and petitions vary between 740 and 2300. See also Uttar Pradesh Electricity Regulatory Commission. 2008. *THE MATTER OF: Suo-moto proceeding on procurement of power through competitive bidding and alternative fuel for use of bagasse based co-generation capacity during off-season*. <http://www.uperc.org/Order%20for%20CNCE%20Regulation%202008%20-%201st%20May%202008.pdf>

¹³ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

tariff the developer receives per kwh from electricity sales is calculated on a cost-plus basis and adjusted periodically to ensure that the developer receives the agreed return on equity based on their true costs and revenues. This means that most project costs are “passed through,” returned to the developer through the tariff. Therefore, unlike most electricity generation projects with a fixed tariff, the IRR of large hydropower does not increase if a project generates more electricity or has lower costs, since the tariff will be adjusted to ensure a fixed return on equity. In such a case, is project IRR a good measure for whether or not such a project would be built? Project IRR does vary among large hydropower projects in India, because the costs that determine the tariff differ somewhat from the costs included in the project IRR analysis. Figure 5 presents the differences between the costs that are typically used to calculate the tariff and project IRR.

One key difference between the way the IRR and tariff analyses address cost is that the tariff calculation takes into account loan interest payments whereas project IRR does not. Second, to incentivize efficient plant operation, operations and maintenance (O&M) costs are calculated as 2% of capital costs annually with an annual escalation rate in the tariff calculation, regardless of the actual costs.¹⁴ The IRR would use the actual expected O&M costs. Capital costs are not always fully passed-through, depending on a reasonability check by the appropriate electricity regulatory commission.

Figure 5 – Comparison of cost inputs used in the tariff calculation and the project IRR analysis for large hydropower projects

The tariff calculation is based on:	The IRR analysis is based on:
Interest on loan capital & depreciation	Actual capital expenses at the beginning of the project
Interest on working capital	Interest on working capital
Operations and maintenance expenses at a fixed 2% of capital costs with an annual escalation rate	Actual operations and maintenance expenses
Return on equity, at 15.5% of capital costs	

As a result, large hydropower projects with lower-than-average project IRRs are those that (1) are expected to have a higher ratio of O&M to capital costs such that a portion of the actual O&M costs are not passed through, (2) are judged by regulators to be built or managed inefficiently such that the full capital costs are not passed through,¹⁵ (3) are able to attract *better* loan terms, since loan interest payments are passed through in the tariff calculation, but are not included in project IRR calculations, (4) have longer construction times, which typically is the case with larger projects, projects built under more difficult geological conditions, or projects

¹⁴ For projects commissioned after April 2004

¹⁵ Interviews with hydropower consultants indicate that private hydropower developers that experience costs overruns are typically able to pass through the full actual costs through a higher tariff. Public companies can find it more difficult to get cost overruns passed through in full.

against which there is substantial public protest. Longer construction time lowers IRR because of the way IRR takes into account time. The IRR is the discount rate that could be applied to the project so that the present value of the project is zero, so costs and revenues in the early years of the project affect IRR more than later years. The longer the time between when the investment is made and revenues start to be generated the lower the present value of the project.

Only one of the above four reasons reflects the actual viability of a project and could potentially justify CDM benefits – projects with longer construction times. A high O&M to capital cost ratio and poor project management are not necessarily indicators that a project would not likely be built. *Better* loan terms lower the tariff and therefore also lower the calculated IRR, indicating a lower rather than higher likelihood that a project would be built. Therefore, when the tariff is determined on a cost-plus basis to achieve an agreed return on equity, an IRR analysis is not an appropriate indicator of whether a project would be built.

Investment analyses do not reliably predict project development and actual project costs - In India and throughout the world cost effectiveness has not been a good predictor of the development of large hydropower projects. Large hydropower is often built when it is not the least cost option (e.g. Paranjape & K.J.Joy 1995). Also, a financial assessment of a hydropower is especially difficult given its often large ecological impacts, the multiple competing uses of rivers, and the multiple people who benefit and are harmed by different uses that are difficult to weigh against one another. Further, even a simple financial analysis such as is performed in a CDM investment analysis, ignoring externalities and competing uses of the river, are notoriously inaccurate for large hydropower projects. Of the 81 hydropower projects surveyed for the World Commission on Dams report (World Commission on Dams 2000), the average capital costs were 21% over the predicted costs in real terms, while for some they were much higher. 30% of the projects surveyed by the World Commission on Dams experienced construction delays of a year or more.

For all of these reasons, the CDM's investment analysis does not accurately predict if a proposed large hydropower project would be built.

Is there an objective benchmark that predicts if a project would be built?

Even if the IRR analysis were relatively accurate, the benchmark would also need to reflect whether the project would likely be built for the investment analysis to be accurate. Since the CDM has a relatively small effect on the IRRs of CO₂ reduction projects, typically by 1%-5%, leading to projects being proven additional by even smaller IRR margins, the benchmark has to be reasonably accurate. The latest guidance from the CDM EB on the investment analysis offers four options for determining a benchmark: (1) benchmarks supplied by relevant national authorities (for project and equity IRR), (2) local commercial lending rates (for project IRR), (3) weighted average cost of capital (WACC) (for project IRR), and (4) required/expected returns on equity (for equity IRR).¹⁶ All of these have been used by some of the projects analyzed by this paper. The first option, a government-derived benchmark does not necessarily represent the decision-making of developers, lenders and equity providers. For example, the 16% benchmark commonly used in PDDs for wind projects in India is used by the government to determine promotional tariffs for independent power producers, but are not necessarily the benchmark expectation of investors. The second option, local commercial lending rates, can be too low a

¹⁶ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

benchmark since equity investors generally expect higher returns than the lending rate. WACC, the cost of capital to the developer, is composed of the lending rate for the debt portion, and the returns expected by the equity investors for the equity portion. The fourth option used for equity IRR is simply the expected returns of the equity provider. Of each of these possible benchmarks, the most accurate representations of developer and investor decision-making would be the last two, WACC for project IRR, and the returns expected by equity investors for equity IRR. This is because typically developers will not build a project if the returns are under their WACC and typical equity providers would not invest in a project if the expected returns of the project are under the returns they expect from their investment.

The question then is if the expected returns on equity can be accurately and objectively assessed. The latest CDM guidance on the investment analysis¹⁷ makes the following distinction. A project that could only be carried out by the project proponent, such as the retrofitting of an existing sugar factory or cement plant, would use the WACC specific to the specific company. A project that could be built by many companies, such as a stand-alone wind or small hydropower project, would assess the WACC or expected returns on equity for the whole industry. In the latter case, the expected return on equity would reflect the risk premium associated with the specific type of investment. Both cases have the same challenges. The returns expected by equity investors can be fairly subjective since it involves the assessment of the financial risk associated of the specific project, and an assessment of their other competing investment options at the particular time of the investment. The decision could also be influenced by a range of non-monetary factors or factors that are not easily incorporated into the IRR analysis. For example, it is difficult to assess the financial benefits to a company of the reliability offered by a captive generation unit. Investors might be interested in investing in a project with lower financial returns for a range of reasons, including wanting to invest in a good project in their home community or a community where they want political support, interest in the positive publicity that goes along with doing a green project, or doing business with a relative, etc. The possibility of determining a conservative industry-wide benchmark for expected returns on equity under which projects would most likely not be built for different industries is beyond the scope of this working paper. Challenges associated with this have been raised here.

Allowing the developer to choose among several acceptable benchmarks enables them to choose one that is more advantageous for demonstrating project additionality, rather than one that truly represents the decision that enabled the project to go forward. The Xiaogushan hydropower project (XHP) in China presents a good example of this.¹⁸ The project was registered as a CDM project on the basis of having an IRR under the government defined benchmark of 8% for power projects. However, the Asian Development Bank, in its evaluation of the project, describes the project as the least cost project in the entire province.¹⁹ It also states that the project is financially viable because its financial IRR (FIRR) of 7.5% “is compared against the post-tax company WACC of 4.53%. Since the FIRR is higher than the WACC, the XHP component is financially viable.”²⁰ While the developer argues in the PDD that the project is unviable because the expected IRR is under the government-defined benchmark, the Asian

¹⁷ Executive Board Report 41, Annex 45, *Guidance on the Assessment of Investment Analysis*, report from EB meeting on 30 July - 02 August 2008 http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03_v02_1.pdf

¹⁸ I worked out this example together with independent television news producer and journalist Janet Klein.

¹⁹ Asian Development Bank. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Gansu Clean Energy Development Project*

²⁰ *ibid.*, p 16

Development Bank states that it decided to lend to the project because the IRR is over the WACC of the company.

5.3 Summary and discussion

Even the best case for an investment analysis – wind projects in India – in which all of the main inputs into the financial assessment are documented, there is still some room to vary assumptions within ranges equivalent to the effect of the CERs in some cases. For most other project types there is much more room for manipulation of cost inputs. The choice of the biomass price for biomass projects in India is one example. The hydropower example suggests that it is important to look at the specific conditions under which technologies are developed to determine if the investment analysis is appropriate for that specific technology. For several independent reasons, large hydropower in India is inappropriate for additionality testing. Multiple factors involved in project development decisions and the subjective nature of project risk assessment seem to preclude a single accurate benchmark for most projects that is meaningful within the relatively small improvements carbon credit revenues have on the IRR of CO₂ reduction projects. Both the IRR analysis and the benchmark IRR are adjustable in tandem. In conclusion, an accurate project-by-project additionality test is impractical for CO₂ reduction projects, and another means for determining which projects are worthy of receiving international support through international climate change agreements is required.

6. The CDM has little influence on project development: the effects of uncertainty and the long CDM registration process

Even if the CDM is unable to filter out business-as-usual projects, does it at least enable projects to go forward that otherwise would not? This section explores how the combination of uncertainty and the long registration application process compromises the effects the CDM could have on unviable or marginally viable projects (the types of projects the CDM is designed to support).

6.1 Risks associated with CDM registration and CER value

The CDM is anticipated to improve the financial returns, measured in terms of IRR, of the projects analyzed for this paper by 1% to 6% according to their PDDs. The CDM typically does so, not through assured upfront payments directly providing project financing, but as an additional revenue stream through the lifetime of the project. In the small proportion of cases in India when CER buyers do offer upfront payments to the project developer, these payments come at a substantial discount per CER generated by the project, often between 40% to 75% of the spot market price for carbon dioxide projects, almost always signed after the project has been successfully registered, and only for credits to be generated up through 2012. The CER revenue stream involves a number of uncertainties, which diminish the value of the CERs at the time that development, lending and investment decisions are being made:

Validation risk: Validators reported at the end of September 2009 that they cumulatively rejected 581 projects.²¹ This is compared with 2,188 projects that have been submitted for registration with positive validations, putting the risk of a negative validation at approximately 21%. We do not know the total number of projects that received positive validations but which have not yet been submitted for registration, implying the validation risk is lower than 21%. On the other hand, validators regularly decline validation requests when they believe the project will most likely not pass validation, implying a higher validation risk for projects that start construction before contracting a validator.

Registration risk: Approximately 5.5% of all projects submitted for registration were rejected by the CDM Executive Board, and at present another 7% are undergoing a review process after not being accepted upon submission.

CER price risk: Once a project is registered, there is uncertainty regarding the value the carbon credits will have once issued. To give some sense of CER price variability, between January 2007 and October 2009, secondary CER prices fluctuated between a high of 23 Euro in June 2008 to a low of 11.5 Euro in October 2009.²² China is mitigating some portion of the CER price risk by implementing a minimum CER price for primary CERs purchased from CDM projects in China.²³

CER value post-2012: At the time that this paper was written, we still did not know the structure of the post-2012 regime and how CER credits can be used under it. There is much uncertainty about the value these credits will have post-2012.

In late 2006 a bank representative expressed his expectation that over time, as banks become more familiar with the CDM, and as more experience is gained with the registration of different types of CDM projects, that his and other banks would start to take carbon credits into account in their loan appraisals. By 2009, the uncertainties associated with the CDM have increased, rather than decreased. Interviewees in 2009 expressed frustration with the increased complexity and time involved in the CDM application process, their perception that the EB's efforts to strengthen the system has led to frequent changes in the CDM requirements and rules, and that the EB is inconsistent and arbitrary in their decisions to reject and review projects. An increase in the number of rejections and reviews, especially over the last year, has also increased uncertainty and risk.

6.2 What does the timing of project development and the CDM application process indicate about the influence the CDM is having?

In light of this uncertainty, the order in which project developers start project construction and submit their projects for CDM validation and registration provides some insight into the effects the CDM is actually having on project development decisions. The process of submitting a project for registration under the CDM, from the start of validation through registration, was seventeen and a half months on average for all CDM projects registered since

²¹ Data taken from UNEP Risoe CDM/JI Pipeline Analysis and Database, October 1st, 2009
<http://www.cdmpipeline.org/>

²² CER prices are taken from PointCarbon's CDM & JI Monitor. Secondary CERs are CERs that were already purchased from the project developer, and are being sold for a second time, often to the end user of the credit.

²³ China's CER price floor is 8 Euro. Prices of CERs bought directly from the developer, called primary CERs, are below those of secondary CERs because of their additional risks.

the beginning of 2008.²⁴ It typically takes at least another year before the first credits are issued. Developers must either wait over a year to assure that their projects are successfully registered under the CDM before going forward with the projects, or accept the risk that their projects will not be successfully registered when deciding to go forward with the project. A commonly expressed sentiment among developers was that they cannot put their project on hold for the long CDM review period since it would be too disruptive to the project to do so.

As of October 1, 2009, approximately three-quarters of all registered CDM projects were operational at the time they were successfully registered under the CDM.^{25 26} This means that a higher proportion had started construction before registration. Further, 66 out of the 70 projects I analyzed for this paper started construction before the beginning of the 30-day public comment period, which typically happens in the first few months of the validation process.²⁷ This indicates that many developers start construction, including acquiring project financing, signing a power purchasing agreement with the government electricity utility, etc., before starting the validation process.

This timing indicates that project developers are not treating the CDM as a part of the necessary financing needed to go forward with a project, and are willing to accept the risk that their projects would not receive CDM revenues. This timing also means that developers probably do not see the CDM as important in helping them acquire a loan or attract investment equity, for if they did, many more developers would start the CDM application earlier, so that if they run into trouble attaining a loan or attracting investment, a positive validation or registration under the CDM could give a boost to the perceived viability of the project. This does not necessarily prove that the CDM is not having an effect on project development decisions. Certainly developers, lenders and investors could be taking the expected but uncertain revenues from the CDM into account when evaluating the viability of a project. The timing does indicate that revenues generated through the CDM are at best having a weak effect. This effect could be strengthened if CER revenues were more certain, and/or if the CDM application process were much shorter.

Construction on 17 of the 70 projects reviewed in this analysis began before the Kyoto Protocol entered into force in February 2005 and before the first project was registered under the CDM in November 2004. The uncertainty at that time regarding whether the CDM would exist as a working mechanism, or how it would work when it did, makes it extremely unlikely that the

²⁴ Calculated from the Risoe CDM Pipeline database as the difference between the “date of registration” and the “comment start” date. The comment start date is the date when the validator began the 30-day public comment period. The public comment period generally comes within the first few months of the validation process. Prior to the start of validation, the developer must write the PDD, which involves additional time.

²⁵ Using data from the UNEP Risoe CDM pipeline database, as of October 1, 2009, 79% of all registered CDM projects have “Credit start” dates equal to, or earlier than, the “Date of registration.” A review of over one hundred PDDs confirms that almost all projects were commissioned on or before the credit start date, suggesting that it is reasonable to estimate that at least three-quarters of all projects were completed at the time of registration.

²⁶ These projects are expected to produce 56% of CERs through 2012 if all registered CDM projects generate the number of credits predicted in their PDDs. The reason the percentage of credits (56%) is lower than the percentage of projects (79%) is that most of the projects that are expected to generate the most CERs – HFC and N₂O projects – are expected to start generating credits at least several months after their date of registration and so are not included in these percentages.

²⁷ The construction start date was taken from the PDDs. The beginning of the 30-day public comment period is listed in the UNEP Risoe CDM pipeline database as the “comment start” date. Typically the validator puts the PDD up for the public comment period in the first few months of validation.

CDM had much effect on these development decision. Two of these projects were registered within the last year.

The claim that the CDM is having very little effect on project development is also supported by the interview responses mentioned above. Particularly, banks seem not to take CERs into account in their decisions to lend to a project because of the uncertainties associated with CDM registration and CER generation. Consultants and developers commonly describe CER revenues as “cream on the top,” and describe developers as building projects on their own merits, not because of a small and uncertain benefit from CER sales.

6.3 Discussion

A high proportion of the risk, time and cost of the CDM application process is associated with additionality testing. PDD consultants and validators describe that a large portion of the time spent writing the PDD and validating the project are devoted to the additionality section. Additionality is the cause of most reviews and rejections by the EB, and is also the most common reason projects do not pass validation.²⁸

Project-by-project additionality testing adds time and uncertainty to the CDM application process, compromising the ability for CERs to influence project development decisions. Additionality testing is also only effective at filtering out some of the most clearly non-additional projects. Therefore, another more effective and predictable means of targeting projects and activities that actually reduce emissions is necessary.

7. Taking a step back: The fundamental structure of the CDM, in certain other ways, leads to the over-generation of credits and limits its ability to reduce emissions

Looking beyond additionality testing, a number of other structural flaws also contribute to the over-generation of credits and weaken the effectiveness of the CDM at supporting projects in real need of support.

Supporting projects in the wrong order - In the power sectors of India, China and other countries, plants are often planned for many years before they are actually built. Hydropower and wind sites are often developed in the order of their attractiveness in terms of resource availability, proximity to demand centers, etc. The Indian government is actively supporting renewable energy and energy efficiency mainly for energy security reasons. From the perspective of most effectively developing these sectors, it makes sense to accelerate the pace at which plants are built, building the most cost effective ones first and supporting current domestic efforts to do so. Instead, the CDM is structured to change the order in which plants are built. Plants that are cost effective are considered “non-additional” while only plants that are less desirable are eligible.

Trade off between project viability and the over-generation of credits - The CDM should result in reductions in emissions in a developing country at least as large as the credits it generates. Once registered, CDM projects are allowed to generate credits for 10 years, if they choose the single credit period option, or 21 years if they choose the 7-year crediting period and renewal

²⁸ Interviews with validators

option. This means that in theory, projects should only register under the CDM if they most likely would not otherwise have been developed for the full crediting period – 10 or 21 years. This would support the development of a portfolio of undesirable projects – the problem mentioned just above. In practice, the PDD requires that projects be tested for additionality at the time of validation only.²⁹ Projects are therefore able to generate credits for 10 or 21 years even if they would have been built within that period, producing more credits than actually emissions avoided by the CDM project.

Improving the profitability of harmful projects - Crediting emissions reductions rather than charging emissions producers such as through a carbon tax could improve the profitability of projects with negative environmental and social impacts. Examples include many large hydropower projects, clean coal, and HFC destruction in HCFC-22 production facilities. HFCs, a potent greenhouse gas (GHG) regulated under the Kyoto Protocol, is a byproduct in the production of HCFC-22, a temporary substitute for CFCs as a refrigerant. Due to the very high global warming potential of HFCs – 11,700 times that of CO₂ – the value of the CERs generated from HFC reduction projects can exceed the profits from the production of HCFC-22 itself, making HCFC-22 production profitable even without selling the HCFC-22 (Wara & Victor 2008). HCFC-22 is an ozone depletor being phased out under the Montreal Protocol, 5% as potent in depleting the ozone layer as CFCs. An international agreement, with financial support to developing countries, would be a more appropriate way to reduce HFC production from HCFC-22 plants than the current CDM process, which overpays the cost of the HFC burning equipment by 47 times (Wara & Victor 2008). Regulations are in place preventing CDM credits from being generated by new HCFC-22 production facilities, or the expansion of existing ones. Still, the CDM creates substantial disincentives for HCFC-22 plant phase out, in direct contradiction with the goals of the Montreal Protocol.

Perverse incentives - One of the early criticisms of the CDM is that it could create perverse incentives for government or the private sector to refrain from implementing policy and taking action to reduce emissions. The need to measure actual emissions against a baseline – a future scenario describing what would likely have happened without the CDM – creates incentives to maintain a high baseline in order to later generate higher amounts of credits per project. Going back to the HCFC-22 example, if a country imposes regulation requiring HCFC-22 production facilities to destroy the HFC gas byproduct, facilities might no longer be able to generate the substantial income from the sale of carbon credits, causing a significant disincentive for such regulation. Of concern is the extent to which the CDM is impeding decarbonization because of perverse incentives that dissuade governments from enacting climate-friendly policies.

Limited in scope - The CDM can only fund activities for which it is believed that emissions reductions can be reasonably estimated, and excludes project types which may have a higher GHG abatement potential at lower cost, but for which emissions reduction estimations are especially complex or uncertain. The CDM is not structured to support many efforts necessary to decarbonize sectors and affect a large-scale deployment of clean technologies – policies, R&D, demonstration projects, information dissemination, etc, because measuring emissions reductions from these efforts may be difficult or infeasible. The dissemination of technologies, such as

²⁹ This decision was clarified in the report from Executive Board Report 43, from the 43rd meeting of the CDM Executive Board, 22 - 24 October 2008, http://cdm.unfccc.int/EB/043/eb43_repan13.pdf

bagasse cogeneration in India, can be limited by multiple barriers requiring a number of different and parallel support efforts simultaneously and over time, many of which could not be supported through a project-based offsetting mechanism (Haya et al 2009). Efforts to affect sectoral change are often best done in the context of an integrated planning process in which multiple goals and interests are addressed together (Halsnaes et al 2008). Revenues from the generation of carbon credits could be only one part of a much larger set of support efforts for both sectors and specific technologies.

8. The large-scale use of offsetting credits poses challenges to near and long term climate change mitigation

Even if we manage to design an international offsetting mechanism that effectively reduces emissions and accurately credits them, what effects does large scale offsetting have on global efforts to mitigate climate change over the next decades? Scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC) suggest that a reduction in industrialized countries by 25% to 40% below 1990 levels by 2020, on a path towards 80% to 95% reductions by 2050, still corresponds with a 2.0-2.4 degree Celsius temperature increase (Box 13.7 from Gupta et al 2007, Table SPM.6 from Intergovernmental Panel on Climate Change 2007). These scenarios correspond with reductions in developing countries by 15% to 30% below business-as-usual growth projections by 2020 (Höhne & Ellermann 2008). Even deeper reductions would be needed globally if we wish to have a high likelihood, rather than an almost 50% chance, of not exceeding a two degree increase. Further, since these scenarios were published, additional research suggests that climate sensitivity (the increase in radiative forcing resulting from the increase in GHGs in the atmosphere) is higher, and feedback effects even greater than the assumptions used to produce the IPCC scenarios (McMullen & Jabbour 2009).

Industrialized countries are proposing high levels of offsetting post-2012, which if used, would put these countries far away from the 25%-40% reductions by 2020 from the IPCC scenarios. At the time this paper was written, the EU was proposing to cut its emissions by 30% below 1990 levels by 2020 within the context of an international agreement, allowing 68% of those reductions to be met through international offsets.³⁰ If all of these offsets are used, the EU would achieve a less than 17% reduction compared to 1990 levels by 2020. In the US, a prominent draft climate bill, the Waxman-Markey American Clean Energy and Security Act of 2009,³¹ would require the US to cut its emissions to 4% below 1990 levels by 2020. This bill allows up to two billion tons of CO₂ as offsets, equal to 28% of its 2005 emissions, allowing a half to three-quarters of these, depending on the availability of domestic offset credits, to be from international sources. The international portion, if used in full, would allow the US to postpone making any reductions in its emissions from current levels until 2020 to 2024. This postponement would be even longer if some portion of domestic offsets is non-additional.

Two justifications are commonly given for high quantities of offsets. The first is simple market efficiency. Trade in emissions reductions allows industrialized countries to reduce

³⁰ Hanley N. 2009. *EU Climate and Energy Package, December 2008*. Presented at the Energy and Resources Group, University of California, Berkeley. *March 18*. The package recommended 50% of all reductions in the ETS, covering approximately 40% of EU emission, can be met with foreign credits and 80% of reductions in non-ETS sectors can be met with foreign credits.

³¹ <http://www.govtrack.us/congress/bill.xpd?bill=h111-2454>

emissions less expensively than if they were required to reduce them domestically. Second, by providing low cost compliance options, offsets help bring buy-in from domestic industries, making it easier and more likely for industrialized countries to accept deeper targets than they would have otherwise.

However, large-scale access to these potential lower-cost compliance options also introduces risk to present mitigation efforts and would most likely make climate change mitigation more difficult in the future. First, domestic reductions are more certain than international offsets.³² Any country has more knowledge about and control over activities within its own borders than it does for projects and activities which it funds elsewhere. Also, measuring emissions, as is done in a cap-and-trade program, is easier than measuring reductions in an offsetting program, as described in detail above. As such, offsets introduce various uncertainties regarding the amount of emissions reductions they actually represent. Any offsetting in developing countries, whether it is project-based or sector-based, involves measuring emissions against a BAU growth scenario, which is inherently uncertain, and politically difficult to set at a low level.

Second, cap-and-trade weakens incentives for innovation by allowing a larger portion of compliance to be met with existing and low cost technologies (Driesen 2003). Decarbonization to 80-95% below 1990 levels by 2050 in industrialized countries will require major shifts in all high emitting sectors. Transportation, the electricity sector, buildings, and agriculture all involve complex systems. Major shifts in each of these sectors requires time to allow for changes in behavior and in support industries, for experimentation and learning, research, development and deployment, etc.

The high level of offsets allowed could easily place the majority of global reductions up to 2020 in developing rather than industrialized countries. In the context of meeting the global reductions suggested in the IPCC scenarios, if 50% of all Annex 1 reductions are made through offsets (remember that the EU and the US are proposing substantially higher than that as upper limits) and that these offset projects are performed in addition to the suggested 15%-30% decrease from BAU in developing countries, then around 70% of all global reductions through 2020 would likely come from developing countries rather than the high per capita emitters.³³

If industrialized countries postpone domestic reductions as they are proposing through the use of offsets, they are either committing to steeper annual reductions in the future, or to long-term inequalities in emissions in the North and the South. Both options make future cooperation more difficult. In industrialized countries, a gradual migration of infrastructure is likely to be less costly than rapid transitions that could require retiring technology and infrastructure before the end of their lifetime. If the costs of mitigation are expected to be high, there will be more resistance from industry.

In addition, a high future dependence of offset credits from developing countries poses compliance risks on industrialized countries. The further actual domestic emissions are in an industrialized country from their targets for a given commitment period through the help of offset credits, the harder it will be for that country to commit to meaningful reductions in the following period. Large quantities of offsets might make it easier for industrialized countries to

³² Here offsets refer to credited emissions reductions generated by any activity whose emissions are not capped under a cap-and-trade program.

³³ Reductions are defined here as reductions from the Kyoto Protocol caps for industrialized countries, and reductions from BAU in developing countries.

take on deeper commitments now, but could also make it harder for them to accept deeper targets in the future.

We live in a world with a widely shared linear view of development and progress (Norgaard 1994). Deep in urban and rural India, visions of “development” and symbols of high status are heavily influenced by images of consumption from the North. The discourse of development used by the World Bank is also used by country governments, and is disseminated through participants in and those affected by World Bank projects. Developing country citizens have learned that they are “backwards” and “underdeveloped” (Escobar 1995, Gupta 1998). Rural electrification has allowed more and more people to view western lifestyles on TV, and TV commercials spreading a culture of consumerism and awareness of not having (Jacobson 2004). Development in India is highly status driven – beyond getting out of poverty is a pursuit of symbols of high status, such as a big car and a new cell phone. In a world dominated by a single vision of “progress” sustainability requires changing the image of what “developed” means. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

Advanced developing countries are being asked to join the global community in accepting obligations to mitigate their emissions below BAU growth projections. Will developing countries commit to controlling the growth in their already low per capita emissions if it is clear that there is relatively little willingness in the industrialized world to reduce their much higher per capita emissions? Developing countries will need to make voluntary reductions before it is fair, given how quickly we need to reduce globally. This can happen only in a regime built on trust and mutual cooperation. Politically, it will be unlikely that developing countries will take calls for global cooperation seriously, if industrialized countries do not take on commitments to curb their own emissions as prescribed by the IPCC.

9. Discussion and conclusions

Industries in industrialized countries are putting pressure on their governments to provide options for controlling costs of compliance with post-2012 emissions limits. The CDM is currently seen as a legitimate way to do so. The CDM also provides a way to engage the private sector in climate change mitigation in developing countries. The private sector is seen as well poised to find efficient and innovative options for reducing emissions, while avoiding some of the concerns over funds – corruption, lack of accountability, conditionality and traditionally donor-weighted decision-making. There is also an interest in taking advantage of existing institutions, rather than disbanding them and starting anew. The CDM was promoted with numerous trainings, workshops and promises, and has attracted many new players and new interest into the clean energy, energy efficiency and other low-emitting industries in India and elsewhere. Admitting the CDM was largely a failure could dampen interest in the next instrument.

Researchers and policy-makers have sought ways to reform the CDM to retain these benefits while improving its environmental integrity. In weighing the pros and cons of various options, we need to honestly assess the possibility of improving the environmental integrity of the CDM as a project-based offsetting mechanism, as well as what we need to do in the next commitment period to be on a path towards a high likelihood of not exceeding a global two degrees temperature increase.

A purpose of this paper is to examine the possibility of substantially improving the CDM's environmental integrity and effectiveness as a project-based offsetting mechanism. This paper shows that reasonably accurate project-by-project additionality testing is infeasible given the subjectivity involved in project development, investment and lending decisions. The need to do a test that is fundamentally difficult and inaccurate is disabling the CDM from being able to support truly additional projects, because of the complexity, uncertainty and time it adds to the CDM application process. As a result, the majority of CDM projects, and a large majority of CDM CO₂ reduction projects, are non-additional, evidenced by a range of analysis presented in this paper. Beyond additionality, the CDM is structured to either over-credit, or support a portfolio of projects that would otherwise be unviable for 10 or 21 years. Neither are good options. Because of the challenge of measuring emissions reductions from specific projects, the CDM is unable to support many measures needed, and sometimes more cost effective, for the deployment of technologies and decarbonization of sectors, such as policy, research and development, demonstration projects, and information dissemination. The CDM can also have the opposite effect, creating perverse incentives against the implementation of policy and for delaying the implementation of projects so that developers are able to maintain a high baseline against which to prove additionality and generate CERs. Even if the environmental integrity of the mechanism were ensured, large scale offsetting introduces various challenges to global climate change mitigation efforts over the next decades, especially considering the very weak post-2012 targets being proposed by industrialized countries.

Any post-2012 offsetting program will need to:

- include an alternative means for targeting projects and activities without testing additionality on a project-by-project basis, a process which is essentially subjective and inaccurate;
- be predictable, providing certain benefits to those depending on it; and
- be small in the context of deeper Annex 1 targets.

This could possibly be accomplished through small, targeted offsetting programs designed to help decarbonize specific sectors and promote specific technologies. Such programs could be custom designed through industrialized-developing country partnerships, at national or sub-national levels, to address what is needed to control emissions and promote technologies in their specific local contexts in line with domestic priorities and the expertise the industrialized country can offer. As opposed to the current CDM, such programs can involve multiple coordinated components, some credited and some not credited, that work together to address the barriers and support needs facing a technology or a sector. These programs would require a commitment to cooperate over many years. Additionality would still be a concern for such a program but would be more easily managed than with the CDM. Under the CDM, developers initiate projects, and the CDM EB and other CDM governance bodies mainly respond when projects and methodologies are submitted to them. As described above, it is very difficult to distinguish additional from non-additional projects individually. In contrast, under the offsetting program suggested here, the administrators of the program actively initiate projects and programs based on analysis as to how their involvement could lower emissions.

Experience so far with the CDM does not bode well for the political feasibility of such an approach. We have seen little indication that countries will agree to an offsetting mechanism that is small enough, targeted enough, and with conservative enough baselines, to preserve its environmental integrity, and the environmental integrity of the whole agreement. So far offsetting has not been effective and imposes uncertainty on global climate change mitigation efforts. Attention must be refocused on reductions in countries with emissions caps, with non-

credited support for mitigation efforts in developing countries. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North.

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APPENDIX: Figures and tables

Figure A-1: The CDM Project Pipeline Step-by-Step

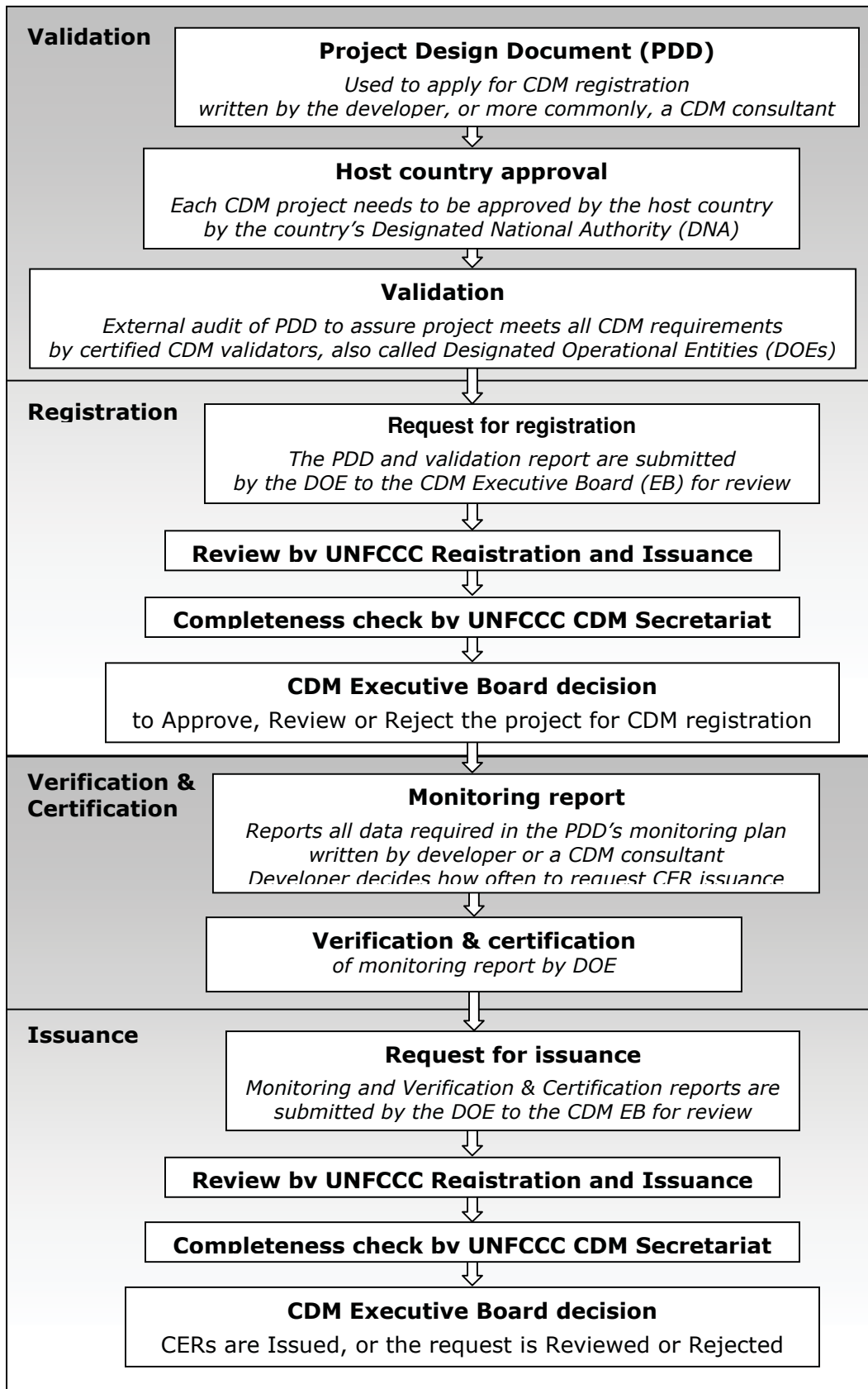


Table A-1 – Effects of the choice of post-PPA tariff and a deration rate on wind project financial returns

Project name	State in India	PPA length (years)	Tariff in year 1 (rp/kwh)	Tariff escalation rate? (rp/yr)	Tariff after end of PPA (rp/kwh)	Tariff escalation rate after end of PPA?	Deration rate?	Change in IRR from	
								Lower tariff 1 rs/kwh after end of PPA or increase to last PPA year ^b	5% deration rate in year 11
Bundled wind energy power projects (2004 policy) in Rajasthan	Rajasthan	13	3.25	0.06 through year 9	3.79 - same as last PPA year	--	--	-0.80%	
22.5 MW grid connected wind farm project by RSMML in Jaisalmer	Rajasthan	10	3.32	0.06	3.92 - same as last PPA year	--	--	-1.12%	
75MW wind power project in Maharashtra by Essel Mining Industries Limited	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.26%	
Wind power project by GFL in Gudhepanchgani	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-0.49%	
40 MW Grid Connected Wind Power Project	Maharashtra	13	3.5	0.15	3.89	2.50%	--	0.71%	
Wind Electricity Generation Project	Maharashtra	13	3.5	0.15	5.3 - same as last PPA year	--	--	-1.07%	
NSL 27.65 MW Wind Power Project in Karnataka	Karnataka	?? ^a	3.1	--	3.1	--	--	-2.20%	
Tungabhadra wind power project in Karnataka	Karnataka	10	3.4	--	Varies, 1.89 is average	--	--	2.03%	
Enercon Wind Farm (Hindustan) Ltd in Karnataka	Karnataka	10	3.4	--	Varies, 1.82 is average	--	--	2.23%	
29.7 MW Wind Power project in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.52%	
Wind power project by HZL in Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.59%	
42.5 MW Wind Power Project by VRL Logistics Ltd. In Karnataka State	Karnataka	10	3.4	--	3.06	--	-5% in year 11	0.90%	-0.31%
24.8 MW Wind power project by Belgaum Wind Farms Private Ltd. in Gadag, Karnataka	Karnataka	10	3.4	--	3.4	--	--	-1.46%	
150 MW grid connected Wind Power based electricity generation project in Gujarat	Gujarat	13	3.37	--	3.5	--	--	-0.81%	

^a The PPA length is not mentioned in the CDM project documentation. This analysis assumes a 10 year PPA, the same as the PPAs for the other projects in Karnataka.

^b Values in boldface indicate cases where the developer chose a post-PPA tariff lower than the tariff in the last year of the PPA. For this analysis, the post-PPA tariffs of these projects are brought up to the tariff in the last PPA year, rather than reduced an additional one rupee

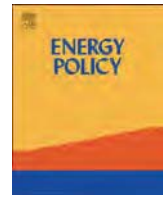
Table A-2 – Effects of biomass price on biomass project financial returns

Project name	CDM Status	PDD Date	Start project construction	Rice husk price in first year Rs./ton	Rice husk price annual escalation rate	Change in IRR or DSCR ^a		
						From CDM	+200 Rs./ton & + 2% esc rate in rice husk prices	+300 Rs./ton & + 2% esc rate in rice husk prices
Rice husk based Co generation project at Dujana unit of KRBL Limited	Registered	Jan-08	Oct-05	2650	0%	0.45	-0.41	-0.53
15 MW Biomass Residue Based Power Project at Ghazipur	Requesting registration	Nov-08	Dec-06	1200	4%	7.86%	<-10%	<-10%
DSCL Sugar Ajbapur Cogeneration Project Phase II	Registered	Feb-07	May-05	1150	2%	7.11%	-7.91%	-10.70%
KM RE project	Registered	Jan-07	Feb-06	700	0%	8.07%	-5.83%	-8.34%

^a DSCR (Debt Service Coverage Ratio) is a common financial metric used by banks to assess loan applications. A DSCR of less than one means that annual project revenues are less than the annual debt service. Here, the first project uses DSCR to measure project viability, and the other three use project IRR.

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Addressing carbon Offsetters' Paradox: Lessons from Chinese wind CDM



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HIGHLIGHTS

- We investigated 143 Chinese wind CDM projects by the eruption of the additionality controversy.
- We examined the application of additionality in the Chinese wind power market.
- We drew implications for the design of effective global carbon offset policy.
- The underlying structural flaws of CDM, the Offsetters' Paradox, was discussed.
- We charted a reform path that can strengthen the credibility of global carbon markets.

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ABSTRACT

The clean development mechanism (CDM) has been a leading international carbon market and a driving force for sustainable development. But the eruption of controversy over offsets from Chinese wind power in 2009 exposed cracks at the core of how carbon credits are verified in the developing economies. The Chinese wind controversy therefore has direct implications for the design and negotiation of any successor to the Kyoto Protocol or future market-based carbon regimes. In order for carbon markets to avoid controversy and function effectively, the lessons from the Chinese wind controversy should be used to implement key reforms in current and future carbon policy design. The paper examines the application of additionality in the Chinese wind power market and draws implications for the design of effective global carbon offset policy. It demonstrates the causes of the wind power controversy, highlights underlying structural flaws, in how additionality is applied in China, the Offsetters' Paradox, and charts a reform path that can strengthen the credibility of global carbon markets.

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1. Introduction

The clean development mechanism (CDM) set by Kyoto Protocol is the leading international carbon market which allows developed countries to meet their mitigation commitments by financing emission reductions in the developing world (UNFCCC, 1997). Project based CDM is seen as an important mechanism to achieve global sustainable development by fostering clean energy development in developing countries and cost-effective reduction of greenhouse gasses in developed countries (Olsen, 2007), and typically allows for nations with emissions commitments to invest in greenhouse gas mitigation projects in host countries without commitments.

International carbon finance has provided a significant boost to Chinese wind development. China's installed wind capacity has been growing at an unprecedented pace, the total installed capacity has reached 75.5 GW as of the end of 2012 (CWEA, 2013). CDM first provided finance for Chinese wind in 2005, and we estimate that about 32% of China's total wind capacity of 25.1 GW has benefited from CDM finance through 2009 (CREIA, 2009).

One of the central criteria used to evaluate CDM projects is "additionality", which is defined as carbon offset payments result in "real" emissions mitigation that "would not have happened otherwise" (UNFCCC, 2006). Controversy over the CDM projects is not new. There have been concerns about the additionality and the economically efficiency of industrial gas projects, for example trifluoromethane (HFC-23), which is inexpensive to cut but received payments via the CDM which may have been many times more valuable than the gas being produced, creating perverse incentives. Scholars have argued that such projects therefore

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undermine the effectiveness of CDM (Wara, 2007). But other types of projects, such as renewable energy projects, are usually viewed as comparatively higher quality with lower risk of “non-additionality” or economic inefficiency.

The questionable additionality of many CDM projects has become a central issue in the CDM discussion (Paulsson, 2009). Haya (2010) examined hydro CDM projects in India, and found that there is no accurate verifiable indicator of whether CO₂ reduction projects would be built without the CDM. Those concerns raise the incentive problems created by asymmetric information, include adverse selection and moral hazard, in the offset markets (Bushnell, 2010). However, the implementation of CDM in China is less discussed, and the impact of how and whether CDM might interface with domestic policy and regulatory regimes is not seen in the existing literature.

However, this issue came to a head when the CDM Executive Board (CDM EB) shocked the carbon market by forcing an unprecedented review of whether Chinese wind projects satisfied UNFCCC additionality requirements and then rejected 10 Chinese wind CDM from registration in 2009 (CDM EB, 2009a, 2009b). CDM investors were shocked as the safest CDM bet became the riskiest; the Chinese stakeholders publicly attacked the UN’s oversight of carbon markets and criticized the decision “unfair” and “non-transparent” (10 Chinese Wind Power Project, 2009); and the CDM EB prepared itself for an unprecedented fight over how carbon offsets could be verified in the world’s largest CDM market. In 2010, the EB’s 52nd meeting saw two of the ten wind projects registered after clarification, but the remaining eight projects were rejected (CDM EB, 2010). We call the controversy along the additionality of Chinese wind CDM project the “Chinese wind controversy” (controversy for short).

Additionality is the concept employed to verify that credits for carbon reductions are not payments for business as usual (BAU) (UNFCCC, 2001). Additionality is at first glance a simple counterfactual, but proving a counterfactual is not easy (Haya, 2010; Schneider, 2009; Sutter and Parreño, 2007; Wara and Victor, 2008). The CDM’s “additionality tool” attempts to do this by comparing the financial returns of all possible investments, with the logic that businesses will invest in the projects with the highest projected internal rate of return (IRR) (CDM EB, 2008). Project developers wishing to receive CDM credits must demonstrate that the proposed CDM activity is not the most profitable (has lower IRR) when compared to a BAU investment scenario (which might be a coal plant in China, for example), but that with CDM finance it becomes competitive with the alternative investments. Two conditions are necessary for the IRR comparison to be a credible indicator of additionality: (1) the selected baseline that wind is compared to must represent actual BAU in the relevant market, and (2) IRR must be a credible indicator of behavior and investment patterns in the relevant market. As we will show, there are serious problems meeting either of these conditions for Chinese wind because of the complex structure of China’s power market.

At the center of the controversy was the concern that the Chinese government might be manipulating power tariffs in order to guarantee additionality and subsidize domestic renewable energy development with carbon finance. If it were, the credibility of the CDM in its largest market would be crippled. It is important to note that the challenges of CDM project validation in China are relevant in most of the developing world. A solution to the controversy is therefore imperative – not just for CDM investment in China – but for preserving the credibility of offsets as a global mitigation regime. In addition to EU Emission Trading Scheme (ETS), the major carbon offsets buyer, national or sub-national schemes are already in place in Australia, New Zealand, Japan, the U.S., Switzerland and Canada, and are planned in South Korea and Brazil (Promethium Carbon, 2013). China has also opened its pilot carbon trading program in June 2013. The

potential for these programs to allow international credits as offsets in national or sub-national carbon pricing schemes and to meet mitigation targets are under discussion. The lessons and experiences from CDM will be essential in the development of standards and procedures among those emerging carbon policies and ETs around the world.

Yet despite the best efforts of developers, Designated Operational Entities (DOEs), and the EB to address this problem, a comprehensive solution has so far remained elusive. In trying to decide whether the Chinese government was setting artificial power tariffs to “game” additionality, the EB initially suggested a rule which would compare power tariffs for new projects to the highest historical tariffs. Thus if new tariffs were significantly below historical tariffs, the thinking was that this could be an indication of manipulation. However such approaches are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005, and there exist numerous market-based reasons for altering the tariffs. Thus applying the “additionality tool” to compare power tariffs for new projects to the highest historical tariffs are not effective because both the Chinese wind industry and Chinese wind power pricing policy have change drastically since 2005 (CDM EB, 2008; CREIA, 2009; Li and Gao, 2008), making such comparisons obsolete in a rapidly changing market. The wind industry of 2005 looks very little like the wind industry of 2012. But more importantly, focusing so narrowly on the question of historical tariffs risks missing the forest for the trees. One central question and challenge to solve the Chinese wind controversy is how can the CDM reliably separate the impact of domestic regulations and policies from that of international carbon finance?

The paper addresses this essential question, utilizing a detailed analysis of all Chinese wind projects registered through 2009 when this controversy erupted. First, we demonstrate the structural dependency of IRR-based additionality in state-controlled power sectors on host country regulators. This dependency simultaneously gives host countries control of additionality outcomes while preventing additionality verification by the UN, and is a major cause of such problems. Second, we argue that the available evidence does not suggest that China games the CDM. Finally, we argue that the CDM must upgrade its policy to deal with the reality of power markets where additionality is inherently impacted by domestic policy. However, this challenge presents a paradox for climate policy makers that must be weighed carefully.

2. Data and methods

Data used in this paper was extracted and compiled by the authors from the project design documents (PDDs), investment analysis spreadsheets, and validation reports which are used for CDM project registration provided through the UNFCCC CDM official website (<http://cdm.unfccc.int/Projects/projsearch.html>). PDDs are the key documents involved in the validation and registration of CDM project activities submitted by project developers and validated by DOEs. Key project-based data, including the power tariff, investment costs, IRR with and without CDM, and sensitivity analyses, from all registered PDDs was manually entered to a database and adjusted for consistency of currencies, exchange rates over time, and tax policies. The basic statistics of studied wind CDM projects are presented in Table 1. One hundred forty three projects in total were included and analyzed, representing all Chinese wind CDM projects registered through the end of 2009. Sixty seven projects did not provide complete data in their sensitivity analysis in their PDDs, the authors calculated the sensitivities by extrapolating available data on percentage changes of IRR with changes of power tariff and investment costs.

Table 1
Basic statistics of the studied wind CDM projects.

Key variables	Mean	Max	Min	SD	Sensitivity
IRR with CDM	9.04%	11.87%	7.24%	0.0075	
IRR without CDM	6.40%	8.43%	4.24%	0.0070	
Power tariff (RMB/kWh)	0.5443	0.7600	0.3521	0.0973	11.35%
Investment cost (RMB/MW)	9,549,846	18,071,400	2,358,885	1,488,498	12.03%

3. Key findings

3.1. *Additionality is highly dependent on domestic regulation*

If China were manipulating power tariffs to game the CDM, it would only be possible because the current design of additionality gives them that power. The structural dependency of additionality on Chinese regulators can be clearly demonstrated as follows. Additionality for Chinese wind is largely determined by IRR comparisons of CDM projects to the 8% baselines given in the “Internal Notice on New Project Feasibility Assessment” by the [State Power Corporation \(2002\)](#). And our analysis shows that the single largest factor determining Chinese wind project IRR is the power tariff, in fact the data shows that on average, an 11.35% increase of the power tariff will make Chinese wind farms non-additional while China’s average on-grid power tariff had already increased from 0.3175 to 0.3676, 15.78% increase from 2006 to 2009 ([SERC, 2010, 2007](#)). There have been four major phases in the development of the Chinese wind power tariff system. In the first phase (1986–1993), wind power developments were funded by overseas aid funds and the tariff paid was less than 0.3 RMB/kWh, similar to that for coal-fired plants. In the second phase (1994–2003), the tariff was proposed by local governments and approved by the central government. During this period prices ranged from the relatively low price of 0.3 RMB/kWh up to 1.2 RMB/kWh. In the third phase, from 2003 to 2009, tariffs were decided by a concession process. Projects larger than 50 MW or in special wind-rich areas used this system (projects less than 50 MW were still subject to tariffs appointed by local regulatory decree), in which they submitted bids to the NDRC that included a proposed power tariff and the proposed share of domestically manufactured turbines. NDRC then approved the winning projects. The concession system ended in late 2009 when the NDRC established the “regional flag price” system, which set a single wind power price in major regions that functions like a feed-in tariff. These mandated prices are derived from the principle of “cost+reasonable return (with consideration of available wind resources)” ([CREIA, 2009](#); [NDRC, 2009](#)). The power tariff in those stages is highly dependent to China’s National or Local Development and Reform Commission. Thus the current design of the additionality test makes the Chinese government the most important arbiter of additionality – whether it wants to be or not – because IRR-based additionality is by design a function of NDRC power pricing.

This would not be a problem if China had market-based power pricing that could be validated by CDM regulators because power prices, and thus IRRs, would be a function of market pricing rather than regulatory decree. In this case IRRs would be a reliable indicator of project viability. But China’s power sector is not fully market-oriented. Unlike in liberalized power markets where prices are the result of bids and offers subject to some regulatory constraints, Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs). Wind is no exception. NDRC is directly determining wind tariffs based on its judgment of appropriate IRR as is China’s sovereign right. In fact, the official NDRC pricing

policy of “cost+reasonable return with consideration of available wind resources” explicitly indicates that the NDRC is determining the “reasonable return” through the tariff. But NDRC does not specify what the appropriate return is or how it is determined which again is China’s right, but a problem for CDM. In this context it is nearly impossible to know whether China is gaming the process or not. IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime.

Further, where more market-based pricing mechanisms have been tried, outcomes have been distorted by the presence of major SOEs that are not always motivated by market-based incentives. Investment and operations decisions in the power sector can be more sensitive to politics than profit, and politically driven losses are subsidized from the state balance sheet. In 2008 the “Big 5”, the largest SOE power producers including Huaneng, Datang, Huadian, Guodian, and China Power Investment, alone lost 40 billion RMB because raw coal was worth more than tightly capped power prices and generators were forced to run at a loss, which they wrote off as a “policy loss” that the government would make whole ([He and Morse, 2010](#)). Wind investment and pricing has been afflicted by a similar phenomenon. The national “concession system” for establishing wind power prices, which tried bidding by developers to establish tariffs five times from 2003–2009, certainly helped China move some projects closer to a market-based price discovery mechanism. But major SOEs were known to bid below-market prices in order to win projects and meet central government renewable energy quotas. Accordingly, observers have noted that the tariff outcomes of the concession system were artificially depressed and prices were low enough to discourage investment from private, non-SOE investors ([Li and Gao, 2008](#)). These distorted concession prices heavily influenced the setting of current regional feed-in tariffs ([NDRC, 2009](#)).

3.2. *No evidence of manipulation in China’s wind case*

The empirical analysis of power data for all CDM wind projects in China shows no obvious evidence of dramatic changes in pricing policy that might reveal deliberate price manipulation by the NDRC. While the design of current additionality policy creates the opportunity for manipulation without a way of proving it, the available evidence does not directly suggest that the Chinese government is in fact gaming the CDM. [Figs. 1 and 2](#) below show the trend in Chinese power tariffs granted to registered CDM wind projects since the inception of the CDM in China, and most projects were registered until late 2009. Though policies have changed, prices have not dramatically shifted lower. The single tariff granted higher than 1 RMB/kWh is an offshore wind project and therefore received an exceptional tariff. All tariffs discussed here exclude VAT. It should also be noted that the Chinese feed-in tariff for wind is roughly 1.5 times higher than the average tariff for on-grid power; the average price granted to CDM wind projects was 0.5443 RMB/kWh (excluding VAT), and the average on-grid power price was 0.36034 RMB/kWh in 2008 ([SERC, 2009](#)). The average wind tariff (excluding VAT) for the 10 rejected wind projects is 0.5094, compared to 0.5443 of the total average. Those projects locate in Inner Mongolia, Heilongjiang, Liaoning and

Xinjiang, which have the best wind resources thus are granted lower on-gird wind prices set by NDRC (2009). The average IRR without CDM for those projects is 6.39%, IRR with CDM is 9.99%, and CDM would make 3.6% difference.

Table 2 shows the average wind tariff of the projects registered in a year decreased 5.8% from 2006 to 2008, then increased 3.7% in 2009, an overall 2.3% decrease from 2006 to 2009. At the same time, the reported average wind investment cost had grown 6.2% from 2006 to 2009, which is not consistent with what reported in the industry that the wind investment cost started to fall in 2008 due to the localization of manufacture and economy of scale (Li et al., 2010). As the total wind capacity in China has risen, absolute subsidies for Chinese wind projects have increased dramatically. Total subsidies paid by the Chinese government have rocketed from 229.29 million RMB in 2003 to 2379.94 million RMB in 2008 (CREIA, 2009). However, on a per-MW basis, those subsidies have mostly decreased from 0.4 million RMB in 2003 to 0.2 million RMB in 2008, half of that five years ago.

4. Implications for climate policy

We have shown the additionality test dependent on an IRR generated from Chinese power prices. This problem is not limited to Chinese wind – it applies for almost all renewable energy

projects in developing countries with state controlled power sectors – and thus could damage the credibility of the CDM (Haya, 2010; Victor, 2011; Wara, 2007). Reform is necessary to use additionality metrics that are less dependent on domestic regulators. Possible reforms in the near term might contemplate using an enhanced barrier analysis that phasing out easy investment projects, interacting with NDRC to better understand domestic pricing policy so to make more transparent and sound observation of the pricing dynamics, or using a more credible baseline that reflect the evolution of China’s changing power sector (He and Morse, 2010). This could be challenging as the projects involve multiple technologies in multiple countries, however, a more transparent, credible baseline will apply immediate improvement to the mechanism. In the long-term, offset policy needs to be agnostic to market structure in developing country power sectors. The thinking on new market mechanisms (NMMs), for example sectoral approaches and program of activities that decouple the host entity from specific activities or policies, mitigates the additionality tests by building a sectoral baseline (Aasrud et al., 2009; IGES, 2013). The NMMs issue allowances based on a sectoral ex-ante, no-lose targets, with penalty for missing target, thus make incentives more compatible.

Even if reforms eliminated the dependency of additionality on domestic power pricing decisions, a more difficult question remains. How should additionality account for the impact of broader changes in domestic policy over time? China’s wind power policies have changed dramatically since 2003, making additionality a moving target (Li and Gao, 2008). “E+/E-” policies were introduced to provide clear rules on how to treat domestic policies impact emissions, “E+” policies increase emissions, “E-” policies reduce them (CDM EB, 2009c). “E+/E-” policies refers to clarifications on the consideration of national and/or sectoral policies and circumstances to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that have impact the host country’s contributions to the ultimate carbon mitigation (CDM EB, 2009c). But they were not designed to accommodate complex issues like Chinese feed-in tariffs where subsidies are embedded within a complicated, state-controlled power pricing regime (Morse et al., 2010; Peng, 2011).

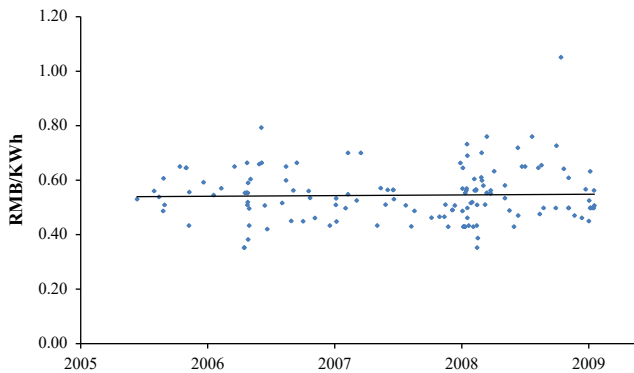


Fig. 1. Wind tariff by registration date for CDM projects.

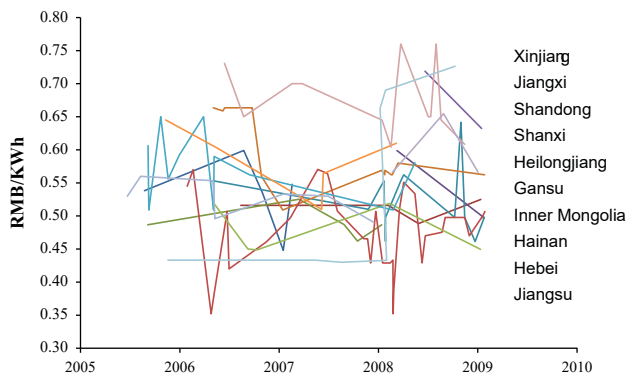


Fig. 2. Wind tariff by province for CDM projects, Note: The provinces are appeared in the order of their 2009 tariffs.

Table 2 Average wind tariff and investment cost of registered wind CDM projects by year.

Year	2006	2007	2008	2009
Average project power tariff (RMB/kWh)	0.5613	0.5355	0.5288	0.5485
Average wind investment cost (million RMB/MW)	8.96	8.81	8.99	9.51

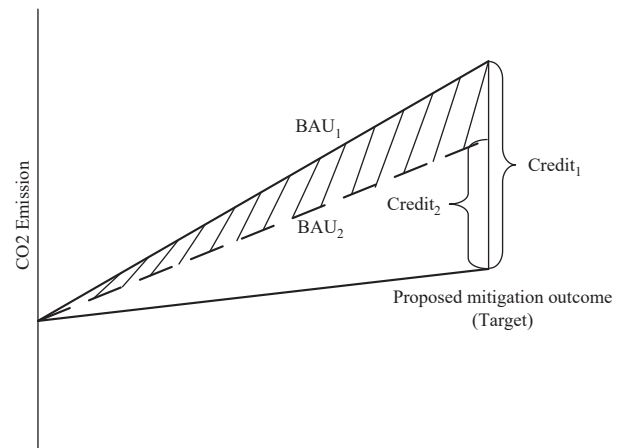


Fig. 3. The Offsetters' Paradox.

Carbon policy must craft rules for the entire CDM that segregate the impact of evolving domestic policy from the impact of carbon finance when judging additionality. Unfortunately, this challenge presents a paradox for policy makers. On one hand, including domestic subsidies in the additionality calculation creates perverse incentives for the host country by making projects less eligible for CDM and therefore discouraging policies that would jeopardize CDM revenues. On the other hand, ignoring these subsidies assures crediting for business as usual projects, which reduces the integrity of global emissions caps (Morse and He, 2010).

This problem applies in nearly any situation where additionality is the central principle because additionality by definition compares a baseline of BAU to a lower emissions trajectory. As shown in Fig. 3, if credits are given for the difference between BAU₁ and target trajectories, any domestic policy that lowers baseline emissions to create BAU₂ reduces carbon payments, and therefore disincentivizes domestic emissions-reducing policies that would shift BAU₁ to BAU₂. Alternatively, if the offset mechanism attempts to solve the perverse incentive problem by crediting against BAU₁ instead of BAU₂ and ignores the domestic mitigation policy, then carbon offsets pay for what would have happened anyway as the shaded area depicts. We call this fundamental tension of additionality the Offsetters' Paradox. Post-CDM offset policy will need to directly confront this problem and decide how to strike an appropriate balance. This will become increasingly important as negotiators push for Nationally Appropriate Mitigation Actions (NAMAs) of developing countries that give domestic policy an even larger role in international climate policy.

5. Conclusion

The analysis presents additionality's dependence on domestic regulators in the near-term and draws an uneasy line between creating perverse incentives and crediting for BAU in the longer-term. The controversy over the additionality of Chinese wind offers key lessons for how the world can design, validate, and implement carbon offsets. This calls into question the integrity of the global carbon cap set under the second commitment period of the Kyoto Protocol. Post-2012 carbon policy should confront these imperfections and seek to reduce them by addressing the type of failures exposed by the Chinese wind controversy. Short-term reforms can immediately make project approval more credible and expeditious. Longer-term, mechanisms that are agnostic to market structure and independent of domestic regulators offer a better chance for avoiding controversy and proving the viability of carbon markets as a sound mitigation regime. Finally, the designs of offset mechanisms and linking of different trading schemes need to directly confront the Offsetters' Paradox because ignoring it will ultimately undermine the ability of the market to function.

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MEASURING THE CLEAN DEVELOPMENT MECHANISM'S PERFORMANCE AND POTENTIAL

Michael Wara*

The Clean Development Mechanism (CDM) of the Kyoto Protocol is the first global attempt to address a global environmental public goods problem with a market-based mechanism. The CDM is a carbon credit market where sellers, located exclusively in developing countries, can generate and certify emissions reductions that can be sold to buyers located in developed countries. Since 2004 it has grown rapidly and is now a critical component of developed-country government and private-firm compliance strategies for the Kyoto Protocol. This Article presents an overview of the development and current shape of the market, then examines two important classes of emission reduction projects within the CDM and argues that they both point to the need for reform of the international climate regime in the post-Kyoto era, albeit in different ways. Potential options for reforming the CDM and an alternative mechanism for financing emissions reductions in developing countries are then presented and discussed.

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INTRODUCTION

Global warming is one of the most difficult and important environmental challenges facing the international community. To date, the most substantial effort to address climate change is the Kyoto Protocol (Protocol).¹ Although not ratified by the United States and only recently by Australia,² the Protocol was signed and ratified by every other large developed country and entered into force on February 16, 2005.³ It is likely the largest and most expensive international effort to combat a global environmental commons problem.

The Protocol is a highly innovative international agreement as it both incorporates and allows for numerous trading mechanisms. These flexibility mechanisms were inserted into the text during the negotiation process at the insistence of the United States, its most prominent nonsignatory.⁴ They are quickly becoming, if they have not already become, the preeminent examples of attempts to address an international environmental problem using market-based approaches.

The United States and the international community are at a critical juncture in the effort to address the problem of climate change. Although the United States declined to join the Protocol, regulations to control carbon dioxide (CO₂) emissions are currently being developed by a coalition of seven

1. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22, available at <http://unfccc.int/resource/docs/cop3/07a01.pdf> [hereinafter Kyoto Protocol].

2. *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, N.Y. TIMES, Dec. 4, 2007, at A8, available at <http://query.nytimes.com/gst/fullpage.html?res=9800E7DF1E3BF937A35751C1A9619C8B63>.

3. United Nations Framework Convention on Climate Change, Kyoto Protocol: Status of Ratification, http://unfccc.int/essential_background/kyoto_protocol/status_of_ratification/items/2613.php (last visited June 5, 2006) [hereinafter Kyoto Protocol Status]. The Kyoto Protocol entered into force on the ninetieth day after at least fifty-five parties to the Convention, including Annex 1 parties accounting for at least 55 percent of total 1990 carbon dioxide emissions ratified the treaty. Kyoto Protocol, *supra* note 1, art. 25 § 1.

4. Daniel Bodansky, *Bonn Voyage: Kyoto's Uncertain Revival*, NAT'L INTEREST, Fall 2001, at 5.

northeastern states,⁵ by California,⁶ and are proposed in multiple bills in the U.S. Senate.⁷ In addition, many U.S. firms will be forced to comply with the Protocol in their international operations. Finally, the Protocol is set to expire at the end of 2012, and negotiations for a future global warming treaty, including market-based components, are therefore underway.⁸

The effort to curb global warming will be difficult and costly. Sustaining necessary political support and expenditure will require that policies implemented to achieve climate stabilization are both environmentally sound and cost effective. This Article aims to contribute to the success of this effort by presenting a critical empirical analysis of the current market for greenhouse gases (GHGs) under the Protocol and suggesting possible reforms. It is highly likely that any future global warming treaty will include market-based solutions; all current examples of climate regulation incorporate market-based mechanisms, and such mechanisms may result potentially in substantial cost savings.⁹ These markets for pollution, if they are to succeed in accomplishing a future treaty's environmental goals, must both incorporate the successes and eliminate the shortcomings of previous efforts. Given the rapid development of the Protocol's GHG markets over the last three years and the incipient negotiations over a future treaty, the time is ripe for an analysis that attempts to identify the successes and the failures of the initial experiments in GHG emissions trading.

The Clean Development Mechanism (CDM), a market-based emissions trading mechanism created under the auspices of the Protocol,¹⁰ certifies GHG emission-reduction credits generated by projects in the developing world that can be sold to emitting developed countries facing compliance obligations under the treaty. Payment for the credit is intended to fund the

5. The coalition includes Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. Memorandum of Understanding From the Regional Greenhouse Gas Initiative *passim* (Dec. 20, 2005), http://www.rggi.org/docs/mou_12_20_05.pdf [hereinafter RGGI Memo].

6. MKT. ADVISORY COMM., CAL. AIR RES. BD., RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA, at iv-v (2007), available at http://www.climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF.

7. The most prominent federal proposal to reduce U.S. greenhouse gases (GHG) emissions, which includes a market for GHG emissions, is America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007).

8. The Bali Action Plan lays out a path for negotiation of a post-Kyoto framework. See United Nations Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali, Indon., Dec. 3–15, 2007, *Decision 1/CP.13: Bali Action Plan*, U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3> [hereinafter *Bali Action Plan*].

9. Kyoto Protocol, *supra* note 1, arts. 6, 12, 18; RGGI Memo, *supra* note 5; America's Climate Security Act of 2007, S. 2191, §§ 2101–2503.

10. Kyoto Protocol, *supra* note 1, art. 12, § 1.

cost of reducing GHG emissions, thereby facilitating developing-country participation in the international climate regime and assisting in the achievement of sustainable development.¹¹ All emissions reductions certified under the CDM are supposed to be voluntary, real, and additional to any that would occur in the absence of the credit system.¹²

The CDM is the first attempt to address a global atmospheric commons problem using a global emissions trading market.¹³ Over the past three years, the CDM has developed the shape that it will likely have during the first commitment period of the Protocol.¹⁴ The goal of this Article is both to describe this broad outline and to use it to inform the design of future treaty architectures and administrative legal regimes¹⁵ aimed at the control of GHG emissions and global warming.

This analysis builds both on legal scholarship that first identified the potential of emissions trading regimes to reduce the costs of providing environmental goods,¹⁶ and on a relatively extensive body of legal scholarship analyzing the results of attempts to design and to implement emissions trading markets. Empirical work on emissions trading markets has focused on the strategic behavior of market participants,¹⁷ the complicated role of the regulator,¹⁸ environmental justice problems caused by emissions trading markets,¹⁹ and the difficulty of monitoring certain air pollutants necessary for

11. *Id.* art. 12, § 2.

12. *Id.* art. 12, § 5.

13. In contrast, the Montreal Protocol utilized a fund contributed to by developed countries to pay for the cost of emissions reductions of ozone-depleting substances in developing countries. See The Montreal Protocol on Substances That Deplete the Ozone Layer art. 10, *opened for signature* Sept. 16, 1987, 1522 U.N.T.S. 28, available at <http://www.unep.org/OZONE/pdfs/Montreal-Protocol2000.pdf> [hereinafter Montreal Protocol].

14. The first commitment period extends from January 1, 2008 to December 31, 2012. Kyoto Protocol, *supra* note 1, art. 3.1.

15. Regarding the emergence of a body of international administrative law, see Benedict Kingsbury et al., *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15 (2005).

16. Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1341–51 (1985).

17. David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 310 (1998); Gary C. Bryner, *Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading*, 17 TUL. ENVTL. L.J. 267, 291 (2004).

18. Lesley K. McAllister, *Beyond Playing “Banker”: The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 312–13 (2007).

19. Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Injustice: Los Angeles’ Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL’Y F. 231, 252 (1999); James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 628–29 (2000).

emissions trading.²⁰ To date, however, these analyses have focused on domestic markets. International markets, because they involve both an international regulator as well as developing-country governments and firms, are likely to present both similar and unique challenges.

The CDM was designed around the insight that the marginal cost of emissions reductions in developing, and especially rapidly developing, countries would be less than those faced by developed nations.²¹ The basis for this insight was that the cost of building more efficient, lower-GHG-emitting industrial and energy facilities in the developing world would be far lower than the cost of prematurely retiring or retrofitting existing developed-world capital stock.²² By means of the CDM, GHG emissions reductions could occur in the developing world that would otherwise have occurred in the developed world at far higher cost.²³ The expectation was that by putting a price on GHG emissions in the developing world and by linking that price to developed-world cap-and-trade markets for CO₂, costs of compliance with the Protocol in the developed world could be significantly reduced. This Article will show that what has in fact occurred is something far different: (1) the CDM has primarily proffered an exchange of CO₂ emissions reductions in the developed world for reductions of various non-CO₂ gases in the developing world; (2) substantial strategic behavior has occurred, aimed at manipulating baselines in order to increase the number of offsets created; and (3) as participation in the energy sectors of developing countries has deepened, the regulatory challenge faced by the CDM Executive Board in determining whether a project's reductions are "additional to any that would occur"²⁴ in its absence has become deeply problematic.

The CDM in its current form is, from an environmental perspective, highly imperfect. It is nonetheless creating both powerful political institutions and stakeholders interested in maintaining the current system or something similar.²⁵ Given the relatively poor performance, at least initially,

20. Drury et al., *supra* note 19, at 280–81; Thomas O. McGarity, *Missing Milestones: A Critical Look at the Clean Air Act's VOC Emissions Reduction Program in Nonattainment Areas*, 18 VA. ENVTL. L.J. 41, 57 (1999).

21. See Michael A. Toman, Richard D. Morganstern & John Anderson, *The Economics of "When" Flexibility in the Design of Greenhouse Gas Abatement Policies 2–3* (Resources for the Future, Discussion Paper No. 99-38-REV, 1999).

22. Prepared Testimony of Janet Yellen, Chair, Council of Economic Advisors Before the House Commerce Committee Energy and Power Subcommittee (Mar. 4, 1998), *reprinted in* FED. NEWS SERVICE, Mar. 4, 1998, at 5.

23. Toman, Morganstern & Anderson, *supra* note 21, at 2–3.

24. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

25. See for example, the membership of the International Emissions Trading Association, a strong CDM supporter which includes many of the largest global financial institutions.

of other markets for atmospheric pollution, the imperfect performance of the CDM is not entirely surprising and should not be a reason to abandon the system. The CDM is failing as a market because its rules, rather than producing real reductions, have accounting loopholes that allow participants to manufacture GHG credits at little or no cost beyond the payment of consultants necessary to surmount the necessary regulatory hurdles. Further, although it is supplying credits to developed signatories of the Protocol at prices less than they would otherwise be, the CDM is an excessive subsidy that represents a massive waste of developed-world resources. It is too late to change the structure of the CDM to address its shortcomings prior to the end of the first commitment period.²⁶ The overarching aim of this Article is to argue that in the period after 2012, both the financial resources devoted to the current CDM architecture and the additional resources likely to be added as developed-world commitments to cut GHGs deepen, might be far more efficaciously allocated in the international effort to stem global warming.

Such reform need not compromise the notable success of the CDM as a political mechanism. The CDM has produced remarkable participation in the developing world. Participation has been most active in countries with relatively high rates of economic growth. In other words, the developing countries whose efforts are most needed to help resolve the global warming problem are the same countries that have been engaged. At the same time, this has created political difficulties within developed countries where the subsidy of nations such as China and India is unpopular and hard to justify given their high rates of growth. Relative levels of developing-world participation and benefit from the CDM have also created tensions among the signatories to the Protocol²⁷ because of the growing perception that the distribution of credit revenues is extremely inequitable; most of the funds flow to a few relatively well-off developing countries.

Two tracks for reform seem possible. One option is to address the current regime's shortcomings while maintaining its basic structure in the post-2012

International Emissions Trading Association, Membership, <http://www.ieta.org/ieta/www/pages/getfile.php?docID=556> (last visited July 15, 2008).

26. The Kyoto Protocol's First Commitment Period, the interval of time during which developed-world parties to the treaty must comply with quantified emissions limits, extends from 2008 to 2012. Kyoto Protocol, *supra* note 1, art. 3.

27. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Bali, Indon., Dec. 3–15, 2007, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol in Its Third Session, Held in Bali From 3 to 15 December 2007*, ¶ 36, at 11, U.N. Doc. FCCC/KP/CMP/2007/9 (Mar. 14, 2008), available at <http://unfccc.int/resource/docs/2007/cmp3/eng/09.pdf>; see also, United Nations Framework Convention on Climate Change, The Nairobi Framework-Catalyzing the CDM in Africa, http://cdm.unfccc.int/Nairobi_Framework/index.html (last visited Mar. 31, 2008).

climate regime. This would involve strengthening the administrative procedures within the CDM in order to increase the certainty that projects are producing real reductions that are additional to any that would have occurred without the program. This reform would have to be accomplished without increasing transaction costs or project risks to such an extent that participation in the scheme was reduced below a useful level. The second option would discard the market-based approach of the CDM and adopt a fund-based approach best exemplified by the Montreal Protocol's Multilateral Fund.²⁸ While a fund approach would not necessarily solve all of the problems associated with the CDM, and might create new and as yet unforeseen difficulties, it would improve the efficiency of the system and likely increase its environmental effectiveness.

In Part I, I will first briefly introduce the Kyoto Protocol and the Clean Development Mechanism. I will then present in Part II a description of the current state of supply to the CDM market, followed in Part III by a story of the participation of a particular highly specialized industry that produces small quantities of a very potent greenhouse gas. Part IV explains how the underlying structure of the market has incentivized this particular industry to generate large numbers of CDM credits and thus to dominate the first phase of market growth. I will also tell a second story in Part V about the challenges presented by the recent dramatic increase in the level of CDM participation by China's energy sector. Here, the interaction between international regulators and a state-regulated industry is leading to attempts to generate large numbers of credits for behavior that would have occurred even in the absence of the CDM. Finally, in Part VI I will conclude by sketching out two possible futures for international emissions trading between developed and developing countries that incorporate lessons from the unforeseen problems of the first three years of emissions crediting under the CDM.

I. THE KYOTO PROTOCOL AND THE CLEAN DEVELOPMENT MECHANISM

A. The Kyoto Protocol

The international agreements aimed at controlling greenhouse gas emissions are hierarchically structured. The most general and overarching agreement, known as the United Nations Framework Convention on Climate Change (UNFCCC or Convention), adopts as its goal the stabilization

28. Montreal Protocol, *supra* note 13, art. 10, § 3.

of GHG concentrations in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system.²⁹ The UNFCCC has been signed and ratified by 192 countries,³⁰ including all major emitters of greenhouse gases.³¹ Although its goal is ambitious, the UNFCCC contains no provisions that compel action to accomplish it. Rather, it lays out a process through which various protocols containing more specific commitments might be negotiated.³² The first of these protocols was negotiated at Kyoto in 1997.³³ The Kyoto Protocol (Protocol), as it has come to be called, establishes binding caps on emissions for developed nation parties and parties with economies in transition (Annex B parties or Annex B nations).³⁴ These caps are limits on emissions of GHGs during the 2008–2012 period.³⁵ The caps are set as reductions below each party's 1990 emission level³⁶ of six GHGs: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).³⁷ Emission reduction commitments specified by the Protocol are typically 5 to 8 percent below the 1990 emissions baseline, although some parties successfully negotiated a commitment of no reduction, or even an increase

29. United Nations Framework Convention on Climate Change, New York, U.S., May 9, 1992, art. 2, U.N. Doc. FCCC/Informal/84, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> [hereinafter UNFCCC Convention].

30. United Nations Framework Convention on Climate Change, Status of Ratification, http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (last visited July 15, 2008).

31. Compare United Nations Framework Convention on Climate Change, Status of Ratification, available at http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_conv_rat.pdf (last visited Apr. 3, 2006), with UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003 SUBMITTED TO THE U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, KEY GHG DATA 21, 92–94 (2005), available at http://unfccc.int/resource/docs/publications/key_ghg.pdf. I define major emitters of greenhouse gases somewhat arbitrarily as those nations emitting more than 500 million metric tons (Mt) of CO₂ or its equivalent in other GHGs (CO₂) per year. As of their latest reports of GHG emissions to the United Nations Framework Convention on Climate Change (UNFCCC), this list included Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, the Russian Federation, Ukraine, the United Kingdom of Great Britain and Northern Ireland, the United States, and collectively, the European Union. *Id.*

32. UNFCCC Convention, *supra* note 29, at arts. 7, 17.

33. Kyoto Protocol, *supra* note 1, at art. 28.

34. *Id.* art. 3. Note that not all Annex I nations of the UNFCCC adopted commitments as specified in Annex B of the Kyoto Protocol. The most notable of these are the United States and Australia. This Article will use the terminology “Annex B” nation or party to refer to a signatory that did adopt such a commitment. These nations are sometimes referred to as Annex I nations or parties.

35. This period is commonly referred to as the “commitment period” or the “first commitment period.” *Id.*

36. *Id.* art. 3, annex B.

37. *Id.* annex A.

above the baseline.³⁸ Additionally, different levels of economic growth or stagnation since 1990 mean that while some Annex 1 nations face steep cuts, others actually have excess allocations.³⁹

The Protocol includes various flexible mechanisms aimed at reducing the cost of compliance for Annex B parties.⁴⁰ These include provisions allowing parties to trade their allowable emissions (assigned amount units or AAUs)⁴¹ as long as such trading is supplemental to domestic actions.⁴² Also included are provisions allowing Annex B parties to pay for additional emissions reductions within other Annex B parties and then credit them against their own assigned amount units.⁴³ This plan is known as Joint Implementation (JI).⁴⁴ Finally, Annex B parties may pay for emissions reductions within developing (non-Annex B) parties and also credit these against their commitments under the Protocol. The purchasing Annex B nation may then credit these emissions reductions against its assigned amount units. This provision is known as the Clean Development Mechanism (CDM).⁴⁵

The Protocol was ratified by a sufficient number of nations representing a sufficient proportion of global GHG emissions to enter into force,⁴⁶ but it

38. These nations include Australia (108 percent), Iceland (110 percent), New Zealand (100 percent), Norway (101 percent), Russia (100 percent), and Ukraine (100 percent). *Id.* annex B.

39. Compare *id.*, with United Nations Framework Convention on Climate Change, Total Aggregate Greenhouse Gas Emissions of Individual Annex B Parties, 1990–2003, http://ghg.unfccc.int/graphics/graph1_05.gif (last visited Apr. 6, 2006). The Annex B parties with the most headroom are Russia and Ukraine. To date, no nation has purchased assigned amount units (AAU's) from either nation, although there is much discussion of this compliance option. Another nation whose compliance was made far easier by the chosen baseline is Germany. Germany's allocation includes that of the former East Germany, where heavy industry and power demand collapsed after unification. This led to a large decrease in emissions relative to allocation, making the unified Germany's and hence the European Community's compliance challenge much more tractable. See WOLFGANG EICHHAMMER ET AL., GREENHOUSE GAS REDUCTIONS IN GERMANY AND THE UK—COINCIDENCE OR POLICY INDUCED? AN ANALYSIS FOR INTERNATIONAL CLIMATE POLICY 1 (2001), available at <http://publica.fraunhofer.de/eprints/N-6386.pdf>.

40. Lawrence H. Goulder & William A. Pizer, *The Economics of Climate Change*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 10 (Steven Durlauf & Lawrence Blume eds., 2d ed. 2005), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=869644.

41. Indeed, the structure of the agreement is essentially a cap-and-trade system in which AAUs are freely allocated permits to emit that can then be traded between parties via a common registry, administered by the UNFCCC Secretariat. Kyoto Protocol, *supra* note 1, art. 3 ¶ 7.

42. *Id.* art. 17.

43. *Id.* art. 6.

44. Joanna Depledge, *Tracing the Origins of the Kyoto Protocol: An Article by Article Textual History*, 61, 64, delivered to the UNFCCC, U.N. Doc. FCCC/TP/2000/2 (Nov. 25, 2000), available at <http://unfccc.int/resource/docs/tp/tp0200.pdf>.

45. Kyoto Protocol, *supra* note 1, art. 12.

46. *Id.* art. 25 (At least 55 parties to the Protocol representing at least 55 percent of 1990 emissions of GHGs must ratify for the treaty to enter into force.); Kyoto Protocol Status, *supra* note 3.

was not ratified by either the United States or Australia.⁴⁷ It now appears at least possible, if not likely, that one Annex B party, Canada, will either withdraw or fail to comply with the Protocol, while another, Australia, may now join the treaty.⁴⁸ In order to induce a sufficient number of Annex B parties to ratify the treaty, significant concessions were made to particular parties. Notably, the Russian Federation and Ukraine were allowed to join the Protocol with commitments of a zero percent reduction below 1990 levels, although by the time of the negotiations their actual emissions were already far below the 1990 baseline because of the post-Soviet economic contraction.⁴⁹ These nations were able to join the Protocol without fear of facing emissions reductions and with the prospect of future sale of their excess AAU's to countries facing a commitment requiring actual cuts in emissions.⁵⁰

Before and after its entry into force, the Protocol has faced severe criticism: It has been criticized for doing little to combat global warming;⁵¹ for being economically inefficient in requiring nations to reduce emissions too quickly;⁵² for utilizing absolute emissions caps rather than emissions intensity targets or a carbon tax;⁵³ and for not committing the largest developing nations, most notably China and India, to binding emissions

47. *Id.*

48. Both changes are due, of course, to a change in government. In Canada, the election of a conservative government in 2006 led to a reevaluation of Canada's efforts on climate. In Australia, subsequent to the 2007 election, Prime Minister Kevin Rudd's first action was to ratify the Protocol. See, Doug Struck, *Canada Alters Course on Kyoto*, WASH. POST, May 3, 2006, at A16; *World Briefing: Australia; Kyoto Ratification First Act of New Leader*, *supra* note 2.

49. David G. Victor et al., *The Kyoto Protocol Emission Allocations: Windfall Surpluses for Russia and Ukraine*, 49 CLIMATIC CHANGE 263, 264 (2001).

50. ALAIN BERNARD ET AL., MIT JOINT PROGRAM ON THE SCI. & POL'Y OF CLIMATE CHANGE, REPORT NO. 98, RUSSIA'S ROLE IN THE KYOTO PROTOCOL 1-3 (2003), available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt98.pdf.

51. William D. Nordhaus, *Global Warming Economics*, 294 SCIENCE 1283, 1283-84 (2001).

52. Joseph E. Aldy et al., *Thirteen Plus One: A Comparison of Global Climate Policy Architectures*, 3 CLIMATE POL'Y 373, 391 (2003). For the argument that economically efficient greenhouse gas reduction trajectories differ little from business as usual in the short term but substantially in the long term, see Alan Manne & Richard Richels, *On Stabilizing CO₂ Concentrations—Cost-Effective Emission Reduction Strategies*, 2 ENVTL. MODELING & ASSESSMENT 251 (1997).

53. William Pizer, *The Case for Intensity Targets* 1-2 (Resources for the Future, Discussion Paper No. 05-02, 2005). The case for setting intensity targets, which limit a country's CO₂ emissions per dollar of GDP, is a consequence of Weitzman's insight that when uncertainty exists as to costs of abatement and the slope of the marginal benefit of abatement curve for an environmental good is relatively flat, a tax rather than a quantity control leads to a superior welfare outcome. See William A. Pizer, *Prices vs. Quantities Revisited: The Case of Climate Change* 3-4 (Resources for the Future, Discussion Paper No. 98-02, 1997); Martin L. Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUD. 477 (1974).

reductions.⁵⁴ Finally, its flexible mechanisms also have been criticized as dependent on counterfactuals, namely an emissions baseline, that is either unknowable or politically determined.⁵⁵ Reflecting this criticism, at least thirteen modified treaty architectures have been offered as alternatives or improvements for the post-2012 period.⁵⁶

The most common response to these criticisms is that the Protocol has been, since its negotiation in 1997, the only game in town when it comes to controlling the growth in global GHG emissions and mitigating future harms from global warming. Further, it has spurred the emergence and growth of institutions and capacities that will likely endure beyond its existence, albeit perhaps in altered and improved form. Some of the most notable diplomatic successes of the twentieth century were the result of a long series of negotiations and agreements. Institutions like the GATT and its successor, the WTO, and perhaps most of all, the European Union, that have ultimately delivered tremendous benefits to their members, began with modest and limited agreements. Members were not afraid to tinker with these institutions as they learned by doing. The Protocol has given birth to a whole set of institutions and has fostered capacity development both in the developed and developing world that will prove invaluable in ultimately overcoming the challenges presented by climate change.

This Article's aim is to take a close look at the actual, as opposed to the theoretical, outcome of one of the Protocol's most significant institutional creations—a global market for GHG emission credits. Most or all of the criticisms of the Protocol were made prior to the development of a substantial track record for the CDM and the other flexible mechanisms, so these criticisms were of necessity theoretical in nature. Although to date there has been little use of JI and no sale and purchase of AAUs, there has been an explosion of activity within the CDM that now provides a basis for an empirical critique of the Protocol. This critique aims not to undermine the rationale for the Protocol, but to understand how, in the next phase of the international effort to avoid “dangerous anthropogenic interference”⁵⁷ with the world's climate, trading can accomplish more than it has or is likely to under the Kyoto regime.

54. Prepared testimony of Janet Yellen, *supra* note 22, at 4; Letter From George W. Bush, President of the U.S., to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), <http://www.whitehouse.gov/news/releases/2001/03/20010314.html>. Since developing nations are involved in the Kyoto Protocol through the CDM, this criticism is the extent of their involvement. Kyoto Protocol, *supra* note 1, art. 12.

55. Chi Zhang et al., *Carbon Intensity of Electricity Generation and CDM Baseline: Case Studies of Three Chinese Provinces*, 33 ENERGY POL'Y 451 (2005).

56. Aldy et al., *supra* note 52, at 373.

57. UNFCCC Convention, *supra* note 29.

B. Clean Development Mechanism

1. Structure of the CDM

The CDM is a market-based approach to the problem of global warming. It allows buyers, who may be Annex B parties or firms within Annex B nations, to purchase credits from emission reduction projects carried out in non-Annex B nations. The CDM builds on experience derived from various regional markets for atmospheric pollutants, most notably the United States' experience with emissions trading under the Clean Air Act.⁵⁸ The developing country (non-Annex B) firms that are sellers of Certified Emission Reductions (CERs), the currency of the CDM system, have no limit to the mass of GHGs that they may emit under the Protocol. This absence of a cap on emissions for designated parties necessitates a far more complex design than had been attempted for most previous pollution markets. Adding further complexity to the program is the fact that the CDM is the first atmospheric pollutant trading program that covers multiple gases and allows conversion between them through the medium of its common currency, CERs.

Further, the CDM is a project-based system. It accomplishes its objectives at the microlevel of individual emission reduction projects that are each validated by designated third party verifiers and then registered by the mechanism's governing body, the CDM Executive Board (CDM EB), as eligible for crediting. Each project wishing to participate in the CDM must prepare a Project Design Document (PDD) that explains in detail how its future emissions reductions will be voluntary, real, additional, and will not induce leakage. It must also either utilize a previously approved monitoring methodology that explains in detail how it will monitor emissions reductions made by the project or propose a new methodology. Voluntary emissions reductions are not compelled by national or provincial law or regulation. Real emissions reductions are monitored with sufficient care to ensure that they actually occur. Additional emissions reductions are those that are in addition to any that would have occurred absent the CDM subsidy. Leakage of emissions occurs when emissions reductions that would have occurred from a CDM project absent the CDM subsidy are displaced to another location because of the subsidy.

58. Prepared testimony of Janet Yellen, *supra* note 22, at 12; see also Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109, 151-53 (1989) (detailing the successes and disappointments of the EPA program and suggesting that many of the program's failings stemmed from regulators' need to satisfy multiple constituencies with divergent objectives).

All four of these concepts require that a hypothetical baseline of emissions be defined for each project, and in the case of leakage, the world outside the project. This baseline represents the timeline of emissions that would have occurred absent the subsidy provided by the CDM (and thus absent the emission reduction project). It is an attempt to estimate the counterfactual of typical levels of emissions in a world without CDM. The CDM project baseline is described in terms that vary by project type. Nevertheless, several common variables can be seen in most PDDs.⁵⁹ Project proponents often describe the regulatory baseline, that is, the emissions permitted by local law and regulation.⁶⁰ They also often describe the financial baseline, which is the lack of an adequate return on investment without the benefit of the CDM subsidy.⁶¹ They often describe typical technologies applied by the type of project in the PDD and how the CDM-subsidized project exceeds these local standards.⁶² Finally, they sometimes must describe a sectoral or national baseline for installations of the project type.⁶³ Ultimately, the CDM project proponents must quantify, third party verifiers must check, and the CDM EB must certify the hypothetical emissions that would have occurred in the future without the CDM project subsidy.

Project proponents and environmental regulators do not live in a world without CDM. As will be shown below, they have acted strategically in order to maximize many projects' baselines and so maximize the potential for the generation of CER revenues. The fact that most industries involved in CDM projects are already highly regulated makes this strategy attractive

59. PDDs follow a standardized format that includes a general description of the project, a description of how the baseline for the project is determined, a specification of the duration of the project, an explanation of how the project's emissions reductions will be monitored, a quantitative estimate of the project's emissions reductions, a discussion of any other environmental effects of the project, and finally a synthesis of comments on the project by local stakeholders. CDM Executive Bd., UNFCCC, *Guidelines for Completing the Project Design Document (CDM-PDD), The Proposed New Methodology: Baseline (CDM-NMB) and the Proposed New Methodology: Monitoring (CDM-NMM)* (Version 04, 2005), available at http://cdm.unfccc.int/Reference/Documents/GuideL_Pdd/English/Guidelines_CDM_PDD_NMB_NMM.pdf.

60. See, e.g., CDM PROJECT DESIGN DOCUMENT OF THE REPUBLIC OF NORTH KOREA: HFC DECOMPOSITION PROJECT IN ULSAN 20 (2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/FS_302727382.

61. See, e.g., CDM PROJECT DESIGN DOCUMENT: ZHANGBEI MANJING WINDFARM PROJECT 9-11 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/5X09Y9XLJO28P4KEA4GNSWG275CF5T>.

62. See, e.g., CDM PROJECT DESIGN DOCUMENT: EQUIPAV BAGASSE COGENERATION PROJECT (EBCP) 13-14 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/PL0URYPVKVZOV8TIW2MI8EG1Y3CBM1>.

63. See, e.g., CDM PROJECT DESIGN DOCUMENT: WASTE HEAT BASED 7 MW CAPTIVE POWER PROJECT 35 (2006), available at <http://cdm.unfccc.int/UserManagement/FileStorage/6WOJFJIP40XRP77Y7M83R6UVYCBLL>.

and easy to implement. An environmental regulator faced with the choice of preventing an emission with a costly domestic regulation⁶⁴ or by means of the CDM will have obvious political incentives for selecting the international program over new domestic regulation.⁶⁵

The end product of the CDM process is the issuance by the CDM EB of an emission offset to the project participants. This offset can then be sold to an Annex B nation or a party within one that has obligations under the Protocol. The offset, called a certified emission reduction or CER, assuming that certain CDM facilities are established, may be used by Annex B countries in lieu of emissions reductions within their territories in order to meet their targets under the Protocol.⁶⁶ Private parties that are assigned emissions allowances by their governments may also purchase CERs and use them as permits to emit in excess of their assigned allocations, or as an alternative to purchasing allocations from other participants in their domestic market. The European Union and Japan will likely be the major purchasers of CERs during the first commitment period.⁶⁷

The official public process leading to the production of CERs by a CDM project begins with the submission of a PDD to the CDM EB for a period of public comment. This comment process is a part of a project's validation by an independent Designated Operational Entity (DOE).⁶⁸ The project must also receive approval from its host country's Designated National Authority (DNA), typically the host country's environmental ministry, before being submitted for registration to the CDM EB.⁶⁹ Once registered, a project must submit monitoring reports providing data to show how many CERs have actually been generated during a particular period. These reports must be

64. It is costly both from the perspective of total societal costs and from the perspective of allocation of regulator personnel and funding.

65. The incentive not to regulate created by the CDM led the CDM EB to adopt rules specifying the dates after which a new regulation must be taken into account. CDM Executive Bd., UNFCCC, *Twenty-Second Meeting Report, Annex 3: Clarifications on the Consideration of National and/or Sectoral Policies and Circumstances in Baseline Scenarios* (Version 02, 2005), available at http://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

66. Kyoto Protocol, *supra* note 1, art. 12, § 3(b).

67. POINT CARBON, CARBON 2006: TOWARDS A TRULY GLOBAL MARKET 5 fig.2.1 (2006), available at http://www.pointcarbon.com/wimages/Carbon_2006_final_print.pdf. Canada was also likely to have been an important purchaser of Certified Emission Reductions (CERs), but actions by its recently elected conservative government have made it doubtful that it will comply with the Protocol. See Doug Struck, *Canada Alters Course on Kyoto: Budget Slashes Funding Devoted to Goals of Emissions Pact*, WASH. POST, May 3, 2006, at A16.

68. U.N. ENV'T PROGRAM, LEGAL ISSUES GUIDEBOOK TO THE CLEAN DEVELOPMENT MECHANISM 32-34 (2004), available at <http://cd4cdm.org/Publications/CDM%20Legal%20Issues%20Guidebook.pdf>.

69. *Id.*

both consistent with the monitoring plan spelled out in the project's PDD and verified and certified by a DOE.⁷⁰ At that point, the CDM EB will issue CERs into a project participant's account.⁷¹ These CERs will eventually be transferable to a buyer who establishes an account with the International Transaction Log, a yet to be constructed database of Kyoto Protocol GHG accounts.⁷²

2. Goals of the CDM

The CDM was created for three reasons. First, it aims to accomplish the overarching goals of the Framework Convention. Second, it aims to encourage sustainable development in non-Annex B nations. Third, the CDM is intended to reduce the cost of compliance with the Protocol for Annex B nations.⁷³

The CDM is intended, according to the Protocol, to help in accomplishing the Convention's goal of "prevent[ing] dangerous interference" with the climate system.⁷⁴ It aims to do this by assisting developing countries to reduce their emissions of GHGs. Thus, the CDM is significant, and indeed the only way in which non-Annex B signatories to the Protocol will contribute toward achieving the Protocol's goals. A realistic hope for the CDM is that by providing non-Annex B nations with financial incentives for low-carbon intensity development, they might be nudged, however slightly, onto more climate-friendly trajectories.

The second CDM objective—sustainable development—is left largely undefined by the Protocol or the implementing directives of later conferences of the parties.⁷⁵ To the extent that the provision has teeth, it is given them by the requirement under the CDM that the host country DNA of a project must certify that the project meets the DNA's standards of sustainability.⁷⁶ Although some DNAs have prioritized particular types of projects, they have not rejected other types that would otherwise be capable of producing CERs.⁷⁷

70. *Id.*

71. *Id.*

72. UNFCCC, Subsidiary Body for Sci. & Tech. Advice, Twenty-Second Session, Bonn, F.R.G., May 19–27, 2005, *Checks to Be Performed by the International Transaction Log*, at 3–4, U.N. Doc. FCCC/SBSTA/2005/INF.3 (May 13, 2005), available at http://unfccc.int/files/meetings/unfccc_calendar/pre-sessional/application/pdf/inf03.pdf.

73. Kyoto Protocol, *supra* note 1, art. 12.

74. *Id.* art. 12, § 2.

75. *Id.* art. 12, § 2; U.N. ENV'T PROGRAM, *supra* note 68, at 49.

76. U.N. ENV'T PROGRAM, *supra* note 68, at 49.

77. China's official CDM policy favors renewable energy, energy efficiency, and methane capture projects, but the Chinese DNA has approved numerous other types of projects. See Office of Nat'l Coordination Comm. on Climate Change, *Measures for Operation and Management of Clean*

The third CDM goal—lowering the cost of compliance for Annex B parties—was thought possible for two reasons. First, the majority of new energy capacity to be built up during the First Compliance Period will be located in the developing world where rates of economic growth are highest and energy infrastructure is least developed.⁷⁸ Also, the relative cost of prematurely retiring high-carbon-emission intensity power plants is significantly higher than building new low- or zero-carbon emission energy capacity. Thus, if the CDM could be used to subsidize the substitution of new, clean power capacity in the developing world for the premature retirement of old, dirty power capacity in the developed world, it could substantially lower the cost of treaty compliance. Further, such a substitution would not change the environmental outcome, because the location at which an emission reduction of a particular quantity of CO₂ takes place has no impact on the environmental benefit—lower atmospheric greenhouse gas concentrations.⁷⁹ However, as will be shown in our first story about CDM implementation, a substantial proportion of the emissions reductions generated by the CDM are not of this type and are in reality extremely inefficient in terms of the cost of the subsidy compared to the cost of environmental benefits obtained. Our second story regarding CDM implementation will take a close look at the fraction of emissions reductions created by construction of new electric-generating capacity and will show that it is increasingly difficult to tell which CDM projects are producing emissions reductions additional to those that would have occurred in the baseline, and which are claiming credit for nonadditional, anyway credits.

II. RAPID DEVELOPMENT OF THE CLEAN DEVELOPMENT MECHANISM SINCE 2004

The CDM project pipeline began operation in December of 2003, when the first project was accepted for public comment and validation. In

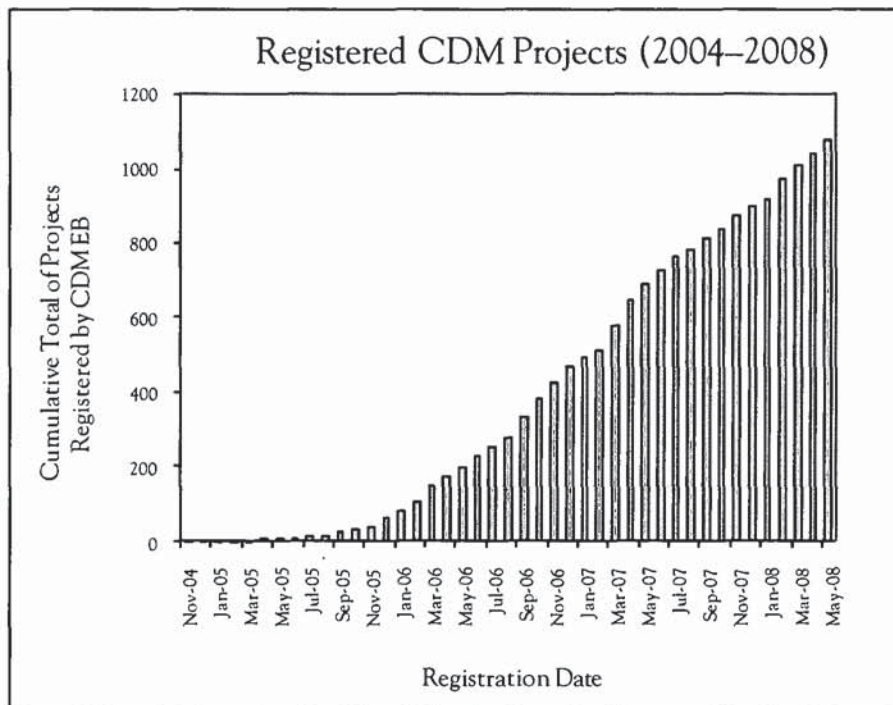
Development Mechanism Projects in China, art. 4 (Nov. 21, 2005), available at <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905>.

78. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2007, at 61 (2007), available at [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2007\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2007).pdf).

79. Because CO₂ is a well-mixed atmospheric gas with a long residence time, the extent to which it causes environmental harm is a function of its concentration in the atmosphere rather than the rate at which it is being added at any one time. William D. Nordhaus, *Life After Kyoto: Alternative Approaches to Global Warming Policies* 6 (Nat'l Bureau of Econ. Research, Working Paper No. 11889, 2005), available at <http://www.nber.org/papers/W11889.pdf>.

November of 2004, the first project was registered by the CDM EB.⁸⁰ Finally, in October 2005, the first CERs were issued to a project participant's account.⁸¹ Since then, there has been extremely rapid growth in the number, type, and total volume of emissions reductions in the CDM pipeline. Figure 1 shows the number of projects completing the registration process by month since the CDM began its activities. Beginning in the second half of 2005, the registration process picked up significant steam so that by the end of 2007, there were 895 projects registered and able to produce CERs for sale in the carbon market.

FIGURE 1: NUMBER OF PROJECTS REGISTERED BY THE CDM EXECUTIVE BOARD SINCE DECEMBER 2003, WHEN PDDs FIRST ENTERED THE CDM PIPELINE⁸²



80. See UNFCCC, Project 0008: Brazil NovaGerar Landfill Gas to Energy Project, <http://cdm.unfccc.int/Projects/DB/DNV-CUK1095236970.6> (last visited Apr. 30, 2008).

81. See UNFCCC, CERs Issued, http://cdm.unfccc.int/Issuance/cers_iss.html (last visited July 15, 2008).

82. Data for Figure 1 comes from UNEP Risø Centre, UNEP Risø CDM/JI Pipelines Database and Analysis, <http://www.cdmpipeline.org/publications/CDMpipeline.xls> (last visited May 2, 2008). As of November 1, 2007, there were 827 projects registered by the CDM EB.

It was not until November of 2005 that the volume of CO₂ reductions deliverable by registered CDM projects to the end of the First Commitment Period began to grow large enough to play a significant role in Protocol compliance for Annex B parties. From the last quarter of 2005 to the present, the potential CDM supply has grown at a breakneck pace. By January 1, 2008, more than 1150 million tons (Mt) CO₂ equivalent (CO₂e)⁸³ had been registered for delivery via the CDM by the end of the first compliance period (see Figure 2).⁸⁴ Another pattern emerging from the project registrations that have occurred is the dominance of large projects in the CDM. As seen in Figure 2, a small number of very large projects dominate the supply of CERs from registered projects. In fact, the 45 largest projects (5 percent of the total number) represent 64 percent of the total supply to the end of the First Commitment Period.⁸⁵

The trend of large projects dominating supply holds for the CDM pipeline as a whole, including projects registered, projects for which registration has been requested, and projects that have entered the validation stage. As of this writing, there are more than 2800 projects in the CDM pipeline that will eventually, if all are registered and deliver reductions as promised in their PDDs, supply more than 2600 Mt CO₂e to the market for Protocol compliance instruments.⁸⁶ This amount represents approximately 2.8 percent of Annex B 1990 GHG emissions for each year of the First Commitment Period.⁸⁷

83. The standard measure of greenhouse gas reduction under the Protocol is 1 ton CO₂e. It is the mass of any one of the six Kyoto gases equal to the 100-year global warming potential (GWP) of one ton of CO₂. GWP is defined as the time integrated radiative forcing from the release of 1 kg of a trace substance to 1 kg of CO₂. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) & TECH. & ECON. ASSESSMENT PANEL, SAFEGUARDING THE OZONE LAYER AND THE GLOBAL CLIMATE SYSTEM: ISSUES RELATED TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS 385 (2005), available at http://www.ipcc.ch/pdf/special-reports/sroc/sroc_full.pdf [hereinafter IPCC].

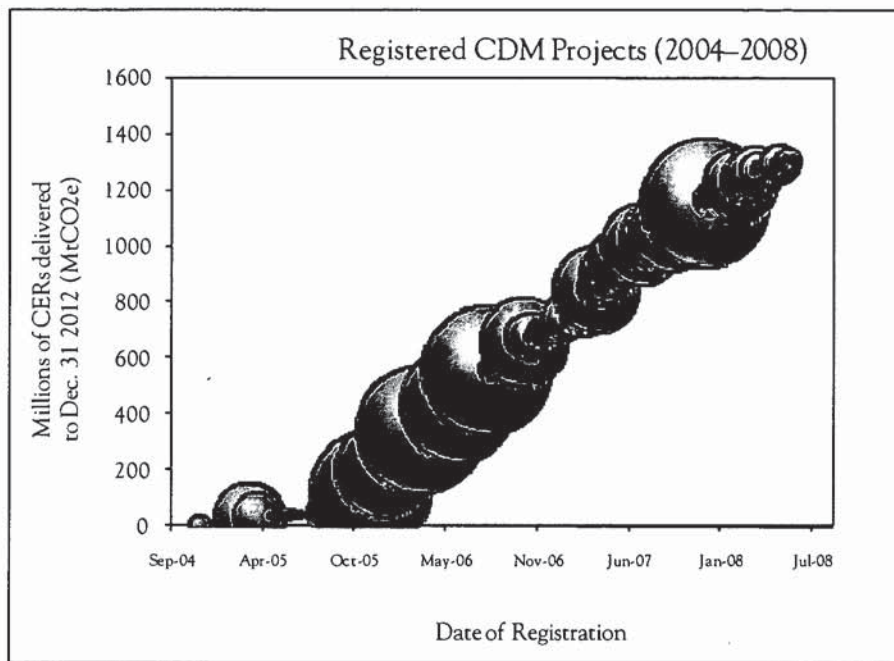
84. See UNEP Risø Centre, *supra* note 82.

85. *Id.*

86. See UNFCCC, CDM Statistics, <http://cdm.unfccc.int/Statistics/index.html> (last visited Jan 7, 2008). I count a project as in the CDM pipeline if it has advanced to the public comment phase of validation. UNFCCC, Validation Projects, <http://cdm.unfccc.int/Projects/Validation> (last visited July 15, 2008).

87. See UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, GREENHOUSE GAS EMISSIONS DATA FOR 1990–2003, *supra* note 31, at 15. Dividing the 2600 Mt CO₂e estimate for production of credits by 5 provides an annual estimate of supply during the First Commitment Period of 520 Mt CO₂e/year. Annex B GHG Emissions in 1990, not including credits for land use, land use change, and forestry, were 18,372 Mt CO₂e. Thus the CDM will provide 520/18,372 or 2.8 percent of Annex B 1990 GHG emissions.

FIGURE 2: PROJECTS REGISTERED IN TERMS OF CER SUPPLY PROJECTED BY END OF FIRST COMMITMENT PERIOD⁸⁸



Projects yet to be registered or yet to even enter the CDM pipeline face a diminishing probability of generating credits as the end of the First Commitment Period draws closer. The flow of projects is likely to diminish over time unless agreement is reached as to the future of the CDM in the post-2012 climate treaty architecture. The shorter the interval before the end of the First Commitment Period, the less money there is to be made from CERs and so the transaction costs associated with registration and monitoring loom larger.⁸⁹ Without certainty about the shape of any future UNFCCC-based trading program or subsidy, financial incentives to invest with post-2012 in mind are absent.⁹⁰ Even for the 2008–2012 market, there is significant

88. Data for Figure 2 comes from UNEP Risø Centre, *supra* note 82. The y-axis shows the total credits promised by December 31, 2012 of CERs to the carbon market from CDM projects; the size of each bubble shows the relative size of the particular project. This figure shows projects registered by November 1, 2007.

89. ERIC HAITES, ESTIMATING THE MARKET POTENTIAL FOR THE CLEAN DEVELOPMENT MECHANISM: REVIEW OF MODELS AND LESSONS LEARNED 63–64 (2004), available at <http://carbonfinance.org/docs/EstimatingMarketPotential.pdf>.

90. *Id.*

demand (and hence price) uncertainty because of the possible competition of CDM with both JI project-based reductions and outright purchases of AAUs from Russia, Ukraine, and the remainder of Eastern Europe.⁹¹ Whether these alternative supplies of AAUs and JI credits are sought out by Annex B parties depends on the costs of domestic compliance, the price of CERs, and other political considerations.⁹²

III. CURRENT SUPPLY OF CERs IN THE CDM PIPELINE BY PROJECT TYPE

The original intent of the CDM was to spur development of low-carbon energy infrastructure in the developing world both through achievement of sustainable development goals and substitution for early retirement of expensive, high-carbon energy infrastructure in the developed world.⁹³ It comes as a surprise, then, to find then that the CDM pipeline bears only a partial relationship to this vision. Instead, the subsidy provided by purchase of CERs to date will largely ensure that high GWP industrial gases such as trifluoromethane (HFC-23) and N₂O as well as CH₄ emitted by landfills and confined-animal-feeding operations (CAFOs) in non-Annex B nations are captured and destroyed. The very large projects dominating the supply of CERs are confined primarily to two relatively obscure industries—adipic acid and chlorodifluoromethane (HCFC-22) production. Adipic acid is the feedstock for the production of nylon-66 and releases abundant N₂O as a production byproduct.⁹⁴ HCFC-22 has two major applications. It is one of two major refrigerants that was phased in to replace the CFC's under the auspices of the Montreal Protocol to Protect on Substances that Deplete the Ozone Layer.⁹⁵ HCFC-22 is also the primary feedstock in the production

91. Russia was granted significant excess AAUs in negotiations leading up to its accession to the Protocol as an inducement to join. SCOTT BARRETT, ENVIRONMENT AND STATECRAFT: THE STRATEGY OF ENVIRONMENTAL TREATY-MAKING 372–73 (2003). This concession, when combined with the post-Soviet economic contraction, leaves Russia with significantly lower actual emissions than its assigned amount under the Protocol. POINT CARBON, *supra* note 67, at 8; Victor et al., *supra* note 49, at 263. Ukraine and the remainder of Eastern Europe also have excess AAUs due to economic contraction. *Id.*

92. See discussion *infra* Part VI.

93. See discussion *infra* Part I.B.2.

94. R.A. Reimer et al., *Adipic Acid Industry—N₂O Abatement: Implementation of Technologies for Abatement of N₂O Emissions Associated With Adipic Acid Manufacture*, in NON-CO₂ GREENHOUSE GASES: SCIENTIFIC UNDERSTANDING, CONTROL AND IMPLEMENTATION 347, 347 (J. van Ham et al. eds., 2000).

95. A. MCCULLOCH, INCINERATION OF HFC-23 WASTE STREAMS FOR ABATEMENT OF EMISSIONS FROM HCFC-22 PRODUCTION: A REVIEW OF SCIENTIFIC, TECHNICAL AND ECONOMIC ASPECTS 2 (2005), available at http://cdm.unfccc.int/methodologies/Background_240305.pdf.

of PTFE,⁹⁶ more commonly known by its Dupont brand name, Teflon. HCFC-22 production inevitably produces HFC-23 as an unwanted byproduct.⁹⁷ These two relatively small industries represent nearly 55 percent of the supply of issued CERs in the CDM to date.⁹⁸

Contrary to ex-ante predictions, CO₂-based projects, including renewable energy, fuel switching from coal to gas, demand side energy efficiency, waste heat capture, and cement process modification account for less than half of the CER supply to 2012. Renewable energy projects alone account for 28 percent. Nineteen HFC-23 capture projects at HCFC-22 production facilities and three projects that capture the N₂O made as a byproduct of adipic acid or nitric acid production account for the third of the pipeline composed of high GWP industrial gas reduction projects. Finally, CH₄-capture and flaring projects, mostly located at large landfills, coal mines, and CAFOs, account for another 19 percent. Moreover, because the HFC-23, N₂O, and to a lesser extent, CH₄, projects are typically of larger size than the renewable energy projects, they are more likely to overcome the transaction costs associated with registration and production of CERs than the smaller hydro, wind, and biomass energy projects that compose the CDM's renewable portfolio.⁹⁹

To date, relatively small numbers of CERs have actually been issued. This slow trickle will likely turn to a flood in the coming years as registered projects begin submitting monitoring reports to the CDM EB. In order for the issuance of a CER to occur, a third-party monitor must audit a CDM project and certify that monitoring of the emissions reductions was adequate to ensure that they actually occurred.¹⁰⁰ Submission of this report to the CDM EB results in the issuance of CERs to that project participant's account.¹⁰¹ The first CERs were issued by the CDM EB in late October 2005.¹⁰² As of January 1, 2008, only 103 million CERs have been issued and deposited into project participant accounts.¹⁰³ The fact that more than half of these issuances are to HFC-23 abatement projects (55 percent) is likely due to the superior financial and logistical capacity of these projects relative to either the CH₄ or renewable-energy projects. The pattern most evident in the early issuances of CERs is the dominance of large over small projects in terms of actually

96. *Id.*

97. *Id.*

98. UNEP Risø Centre, *supra* note 82.

99. HAITES, *supra* note 89, at 45.

100. U.N. ENV'T PROGRAM, *supra* note 68, at 38–39.

101. *Id.* at 39.

102. UNFCCC, *supra* note 81.

103. This amount represents less than 10 percent of CERs promised by registered projects for delivery to 2012. *Id.*

producing emissions reductions. Early issuance shows once again that the barrier represented by transaction costs is more substantial for small CDM projects. As discussed above, the classes of small and large projects are largely coextensive with the CO₂ projects versus the N₂O, HFC-23, and to a lesser extent CH₄ projects.

Contrary to theory and expectation, the CDM market is not a subsidy implemented by means of a market mechanism by which CO₂ reductions that would have taken place in the developed world take place in the developing world. Rather, most CDM funds are paying for the substitution of CO₂ reductions in the developed world for emissions reductions in the developing world of industrial gases and methane. Indeed, the industrial gas emissions that account for one third of CDM reductions do not even occur in the developed world, not because of an absence of adipic acid or HCFC-22 manufacture, but because Annex B industries, after recognizing the threat posed by these emissions and the low cost of abating them, have opted to voluntarily capture and destroy them.¹⁰⁴

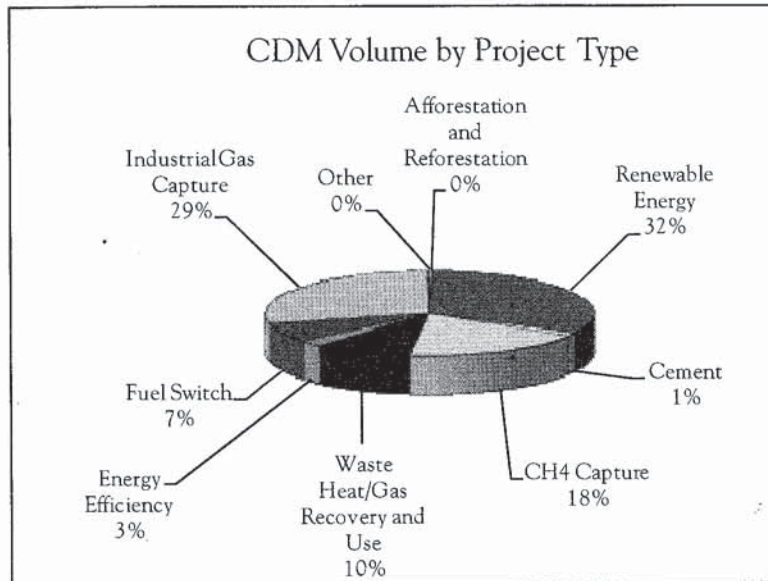
While renewable energy projects do make up 1600 out of 2647 (60 percent) projects in the CDM project pipeline, they account for only 28 percent of the emissions reductions produced. It is important to note that a significant proportion of the CERs generated by biomass power projects are from the CH₄ emissions that are avoided because biomass is burned rather than allowed to biodegrade.¹⁰⁵ Much of the publicity surrounding the CDM has emphasized the number of renewable energy projects sponsored by the CDM while neglecting the relative volume of emissions,¹⁰⁶ hence CERs produced and the relative scale of subsidy provided to various sectors. This emphasis provides a false picture of the true subsidy flows being generated by the international market for carbon (see Figure 3).

104. MCCULLOCH, *supra* note 95, at 18; Reimer et al., *supra* note 94, at 349.

105. Anaerobic digestion of crop residues leads to significant emission of CH₄ that is prevented by collection and use of the waste as a fuel. Many biomass energy projects claim this emission reduction in addition to the fossil-fuel-based energy avoided. See, e.g., CDM PROJECT DESIGN DOCUMENT: CAMIL ITAQUI BIOMASS ELECTRICITY GENERATION PROJECT 7-9 (2005), available at <http://cdm.unfccc.int/UserManagement/FileStorage/7Q7IH03DPAA2EL4SA8AM415CKQ7502>.

106. Compare *infra* fig. 3, with UNFCCC, Registration: Distribution of Registered Project Activities by Scope, <http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html> (last visited May 4, 2006), and The World Bank, Carbon Finance Unit, About World Bank Carbon Finance Unit, <http://carbonfinance.org/Router.cfm?Page=About&ItemID=24668> (last visited May 4, 2006).

FIGURE 3: FRACTION OF CERS SUPPLIED TO 2012 BY PROJECT TYPE FOR ALL PROJECTS CURRENTLY IN THE CDM PIPELINE¹⁰⁷



It is clear that the CDM has induced market participants to produce a large number of emissions reductions in the developing world for sale to those nations with quantified emissions reductions under the Protocol. However, to evaluate whether the CDM as actually realized is a success, more information is required: One must also ask whether Annex B nations get their money's worth. To answer this question, Part IV will examine HFC-23 projects and energy projects in the CDM.

IV. STRATEGIC MANIPULATION OF BASELINES: THE CASE OF HFC-23 ABATEMENT PROJECTS IN THE CDM

A. HFC-23 is a High GWP Byproduct of HCFC-22 Manufacture

Our first story concerns both the strategic behavior on the part of proponents of HFC-23 capture projects, an important class of large projects within the CDM, and the responses of the CDM EB to these attempts to inflate credit issuance. These emission reduction projects are an important component of the emissions market's initial rapid growth. There are

107. Data current as of Dec. 4, 2007. UNEP Risø Centre, *supra* note 82.

nineteen HFC-23 capture projects currently participating in the CDM.¹⁰⁸ These projects consist of the capture and destruction of HFC-23 produced as a byproduct of HCFC-22 manufacture.¹⁰⁹ The primary use of HCFC-22 is as a refrigerant, although its use as a feedstock for fluoroplastics such as PTFE is also significant and growing.¹¹⁰ For every 100 tons of HCFC-22 produced, between 1.5 and 4 tons of HFC-23 are produced.¹¹¹ This group of emission reduction projects have played an important role in shaping the early CDM emissions market and, because of their substantial market share, in determining its environmental performance.

An understanding of the incentives faced by creators of HFC-23 abatement projects must begin with an understanding of the atmospheric chemistry of HFC-23, because this chemistry lies at the heart of what makes them successful CDM projects. HFC-23 is an extremely potent and long-lived greenhouse gas. Its one-hundred-year GWP is 11,700.¹¹² As a consequence of this high GWP and the rules of the CDM, which convert the other six Protocol gases to CO₂e and hence CERs using their GWPs, 1 ton of HFC-23 abated is considered equivalent to 11700 tons of CO₂. In other words, for every kilogram of HCFC-22 produced, between 15 and 30 g of HFC-23 is produced, and potentially captured and destroyed. This 15 to 30 g of HFC-23 is equivalent to 175 to 350 kg of CO₂, or 0.175 to 0.350 CERs.

Although approximately half of HCFC-22 production occurs in the developed world,¹¹³ there are essentially no byproduct emissions of HFC-23 there because major producers have voluntarily adopted measures to capture and destroy it.¹¹⁴ Participation in voluntary abatement programs was substantial but not universal by 2005.¹¹⁵ The situation in the developing world was, prior to CDM, quite different. There, HCFC-22 manufacturers vented all HFC-23 produced to the atmosphere.¹¹⁶ One market analyst predicts that global HCFC-22 production will grow by 6 to 7 percent per year until 2020 and by 16 percent per year in the developing world.¹¹⁷ Thus,

108. This figure is as of Jan. 1, 2008. UNEP Risø Centre, *supra* note 82.

109. CDM Executive Bd., UNFCCC, *Revision to Approved Baseline Methodology AM0001: "Incineration of HFC 23 Waste Streams" 1* (Version 03, 2005), available at http://cdm.unfccc.int/UserManagement/FileStorage/AM0001_version3%20.pdf.

110. MCCULLOCH, *supra* note 95, at 4.

111. *Id.* at 10.

112. *Id.* at 21.

113. *Id.* at 4.

114. *Id.* at 18, 21.

115. IPCC, *supra* note 83, at 409.

116. MCCULLOCH, *supra* note 95, at 4.

117. *Id.*

reducing non-Annex B emissions of HFC-23 should be a goal of any treaty aimed at curbing GHG emissions.

Non-Annex B manufacturers of HCFC-22 have, to a remarkable extent, become participants in the CDM. Developing world production of HCFC-22 in 2005 was approximately 237,000 metric tons.¹¹⁸ Assuming a 3 percent HFC-23 production rate, which has been fairly typical for the 19 HCFC-22 plants participating in the CDM,¹¹⁹ this equates to a production of 83 million CERs per year.¹²⁰ Taken together, the PDDs of the nineteen HCFC-22 plants estimate that they will produce 81.8 million CERs per year. Using these estimates, it would appear that essentially all developing world HCFC-22 production, as of 2005, is currently participating in the CDM. This is a remarkable achievement for the CDM and begs the question of how a financial mechanism was able to achieve near total market penetration in an industry so quickly. An examination of the economics of HCFC-22 abatement and HFC-23 capture explains that the reasons may have as much to do with the perverse incentives created by the carbon market as with an ability to identify low cost emissions reduction opportunities.

B. The Perverse Incentives of HFC-23 Abatement as a CDM Project

The economics of HFC-23 projects create incentives for strategic behavior that, if left unchecked, would undermine the environmental efficacy of the CDM (see Table 1). Consider the 1 kg of HCFC-22 produced by a CDM project that the calculation above showed to be equivalent to 0.35 t CO₂ or 0.35 CERs. At current market prices of €10/CER,¹²¹ the production of 1 kg of HCFC-22 will produce a subsidy of €3.51. The cost of HFC-23 abatement is estimated to be on the order of €0.09/kg HCFC-22.¹²²

118. *Id.*

119. See UNEP Risø Centre, *supra* note 82. The average HFC-23/HCFC-22 ratio of the first 10 plants is 2.99± 0.58 (data on file with author).

120. $237,000 \text{ Mt HCFC-22} * 0.03 = 7110 \text{ Mt HFC-23}$; $7110 \text{ Mt HFC-23} * 11700 = 83,187 \text{ Mt CO}_2\text{e}$.

121. Data collected from publicly available reported trades of CERs is used to create this estimate. Note that the pricing of CERs is dependent upon when in the regulatory process they are sold. Most sales occur prior to registration of a project, let alone monitoring, verification, and issuance of promised CERs. These forward contracts for CERs are termed "primary CER" sales. Primary CER prices reflect validation, registration, credit, and country risk. Issued CERs, termed "secondary CERs" trade at approximately 80 percent of EU ETS allowance prices. This price spread is expected to decrease substantially once the interconnections required for trading are established between the CDM registry and the EU ETS registry.

122. MCCULLOCH, *supra* note 95, at 12. This value is derived assuming an 8 percent return on the investment in destruction facilities (€240,000/year) plus €200,000 operating expenses and a

Thus, the net from subsidy minus abatement costs to an HCFC-22 producer is approximately €3.41/kg HCFC-22. This subsidy compares quite favorably with the wholesale price for HCFC-22, which as of the fourth quarter of 2005 was approximately €1.60/kg.¹²³ A developing world producer of HCFC-22 can earn more than twice as much from its CDM subsidy as it can gross from the sale of its primary product. Even when CER prices were only half of their current value, HCFC-22 manufacturers found these calculations to be a compelling incentive to enter the CDM process.¹²⁴ Given these incentives, it is perhaps not a tremendous surprise that participation in the CDM by the non-Annex B based HCFC-22 industry is nearly universal.

TABLE 1: ESTIMATING THE VALUE OF THE CDM SUBSIDY TO HCFC-22 PRODUCERS

Step 1: Calculate CO ₂ e produced by 1 kg HCFC-22	1 kg HCFC-22 → 0.03 kg HFC-23 0.03 kg HFC-23 * 11700 = 351 kg CO ₂ e = 0.351 t CO ₂ e
Step 2: Estimate gross subsidy	0.351 t CO ₂ e * €10/CER = €3.51 Gross subsidy per kg HCFC-22 = €3.51
Step 3: Estimate the cost per kg HCFC-22 (calculations are for a facility capable of capturing and destroying 200 t HFC-23/year)	€3,000,000 investment at 8% interest + €200,000 per year operating costs = €590,000 per year cost.
Step 5: Calculate the cost per kg HCFC-22	€590,000/200 t HFC-23 = €2950/t HFC-23 €2950/t HFC-23 * 3% HFC-23 = €88.5/t HCFC-22 €88.5/t HCFC-22 * 1 t/1000 kg = €0.09 Cost of subsidy per kg HCFC-22 = €0.09
Step 6: Calculate the net CDM subsidy	€3.51 - €0.09 = €3.42/kg HCFC-22

The perverse incentives created by the economics of HFC-23 capture CDM projects were, from a very early stage, a point of controversy.¹²⁵ The CDM methodology, without which HFC-23 projects could not advance to registration, went through several rounds of revision because of fears that

production rate of 200 t HFC-23 per year, equivalent to 6666 t HCFC-22 per year, and a 3 percent HFC-23 production rate.

123. Telephone Interview With Mack McFarland, Environmental Fellow, DuPont Fluoroproducts (Fall 2005) [hereinafter McFarland Interview].

124. Should primary CER prices fall from their current highs of €10 due to the fall in the value of ETS permits, HFC projects will remain economically attractive.

125. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (June 3, 2004), available at http://cdm.unfccc.int/methodologies/inputam0001/letter_Dupont_03/June04.pdf [hereinafter Jacob].

HCFC-22 manufacturers would produce gas simply to generate CERs, thereby diluting the CDM's currency, at least in terms of its environmental effectiveness.¹²⁶ Recall that a key requirement of CERs is that they be "additional to any that would have occurred in the absence of the project activity."¹²⁷ The economics of HFC-23 projects are a *reductio ad absurdum* of this requirement. It is quite likely that no capture of HFC-23 would occur without the CDM. On the other hand, with the CDM, HCFC-22 factories have very strong incentives to create extra HFC-23 specifically to capture and destroy it. Indeed, merely by capturing what they would have made anyway, a manufacturer can triple revenues and, based on the cost estimates presented above, more than triple profits.

C. Imperfect Regulatory Compromise for HFC-23 Plants in the CDM

To deal with the perverse incentives to overproduce HCFC-22 in order to capture and destroy HFC-23, the CDM EB decided to approve only those projects involving previously existing HCFC-22 production capacity.¹²⁸ New plants or added capacity are not currently allowed into the CDM.¹²⁹ In order to qualify for registration, a plant must have been in operation and able to supply both HCFC-22 and HFC-23 production data for at least three years in the 2000 to 2004 period.¹³⁰ This prerequisite creates the obvious problem of incentivizing the capture and destruction of HFC-23 that is emitted incidental to the 16 percent annual growth of HCFC-22 production predicted to occur in the developing world.¹³¹ The Conference of the Parties has asked for guidance on new plant and added capacity from the Subsidiary Body for Scientific and Technical Advice of the UNFCCC.¹³²

Even with these relatively restrictive rules on eligibility, there is circumstantial evidence and very good reason to suspect that HCFC-22 manufacturers participating in the CDM have behaved strategically to direct a greater share of the subsidy to themselves by artificially inflating their

126. On the concept of tradable emissions permits as a property right, see Hahn & Hester, *supra* note 58, at 110, 117; on the concept of tradable emissions permits as a currency, see David G. Victor et al., *A Madisonian Approach to Climate Policy*, 309 *SCIENCE* 1820 (2005).

127. Kyoto Protocol, *supra* note 1, art. 12, § 5(c).

128. CDM Executive Bd., *supra* note 109, at 3.

129. *Id.* at 1.

130. *Id.*

131. MCCULLOCH, *supra* note 95, at 4.

132. *Summary of the Twenty-Second Sessions of the Subsidiary Bodies of the UN Framework Convention on Climate Change: 19–27 May, 2005*, *EARTH NEGOTIATIONS BULL.* (Int'l Inst. For Sustainable Dev., New York, N.Y.), May 30, 2005, at 5, available at <http://www.iisd.ca/download/pdf/enb12770e.pdf>.

base-year production in two ways. First, the fraction of HFC-23 produced by the production of HCFC-22 can be reduced by modification of the conditions under which chemical synthesis occurs. Dupont has consistently produced, in its United States HCFC-22 plant, HFC-23 byproduct percentages as low as 1.3 percent.¹³³ Developing-country manufacturers have not been able to achieve such rates of HFC-23 production, with reported rates between 2 and 4 percent. The economics of HCFC-22 production in the absence of a CDM subsidy dictate that HFC-23 production should be minimized because it is a waste product costing both energy and materials.¹³⁴ For this reason, almost all plants have historically monitored their HFC-23/HCFC-22 ratio in order to optimize productivity of HCFC-22.¹³⁵

Dupont argued in comments presented to the CDM EB that the crediting methodology for HFC-23 projects should be limited to crediting global best practice—the Dupont value. CDM project proponents responded that their plants lacked necessary capacity and could not be expected to perform with the same efficiency as those in the developed world. Presented with these conflicting arguments, the CDM EB forged a crude compromise. The CDM methodology eventually approved for HFC-23 abatement set 3 percent as the maximum percentage of HFC-23 byproduct allowable in the baseline data of a participating plant, a rough average of reported developing world values.¹³⁶ The average of all reported baseline data from the nineteen participating plants is 2.99 percent—very close to the maximum allowable value.¹³⁷ This suggests that even if the project participants were not actually aiming for the 3 percent sweet spot that would minimize their production costs (due to wasted feedstocks) but maximize their CDM subsidy (due to more CERs for a given production rate of HCFC-22), they were certainly not as concerned with minimizing this percentage as developed-world manufacturers who are not eligible for the CDM subsidy. Furthermore, the presence of the CDM and the prospect that crediting may ultimately be allowed for new plants removes any incentive to improve capital stock or process at existing

133. Jacob, *supra* note 125.

134. IPCC, *supra* note 83, at 394, 396.

135. Jacob, *supra* note 125.

136. Letter From Thomas R. Jacob, Senior Advisor, Global Affairs, Dupont, to Jean-Jacques Becker, Chair, CDM Methodology Panel (Oct. 2, 2004), available at <http://cdm.unfccc.int/methodologies/inputam0001>.

137. It is important to note that at the time the CDM EB made its decision, it had data only from two HCFC-22 plants. Compare, UNFCCC, AM0001: Incineration of HFC 23 Waste Streams—Version 5.2, <http://cdm.unfccc.int/methodologies/DB/0MKGF12PM6TSNFNJZUESTSKG581HN6/view.html> (last visited May 2, 2008) (showing approval of Version 3 of AM0001 on May 13, 2005), with UNEP Risø Centre, *supra* note 82 (showing the public comment phase of the third HFC-23 project beginning on June 5, 2005).

plants, or to invest extra capital in state of the art facilities. Rather, it encourages construction of inefficient plants in order to create a high baseline and maximize potential for future CDM revenues.

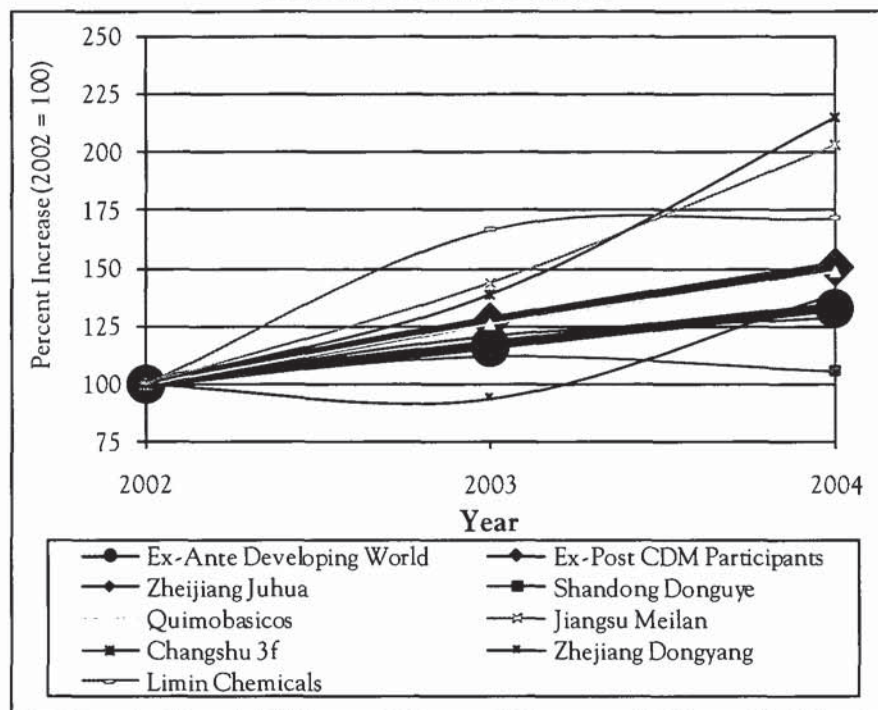
Second, at least some of the HCFC-22 plants participating in the CDM appear to have ramped up production during the baseline period (2000–2004) far beyond expected growth in the sector (15 percent per annum). Figure 4 shows baseline data supplied by plants participating in the program compared with the predicted growth rate for the industry over the 2002–2004 period.¹³⁸ Most plants exceeded the growth rates predicted for the developing-world industry as a whole. The increases in HCFC-22 production among the developing-world manufacturers led to a CDM participant production growth rate of 50 percent rather than 33 percent, as had been predicted *ex-ante* by market analysts.¹³⁹ Whether these plants increased production because of demand for HCFC-22 or in anticipation of higher CER revenue is impossible to say given existing publicly available information. Nevertheless, circumstantial evidence suggests that, rather than building new plants, HCFC-22 manufacturers elected to add capacity at existing plants during the CDM baseline period in order to take advantage of the CDM subsidy.¹⁴⁰

138. For predicted growth rates, see MCCULLOCH, *supra* note 95, at 4; production data for individual HCFC-22 plants on file with author.

139. *Id.*

140. Adding capacity at some existing plants would have been relatively simple because some developing-world plants are swing plants, able to shift configuration to produce a number of different halocarbon gases. With advance knowledge of the CDM and even a forecast price signal of \$3 to \$5, shifting to near constant HCFC-22 production and away from other halocarbons would have made sense during the baseline period. See TECH. & ECON. ASSESSMENT PANEL, U.N. ENV'T PROGRAM, RESPONSE TO DECISION XVIII/12: REPORT OF THE TASK FORCE OF HCFC ISSUES (WITH PARTICULAR FOCUS ON THE IMPACT OF THE CLEAN DEVELOPMENT MECHANISM) AND EMISSIONS REDUCTION BENEFITS ARISING FROM EARLIER PHASE-OUT AND OTHER PRACTICAL MEASURES 51–55 (2007), available at http://ozone.unep.org/teap/Reports/TEAP_Reports/TEAP-TaskForce-HCFC-aug2007.pdf.

FIGURE 4: PERCENTAGE INCREASES AT HCFC-22 PLANTS REPORTING MULTIPLE YEARS OF BASELINE DATA RELATIVE TO EX-ANTE ANALYST PREDICTIONS FOR THE INTERVAL¹⁴¹



In response to the windfall profits enjoyed by their domestic HCFC-22 producers as a result of the CDM, China has imposed a 65 percent tax on CER revenue generated by HFC-23 projects.¹⁴² Revenues from this fund, currently in excess of \$2 billion, are to be devoted to sustainable development, although none have yet been dispersed. In this way, as had been predicted by the critics of the CDM's baseline concept, Chinese environmental regulators, rather than create regulations that would eliminate a CDM project's eligibility, have acted to extract a substantial portion of the subsidy-derived rent. This tax reduces the CERs income to only 60 percent of that derived from the sale

141. The ex-ante developing world growth rate is 16.5 percent. The ex-post CDM participant growth rate is 25 percent. The thick lines show ex-ante (filled circles) and the average CDM participant (filled diamonds) rates of production growth.

142. Office of Nat'l Coordination Comm. on Climate Change, *supra* note 77, art. 24.

of HCFC-22. However, at prices greater than €15, even with a 65 percent tax, it will again make sense to produce gas solely for CER revenue.¹⁴³

The CDM provides perverse economic incentives to HCFC-22 producers that have led to a large fraction of the CER supply being produced by HFC-23 abatement. Even if some fraction of these reductions are voluntary, real, and additional, they still may not be the best use of Annex B resources for addressing non-Annex B GHG emissions. To abate all developing-world HFC-23 emissions would cost approximately \$31 million per year.¹⁴⁴ Instead, by means of a CDM subsidy, the Annex B nations will likely pay between €250 and €750 million to abate 2005 non-Annex B HFC-23 emissions.¹⁴⁵ This is a remarkably inefficient path to an environmental goal.

The case of HFC-23 capture projects, which currently account for nearly 22 percent of the CERs expected for delivery by 2012, illustrates both the success and some fairly significant problems with the CDM market. On one hand, the CDM was successful in identifying a class of emitters with very low marginal abatement costs and inducing near total sectoral abatement. On the other hand, it appears quite likely that the sector is also gaming the system by modifying its behavior in order to generate extra credits that can then be sold to developed countries with compliance obligations. Because of the inherent information asymmetries, the regulator has had a very difficult time, and indeed has not genuinely tried, dealing with these problems. It is not clear under the current system how it could. At the same time, because of the limitation on eligibility for old plants, the problems associated with HFC-23 for the CDM are to some extent limited. It is worth noting, however, that what saves the CDM from being awash in CDM credits does not help the environment. Recent press reports indicate incredibly high rates of growth in the HCFC-22 market, including the construction of new plants. Until these plants are included in the CDM or some other climate regime, they will emit their HFC-23 byproducts into the atmosphere.¹⁴⁶

143. A €15 CER price, taxed at 65 percent will net €1.60 after abatement costs and tax per kg HCFC-22 produced. The market price for HCFC-22 is approximately €1.60. See McFarland Interview, *supra* note 123.

144. McCULLOCH, *supra* note 95, at 21.

145. 80 Mt CO₂e * €5 = €400,000,000; 80 Mt CO₂e * €20 = €1,600,000,000.

146. At recent climate negotiations, China has been arguing for and the EU against inclusion of new plants and additional capacity in the CDM. At this point, no agreement has been reached as to how to incorporate them into the CDM. Keith Bradsher, *Use of Air-Conditioning Is Widening the Hole in the Ozone Layer*, N.Y. TIMES, Feb. 23, 2007, at C1.

V. ANYWAY CREDITS IN CHINA'S POWER SECTOR

The most recent development in the CDM is the entry of important components of the Chinese electricity sector into the market. Early CDM power projects were mostly small power plants utilizing run-of-river hydro or biomass combustion technologies, mostly with nameplate capacity below 25 megawatts (MW). Recently, that picture has changed dramatically with the entry of significant numbers of large hydro¹⁴⁷ and natural-gas-fired power projects into the project pipeline. These projects present extremely challenging regulatory decisions to the CDM EB because it must decide which projects would or would not have gone forward without the carbon finance funds. Answering the question of whether projects are additional or would have happened anyway is always challenging, but is made particularly difficult by two factors: The energy sector in China is heavily regulated and primarily owned by the Government or state-owned entities, and participation rates by several elements of the sector is near 100 percent. On one hand, this outcome is to be applauded because modifications to the development path of the non-Annex B energy sector were a key goal for the CDM. However, this emerging result also raises important questions regarding the assumptions underlying the CDM as well as its potential for growth beyond 2012. The following section sheds light on these issues by telling the story of recent attempts by natural-gas-fired power plants to generate credits under the CDM.

A. Natural-Gas-Fired Power in China

Ultimately, if the problem of global climate change is to be effectively addressed, the methods by which electricity is generated both in the developed and the developing world will have to change. Currently, most electricity is generated via large coal-fired generating stations.¹⁴⁸ This is because large coal-fired generating stations are, at present, the lowest cost supplier of electricity, particularly in countries like the United States, China, and India,

147. For a discussion of the participation of large hydro in the CDM that reaches similar conclusions for that sector, see BARBARA NAYA, *FAILED MECHANISM: HOW THE CDM IS SUBSIDIZING HYDRO DEVELOPERS AND HARMING THE KYOTO PROTOCOL 4-5* (2007), available at http://www.internationalrivers.org/files/Failed_Mechanism_3.pdf.

148. ENERGY INFO. ADMIN., *supra* note 78, at 62; Gerard Wynn, *U.N. Talks Will Not Decide on New HFC Incentives*, REUTERS, Dec. 8, 2007, available at <http://www.reuters.com/article/latestCrisis/idUSL08166304>.

where coal supplies are abundant.¹⁴⁹ Thus, developing both short-term and long-term alternatives to coal-fired generation capacity is critical to mitigating the impacts of climate change. In China, where new capacity is being added at an extremely high rate in order to meet surging demand for electricity, short-term alternatives are especially important.¹⁵⁰

One currently available alternative to the large coal-fired generating station that is superior from a GHG emissions perspective is large power plants that utilize combined cycle gas turbines (CCGT) technology. These plants are superior from a climate perspective because they produce substantially less CO₂ per MW hour (MWh) of electricity than typical coal-fired power plants.¹⁵¹ In addition, CCGTs emit substantially lower quantities of particulate matter, soot, sulfur oxides, and nitrogen oxides per unit of power produced than do coal-fired power plants, because the fuel they burn is cleaner and combustion is more complete.¹⁵² This cleaner emission makes them extremely appealing for new baseload generation to developing countries that have severe local air pollution concerns. It is for this reason that California in-state baseload generation, in contrast to the United States as a whole, is largely via CCGT.

Even with these environmental advantages, natural-gas-fired power has struggled to gain a foothold in developing countries because of the different underlying prices of coal and natural gas.¹⁵³ Capital costs and construction times are generally far higher for coal than for natural gas, while the reverse is true for fuel prices. Thus, while a coal plant requires significant upfront investment, it is relatively cheap to operate compared to a CCGT plant, which is cheap to build but costly to operate. Overall, the higher fuel costs

149. These three are also the countries with the greatest current and future impacts on climate, precisely for the reason that they are large and generate most of their electricity using coal-fired power plants. ENERGY INFO. ADMIN., *supra* note 78, at 62.

150. China built 114 GW of new fossil-fuel-fired generating capacity in 2006 and is on track to build 95 GW of new fossil-fuel-fired generating capacity in 2007. For comparison, the UK electricity grid has a capacity of 75 GW, and the California Independent System Operator administers 46.5 GW. Both of these grids were built out over decades. Keith Bradsher, *China's Green Energy Gap*, N.Y. TIMES, Oct. 24, 2007, at C1; Envtl. Energies Tech. Div., Lawrence Berkeley Nat'l Lab., Current Energy: Supply of and Demand for Electricity for California, <http://currentenergy.lbl.gov/ca/index.php> (last visited July 15, 2007).

151. On average, a subcritical coal-fired power plant produces CO₂ at a rate of 0.92 metric tons CO₂ per MWh while a CCGT has a carbon intensity of 0.35 metric tons CO₂ per MWh. Mike Jackson et al., *Greenhouse Gas Implications in Large Scale Infrastructure Investments in Developing Countries: Examples From China and India* (Stanford Program on Energy & Sustainable Dev., Working Paper No. 54, 2006), available at http://iis-db.stanford.edu/pubs/21061/China_and_India_Infrastructure_Deals.pdf.

152. ENERGY INFO. ADMIN., *supra* note 78, at 62.

153. *Id.*

of gas swamp the higher capital costs of coal. This outcome is especially true in China where coal's capital costs are relatively lower, and CCGT's relatively higher, than global averages.¹⁵⁴ These economics have made gas and the CCGT simultaneously attractive to foreign investors and unattractive to government-controlled power sectors like China's.

In China, these contrasting environmental and economic dynamics have played out via substantial state control of the power sector in ways that have encouraged construction of new CCGT power plants, and at the same time have created substantial uncertainties for their operation. On one hand, the state intervened to insure construction of the West-East Pipeline, opening up a major supply of new gas for the eastern provinces where demand is greatest.¹⁵⁵ Financial viability of this project was assured by take-or-pay contracts for natural gas between the pipeline and the proposed new CCGT's in the coastal provinces.¹⁵⁶ State-owned enterprises are also in the process of constructing multiple new liquefied natural-gas facilities to serve the coastal provinces.¹⁵⁷ In addition, as part of China's eleventh five-year plan, the National Development and Reform Commission, which sets tariffs on China's two electricity grids,¹⁵⁸ is charged with developing the gas industry in an effort to reduce pollution.¹⁵⁹ Although its high costs might make it seem unattractive, the environmental and energy security benefits of increased utilization of gas-fired power have meant that China plans to build twenty-three CCGT power plants between 2005 and 2009, with a combined nameplate capacity of more than 18 GW.¹⁶⁰

154. In China, because the critical components for coal-fired power plants are produced domestically while those for CCGT must be imported, capital cost for subcritical coal-fired power plants may actually be lower than for CCGT. *Id.*; INT'L GAS UNION, GAS TO POWER-CHINA 15 (2005) (on file with author).

155. People's Republic of China, China Factfile: Key National Projects, http://english.gov.cn/2006-02/08/content_182600.htm (last visited July 15, 2008).

156. This support was critical, because in the absence of a well-developed residential and commercial distribution network and demand for gas, a complete pipeline would have insufficient customers to whom it could sell its gas. INT'L GAS UNION, *supra* note 154, at 5, 9.

157. *See id.* at 5.

158. *Id.* at 16.

159. NAT'L DEV. & REFORM COMM'N, PEOPLE'S REPUBLIC OF CHINA, THE OUTLINE OF THE ELEVENTH FIVE-YEAR PLAN FOR NATIONAL ECONOMIC & SOCIAL DEVELOPMENT OF THE PEOPLE'S REPUBLIC OF CHINA, ch. 3: Optimizing and Upgrading Industrial Infrastructure, http://en.ndrc.gov.cn/hot/t20060529_71334.htm (last visited July 15, 2008).

160. For comparison, the entire California Independent System Operator manages 46.5 GW of nameplate capacity. Compare Envtl. Energies Tech Div., *supra* note 150, with INT'L GAS UNION, *supra* note 154, at 2.

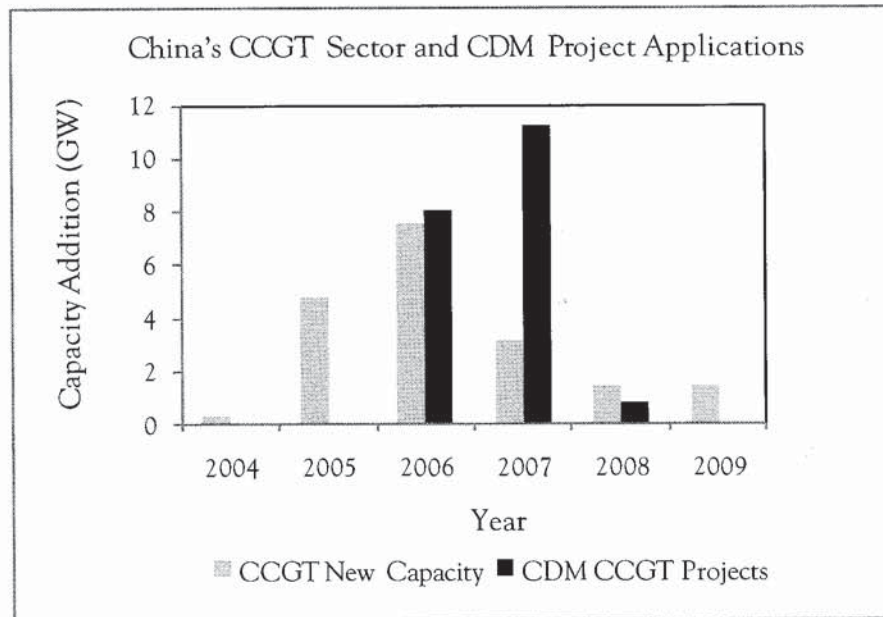
B. Natural-Gas-Fired Power as a CDM Project

Because the primary sources of power to the Chinese electrical grid are subcritical coal-fired power plants and most new builds are either subcritical or supercritical coal,¹⁶¹ construction of a CCGT instead of a coal-fired power plant arguably represents a reduction of GHG emissions. As described in the previous section, the economics in China do not favor the decision to build a CCGT rather than a subcritical coal power plant. Nevertheless, this choice would have clear climate benefits. If such a decision could be influenced by the potential supply of funds from the sale of carbon credits, equal to the difference in GHG emissions between the alternatives, crediting as a CDM project would be possible. Such thinking led to the submission and approval of just such a CDM methodology in mid-2006, called the Baseline Methodology for Grid Connected Electricity Plants Using Natural Gas (AM0029).¹⁶²

161. Subcritical coal-fired power plant boilers operate at temperatures and pressures below the critical point for water—the point at which water no longer turns into steam when heated but instead decreases in density. Supercritical plants operate above this point and as a result achieve significantly higher heat rates and efficiency than is possible for subcritical plants. See World Coal Inst., *Supercritical & Ultra-Supercritical*, <http://www.worldcoal.org/pages/content/index.asp?PageID=421> (last visited Mar. 31, 2008).

162. CDM Executive Bd., UNFCCC, *Approved Baseline Methodology AM0029: "Baseline Methodology for Grid Connected Electricity Generation Plants Using Natural Gas"* (Version 01.1, 2006), available at http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_KTKZTS1HEG4JBIETV74WMLZY10061X.

FIGURE 5: CONSTRUCTION OF COMBINED CYCLE GAS TURBINE POWER PLANTS IN CHINA AND APPLICATIONS FOR CREDITING UNDER THE CDM BY NAMEPLATE CAPACITY (2004–2009)¹⁶³



By the end of 2007, twenty-four CCGT projects, representing essentially all power plants actually being built (as opposed to planned) in China between 2005 and 2010, had applied under the methodology to claim credit for the difference between their emissions and the baseline established by AM0029 (see Figure 1).¹⁶⁴ All plants built or under construction since 2005 are arguing that they would not have been built but for the CDM. This argument, when presented on a project-by-project basis, sounds plausible. It is only when the comparison between total project applications and the entire natural-gas-fired power sector is made, and the two are found to be roughly equivalent, that it becomes problematic.

163. The total CCGT builds equal 18.4 GW while applications for CDM crediting so far equal 17.6 GW.

164. Planned CCGT power plant builds during the 2004–2009 interval equal 18.37 GW. INT'L GAS UNION, *supra* note 154, at 3. CDM applications to the end of 2007 for crediting of plants entering operation between 2005 and 2008 equal 17.59 GW, UNEP Risø Centre, *supra* note 82.

Of the 24 Chinese CCGT CDM projects currently proposed, six have been registered¹⁶⁵ and a further three have requested registration but the CDM EB has required corrections after review.¹⁶⁶ Registration is automatic eight weeks after it is requested unless a project participant or at least three members of the CDM EB submit a Request for Review (RFR) of the project.¹⁶⁷ An RFR is then considered by the full CDM EB at its next meeting. Decisions on whether to grant review and on the scope of review are then made.¹⁶⁸ To date, all requests for review on Chinese CCGT CDM projects by CDM EB members list concerns about additionality as a reason for the RFR.¹⁶⁹ In other words, the CDM EB members requesting review are concerned that these projects would have been built even in the absence of the CDM, and that any emissions reductions claimed by them would not be in addition to what would have occurred in its absence.

165. Six Chinese CCGT CDM projects have been registered as of July 1, 2008. Five of the six were registered only after Requests for Review by the CDM EB and subsequent corrections. UNFCCC Project 1320: Beijing Taiyanggong CCGT Trigeneration Project [hereinafter UNFCCC Project 1320], <http://cdm.unfccc.int/Projects/DB/SGS-UKL1188570070.22> (last visited Jul. 1, 2008); UNFCCC Project 1343: Xiaoshan Power Plant's NG Power Generation Project of Zhejiang Southeast Electric Power Co., Ltd. [hereinafter UNFCCC Project 1343], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189665775.96> (last visited Jul. 1, 2008); UNFCCC Project 1344: Zhejiang Provincial Energy Group Zhenhai Natural Gas Power Generation Co., Ltd.'s NG Power Generation Project [hereinafter UNFCCC Project 1344], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1189684459.76/view> (last visited Jul. 1, 2008); UNFCCC Project 1227: Yuyao Electricity Generation Project Using Natural Gas [hereinafter UNFCCC Project 1227], <http://cdm.unfccc.int/Projects/DB/DNV-CUK1183455647.94> (last visited Jul. 1, 2008); UNFCCC Project 1304: Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant [hereinafter UNFCCC Project 1304], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1187936755.18> (last visited Jul. 1, 2008); UNFCCC Project 1373: Beijing No.3 Thermal Power Plant Gas-Steam Combined Cycle Project Using Natural Gas [hereinafter UNFCCC Project 1373], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1191500853.33> (last visited Jul. 1, 2008).

166. Three projects are currently being revised after the CDM EB required a review of their registration request and corrections. UNFCCC Project 1381: Shanghai Baoshan Grid Connected Natural Gas Combined Cycle Power Plant Project [hereinafter UNFCCC Project 1381], <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1192083874.4> (last visited Jul. 1, 2008); UNFCCC Project 1243: Sulige Natural Gas Based Power Generation Project [hereinafter UNFCCC Project 1243], <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1184339707.46> (last visited Jul. 1, 2008); UNFCCC Project 1368: Qinghai Ge-ermu Gas Turbine Power Plant Project [hereinafter UNFCCC Project 1368], <http://cdm.unfccc.int/Projects/DB/BVQI1191062063.0> (last visited Jul. 1, 2008).

167. United Nations Framework Convention on Climate Change, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Montreal, Can., Nov. 28–Dec. 10, 2005, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on Its First Session, Held at Montreal From 28 November to 10 December 2005, Addendum: Part Two: Action Taken by the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol at Its First Session*, 15, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006), available at <http://unfccc.int/resource/docs/2005/cmpl/eng/08a01.pdf>.

168. *Id.*

169. UNFCCC, Project 1343, *supra* note 165; UNFCCC, Project 1320, *supra* note 165; United Nations Framework Convention on Climate Change, *supra* note 167, at 14, 16–17.

In its review of these projects, it is not at all clear that the CDM EB will be able to address the fact that, taken together, current applications for crediting under the CDM of natural-gas-fired power in China imply that no CCGT builds would occur in the absence of carbon finance. Because review is on a project-by-project basis and is limited to determination that the project documents are in compliance with the AM0029 methodology, this is likely beyond the scope of review.¹⁷⁰ The AM0029 methodology determines a project's additionality by reference to a financial calculation comparing the costs of CCGT to alternative options, and by an analysis of whether the project is common practice.¹⁷¹ The investment analysis treats projects as if they were operating in a deregulated, competitive, power generation sector, rather than in a state-controlled or partially deregulated power sector. The common practice analysis, in the context of a coal-dominated energy sector such as China's, is easy to overcome. Neither takes into account the relevant national priorities for energy development that have been set by the China. Thus, the review of CCGT projects is likely to find them to be additional to what otherwise would have occurred, not because this is in fact the case, but rather because the review is constrained by the procedures of the CDM from asking the right questions about the projects.

The decisions made regarding these projects are likely to set an important precedent that could have far-reaching consequences for the CDM in light of another recently approved methodology. In the fall of 2007, the CDM EB approved, after significant controversy, a methodology for crediting supercritical and ultra-supercritical coal-fired power plants for emissions reductions relative to a grid primarily composed of subcritical coal-fired plants (ACM0013).¹⁷² This methodology is very similar to AM0029 with regard to its additionality test,¹⁷³ but will apply to a substantially larger number of power plants both in China and the rest of the developing world. In 2006 and 2007, China built more than 200 GW of new fossil-fuel-fired power plants. China has begun telling power companies that they should choose to

170. A request for review must relate to a project's failure to comply with a specific validation requirement. See United Nations Framework Convention on Climate Change, *supra* note 167, at 15, 54, 55. Validation requirements relevant to the additionality determination are defined in terms of compliance with an approved methodology, such as AM0029. *Id.* at 14, 16–17.

171. See CDM Executive Bd., *supra* note 162, at 3.

172. CDM Executive Bd., UNFCCC, *Approved Consolidated Baseline and Monitoring Methodology ACM0013: "Consolidated Baseline and Monitoring Methodology for New Grid Connected Fossil Fuel Fired Power Plants Using a Less GHG Intensive Technology"* (Version 01, 2007), available at http://cdm.unfccc.int/EB/034/eb34_repan02.pdf.

173. Compare CDM Executive Bd., *supra* note 162, at 3, with CDM Executive Bd., *supra* note 172, at 4.

build supercritical rather than subcritical plants because they use 10 percent less coal.¹⁷⁴ As China shifts from subcritical to supercritical and ultra-supercritical coal-fired generation technology, the potential for the generation of large numbers of CERs that do not correspond to any kind of behavioral change appears possible.

The AM0029 methodology and near 100 percent participation of CCGT power plants in China together have placed the CDM EB in an untenable position. On one hand, natural-gas-fired power is a climate friendly alternative to coal, whose development should be encouraged and fostered by the climate regime. Further, a program to encourage developing-country participation in the global climate change regime would strive to achieve 100 percent participation rates within developing country electricity sectors. On the other hand, it appears that the CDM, because it functions at a project rather than a sectoral level, is likely giving credit for activities that would have occurred without it. These “anyway” credits are especially important given that the CDM credit, “anyway” or not, can be sold to Annex B parties in order to reduce the extent to which they cut their own emissions.

VI. REFORM OF THE POST-2012 REGIME

The parties to both the Kyoto Protocol and the UNFCCC are now considering what to do to accomplish the goal of the UNFCCC after the first compliance period ends in 2012.¹⁷⁵ Global carbon trading is likely to play a role in any future architecture. At the same time, the U.S. Senate is considering proposals for an economy-wide cap-and-trade program for GHGs that would allow extensive utilization of international carbon credits.¹⁷⁶ Thus, consideration of how to improve the performance of the CDM is critical from both a domestic and an international perspective.

This description of the current and likely future state of the CDM is meant to point out that, before we assume that expansion of the current offset trading market is the appropriate route for engaging with developing countries, it is worth looking at the empirical evidence from the trading program as it exists now. That evidence, as detailed in the two examples above, suggests that the CDM is leading to widespread strategic behavior. In the case of the HFC-23 projects, the incentives created by the CDM are

174. Bradsher, *supra* note 150.

175. *Bali Action Plan*, *supra* note 8.

176. For example, the Lieberman-Warner Bill would allow 15 percent of a covered facility's compliance obligation to be met with international allowances or credits. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2501 (2007).

leading to undesirable behavior in the name of claiming credit. HFC-23 projects appear to be creating extra GHGs in order to claim credit for their capture and destruction even as they do capture and destroy some emissions that would have contributed to climate change. In the case of the CCGT projects, the incentives created by the CDM are likely leading to no change in behavior except for widespread claims for credits. Furthermore, procedures for project regulation likely limit the CDM EB from examining the issues most central to whether the projects are producing additional emissions reductions.

In addition, both cases present severe information challenges for the regulator. The rules of the game in the CDM systematically create incentives for project proponents to manipulate the transfer of information to the CDM EB while providing it with essentially no other information-gathering resources. In the case of HFC-23, the CDM creates strong incentives for project proponents to conceal the extent to which process efficiencies might lower their GHG production rate. In the case of the CCGTs, the system creates strong incentives for project proponents to misrepresent the motivations for their choice of power plant technology. Unlike in a natural market, buyers of CDM credits have no incentive to disclose information they have regarding projects. Their incentive, just like the generators of credits, is to facilitate the approval of projects and the issuance of credits. This informational problem is particularly acute because the CDM EB is called upon to make decisions requiring technical expertise across a wide array of both countries and industries.

The CDM set three goals: to produce sustainable development, to help developing countries accomplish the objective of the UNFCCC, and to reduce the costs of compliance for parties with quantitative targets.¹⁷⁷ The evidence presented above points to the possibility that the CDM is accomplishing these goals, but only to a limited extent. In one case, strategic but legal behavior is leading to the creation of extra GHGs in conjunction with emissions that would have occurred in order to generate a mix of additional and anyway credits. In another case, strategic disclosure of information and limitations on the scope of review will potentially lead to wholesale crediting of behavior that would have occurred anyway. Both indicate a need to consider reform, either by improving the CDM or by replacing it with an alternative mechanism for developing-country engagement.

177. Kyoto Protocol, *supra* note 1, art. 12.

A. Reforming the CDM

Limited reforms to the existing CDM structure might improve its ability to detect and deter strategic behavior by participants. Under the current regime, the third party verifiers charged with validating project applications face unavoidable conflicts of interest when it comes to substantive review of project proponents' claims. These DOEs are currently paid by the project proponents and face a competitive business environment.¹⁷⁸ One potential reform measure might be to include the costs of third-party verification in CDM project application fees. The CDM EB would then have adequate resources to contract directly with DOEs, who would have incentives to disclose as much as possible regarding CDM projects to avoid loss of business. Another reform possibility is to clarify that DOEs are responsible for checking not only that a project's additionality analysis is performed consistently with the applicable CDM procedures, but also that key facts and assumptions underlying it are accurate.¹⁷⁹ Standardized accounting procedures might also be specified in order to limit the extent to which creative accounting is used to argue that projects would not have gone forward without the sale of carbon credits.¹⁸⁰ Finally, under the current regime, project proponents must "take[] due account"¹⁸¹ of comments received by the public during the validation process. All of these incremental reforms would likely reduce the extent to which project proponents can game the system, increase the incentives that DOEs have for monitoring strategic behavior, and help to simplify the extremely difficult regulatory choices with which the CDM EB is often faced. These procedures might, to a great extent, help to deal with the HFC-23 case.

Nevertheless, they do not resolve the issue of how to separate additional from nonadditional projects in regulated and state-owned industries like the Chinese energy sector. Ultimately, this issue looms larger than any other because of the emissions associated with the explosive growth in the Chinese and Indian economies. Fully addressing it will likely require transforming the CDM into a system that can deal directly with the actors that matter most in these industries—the government policy makers that set energy development priorities.

178. LAMBERT SCHNEIDER, *IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT* 56 (2007), available at http://assets.panda.org/downloads/oeko_institut_2007_is_the_cdm_fulfilling_its_environmental_and_sustainable_developme.pdf.

179. *Id.* at 55.

180. *Id.* at 59.

181. United Nations Framework Convention on Climate Change, *supra* note 167.

B. Border Controls for CERs

If agreement on incremental reform proves impossible, but individual Annex B nations still want to improve the quality of the CDM market, they can do so, albeit at the cost of some market fragmentation. Nations are not required to purchase, or to allow private entities within their borders to purchase, CERs for compliance purposes. This is an option that Europe has chosen to adopt and it is one that Europe, or a future U.S. program could utilize to encourage the kind of CDM that all had hoped for, and to discourage the accounting gimmicks and oversubsidization that are present within the current market. The Linking Directive of the European Commission lays out the rules by which CERs may be imported into the EU Emissions Trading Scheme (ETS).¹⁸² It would be easy for the European Commission to modify this directive to enable additional review of CERs before their use is allowed in the EU. Currently, the Linking Directive already specifies special import criteria for CERs created by large hydro projects.¹⁸³ The United States, if it passes climate legislation including a cap-and-trade system with provision for use of international offsets, could also implement additional review of projects. Because the European ETS currently is the largest consumer of these credits, as the United States would be if it were to adopt such legislation, it has significant influence over the market. Were either country to enact CER standards tougher than mandated by the CDM EB, these standards would likely be adopted by all project proponents in order to allow sale of their credits into key markets. To some extent, this might lead to market fragmentation, with separate prices developing for EU- or U.S.-qualified CERs, but fragmentation is already a hallmark of carbon markets.¹⁸⁴

C. An Alternative to the CDM

Ultimately however, without radical reform of the incentive structure facing market proponents, the accounting tricks illustrated by the HFC-23 and CCGT examples are unlikely to be eliminated entirely. At the same time, simply eliminating the CDM without replacing it with an alternative method for engaging developing countries is unwise. It would leave many

182. Council Directive 2004/101 Amending Directive 1003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, in Respect of the Kyoto Protocol's Project Mechanisms, 2004 O.J. (L 338) 18 (EC).

183. CERs derived from hydro projects larger than 20 MW must insure that these dams meet the criteria specified by the World Commission on Dams. *Id.* at 21.

184. And fragmentation is not necessarily a bad thing. It can promote faster learning and evolution of effective trading structures. Victor et al., *supra* note 126, at 1820.

low-cost reduction opportunities on the table, increase costs for developed-nation emitters in the short term, and both delay and increase the cost of eventual acceptance of caps by developing countries.

There is an alternative. The international community has significant experience in compensating developing countries for the reduction of dangerous atmospheric emissions in another context. The Multilateral Fund of the Montreal Protocol has been very successful at accomplishing the phase out of the most harmful ozone depleting substances (ODSs).¹⁸⁵ This fund has operated on the principle that developed nations should pay any additional costs incurred by developing countries in transitioning away from ODSs to new, ozone-friendly chemicals.¹⁸⁶ Under a future climate change protocol, this model could be adopted for the purposes of engaging developing-country sectors that are state-controlled or particularly subject to gaming while still allowing for use of the CDM in some sectors. Alternatively, a climate fund could completely supplant the CDM as the major tool for engagement with developing countries.

A climate fund might have numerous advantages over the CDM. Agreed incremental costs or a reverse auction could generate a marginal cost-abatement curve for applicants to the fund. The climate fund could then invest in projects with the lowest marginal abatement cost until its resources were exhausted. Price setting via a reverse auction would encourage low-cost reduction opportunities to surface without having to pay them substantially more than the costs of abatement, as occurs in the current system. Inframarginal rents would thus be reduced.

Another advantage of this approach is that state-managed sectors, like electric power in China, may be more effectively addressed by direct discussions with governments about priorities and costs rather than through the distorting filter of State Owned Entities. Further, low-cost emissions reduction opportunities such as building standards and avoiding deforestation, which require state intervention and regulation, can be accessed.¹⁸⁷ Finally, transaction costs of emissions reductions would likely be reduced because project proponents would not have to prove that their project would not have gone forward without the sale of carbon credits.

A climate fund approach could also continue to fulfill the function of cost control for Annex B nations that have committed to caps on their GHG

185. RICHARD ELLIOT BENEDICK, *OZONE DIPLOMACY* 265–68 (1998).

186. *Id.* at 254–65.

187. Emissions reductions must be voluntary to qualify under the CDM. Voluntary has been interpreted by the CDM EB to mean not caused by domestic law or regulation. Kyoto Protocol, *supra* note 1, art. 12.

emissions. GHG abatement in the developing world with resulting emissions reductions could be credited to Annex B countries based on their contributions to the fund or an alternative agreed upon metric. In this way, cost control would be at the national level rather than at the firm level as in the EU ETS. A nation participating in the fund could simply reduce the scarcity of permits and hence their price in its cap-and-trade system rather than, as now, allowing covered entities to surrender CDM credits in lieu of domestic tradable permits.

Perhaps the biggest advantage of this type of fund would be that it reduces the incentives of firms and governments to misrepresent their business-as-usual emissions and costs to the regulator. Under the current system, the more a project proponent can inflate its baseline, the more money there is to be made. Under a climate fund in which nations agree on incremental costs or allow a reverse-auction to establish them, firms and regulators would have at least some incentive to report a more accurate estimate of their emissions and costs. In a context in which emission reduction projects are competing for a limited pool of emissions reduction funds and where the odds of receiving payment for an activity increase as the costs of marginal abatement fall, sellers of credits have an incentive to report the lowest costs for emissions reductions that they can reasonably deliver.

The incentives created by this type of system are admittedly imperfect—governments or firms might still attempt to inflate baselines in order to lower marginal costs of abatement. The advantage, though, is that the fund manager would have information from other bidders with similar projects on the costs of abatement. The odds of collusion among governments or individual emitters in order to systematically misrepresent abatement costs or baselines are lower than the odds of such misrepresentation by individuals within the current system.

A climate fund would address many of the defects of the current system. It would allow direct engagement with domestic regulators in developing countries and an honest discussion regarding policy baselines. It would potentially reduce the costs of emissions reductions through a utilization of a reverse auction price-setting mechanism rather than allowing prices to be set by the cost of emissions reductions in developed-country cap-and-trade markets. Finally, it would likely modify the incentives facing project proponents and so lead to a better information transfer to the fund manager than is currently in the CDM. Nonetheless, it would almost certainly have its own problems. No system as complicated as the global carbon market, or a global climate fund, is likely to operate flawlessly or avoid all unintended consequences.

CONCLUSION

Climate change is a long-term problem that requires long-term solutions. Active, broad engagement of both developed and developing countries is absolutely essential for success. The preceding analysis has illustrated that the global carbon market does not live up to its current hype. Too often, market participants behave strategically to generate credits for activities that do not merit them. At the same time, the analysis shows that the incentives produced by the global carbon market do indeed have the potential to induce significant participation on the part of developing nations in the global effort to combat climate change.

The challenge for the international community is to maintain this active participation while honestly facing up to the flaws in the CDM. If it can manage this, a more environmentally effective system is possible. Moving forward, and as developed-world investment in developing-country climate mitigation increases, more effective methods must be developed. Either the CDM needs significant reform, major buyers of CERs should adopt domestic controls that raise crediting standards, or an alternative mechanism such as a carbon fund should be devised to engage the developing world in fighting climate change.



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Co-benefits and additionality of the clean development mechanism: An empirical analysis

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ABSTRACT

The Clean Development Mechanism (CDM) allows industrialized countries to comply with the Kyoto Protocol by using carbon offsets from developing countries. There are two puzzles within this carbon market: additionality (the proposed activity would not have occurred in its absence) and co-benefits (the project has other environmental benefits besides climate mitigation). This paper proposes an econometric approach to evaluate the CDM effect on sulfur dioxide emission reductions and assess its additionality indirectly. Our empirical model is applied to China's emissions at the prefecture level. We found that the CDM does not have a statistically significant effect in lowering sulfur dioxide emissions. This result casts doubt on additionality of these CDM activities, that is, they would have happened anyway.

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1. Introduction

The Clean Development Mechanism (CDM) is a project-based carbon market which enables industrialized countries to reduce costs of compliance with the Kyoto Protocol by implementing climate mitigation projects in developing countries. The CDM has been successful in mobilizing the investment of public and private sectors from both developed and developing countries for reducing greenhouse gas (GHG) emissions. By the year 2009, there were more than 4200 projects in the pipeline that are expected to reduce GHG emissions by more than 2900 million metric tons of carbon dioxide equivalent (CO₂e) by the end of 2012. The CDM emission reduction is not trivial, in that it is around 40% of the U.S. emissions in 2007.¹

The CDM is nonetheless facing mounting criticism, in which the most serious challenge is its environmental integrity [1–3]. Since there are no emission caps for developing countries, the usefulness of the CDM hinges on whether the proposed project would have occurred in its absence. This assessment is known in the literature as additionality. Lack of rigorous criteria to establish additionality, however, may result in some projects receiving an excess of carbon credits. Even worse, some “business-as-usual” (BAU) activities might be wrongly registered as CDM projects. In this case, the credit buyers' increased emissions may not be fully offset by real emission reductions in the CDM activity. This may jeopardize on the effectiveness of the international emission trading system [4].

Another criticism is that the CDM insufficiently promotes sustainable development, although it is stipulated as one of its dual goals in the Kyoto Protocol [5,6]. The CDM is expected to improve environmental quality in host countries because

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¹ Source: The CDM project statistics are from <http://cdm.unfccc.int/index.html>. The U.S. emissions data are from “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007” available at <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

GHG emission reductions may also lower emissions of other pollutants such as sulfur dioxide (SO₂). The so-called co-benefit is one of the major reasons for developing countries to be involved in climate mitigation. However, while there is a price for CO₂, the local pollutants may not be monetized. Since the carbon market is only responsive to price signals, CDM developers have limited interest in generating other benefits besides carbon credits.

Additionality and co-benefits are two puzzles within this carbon market. Little is known empirically about whether the CDM has achieved these two goals. A major barrier for empirical studies is that the GHG emission data is not reported at the subnational level in developing countries. We address this problem by exploiting the connections between GHG and its co-pollutant emission reductions. To our knowledge this is the first paper that simultaneously evaluates additionality and co-benefits. Furthermore, the proposed econometric framework is not just applicable to the CDM. It has the potential to contribute to emerging policy debates about other baseline-and-credit programs such as voluntary carbon markets and energy efficiency credits.

As for the co-benefits of the CDM, we focus on sulfur dioxide (SO₂) emission reductions because of its broad environmental and health impacts.² Emissions of sulfur dioxide and GHGs are closely correlated with fossil-fuel use [8]. A separate analysis of either pollutant may not be able to provide a sufficient analytical framework [9]. More importantly, since GHG data are not widely available, SO₂ abatement may be useful for inferring GHG emission reductions. The rationale is that if fossil-fuel power generation is replaced by renewable energy, both CO₂ and SO₂ emissions will be reduced. If there is no observed change in SO₂ emissions, the efficacy of the CDM to reduce CO₂ would be called into question. Note that our additionality test is conditional on non-zero co-benefits. Therefore, we are not able to assess additionality for those projects that do not reduce sulfur emissions.

The econometric framework is an extension of the literature that investigates the determinants of SO₂ emissions [10–15]. Our model is adapted from, without relying on, the environmental Kuznets curve (EKC). Realizing that the classical polynomial EKC model may be too restrictive [16], we apply a fixed-effect semiparametric model that does not specify the functional form between emissions and income.

Our model augments a typical specification of SO₂ emissions through the inclusion of a policy variable reflecting CDM activities (measured by carbon credits). Identification of the causal effect of a CDM project is achieved through the inclusion of fixed effects, as well as the fact that CDM activities are determined well in advance of current SO₂ emissions because CDM approval is a lengthy process. Project developers have to wait at least one year between public comments and registration. The fixed effects capture resource endowment and industrial base, both of which are critical in the selection of CDM projects. Because resource endowment and industrial base change slowly, they can be regarded as fixed over the sample period. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

In this paper, we estimate the effect of the CDM in reducing SO₂ emissions at China's prefecture level. China is the world's largest GHG and SO₂ emitter. It is also the dominant player on the CDM market. The prefecture is the most disaggregated administrative unit that documents SO₂ emissions consistently, and this unit of analysis provides sufficient cross-sectional and temporal variation. Our econometric model shows no empirical support that the CDM has led to lower SO₂ emissions. This finding casts doubt on additionality—specifically, that these project activities would have happened without the CDM.

2. Background and data

We first briefly discuss some key issues in the Clean Development Mechanism, including the baseline and co-benefits. We then discuss the CDM activities in China. Finally, we present the data set used in our study.

2.1. Key issues in the CDM

The Clean Development Mechanism is the only “flexible mechanism” under the Kyoto Protocol that engages developing countries in climate mitigation.³ Because the marginal abatement costs in developing countries are lower than those of developed ones, the CDM helps the latter to reduce their costs of compliance with emission reduction commitments. Reciprocally, the host countries can benefit from financial assistance, technology transfer, and non-GHG emission reductions.

The CDM employs a baseline-and-credit program. It is distinguished from the cap-and-trade system by the fact that there are no explicit caps for carbon credit suppliers.⁴ Theoretically, these two systems are numerically equivalent if the baseline implies the same level of caps. Since the baseline describes a hypothetical emission scenario that would have occurred without the project, how to construct a baseline becomes the central problem of the CDM. Project developers

² It is worth noting that reducing SO₂ emissions may have an unintended consequence on global warming. Its product sulfate aerosol, a major component of atmospheric brown clouds (ABCs), has a climate cooling effect by reflecting visible solar radiation [7].

³ The other two are emission trading (ET) and joint implementation (JI) among annex I countries. The ET is an allowance-based carbon market while the CDM and the JI are project based.

⁴ According to the principle of “common but differentiated responsibility”, annex I countries (industrialized countries and economies in transition) are subject to quantified emission limitation and reduction commitment while developing countries have no emission caps.

have incentives to overstate BAU emissions to maximize credits. Even worse, some projects that would have occurred otherwise might enter the CDM pipeline and hence additionality requirements are violated.

In order to avoid awarding carbon credits to projects that would have happened anyway, the CDM Executive Board (EB) has set rules to determine additionality.⁵ This overarching additionality framework consists of four steps: (1) identification of alternatives to the project activity, (2) investment analysis to demonstrate the proposed activity is not the most economically or financially attractive, (3) barrier analysis, and (4) common practice analysis. Although official criteria have been designed for assessment purposes, their implementation is highly subjective and often lacks documented evidence to substantiate additionality [17]. Overall, the methodology does not achieve its intended objective of establishing a valid counterfactual.

The CDM is supposed to achieve dual goals: lowering abatement costs and promoting sustainable development. As for the first objective, the certified emission reductions (CERs), being equal to one metric ton of CO₂e, consistently sell at a discount to the European Union Allowances (EUAs).⁶ However, when it comes to the sustainability goal, some argue that its role is largely marginalized [5]. The carbon market cannot optimally allocate resources for non-monetized sustainability. The low-cost emission reduction projects are not necessarily aligned with the sustainability priority in the host countries. Examples include industrial gas projects such as hydrochlorofluorocarbons (HFCs) and nitrous oxide (N₂O). These projects can generate large volumes of CERs at low costs, but they have very little sustainability benefit other than climate change.

The controversial industrial gas projects are gradually being phased out due to the saturation of project opportunities and stringent regulations. Renewable energy and energy efficiency have become the mainstream project types. These projects have strong co-benefits beyond climate mitigation. Fig. 1 shows a breakdown of CDM projects by types. For example, renewable power replacing fossil-fuel power plants will reduce not only GHGs, but also other air pollutants such as sulfur dioxide, nitrogen oxide, and particulates. As long as the CDM activities of these types are additional, we should be able to observe associated co-benefits.

2.2. The CDM in China

China is the biggest supplier on the primary CDM market. It accounts for 35% of registered projects and 59% of expected annual reductions as of 2009. The concentration of the market is mainly due to abundant opportunities for emission reductions. China has risen to become the world's largest GHG emitter since 2007 and the momentum will likely be maintained in the future.⁷ According to Auffhammer and Carson [18], the projected increase in China's emissions out to 2010 is several times larger than the amount reduced in Kyoto Protocol. In addition to total emissions and the size of industrial base, factors that attract foreign direct investment (FDI) also increase the flow of international carbon credit investment. In this regard, economies of scale and the business environment all contribute to China's market share [19].

China's preference for the CDM is aligned with its national strategy in energy and climate change [20]. According to China's National Climate Change Program, energy efficiency and renewable energy supplies are top priorities in climate mitigation [21]. Specifically, industrial and residential energy efficiency, hydro power, coal-bed/mine methane, bio-energy, wind, solar, and geothermal energy are all actively supported. These project types account for the majority of the CDM activities.

Environmental pollution is another incentive for China to be engaged in the CDM. Coal is the dominant fuel source in China's primary energy consumption. According to China's Statistical Yearbooks, its share has varied between 66% and 76% over the last two decades. Emissions of SO₂, NO_x, and particulates from coal consumption have created severe environmental and health problems. It is estimated that SO₂ caused over 213 billion Chinese Yuan (CNY) in health damage in 2003 [22].⁸ Another study finds that acid rain, which is mainly caused by SO₂ emissions from fossil fuel use, causes 30 billion CNY in crop damage and 7 billion CNY in building damage [23]. The expectation that the CDM helps reduce local and regional air pollutants besides GHGs makes participation even more attractive for China.

2.3. The data

In this paper, the unit of analysis is a prefecture. A prefecture, literally translated as a region-level city, is an administrative unit ranking immediately below a province and above a county. It typically includes both urban and rural areas. A prefecture is the most disaggregated level that consistently documents economic and environmental data and information. The economic data are from China's City Statistical Yearbooks (2000–2008). China has 333 prefectures, of which 287 are covered by the Yearbooks. The prefectures that are not included are those with low economic significance. On average a prefecture had a population of 4.27 million, an area of 16,448 square kilometers, and a GDP of 112.5 billion Chinese Yuan (CNY) in 2008. Table 1 reports summary statistics for the variables used in our analysis.

⁵ Source: "Tool for the demonstration and assessment of additionality" by the CDM-EB, available at http://terrapass.pbworks.com/f/Additionality_tool.pdf.

⁶ The prices of CERs and EUAs are available at the European Climate Exchange <http://www.ecx.eu/>. The discount on the primary CDM market is greater than the secondary market. The primary market discount reflects the risks of CER issuance. The secondary market discounts may reflect that CERs are not completely fungible to EUAs.

⁷ Source: "CO₂ Emissions from Fuel Combustion 2009 Highlights" by the International Energy Agency. Available at http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2143.

⁸ 1 U.S. Dollar ≈ 6.8 Chinese Yuan in 2009.

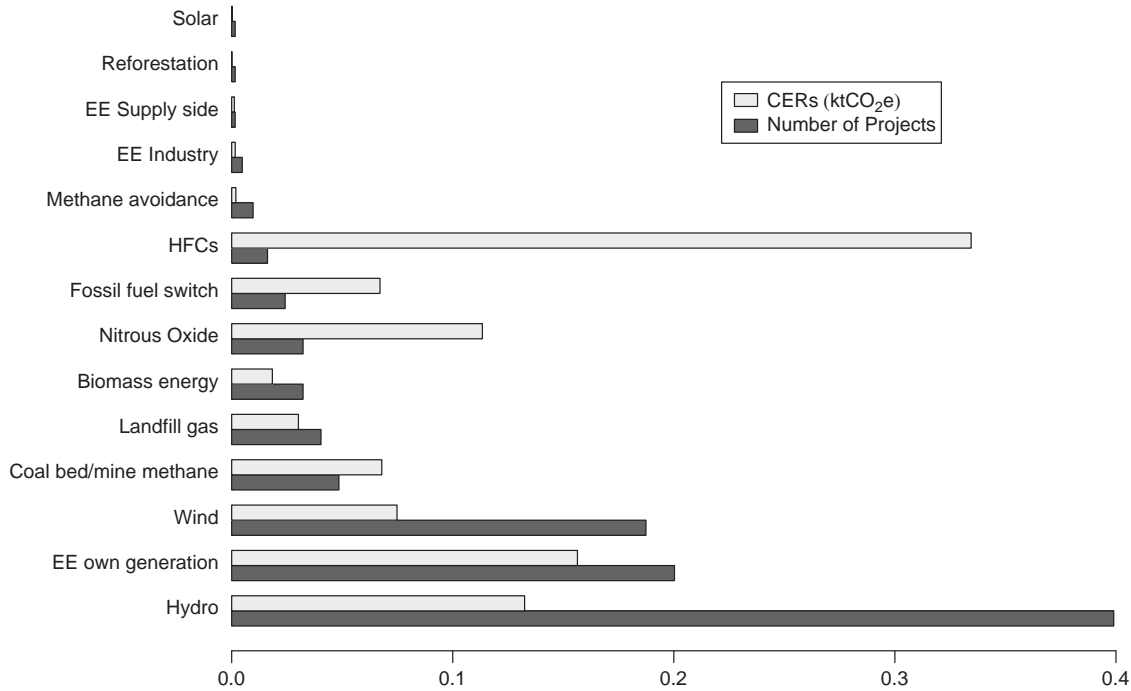


Fig. 1. Shares of CDM projects by types.

Table 1
Summary statistics.

Variable	Definitions	N	Mean	Std dev	Min	Max
SO2P	SO ₂ emitted by power plants (10 ⁵ ton)	831	0.42	0.63	0.00	4.63
SO2T	SO ₂ generated by all industries (10 ⁵ ton)	1711	1.12	1.46	0.00	13.09
SO2E	SO ₂ emitted by all industries (10 ⁵ ton)	1711	0.66	0.72	0.00	7.91
GDPPC	GDP per capita (10 ⁵ CNY)	2239	0.17	0.22	0.02	3.42
POPDEN	Population density (10 ⁻¹ /km ²)	2243	0.42	0.40	0.00	11.56
EE	Industrial output/electricity use (100 CNY/kWh)	2223	0.20	0.48	0.01	21.09
KL	Fixed asset investment/number of employees (10 ⁵ CNY)	2243	0.74	0.62	0.00	7.19
ESPC	Expenditure on education and R&D per capita (10 ³ CNY)	2239	0.24	0.29	0.00	4.96
FDIR	FDI as a ratio of fixed asset investment (10 ⁻²)	2161	0.90	1.53	0.00	32.74
CCO2	Prefecture-level CERs (10 ⁶ ton)	2296	0.55	2.49	0.00	41.64
PCO2	Province-level CERs (10 ⁶ ton)	2296	0.63	1.39	0.00	8.07
GCO2	Grid-level CERs (10 ⁶ ton)	2296	0.23	0.49	0.00	2.83
HYDRO	Hydropower CERs (10 ⁵ ton)	2296	0.09	0.62	0.00	9.07
WIND	Wind energy CERs (10 ⁵ ton)	2296	0.08	0.67	0.00	16.66
ENERGY	Energy efficiency CERs (10 ⁵ ton)	2296	0.20	1.66	0.00	34.95
OTHER	Other CERs (10 ⁵ ton)	2296	0.11	1.19	0.00	41.24

Notes: All monetary values are real values.

We have two sources of data for SO₂ emissions. First, information on SO₂ emissions from power plants is provided by the Institute of Air Pollution Control at the Tsinghua University. The emission data are generated from their internal database of national power plant inventory; this detailed data set has not been used in the economics literature studying SO₂ emissions in China. Although the data are only available in 2000, 2005, and 2007, it covers a period before and after CDM activities, which enables us to identify the CDM effect in a difference-in-difference framework.

Second, the Yearbooks have documented SO₂ emissions from all industries during 2003–2008. Although SO₂ emissions before 2003 were also reported, their measurement was inconsistent with those after 2003 so they are not used. The power and heating industry accounts for about 60% of total emissions. Two industrial SO₂ variables are used in the analysis: the amount of SO₂ generated and the amount of SO₂ released into the atmosphere. The two variables are related by the following equation:

$$SO_2 \text{ emitted} = SO_2 \text{ generated} - SO_2 \text{ removed.}$$

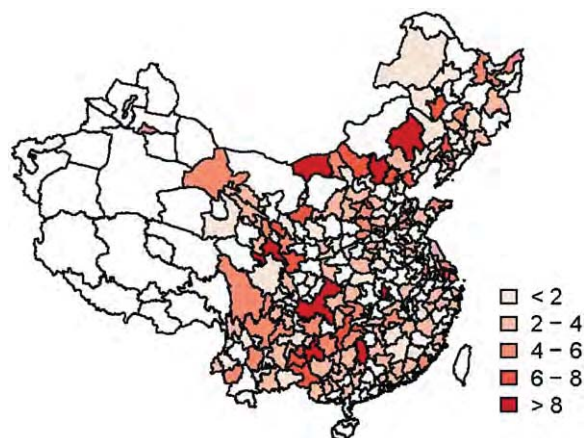


Fig. 2. CDM activities in China by the number of projects.

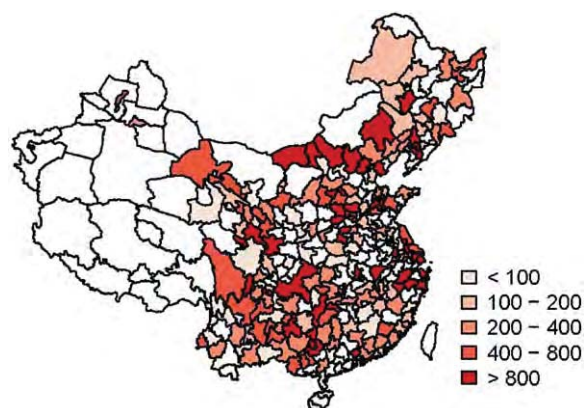


Fig. 3. CDM activities in China by CERs (10^3 ton).

We analyze industrial emissions because the CDM also affects non-power SO_2 emissions, which is the so-called “leakage effect.” Although a CDM project can reduce emissions within the boundary (power sector), it may cause additional emissions elsewhere. For example, the construction and operation of CDM projects may boost local economic activities and increase emissions out of the boundary.

The CDM data are from the United Nations Framework Conference on Climate Change (UNFCCC), which maintains a database that includes project design documents (PDDs) for every registered project. Only the projects in China that were registered before 2008 are used because of the constraint posed by the economic and emission data. The United Nations Environmental Program (UNEP) Risoe Center provides a compiled list of all CDM projects.⁹ The first CDM project in China was a wind farm in the Liaoning Province which started in 2003. The credit start date is used to match the economic data because this is the time when the project starts emission reductions. As of 2008, 191 prefectures in all provinces except Tibet had CDM activities. The locational distributions of the CDM projects are depicted in Figs. 2 and 3.

3. Empirical strategy

The emission reduction of a CDM project is measured by the difference between the baseline emissions and the project’s real emissions. A baseline is a scenario that represents GHG emissions in the absence of the CDM. Let t index time and k index pollutant. Let y denote the project emission, y^* denote the baseline emission, and r denote the emission reduction. A project’s emission reduction is

$$r_{kt} = y_{kt}^* - y_{kt}. \quad (1)$$

Note that the emission reduction is positive only if its emission level is below the baseline. While it is straightforward to monitor a project’s real emissions, it is tricky to determine what the emissions would otherwise be. Different baselines

⁹ Source: <http://www.cdmpipeline.org/>.

may imply significantly different amounts of emission reductions. In this section, we present two approaches that can be used to construct emission baselines.

3.1. Engineering model

Most CDM activities replace fossil-fuel power generations by delivering electricity generated from renewable energy sources. Hence the emissions reduction attributed to a CDM project is the avoided emissions of the displaced power plants/units. Instead of identifying the exact source of displaced generations, a grid-level emission baseline can be used to quantify the emission reduction

$$r_{kt} = e_t f_{kt}^{\text{grid}} - l_{kt}. \quad (2)$$

In this form, e is the net electricity supply by the CDM project (MWh), f_{kt}^{grid} is a grid-level emission factor (ton/MWh), and l is the leakage. The leakage is the increased emissions attributable to CDM activities that occur outside the project boundary. For renewable energy projects, there are no emissions and leakage is often treated as zero.

One method to calculate the emission factor is the operating margin (OM). The OM assumes that it is the electricity from marginal power plants that is displaced. A marginal plant is defined as the power plant on the top of the grid system dispatch order without CDM activities. It is apparent that the OM measures the short-run effect of CDM activities. The CDM Executive Board suggests the operating margin emission factor can be calculated by generation-weighted emissions from all grid-tied power plants excluding low-cost and base-load plants/units.¹⁰

Another method is to use the build margin (BM) emission factor. It assumes that CDM activities delay or cancel the construction of new power plants/units. The BM can be calculated in the same ways as the OM, except that a different sample of power plants is used. In general, the newly built plants are equipped with better technology and thus emit fewer pollutants than existing plants. This implies that the build margin is normally smaller than the operating margin.

In this section, we outline an engineering model that can be used to compute emission factors. This model is based on the simple OM method since it is widely used in CDM project designs. The grid-level emission factor is calculated by

$$f_{kt}^{\text{grid}} = \frac{\sum_{\text{plant}} e_t^{\text{plant}} f_{kt}^{\text{plant}}}{\sum_{\text{plant}} e_t^{\text{plant}}}, \quad (3)$$

where f_{kt}^{plant} is a plant-level emission factor. It is worth noting that not all power plants/units in the grid are included in the calculation. The project developers, following guidelines in host countries, propose how to select the sample. The proposed baseline needs to be validated by independent audits.

If multiple fuels are involved, the plant-level emission factor is then

$$f_{kt}^{\text{plant}} = \frac{\sum_{\text{fuel}} c_t^{\text{fuel}} \nu_t^{\text{fuel}} f_{kt}^{\text{fuel}} (1 - \lambda_{kt})}{e_t^{\text{plant}}}. \quad (4)$$

In this form, c is the amount of fuel consumed (mass or volume unit), ν is the energy content (GJ/mass or volume unit), and λ is the fraction of pollutants removed. Carbon capture and storage (CCS) can remove CO_2 but it is not yet commercialized, so that $\lambda_{\text{CO}_2} = 0$. As for SO_2 emissions, all new and existing coal-fired power plants in China are required to install flue gas desulfurization (FGD) equipment. The average removal rate in 2008 is around 78.7%.¹¹

In calculating emission factors, either the *ex ante* or *ex post* approach is allowed. All CDM projects in China employ *ex ante* information to establish the baseline because it reduces the risks of carbon credit generation. The most recent available information of already built power plants/units is included in the sample group (three years before the submission of PDDs). In addition, the emission factor is generally fixed or adjusted according to a predetermined rate during the project crediting period.

According to Eqs. (2)–(4), it is apparent that there is a connection between CO_2 and SO_2 emission reductions. To simplify this illustration, suppose that a renewable energy project with zero leakage delivers electricity to a grid. The grid's baseline emissions can be characterized by average emission factors f_{SO_2} and f_{CO_2} , as well as average the SO_2 removal rate λ_{SO_2} . The ratio of emission reductions for these two pollutants is then

$$\frac{r_{\text{SO}_2}}{r_{\text{CO}_2}} = \frac{f_{\text{SO}_2} (1 - \lambda_{\text{SO}_2})}{f_{\text{CO}_2}}. \quad (5)$$

In this form, if all parameters are known, we can use CO_2 emission reductions to estimate the abatement of SO_2 emissions.

Note that Eq. (5) is greatly simplified. When the engineering approach is used to estimate SO_2 emission reductions, the emission factors take into account multiple plants and multiple fuels. The emission factors of China's power industry are adapted from Cao and Wang [24] and are reported in Table 2. In this table, the combined margin (CM) is just a simple average of the operating margin and the build margin.

¹⁰ Source: "Tool to calculate the emission factor for an electricity system (October 2009)". Available at <http://cdm.unfccc.int/methodologies/PAMethodologiesapproved.html>.

¹¹ Source: "Emission Reductions of Power Plants in 2008" by the State Electricity Regulatory Commission. Available at www.serc.gov.cn/ywdd/200911/W020091102328545684394.doc.

Table 2
Emission factors for China's power industry.

Grid	CO ₂			SO ₂		
	OM	BM	CM	OM	BM	CM
North	1.007	0.780	0.894	0.009	0.002	0.006
Northeast	1.129	0.724	0.927	0.007	0.002	0.004
East	0.882	0.683	0.783	0.007	0.002	0.005
Central	1.126	0.580	0.853	0.013	0.002	0.008
Northwest	1.025	0.643	0.834	0.010	0.002	0.006
South	0.999	0.577	0.788	0.009	0.002	0.005
Hainan	0.815	0.730	0.773	0.007	0.002	0.005

Notes: Unit: ton/MWh. The CO₂ emission factors are from "Emission Factors of China's Regional Electricity Grid 2009" published by China's National Development and Reform Commission. Available at http://qhs.ndrc.gov.cn/qjzfzj/t20090703_289357.htm. The SO₂ emission factors are from Cao and Wang [24].

3.2. Econometric identification

The engineering approach can be used to quantify co-benefits if CO₂ emission reductions are real (or additional). However, if we only observe carbon credits instead of real emission reductions, this approach is correct only if the carbon credits are issued based on an appropriate baseline. An exaggerated baseline results in overallocated carbon credits and exaggerated co-benefits. To estimate co-benefits without assuming that carbon credits reflect real emission reductions, we propose an econometric approach in this section.

An alternative treatment of Eq. (5) is to regard the emission ratio as a parameter. If CO₂ and SO₂ emission reductions are known, this parameter can be estimated by regression analysis. Let $\sigma \equiv f_{SO_2}(1 - \lambda_{SO_2})/f_{CO_2}$, then Eq. (5) is rewritten as

$$r_{SO_2} = \sigma r_{CO_2}. \quad (6)$$

However, this model is not estimable because emission reductions in CO₂ and SO₂ are not directly observable.

Suppose that a CDM project receives a credit of c_{CO_2} , while the real emission reduction is $r_{CO_2} = \rho c_{CO_2}$, where ρ is an unknown parameter. If the project is awarded more than what it actually reduces, then $\rho < 1$. If $\rho = 1$, then the carbon credit issuance is fair. If $\rho > 1$, it means that the emission baseline is too conservative. According to Eq. (6), the reduction in SO₂ emissions is $\sigma \rho c_{CO_2}$. The relationship between SO₂ emission reductions and carbon credits is

$$r_{SO_2} = \sigma \rho c_{CO_2}. \quad (7)$$

In this form, the empirical challenge is that the SO₂ emission reductions attributed to the CDM activities are not directly observable. According to Eq. (1), SO₂ emission reductions are estimated by the difference between baseline and real emissions. Combining Eqs. (1) and (7) and denoting $\gamma \equiv -\sigma \rho$, we obtain

$$y_{SO_2} = y_{SO_2}^* + \gamma c_{CO_2}. \quad (8)$$

Eq. (8) can be used to evaluate the effectiveness of the CDM on SO₂ emission reductions. It also provides an indirect test for additionality. Based on the engineering model, σ can be estimated and used as the prior information. If $-\gamma < \sigma$ or equivalently $\rho < 1$, it suggests that there is an over-issuance of the carbon credits. Even worse, if $\gamma = 0$, it implies that the CDM activities may not be additional at all. Note that our argument is based on the assertion that $\sigma \neq 0$. Since we have excluded all industrial gas projects that have zero co-benefits, the assumption is true for all other projects. The argument is supported by the environmental engineering studies, for example Aunan et al. [8].

Let i index prefecture ($i = 1 \dots n$) and t index year ($t = 1 \dots T$). The baseline emission $y_{SO_2}^*$ is modeled as

$$E(y_{it}^* | w_{it}, x_{it}, u_i, v_t) = m(w_{it}) + x'_{it} \beta + u_i + v_t.$$

The pollutant subscripts are ignored to reduce notational clutter. According to Eq. (8), the CDM effect is additive and proportional to the project scale, which implies that

$$E(y_{it} | w_{it}, x_{it}, c_{it}, u_i, v_t) = m(w_{it}) + x'_{it} \beta + \gamma c_{it} + u_i + v_t. \quad (9)$$

In this form, w_{it} is income measured by real GDP per capita (GDPPC), $m(\cdot)$ is a flexible function that we define below, and x_{it} includes prefecture- and time-variant control variables other than income. The prefecture fixed effects u_i controls for time invariant unobservables such as resource endowment, industrial base, and institutional capacity. The time effect v_t controls for unobserved trends such as national emission regulations and technological progress as well as year-specific shocks to emissions.

The causality of the regression follows that if the CDM decreases fossil fuel consumption, SO₂ emissions will also be reduced since sulfur emissions result from energy use. A CDM project is determined before the current SO₂ emissions because its approval is a lengthy process. Project developers have to wait at least one year from public comments to registration. In addition, the selection of the CDM projects hinges on resource endowment and industrial base. Hydro, wind, solar, coal-bed methane, and biomass projects depend on the abundance of their respective natural resources. The

remaining energy efficiency projects depend on the industrial base and the energy intensity of the economy. Because resource endowment and the industrial base change slowly, they can be regarded as the fixed effects. Energy intensity can also be controlled for. Therefore, conditional on the observables and the fixed effects, the selection of CDM activities is independent of sulfur emissions.

The included explanatory variables are widely used in the empirical studies that investigate the determinants of SO₂ emissions (see [13] for a review). The causal relationship of income and pollution is a concern [15]. The argument that income causes emissions is fully discussed in Antweiler et al. [11]; changes in real income have contemporaneous effect on pollution, but environmental policies that determine pollution level respond to income levels slowly. To further address this issue, we use lagged income to replace current income in the robustness checks as is suggested by the growth literature.

In the set of control variables x_{it} , population density (POPDEN) is a measure of land area per capita. This demographic is a determinant of pollution but it responds to pollution slowly because migration takes time to realize. In addition, residential migration is constrained by the family register system (*hukou*) in China. Energy efficiency (EE) is a measure of real industrial output per kilowatt of electricity use. Pollution is a consequence of energy use and so it hinges on the energy intensity. The capital-to-labor ratio (KL) is defined as a ratio of fixed asset investment to number of employees. The inclusion of KL controls for the factor endowment effect. Both EE and KL enter the model with a quadratic term to account for nonlinearity. Expenditure on education and R&D per capita (ESPC) controls for the knowledge and technology effect. The empirical decomposition of pollution into scale, composition, and technique effects is attributed to Antweiler et al. [11].

We also include FDIR, which a ratio of foreign direct investment (FDI) as a share of fixed asset investment. The endogeneity of this trade variable might be a concern. According to Frankel and Rose [14], geographical variables can be used as instruments for endogenous trade based on trade theory. However, this approach is not applicable to panel data, because these instruments are time invariant. In any case this particular instrumental variable approach is not superior to a panel method that uses individual fixed effects to control for geographical attributes. In addition to the prefecture effects, we use subnational time dummies to control for time-variant unobservables that may be correlated with both FDI and emissions.¹²

3.3. Specification and estimation

The classical environmental Kuznets curve (EKC) model posits an inverted-U relationship between income and pollution [10]. It claims that emissions increase with income at an early development period and then decrease after passing some income thresholds. Although the EKC model has many limitations [12,13,15], it provides a basic structure to predict pollution at the aggregate level. Although our approach does not rely on the EKC framework, it motivates us to specify a nonlinear income–emission relationship.

A prefecture is the unit of analysis in this paper, but the CDM activity does not necessarily replace carbon-intensive generators in the same prefecture. It may replace generators in the same province or even in the same grid. It is therefore important to incorporate the spillover effect in a spatially explicit model. Following the approach proposed by Duflo and Pande [25], we incorporate the effects of the CDM activities in adjacent areas.

With the above two assumptions, our parametric regression is specified as

$$y_{it} = \alpha_1 w_{it} + \alpha_2 w_{it}^2 + \alpha_3 w_{it}^3 + \alpha_4' \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}. \quad (10)$$

In this form, c_{it}^c designates prefecture-level carbon credits generated from the CDM activities. c_{it}^p designates carbon credits in the same province excluding c_{it}^c . c_{it}^g designates carbon credits in the same grid excluding c_{it}^p , and α , β , and γ are parameters to be estimated. ε_{it} is an error term which captures deviations between actual and estimated baseline emissions. Under the assumption of strict exogeneity, its mean is zero conditional on the observables and the fixed effects.¹³

Although a cubic term is included to accommodate more curvatures in Eq. (10), the polynomial specification is still very restrictive. Millimet et al. [16] suggest that a semiparametric model is more appropriate because the parametric model is rejected by their specification test. We generalize their model to accommodate CDM activities and other variables. Specifically, we propose a semiparametric partially linear model, in which the conditional mean of SO₂ emissions has an unknown relationship in income and is linear in other variables. The semiparametric model is then

$$y_{it} = m(w_{it}) + \alpha_4' \beta + \gamma_1 c_{it}^c + \gamma_2 c_{it}^p + \gamma_3 c_{it}^g + u_i + v_t + \varepsilon_{it}, \quad (11)$$

where $m(w_{it})$ is a smooth function that is unknown to the researcher. For simplification, the above model can be written as

$$y_{it} = m(w_{it}) + z_{it}' \pi + u_i + \varepsilon_{it}, \quad (12)$$

where z_{it} includes all time-variant explanatory variables other than income w_{it} . The time effects are lumped into z_{it} as dummy variables. To estimate the above model, we can use the first difference or de-meaning to cancel out fixed effects.

¹² To further address the concern of endogenous FID, we have estimated all models without FDI. These additional robustness checks do not change our results.

¹³ Our identification strategy rests on the timing of the CDM application process in light of the strict exogeneity requirement. If CDM is related to past unobserved determinants of baseline emissions, the results will be biased.

A first difference of Eq. (12) leads to

$$\Delta y_{it} = \Delta m(w_{it}) + \Delta z'_{it} \pi + \Delta \varepsilon_{it}. \quad (13)$$

The profile-kernel method proposed by Henderson et al. [26] is employed to estimate the differenced partially linear panel data model. This approach shows that a consistent estimator of π is given by

$$\hat{\pi} = \left(\sum_{i=1}^n \Delta \ddot{z}_i \Omega^{-1} \Delta \ddot{z}_i \right)^{-1} \left(\sum_{i=1}^n \Delta \ddot{z}_i \Omega^{-1} \Delta \ddot{y}_i \right). \quad (14)$$

In this form, $\Omega = \text{cov}(\Delta \varepsilon_{it})$, $\Delta \ddot{z}_{it} = \Delta z_{it} - (\hat{m}_z(w_{it}) - \hat{m}_z(w_{it-1}))$ and $\Delta \ddot{y}_{it} = \Delta y_{it} - (\hat{m}_y(w_{it}) - \hat{m}_y(w_{it-1}))$. $m_z(w)$ (or $m_y(w)$) represents estimates from a nonparametric regression of z (or y) on w alone. This estimator in (14) is \sqrt{n} -consistent, and the asymptotic variance can be estimated by

$$\text{Avar}(\hat{\pi}) = \frac{1}{n} \sum_{i=1}^n \Delta \ddot{z}_i \hat{\Omega}^{-1} \Delta \ddot{z}_i.$$

A consistent estimator of the variance-covariance matrix Ω is

$$\hat{\Omega} = \hat{\sigma}_v^2 (I_{T-1} - e_{T-1} e'_{T-1}).$$

In this form, I is an identity matrix, e is a vector of ones, and $\hat{\sigma}_v^2$ is estimated by

$$\hat{\sigma}_v^2 = \frac{1}{2n(T-1)} \sum_{i=1}^n \sum_{t=2}^T (\Delta \ddot{y}_i - \Delta \ddot{z}_i \hat{\pi})^2.$$

With a consistent estimate of π , let $\hat{y}_{it} = y_{it} - z_{it}' \hat{\pi}$. With this model (12) can be converted to a nonparametric fixed effect regression

$$\hat{y}_{it} = m(w_{it}) + u_i + \varepsilon_{it}. \quad (15)$$

Multiple methods are available to estimate this model including the series method and the profile-kernel method [27,28]. We utilize the nonparametric iterative kernel estimator proposed by Henderson et al. [26] because it accounts for the variance structure and semiparametric efficiency. The estimation is implemented in Matlab. The code is available upon request.

4. Results and discussion

4.1. Engineering results

First, we estimate the effect of CDM activities in reducing SO₂ emissions by means of the engineering approach. The grid-specific combined margin emission factors are used, which is a simple average of the operating margin and the build margin. The combined margin is shown in Table 2. We report the resulting grid-level emission reductions from the CDM activities in Table 3. The emission data are for 2005, which is the most recent available information. The CO₂ data are also included for comparison. The figures show that the CDM activities are expected to reduce 35.8 million tons of CO₂ annually, which is about 1.6% of total emissions from all grids in 2005. In terms of SO₂ emissions, they are expected to reduce 0.27 million tons annually, or 1.4% of 2005 emissions from all grids. According to the national data, σ is estimated to be 0.0076 ton-SO₂/ton-CO₂, which implies that one ton of CO₂ emission reduction will lower SO₂ emissions by 0.0076 ton at the grid level.

Table 3
Annual emission reductions by hydro and wind CDM activities.

Grid	CO ₂		SO ₂	
	Emissions	Reductions	Emission	Reductions
North	651.753	6.820	5.812	0.039
Northeast	207.338	3.100	1.089	0.012
East	499.415	2.002	4.037	0.011
Central	360.321	7.655	3.938	0.087
Northwest	147.440	7.131	1.365	0.067
South	310.883	9.077	2.543	0.055
Hainan	5.999	0.021	0.048	0.000
All	2183.877	35.805	18.848	0.272

Notes: Unit: million tons/year. The emissions data are for 2005. The reductions data are based on CDM projects registered before 2008. Only small hydro and wind power projects are included.

It is worth noting the engineering estimate does not have an associated standard error. The parameters that we are using, mostly from the literature and official documents, only report the mean values instead of confidence intervals. Another important point is that only small hydro power and wind power projects are included in the analysis, because they have zero emissions. These two project types account for 59% of total registered projects as of 2008. CDM activities other than industrial gas projects can also reduce SO₂ emissions. However, their own emissions need to be taken into account. If other project types are included, the estimated coefficient would be smaller than the current estimate.

The engineering approach assumes that the BAU emissions can be extrapolated from the *ex ante* information. Specifically, the baseline is calculated by using present and past emission factors of existing power plants. This approach reduces risks for project developers because the expected carbon credits are known in the future. However, uncertainties arise in the environmental integrity because the static baseline does not make adjustment for future changes. Most CDM projects use static baselines. Even if a “dynamic” baseline is used, the adjustment is linear and the slope is predetermined [29,30]. In a fast changing economy, this methodology does not perform well. For example, if renewable energy increases exponentially as is observed in some developing countries, the engineering baseline would set the BAU emissions too high and lead to an inflation of carbon credits.

4.2. Econometric results

In this section, we present the results for the econometric models that use *ex post* information to evaluate the CDM's co-benefits on sulfur emissions. We estimate the parametric model (10) and the semiparametric model (11) using the prefecture-level data in China. The CDM effect on power generation is the focus of this study, which determines if the CDM has co-benefits and additionality within the power sector. The semiparametric model is our preferred specification because of its flexibility, while the parametric model is used for comparison purpose. The estimates of central interest are the coefficients for carbon credits at the prefecture level (CCO₂), province level (PCO₂), and grid level (GCO₂). The estimation results are reported in Table 4. A Wald test of model 1.2.1 for the joint significance of the CDM effect results in a *p*-value at 0.99, which rejects the null hypothesis that the CDM reduces SO₂ emissions. A joint test of the parametric model 1.1.1 leads to the same conclusion.

It is interesting to test the econometric estimate against the engineering estimate. If the CDM activities receive a fair amount of carbon credits, both estimates should be close. Since the econometric models are estimated using the prefecture-level data, the CDM effect needs to be aggregated to the grid level to be compared with that of the engineering model.¹⁴ The test results show that we fail to reject the null hypothesis that engineering and econometric estimates are being equal. The fact that we are not able to rule out co-benefits and additionality is at odds with the previous result. This is likely because the data do not provide precise enough estimates to distinguish between two vastly different hypotheses.

Although the treatment effect is insignificant, the sign of the estimate is still interesting. If CDM activities have lowered sulfur dioxide emissions, the coefficients of carbon credits should be negative. However, the estimates for provincial and grid CERs are positive. This may be explained by the fact that fossil-fuel power plants are built to match with renewable power generation. For example, wind power is highly variable in electricity output at different time scales. Additional power plants are needed to stabilize intermittent power supply and safeguard against blackouts. The coal-fired power is often used as a backup because of its availability and reliability. It is possible that the CDM helps ramp up thermal power capacity as it promotes wind farms. In this case, the effect of the CDM activity – a combination of wind and coal-fired power – hinges on the baseline scenario. If the baseline is coal-fired power, the CDM reduces emissions unambiguously. If the baseline is renewable power, the CDM actually increases emissions. If the baseline is a wind–coal combination, the CDM has no effect at all. In all other cases, the CDM has an uncertain effect in emission reductions. Table 7 summarizes the hypothetical effect of the CDM activity under different baseline scenarios.

The econometric results suggest that the CDM activities in China are not effective at reducing SO₂ emissions, and therefore cast doubt on additionality. That is, without the compensation of carbon credits, these projects may still have occurred. There is some evidence to support this hypothesis. As of 2008, the cumulative installed capacity of wind power in China was 12,152.79 MW, of which 11,389.58 MW was installed during 2005–2008.¹⁵ In the same period, the CDM wind farms generated a total capacity of 5154.92 MW. This suggests that about 55% of wind power projects have been built without the assistance of the CDM. During a recent CDM-EB meeting in December 2009, 10 of China's wind power CDM projects were not approved. The decision was made on the grounds that these projects do not meet the additionality requirement.

This is not to say that project developers intentionally manipulate additionality requirements. Rather, it is the current CDM baseline methodology that fails to predict future emissions in a fast changing economy. China's central planners made the same mistake as they set a 2010 wind power target of 5000 MW in the Renewable Energy Planning Report of 2007. In fact, in the same year that the Plan was published, China's total capacity reached 5906 MW. The rapid growth of

¹⁴ The null hypothesis $\gamma_1 + \gamma_2 + \gamma_3 = \sigma$ is tested. The engineering estimate is the grid level reduction in SO₂ from a carbon credit unit. So, we need the econometric estimate of a grid level reduction. If a carbon credit is issued in prefecture *i*, then CCO₂ goes up by one unit and SO₂ changes in *i* by γ_1 . But, then SO₂ changes in each other prefecture in the same province by γ_2 , and in each other prefecture in the grid, but outside the province, by γ_3 .

¹⁵ Source: “China Wind Power Installed Capacity Statistics 2008” by the China wind power Association. Available at www.cwea.org.cn/upload/20090305.pdf.

Table 4
Regression results: dependent variable-SO₂ emitted by power plants.

	Parametric models			Semiparametric models		
	1.1.1	1.1.2	1.1.3	1.2.1	1.2.2	1.2.3
GDPPC	2.995*** (0.741)	2.270*** (0.760)	1.424*** (0.763)			
GDPPC ²	-2.910*** (0.825)	-2.305*** (0.849)	-1.785*** (0.828)			
GDPPC ³	0.740*** (0.233)	0.593*** (0.239)	0.491*** (0.232)			
POPDEN	0.139 (0.125)	0.148 (0.143)	0.181 (0.136)	0.178 (0.128)	0.165 (0.121)	0.278** (0.118)
EE	0.625*** (0.237)	0.528*** (0.233)	0.350*** (0.222)	0.618** (0.265)	0.536** (0.252)	0.526** (0.258)
EE ²	-0.384** (0.167)	-0.371** (0.165)	-0.230** (0.157)	-0.340* (0.187)	-0.324* (0.179)	-0.325* (0.180)
K/L	0.281** (0.136)	0.164** (0.136)	0.007** (0.150)	0.394*** (0.097)	0.251* (0.132)	0.642*** (0.127)
(K/L) ²	-0.107* (0.057)	-0.063* (0.058)	-0.015* (0.059)	-0.126*** (0.046)	-0.088 (0.054)	-0.232*** (0.051)
ESPC	-0.084 (0.111)	-0.091 (0.109)	-0.064 (0.113)	-0.019 (0.079)	-0.063 (0.082)	0.070 (0.081)
FDIR	0.001 (0.009)	-0.005 (0.009)	-0.010 (0.010)	0.003 (0.010)	-0.006 (0.009)	-0.007 (0.010)
CCO ₂	0.007 (0.064)	0.014 (0.062)	-0.051 (0.057)	-0.000 (0.072)	0.025 (0.067)	-0.021 (0.063)
PCO ₂	0.005 (0.020)	0.007 (0.027)		0.002 (0.023)	-0.013 (0.030)	
GCO ₂	-0.001 (0.009)			0.002 (0.010)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 758. The SO₂ emission data for power plants are only available for 2000, 2005, and 2007. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

wind power is partially explained by the favorable on-grid power tariff. It also reflects the fact that state-owned power companies have attempted to grab market share without cost considerations [31]. If this is true, it shows that wind power projects are still not the most economically or financially attractive. Under the current additionality criteria, wind projects should still qualify as CDM activities.

Our model sheds some insight on the environmental Kuznets curve. The estimated coefficient is highly significant for all parametric models. The result supports a nonlinear relationship between SO₂ emissions and income. However, the relationship is not an exact inverted U-shape because the coefficient for the cubic term is significantly different from zero. Instead, the pollution-income relationship is better described by an N-shape curve. The semiparametric model does not specify the functional form. The nonparametric estimate of the relationship is depicted in Fig. 4. The solid line is $\hat{m}(w)$ estimated by the iterative kernel method. Two dashed lines outline a 95% confidence interval for each point estimate.

A visual inspection of Fig. 4 shows that there are multiple maxima and minima in the environmental Kuznets curve. This implies that the parametric model is misspecified because the cubic model only has one local maximum and one local minimum. A formal specification test is needed to show that the semiparametric model performs better. This can be implemented by the bootstrapping method proposed by Henderson [26]. However, since different specifications produce the same qualitative results for the policy variables, we leave this specification test for future research.

The econometric model also yields reasonable estimates for other parameters. The coefficient for population density (POPDEN) is positive but it is not statistically significant. It may be a net effect of: (1) fossil-fuel power generation is located close to demand factors such as population centers and (2) pollution is more regulated in population centers because of public health concerns. Energy efficiency (EE) has a significant nonlinear effect on power SO₂ emissions. At first, as the industrial output per kilowatt increases, demand for electricity as well as emissions climb. After some threshold, improving energy efficiency will lower the demand for electricity and hence SO₂ emissions. The capital-to-labor ratio (KL) has a significant nonlinear effect as well. If the capital endowment is low, increasing capital can cause more constructions of power plants and induce more SO₂ emissions. However, if the capital endowment is large enough, an increasing capital-to-labor ratio leads to lower emissions because of investment in capital-intensive cleaner industry or pollution abatement. The investment in education and R&D per capita (ESPC) reduces SO₂ emissions but the effect is not significant. The level of foreign direct investment (FDIR), which is measured as a ratio of FDI to fixed asset investment, has an ambiguous effect on

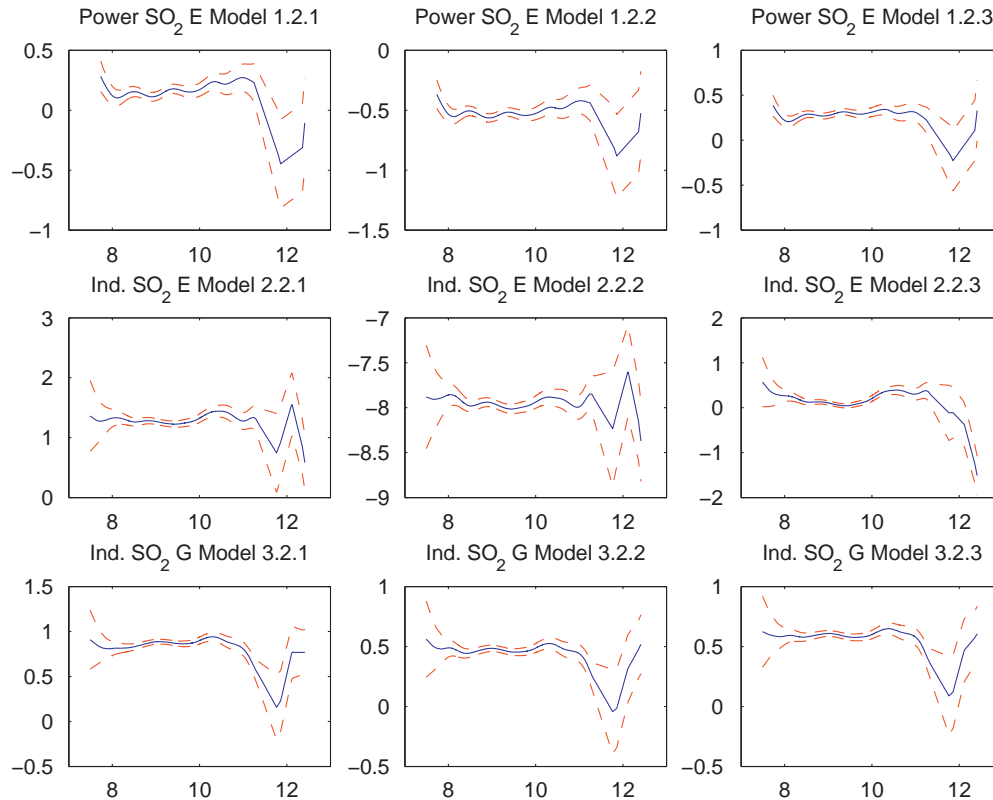


Fig. 4. Nonparametric estimate of the pollution–income relationship $m(w)$.

emissions. Its estimate is statistically insignificant. The insignificant effect of FDI might be due to a complex interaction between the “pollution haven” effect and the “gain from trade” effect [11,32,33].

5. Robustness checks

The first robustness check is concerned with the dependent variable. Besides power generation, we also evaluate the CDM effect on SO_2 emitted (SO2E) and generated (SO2T) by all industries. The CDM effect on all industries is not necessarily the same as that of the power sector because of the spillover or leakage effect. Estimation results for industrial SO_2 emissions are reported in Table 5. The semiparametric specification is still preferred because of its flexibility. For the main specification 2.2.1, the p -value of the Wald test for the joint significance of the CDM effect is 0.21, so that we cannot reject the null hypothesis of no effect at the 90% confidence level. The empirical results do not support the notion that CDM activities reduce total industrial SO_2 emissions.

As for SO_2 generated from all industries, the coefficients for CCO2, PCO2, and GCO2 are positive as is shown in Table 6. The Wald test for model 3.2.1 has a p -value less than 0.01, which means that the null hypothesis of no effect is rejected at the 99% confidence level. This result suggests that the CDM has increased SO_2 generated by all industries. This can be explained by the leakage effect. An increase in pollution induced by CDM activities outside the project boundary could fully offset the effect within the boundary. The magnitude of the CDM effect is the greatest at the prefecture level and the weakest at the grid level. This is sensible, because the leakage effect comes from project construction and operation, and thus the prefecture that hosts the projects undergoes the major impact.

To address the concern that locational and time-varying unobservables may affect CDM projects and SO_2 emissions simultaneously, we include province-by-time and grid-by-time dummies. When subnational time dummies are included, the time effects are not necessary because of multicollinearity. It is also worth noting that provincial CERs are almost absorbed by the province-by-time dummies. Note that PCO2 is defined as the difference between provincial and prefecture CERs. Because provincial CERs are much larger than prefecture CERs, prefectures within the same province have very little variation in PCO2. Including both PCO2 and province-by-time dummies causes the data matrix to be close to singularity. This is also true for the grid-by-time dummies. Therefore, when the grid-by-time dummies are present, the grid CERs are removed for identification purpose; when the province-by-time dummies are present, both grid and provincial CERs have to be removed.

Our empirical results are robust to the inclusion of the subnational time effects. For the emissions from power plants, the CDM effect is still insignificant with additional dummies. Other parameters yield the same qualitative results. A notable

Table 5
Regression results: dependent variable-SO₂ emitted by all industries.

	Parametric models			Semiparametric models		
	2.1.1	2.1.2	2.1.3	2.2.1	2.2.2	2.2.3
GDPPC	0.933 (0.803)	0.960 (0.849)	1.133 (0.824)			
GDPPC ²	-1.359* (0.764)	-1.397* (0.801)	-1.492* (0.753)			
GDPPC ³	0.368* (0.199)	0.380* (0.206)	0.402* (0.191)			
POPDEN	-0.167 (0.199)	-0.160 (0.201)	-0.091 (0.182)	-0.009 (0.156)	-0.009 (0.151)	-0.016 (0.142)
EE	0.075 (0.233)	0.044 (0.236)	-0.049 (0.223)	0.083 (0.205)	0.008 (0.206)	-0.060 (0.206)
EE ²	-0.213 (0.163)	-0.176 (0.165)	-0.149 (0.152)	-0.204 (0.145)	-0.152 (0.143)	-0.144 (0.140)
K/L	0.316*** (0.093)	0.290*** (0.095)	0.292*** (0.104)	0.460*** (0.065)	0.342*** (0.080)	0.275*** (0.087)
(K/L) ²	-0.098*** (0.025)	-0.094*** (0.026)	-0.093*** (0.025)	-0.132*** (0.019)	-0.109*** (0.021)	-0.097*** (0.021)
ESPC	-0.051 (0.104)	-0.072 (0.106)	-0.122 (0.104)	-0.054 (0.070)	-0.108 (0.072)	-0.176*** (0.068)
FDIR	-0.035 (0.022)	-0.049 (0.023)	-0.007 (0.025)	-0.047** (0.019)	-0.038** (0.019)	-0.026 (0.022)
CCO ₂	-0.032 (0.038)	-0.035 (0.038)	-0.022 (0.036)	-0.028 (0.034)	-0.031 (0.033)	-0.046 (0.031)
PCO ₂	0.009 (0.012)	0.010 (0.014)		0.007 (0.009)	0.009 (0.012)	
GCO ₂	-0.006 (0.004)			-0.007 (0.004)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1608. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

difference is that the coefficient for population density is now significantly positive. For SO₂ emitted by all industries, there is no significant CDM effect either. However, including provincial time dummies makes the parameter for FDI insignificantly negative and that for ESPC significantly negative. Subnational time dummies do not change the qualitative results for SO₂ generated by all industries. Similar to the previous case, the significance of the FDI effect disappears with subnational dummies, which suggests that locational differences that affect FDI may be time variant [33].

The causality of the pollution–income relationship is another concern. According to the growth theory, lagged income can be used as an instrument for current income [14]. Because the income parameters are not our focus, we adopt the reduced form strategy and use lagged GDP per capita as a regressor. Since the model yields very similar results to the one that uses current income, we do not report the full estimation results here, but they are available upon request.

The last robustness check is to separate out the treatment effect by project types. The CDM is divided into four categories: hydropower (HYDRO), wind energy (WIND), energy efficiency (ENERGY), and other activities (OTHER). Table 1 reports the summary statistics for these variables. Our specification includes province-by-time dummies. The estimation results support our main conclusion. For power plants, none of the parameters for CERs yields significant results. The CDM effect on industrial SO₂ emissions is also insignificant. As for SO₂ generated by all industries, the only significant effect is that the energy efficiency projects increase SO₂ generation. Results for these regressions are also available upon request.

6. Conclusion

Utilizing the relationship that CO₂ and SO₂ are co-pollutants of fossil-fuel combustion, we propose an econometric approach to evaluate the co-benefits of the Clean Development Mechanism and indirectly assess its additionality. Using China's prefecture-level economic and emission data, we find that the CDM does not have a statistically significant effect on SO₂ emissions. Our empirical findings contradict the results predicted by the engineering model. It thus casts doubt on the additionality assumption on which the engineering model is based. These results lend support to the previous conjectures that some CDM activities would have happened anyway.

Nevertheless, our paper is limited by the available data. We only include the registered CDM projects, while there are many more in the pipeline. If all these projects are eventually approved and implemented, it is possible that some non-negligible co-benefits will be observed. At present, the number of projects is relatively small, and the time period is

Table 6
Regression results: dependent variable-SO₂ generated by all industries.

	Parametric models			Semiparametric models		
	3.1.1	3.1.2	3.1.3	3.2.1	3.2.2	3.2.3
GDPPC	5.921*** (1.300)	5.758*** (1.362)	6.367*** (1.436)			
GDPPC ²	-3.128** (1.231)	-3.087** (1.280)	-3.443** (1.311)			
GDPPC ³	0.493 (0.320)	0.496 (0.329)	0.563 (0.332)			
POPDEN	0.574* (0.318)	0.522* (0.319)	0.619* (0.315)	-0.045 (0.301)	-0.135 (0.289)	-0.016 (0.283)
EE	0.010 (0.376)	-0.057 (0.380)	0.024 (0.390)	0.112 (0.402)	-0.172 (0.400)	0.141 (0.414)
EE ²	-0.054 (0.262)	-0.012 (0.264)	-0.051 (0.264)	-0.029 (0.282)	0.072 (0.276)	-0.112 (0.280)
K/L	0.265* (0.155)	0.309* (0.157)	0.091* (0.187)	0.476*** (0.129)	0.282* (0.161)	0.280 (0.182)
(K/L) ²	-0.191*** (0.042)	-0.203*** (0.042)	-0.181*** (0.045)	-0.173*** (0.037)	-0.145*** (0.041)	-0.159*** (0.043)
ESPC	0.114 (0.166)	0.085 (0.169)	0.095 (0.179)	0.488*** (0.135)	0.340** (0.140)	0.460*** (0.137)
FDIR	-0.009 (0.038)	-0.009 (0.039)	-0.021 (0.046)	-0.077** (0.039)	-0.028 (0.040)	-0.031 (0.049)
CCO ₂	0.187*** (0.061)	0.185*** (0.061)	0.134*** (0.063)	0.202*** (0.066)	0.188*** (0.064)	0.190*** (0.062)
PCO ₂	0.043** (0.019)	0.022** (0.023)		0.033* (0.018)	0.023 (0.024)	
GCO ₂	0.015** (0.006)			0.004 (0.005)		
Time effects	YES			YES		
Prefecture effects	YES	YES	YES	YES	YES	YES
Grid-time effects		YES			YES	
Province-time effects			YES			YES

Notes: Number of observations 1557. Time period 2004–2008. Block bootstrapping standard errors in parenthesis. Significance level: *10%, **5% and ***1%.

Table 7
Hypothetical effect of the CDM activity under different baseline scenarios.

Baseline scenario	Effect of the CDM activity (wind + coal)	
	SO ₂ emitted	SO ₂ generated
Wind/other renewable energy	+	+
Wind + coal	0	0
Natural Gas	±	±
Coal	-	-
Other combinations	±	±

Notes: The CDM activity is building a wind farm. A companion coal-fired power plant is built for backup supply. Each baseline scenario generates the same electricity output.

relatively short for the CDM to make a difference. Methodologically, our micro-econometric approach is appealing for further tests of additionality, since project-level information is also available. We leave this for future research.

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Perverse effects of carbon markets on HFC-23 and SF₆ abatement projects in Russia

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Carbon markets are considered a key policy tool to achieve cost-effective climate mitigation^{1,2}. Project-based carbon market mechanisms allow private sector entities to earn tradable emissions reduction credits from mitigation projects. The environmental integrity of project-based mechanisms has been subject to controversial debate and extensive research^{1,3-9}, in particular for projects abating industrial waste gases with a high global warming potential (GWP). For such projects, revenues from credits can significantly exceed abatement costs, creating perverse incentives to increase production or generation of waste gases as a means to increase credit revenues from waste gas abatement¹⁰⁻¹⁴. Here we show that all projects abating HFC-23 and SF₆ under the Kyoto Protocol's Joint Implementation mechanism in Russia increased waste gas generation to unprecedented levels once they could generate credits from producing more waste gas. Our results suggest that perverse incentives can substantially undermine the environmental integrity of project-based mechanisms and that adequate regulatory oversight is crucial. Our findings are critical for mechanisms in both national jurisdictions and under international agreements.

The Kyoto Protocol's project-based mechanisms, the Clean Development Mechanism (CDM) for emission reductions projects in developing countries and Joint Implementation (JI) for projects in industrialized countries, provided industrialized countries flexibility in meeting their greenhouse gas (GHG) reduction commitments. Numerous sub-national and national jurisdictions are implementing similar mechanisms around the world, often in combination with emissions trading schemes².

Projects abating waste gases with a high global warming potential (GWP) can generate large volumes of emission reductions at low abatement costs^{1,15}. Under the CDM, the two largest waste gas project types—incineration of hydrofluorocarbon-23 (HFC-23) from hydrochlorofluorocarbon-22 (HCFC-22) production and destruction of nitrous oxide (N₂O) from adipic acid production—account for only 0.3% of the registered projects but generated about half of the 1.5 billion emission reduction credits issued so far¹⁶. For such projects, revenues from credits can significantly exceed GHG abatement costs and, in some instances, the costs of producing the main product^{10,11}. This can create perverse incentives for plant operators to increase production or waste generation beyond levels that would occur in the absence of crediting^{12-14,17}. If more waste gas is generated owing to the incentives from crediting, emission reductions are overestimated; the emissions baseline is inflated compared to the emissions that would actually occur without crediting, and, in consequence, excess credits are issued.

Such perverse incentives can be avoided through appropriate safeguards in methodological standards for the calculation of emission reductions, mainly by capping the amount of production

and waste generation to historically observed levels or conservative benchmarks for the purpose of calculating emission reductions. Under the CDM, safeguards to prevent perverse incentives were gradually introduced and strengthened over time, following observations that the initial safeguards may not have been adequate^{13,14,18}. Whereas the CDM requires using internationally agreed standards and international approval for registering projects and issuing credits, JI allows using a project-specific approach for calculating emission reductions, and either the host countries or the international Joint Implementation Supervisory Committee (JISC) execute regulatory oversight. Under host country oversight, countries can largely establish their own rules for approving projects and issuing credits without international oversight. The host country can determine whether it deems emission reductions as additional. Under international oversight, the JISC oversees project approval and issuance of credits.

This Letter assesses perverse incentives in the context of JI. We evaluate JI projects that incinerate high GWP waste gases, as these project types were particularly vulnerable to perverse incentives under the CDM. Four such projects were registered under JI, all of them under host country oversight. They account for 54 out of the 863 million credits issued to the 604 JI projects registered as of 1 April 2015 (ref. 16). The four projects involve five plants: two hydrochlorofluorocarbon-22 (HCFC-22) and two sulphur hexafluoride (SF₆) production plants in Russia, and one trifluoroacetic acid (TFA) production plant in France. The production of HCFC-22 generates hydrofluorocarbon-23 (HFC-23) as an unwanted waste gas; in the production of SF₆ a waste stream of SF₆ is generated at rectification; and the production of TFA generates various unwanted fluorinated waste gases. The amount of waste gas generated depends on the production level of the main product—HCFC-22, SF₆ and TFA—and the waste generation rate, which is defined as the quantity (mass) of waste gas generated per quantity (mass) of product produced¹⁴. The waste generation rate depends on factors, such as plant design, product purity requirements, and degree of process optimization¹⁹. In the absence of regulations, incentives, or voluntary commitments by the industry, the waste gases are usually vented to the atmosphere. The five registered JI plants capture and incinerate these waste gases (see Supplementary Documentation).

The plant in France aimed to address perverse incentives by capping the emission reductions to the historical emissions of the installation. However, data on historical and monitored production and waste gas generation are not available to assess whether the cap adequately prevented perverse incentives.

Three plants in Russia initially applied caps on the production and waste generation rate to avoid perverse incentives, drawing upon CDM standards. In the second quarter of 2011, the plant operators decided to retroactively change the way emission reductions

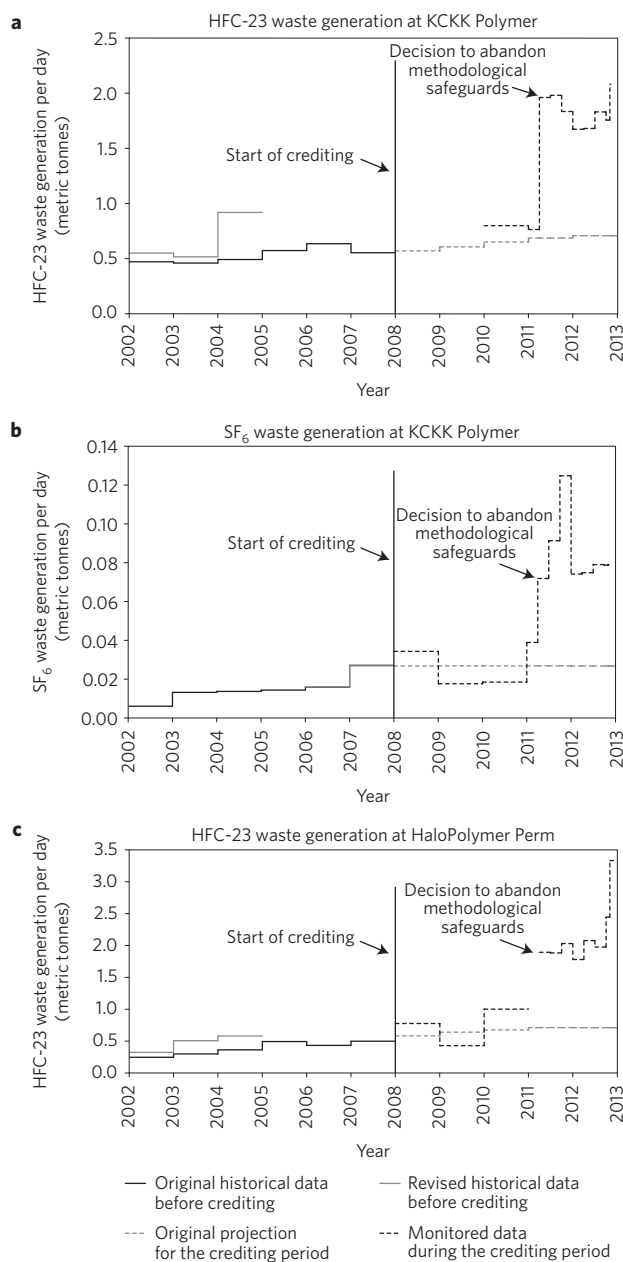


Figure 1 | HFC-23 and SF₆ waste generation at three plants in Russia.

a. HFC-23 waste generation at the KCKK Polymer plant. **b.** SF₆ waste generation at the KCKK Polymer plant. **c.** HFC-23 waste generation at the HaloPolymer Perm plant. Waste generation increased in all three plants beyond previously reported levels when plant operators decided in 2011 to abandon methodological safeguards to prevent perverse incentives.

are calculated as of 1 January 2010, removing the caps and crediting all waste gas destroyed. Moreover, data and information provided in the original project documentation was considered incorrect, or not applicable, and replaced (see Supplementary Information). Figure 1 shows that waste gas generation increased in all three facilities to unprecedented levels compared to both historical and originally projected levels, after abandoning methodological safeguards in 2011.

The project at the fourth plant in Russia was developed and approved in 2011/2012 and claimed credits retroactively as of 1 January 2008. The project did not apply any methodological safeguards to avoid perverse incentives; all waste gas destroyed was credited. For the period 2008 to 2010, for which data on both

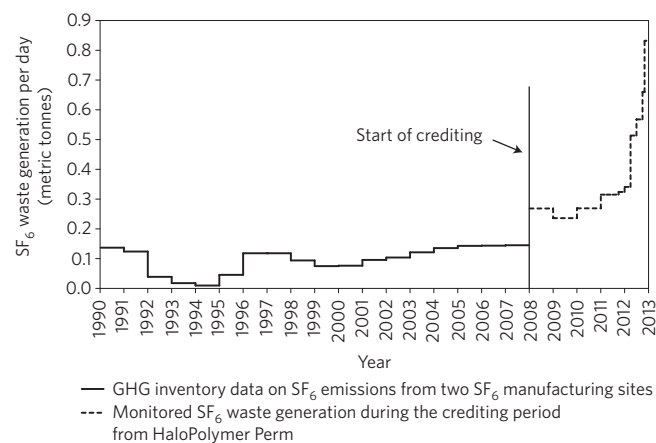


Figure 2 | SF₆ waste generation at the HaloPolymer Perm plant. The GHG inventory data includes emissions from both SF₆ production plants in Russia (KCKK Polymer and HaloPolymer Perm). After the start of crediting, the waste generation from HaloPolymer Perm increased beyond historical emission levels reported in the Russian GHG inventory from both plants.

GHG inventory data on SF₆ emissions from two SF₆ manufacturing sites in Russia (KCKK Polymer and HaloPolymer Perm). After the start of crediting, the waste generation from HaloPolymer Perm increased beyond historical emission levels reported in the Russian GHG inventory from both plants. SF₆ production and SF₆ waste generation are available, the average waste generation rate was 16.9%, which considerably exceeds the default value of 0.2% suggested by the Intergovernmental Panel on Climate Change (IPCC; ref. 20) or the average historical waste generation rate of 2.0% observed at the KCKK Polymer plant. A comparison with GHG inventory data reported by Russia to the United Nations Framework Convention on Climate Change (UNFCCC; ref. 21) shows that waste generation significantly increased with the implementation of the JI project (Fig. 2). Before project implementation, the GHG inventory emissions from SF₆ manufacturing—which cover both SF₆ plants and which may not only include waste gas emissions from SF₆ production but also emissions from handling of SF₆ at the production site, and thus represent the upper end of the possible range—varied between 4 and 53 tonnes of SF₆ over the period 1990 to 2007, whereas after project implementation the plant reported an average annual waste gas generation of 117 tonnes of SF₆.

The abrupt increase occurred in all four plants exactly at the point in time when plant operators could generate (more) credits by producing more waste gas, and higher levels of waste generation were sustained thereafter. The increase in waste generation is mostly attributable to an increase in the waste generation rate, and not in production levels (see Supplementary Information). There was also no reporting of any changes in plant capacity, design, or product specifications which might have affected the waste generation rate. Without credit revenues, plant operators would have economic incentives to reduce rather than increase waste generation^{13,14}.

Absent methodological safeguards to prevent perverse incentives, increasing waste gas generation beyond levels that would occur in the absence of crediting leads to excess issuance of credits. The extent of such over-crediting is uncertain; it depends on how much waste gas the plants would otherwise have generated. We assess the magnitude of over-crediting using three scenarios to estimate the plausible range of waste gas generation that would have occurred in the absence of crediting (see Methods). We conclude that, in the periods where methodological safeguards were not applied, about 28 to 33 million credits were issued in excess, corresponding to 66 to 79% of the credits issued for these periods.

Several lessons can be learned from this analysis. First, although previous research indicated that perverse incentives affected plant operations, the extent and implications were more confined^{13,17,18}. Our results suggest that perverse incentives arising from project-based mechanisms can have rather substantial adverse impacts on environmental integrity, with about two-thirds of the credits

being issued in excess in periods when no safeguards were applied. Second, regulatory oversight by the host country alone may not be sufficient to ensure environmental integrity. Under the Kyoto Protocol, Russia had no incentives to ensure environmental integrity of JI projects; it had an emissions target well above its actual emissions and could issue credits from its emissions budget without repercussions for meeting its target. For the three plants in Fig. 1 the methodological safeguards were removed at a point in time when perverse incentives from HFC-23 CDM projects received wide media and policymaker attention, leading ultimately to a ban of HFC-23 credits under the EU's emissions trading scheme and a revision of the applicable methodological standard under the CDM (refs 14,22). Third, the Accredited Independent Entity (AIE) performing the relevant auditing functions—Bureau Veritas Certification—did not address the perverse incentives. Although AIEs were accredited by the JISC, the projects were implemented under oversight by the host country, in which case the JISC did not assess the performance of auditors or apply any sanctions in cases of non-performance. Finally, we note a lack of transparency, with project information being only partially publicly available.

These lessons are critical for both ongoing international discussions on the review of JI and market-based mechanisms under the new climate agreement, as well as the growing use of domestic carbon markets around the world. Our findings confirm earlier research that project-based mechanisms are exposed to significant risks of over-crediting, for example, due to the information asymmetry between project operators and auditors or regulators^{4,5,7,8}. If crediting mechanisms are further pursued, it is essential that adequate international oversight be executed for any mechanisms involving international transfer of credits, that methodological standards be internationally accepted and include appropriate safeguards to prevent perverse incentives, that mechanisms monitor the performance of auditors and apply effective sanctions in the case of non-performance, and that information on credited activities is transparent and publicly accessible.

Methods

Methods and any associated references are available in the [online version of the paper](#).

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Author contributions

L.S. evaluated the data and analysed the results. L.S. and A.K. wrote the paper.

Additional information

Supplementary information is available in the [online version of the paper](#). Reprints and permissions information is available online at www.nature.com/reprints. Correspondence and requests for materials should be addressed to L.S.

Competing financial interests

L.S. is member of the CDM Executive Board under the Kyoto Protocol.

Methods

Data on production and waste gas generation was gathered from project design documents (PDDs) and monitoring reports, published by the UNFCCC (<http://ji.unfccc.int>) and the Russian Registry of Carbon Units (<http://www.carbonunitsregistry.ru>), and audited by AIEs. The monitoring and verification reports publicly available are incomplete for four out of the five plants: for HFC-23 and SF₆ abatement at KCKK Polymer, the first and second monitoring report covering the years 2008 and 2009 are lacking. For HFC-23 abatement at HaloPolymer Perm, the first, second and fourth monitoring report, covering the years 2008 and 2009 and the period 1 January to 31 March 2011, are lacking, as well as the fourth verification report for the period 1 January to 31 March 2011. Moreover, as of 1 January 2012, HaloPolymer Perm reports only HFC-23 incineration but no longer HFC-23 generation. We conservatively assume that all HFC-23 generated was incinerated. If HFC-23 was partially vented or sold, the actual HFC-23 generation in 2012 would be even higher than presented in Fig. 1. Finally, monitoring reports are not publicly available for the plant in France.

Project-based mechanisms generally calculate emission reductions by comparing an emissions baseline with monitored project emissions and adjusting for any indirect upstream or downstream leakage emissions occurring as a result of the project:

$$ER = BE - PE - LE$$

where ER are the emission reductions, BE are the baseline emissions, PE are the project emissions and LE are the leakage emissions (all expressed as metric tonnes of CO₂ equivalent). Whereas project emissions can in most cases be directly measured, baseline emissions are estimated based on a counterfactual, hypothetical scenario. Baselines often aim to reflect the emissions level that would most likely occur if the project was not implemented, but could also be set at a lower, more conservative level—for example, to address uncertainties or to prevent perverse incentives. Over-crediting, or excess issuance of credits, occurs if the estimated baseline is higher than the emissions level that would occur if the project was not implemented (or if project or leakage emissions are underestimated).

Absent methodological safeguards, the four projects determine baseline emissions as the observed waste gas generation, that is, assuming that the same amount of waste gas would be generated and emitted in the absence of crediting. We estimate the extent of excess issuance of credits as the difference between the claimed baseline emissions (BE_{claimed}) and different assumptions on plausible baseline emission levels (BE_{plausible}):

$$E = BE_{\text{claimed}} - BE_{\text{plausible}}$$

where E are the credits issued in excess, BE_{claimed} are the baseline emissions specified in the monitoring reports of the plants and BE_{plausible} is our estimate of the plausible range of baseline emissions (both expressed in metric tonnes of CO₂ equivalent).

We use three scenarios to reflect the range of plausible baseline emissions (BE_{plausible}). For the three plants in Fig. 1, historical data on waste generation is available. We estimate the magnitude of over-crediting over the period 1 April 2011 to 31 December 2012, when methodological safeguards were not applied, assuming that the three facilities would have produced the same amount of waste gas per day as before the start of crediting, as during the crediting period before their decision to abandon the methodological safeguards, or as originally projected when the project was approved. The credits issued in excess would amount to 19.7, 17.3, or 17.6 million, respectively, corresponding to 69%, 61%, or 62% of the 28.3 million credits issued to the three facilities over that period.

For SF₆ abatement at HaloPolymer Perm in Fig. 2 the magnitude of over-crediting is more uncertain because historical data is not available. We determine plausible baseline emission levels based on the SF₆ production and a range of plausible assumptions on the waste generation rate:

$$BE_{\text{plausible}} = P_{\text{SF}_6} \times w_{\text{SF}_6} \times \text{GWP}_{\text{SF}_6}$$

where P_{SF_6} is the SF₆ production at the plant (in metric tonnes of SF₆), w_{SF_6} is the waste generation rate expressed as metric tonnes of SF₆ waste gas generated per metric tonnes of SF₆ produced, and GWP_{SF_6} is the global warming potential of SF₆ valid for the first commitment period under the Kyoto Protocol (metric tonnes of CO₂ equivalent per metric tonnes of SF₆). We estimate the magnitude of over-crediting for the period 2008 to 2012 when methodological safeguards were not applied. For the period 2008 to 2010 we use the SF₆ production data reported by the plant. For 2011 and 2012, SF₆ production data is not reported; we conservatively assume that the plant would operate at its maximum production capacity. We use three scenarios to estimate the plausible range of the waste generation rate, assuming that the plant would have operated at a waste generation rate of 0.2%, as suggested by the IPCC, 2.0%, as observed before crediting at the KCKK Polymer SF₆ production plant, or 3.8%, as approximated based on SF₆ emissions data reported in the Russian GHG inventory (see Supplementary Information). The credits issued in excess would amount to 13.5, 11.9, or 10.2 million, respectively, corresponding to 99%, 87%, or 75% of the credits issued over that period.

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
 FOURTH APPELLATE DISTRICT, DIVISION ONE

<p>SIERRA CLUB, v. COUNTY OF SAN DIEGO,</p>	<p>Petitioners and Respondents, Defendant and Appellant.</p>
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Case No. D075478

San Diego County Superior Court, Case Nos. 37-2018-00014081-CU-TT-CTL, 37-2018-00013324-CU-TT-CTL, No. 37-2012-00101054-CU-TT-CTL

The Honorable Timothy Taylor, Judge

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INTRODUCTION

The California Attorney General respectfully submits this brief as amicus curiae in support of Petitioners and Respondents Sierra Club¹ and Golden Door Properties (collectively, Respondents) pursuant to Rule 8.200(c)(7) of the California Rules of Court. This brief is submitted in the Attorney General's independent capacity and not on behalf of any State agency or entity.

At issue in this case is San Diego County's (County) revised Climate Action Plan (CAP), which was adopted to mitigate greenhouse gas (GHG) emissions from the County's 2011 General Plan Update, and the CAP's accompanying Supplemental Environmental Impact Statement (SEIR). The Attorney General has long advocated the use of local climate action plans, or other GHG reduction plans, to address GHG emissions. Such plans allow cities and counties to analyze impacts and identify mitigation opportunities at the programmatic level that may be lost on project-by-project review.² The County's decision in 2011 to address mitigation of GHG emissions from future development through a CAP was an important step in the right direction from a legal, policy, and environmental standpoint. However, the County's CAP cannot provide adequate

¹ Sierra Club files with Respondents Center for Biological Diversity, Cleveland National Forest Foundation, Climate Action Campaign, Endangered Habitats League, Environmental Center of San Diego, and Preserve Wild Santee.

² See, e.g., AR 11:8602-8610 (Attorney General's Comment Letter on San Diego County General Plan Update Draft Environmental Impact Report (August 31, 2009)); Attorney General's Comment Letter on Tulare County General Plan and Recirculated Draft Environmental Impact Report (May 27, 2010); Attorney General's Comment Letter on City of Pleasanton's Proposed General Plan Update and Final Environmental Impact Report (May 8, 2009), available at <https://oag.ca.gov/environment/ceqa/letters>.

mitigation as required by the California Environmental Quality Act (CEQA). Instead, its heavy, unfettered use of offsets allows status quo development to continue, locking the County into increased local emissions that work against the State’s long-term GHG reduction targets.

This amicus brief supplements the Respondents’ briefs by explaining why reducing vehicle use, referred to as vehicle miles traveled (VMT), is crucial to achieving the State’s climate objectives. Reducing VMT requires cities and counties to engage in forward-thinking and innovative land use planning. The County’s failure to meaningfully address VMT in the CAP will interfere with the region’s ability to achieve needed infrastructure changes consistent with long-term climate objectives, and ultimately prevents the CAP from serving as legally adequate mitigation. Moreover, the lack of limits, standards or other criteria for the CAP’s use of offsets, allows developers to avoid making crucial onsite reductions and instituting measures to reduce vehicle use, rendering the CAP unenforceable.

Further, the SEIR for the CAP hides the inconsistencies with State and regional climate objectives from the public by failing to disclose or analyze these conflicts, in violation of CEQA. The County also violates CEQA by not considering compact growth alternatives that reduce VMT, and by failing to analyze impacts of increased VMT on air quality or environmental justice communities. This amicus brief aims to provide guidance on how the County and other local entities can create GHG reduction plans that reduce VMT, adopt enforceable programmatic mitigation for land use development, and as the California Supreme Court requires, do their part to ensure that their CEQA analysis “stays in step” with State climate objectives. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 3 Cal.5th 497, 519 [hereafter *SANDAG*].)

STATEMENT OF INTEREST

The Attorney General, as the State’s chief law enforcement officer, has a duty to ensure that the State’s laws are appropriately enforced and a duty under the Government Code to protect the environment and natural resources of California. (Cal. Const., art. V, § 13; Gov. Code, §§ 12600-12612; *D’Amico v. Bd. of Medical Exam’rs* (1974) 11 Cal.3d 1, 14-15.) The Attorney General has a particular interest in ensuring the proper interpretation of CEQA and of the regulations implementing CEQA (Cal. Code Regs., tit. 14, § 15000 et seq. [CEQA Guidelines]). The Attorney General also has a unique role with respect to actions concerning pollution and adverse environmental effects that could affect the public or the natural resources of the State. (Gov. Code, §§ 12600-12612.) Government Code section 12600 specifically provides that “[i]t is in the public interest to provide the people of the State of California *through the Attorney General* with adequate remedy to protect the natural resources of the State of California from pollution, impairment, or destruction.” (Emphasis added.)

The California Attorney General has actively participated in CEQA litigation regarding GHG emissions and climate change impacts at the local level. In 2006, the Attorney General’s Office submitted its first comment letter arguing that climate change is an environmental impact that must be addressed under CEQA. Ultimately, the Attorney General’s position was codified in 2007 with the passage of Senate Bill 97 (Pub. Resources Code, § 21083.05) and is reflected in CEQA’s implementing regulations (CEQA Guidelines § 15064.4). In submitting this amicus brief, the Attorney General furthers its efforts to ensure that CEQA is enforced in a way that discloses impacts from land use development plans and projects, and ensures the consistency with State laws and policies.

ARGUMENT

I. THE COUNTY’S CLIMATE ACTION PLAN IS INADEQUATE MITIGATION FOR GHG IMPACTS ANTICIPATED UNDER THE COUNTY’S GENERAL PLAN UPDATE

The CAP, by incorporating mitigation measure GHG-1 (referred to in this brief as the Offset Provision, or Provision),³ allows future development requesting a general plan amendment in the County to mitigate emissions largely through the purchase of carbon offsets. Carbon offsets represent discrete GHG reduction events that take place offsite of a proposed development, and, in many cases, outside of the County entirely. While offsets can be a positive part of a robust and comprehensive GHG emissions plan, the Offset Provision relies almost exclusively on offsets to the exclusion of long-term, carbon-efficient planning. The Provision does not, for example, require or incentivize developers to locate projects in already dense, urban areas to limit residents’ daily vehicle trips.

As a consequence, and as discussed in detail in the Respondents’ briefs, the CAP will foreseeably increase vehicle use in the County, creating inconsistencies with Senate Bill 375 (SB 375), a State law designed to reduce vehicle-related GHG emissions through smart growth land use planning and transportation design. (Gov. Code §§ 65080 et seq.; see also *Sierra Club Br.* at 62-70; *Golden Door Br.* at 75-82.)⁴ The CAP

³ The County insists that the Offset Provision is not a part of the CAP but a part of the SEIR for the CAP. (*County Reply Br.* at 21.) However, given that the Offset Provision is discussed in the CAP, is a mitigation measure adopted to reduce the CAP’s impacts below the threshold of significance, and that CEQA mandates that agencies consider “the whole of an action,” this brief considers the CAP and the Offset Provision to be part of the same action under CEQA. (CEQA Guidelines § 15003, subd. (h); see also AR 1340:58761.)

⁴ Since the approval of the CAP, several new general plan amendment projects using offsets to mitigate GHG emissions have been approved. (CT 10:2385-87; CT 13:3300; see also *Sierra Club Br.* at 18; (continued...))

will also conflict with the sustainable communities strategy developed by the regional transportation planning body, the San Diego Association of Governments (SANDAG) to comply with SB 375's targets (hereafter SANDAG Plan). (Sierra Club Br. at 62-70; Golden Door Br. at 75-82.)

Ultimately, the CAP in its current form will perpetuate current sprawling development patterns, which will impede the ability of the region and State to reach their long-term climate objectives. This is particularly concerning because of the crucial role of local governments in obtaining important VMT reductions. Moreover, the County cannot avoid implementing necessary compact land use development designed to reduce vehicle use entirely by adopting the Offset Provision, which in addition to increasing VMT, requires no meaningful standards or criteria to ensure enforceable GHG reductions. Thus, the CAP is inadequate mitigation for the impacts of the 2011 General Plan Update.

A. Sustainable, Long-Term GHG Reductions Cannot Be Achieved Without Addressing Vehicle Miles Traveled

The County asserts that so long as GHG reductions are being achieved somewhere, by some means, for some period of time, the CAP serves its mitigative purpose. (County Opening Br. at 48 [hereafter County Br].) Not only is this position incorrect, it reveals a deep misunderstanding of the importance of VMT reductions to meeting not only the goals in relevant

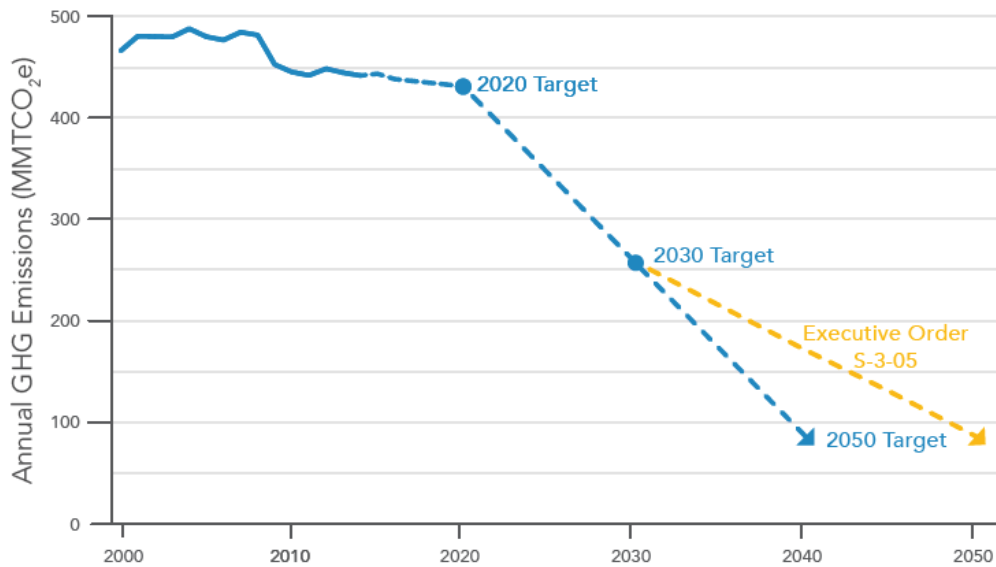
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Golden Door Br. at 50-51.) All are large-scale housing projects located well outside of urban centers that will increase VMT. For example, the Harmony Grove Village South project, which was recently approved by the County, will increase vehicle miles traveled by 11.5 million miles annually. (CT 10:2451 [Harmony Grove Village South Draft Final Environmental Impact Report (May 2018) p. 2.7-17].) Similarly, the Newland Sierra project will increase vehicle use by 294,804 miles *daily*. (CT 15:3918; see also Newland Sierra Final Environmental Impact Report (June 2018) p. 2.7-38].)

State and regional programs and plans, but also California’s larger climate objectives. Without significant VMT reductions across the State, California simply will not be able to achieve its GHG reduction targets.

A review of California’s climate laws reveals that reducing vehicle use is a crucial element of California’s policy and regulatory framework to reduce the State’s GHG emissions and the consequences of extreme changes in climate. California took the lead in reducing GHG emissions by enacting the Global Warming Solutions Act of 2006, also known as AB 32, which set the State’s original target of reducing GHG emissions to 1990 levels by 2020. (Health & Saf. Code, §§ 38500 et seq.) In 2016, California passed Senate Bill 32 (SB 32), which set a target of reducing GHG emissions 40 percent below 1990 levels by 2030. (*Id.* at § 38566.) Looking further to the future, Executive Order S-3-05 sets a goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. (Governor’s Exec. Order No. S-3-05 (June 1, 2005).)

As required by AB 32, the California Air Resources Board (Air Resources Board) developed the Scoping Plan, which outlines a framework of GHG reduction strategies and a path for the State to meet AB 32’s 2020 targets, and, as updated in 2017, SB 32’s 2030 targets. (Health & Saf. Code, § 38561; AR 1026:55038 [Air Resources Board, 2017 Scoping Plan (2017) p. ES 3, hereafter Scoping Plan].) The Scoping Plan emphasized that the State’s reduction “targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in line with California’s role in stabilizing global warming below dangerous thresholds.” (*Ibid.*) Represented graphically, our climate challenge is significant:

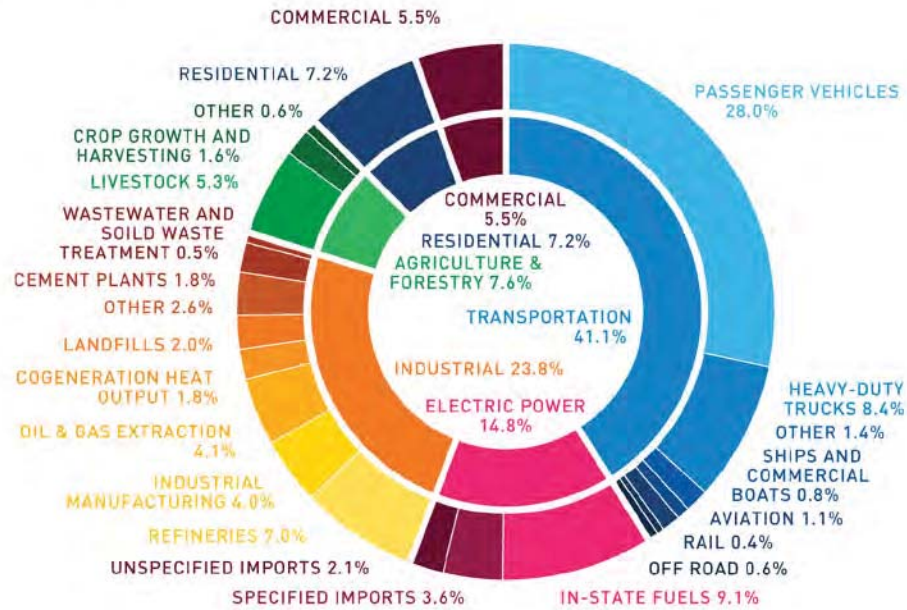


(*Id.* at 55071 [Scoping Plan at p. 18, fig. 5, “Plotting California’s Path Forward”].)

Within this significant undertaking to reduce GHGs, emissions from transportation represent a particular challenge. Transportation is the largest source of GHG emissions in the State, totaling almost half of statewide GHG emissions. (AR 1026:55063 [Scoping Plan at p. 10].)

Figure 2. Greenhouse Gas Emissions by Source

CALIFORNIA, 2017



(Next 10, California Green Innovation Index (2019),⁵ p. 7 [data source: Air Resources Board, California Greenhouse Gas Inventory – By Sector and Activity (2019)].)

In light of these significant transportation emissions, the Scoping Plan specifically noted that reductions in VMT are necessary to achieving California’s 2030 targets and “must be a part of any strategy evaluated in the [Scoping] Plan.” (AR 1026:55128 [Scoping Plan at p. 75].) In fact, the Air Resources Board has emphasized that “California *cannot* meet its climate goals without curbing growth in single-occupancy vehicle activity.” (Air Resources Board, 2018 Progress Report, California’s Sustainable Communities and Climate Protection Act (2018) p. 28, hereafter Progress Report [emphasis added].)⁶

⁵ Available at <https://www.next10.org/publications/2019-gii>.

⁶ Available at <https://ww2.arb.ca.gov/resources/documents/tracking-progress>.

Implementation of SB 375 is a primary strategy identified in the Scoping Plan to reduce GHG emissions from the transportation sector. (AR 1026:55154 [Scoping Plan at p. 101].) SB 375 aims to achieve GHG reduction goals specifically by reducing regional GHG emissions from light duty vehicles through coordinated land use transportation planning. (Gov. Code, § 65080 subd., (b)(2)(B)(vii).) Under SB 375, regional planning organizations develop plans to achieve the GHG reduction targets set by the Air Resources Board. (*Id.* at § 65080.) These regional plans, or sustainable communities strategies, integrate “land use, transportation, and housing planning” to reduce emissions from driving, curtail traffic, preserve natural resources, reduce air pollution, and expand clean transportation options. (Progress Report at p. 16.) In order to meet the intent of SB 375, these regional plans should achieve their emissions targets “predominantly through strategies that reduce [VMT].” (AR 22:20413 [Air Resources Board, Final Staff Report on the Proposed Update to the SB 375 GHG Emissions Reduction Targets (Oct. 2017) p. 19].)

SANDAG’s sustainable communities strategy was created to be consistent with this intent. The SANDAG Plan specifies that GHG reductions are to be achieved through land use planning methods that are designed to reduce vehicle miles traveled, including “using land in ways that make developments more compact, conserving open space, and investing in a transportation system that provides people with alternatives to driving alone.” (AR 430:39941.) Indeed, one of the “five building blocks” of the SANDAG Plan is to implement “policies and other measures designed to reduce the number of miles that people travel in their vehicles.” (*Id.* at 39870.) Thus, the County’s assertion that the SANDAG Plan does not require reductions in VMT is directly contradicted by the plain language of the document.

Moreover, the SANDAG Plan emphasizes that achieving GHG reductions through more compact development designed to reduce vehicle use is important for numerous reasons. Specifically, the SANDAG Plan discusses how smart growth land development decreases air pollution, preserves open space and agricultural land, improves water quality, and promotes healthier lifestyle choices, among other benefits. (AR 430:39934-35; see also AR 1026:55117, 55127 [Scoping Plan at pp. 64, 74] [noting that compact development that reduces VMT also demands less energy per capita, preserves natural and working lands, uses less water per capita and encourages physical activity].)

Thus, VMT reduction is an integral part of California’s climate laws and policies, as well as the SANDAG Plan. The CAP’s Offset Provision allows the County and future development projects to avoid consideration of whether the proposed project is properly located, sufficiently dense, and adequately supported by existing infrastructure, services, and public transportation. (See *Golden Door Br.* at 76-81; *Sierra Club Br.* at 62-70.) In this way, the CAP allows VMT-inefficient projects to continue to be built, locking the County into emissions for decades to come.

B. Local Governments Have an Essential Role to Play in Meeting the State’s Climate Objectives, Including Reducing Vehicle Miles Traveled

By failing to place any meaningful limitations or criteria for offsets, and by not requiring developers to make reductions in VMT, the County is effectively abdicating its land-use planning role. But local governments are necessary partners in reducing GHG emissions from land use and transportation. As the California Supreme Court has recognized, “[l]ocal governments ... bear the primary burden of evaluating a land use project’s impact on greenhouse gas emissions.” (*Ctr. for Biological Diversity v. Cal. Dep’t of Fish and Wildlife* (2016) 62 Cal.4th 204, 230.) The Scoping Plan

also emphasizes that local governments are critical players in achieving the State’s climate stabilization goals. (AR 1026:55150 [Scoping Plan at p. 97]; see also *id.* at 55072, 55115, 55125, 55140, 55144, 55150-55155 [pp. 19, 62, 72, 87, 91, 97-102].) In particular, the Scoping Plan relies on local governments to achieve reductions from land use planning and transportation, and states that local governments “can develop land use plans with more efficient development patterns that bring people and destinations closer together in more mixed-use, compact communities that facilitate walking, biking, and use of transit.” (*Id.* at 55150 [Scoping Plan at p. 97].) Because of this unique position, local government actions to combat severe changes in climate can in many cases be more effective, less costly and provide more environmental and economic co-benefits than regulating at the State level. (*Ibid.*)

In recognition of the important role that local jurisdictions have in GHG reductions and land use planning, many local jurisdictions have developed program-level GHG emissions reduction plans, such as CAPs. These plans outline city-, county- or regional-level frameworks that detail the specific actions a local agency will implement to reduce GHG emissions to a specified emissions level that is consistent with the State’s long-term climate objectives. (Governor’s Office of Planning and Research, General Plan Guidelines (2017) p. 226-229.)⁷ CAPs, when done correctly, provide a comprehensive approach to reducing GHG impacts on the local level and allow the local government to disclose, analyze, and mitigate impacts that may not be sufficiently analyzed and mitigated if projects are only reviewed one at a time. (*Id.* at 223.)

⁷ Available at http://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf.

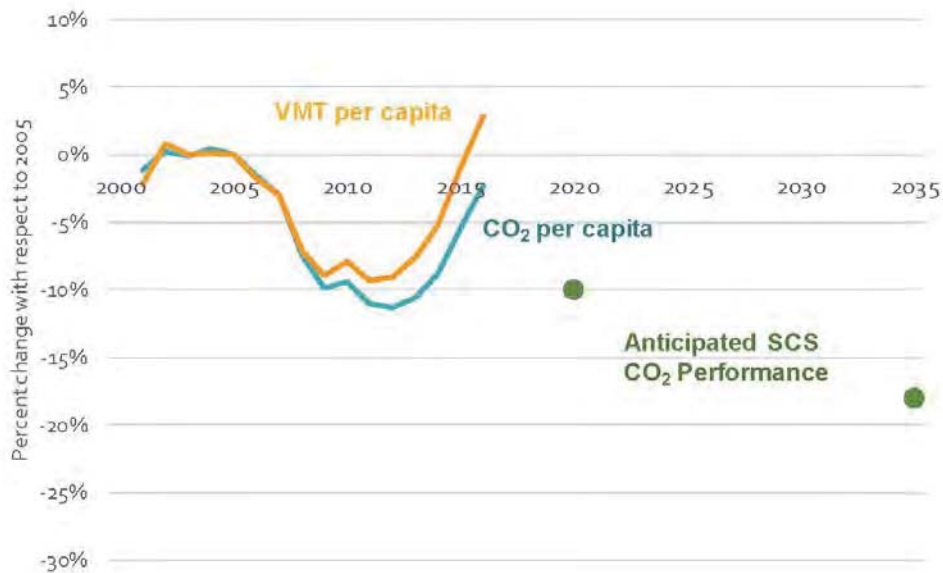
One of the key benefits of a properly prepared CAP is its ability to integrate GHG reductions with land use development plans. (General Plan Guidelines at pp. 222-224.) For example, by developing a CAP alongside a region’s general plan, a jurisdiction can consider methods of GHG reduction not available on a project-by-project-basis, such as zoning for compact development to decrease reliance on vehicles. (*Ibid.*) Moreover, the CEQA Guidelines allow well-designed CAPs that are consistent with State and regional climate goals to “streamline” future projects – meaning that future projects that comply with the CAP can appropriately reduce their GHG emissions to less than significant. (CEQA Guidelines § 15183.5, subd. (b).) This can allow local entities to more easily approve needed development, such as additional housing, or low-income housing, in existing, compact communities that reduce VMT.⁸ Thus, well designed CAPs provide excellent opportunities to achieve long term GHG reductions through dense development and can complement regional sustainable communities strategies’ and SB 375’s VMT reduction goals.

SB 375, too, relies on local planning innovation and leadership. The goals of regional sustainable communities strategies, including the SANDAG Plan, cannot be achieved if the County and other local entities operate with no regard for the compact growth principles. Recent data on compliance with SB 375 reflect this important point. In November 2018, the Air Resources Board released its 2018 Progress Report pursuant to SB 150,⁹ a State law that requires the preparation of a report every four years analyzing the progress made under SB 375. (Progress Report at p. 3.) The

⁸ The County claims that Petitioners are attempting to prevent all development in San Diego County. (County Reply Br. at 9-10.) However, had the County developed an adequate CAP, it could have actually *facilitated* dense development.

⁹ Gov. Code § 65080, subd. (b)(2)(J)(iv).

Progress Report found that despite the preparation of sustainable community strategies designed to comply with SB 375 by all the regional planning organizations, actual GHG emissions and VMT per capita have not declined, and California is not on track to meet its SB 375 targets. (*Id.* at 22.) In fact, VMT per capita and carbon dioxide emissions per capita are increasing¹⁰:



Source: CDTFA, U.S.EIA, U.S. EPA, CARB

(*Id.* at 23.)

The wide gap between the actual, measured VMT per capita and the targets of the sustainable community strategies reflects, among other things, that the regional plans are “not being implemented as envisioned.” (Progress Report at p. 24.) Further, the Progress Report warns that continued growth of urban sprawl could create barriers to achieving the compact land use patterns outlined in the regional plans. (*Id.* at 52.) The

¹⁰ CO₂ and VMT in the chart calculated based on California Department of Tax and Fee Administration gasoline fuel sales data.

Air Resources Board advised that “structural changes and additional work by all levels of government are still necessary to achieve State climate goals and other expected benefits.” (*Id.* at 7.) This includes the County.

Thus, neither the State nor the San Diego region can achieve their climate goals if local entities, such as the County, persist in expanding urban sprawl, and consequently VMT. The County cannot disregard VMT reductions in the CAP without creating potentially significant and long-lasting impacts on the region’s ability to comply with the SANDAG Plan, SB 375 and consequently, California’s 2050 goals. These foreseeable conflicts with State and regional laws and plans prevent the CAP from adequately mitigating the impacts of the General Plan Update.

C. Offsets Are Not a Substitute for Efficient, Long-Term Land-Use Planning and Carbon-Efficient Project Design

GHG offsets can be a valuable and useful tool for achieving additional reductions that cannot be attained through onsite or VMT reduction measures alone. (AR 1026:55155 [Scoping Plan at p. 102].) For example, where a properly sited project has agreed to implement all feasible design changes and on-site mitigation, but will still have significant GHG emissions, it may be appropriate to consider the purchase of rigorously quantified and verified offsets to further reduce the project’s impacts. But in the land-use planning context, offsets—particularly offsets that are not tied to local projects—have distinct disadvantages as compared to on-site mitigation or other direct emission reduction measures. These disadvantages, combined with the lack of any adequate criteria to ensure enforceability of the offsets purchased in this case, conspire to make the CAP ineffective and unreliable as a mitigation measure for the General Plan Update.

The Offset Provision provides only vague pronouncements and little accountability.¹¹ It does not require any minimum amount of reductions to be made onsite before a project applicant can turn to offsets. (AR 38:22771.) In fact, the only standard that the Offset Provision requires is the satisfaction of the County and the Director of Planning and Development Services (PDS) that onsite reductions were considered first before turning to offsets. (*Ibid.*) Without any measurable guidance or standard for what “feasible” onsite reductions are, it is unclear how much onsite reduction will actually be required of future general plan amendment projects. What is clear, however, is that the County has recently approved developments using mitigation measures nearly identical to the Offset Provision that achieve onsite reductions for a very small portion of overall emissions. For example, the approved Newland Sierra project mitigates a staggering 82 percent of its emissions with offsets. (AR 22:18678.)

The Offset Provision also states that if offsets are used, the project “shall first pursue offset programs locally within unincorporated areas of the County of San Diego to the extent such carbon offset credits are available and financially feasible, as reasonably determined by the Director of PDS.” (AR 38:22772.) Again, the County provides no detail as to what “financially feasible” means, nor what criteria the Director of PDS will use to make its determination. Further, the evidence in the record shows that there are few carbon credits available within the County, meaning that most offset purchases

¹¹ Like all mitigation under CEQA, any mitigation measure that utilizes offsets must be enforceable. “Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments.” (CEQA Guidelines § 15126.4, subd. (a)(1)(D).) “The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded.” (*Lincoln Place Tenants Assn. v. City of Los Angeles* (2007) 130 Cal.App.4th 1491, 1508 [citing Pub. Resources Code, § 21002.1].)

will inevitably occur outside of the County. (AR 38:23110-11.) Once all “available and financially feasible” in-County offsets have been considered, the Offset Provision allows projects to turn to out-of-county offsets. (*Id.* at 22771.) While the Provision requires that developers should prioritize in-state and in-country offsets (again without minimum amounts of reduction achieved by in-state or in-country offsets), it ultimately permits projects to purchase international offsets as well, unrestricted by any geographic boundaries. (*Ibid.*) This lack of meaningful criteria or limitations renders the Offset Provision unenforceable.

Moreover, the County’s attempts to justify the Offset Provision lack merit. The County asserts that the CAP’s allowance of offsets is no different than the use of offsets by the Air Resources Board’s Cap and Trade program.¹² (County Br. at 32-33.) This is untrue. Unlike the Offset Provision, offsets used in the Air Resources Board’s Cap and Trade Program are subject to detailed compliance protocols that were developed pursuant to the State’s public rulemaking process. (Cal. Code Regs., tit. 17, § 95972.) Further, and of critical importance, these requirements only allow offsets to comprise a maximum of 8% of any compliance entity’s compliance obligation.¹³ (*Id.* at § 95854, subd. (b).)

The County further argues that the Offset provision is no different than the use of offsets for the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, which the Scoping

¹² The County also concludes that because the Air Resources Board did not comment on the EIR, that the Board does not find the Offset Provision problematic. (County Br. at 49.) However, the County has provided no evidence to support this conclusion.

¹³ With the passage of Assembly Bill 398 in 2017, this maximum percentage has been further reduced to 4% of emissions from 2021-2025 and 6% for emissions from 2026-2030. (Assem. Bill No. 398 (2017-2018 Reg. Sess.) § 4(c)(E)(i).)

Plan identified as an example of a development project that will help the State meet its climate goals. (County Br. at 33 citing AR 1026:55154-55155 [Scoping Plan at pp. 101-2].) This is also untrue. The Newhall Ranch development required more than 50% of offsets to be local and limited international offset purchases to 20%. (AR 22:19785, 19796.) Moreover, offsets were only permitted after very extensive onsite reductions and measures to reduce VMT were implemented. (*Id.* at 19645-56.) Thus, the County cannot rely on the Newhall Ranch development to justify the shortcomings of the Offset Provision.

Crucially, what regional and State plans to reduce VMT require, and what the County cannot achieve through offsets, is long-term structural change. While the Offset Provision results in the purchase of GHG reductions for a 30-year lifespan, building in structural urban sprawl throughout the County will create GHG emissions far beyond 2050. (AR 38:22770, 24183.) Under the Offset Provision, rather than achieving the low-carbon 2050 that California’s climate laws and plans envision, the San Diego Region will see a sharp *increase* in GHG emissions around 2050, when recently approved projects’ 30-year offsets will expire. (AR 1026:55128; see also CT 15:3907, CT 10:2458 [reflecting that both the Newland Sierra and Harmony Grove Village South projects purchased offsets for a 30 year period].)

In order to truly be able to reach its 2050 goals, California, and particularly the local governments who manage land use throughout the State, must make the hard infrastructure changes needed to create dense communities that are not heavily reliant on vehicle use for travel. Despite this, the CAP ignores VMT reductions in favor of providing an easy solution for developers that kicks the can down the road and saddles a future generation of Californians with the costs of climate change. The County attempts to characterize the Offset Provision as an “additional burden”

on developers seeking a general plan amendment. (County Reply Br. at 10.) In reality however, it is an attempt to provide a backdoor for developers to purchase CEQA compliance while avoiding the difficult work that achieving our 2050 goals will require. As a result, the CAP's Offset Provision cannot deliver the same level of reliable, verifiable, substantial, and long-term GHG emissions reductions that active planning by the County, and smart project design by developers, can. Moreover, the County cannot assert consistency with SB 375 and the SANDAG Plan while the Offset Provision stands in its current form.

For these reasons, the CAP cannot serve as adequate mitigation for the General Plan Update.

II. THE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE CLIMATE ACTION PLAN FAILS AS AN INFORMATIONAL DOCUMENT UNDER CEQA

“The fundamental purpose of an EIR [pursuant to CEQA] is ‘to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment.’” (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 [citing Pub. Resources Code, § 21061].) An EIR serves as “‘an environmental alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.” (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392 [citation omitted].) In conducting an EIR for broader planning documents, the California Supreme Court has emphasized that planning agencies “must ensure that CEQA analysis stays in step with evolving scientific knowledge and state regulatory schemes.” (*SANDAG, supra*, 3 Cal.5th at p. 519.)

Here, where the CAP will create foreseeable VMT increases that will lock in emissions in the County long into the future, the County is obligated to disclose these environmental changes to the public. Instead, the SEIR provides no analysis of the CAP’s foreseeable conflicts with regional and State plans calling for land use planning decisions that reduce VMT, nor the air quality and environmental justice impacts that will also follow from increased VMT. This prevents the public and other agencies from adequately understanding how the CAP could impact future land use development, public health, and communities in the region. Moreover, the SEIR does not consider any alternatives that would reduce VMT in the region, and thus minimize the significant impacts created by the Offset Provision. For these reasons, the SEIR violates CEQA.

A. The County Did Not Adequately Evaluate Conflicts with the SANDAG Plan and SB 375

Despite the Offset Provision’s inconsistency with the SANDAG Plan and SB 375, the SEIR offers no analysis of these conflicts. This directly contravenes CEQA’s requirements. The CEQA Guidelines require that EIRs “shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans... [including] regional transportation plans.” (CEQA Guidelines § 15125, subd. (d).) Further, “[i]f a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed” (*Id.* at § 15126.4, subd. (a)(1)(d).) While such impacts can be discussed “in less detail than the significant effects of the project as proposed,” the impacts of mitigation measures cannot be ignored. (*Ibid.*) In addition, any inconsistency with the SANDAG Plan or SB 375 would strongly suggest that the CAP will work against the State’s overarching environmental objective: to reduce statewide emissions of GHGs by 2050 to a level that is consistent with

climate stabilization (80 percent below 1990 levels). (AR 1026:55152 [Scoping Plan at p. 99].)

In contrast to CEQA’s mandates, the SEIR does not even acknowledge that the Offset Provision will foreseeably result in increased VMT, let alone provide a complete analysis of its consistency with the SANDAG Plan. (County Br. at 46-49; AR 38:22773-4.) Instead, the County argues that it need not evaluate its consistency with the SANDAG Plan because the County is “not required to make its ‘land use policies and regulations, including its general plan ... consistent with the [SANDAG Plan] or an alternative planning strategy.’” (County Br. at 47, citing Gov. Code, § 65080, subd. (b)(2)(J).) However, this explanation is irrelevant to whether the County has complied with CEQA. CEQA is a document of public disclosure and accountability, meant to provide the public, along with other government agencies, information on how the County’s actions may impact the environment, and other land use plans. (See *Ctr. for Biological Diversity v. Cnty. of San Bernardino* (2010) 185 Cal.App.4th 866, 882.) Here, the Offset Provision will foreseeably impact the ability of the region to meet its VMT reduction goals under the SANDAG Plan – an impact that could have regional environmental consequences long into the future. CEQA requires that the SEIR must discuss and analyze those impacts, even if, as the County argues, it does not have to make its General Plan Update consistent with the SANDAG Plan. It must, under CEQA, disclose and discuss the inconsistency.

The County’s other attempts to justify its lack of analysis are similarly unavailing. First, the County states that the SANDAG Plan does not require reductions in VMT, and that reducing GHG emissions with offsets is consistent with the SANDAG Plan and SB 375. (County’s Br. at 48.) However, as discussed above, SB 375 and the SANDAG Plan both require GHG reductions through land use changes designed to reduce VMT, and so

the County cannot achieve consistency with the goals of these laws and plans with a CAP that increases VMT. Second, the County claims that other provisions of the CAP and the General Plan Update will reduce VMT, and so it need not discuss any increases caused by the Offset Provision. (*Id.* at 46-47; AR 1340:58773-78, 58780-88.) However, the County fails to explain how the CAP measures it discusses, none of which prevent or reduce VMT from new residential development projects in unincorporated land, will prevent the increases in VMT caused by the Offset Provision. Moreover, the County does not address how provisions in the General Plan Update will minimize VMT increases caused by general plan *amendments*, which, by definition, do not conform to the General Plan's requirements.

Finally, the County argues that consistency with SB 375 and the SANDAG Plan will be considered by future GPA projects and that the development of future general plan amendments is too speculative to be analyzed now. (County's Br. at 48, 50.) However, the environmental review of future projects does not relieve the County of its requirement evaluate the Offset Provision's consistency with the SANDAG Plan and SB 375 under CEQA. (CEQA Guidelines § 15125, subd. (d).) Further, CEQA requires that the County consider the impacts of *foreseeable* general plan amendment projects. (Pub. Resources Code, § 21065.) At the time the SEIR was drafted, the County identified numerous pending general plan amendment projects, many of which had published climate changes analyses as part of draft or final EIRs, and analyzing their foreseeable use of offsets would have required no speculation. (AR 38:22490-92.)

Thus, the SEIR's failure to disclose and analyze the inconsistency of the Offset Provision with SB 375 and the SANDAG Plan (and thereby with the State's long-term climate objectives) violates CEQA.

B. The County Did Not Analyze Air Quality or Environmental Justice Impacts from Increased VMT

Transportation is a major source of air pollution statewide and can produce impacts such as “smog forming and toxic air pollutants. (AR 55100, 55127 [Scoping Plan at pp. 47, 74].) As the Scoping Plan acknowledges, “[a]ir pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease and early death.” (*Id.* at 55127 [Scoping Plan at p. 74].) In particular, these adverse health outcomes disproportionately impact “vulnerable populations such as children, low income communities and communities of color,” referred to in this brief as environmental justice communities.¹⁴ (*Ibid.*) By increasing vehicle use, the CAP will foreseeably increase tailpipe emissions that contribute to poor air quality and disproportionate health impacts on environmental justice communities in the County. Yet, the County offers no analysis in the SEIR of these impacts, and consequently prevents the public from understanding the full environmental consequences of the CAP. “A sufficient discussion of significant impacts requires not merely a determination of whether an impact is significant, but some effort to explain the nature and magnitude of the impact.” (*Sierra Club v. City of Fresno* (2018) 6 Cal. 5th 502, 519.) The County’s lack of analysis violates CEQA.

C. The County Did Not Adequately Consider Alternatives that Would Prioritize Density

CEQA requires that lead agencies consider “a range of reasonable alternatives to the project.” (CEQA Guidelines § 15126.6, subd. (a).) “[T]he discussion of alternatives shall focus on alternatives to the project or

¹⁴ The Government Code defines “environmental justice” as the “fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws regulations and policies.” (Gov. Code, § 6540.12, subd. (e).)

its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.” (*Id.* at § 15126.6, subd. (b); see also *Ctr. for Biological Diversity v. Cnty. of San Bernardino, supra*, 185 Cal.App.4th. at p. 882-83.) Here, despite extensive evidence presented in comments on the SEIR that the Offset Provision would create significant increases in VMT and conflict with the regional SANDAG Plan and SB 375, the County did not even consider an alternative that would limit sprawl and prioritize development in dense, urban areas. (See AR 38:22953-23034; see also AR 22:18424-25, 18440-41.)

The County asserts that it is not required to consider “every imaginable project alternative.” (County’s Br. at 52 [citing *Cherry Valley Pass Acres & Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316, 354].) However, consideration of an alternative that would reduce VMT and prevent urban sprawl that could impact the whole region is patently reasonable and already envisioned by the SANDAG Plan. (See CEQA Guidelines § 15126, subd. (f) [“The range of alternatives required in an EIR is governed by a ‘rule of reason’ ... alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.”].) Moreover, this appellate district has recently found that a plan to reduce GHG emissions which failed to include an alternative that would “significantly reduce total [VMT]” was inadequate. (*Cleveland Nat’l Forest Found. v. San Diego Assn. of Gov’ts* (2017) 17 Cal.App.5th 413, 436 [noting that “the state’s efforts to reduce greenhouse gas emissions from on road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced.”].) The County’s failure to consider an alternative that would prioritize density and other

carbon-efficient development strategies results in inadequate environmental review.

Thus, for these reasons, the SEIR violates CEQA.

CONCLUSION

The Superior Court's judgment should be affirmed.

Dated: October 29, 2019

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Per California Rule of Court § 8.204(c), I certify that this brief uses a
13 point Times New Roman font and contains 6,844 words.

Dated: October 29, 2019

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Court of Appeal Case Number: D075478
Superior Court Case Number: 37-2018-00014081-CU-TT-CTL

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2. a. My [] residence [x] business address is (specify): Office of the Attorney General, 1515 Clay Street, 20th Floor, P. O. Box 70550, Oakland, CA 94612-0550
b. My electronic service address is (specify): debra.baldwin@doj.ca.gov
3. I electronically served the following documents (exact titles): AMICUS BRIEF OF THE CALIFORNIA ATTORNEY GENERAL IN SUPPORT OF PETITIONERS AND RESPONDENTS
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c. On (date): October 29, 2019
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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: October 29, 2019

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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

APP-009E – Item 4**Sierra Club, et al. v. County of San Diego****Fourth Appellate District, Division 1****Case No. D075478****Appeal From the Superior Court of San Diego****Case Nos. 37-2018-00014081-CU-TT-CTL****37-2018-00013324-CU-TT-CTL****37-2012-00101054-CU-TT-CTL**

On October 29, 2019, based on a court order or an agreement of the parties to accept service by electronic transmission through TrueFiling, I caused the foregoing document described as:

**AMICUS BRIEF OF THE CALIFORNIA ATTORNEY GENERAL IN SUPPORT OF
PETITIONERS AND RESPONDENTS**

in this action to be sent to the persons at the electronic addresses listed below.

<p>Judge Timothy B. Taylor Superior Court of San Diego County Department C-72 330 West Broadway San Diego, CA 92101</p> <p><i>(Via U.S. Mail only)</i></p>	<p>Attorneys for Plaintiff & Respondents <u>Sierra Club, et al.</u> Jan Chatten-Brown Josh Chatten-Brown CHATTEN-BROWN, CARSTENS & MINTER LLP 302 Washington Street, #710 San Diego, CA 92103</p> <p>E-mail: jrcb@cbcearthlaw.com jcb@cbcearthlaw.com</p>
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Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

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This page last reviewed February 15, 2018

Offset Project Registries

Background

The Cap-and-Trade Regulation allows ARB to approve Offset Project Registries to help administer parts of the Compliance Offset Program. Offset Project Registries must meet specific regulatory criteria to be approved under the Regulation. Offset Project Registries will help facilitate the listing, reporting, and verification of offset projects developed using the Compliance Offset Protocols, and issue registry offset credits. Registry offset credits **cannot** be used for compliance with the Cap-and-Trade Program. Registry offset credits must be converted to ARB offset credits to be eligible for use in the Cap-and-Trade Program.

List of ARB Approved Offset Project Registries

All offset projects developed under an ARB Compliance Offset Protocol must be listed with an ARB approved Offset Project Registry. Offset Project Registries will help facilitate the listing, reporting, and verification of compliance offset projects, and issue registry offset credits. A list of approved Offset Project Registries can be found below.

- [American Carbon Registry \(ACR\)](#)
- [Climate Action Reserve \(CAR\)](#)
- [Verra](#) (formerly Verified Carbon Standard)

Guidance and Frequently Asked Questions (FAQs) for Offset Project Registries

ARB has developed guidance for Offset Project Registries. This guidance is intended to help Offset Project Registries and other offset program participants understand the role of the Offset Project Registries and how they interact with ARB and Offset Project Operators. In addition, ARB will develop Frequently Asked Questions (FAQs) that will be continuously updated as answers to specific questions are established. FAQs will be developed for general issues around Offset Project Registries.

- ***(Coming Soon!) Guidance for Approved Offset Project Registries***
- ***(Coming Soon!) FAQs on Offset Project Registry Related Issues***

Forms Made Available by Offset Project Registries

ARB has developed forms for use in the Compliance Offset Program. These forms may be used by program participants for submitting information related to listing, reporting, verification, and issuance of ARB offset credits. ARB will make all forms available on the [Compliance Offset Program Forms web page](#). In addition, each approved Offset Project Registry will make all forms available on its own public web page.

Application for Potential Offset Project Registries

Offset Project Registries must be approved by ARB to perform registry services under ARB's Compliance Offset Program. To become approved, potential Offset Project Registries must submit an

application and meet the requirements for education and experience as defined in section 95986 of the Regulation.

- The application below must be completed and submitted to ARB to begin the Offset Project Registry application process. If the applicant satisfies all the requirements of the regulation, they will be notified of the dates and times of approved ARB Compliance Offset Program and Compliance Offset Protocol training classes. Upon successful completion of training classes by Registry Staff the Executive Officer may approve the Offset Project Registry. Submission of this form and checking the appropriate box in Part IV will also suffice for applying to be an Early Action Offset Program.
- [Application for Offset Project Registry Approval](#)

For questions or comments, please contact Stephen Shelby at (916) 327-8228 or via email at sshelby@arb.ca.gov.



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Collaboration: Participating air districts will work together to create and maintain an Exchange bulletin board that lists all available credits registered under respective air districts.

Integrity: The Exchange services will be provided with the utmost integrity so our customers can be confident that the credits they are providing, purchasing, or using are of the highest quality possible.

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Project ID	<input type="text" value="Choose"/>	Project Name	<input type="text" value="Choose"/>
			<input type="button" value="Search"/> <input type="button" value="Clear"/>

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Air District	GHG Credit Available	
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Hydropower in the CDM:

Examining Additionality and Criteria for Sustainability

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Executive Summary

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies. Hydropower makes up 30% of all carbon offsets projects registered under the Kyoto Protocol's Clean Development Mechanism (CDM) – just over 1000 projects as of 1 September 2011, the most of any project type. Hydropower also often has negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. This means that effective criteria to ensure that accepted CDM hydropower projects generate new and additional emissions reductions and do not cause substantial social and environmental harm is critical. Otherwise, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual projects that do not represent real emissions reductions, and risks transferring costs of climate change mitigation from polluters in the North to poor communities in the South.

This paper examines means for filtering CDM projects that have high likelihoods of generating real and new (additional) emissions reductions, and of avoiding substantial adverse social and environmental impacts. We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects, and on the Least Developed Countries (LDCs) which are the only host countries from which the European Union (EU) will accept CDM carbon credits for projects registered post-2012. We also evaluate the EU's assessment of compliance with World Commission on Dams (WCD) guidelines, a requirement for all large hydropower projects that wish to sell carbon credits into the European Emissions Trading Scheme.

ADDITIONALITY

The CDM requires each approved project to be 'additional': that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country.

Most large and small hydropower project proponents use the *Additionality Tool's investment analysis* to prove additionality, generally viewed as having the most potential to be accurate if performed well. The investment analysis is used to show that a project is not financially viable without additional funding available through the sale of carbon credits. The CDM's *Additionality Tool* also requires a common practice assessment as a credibility check; if a technology type is common practice, the proposed CDM project is not eligible for CDM crediting unless it can be shown to be "essentially distinct" from other similar projects in the same region.

Our analysis of factors that influence hydropower development decisions suggest the following conclusions:

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

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Large hydropower should be excluded from the CDM in all countries because it is common practice, unlikely to be additional and additionality testing is inaccurate.

Large hydropower is a conventional technology that is being built in large quantities worldwide without carbon credits and should be considered common practice. China and India, the two countries with most hydropower CDM projects, have aggressive targets for building out their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal.

Furthermore, additionality testing is inherently inaccurate for large hydropower. First, financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. In China, India, the LDCs and other countries, the government plays a dominant role in deciding how much and which hydropower projects are built; additionality testing is not meant to predict the planning processes of governments that take into account many factors other than those directly related to cost. The interest in building large hydropower in China, India and other countries supersedes the relatively small effect CDM carbon credits have on hydropower project financial return. Second, uncertainty in investment analysis inputs – particularly in the viability benchmark, expected capital costs, and cost and production risk – allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developers, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test in those areas. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower projects to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size, location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for project types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. At present, by allowing the boundaries of the assessment to be defined narrowly, and “essentially distinct” to be defined broadly, practically any project can be shown to not be common practice. Projects under construction and projects in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM

project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

SUSTAINABILITY CRITERIA

Hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. The World Commission on Dams (WCD), established in 1998 in response to growing public scrutiny of large dams, developed a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.

To address concerns that hydropower projects can have serious environmental and social impacts the EU requires all credits from CDM hydropower projects larger than 20 Megawatts (MW) sold in the EU Emissions Trading Scheme to meet World Commission on Dams environmental and social standards, but similar standards are not required by the CDM itself.

Shortcomings in the EU’s assessment of WCD compliance

While the EU took a laudable step to operationalize the WCD guidelines, the current rules in many instances do not go far enough. Below we outline the shortcomings we find in the EU’s assessment of WCD compliance.

Inherent conflicts of interest in WCD compliance evaluations. The WCD requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. In our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation. We recommend:

- The Designated National Authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

Weak guidelines for and evaluation of stakeholder involvement. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior

and informed consent'. But the EU guidelines do not require mutual agreement of key issues such as compensation packages with all recognized adversely affected people; they had merely to be planned 'in consultation' with affected people. Furthermore, the proof of 'free, prior and informed consent' from indigenous or tribal peoples is not required. We recommend:

- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

Uneven access to compliance reports. Member States are required to provide publicly accessible information on projects that have been approved. We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. We recommend:

- EU member states should be required to provide online access to compliance reports and other relevant project information.

Only large hydropower projects must comply with WCD guidelines. Categorizing hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. We recommend:

- All hydropower projects, large and small, should be required to meet WCD criteria.

CONCLUSION

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on those communities that most vulnerable to the impacts of climate change. Excluding large and some small hydropower projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate change mitigation goals.

¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

Barbara Haya² and Payal Parekh³

Abstract

This paper examines the effectiveness of additionality and sustainability criteria being applied to hydropower projects applying for carbon crediting under the Kyoto Protocol's Clean Development Mechanism (CDM). We examine the conditions under which hydropower development decisions are commonly made, with a focus on China and India where the majority of CDM hydropower projects are hosted. We find that the CDM is having little effect on large hydropower development, and that the basic conditions needed for an accurate additionality assessment are not met. In particular, non-financial factors such as energy security heavily influence decisions to build large hydropower, and uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they actually are. Further, large hydropower and some small hydropower are being built in large quantities worldwide, are heavily supported by governments, and therefore should be considered common practice and ineligible for CDM crediting. We recommend that large hydropower be excluded from the CDM, and that small hydropower be accepted only in places where it is not already being built. The second part of this paper examines the European Union's (EU's) assessment of compliance of hydropower projects with World Commission on Dams (WCD) guidelines. We identify several shortcomings including auditor conflicts of interest, weak guidance for the assessment of public consultations, lack of documented acceptance of projects by project-affected persons, and insufficient access to compliance reports by the general public. We provide concrete recommendations to strengthen the EU's assessment of WCD compliance.

1 INTRODUCTION

The Kyoto Protocol's Clean Development Mechanism (CDM) allows industrialized countries (Annex 1) to partially meet their Kyoto Protocol commitments by reducing emissions in developing countries (non-Annex 1) and using the resulting emissions reduction credits towards their Kyoto targets. The CDM plays a pivotal role in the international climate change regime helping emitters in industrialized countries lower their costs of compliance and providing funds for renewable energy, energy efficiency and other emissions reducing activities in developing countries. An appeal of the CDM is efficiency – the CDM is designed to create a more global market for emissions reductions, allowing regulated emitters to reduce emissions wherever in the world it is least expensive to do so. However, critics of the CDM have

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challenged the program's efficiency claims, arguing that large numbers of CDM projects are generating credits that do not represent real additional emissions reductions (He & Morse 2010, Lazarus & Chandler 2011, Michaelowa & Purohit 2007, Schneider 2009, Wara & Victor 2008) and do not contribute to sustainable development (Boyd et al. 2009, Schneider 2007).

Hydropower makes up 16% of installed electricity capacity worldwide and is in many cases already cost competitive and/or strongly supported by government policies (Kumar et al. 2011). Hydropower makes up 30% of all registered CDM projects, just over 1000 projects (CDM/UNEP Risoe 1. Sept. 2011), the most of any project type. This means that the criteria applied to proposed CDM projects to ensure that accepted projects generate new and additional emissions reductions must be accurate and effective. If they are not, allowing hydropower to participate in the CDM risks generating large numbers of credits from business-as-usual development of a conventional technology.

In addition, hydropower projects can have negative and sometimes severe impacts on river ecosystems and communities, including displacement of communities, loss of agricultural land, and decline in biodiversity. To address this, the European Union (EU) requires all credits from CDM hydropower projects sold in the EU Emissions Trading Scheme (EU-ETS) to meet World Commission on Dams (WCD) environmental and social standards, but similar standards are not required by the CDM itself.

The analysis in this paper centers around a practical policy question – how to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts? We focus the additionality analysis on China and India with a combined 78% of registered hydropower CDM projects (CDM/UNEP Risoe 1. Sept. 2011), and on the Least Developed Countries (LDCs) which are the only host countries from which the EU will accept CDM carbon credits (Certified Emissions Reductions – CERs) for projects registered post-2012. We focus the assessment of sustainability criteria on the World Commission on Dams guidelines and the EU's assessment of WCD compliance.

Section 2 provides background information on different types of hydropower and a summary of the hydropower projects in the CDM. Section 3 examines the additionality of large and small hydropower projects, and the accuracy of additionality testing in the case of hydropower. Section 4 describes the common social and environmental impacts of hydropower projects of different sizes and types. Section 5 discusses World Commission on Dams (WCD) guidelines created to minimize adverse impacts from dams and the EU's assessment of WCD compliance. Section 6 presents our conclusions and recommendations.

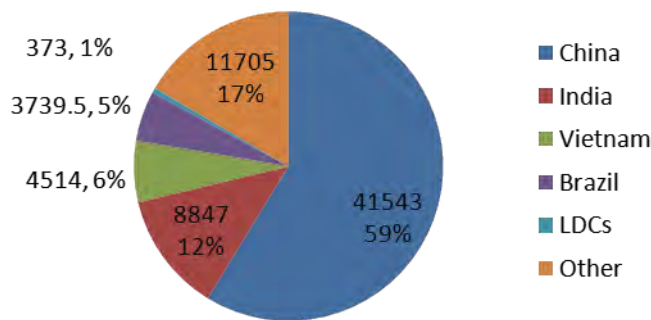
2 ABOUT HYDROPOWER AND CDM HYDROPOWER PROJECTS

There are over 37,000 large dams listed in the World Register of Dams, a database maintained by the International Commission on Large Dams (ICOLD), which defines a large dam as one with a height of at least 15 m from the foundation. No reliable data exist for the number of small dams worldwide (Anisfield 2010). Dams are built primarily for irrigation purposes. Hydropower, domestic and industrial use, and flood control (in descending order of use) are the other main reasons for building dams. During the 1990s, the majority of financial investments in dams were for hydropower projects (WCD 2000).

Currently hydropower is the largest source of non-fossil fuel electricity globally. In 2008 hydropower accounted for 16% of electricity supply worldwide with an installed capacity of 926 Gigawatts (GW), producing 3,551 billion kilowatt hours per year (Kumar et al 2011). Its growth is expected to continue in part due to its low carbon emissions.

China, Brazil and India are the 1st, 2nd and 6th largest hydroelectricity producer countries with installed capacities of 200, 84 and 38 GW, respectively (IJHD 2010). Hydropower constitutes 15.5 and 17.5% of the domestic grid in China and India, while it accounts for 84% of Brazil’s domestic electricity production (IJHD 2010). We highlight these three countries, because they represent over 75% of the hydropower projects in the CDM pipeline (Figure 1).

Figure 1: Total Installed Capacity (MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011).

2.1 SIZE CLASSIFICATIONS

While dams of all purposes are usually classified as large or small based on dam wall height, hydropower dams are usually classified by installed capacity (megawatts - MW). Hydropower dams can vary tremendously in size. In the CDM for example, the smallest project is 0.1 MW (Bhutan) whereas the largest is 1200 MW (Brazil). There is no consensus for setting the size threshold (Egré and Milewski 2002). For example, Sweden classifies a hydropower plant as large if its installed capacity exceeds 1.5 MW (European Small Hydro Association 2010), while in Canada and China the cut-off is 50 MW (Natural Resources Canada 2009, Ministry of Water Resources – China 2002). Defining hydropower by size is somewhat arbitrary, as there are no clear relationships between installed capacity and general properties of hydropower (Kumar et al. 2011) or impacts (Kibler 2011). This is because hydropower is site specific (Kumar et al 2011, McCully 2001) and definitions of categories by government agencies are chosen to match local energy and resource management needs (Kumar et al 2011).

The CDM considers all renewable energy including hydropower projects with an output capacity up to 15 MW (or appropriate equivalent) small (Decision 17/CP.7, paragraph 6(c)). The EU Linking Directive on the other hand, considers hydropower with an installed capacity greater than 20 MW large (Directive 2004/101/EC, article 11a (6)).

2.2 RUN-OF-RIVER VERSUS RESERVOIR HYDROPOWER PLANTS

The two main types of hydropower are run-of-river (RoR) and reservoir (Figure 2 and Figure 3). Depending on the hydrology and topography of the watershed, both types can be large or small (Kumar et al 2011).

A reservoir hydropower plant stores water behind a dam for times when river flow is low, resulting in power generation that is more stable and less variable than RoR plants (Figure 3). Often the reservoir is an artificial lake located in an inundated river valley. In mountainous regions, existing high latitude lakes are sometimes turned into (larger) reservoirs. Reservoir hydropower plants can have major environmental and social impacts due to the flooding of land for the reservoir.

Figure 2: Schematic diagram of a Run-of-River hydropower plant

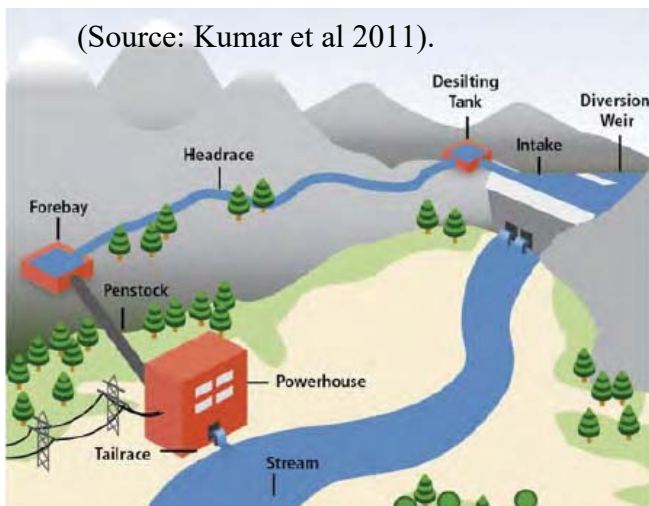
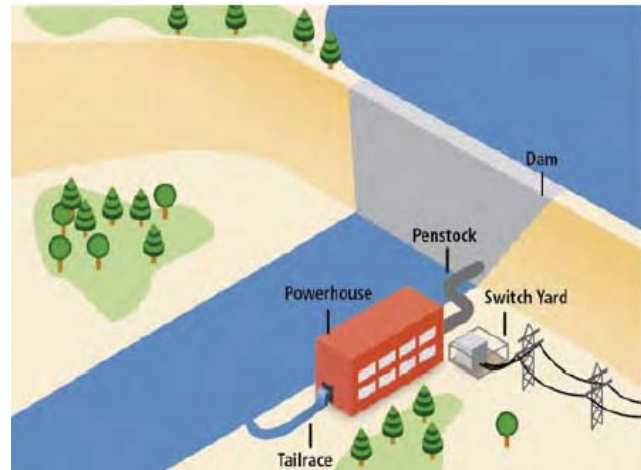


Figure 3: Schematic diagram of a reservoir hydropower plant

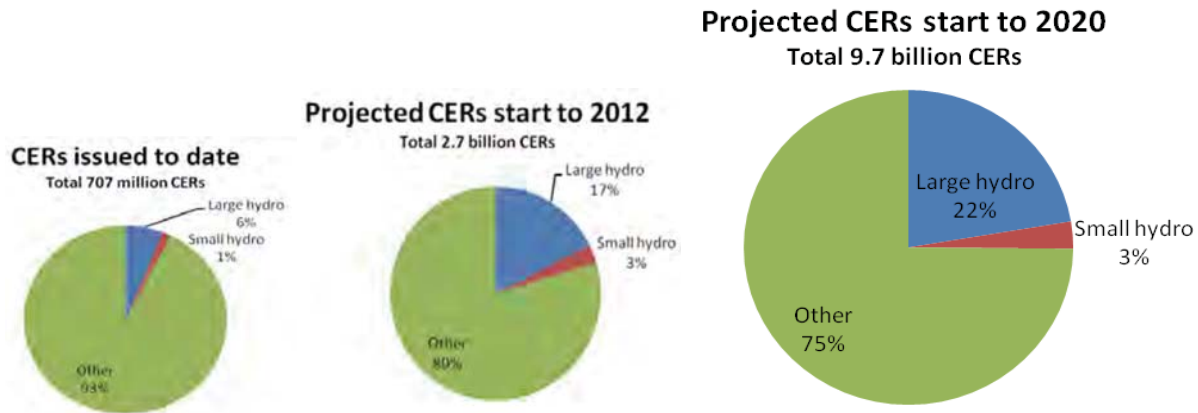


A RoR plant primarily draws energy from the available flow of the river (Kumar et al 2011), taking advantage of the natural elevation drop of a river. Therefore it is suitable for streams or rivers that have a minimum flow all year round or those that are regulated by a larger dam and reservoir upstream (Raghunath 2009). Water is diverted into a penstock or pipe and channeled to the turbine and then returned to the river (Figure 2). The elevation difference between the intake and the powerhouse provides the kinetic energy needed to power the turbine and produce electricity. The longer the diversion, the higher the environmental impacts can be. Power generation tends to be variable at RoR plants, depending on the extent of storage and the natural fluctuations in seasonal flow (Kumar et al 2011). RoR plants have either no storage or short-term storage; such reservoirs are usually smaller than those of reservoir hydro power plants. Yet RoR reservoirs can be quite large and there is no maximum size specified for RoR reservoirs above which they would be considered a reservoir hydro power plant. RoR dams can be ten to twenty meters high and can have gates to allow for water storage (McCully 2001). Impacts of RoR and reservoir hydropower plants are discussed in more detail in Section 4.

2.3 HYDROPOWER IN THE CDM

Hydropower is the most prevalent project type in the CDM pipeline (under validation and registered) comprising 26% of all projects. Hydropower accounts for 7% of CERs issued to date; it is expected to generate 20% of all CERs by 2012 and 25% by 2020 (CDM/UNEP Risoe August 1st 2011, see Figure 4). Hydro projects can register under the CDM either as small scale projects (<15 MW) or as large scale projects (>15 MW).⁴ While there are more small hydro projects (≤ 15 MW) in the CDM pipeline, larger projects account for over 80% of CERs from hydropower generated by 2012 and for over 85 % in 2020 (Figure 4; CDM/UNEP Risoe 1. August 2011).

Figure 4: Percentage of CERs from large and small hydropower in 2011, 2012 and 2020



Although hydropower is the most prevalent project type in the CDM, they are located in a small number of countries. Almost 90% of all hydro projects in the CDM pipeline are located in China, India, Vietnam and Brazil, countries considered emerging economies. Three of the four countries (China, India, and Brazil) are ranked within the top ten hydroelectric producing countries globally (IJHD 2010). China is expected to generate the most credits from small and large hydro (Figure 5, Figure 6, Figure 7, Figure 8). In contrast, less than 1% of registered projects are hosted in Least Developed Countries (LDCs).

⁴ Large hydro projects primarily (99%) use methodology ACM0024, which was developed for grid-connected electricity generation from renewable sources. All small hydro projects use the AMS-I.D.4 methodology, which was developed for grid-connected renewable electricity generation for small projects. Some small scale projects use AMS-I.A.4 or AMS-I.F.4 in conjunction with AMS-I.D, which account for electricity generation by the user; and captive use and mini-grid, respectively.

Figure 5:
Number of Registered Small Hydro (15 MW or less) by Country

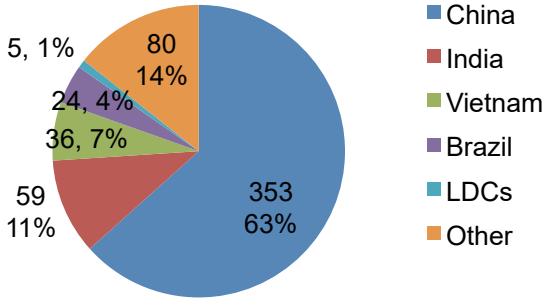


Figure 6:
Number of Registered Large Hydro Projects (> 15 MW) by Country

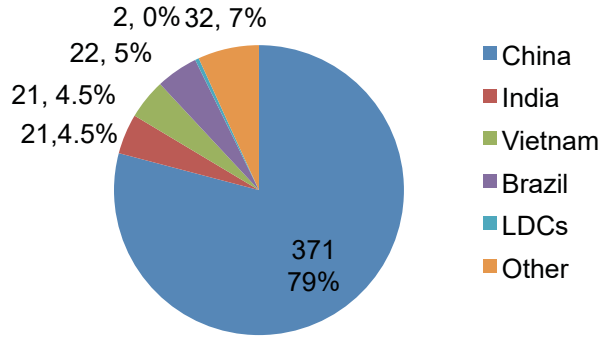


Figure 7:
Small Hydro Projects (15 MW or less) in the CDM Pipeline by Country

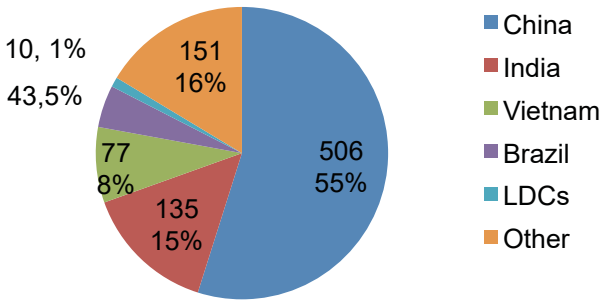
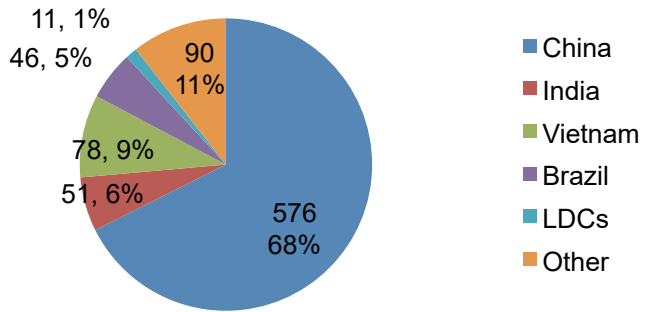


Figure 8:
Large Hydro Projects (> 15 MW) in CDM Pipeline by Country



(Source: CDM/UNEP Risoe 1. Sept. 2011; Rejected and Withdrawn projects are not included).

3 EVALUATING THE ADDITIONALITY OF HYDROPOWER CDM PROJECTS

The CDM requires that a project prove that it is ‘additional’: that it only went forward because of the extra financial support provided by the sale of carbon credits and would not have gone forward otherwise. Assuring that each project is additional is integral to the integrity of the CDM. Each business-as-usual project that is allowed to register under the CDM allows an industrialized country to emit more than their targets without causing the equivalent emissions to be reduced in a developing country. Verifying that an activity is additional is difficult because it involves assessing the considerations of a project developer under a counterfactual scenario in which there was no CDM.

The “Tool for the demonstration and assessment of additionality,”⁵ is the most common method used for proving the additionality of proposed CDM projects. The *Additionality Tool* has three basic steps. The project proponent must:

- identify alternatives to the project activity.
- conduct an investment analysis and/or a barrier analysis to prove the project would not otherwise proceed.
 - The investment analysis demonstrates that a project is not financially attractive without CER revenues.
 - The barrier analysis documents barriers that would prevent the project from going forward without the additional support from CER sales.
- undertake a common practice analysis as a “credibility check” to filter out project activities that are already commonly implemented.

In order to probe whether additionality testing is able to effectively filter out non-additional hydropower projects if performed more rigorously, we examine whether the conditions under which hydropower development decisions are being made are conducive for additionality testing.

Most large and small hydropower project proponents use the investment analysis to prove additionality, either alone or in combination with the barrier analysis. Most attention placed on improving project-by-project additionality testing focuses on improving the accuracy of the investment analysis, viewed as having the most potential to be accurate if performed well.

Two conditions are necessary for the investment analysis to be accurate: (1) Financial return must be a good predictor of whether a project will be built. And (2) an investment analysis must accurately and verifiably reflect the real financial considerations of key project decision-makers. We explore whether these two conditions are true for hydropower, and then examine whether large and small hydropower meet the CDM’s requirement that projects not be common practice.

⁵ The *Tool for the demonstration and assessment of additionality*, and a version of this tool that is combined with a baseline identification methodology - *Combined tool to identify the baseline scenario and demonstrate additionality* - can be found here: <http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

3.1 IS FINANCIAL RETURN A GOOD PREDICTOR OF HYDROPOWER DEVELOPMENT?

In this section, we examine how large hydropower development decisions are being made with a focus on China, India and the LDCs to assess whether financial return is a good predictor of hydropower development and the likely influence of the CDM on hydropower development decisions.

3.1.1 Large hydropower in China

China's *Middle and Long Term Development Plan for Renewable Energy* calls for a doubling of China's hydropower capacity from around 150 GW to 300 GW between 2007 and 2020 (NDRC 2007). This hydropower expansion, in the country that already has the world's largest hydropower capacity, is unprecedented in its scale. Much of this growth is expected to come from the large and largely untapped hydropower capacity in the southwest of the country.⁶ Plans include a series of large back-to-back reservoirs along western rivers such as the Lancang and the Nu as a part of China's Great Western Development campaign. Much of the electricity from these dams will be brought to meet electricity demand in population and industrial centers in China's east (Magee & McDonald 2009).

China is heavily promoting hydropower and renewable energy as a way to decrease its reliance on coal. The high proportion of coal on China's grid (78% in 2009) is of concern because of increasing coal prices, growing reliance on imports and air quality impacts (Kahrl et al 2011). China has identified hydropower as the most important replacement of coal in terms of its percentage of power on the grid (ibid). There is also strong interest in hydropower development at the provincial and local government levels because of its potential to support local economic growth (ibid) and to ensure adequate electricity supply to attract industry.^{7 8}

Government in China plays a large role in determining how much and which hydropower is developed. The central government sets national goals for the sector as a whole, most importantly through its five-year plans. The government controls the amount of hydropower that is built by setting the tariffs for hydropower projects, which are set by China's National Development and Reform Commission (NDRC) on a project-by-project basis (Kahrl et al 2011). Despite steps China has taken towards introducing competition into its power sector through a series of reforms, the tariff-setting process maintains a top-down approach to carrying out policy objectives (ibid). The Chinese government also supports hydropower development by providing access to low-interest loans (Bogner & Schneider 2011).

Further, China's hydropower sector is predominantly state-owned. China's large hydropower development (defined in China as greater than 250 MW) is allocated to "the big five" – the five large state-owned companies that were created when China's monopoly state-

⁶ Shanghai Daily, (January 6, 2011). *China Ready for Flood of Hydropower*. (<http://business.globaltimes.cn/industries/2011-01/609534.html>, accessed 3 November 2011)

⁷ Interview with Kristen McDonald, on 9 October 2011

⁸ In the last five-year plan, China did not meet its goal for hydropower approvals, but this was due to tensions within the government between the Premier and the Ministry of Water on the one hand which rejected projects based on their expected environmental impacts, and the local governments and hydropower developers on the other which wish to build these projects (Magee & McDonald 2009), considerations that would not be influenced by the CDM. Hydropower in the CDM: Examining Additionality and Criteria for Sustainability 8

owned power company was broken up in 2002. Medium hydropower, defined as between 50 and 250 MW, is typically built by companies owned by some combination of subsidiaries of the big five, municipalities, and banks and private investors.⁹ These hydropower developers sell their power to the two state-owned grids, or less frequently to municipalities.¹⁰ Most banks in China are state-owned (Naughton 2007). Sinohydro, China's national hydropower developer, built around 65% of China's hydropower capacity.¹¹ State-owned enterprises in China generally do not lack capital resources or access to debt financing on good terms and receive various other forms of government support.¹²

Within this context, it seems highly unlikely that the CDM can lead to additional hydropower development in China. The government has a strong interest in supporting large scale hydropower development and has the means to effectively carry those goals forward. China's interest in building large hydropower supersedes the relatively small effect CERs have on hydropower project return. The investment analysis with its sole focus on financial return measured against a clear viability benchmark is not predictive of how large and medium hydropower development decisions are being made in China, given the range of consideration being made by government in China at all levels of decision-making.

3.1.2 Large hydropower in India

India is also expanding its power sector very quickly to meet soaring power demand and chronic power shortfalls. It anticipates quadrupling its electricity supply between 2005 and 2030, a tremendous undertaking. It intends to do so through pursuing all fuel options (Planning Commission of the Government of India 2006). India's Eleventh Five Year Plan called for 16.5 GW of hydropower to be built between 2007 and 2012 (Planning Commission of the Government of India 2008). The Central Electricity Authority recommends that 30 GW be pursued during the twelfth five year plan between 2012 and 2017 (Central Electricity Authority 2008).¹³

Hydropower is viewed as an attractive source of power because it is a domestic resource without the energy security concerns of coal and natural gas, a serious concern for India since it expects imports of coal and natural gas to increase in the future (Planning Commission of the Government of India 2006). Hydropower is also considered the best option for providing peak power (Planning Commission of the Government of India 2006).

In India, river development is determined through a government planning process involving a team of public and private actors. This planning process identifies potential large hydropower sites and determines which specific sites will be developed in what order and by which sector – central, state or private (Central Electricity Authority 2008). These plans follow India's five-year planning cycle. The private sector is involved in hydropower development by participating in the planning process, and by responding to bid requests put out by national- and state-owned power companies.

⁹ Interview with Kristen McDonald, on 9 October 2011

¹⁰ *ibid*

¹¹ <http://www.hydrochina.com.cn/English/pages/aboutus/brief.jsp>, accessed 17 October 2011

¹² Interview with Kristen McDonald, on 9 October 2011, and noted in a number of CDM application documents for hydropower projects in China that are built by privately owned hydropower developers.

¹³ With the expectation that 25 GW is feasibly attainable.

Additionality testing is not meant to predict the planning decisions of governments, which consider a wide range of factors in their planning process beyond those directly related to cost. In the case of Indian hydropower, the planning commission takes into account energy security concerns, displacement of people, the need for peak power, and the competing uses of rivers for irrigation and flood control, all concerns that are not easily monetized and integrated into an investment analysis with a reliable benchmark (Central Electricity Authority 2008).

The Indian government has mapped out its hydropower resources by river basin, ranking the attractiveness of potential hydropower sites (Central Electricity Authority 2008). This ranking contributes to the decision of which plants will be built in what order. When hydropower sites are mapped out and ranked for future development, the most influence the CDM might have on planning decisions is to accelerate the pace at which some hydropower facilities are being built, not whether they are built at all, perhaps justifying only a few years of credits for some projects if the acceleration effect is discernible. This would be true for many countries in addition to India and China that have assessed potential hydropower sites with the intention of expanding their hydropower capacity.

The effect of CDM revenues on India's planning process is not clearly apparent. Neither India's 11th Five Year Plan nor its 12th Hydropower Plan mention the CDM or carbon credits as a factor in its decisions to support and develop hydropower and renewable energy (Central Electricity Authority 2008, Planning Commission of the Government of India 2008: Chapter 10-Energy). The few times the CDM is mentioned, it is only mentioned to highlight India's contribution to global climate change mitigation efforts, rather than as a factor helping India develop its hydropower resources (Planning Commission of the Government of India 2006).

The CDM is also unlikely to have much influence on private sector involvement in hydropower development in India. The tariff paid to hydropower developers per kilowatt hour produced is calculated on a cost-plus basis for each hydropower facility and is adjusted periodically to ensure that the developer receives a pre-agreed return on equity based on their true costs and power output. This return on equity investment is typically 14% or 15.5%.¹⁴ This means that most project costs are "passed through," since they are returned to the developer through the tariff. Therefore hydropower developers take little of the risk that there will be cost overruns during construction, or that less power will be produced than expected. As a result, the financial return to a large hydropower developer varies only minimally between projects. When the tariff is determined on a cost-plus basis per project, a financial return analysis has little meaning, and is not an appropriate indicator of whether a project would be built. Since tariffs are set to guarantee each developer a pre-determined return on their equity investment, the investment analysis is not meaningful in distinguishing the feasibility of individual hydropower projects.

3.1.3 Hydropower in general, with a focus on the Least Developed Countries (LDCs)

¹⁴ 14% is the return on equity from the Central Electricity Commission's 2005 tariff order and 15.5% is the return on equity from the 2009 tariff order. The CERC order applies to all central plants, and plants whose electricity is traded between more than one state. Each state writes its own tariff policy for its own plants, typically modeled after the CERC policy.

Of the twelve hydropower projects above 10 MW in the CDM pipeline (both registered and in the validation stage) in LDC countries, all but two document direct government involvement in the project in their CDM application documents (project design documents – PDDs).¹⁵

As our description of hydropower decision-making in China and India show, decisions to build hydropower are complex and political, and involve a range of considerations beyond those directly influencing cost. Large hydropower is often treated in a similar manner to mining; rivers are an exploitable resource that the government can use as political currency, giving the right to build a facility to public and private entities.

Government involvement, including through international, bi-lateral lending agreements and loan guarantees, is also common with hydropower development due to its nature as an infrastructure project, large upfront capital requirements, and high levels of uncertainty and risk associated with its construction costs and electricity output. Lending decisions can be based on political rather than purely financial grounds. For example, Chinese banks provide loans to Chinese hydropower development in Africa often as a part of much larger agreements for trade and investment between itself and the African country (Bosshard 2008).

Almost half of all hydropower plants with dams greater than 15 meters in height worldwide are considered multipurpose.¹⁶ These dams can be used for irrigation, flood control and/or other services in addition to electricity generation. Quantifying the benefits of these other uses, such as by attributing a portion of project capital costs to these other purposes, is far from straightforward. Benefits from other project uses are not commonly quantified in investment analyses for CDM hydropower projects. This means that hydropower CDM projects that serve multiple purposes can appear to be less cost effective than they actually are if benefits from other uses are left out of the investment analysis or are given a low value.

The influence of non-financial factors in hydropower development decisions is evidenced by the fact that large hydropower projects are typically more costly than predicted, sometimes by more than double (World Commission on Dams 2000: chapter 2), yet decisions to build large hydropower projects are repeatedly approved by governments as well as international and bi-lateral finance institutions based on low cost estimates.

Certainly cost affects the decision to build a large hydropower project, but given the relatively small effect of CERs on project return and the range of influences on project development beyond cost factors, the effect of CERs is in the noise and is not predictive of project development.

3.1.4 Small hydropower

Small-scale hydropower facilities, with their smaller electricity output and financial requirements, typically draw less political interest, involve different decision-making processes

¹⁵ Six are built directly by government developers, one was built by private developers responding to requests for proposals from the government, and one project mentions a government loan guarantee. One was a part of a larger economic, cultural and technical science cooperative agreement between the governments of Lao and Vietnam, and another involved an agreement to sell electricity from the project in Myanmar into the Chinese grid.

¹⁶ International Commission on Large Dams (ICOLD), Register of Dams, General Synthesis (http://www.icold-cigb.org/GB/World_register/general_synthesis.asp, accessed 3 November 2011)

and government support, and are more likely to be initiated by private sector actors compared to large hydropower. In some countries, like India and China, small hydropower formally involves different tariff-setting and planning processes. With regard to additionality testing, small-scale hydropower shares some features of large hydropower and some emerging technologies like wind, depending on location and size.

Many of the factors that make large hydropower a political decision are less important with small hydropower, including the importance for meeting electricity demand, potential for corruption, scale of the financial risk, and involvement of international lending institutions.

Both India and China actively support the development of small hydropower, defined as less than 25 MW in India, and less than 50 MW in China. Already in 2009 China had 55 GW of hydropower capacity, the most in the world. China's 2007 Renewable Energy Plan defined a goal of expanding China's small hydropower capacity to 75 GW by 2020. China is promoting small hydropower with a combination of tax benefits and dedicated and low interest loans, technical training and preferential tariffs (Jiandong 2009). Instead of defining the tariff for each project individually as is done with large hydropower, provinces should define preferential tariffs that are paid to private developers that choose to build small hydropower projects. China has a strong interest in supporting small hydropower, considered the best means for extending electrification to 100% of households, a priority goal of the government (Jiandong 2009). About one-third of China's counties rely on small-scale hydropower as their main power generation source (International Energy Agency 2007).

India also has goals to provide full rural electrification (Planning Commission of the Government of India 2006); small hydropower is viewed as an important way to provide electricity access to remote areas.¹⁷ India's 12th five year plan includes a goal of increasing its small hydropower capacity from just under three GW at the beginning of 2011 to around six GW in 2017.¹⁸ The Government of India has instructed the states to set preferential tariffs for small hydropower tariffs (Central Electricity Regulatory Commission 2009) and offers financial incentives including capital subsidies (Ministry of New and Renewable Energy 2009).

In both India and China, the preferential tariffs set at the state and province level mean that any approved hydropower project will receive that tariff, regardless of its costs.¹⁹ In this context, as opposed to cost-plus tariff determinations for large hydropower in both countries, the CDM could improve the financial returns of a project and could potentially spur more development. Still, the challenges with assessing the additionality of small hydropower are not unlike those of large hydropower. By setting goals for small hydropower development, defining promotional tariffs, and creating incentives the Chinese and Indian governments are substantially affecting the amount of small hydropower built. He and Morse (2010) describe how, by setting the tariff for wind, the Chinese government in effect decides what wind projects are additional and not additional. The same argument applies to small hydropower in both India and China. If the government does not see enough small hydropower being built, it can raise the incentives, or

¹⁷ From the Government of India, Ministry of New and Renewable Resources web site, <http://www.mnre.gov.in/>, accessed 19 October 2011

¹⁸ *ibid*

¹⁹ In practice this is not always the case. Tariffs for many of the small hydropower projects registered under the CDM in both China and India are set in the same way as they are for large hydropower.

if it sees that small hydropower is being built quickly, it can lower its incentives and invest those funds elsewhere.

This discussion suggests that the CDM is more appropriate for small hydropower in countries where the government is investing fewer financial resources to incentivize the development of small hydropower and where small hydropower would not be considered common practice (discussed below in Section 3.3). Ensuring small hydropower projects accepted for crediting have high likelihoods of being additional will also depend on the accuracy of the investment analysis for this technology (discussed in the next section).

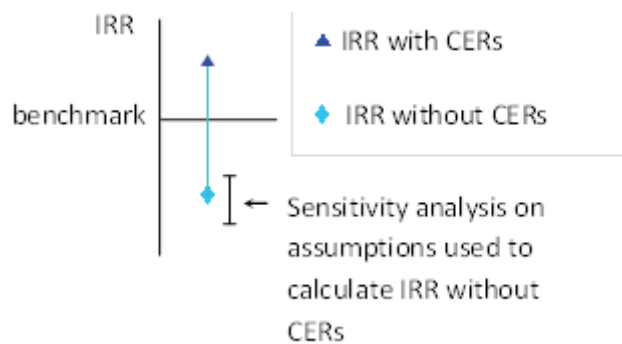
3.2 IS THE INVESTMENT ANALYSIS ACCURATE AND VERIFIABLE FOR HYDROPOWER PROJECTS?

In this section we assess the accuracy and verifiability of the inputs that go into the investment analysis. We first provide a more detailed description of the investment analysis, and then assess the level of uncertainty in two major investment analysis inputs – the benchmark and project capital costs.

3.2.1 The Additionality Tool's investment analysis

The investment analysis is used to show that a project is not financially viable without carbon credits. A benchmark is determined that represents the threshold financial return, or hurdle rate, defining whether the project would likely go forward. For renewable energy and hydropower projects, the benchmark is most commonly defined in terms of project or equity internal rate of return (IRR).²⁰ If the expected financial return of the project is below the benchmark, then it is assumed that the project most likely would not have gone forward without carbon credits and the project is considered additional. The financial assessment is tested with a sensitivity analysis of the most important cost and revenue inputs. It is optional to show that CERs bring the financial return of the project above the benchmark. Figure 1 illustrates the investment analysis for a project that is additional and uses IRR as the metric used to assess project financial return.

Figure 9: The Investment Analysis



3.2.2 Examination of the benchmark

Hydropower developers have used all four options recommended by the CDM Executive Board in their latest guidance on the investment analysis²¹ to determine the viability benchmark in their CDM application document. These four options are: (1) Local commercial

²⁰ Internal rate of return (IRR) is the discount rate that would be applied to the cash flow of a project so that the net present value of the project is zero. A higher IRR indicates better financial return.

²¹ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

lending rates (for project IRR), (2) weighted average cost of capital (WACC)²² (for project IRR), (3) required/expected return on equity (for equity IRR), and (4) benchmarks supplied by relevant national authorities if the validator can validate their applicability (for both project and equity IRR).²³ Chinese hydropower developers almost exclusively use the fourth option, benchmarks supplied by the government. In India, most use the second option – the weighted average cost of capital (WACC).

Calculation of WACC typically involves a combination of two values – the cost of debt, and the expected return on equity investment, which is estimated with a market analysis. Following CDM Executive Board guidance in 2008 (CDM Executive Board 2009), hydropower projects registered in India in the last two years commonly calculate the expected return on equity using the Capital Asset Pricing Model (CAPM). CAPM estimates the equity return required by investors from a project as a risk free rate (e.g. government securities), plus a risk premium that takes into account the higher expected IRR needed to counterbalance the risk associated with the particular project type. CAPM uses the following formula based on historical return on equity:

$$\text{investor expected return} = \text{risk free rate} + (\text{market rate} - \text{risk free rate}) * \text{beta}$$

where government securities are typically used for the risk free rate, the market rate is the rate of return from the stock market generally, and beta captures the correlation between the fluctuation of the value of stocks in the specific industry of the project being analyzed and the stock market generally. For example, the milk industry should have a low beta, since purchases remain relatively steady regardless of the state of the economy, but luxury goods have high betas, since their purchase rates increase and decrease according to the state of the economy. In other words, beta indicates if hydropower investments are more risky or less risky than the stock market in general.

The risk free rate is fairly straightforward – this is the rate of return on investments that have very low risk, such as government bonds. The market rate and beta are both less straightforward, and values have differed considerably among the CDM applications of similar projects in a single country.

The CAPM model, while considered one of the most reliable ways of determining expected return on investment, is very dependent on assumptions used. We provide a simple example to illustrate this. Bhilangana III, a 24 MW hydropower project in India registered under the CDM in 2011, defines their viability benchmark using WACC. The interest rate on their debt is taken as the prime lending rate from the Reserve Bank of India as 9.62% at the time the development decisions was made. The CAPM model is used to estimate the expected investment return.

We examine just one of the inputs into the CAPM model – the market rate, which is the expected return of the stock market. The developers of Bhilangana III calculate the market rate as the average annual percentage increase on stock market values of the top 500 companies on

²² Weighted Average Cost of Capital (WACC) is the cost of capital to the project developers, normally combining two components: the costs of a loan (loan interest rates) and the costs of equity (return on equity required by an equity investor).

²³ Executive Board Report 51, Annex 58, *Guidelines on the Assessment of the Investment Analysis (version 3)*, report from EB meeting ending 4 December 2009, http://cdm.unfccc.int/EB/051/eb51_repan58.pdf

the Bombay stock exchange (BSE 500) between February 1999 and February 2006. The choice of end date is the month that the investment decision was made. They chose the beginning date, February 1999, as the year of inception of BSE 500. The benchmark derived is 13.18%. If instead, February 2000 had been the first year with available BSE 500 data, the market rate would have been 3% lower, generating a benchmark WACC as 10.11%. The IRR of the project without carbon credits is calculated as 10.49%. The IRR of the project would have been above the benchmark and the project would not have been considered non-additional if the market return calculation started in February 2000 instead of February 1999, an arbitrary choice.

Other hydropower projects registered in India around the same time calculate benchmarks that range from 11.0% to 15.8% using the same method, by choosing different CAPM model parameters.

3.2.3 Examination of IRR analysis

We start this discussion with wind power development in India – a best case technology for an accurate IRR analysis – and then draw a comparison with hydropower. Wind power in India is a best case for an accurate IRR analysis because almost all investment analysis inputs are recorded in legal agreements before construction starts. Wind development in India involves a supply agreement between a wind developer and an investor whereby all of the major costs are agreed in formal documents before construction starts. In addition, most states in India publish their wind power tariffs paid to the project owner per kilowatt hour produced that would apply to all new wind development. Even so, for the majority of large wind projects registered in India, the choice of assumption about one cost input that is not pre-determined in the majority of cases – the tariff after the end of the first power purchasing agreement – can affect expected project financial return by around the same amount as expected increase by carbon credits (Haya under preparation). This means that wind power developers have some leeway to choose investment analysis inputs that could show that a feasible wind project is infeasible.

An investment analysis for a hydropower project involves much more uncertainty than for a wind project. For one, from the perspective of the project investor, the costs contained in wind project supply agreement are the actual costs that will be paid to the wind manufacturer. For a hydropower project, the capital costs documented in documents cited in the CDM project applications (Detailed Project Reports, feasibility studies, techno-economic clearance report, loan agreements, etc.) are best estimates. Actual costs can be less or more than what is written in these documents. Cost predictions for a single project often vary between project documents for a single project as cost estimates are revised over time. Hydropower is notorious for large cost overruns, but also in some instances has been less expensive than predicted (World Commission on Dams 2000). In addition, the perceived risk of cost overruns or project underperformance certainly influence project development decisions, but is not recorded in a citable document.

Further, as discussed above, there are many benefits of hydropower that are not easily quantified in an investment analysis, but when not quantified lead to a project appearing less cost effective than it actually is. Such benefits include energy security, the flexibility of being able to be used for base load and for peak load, and other uses for multi-purpose dams.

The investment analysis is accurate to the extent that developers report the same cost and revenue assumptions and benchmark in their CDM applications as they use in their internal decision-making. Uncertainty in investment analysis inputs enables a range of possible values,

from which the project proponent could choose strategically to show the project is less viable than it may actually be. This analysis of ranges of acceptable benchmarks and capital cost estimates shows that in the case of hydropower there is substantial room to choose assumptions.

3.2.4 More evidence that the IRR analysis is not filtering out non-additional projects

The timing of the start of project construction of CDM hydropower projects provide additional evidence that many non-additional hydropower projects are currently registered under the CDM. The *starting date of the project activity* documented in each PDD gives the date when project construction started or otherwise when “real action of a project activity begins/has begun” (CDM Executive Board 2008). Starting dates for 16% of all registered hydropower projects (180 projects) were prior to when the Kyoto Protocol entered into force on February 16, 2005.²⁴ Of these, 60% were registered in 2007 or later. The starting dates of 89% of all registered hydro projects were before the start of the validation process (start of the public comment period) indicating that certainty about a positive validation or registration was not needed for the decision to build the project to be made.²⁵

3.3 WHEN SHOULD HYDROPOWER BE CONSIDERED COMMON PRACTICE?

The *Additionality Tool's* common practice assessment provides a “credibility check” on the investment and barrier analyses. The common practice assessment requires discussion of activities that are in operation and are similar to the proposed CDM project in terms of location, technology and scale. As per the *Additionality Tool*, if similar activities are “widely observed and commonly carried out,” the developer must explain “essential distinctions” between the proposed project and other similar activities in terms of financial attractiveness or the presence of barriers. Projects in the CDM pipeline are excluded from the comparison.

3.3.1 Is hydropower common practice?

Worldwide hydropower is a conventional technology. Around 8,700 hydropower projects with dams at least 15 meters in height²⁶ and an uncounted number of smaller dams produce 16% of global electricity supply (Kumar et al 2011). As discussed above, hydropower is common practice in China and India. In Vietnam, with the third largest number of hydropower CDM projects, 36% of the country’s electricity production is from hydropower.²⁷ In Brazil, the country with the fourth largest number of proposed and registered CDM projects, 84% of the country’s electricity generation is from hydropower.²⁸ Hydropower is a mature technology, which has played an important part in electricity generation since the beginning of electricity generation.

The extent to which small and micro hydropower is common practice is less clear than for large hydropower and would need to be assessed for different size classes for each country,

²⁴ The starting dates for all registered CDM projects and projects in the validation stage are listed in IGES Institute for Global Environmental Strategies (IGES). 2011. IGES CDM Project Database. Japan: 1 September 2011

²⁵ The start of the public comment period is listed in the same database.

²⁶ Listed in the World Register of Dams, a database maintained by International Commission on Large Dams (ICOLD)

²⁷ International Energy Agency website http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=VN, accessed 21 October 2011

²⁸ US Energy Information Administration website <http://www.eia.gov/countries/cab.cfm?fips=BR>, accessed 21 October 2011

and if appropriate for different states or provinces. As mentioned above, small hydropower is defined differently in different countries, and typically attracts less government interest and government involvement than large hydropower. But small hydropower is already common practice in some countries. For example, China's small hydropower should be considered common practice due to the capacity that already exists in the country, and China's plans to continue to build small hydropower as the main way to meet China's rural electrification goals.

3.3.1 How common practice is being assessed

In China, 739 hydropower projects in China passed the common practice assessment and were successfully registered under the CDM. Many of them passed the test by defining "similar" projects narrowly, and then describing how the proposed CDM project faces more hardship in at least one way compared to each of the projects that are still considered similar to it. For example, Longjiang 240 MW Hydropower Project in Yunnan Province (CDM ref #4859) in China's southwest noted eleven medium-sized hydropower projects (50-300 MW) that started construction in the province after 2002 (when structural changes were made to China's electric power sector) and were in operation by 2008 (narrowly defined assessment boundaries). Of these eleven projects, seven projects are excluded from the analysis because they are in the CDM pipeline, registered under a voluntary offsets program, or sold power to a different grid within China. The following essential distinctions are then described between the proposed CDM project and the four remaining "similar" projects: the proposed CDM project expected lower financial return compared to one project, was offered a lower tariff compared to two projects, and expected a higher cost per kilowatt compared to the last similar project. Other reasons commonly used by Chinese hydropower project developers to describe their projects as distinct include that the expected capacity factor is lower than for other projects, and that the project developer is a private sector developer while most hydropower is built by state owned enterprises with preferential treatment from the government. Each of these distinctions may indeed be factually true for a particular comparison between two projects. However, if a project is considered distinct if it less attractive than a similar project in only one way among many, it can always prove that it is distinct. By allowing "similar" to be defined so narrowly, and "essentially distinct" so broadly, practically any project can show it is not common practice, even if it is sitting in a sea of hydropower development.

It is important to mention one more problem with the way common practice assessments are carried out. If additionality testing were perfectly accurate, it would be appropriate to leave out other similar projects that are in the CDM pipeline from the common practice analysis. In China, well over half of all hydropower projects that came on line in 2007 are in the CDM pipeline (Bogner & Schneider 2011). If some of these projects are in fact non-additional, which we are arguing could easily be the case for a large proportion of them, then they would be incorrectly excluded from the common practice analysis and the effectiveness of the common practice test as a credibility check would be compromised.

Our assessment of how the common practice test is being applied to hydropower projects in China indicates that the common practice assessment is not being used in a meaningful way. The boundaries defining what projects are "similar" to the proposed CDM project must be judged conservatively in the conditions of the particular sector and technology. A change in the structure of a sector, such as the breakup of the national Chinese power company in 2002, should not mean that projects built after 2002 are dissimilar from those built before 2002, since

hydropower development was supported before and after the change in the sector. Projects under construction and other projects in the CDM pipeline should be included in the common practice assessment. If a technology is deemed common practice, then projects using that technology should be considered common practice without the ability to show that they are “essentially distinct” which has been shown to be easy to do and therefore not meaningful.

3.4 DISCUSSION

In examining the additionality of large hydropower CDM projects we find three main reasons why large hydropower does not meet the CDM’s additionality requirements:

- Financial return is not a good predictor of whether a project will be built because non-financial factors have a large influence on the decision to develop large hydropower projects.
- Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are. These first two points mean that the investment analysis is inappropriate and inaccurate for large hydropower.
- Large hydropower is a well-established technology that is heavily promoted by governments and therefore does not meet the requirement that CDM projects should not be common practice.

Small hydropower typically benefits from less political backing and is thus more likely to involve private developers for whom financial return is more predictive of the development decision. However, the investment analysis is unreliable for small hydropower for the same reason as for large hydropower – because of uncertainty in input values. In some countries small hydropower is already being built at substantial rates and therefore should not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be identified that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernable for those projects types to continue to be eligible for crediting.

4 SOCIAL AND ENVIRONMENTAL IMPACTS OF HYDROPOWER

4.1 ENVIRONMENTAL IMPACTS

Dams, interbasin transfers and diversion of water for irrigation purposes have resulted in the fragmentation of 60% of the world’s rivers (Revenga et al. 2000). In the following sections we summarize the main environmental impacts of hydropower plants.

4.1.1 Impacts by size and type of hydropower plant

It is difficult to correlate the damage caused by dams to their size or type, as the impacts depend on local conditions. Generally small dams for non-energy purposes are considered to be less environmentally damaging than large dams and hydropower dams, but there have been

fewer studies documenting the impacts of smaller dams (Kibler 2011) and run-of-river dams. Gleick (1992) found that small hydropower facilities in the United States (< 25 MW) tended to exert greater ecological cost per unit of electricity produced compared to larger projects. A comparison of small and large hydropower projects on the Nu River in China also found that small projects more adversely impacted habitats, water quality and hydrology on per megawatt basis, relative to large dams (Kibler 2011).

Also, small hydropower projects are subjected to fewer regulations and less scrutiny in many countries. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011) and therefore are subjected to fewer additional checks (Kibler 2011). Small projects are permitted as individual projects, therefore cumulative impacts of multiple dams within a watershed are not considered. While large projects in India are granted clearance from the central government and required to carry out an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006). Projects between 25 and 50 MW require clearance from the environmental entity of the state that the project is located in, while projects smaller than 25 MW do not require any permits (MOEF 2006).

Run-of-river hydropower plants are generally less damaging than reservoir power plants, because it is not necessary to flood large areas upstream of the project for storage. Yet in some cases run of river impacts can also be severe due to river diversion over long stretches of the river. Also there is no standard defining the maximum storage size allowed for a RoR plant. Thus there have been cases of developers taking advantage of this ambiguity to misclassify their project as RoR so that it appears more environmentally benign (McCully 2001).

4.1.2 Impact of reservoirs

Dams have major impacts on the physical, chemical and geomorphological properties of a river (McCully 2001, WCD 2000). Environmental impacts of dams have largely been negative (WCD 2000). Worldwide, at least 400,000 square kilometers have been flooded by reservoirs (McCully, 2001). Impacts of hydro power projects extend to the construction of the support infrastructure including the construction of roads and power lines (Egré and Milewski 2002). Other secondary impacts include clearing of land upstream by communities that have been displaced (WCD 2000, McCully 2001). Such clearing can lead to further loss of biodiversity and increases in erosion.

Large dams with reservoirs significantly alter the timing, amount and pattern of riverflow. This changes erosion patterns and the quantity and type of sediments transported by the river (WCD 2000, McCully 2001, Kumar et al 2011). Sedimentation rate is primarily related to the ratio of the size of the river to the flux of sediments (McCully 2001, Kumar et al 2011). The trapping of sediments behind the dam is a major problem (WCD 2000, McCully 2001, Kumar et al 2011). Every year it is estimated that 0.5 to 1% of reservoir storage capacity is lost due to sedimentation (Mahmood 1987). Trapping of sediments at the dam also has downstream impacts by reducing the flux of sediments downstream which can lead to the gradual loss of soil fertility in floodplain soils.

Dams can also lead to changes in temperature and chemistry of the water in the reservoir and downstream. These changes often create more favorable conditions for non-native species (Thomas 1998). For example, aquatic weeds such as water hyacinths and orange fern have

become problematic in tropical and African reservoirs (WDC 2000, McCully 2001). A rise in temperature and accumulation of nutrients in the reservoir can cause algal blooms (WCD 2000 McCully, 2001), which in turn can lead to anoxic conditions during decomposition. Increases in certain types of bacteria in reservoirs can lead to the release of mercury from sediments and lead to the bio-accumulation of mercury in fish, a common problem in reservoirs (WCD 2000, McCully 2001).

4.1.3 Impact of river diversion

While both RoR and reservoir types of hydropower dams may divert water, this is always the case with RoR plants, since they seek to increase kinetic energy with an increased head. The length of diversion can range from a few meters or less to kilometers (km). For example, the Teesta V RoR dam in northeastern India diverts water for a 23 km long stretch of the river (Neeraj et al 2010). Eventually the diverted water is returned to the river. There have been fewer studies documenting the impacts of RoR and diversion projects. Nevertheless impacts can be significant. Often downstream flows are reduced considerably or even completely eliminated during certain periods of time with sudden intervals of high flows (Englund and Malmqvist 1996, Kibler 2011). Such drastic variability in water flow impacts the structure of aquatic ecosystems often leading to a loss of biodiversity (Englund and Malmqvist 1996, Kibler 2011). A decrease in fish populations has been observed in dewatered reaches below diversions (Amodovar and Nicola 1999, Kubecka et al 1997, Anderson et al 2006). After long periods of little to no flow some species may not be able to recover and go extinct (Kibler 2011). Also, under normal conditions, increased sediment transport from low to intermediate flows provides a warning to aquatic organisms that high flows may follow. Abrupt changes from low to high flows obliterate this cue, making it difficult for organisms to respond to impending environmental changes (Kibler 2011).

4.1.4 Impact on fisheries

Dams and river diversion can impact freshwater, as well as marine fisheries. Estuarine and marine fisheries are dependent on estuaries and rivers as spawning grounds and the transport of nutrients from the river to the sea. For example, the productivity in Mediterranean coastal waters is lower due to the reduction of nutrients transported to sea because of the construction of the Aswan dam (Aleem 1972, Drinkwater and Frank 1994).

Migratory fish are especially vulnerable to the impacts of dam construction. Dams can prevent migrating fish such as salmon and eel to reach their spawn grounds (WCD 2000). A survey of 125 dams by the WCD reported that blocking the passage of migratory fish species has been identified as a major reason for freshwater species extinction in North America. Lower catch is a common side effect of dams and has been reported worldwide (WCD 2000). There have been cases where fishery production below a dam has increased due to controlled discharge of the sediments. For example at Tucurui Dam in Brazil there have been an increase in the productivity of the fishery, but there are fewer number of species found (WCD 2000).

4.1.5 Impacts of multiple dams

Few studies have analyzed the cumulative impacts of multiple dams on a particular river, but the WCD (2010) has documented some. Placing 24 dams on the Orange-Vaal River in South Africa has led to changes in temperature on almost two-thirds of the river (2,300 km), which

affects the habitat of flora and fauna. Cumulative impacts of multiple small dams is especially important, since multiple small dams are often built on one river and its tributaries to increase power output. An analysis of proposed small (< 15 MW) hydropower projects on the Salmon River in the United States found that the combined effect of the dams proposed on that river could exceed those associated with the sum of the effects of each single project on their own (Irving and Bain 1993). Further studies are needed to increase our understanding of the interplay between multiple small dams.

4.1.6 Greenhouse gas emissions from reservoirs

Freshwater reservoirs can emit substantial amounts of the greenhouse gases methane and carbon dioxide as organic matter submerged in a reservoir decays under anaerobic and aerobic conditions, respectively (St. Louis et al. 2000, Fearnside 2004, Giles 2006).

From the limited number of measurements, GHG emissions from hydropower reservoirs in boreal and temperate region are low relative to the emissions from fossil fuel power plants, but higher relative to lifecycle emissions from wind and solar power (Mäkinen and Khan 2010). Tropical reservoirs with high levels of organic matter and shallow reservoirs have higher emission levels (Soumis et al. 2005). A recent compilation of greenhouse gas emissions from reservoirs found a correlation between the age of the reservoir and latitude (Barros et al. 2011). Younger reservoirs and those in low latitudes are the highest emitters. For example, one study of four Brazilian dams in the Amazon, showed that the GHG emissions factor of the electricity produced by those hydropower dams exceed those from a coal-fired power plant (Fearnside 2004, Kemenes et al. 2007).

To account for these GHG emissions the CDM Executive Board uses a threshold criterion to determine the eligibility of hydroelectric plants for CDM projects. Table 1 below summarizes the thresholds.

Table 1: How GHG emissions from hydropower projects are treated under the CDM

(Source: Mäkinen and Khan 2010).

Power Density (W/m ²)	CDM Rules
< 4	Excluded from using currently approved methodologies
4-10	Allowed to use approved methodologies, but project emissions must be included at 90 g CO ₂ eq/kilowatt hour
> 10	Allowed to use approved methodologies and project emissions can be neglected.

Projects with low power densities (< 4 Wm²) are not explicitly excluded from the CDM, but developers of such projects would need to create a new methodology and gain approval in order to apply for registration under the CDM. We tested the thresholds on a number of tropical hydropower reservoirs and found that they are effective at preventing projects with high greenhouse gas emissions from entering the CDM pipeline and can also account for emissions from hydropower reservoirs with power densities lying in the middle range.

4.2 SOCIAL IMPACTS

Similar to other large infrastructure projects, dams have both negative and positive social impacts. The benefits of hydropower include electricity from a local resource that has negligible

GHG emissions in most cases, delivery of peak power, and the avoidance of the health and environmental impacts associated with fossil fuels, especially coal. Multipurpose dams can also reliably deliver water and flood control as well as other ancillary services. On the other hand, displacement, loss of livelihood, poorer health and loss of cultural heritage²⁹ are some of the worst impacts (WCD 2000, McCully 2001, Kumar et al 2011). Often groups that bear the social and environmental costs of dams are not the ones who reap the benefits. Poor, vulnerable groups such as rural populations, subsistence farmers, indigenous communities and ethnic minorities often bear a disproportionate share of the negative impacts, while the main beneficiaries are urban dwellers, commercial farmers and industries (WCD 2000).³⁰

4.2.1 Displacement

It is estimated that 40-80 million people have been physically displaced by dams worldwide (WCD, 2000). In India and China alone, 26-58 million people have been displaced between 1950-1990 due to dam projects (Fernandes and Paranjpye 1997). These figures do not include displacement from other factors such as construction of canals, powerhouses or project infrastructure. In-depth case studies of eight large dams on four continents by the WCD (2000) found that in each case the expected number of displaced persons was initially underestimated by 2,000 – 40,000 people. Among dams funded by the World Bank, 47% more people were displaced than initially estimated (WCD 2000). The WCD case studies show that downstream communities, landless peasants and indigenous people are often not counted as project-affected and therefore often do not receive compensation. The impacts for down-stream communities are often only clear after the dam comes into operation and often impacts worsen over time. (WCD 2000). Resettlement has mostly been involuntary and there has been little meaningful participation of those affected in the resettlement and rehabilitation process (Cernea 1999, Bartholeme et al. 2000, Scudder 2005). In the most extreme cases, violence has been employed to force eviction.³¹

Compensation usually only occurs once as a cash payment or in the form of an asset such as housing and/or land (Bartolome and Danklmeier 1999, WCD 2000b). Lands provided for resettlement are often resource-depleted and environmentally degraded areas (WCD 2000). The focus of resettlement programs is on physical relocation, rather than economic and social development (Cernea 2000, WCD 2000b). In China, almost half (46%) of those displaced are living in extreme poverty (Driver 2000). In India, 75% of people displaced by dams have not been rehabilitated³² (Cernea 2000). The larger the number of people displaced from a project, the less likely that resettlement will be adequate due to lack of enough suitable land (WCD 2000).

²⁹ The socio-cultural impacts of displacement by large dams on communities has been poorly documented because socio-cultural impacts are intangible, making them difficult to monetize (McCully 2001, Koenig and Diarra 2000, Pandey 1998). Displacement often results in the loss of sacred land and common property resources (Casparly 2007). A study of a village displaced by the Rengali Dam in eastern India found a breakdown in family and community structures (Behura and Nayak 1993). Alienation and marginalization are major risks for displaced communities (Cernea 1999).

³⁰ For example, although indigenous people are 8% of India's population, they comprise 60% of those displaced by dams there (WCD 2000a). Almost all of the large dams in the Philippines that have been built or proposed are on the land of indigenous people (WCD 2000a).

³¹ For example: Over 350 Maya Achi people were killed during the forced eviction at the Chixoy Dam Site in Guatemala (Stewart et al. 1996). Over 1,000 people of the Ngobe tribe have been forcibly removed from their homes due to construction of Changuinola Dam in Panama (UN 2009).

³² Rehabilitation refers to economic, social and psychological adjustment after displacement.

4.2.2 Health impacts

Impacts on human health from large dams include an increase in vector-borne diseases in tropical regions, lower water quality and food insecurity (WCD 2000). The edge of tropical reservoirs and irrigation canals provide ideal conditions for disease-vectors such as insects and snails. McCully (2001) has documented numerous examples of the spread of schistosomiasis³³ after the construction of dams. Increases in transmission of malaria due to the construction of reservoirs and irrigation canals in malaria-prone areas have also been reported (World Bank 1999). Other health impacts include the release of toxins by cyanobacteria³⁴ due to rapid eutrophication in new dams and the bioaccumulation of mercury in fish, which is released from soil by bacteria decomposing organic matter in the reservoir (WCD 2000).

4.3 CONCLUSION

While hydropower dams can produce power with low GHG emissions and can in the case of multi-purpose dams also deliver flood and irrigation control, the adverse social and environmental costs can be substantial, as we have described above. Such negative impacts are not compatible with the promotion of sustainable development, one of the core objectives of the CDM. Evidence indicates that on the whole the CDM has not effectively fulfilled its sustainability objective (Boyd et al. 2009, Schneider 2007). This seems to hold true for hydropower projects as well. There is much anecdotal evidence that some hydro projects have been registered under the CDM despite their significant negative impacts. Table 2 gives a few examples of such projects.

The increase in opposition to large dams in developing countries by projected-affected persons and their supporters has led to the development of frameworks and standards to analyze and minimize project impacts that are dam specific, most notably the World Commission on Dams (WCD) criteria and guidelines. In the next section we discuss how the EU has used the WCD criteria to screen hydro projects that sell CERs into the EU-ETS. We also include a discussion of how the EU's process could be improved to increase the effectiveness of the screening.

³³ Schistosomiasis or bilharzia, is a parasitic disease caused by trematode flatworms. Schistosomiasis causes damage to the bladder, kidneys, liver, spleen and intestines.

³⁴ Humans are affected with a range of symptoms including skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage.

Table 2: A selection of registered hydropower projects with considerable adverse impacts

<p>Allain Duhangan Dam (192 MW), India, Approved May 2007</p> <p>The project has suffered from inadequate rehabilitation of affected villages and environmental violations. The Office of the Compliance Advisor/Ombudsman of the International Finance Corporation (2005) verified that the project developer had not ensured enough irrigation and drinking water for affected villages. The project was also temporarily halted and fined for violations of Indian forest conservation law due to illegal felling of trees, dumping of waste and road construction.³⁵</p> <p>Bhilangana (22 MW), India, Approved January 2007</p> <p>Affected villagers never consented to the project and actively opposed the project.³⁶ Villagers opposed to the project were jailed multiple times and 29 people were arrested in November 2006 were forced to sign a document stating that they would stop resisting the project.³⁷ Significant physical abuse by the police was reported.³⁸</p> <p>Jorethang Loop (96 MW), India, Approved February 2008</p> <p>A survey of the affected villages by an Indian NGO after the public hearing found that many villagers were not informed about the meeting (McCully 2008). Requests by villagers and NGOs of project documents including the environmental impact assessment were ignored by the project developer (McCully 2008).</p> <p>Xiaoxi (135 MW), China, Approved December 2008</p> <p>A field report commissioned by International Rivers³⁹ documented problems include the forced eviction of 7,500 people, a failure to restore pre-eviction incomes, arbitrary and inadequate compensation for resettlers, a lack of legal recourse for those who suffered losses, and a non-independent EIA process marred by conflict of interest.</p> <p>El Chaparral (65 MW), El Salvador, Approved March 2010</p> <p>The public consultation process has been criticized as being neither open nor transparent. Adverse impacts include the displacement of 10,000 families in three municipalities, habitat loss of endangered flora and flooding of archaeological artifacts. The dam has divided and destabilized the community between those in favor and those opposed.⁴⁰</p> <p>Barro Blanco (29 MW), Panama, Approved January 2011</p> <p>Although the dam site is in an area recognized by the Panamanian government as collective property of the Ngobe indigenous people, only members of non-indigenous population were consulted. The project developer has also been accused of human rights abuses. An investigation by the European Investment Bank into human rights abuses at the dam site resulted in the project developer retracting their loan request and only then applied for registration under the CDM.⁴¹</p>
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³⁵ <http://www.internationalrivers.org/en/blog/payal-parekh/cdm-changing-lives-worse>
Hydropower in the CDM: Examining Additionality and Criteria for Sustainability

5 ASSESSING THE EUROPEAN UNION'S SCREENING CRITERIA FOR HYDROPOWER

In order to minimize the negative impacts of hydropower effective screening criteria are needed. Yet assessing and mitigating the social and environmental impacts of hydropower projects is difficult and complex at best. Deciding whether the benefits of constructing a hydropower plant outweigh the costs requires multiple factors to be considered and weighed. Many of the impacts such as loss of traditional ecological knowledge or biodiversity are difficult to monetize and compare against one another (Koenig and Diarra 2000, Pandey et al. 1998). A cost-benefit approach is also problematic in cases when those that bear the social and environmental costs of a dam are not the same as those who benefit. As shown in the previous section, neither size (installed capacity) nor type are effective predictors of environmental and social impacts of hydropower dams. Additionally, empirical data from which to draw robust relationships is sparse (Poff and Hart 2002). Therefore classifying environmental and ecological impacts of dams based objective criteria such as dam size or type is difficult because impacts are influenced by the interactions among natural processes, dam characteristics and management practices (Poff and Hart 2002).

In the following sections we discuss efforts that have been made to develop such screening criteria. We summarize the World Commission on Dams criteria and discuss how they have been implemented in the European Union. In our analysis on the effectiveness of such criteria we also highlight the Gold Standard stakeholder process and discuss how the evaluation and verification processes could be improved to strengthen the effectiveness of such screening criteria.

5.1 WORLD COMMISSION ON DAMS CRITERIA

In 1998 the International Union for the Conservation of Nature (IUCN) and the World Bank established the World Commission on Dams (WCD) in response to growing public scrutiny of large dams. The mandate given to the Commission was to

- *review the development effectiveness of large dams and assess alternatives for water resources and energy development; and*
- *develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.*

Dams and Development (WCD, 2000), the report of the commission includes a comprehensive framework for energy and water planning to ensure that adverse impacts from dam projects are minimized and the benefits and costs are more evenly distributed among

³⁶ SANDRP Comments on Bhilangana PDD, see <http://www.internationalrivers.org/global-warming/carbon-trading-cdm/sandrp-comments-bhilangana-hydro-project-uttaranchal-india>

³⁷ Asian Human Rights Commission, available at <http://www.humanrights.asia/news/urgent-appeals/UP-164-2005>

³⁸ Ibid.

³⁹ <http://www.internationalrivers.org/en/node/3006>

⁴⁰ CESTA Letter to CDM Board on El Chaparral Hydroelectric Project, see <http://www.internationalrivers.org/en/am%C3%A9rica-latina/cesta-letter-cdm-board-el-chaparral-hydroelectric-project-el-salvador>

⁴¹ Letter to the CDM Executive Board, see <http://www.internationalrivers.org/node/6215>

stakeholders. The report is considered the most comprehensive, independent and thorough review of large dams to date.⁴²

The WCD criteria go beyond a simple Environmental Impact Assessment (EIA), as it creates a process meant to address the complex set of considerations involved in dam development decisions. These include the recognition that most dams have negative impacts, and that the distribution of costs and benefits among different sectors of society is often unequal. Seven strategic priorities based on principles of equity, efficiency, participatory decision-making, sustainability and accountability were defined. They are:

1. **Gaining Public Acceptance:** There must be public acceptance of the project by affected people. Indigenous and tribal communities should give free, prior and informed consent.
2. **Comprehensive Options Assessment:** All possible options for water and energy resource management should be considered. Social and environmental aspects should be weighted equally as financial and economic factors.
3. **Addressing Existing Dams and Hydroelectric Projects:** New projects should be considered only after existing projects are at maximal efficiency.
4. **Sustaining Rivers and Livelihoods:** Location of a new dam should be chosen so as to minimize adverse environmental and social impacts.
5. **Recognizing Entitlements and Sharing Benefits:** Projected affected persons must be adequately resettled and rehabilitated and mitigation strategies should be implemented to sustain ecosystems and livelihoods.
6. **Ensuring Compliance:** Compliance by the developer of regulations, guidelines and agreements must be ensured.
7. **Sharing rivers for peace, development and security:** There should be cooperation and agreement for dam construction on transboundary rivers.

The WCD developed a decision-making process with five stages in order to fulfill the priorities. They are 1. Needs assessment; 2. Selection of alternatives; 3. Project preparation; 4. Implementation of project; 5. Operation of project. A further set of 26 guidelines outlines how to assess options, plan and implement dams projects in order to fulfill identified criteria for each stage of decision-making.

This short summary of WCD substance and process criteria make it clear that WCD requirements are extensive and complex. In the next section we discuss how the EU has used these criteria for their requirements for large CDM hydro project that wish to sell their CERs into the EU-ETS.

5.2 THE EUROPEAN UNION'S WCD CRITERIA TO ASSESS CDM HYDRO PROJECTS

⁴² The World Commission on Dams was a multi-stakeholder body that established the most comprehensive guidelines for dam building. The twelve members of the Commission were drawn from industry, government, academia and civil society. The Commission created a 68 member Stakeholder Forum with participants on various sides of the dam debate that served as an advisory group to the Commission. To gather information and data for the assessment, the WCD organized four regional consultations, performed case studies of eight large dams on five continents, commissioned country studies of China and India, undertook 17 thematic reviews of a wide range issues from environmental to institutional issues and conducted a global survey of 125 dams in 56 countries to “cross-check” the findings of individual studies.

The EU-ETS, launched in 2005, covers about 50% of the EU's CO₂ emissions and is currently the largest cap-and-trade system in the world and also the largest buyer of CERs.⁴³ The EU has placed several restrictions on what types of CERs can be used in the EU-ETS. To address concerns that hydropower projects can have serious environmental and social impacts, the EU added additional requirements for projects larger than 20 MW:

[...] Member States shall, when approving such project activities, ensure that relevant international criteria and guidelines, including those contained in the World Commission on Dams November 2000 Report "Dams and Development A New Framework for Decision-Making", will be respected during the development of such project activities. (Article 11b(6) of the Linking Directive)

The issue of how and if to restrict the use of credits from CDM hydro projects was contentious and the opinions between Member States varied considerably.⁴⁴ The final document was approved in 2004 and requires WCD criteria to be met for hydropower plants that are larger than 20 MW.

The language of Article 11b(6) of the linking directive is vague. For example, the text states that Member States are obliged to comply with 'relevant' international criteria and guidelines, 'including' those contained in the WCD. Up until 2008 there was no harmonized approach in the EU and the requirements for large hydro projects were interpreted differently by each Member State and implemented with varying degrees of rigor. This raised doubts about the environmental and social integrity of CERs entering the ETS and led to uncertainty and fragmentation in the European CER market. Many carbon exchanges excluded CERs from large hydro for fear that individual EU member states may refuse to accept them. In other words, "there was a danger that mutual recognition by Member States of national project approval decisions might break down" (Scott, 2011).

While the WCD evaluation and criteria are very comprehensive (the report is several hundred pages long), they do not include an evaluation process that could be used to assess WCD compliance ex-post. In 2008, the EU launched an effort to do exactly that: operationalize and harmonize the WCD criteria for the evaluation of large CDM hydropower projects. The European Commission launched an ad-hoc process of 'voluntary coordination' of Member State regulation of large hydro projects. In late 2008, all 27 Member states adopted uniform guidelines on the application of the linking directive's hydropower requirements (EU, 2008a), and a common compliance report template (EU, 2008b). All EU Member States agreed to use these harmonized criteria as of 1 July 2009:

⁴³ The EU-ETS is linked to the CDM via its 'linking directive' (Directive 2004/101/EC). This makes it possible for installations covered under the EU-ETS to use a certain proportion of CERs to meet their emission reduction obligations. In the 2nd and 3rd trading periods (2008-2020), up to half of the EU-ETS emission reductions can be met by using CERs and credits from Joint Implementation (JI). About 277 million CERs have been surrendered in the EU-ETS to date. 2% of those credits have come from large hydro projects (Sandbag, personal communication). Total demand for CERs in the EU-ETS until 2020 is estimated to be around 2.7 billion. In the sectors not covered under the ETS, such as agriculture and transportation, it is the EU member states that can choose to purchase CERs to achieve compliance with European emission reduction obligations.

⁴⁴ Germany, the Netherlands, Sweden and Belgium pushed for the inclusion of WCD requirements whereas Spain, France, Portugal, Italy, Greece, Austria, Finland and Estonia were opposed. There was also controversy about the threshold (10 MW or 20 MW) and a particularly fierce debate was held over whether compliance with WCD standards should be mandatory or whether Member States should simply be required to take them into account. For a more detailed history on the negotiations around the linking directive, see Hægstad Flåm, 2007.

Once a project activity has received a Letter of Approval (LoA) from an investor country upon the submission and positive assessment of a validated Article 11b(6) Compliance Report, all Member States agree to accept CERs/ERUs from this project for use in their national registries under the EU ETS. (EU WCD guidelines, 2008)

This means that in addition to the CDM application materials required by the UNFCCC, project developers are required to submit an Article 11b(6) Compliance Report to the Designated National Authority (DNA) of the Member State. The Compliance Report must be validated by a Designated Operational Entity (DOE).

The *Guidelines on a common understanding of Article 11b (6) of Directive 2003/87/EC as amended by Directive 2004/101/EC*, as the guidelines are officially called, include nine pages of guidelines including background information on the linking directive and the WCD spells out the procedural and content requirements needed for compliance.

The template of the compliance report, called *Compliance Report Assessing Application Of Article 11 B (6) Of Emissions Trading Directive To Hydroelectric Project Activities Exceeding 20 MW* is 17 pages long and includes specific questions on the seven strategic priorities of the WCD to evaluate compliance, these include:

Section 1: Description of the project, includes questions on dam height, total submerged area, number of displaced inhabitants and information on related infrastructure being build (e.g. access roads).

Section 2: Assessment of compliance with the WCD criteria:

- 1. Gaining public acceptance**, includes questions on the number of people affected by the project, how stakeholders were identified, informed and involved in the in the decision-making process, and how compensation and benefit agreements correspond with the identified needs and rights of the stakeholders negatively affected upstream and downstream due to the project. It also includes a question on how transparency was ensured.
- 2. Comprehensive options assessment**, includes questions about the needs for hydropower, potential alternatives and reasons for project choice and site selection.
- 3. Addressing existing dams/hydroelectric projects**, includes questions on national monitoring requirements for social and environmental issues and questions about how social and environmental issues of existing dams have been resolved.
- 4. Sustaining rivers and livelihoods**, includes questions about impact assessment (environmental and social) and cumulative impacts.
- 5. Recognizing entitlements and sharing benefits**, includes questions about mitigation, resettlement and development plans and compensation packages.
- 6. Ensuring compliance**, includes questions about complying with relevant laws, regulations, agreements (including resettlement and compensation agreements) and about the legal nature of the compensation agreements.
- 7. Sharing rivers for peace, development and security**, includes questions about trans-boundary impacts

The EU took a laudable and important step in developing these two documents to operationalize the WCD guidelines. It is a difficult and complex task to come up with guidance and requirements that capture the criteria in a meaningful and yet implementable way. Although

the harmonization effort has led to a more uniform application of the WCD guidelines, it did not succeed in fully capturing the criteria set out in the WCD. The shortcomings of the implementation documents can probably at least partially be explained by the process that was used to develop the current guidelines and template. The process that led to the adoption of the EU's WCD guidelines and compliance report template was informal and notably lacked transparency and public consultation.⁴⁵ For example, neither the European Parliament nor direct representatives of dam-affected peoples were involved (Scott 2011).

In order to avoid or minimize harm of such complex projects as hydropower, the WCD requires that planning and implementation processes be based on effective and fair stakeholder involvement, participatory decision-making and accountability. The EU evaluation is a one-time, ex-post check to make sure that the process was carried out in a satisfactory manner. Ensuring WCD requirements have been met ex-post is difficult given the complexity of the processes, and the subjectivity involved with assessing whether the WCD strategic principles were met in a meaningful way. In the following section we suggest concrete improvements in EU's assessment of WCD compliance.

5.3 DISCUSSION OF THE EU WCD EVALUATION REQUIREMENTS

5.3.1 Independent evaluation of WCD criteria is needed

The WCD report requires that projects be appraised by auditors that are institutionally and financially independent from the project developers. The EU guidelines require that the project developer hire and pay a Designated Operational Entity (DOE) to conduct the assessment (Scott 2011, Herz and Schneider 2008). This process is also used under the UNFCCC for the validation and verification of CDM projects. An inherent conflict of interest exists when those performing or verifying project assessments are hired directly by those with vested interests in the projects going forward. The lack of independence of these auditors has been criticized as one of the fundamental flaws of the CDM process (see for example, Schneider 2009 and Schneider and Mohr 2010). In informal conversations with the authors, project developers freely admitted that it is quite simple to get a WCD validation from a DOE. Also in our interviews and e-mail exchanges with European DNAs, we did not find a single instance where a project was rejected by a DNA because of an insufficient WCD evaluation.

The independence of the verifier is especially important if the assessment being made involves subjective judgments, as does the WCD evaluation. For example, while the WCD requires stakeholder participation at all stages of project development, evaluating the quality of that involvement can be quite subjective. The public consultation requirement can be deemed fulfilled even if community members were not properly informed of the impacts of the projects or given the opportunity to meaningfully express their opinions, or if opinions received are ignored when project design decision are made.

⁴⁵ There were no formal rules of procedure and no minutes of the various meetings were kept. The main actors included the European Commission and representatives from the Member States. A number of stakeholders were invited to participate, yet aside from 2 NGOs (International Rivers and WWF) these stakeholders were limited to carbon market participants, (project developers and consultants).

Recommendations on improving independent verification

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future verifier hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Verifier performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.

5.3.2 Improving stakeholder involvement and evaluation of stakeholder involvement

Public consultations are difficult to conduct effectively even when those conducting them have the best of intentions of creating a participatory and informed decision-making process. Consultations are especially difficult to conduct effectively when there are power imbalances among members of the affected communities. Those who are more powerful often can more forcefully or effectively express their opinions (Mosse 1995, Rosenberg 2001) and the consultation leader must work to ensure a range of voices are heard.

Sound and thorough stakeholder involvement is especially important for hydro projects with their potential to cause serious harm to local ecosystems and communities. The WCD emphasizes that throughout project planning and implementation project-affected people must have the opportunity to actively participate in the decision-making process. Where projects affect indigenous and tribal peoples, decision-making processes must be ‘guided by their free, prior and informed consent’ (WCD 2000). The EU compliance report template asks project developers to report on a variety of issues involving the participation of stakeholders in the decision-making process, but it falls short of requiring that project developers demonstrate the acceptance of key decisions by them. The template for example asks: *Were compensation and benefit agreements planned in consultation with affected groups?* And: *Were the affected people satisfied with the compensation packages?* But the template does not require that compensation packages had to be mutually agreed with all recognized adversely affected people, but had merely to be planned ‘in consultation’ with affected people. Furthermore, the report template does not require proof of ‘free, prior and informed consent’ from indigenous or tribal peoples.

The stakeholder process under the UNFCCC has long been criticized for being inadequate. To address and potentially improve guidance and requirements for stakeholder involvement, the CDM Executive Board recently launched a public call for inputs on how stakeholder consultations could be improved. Nevertheless the CDM Executive Board has continued registering projects that were implicated in creating significant harm; for example the Board recently registered a project that has been linked with serious human rights abuses (Bajo Aguan #3197⁴⁶) and several other projects that have been criticized for inadequate stakeholder

⁴⁶ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1260202521.42/view> Also see: <http://www.fian.org/news/press-releases/united-nations-under-pressure-to-denounce-human-rights-abuses-in-carbon-offsetting-scheme>

consultations in the face of stiff local opposition to the project (for example Barro Blanco #3237,⁴⁷ and Rampur hydro-electric project #4568⁴⁸).

It seems that the EU should be legally required to guarantee transparency and public participation: The EU has ratified the UN/ECE Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). The Aarhus Convention is a multilateral environmental agreement that grants the public rights regarding access to information, public participation in decision making and access to justice.⁴⁹ Yet the EU's harmonized procedures for approval of hydro projects do not specify clear mechanisms for the public to participate in credit application decisions, as required by the Aarhus Convention.

Recommendations on improving stakeholder involvement

More detailed requirements on how to conduct and verify stakeholder consultations and how to resolve contentious issues are especially important because WCD compliance assessments involve subjective judgments. The guidelines for carrying out and auditing stakeholder consultations prepared by the Gold Standard⁵⁰ (GS) could serve as a template for examining whether stakeholder involvement has been adequate. The GS guidelines require two stakeholder consultations. The first meeting is similar to what the UNFCCC requires, but much more guidance for organizing the meeting and content to be covered during the meeting is provided by GS. The second meeting is an opportunity for stakeholders to give feedback on how their comments were incorporated. The developer is required to submit a report detailing the outcome of the stakeholder consultations. The Gold Standard furthermore requires a "No Harm" assessment, guided by the UNDP Millennium Development Goals. Human rights, labor standards, environmental protection, and anti-corruption are assessed. The project developer is required to assess the risk of breaching 11 safeguarding principles and identify mitigation measures. For example, respect of rights of indigenous people and no involuntary settlement are principles listed under for the human rights category.

- Verifiers should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.

⁴⁷ <http://cdm.unfccc.int/Projects/DB/AENOR1261468057.59/view> Also see unsolicited letter by CDM Watch to the CDM Executive Board: http://www.cdm-watch.org/wordpress/wp-content/uploads/2011/02/Unsolicited-letter_Barro-Blanco-PA-3237_March-2011.pdf.

⁴⁸ <http://cdm.unfccc.int/Projects/DB/BVQI1299859361.8/view> For more information see: <http://www.internationalrivers.org/node/1428>

⁴⁹ Article 1 of the Convention states:

In order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being, each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention.

Access to information: any citizen should have the right to get a wide and easy access to environmental information. Public authorities must provide all the information required and collect and disseminate them and in a timely and transparent manner.

Public participation in decision making: the public must be informed over all the relevant projects and it has to have the chance to participate during the decision-making and legislative process.

Access to justice: the public has the right to judicial or administrative recourse procedures in case a Party violates or fails to adhere to environmental law and the convention's principles. (Rodenhoff 2003).

- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.

5.3.3 Improving access to compliance reports

According to the guidance document, ‘Members States are to provide publicly accessible information on projects that have been approved as fulfilling the requirements of Article 11(b)(6) as well as indicating the entities accepted to carry out a validation of the Compliance Report in each Member State.’

We found that Member States interpret this requirement quite differently. While some, such as Germany, make all the WCD compliance reports available on their website,⁵¹ others such as Sweden, France, the UK, Spain and the Netherlands do not. Sweden for example stated “The principle of public access does not mean that all documents are available online, but made available on request.” (e-mail communication with Swedish Energy Agency).

Recommendations on access to compliance reports

The lack of web-access to the compliance reports makes it difficult for stakeholders in host countries to get information needed to evaluate if a project has been sufficiently assessed. This could easily be remedied by requiring DNAs to make all the compliance reports available online.

- The transparency rules should be further harmonized: Member states should be required to provide online access to compliance reports and other relevant project information.

5.3.4 Requiring all hydropower projects comply with WCD criteria

Currently only hydropower projects over 20 MW are required by the EU to meet WCD standards. As discussed earlier, the distinction based on size of installed capacity is not adequate to filter out projects that cause substantial environmental and social harm. Furthermore smaller projects are subjected to fewer regulations and scrutiny in India and China, which represent over 70% of all small hydropower projects in the CDM pipeline (CDM/UNEP Risoe 1. Sept. 2011) and is likely to be the case for other countries as well. In China, small hydropower plants (< 50 MW) can be approved at the prefectural or provincial level, rather than the national level (Kibler 2011), resulting in fewer checks. While large projects in India are granted clearance from the Central Government and required an Environmental and Social Impact Assessment, small projects are not required to conduct such an assessment except under special conditions (MOEF 2006).

Recommendation on extending criteria

- Small hydropower projects providing credits to the EU should also comply with WCD requirements and procedures.

⁵¹ <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

6 CONCLUSIONS

This paper evaluated the additionality of hydropower projects in the CDM and sustainability criteria applied to these projects. Hydropower makes up 30% of all registered CDM projects and is expected to deliver close to a quarter of all CERs by 2020 (UNEP Risoe CDM/JI Pipeline Analysis and Database, 1 September 2011). Our analysis shows that the CDM's *Additionality Tool* is not effective at filtering out non-additional hydropower projects. We also find weaknesses in the EU's assessment of compliance with WCD guidelines. In the following conclusions we summarize the policy changes we recommend in order to ensure that CDM credits from hydropower projects have a high likelihood of being additional and of avoiding substantial adverse social and environmental impacts.

Large hydropower should be excluded from the CDM in all countries because it is unlikely to be additional and additionality testing is ineffective. Hydropower is already a conventional technology that is being built in large quantities worldwide without carbon credits. India and China, the two countries with most hydropower CDM projects, have aggressive targets for utilizing their hydropower resources in attempts to meet soaring power demand and to address energy security concerns related to growing dependence in both countries on imported coal. The interest in building large hydropower in both countries supersedes the relatively small effect CERs have on hydropower project financial return.

Furthermore additionality testing through the assessment of financial return is not a good predictor of whether a large hydropower project will be built because non-financial factors have a large influence on decisions to develop these projects. Uncertainty in investment analysis inputs allows project developers to choose input values strategically in order to show that their projects are less financially viable than they really are.

Small hydropower projects should only be allowed under the CDM where they are not already being built or are being built at much slower rates than they would with carbon credits, and in countries in which the governments are less able to financially support the technology. Small hydropower typically benefits from less political backing than large hydropower and so is more likely to involve private developer, making financial return more predictive of the development decision. However, the investment analysis is unreliable for small hydropower projects for the same reason it is unreliable for large hydropower – because of uncertainty in input values. Small hydropower is already being built in some countries at substantial rates and therefore would not pass the common practice test. In countries where there already is development of small hydropower projects, such as in China and India with supportive subsidies and tariffs, allowing small hydropower project to register under the CDM means potentially allowing a substantial portion of non-additional projects to register. Instead, types of small hydropower, defined by their size and location, and perhaps other objective characteristics, should be used to identify projects that are not currently being built, but which could be effectively enabled by the help of carbon credits. The effects of the CDM should be evaluated over time and should be clearly discernible for those projects types to continue to be eligible for crediting.

The common practice assessment should be strengthened. Our assessment of how the common practice test is being applied to hydropower projects shows that the definition of what constitutes common practice needs to be more stringent. Projects under construction and projects

in the CDM pipeline should be included in the common practice assessment for technologies such as hydropower that are already being built without the CDM. If a technology is deemed to be common practice through the common practice assessment, a proposed CDM project of that technology type should also be considered common practice; the ability to argue that a project is “essentially distinct” from other similar projects can easily be abused and should therefore be removed as an option under the common practice test.

Large and small CDM hydropower projects seeking to sell their CERs in the European Union should fulfill World Commission on Dams (WCD) sustainability criteria. Since hydropower projects of all sizes and types can have substantial, and sometimes severe, negative social and environmental impacts, all hydropower projects should be evaluated for their social and environmental impacts. Further, small hydropower is usually subject to fewer regulations and scrutiny than large hydropower. It would therefore be prudent that the EU’s WCD criteria be expanded to include hydropower projects below 20 MW.

The EU’s assessment of WCD compliance should be further strengthened. The EU’s efforts to operationalize the WCD guidelines are commendable but current rules and procedures do not fully capture the criteria set out in the WCD. Shortcomings include auditor conflicts of interest, weak guidance for the assessment of public consultations, and insufficient access to compliance reports by the general public. The current EU WCD requirements could be strengthened as follows:

- The designated national authority (DNA) of the buyer country, or another government agency, rather than the project developer, should choose WCD auditors. Project developers should be charged a fee that covers the costs of those audits and the oversight tasks of the government agency.
- The quality of WCD verification reports should be reviewed carefully. Future auditor hiring decisions should be based on whether previous assessments were performed rigorously and conservatively.
- Auditor performance should be evaluated periodically during a process of re-accreditation.
- The accreditation and re-accreditation processes should involve conflict of interest assessments.
- Auditors should receive additional guidelines and requirements on how to assess stakeholder involvement. These could be modeled and expanded based on Gold Standard processes and requirements.
- The EU should require formal agreements regarding compensation and rehabilitation plans and the distribution of benefits from the dam between the project developer and project-affected persons in order to demonstrate acceptance of key decisions.
- The EU should require the proof of free, prior and informed consent of indigenous people.
- EU member states should be required to provide online access to compliance reports and other relevant project information.
- All hydropower projects, large and small, should be required to meet WCD criteria.

Over 1000 hydropower projects are already registered under the CDM and another 700 are applying for registration. The consequences of registering non-additional projects and those with substantial adverse environmental and social impacts undermine climate mitigation goals by actually increasing emissions and placing the costs of climate change mitigation on communities most vulnerable to the impacts of climate change. Excluding large and some small hydropower

projects from the CDM and strengthening WCD compliance evaluations are important steps the European Union could take to strengthen the integrity of its climate mitigation goals.

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Agrarian livelihoods under siege: Carbon forestry, tenure constraints and the rise of capitalist forest enclosures in Ghana

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ABSTRACT

Drawing on theoretical insights from agrarian political economy, and based on empirical research in the High Forest Zone of Ghana using in-depth interviews and participant observation, this paper examined the context-specific but often less highlighted impacts of REDD+-based carbon forest development activities on local agrarian livelihoods. We find that although REDD+ intends to align local communities to benefit financially for contributions to carbon forestry, its uptake in the Ghanaian context has created entry points for the displacement of smallholder farmers through unregulated profit-driven and restrictive plantation-style carbon forest activities. This yields landless smallholder farmers whose labour is craftily integrated into a capitalist carbon forestry regime as tree planters, with many others striving to reproduce themselves through exploitative sharecropping arrangements and corrupt 'backdoor' land deals. We emphasize that, 'more than carbon' accumulation engendered by REDD+ is fast moving beyond land grabs to a more complex dimension in which the labour and financial resources of marginalized groups are further appropriated by forest investors, and their relatively powerful counterparts in what we term *intimate exploitation*. Given the ongoing plight of smallholder farmers, particularly the multitude of 'hungry' migrant farmers who seek 'salvation' in the High Forest Zone, it is obvious that REDD+ is pushed at the expense of ensuring food security. To sustainably address current land-related agricultural production bottlenecks and empower local communities to directly benefit from REDD+, we recommend that rather than centralizing both carbon rights and land rights in the hands of the state and a few private investors, community forestlands should be returned to local people under community-led forest management approaches. Local control of both land and carbon stocks will promote sustainable coexistence of smallholder agriculture and carbon forestry.

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1. Introduction

The Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks (REDD+) initiative emerged to strategically align local communities in developing countries to benefit³ financially for contributions to climate change mitigation through community reforestation and enhancement of carbon stocks (Hiraldo & Tanner, 2011; Leach & Scoones, 2013; Lemaitre, 2011; Lyons & Westoby, 2014; Sunderlin

et al., 2014). Based on claims of robust economic returns and the promise of a 'new salvation' for biodiversity conservation and climate change mitigation, private sector investment in carbon forestry⁴ under the REDD+ has grown in importance across sub-Saharan Africa (SSA) over the last decade (Asiyanbi, Arhin, & Isyaku, 2017; Leach & Scoones, 2013). Designed purposely to support developing countries' REDD+ efforts, the Forest Investment Programme (FIP) is one of the three funding windows of the Climate Investment Fund (CIF). It provides scaled-up financing in the form of grants and low interest loans to developing countries through partner multilateral development banks (MDBs) to implement reforms outlined in national REDD+ plans (World Bank, 2015).

Ghana was selected as a pilot country for the FIP in 2010 with a grant of USD 50 million to support national REDD+ activities. Through coordination between government and the private sector,

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³ Benefits broadly denote the direct or indirect incentives and payments that derive from actions associated with reducing emissions from deforestation and forest degradation.

⁴ The process of 'conserving and enhancing forest carbon stocks, and trading these values in emerging carbon markets' (Leach & Scoones, 2013)

Ghana's REDD+ strategy focuses on rehabilitating degraded natural forests, supporting off-reserve forest plantation development and promoting climate-smart agriculture especially in cocoa growing areas in the High Forest Zone. Through the Dedicated Grant Mechanism (DGM) of the FIP, a National Executing Agency provides demand-driven grants to organizations for carbon forestry activities (World Bank, 2015). The strategy aims to stimulate private sector investment in carbon forest plantation development in both on-reserve and off-reserve areas in the High Forest Zone (Ministry of Lands and Natural Resources, 2014). Critical to the implementation of REDD+ in the Ghanaian context, however, are the crucial questions of how to adequately reconcile the interests of project financiers with those of forest communities and ultimately, how local communities can be aligned to benefit from carbon forestry.

Despite the promise that stimulating private sector investment in forest plantation development and carbon financing will yield sustainable benefits to local farming communities and enhance carbon stocks, the outcome of close to a decade implementation of REDD+ in Ghana is arguably the reverse (see Asiyambi et al., 2017; Saeed, McDermott, & Boyd, 2018). In this paper, we analyse the political economy of REDD+ in Ghana by examining how private sector entry into the carbon forest development trajectory has influenced local farming livelihoods. Drawing on the experiences of smallholder farmers in the High Forest Zone where forest community lands are massively targeted for carbon forest plantation development, we interrogate how corporate penetration in the carbon forestry sector has engendered 'new' agricultural land access and labour relations that are detrimental to smallholder agriculture. This analysis contributes to the broader debate on the rise of transnational corporations (TNCs) in global resource management and agriculture, and the resultant 'depeasantization' of rural populations (Makki, 2012; Weis, 2007). From our choice of methodology, we contribute to the literature by 'telling the smallholder story, the smallholder way'.

Against the universalized claim that REDD+ will improve land tenure security in local farming communities in developing countries (Corbera, Martin, Springate-Baginski, & Villaseñor, 2017; Harvey, Dickson, & Kormos, 2010), the materialization of these benefits is heavily dependent on an array of contextual factors including the underlying power relations that structure access and control over forest resources among diverse actors, local land tenure dynamics, and the effectiveness of REDD+ implementation and regulatory frameworks (Asiyambi, 2016; Sanders, da Silva Hyldmo, Ford, Larson, & Keenan, 2017). Indeed, Peskett, Schreckenberg and Brown (2011) argue that using carbon financing for REDD+ in developing countries introduces new actors, interest and rules in the forest sector, with the potential to alter existing forest management practices in ways that have potential adverse implications on the livelihoods of weaker groups. With the increased involvement of the private sector in carbon forest plantation development in local communities in the Ghanaian context, coupled with the fact that these activities are profit-driven and rely mainly on external donor support, it is possible that existing agricultural land access arrangements and labour relations could be reconfigured in ways that adversely affect agrarian livelihoods. In the context of competing land uses from urbanization, mining and grazing in the forest sector, these ambiguities may be further reinforced (see Armah, Luginaah, Yengoh, Taabazuing, & Yawson, 2014; Kleemann et al., 2017; Kuusaana & Bukari, 2015; Owusu-Nimo, Mantey, Nyarko, Appiah-Effah, & Aubynn, 2018; Taabazuing, Luginaah, Djietror, & Otiso, 2012). Yet, the basic requirement to ensure a coexistence of farming activities and carbon forest development as stipulated in the national REDD+ implementation framework remains unenforced by the state and is largely at the discretion of private investors. Little attention has

been paid to the property rights the state devolves to private actors in the management of community forest resources.

Given that the High Forest Zone has relatively favourable climatic and edaphic conditions, and serves as a haven for many food insecure smallholder farmers from impoverished parts of the country, these tenure complexities could exacerbate food insecurity. In a regional analysis of the impact of REDD+ on food security, Tabeau, van Meijl, Overmars, and Stehfest (2017) finds that, SSA is the most adversely affected region. Compared to Central and South America (with 16.2% and 12.4% decreases in land use and agricultural output respectively) and China (with 7.1% and 1.3% decreases in land use and agricultural output respectively), reductions in land use and food production were more pronounced in SSA (19.9% and 18.1% respectively) (Tabeau et al., 2017). Despite the fact that these regional statistics offer a general picture of the negative impacts of REDD+ on food production, a rigorous context-specific analysis of the lived experiences of smallholder farmers⁵ is crucial. In the Ghanaian context for instance, Asiyambi et al. (2017) give a hint on the local level inclusion-exclusion politics that characterize REDD+, and call for in-depth context-specific analysis of the experiences of forest-based communities.

Although a number of studies have recently explored forest management in Ghana (see Acheampong, Insaïdoo, & Ros-Tonen, 2016; Foli, Ros-Tonen, Reed, & Sunderland, 2017; Murray, Agyare, Dearden, & Rollins, 2018; Ros-Tonen, Derkyi, & Insaïdoo, 2014; Teye, 2013), little research attention has been paid to REDD+ despite the uptake of carbon forestry activities in farming communities in the High Forest Zone since 2010. Furthermore, while REDD+ is currently piloted in other countries in sub-Saharan African (SSA) where livelihoods are generally dependent on land-based resources, existing studies on its implementation have mostly focused on understanding its design, institutional frameworks of governance and benefit sharing arrangements (see Andersson et al., 2018; Asiyambi et al., 2017; Leach & Scoones, 2013; Saeed, McDermott, & Boyd, 2017; Saeed et al., 2018; Sills et al., 2017). Invariably, there are no studies that examine the distributional impacts of the uptake of carbon forestry on local livelihoods activities and food security. It is to this salient gap in the literature that this study contributes.

What we explore in this paper are opportunities for knowledge sharing, inclusiveness and sustainability towards finding a common ground for the reconciliation of environmental conservation and agricultural production in forest communities across the developing world. While this paper does not suggest a blueprint for carbon forestry, it takes a preliminary stance at stimulating the discussion on the distributional impacts of REDD+ on farming communities with the goal of broadening the scope of options policymakers and local communities can draw upon to ensure sustainable coexistence of food production and carbon forestry. This analysis further demonstrates the continuous relevance of the agrarian question in the developing world and highlights the critical need to reconcile the increasingly neglected food security concerns of local farming communities with ongoing environmental conservation objectives. This connects to the clarion call by Asiyambi (2016, p. 146) for researchers to, "also engage with more-than-carbon accumulations justified by carbon".

In this paper, we argue that beyond 'green colonialism' and the widespread land grabs engendered by carbon forestry across different geographical contexts (see Asiyambi, 2016; Barbier & Tesfaw, 2013; Ickowitz, Sills, & de Sassi, 2017; Lund, Sungusia, Mabele, & Scheba, 2017; Phelps, Webb, & Agrawal, 2010; Saeed et al., 2018; Sunderlin et al., 2014), neoliberal accumulation under

⁵ Small-scale farmers who cultivate for consumption and sell surplus for income (Chamberlin, 2008). Production is largely based on simple tools and inputs (Kansanga, 2017).

the REDD+ is rapidly moving into non-carbon frontiers in the Ghanaian context whereby the labour and financial resources of displaced local farmers are further appropriated through corrupt ‘backdoor’ land deals and exploitative labour relations. In the context of these challenges, we make several recommendations for restructuring the current carbon forest development approach.

2. Background

2.1. Forest resource management in Ghana

Prior to state-led forest management in Ghana, community forestlands were administered through customary law. Chiefs who are the custodians of the land held forestlands in trust for the people who possessed user rights (Owubah, Le Master, Bowker, & Lee, 2001; Teye, 2005). As timber became a major source of revenue in the colonial era, concessions of stool lands⁶ were zoned as forest reserves under the Forest Ordinance of 1927 and controlled by the colonial government (Owubah et al., 2001). Post-independence governments maintained this top-down state-led community forest management approach. Over the years, a number of policies were enacted to regulate forest resource use including the Forest Commission Act of 1960; Forest Concessions Act of 1962; Land Administration Act of 1984; Control and Prevention of Bushfires Law of 1990; Forest and Wildlife Policy of 1994; and the Forest and Plantation Development Act of 2000. These policies supported a concessional forest governance approach in which forest timber rights are vested in the president in trust for local communities (Owubah et al., 2001). To harvest timber under this system, a stumpage fee determined based on the standing value of the timber concession is paid to the GFC after which a Timber Utilization Contract is reached with the logger (Ministry of Lands and Natural Resources, 2014). Concerns over the unfair benefit sharing and the lack of access to forest lands by local communities led to the evolution of integrated community forest management schemes. For instance, as part of the Voluntary Partnership Agreement (VPA) under the European Union’s Forest Law Enforcement Governance and Trade (FLEGT) program, the timber rights allocation procedure was revised to make it open to all citizens. However, the processing cost of putting in a bid still excluded many actors at the local level. To enhance the sustainable flow of benefits to local communities, Community Resource Management Areas (CREMAs) were created in 2000 as integrated forest governance avenues through which local knowledge systems and community needs can be brought to bear on decision making on forest resource conservation and utilization (Murray et al., 2018).

These co-management efforts were later consolidated under the Modified Taungya Scheme (MTS) in 2002 – a collaborative reforestation initiative between the GFC and local farmer groups in forest communities aimed at ensuring coexistence of local livelihood activities and reforestation projects (Ros-Tonen et al., 2014). Under this scheme, farmers were given degraded portions of forestlands to cultivate while taking care of trees planted by the GFC until the trees close canopy (usually after three years). The benefit sharing framework of the MTS allocated 40% of timber revenue to the Forestry Commission, 40% to each gang of farmers, 15% to traditional landowners, and 5% to the forest-adjacent community (Acheampong et al., 2016). The MTS did not result in tenure security after all – a situation which made aggrieved farmers to deliberately retard tree growth in order to prolong their tenure (Acheampong et al., 2016; Ros-Tonen et al., 2014). Since the last decade, the Land Use, Land-Use Change and Forestry (LULUCF) sec-

tor in the High Forest Zone became a net emitter of greenhouse gases – a development that justified the need for intense forest conservation (Kansanga, Atuoye, & Luginaah, 2017).

Against this background, Ghana as a party to the United Nations Framework Convention on Climate Change (UNFCCC), subscribed to REDD+ in order to mitigate deforestation through plantation development in both on-reserve and off-reserve lands (Ochieng, Visseren-Hamakers, & Nketiah, 2013). Initially, Ghana’s REDD+ strategy embraced a ‘learning from the ground up’ approach in which about seven pilots were implemented to provide lessons for scaling up. Following the failure⁷ of these pilots, Ghana’s REDD+ strategy has since shifted to, “the implementation of large scale, sub-national programmes that follow ecological boundaries (jurisdictions) and are defined by major commodities and drivers of deforestation and degradation” (Government of Ghana, 2015, p. 25). Although other REDD+ activities are planned for later implementation in the savannah zones, Ghana’s REDD+ strategy currently focuses on enhancing carbon stocks in the High Forest Zone.

Ghana’s REDD+ activities are implemented in two major phases. The first phase involved policy reforms and institutional strengthening aimed at advancing the design and implementation of policy reforms to create the necessary institutional capacity for sustainable carbon forest development. The second phase, which is the core of Ghana’s REDD+ agenda is currently implemented through three major forest investment projects (World Bank, 2015). Project 1 aims at enhancing natural forests in agroforest landscapes in forest corridors in the High Forest Zone. Project 2 focuses on securing and enhancing trees in agroforestry and cocoa cultivation areas in the High Forest Zone with emphasis on the Brong-Ahafo and Western Regions. While extending forest conservation into target off-reserve community lands, this project is supposed to provide incentives for farmers on ‘admitted farms’⁸ especially for the production of climate-smart cocoa. Project 3 focuses on, “enhancing carbon stocks through facilitation of plantation investment in severely degraded landscapes” towards linking several Forest Reserves in the High Forest Zone (World Bank, 2015, p. 12). It also aims to build private sector engagement in the REDD+ process. Unlike project 2 where provision is made for ‘admitted farms’ in off-reserve areas, project 1 and 3 have no such provision for farmers, especially migrant smallholder farmers who were already farming on these forestlands while taking care of trees planted by the GFC under collaborative forest landscape restoration projects.

Key stakeholders in the implementation of the REDD+ in Ghana include MDBs, the Ministry of Lands and Natural Resources (MLNR), the GFC (which hosts Ghana’s National REDD+ Secretariat), the Ghana Cocoa Board (COCOBOD), the Ghana Investment Promotion Centre (GIPC), Local government units (Districts and Unit Committees), private forest investors, Civil Society Organizations (CSOs), local community members and traditional leaders (see Fig. 1) (Saeed et al., 2018; World Bank, 2015). MDBs under the direction of the World Bank provide overall funding for the REDD+ in the form of low interest loans and grants. The MLNR is the lead implementing agency and is responsible for overall management and coordination of carbon forestry activities at the country level, and reporting to the UNFCCC on behalf of the government of Ghana. The GFC hosts the National REDD+ Secretariat. It is the implementation arm of MLNR and coordinates carbon forestry activities in forest communities. COCOBOD has the mandate of

⁷ According to the Ghana Forestry Commission (2017, p. 35) these pilots failed due to the lack of technical expertise and financial backing. Moreover critical concerns such as tree tenure reforms, required national level policy decisions that were beyond the scope of the pilots.

⁸ Refers to farms that were already on community lands before they were rezoned as forest conservation reserves. Per Ghana’s REDD+ implementation arrangements, owners of these admitted farms are entitled to continue to farm in these areas while project activities continue.

⁶ Local community lands administered through traditional customary practices under the leadership of the chief. In southern Ghana, chiefs are enstooled and sit on stools. The stool is a symbol of traditional authority.

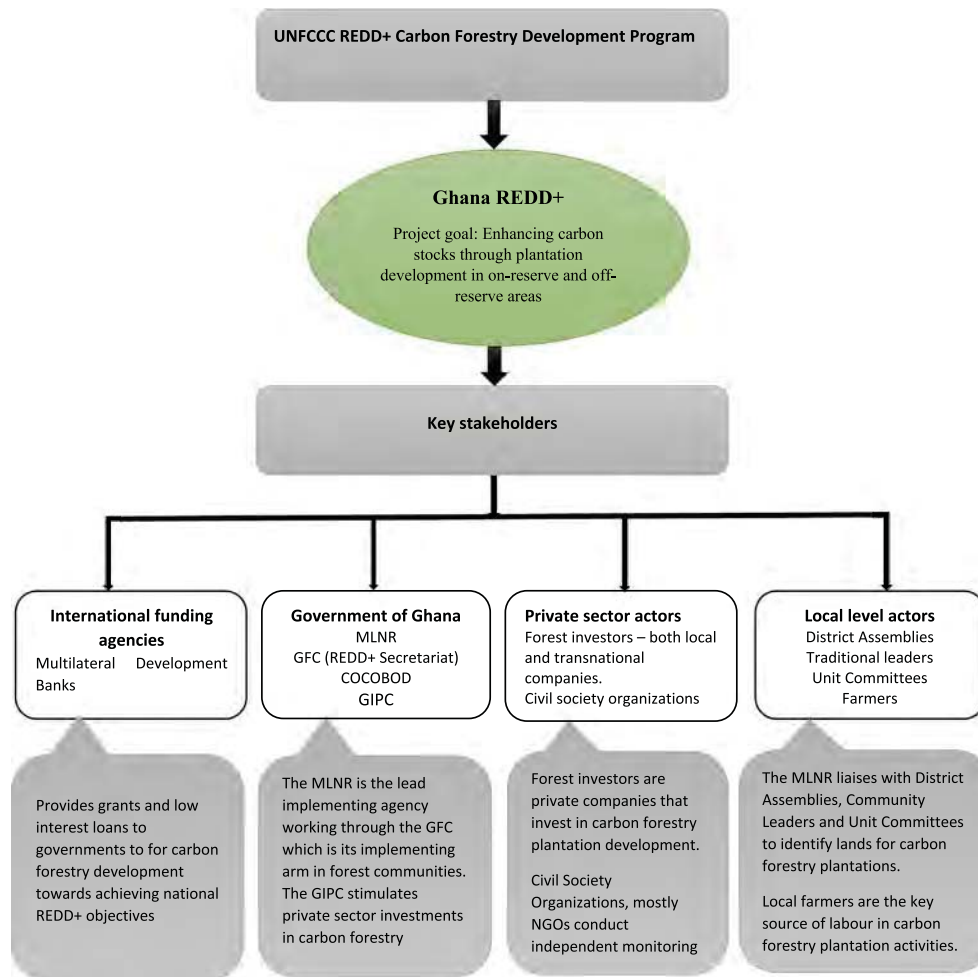


Fig. 1. Key stakeholders in the implementation of REDD+ in Ghana. Source: Adopted and modified from the Ghana REDD+ Strategy Report, 2015.

providing incentives and technical assistance to local farmers to support climate-smart crop production (particularly cocoa). The GIPC is responsible for creating incentives to stimulate private sector investment in carbon forest plantation development. It also spearheads the development of Public Private Partnerships (PPP) for the forest sector under REDD+. District Assemblies collaborate with local communities and traditional leaders to identify suitable degraded lands in forest communities for plantation development. Local farmers offer labour for day-to-day conservation activities. CSOs, mostly NGOs, are expected to engage in independent project monitoring and evaluation.

Currently, private sector involvement in forest plantation development includes the role of private investors as developers and owners of forests plantations; providers of technical services for tree development and buyers of timber (Ghana Forestry Commission, 2017; Saeed et al., 2018; World Bank, 2015). It is important to mention that private sector involvement in forest management in Ghana is not a novelty. In the past, private companies⁹ have been contracted by the state to offer secondary services to the GFC in previous state-led reforestation initiatives including the supply of seedlings and forest valuation. In recent times under the REDD+ however, their role in direct forest development has increased tremendously. For instance, between 2002 and 2010, 280 private forest investors were operating in 12 forest districts in the

⁹ The category private is herein used to refer to large scale companies of both national and international origin involved in carbon forestry development in Ghana.

country following the Expanded Plantation Programme that extended forest conservation activities from on-reserve areas to off-reserve community lands (Insaiddoo, Ros-Tonen, Hoogenbosch, & Acheampong, 2012; Ros-Tonen et al., 2014). In the last ten years the GFC has released forestlands to a number of private forest investors, majority of whom are transnational corporations for plantation development in the High Forest Zone. Some of these companies include Portal Limited, FORM Ghana Limited, Mere Plantations Limited, Ecotech Services Limited, Zoil Services Limited, Kwadkoff Company Limited, Logwood Industries Limited and GroTeak Afforestation Limited.

Although benefit sharing plans under the REDD+ in the Ghanaian context are yet to be finalized as of the time of writing this paper (see also Saeed et al., 2018), the National REDD+ strategy outlines three broad benefits to be generated through carbon forestry on which any benefit sharing framework will likely be based. The first entails up-front indirect benefits including enhanced access to agricultural inputs, technical services and credits to support climate smart farming in forest areas. The second category include performance-based indirect benefits such as corporate social responsibility initiatives in forest communities. Direct performance-based benefits are the third category identified in the Government's REDD+ strategy report. These benefits include cash payments to local community CREMA funds for protection of designated off-reserve forest areas and the volume of climate-smart cocoa produced (Fox, 2017).

A number of salient issues underpin this potential benefit structure, especially when considering how local people can participate to improve their livelihoods. First, it is rather ironic that performance-based benefits to local communities are not determined based on the market value of the amount of carbon dioxide emissions local people's contributions to REDD+ initiatives are able to reduce. Rather these benefits are based on the amount of climate-smart cocoa produced by farmers. Secondly, access to the carbon markets under the REDD+ is restricted to government and so-called organized and financially capable investors. This limits the options available to local people to directly engage in carbon markets. Even among local farmers, cocoa farmers are prioritized while smallholders, particularly migrants, who produce food crops have no clearly stipulated direct benefits from carbon forest revenue. What is more pressing is that, with the current desire to extend carbon forest development into off-reserve forest community lands on which local farmers depend, coupled with the fact that restrictive plantation forestry has become the dominant carbon forest development approach (Leach & Scoones, 2013), the reproduction of local livelihoods may be grossly impacted.

2.2. Research sites

This study draws on the experiences of smallholder farmers from agrarian communities in the Bosomoa-Kintampo and Offinso forest districts (see Fig. 2). These forest districts are located in the High Forest Zone of Ghana which falls within the West African Biodiversity Hotspot. Some of the largest forest reserves in Ghana including the Bosomkese, Bosomoa, Afram Headwaters, and Afransu-Brohoma Forest Reserves are found in these study areas.



Fig. 2. Map showing the two forest districts of the study. Source: Author's construct, 2018.

The Bosomoa and Afram Headwaters Reserves for instance each span about 20,000 ha, comprising both natural and plantation forest. The High Forest Zone is the major food crop-producing zone in Ghana and attracts farmers from other regions.

The socioeconomic structure of the study context raises some salient concerns that make our analysis crucial. With increasing pressure on smallholder agriculture from climate change in recent times, the High Forest Zone in general is a key safety net for smallholder farmers from various poverty-stricken and relatively drier parts of the country, especially the three northern regions (see Kuuire, Mkandawire, Luginaah, & Arku, 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017; Rademacher-Schulz, Schraven, & Mahama, 2014; Van der Geest, 2011). Also, smallholder farming is a fundamental part of the organization of social life in local communities in the High Forest Zone. As a result, local livelihoods are heavily dependent on community forest lands.

3. Theoretical framework

Theoretically, this paper illuminates the socioeconomic and political situatedness of the impacts of REDD+ on local agrarian livelihoods in Ghana. Specifically, it examines the nature and extent to which smallholder farming livelihoods are shaped and reshaped in the struggle for agricultural land following carbon forest development. Theoretical developments on land grabbing in the Ghanaian context have for some time now focused on large-scale agricultural land deals involving transnational corporations in the middle belt and savannah zones (see Aha & Ayitey, 2017; Boamah, 2014; Boamah & Overå, 2016; Choi, 2018) with little attention paid to the forest zone despite the ongoing leasing of community lands to private investors for carbon forest plantations. To adequately understand the outcomes of such local forest community land deals which often involve varied actors and interests, there is the need to situate particular land struggles within the broader agrarian political economies of land access and control (Hall, Hirsch, & Li, 2011; Montefrio, 2017; Peluso & Lund, 2011).

Despite the centrality of the concept of access to research on natural resource governance and utilization in forest communities (Faye & Ribot, 2017; Kansanga, Andersen, Atuoye, & Mason-Renton, 2018; Larson, Cronkleton, Barry, & Pacheco, 2008; Osborne, 2011), it has been defined differently in the literature. That notwithstanding, Ribot and Peluso's (2003) conceptualization of access as 'the ability to derive benefits from things' is useful to our analysis and gives a broader conceptual base for understanding how carbon forest development activities may be shaping smallholder farmers' access to forestland in Ghana. Ribot and Peluso's (2003) definition connects directly to the agrarian question and allows for a broader interrogation of the fate of smallholder farmers in a neoliberal natural resource management regime as capital rapidly moves into local agrarian spaces (Osborne, 2011; Watts, 1989).

In their concept of 'powers of exclusion', Hall et al. (2011) identified four powers (regulation, market, force and legitimation) that interact to shape land access relations. They argued that, instead of counter-posing 'exclusion' to 'inclusion' in understanding natural resource access and utilization at the theoretical level as already highlighted in the forest belt of Ghana by Asiyanni et al. (2017), emphasis should be placed on who is excluded, how, why, and with what consequences. Proceeding on this theoretical tangent, we consider the opposite of 'exclusion' not to be 'inclusion' but 'access'. This position is based on the realization that including local people in REDD+ processes does not necessarily guarantee them access and control over forest resources and carbon revenue. We therefore proceed on a broader theoretical lens grounded on the understanding that carbon forestry development not only occurs

through a governmentality which shapes livelihoods in a given context, but also influences the broader relations that make such social reproduction possible (Paprocki, 2016).

Moore (2013) draws attention to a critical dimension of the agrarian question that is directly relevant to the analysis in this paper. Moore (2013) argues that capitalism, owing to its inability to accumulate further through agriculture, has shifted its frontiers to other resources in the ecological sphere – particularly investment in forest as exemplified by the increased desire by transnational corporations to invest in carbon forestry in tropical areas of the developing world. Within the ecological sphere, ‘capitalism’ strives to redefine existing structural provisions in human-environment interaction such as customary tenure practices in order to create entry points that engender new political economies (Makki, 2012; Moore, 2017). These premeditated changes to the socioeconomic structure then provide strategic positional spaces for natural resource appropriation and the eventual crafty separation of local people from land-based resources in what Tobias and Richmond (2014) term environmental dispossession. This swift movement of capital from international into national and local agrarian frontiers is largely grounded on the desire to build neoliberal natural resource management and agricultural production regimes with value chains that facilitate accumulation (Bernstein, 2014; Myers et al., 2018; White, Borrás Jr, Hall, Scoones, & Wolford, 2012). Critics have argued that by privatizing and globalizing market economies, national sovereignty and state capacity are weakened as transnational capital moves into national spaces (Lyons & Westoby, 2014; Sassen, 2013). Lyons and Westoby (2014) observe that, ‘there is then a positive feedback cycle in which such investments lead to an increased debt regime’ thereby pushing weakened states to further disassemble national frontiers and legitimize foreign investment in local spheres including agriculture and forestry.

According to Tobias and Richmond (2014) separation of local communities from natural resources eventually sets in; directly through physical separation from land, and indirectly through processes of acculturation and assimilation. Drawing on the concept of ‘powers of exclusion’ (Hall et al., 2011) and environmental dispossession (Tobias & Richmond, 2014), our analysis interrogates how the uptake of REDD+ in the Ghanaian context produces new avenues for the displacement and exploitation of smallholder farmers. In particular, we highlight the mediating role of two powers of exclusion: ‘regulation’ and ‘market’ in shaping smallholder farmers’ access to farmland.

4. Methodology

As observed by Jacobs (2017), the complexities in the struggle over land-based resources cannot be resolved entirely on theoretical grounds since class struggle is not just an element in theory, but also a subject of empirical enquiry. This study is based on a five-month qualitative research conducted from May 2016 to September 2016 in the Bosomoa-Kintampo and Offinso forest districts in the High Forest Zone of Ghana using participant observation and in-depth interviews. We conducted in-depth interviews with 46 local farmers, 4 traditional leaders, and 4 local-level government representatives to uncover the experiences of farming communities with the uptake of REDD+. Participant farmers were sampled through a preliminary visit to the forest to obtain a first-hand experience of ongoing carbon forest activities. This approach helped us to locate farmers who were directly affected by carbon forest development.

We sampled participants to reflect the diverse socioeconomic backgrounds of farmers in the study context. Our sample included two broad categories: migrant and native farmers, majority of

whom were males. Female farmers mostly cultivated on lands within the immediate environs of the community. Male farmers were mostly those who went deeper into the forest to establish farms. Moreover, because family farming is the common farming arrangement in the study area, men who are culturally ascribed family heads mostly cultivated with their wives and were at the forefront of acquiring land. As a result, women were mostly removed from these agricultural land deals. There were however two cases where migrant women who initially settled with their husbands and farmed in the forest under the MTS continued to farm there after the demise of their spouses.

In terms of socioeconomic characteristics of sampled farmers, migrant farmers were mostly from resource-poor areas of the country especially the northern sector. Since they have no right of ownership over customary lands, they mostly farm under sharecropping arrangements with native farmers. Previous state-led integrated forest management schemes which allowed farmers to cultivate while taking care of trees planted by the GFC, further attracted most of these farmers to the forest belt. Most of these migrant farmers, in the attempt to maximize time on the farm and avoid the extra financial burden of renting homes in the community erected temporary structures close to their farms in the forest where they stayed and farmed with their nuclear families and only occasionally coming to town, mostly on market days. Native smallholder farmers on the other hand had relatively better socioeconomic status compared to migrant farmers. Unlike most migrant farmers who lived in deep hideouts in the forest, all native smallholder farmers lived in the town and were therefore able to engage in extra socioeconomic activities such as petty trading to supplement farm income. Following the extension of carbon forestry activities into off-reserve lands, some of these native farmers who previously owned lands in these areas before their re-designation for forest plantation development benefited from the ‘admitted farms’ provision and became forest caretakers¹⁰ for private companies. Most native farmers were therefore able to still engage in some form of cultivation albeit relatively minimal since production mostly has to conform to the permissible crop range of forest developers. Farmers in this category also served as ‘middlemen’ who helped migrant farmers to get temporal farming space under sharecropping arrangements. Educational attainment was low among both category of farmers for which reason interviews were conducted in the local dialect (Twi).

Data from interviews were complemented with secondary data from relevant academic literature, and government policy documents including Ghana’s REDD+ Proposal by the MLNR, and the 2016 – 2035 National REDD+ Strategy Report by the GFC. Direct quotations from the interview transcripts are used to substantiate key themes, contextualize responses, and maintain participants’ voices.

5. Findings and discussion

5.1. Growing trees in place of food? Agrarian displacements through REDD+

Contrary to the underlying requirement that REDD+ should be executed in partnership with local communities particularly to foster mutual benefits for all stakeholders, we find that local farming communities are rather being distanced from forestlands that they ‘must’ depend on for survival. Private forest investors have become the main developers of carbon forest plantations and are displacing

¹⁰ Forest caretakers are mostly community-level representatives/liasons who take care of forest concessions for private companies. These are mostly native farmers and are usually allowed to farm on portions of the forest while taking care of the trees.

local farmers on technical grounds of ownership through their largely unregulated and profit-driven plantation development activities. Central to this complexity over access to forestland are conflicts over meaning about customary and formal land tenure arrangements between farmers and forest investors. While local farmers still see themselves as legitimate co-managers of forest as was previously done under state-led integrated forest management initiatives, private investors regard themselves as 'new' owners of forestlands with the right to make new rules on forest development and resource utilization. These new rules have not only displaced local farmers, but technically frames them as 'illegal intruders' on private forest lands.

Our findings indicate that private forest developers involved in the rehabilitation of degraded forestlands evicted local farmers who were cultivating the land under previous state-led integrated forest management to allow for fresh forest plantation development. We argue that the rhetoric of 'painting' carbon forest development as a pathway to consolidating tenure security is a mere façade at the practical level. This strategic displacement of smallholder farmers by private forest developers is what [Asiyanbi et al. \(2017\)](#) term 'carbonised exclusion'. In the Ghanaian context these displacements were spontaneous and mostly without sufficient prior communication from the GFC or private forest developers. This eventually produced a landless class of smallholder farmers whose labour has been craftily integrated into a corporatized forest management system as forest caretakers and tree planters. Meanwhile, due to the limited nature of such jobs, the majority who do not get forest jobs constantly strive to reproduce themselves through unfulfilling 'backdoor' temporary land access transactions and sharecropping arrangements. A farmer expressed frustration at this displacement saying:

Since these lands [referring to forest concessions] were given to the companies and we were banned from farming there, I have since moved my farm from one hideout to another through the seasons. (Interview, 10 May 2016)

Even the few influential native smallholder farmers who were able to formally negotiate access to private company forest concessions to cultivate while taking care of trees had a different but equally challenging story. One native smallholder farmer observed:

When I finally got permission to use this land I am cultivating now, I was told the company would clear the land and supply seedlings. However, the company later complained of faulty chainsaws and instructed us to cut the trees ourselves which most of us did with our personal resources. Recently, we were asked to suspend all farming activities until after the national elections [referring to the December 2016 presidential and parliamentary elections]. (Interview, 10 May 2016)

Some displaced farmers who were unable to negotiate access to company lands through these backdoor mechanisms were left with no option but to return to portions of the forest that were already rehabilitated through the MTS. Meanwhile, cultivating in these deep hideouts in the forest comes with a key risk of having their crops destroyed during routine forest tours by the taskforce¹¹ of the GFC. A migrant farmer who lamented over his constant inability to renegotiate access to land said:

Four years ago, we were asked to stop farming on a portion of the forest the GFC allocated to us under the taungya Scheme since a new company had taken over the reforestation process. In my case, attempts at renegotiating access to land

under the management of the new company failed. As I speak, there is no other land to go to apart from parts of the forest already rehabilitated by the GFC. [...] This has been the only resort for most of us. Yet, the GFC taskforce keeps destroying our farms (Interview, 16 May 2016)

Despite the general difficulty in renegotiating access and the fact that women were mostly not involved in these land struggles in deeper areas of the forest, the predicament of a 49-year-old widow speaks to a gendered dimension in the gender-differentiated capacity of displaced farmers to renegotiate temporary access to agricultural land through backdoor means:

Since I relocated here with my husband, we lived and farmed in the forest until the company people [referring to a forest investors] came. Even so, my husband was mostly able to obtain a small parcel of land in the forest to sustain us until his demise. [...] Ever since, I have continuously struggled through the seasons to get a meaningful piece of land to cultivate. My children and I are still living in this bush here in the hope of getting some capital in order to go and settle in town (Interview, 12 May 2016).

In spite of the promise of efficiency in forest conservation with private sector involvement, local farmers adjudged private sector forest development activities as relatively more problematic. Most farmers held the opinion that previous state-led initiatives were arguably less restrictive even though they were not entirely immune to problems. The narrative of a 51-year-old displaced migrant farmer contrasts his experiences with the state-led MTS and the current carbon forest plantation development under REDD+. Highlighting how the latter is deepening the plight of smallholder farmers, he observed:

When I came into this community 15 years ago, I obtained land to farm under the taungya scheme while caring for trees planted by the GFC. We farmed under this arrangement for several years until it was rumoured four years ago that some concession of the forest was given to a private company called Mere Plantations Limited. The company asked us to stop farming on the land, cleared the land and started a forest plantation [...]. It is sad that several years since our eviction, more than half of the land still lies vacant with no trees planted. (Interview 11 August 2016)

[Phelps et al. \(2010\)](#) have argued that in the face of challenging capital requirements in forest development, developing country governments tend to revert decentralized forest regimes to meet the conditions of external forest development funding agencies. Eventually the frontiers of forest regulation shift in favour of investors who now make new rules to favour their profit-oriented activities ([Benjaminsen & Bryceson, 2012](#); [Ribot, Agrawal, & Larson, 2006](#)). It is this exclusionary potential of the shift in the mandate for resource 'regulation' [Hall et al. \(2011\)](#) call attention to in their concept of 'powers of exclusion'.

Building on the observation of [Lund et al. \(2017\)](#), we argue that a 'carbon Green Revolution' is underway in the forest belt of Ghana – an agenda whose tenets and underlying politics are geared towards producing forest and greening forest landscapes at the expense local farming livelihoods. The main vehicle for this agenda is the private sector, whose involvement in carbon forest development has not only deepened the agricultural land access challenges that arose in previous state-led reforestation initiatives but created new and more complex ones. Through the REDD+, private capital has now moved into forest landscapes in the ecological sphere and forestlands that were previously under state control have been privatized for carbon forest plantation development activities. By means of these crafty displacements described by [Benjaminsen &](#)

¹¹ These are trained forest guards of the GFC who ensure compliance to forest regulations at the local level. They conduct forest patrols to detect illegal activities and arrest perpetrators (see also [Hansen, 2011](#)).

Bryceson (2012) as ‘green grabbing’, non-capitalist agrarian forest spaces in the Ghanaian context are being opened-up for capitalist accumulation.

In contrast to the Mexican context where Osborne (2011) finds that smallholder farmers continue to have formal land rights following the uptake of REDD+ and can grow their own carbon-sequestering trees as a source of income, in Ghana, local farmers’ rights to forestland under REDD+ are not guaranteed. Even usufruct rights to forestland previously granted by the GFC under state-led reforestation schemes have been truncated and redefined in ways that give private forest investors the ‘ultimate’ power to make decisions over forest resources with the government now playing a mere passive monitoring role. Beyond the theoretical imagery of perfect integration of local communities and their farming livelihoods contained in policy documents of REDD+, lies in practice, the very traits of capitalism which Marx (1978) describes as preoccupied with creating and expanding capital in ways that engender social relations of production centred on turning people (labour) and the environment into resources. In this emerging carbon green revolution, private sector investment in plantation forestry is giving rise to ‘neoliberal forest enclosures’ in farming communities which are used to further extend the contours of accumulation into non-carbon spheres.

5.2. Land access ambiguities as avenues for exploitation of smallholder farmers

This paper argues that beyond the widespread land grabs and green grabs engendered by carbon forestry across different geographical contexts (see Asiyambi et al., 2017; Barbier & Tesfaw, 2013; Bumpus & Liverman, 2011; Saeed et al., 2018; Teye, 2013), accumulation under REDD+ in the Ghanaian context has assumed a more complex dimension in which the labour and financial resources of displaced smallholder farmers are further appropriated under exploitative labour relations and backdoor land deals. By displacing local farmers and altering existing land access and labour relations, a conducive atmosphere is further created for accumulation. This resonates with Osborne’s (2011) observation that such ‘crafty’ alterations of the socioeconomic and political context of resource access and control further acts as enclosure mechanisms that constrain the reproduction of rural agrarian livelihoods and determine local farmers’ continuous availability and willingness to succumb to exploitative demands in the quest to survive.

Indeed, a growing body of literature highlight various tenure complexities that underscore carbon forestry development in tropical countries (de Aquino, Aasrud, & Guimarães, 2011; Holland et al., 2014; Ickowitz et al., 2017; Phelps et al., 2010; Sunderlin et al., 2014). Unique to the Ghanaian context, the unanticipated halt on smallholder farming that characterized the designation of off-reserve local community lands for carbon forestry, produced uncertainties and new exploitation mechanisms in forest communities. Left at the mercy of private investors, most displaced farmers are sometimes compelled to work through ‘middlemen’ to negotiate temporary access to forestland. A critical appraisal of these backdoor mechanisms that underlie smallholder farmers’ struggle for forestland reveal the crucial but less highlighted mechanism we conceptualize as ‘*hierarchical corruption*’. This involves a chain of corrupt transactions whereby farmers are compelled to offer inducements to obtain agricultural land ‘illegally’ either directly from local forest caretakers or on sharecropping basis from other influential natives who also have to ‘oil the lips’¹² of forest officials to obtain temporary user rights. Consistent with the obser-

vation of Nel (2015) in the Ugandan context, there is eventually a “blurring of the lines between legality and illegality” where the negative impacts of the ‘new carbon rules’ are felt disproportionately by relatively less powerful smaller farmers who in this context, bear the burden of pushing through illegal means to gain temporary access to land at exorbitant prices. Lamenting on the exploitation and differential access possibilities that characterize the backdoor land access system, a displaced farmer observed:

These days, to get even temporary access to farmland in the forest you have to pass through an influential person using money. Land in fertile portions of the forest under these companies can be rented as high as 1500 Ghana Cedis [Equivalent to about 350 USD] per hectare for a planting season. [Sighs]. We are really suffering. It is only the rich among us with good connections [referring to networks] who get access to private company concessions. (Interview 4 June 2016)

Further highlighting the frustration and exploitation associated with the current struggles over accessing farmland, another smallholder farmer observed:

My main frustration with the involvement of these private companies is that the very land we were asked to vacate to allow for tree planting is now rented out to their ‘favourites’ under fraudulent arrangements for farming activities [...]. I do not see any special attention being given to tree planting. (Interview 26 July 2016)

Because the lands are transacted on illegal grounds, and paid for by farmers, enhancement of carbon stocks which is the ultimate purpose for the implementation of the REDD+ is rather neglected by farmers who struggle to meet the financial conditions of these illegal leases at the end of each planting season. Even with these informal payments, local farmers are not guaranteed a secure tenure. Farmers alleged that occasionally, investors destroy their farms when they are spotted. A displaced farmer who expressed worry about the uncertainty and insecurity associated with farming on such backdoor basis said:

Even though I paid to farm here this season, I am always afraid of my farm being destroyed if spotted by the GFC taskforce. [Farmer asks rhetorically] how can we produce enough to feed to even think of expanding our farms under this situation? (Interview 12 August 2016)

While we argue that restrictive and ‘market-driven’ carbon forest plantation development is the foremost and major catalyst for the displacement and eventual exploitation of smallholder farmers in the Ghanaian context, we also draw on Hall et al. (2011) idea of intimate exclusion to highlight that local farmers themselves are agents of exclusion and exploitation under REDD+. In the next section, we demonstrate how relatively richer native farmers deepen the exploitation of poorer migrant smallholders in what can best be described as ‘*intimate exploitation*’.

5.3. From exclusion to ‘intimate exploitation’

Akin to the observation of Holmes & Cavanagh (2016), we argue that neoliberal forest conservation under REDD+ has widened existing inequalities and levelled a disproportionate land access burden on migrant smallholder farmers. There is no doubt that migrant farming has become a key strategy in tackling food insecurity in Ghana (Kuuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). Contextualizing the political economy of the study context for instance, it is evident that the local farming population is a microcosm of the national population with smallholder farmers congregating from different parts of the country in search of

¹² A local term used to describe the act of paying inducement to obtain a favour.

fertile lands and better rainfall patterns (Kansanga et al., 2017; Kuuire et al., 2016; Nyantakyi-Frimpong & Bezner Kerr, 2017). That notwithstanding, migrant smallholder farmers who in most cases are escaping the shackles of poverty from resource-poor source regions end up in 'new poverties' of extreme labour and financial exploitation. Relatively wealthier native farmers by virtue of their financial 'muscle' and social networks are able to negotiate access either by being forest caretakers or through backdoor land deals and in turn appropriate the labour of displaced migrant farmers under exploitative sharecropping arrangements. Thus, we argue that these 'new' land and labour relations under the REDD+, tend to favour 'some' but disadvantage 'many'. A migrant farmer recounts his experience:

For the past two years, I have been struggling to access farmland. Just to keep myself in active farming life, I took to share cropping with a native who helped me with this land. Because now it is not only the native landowners we share the farm produce with, but also the local forest caretakers, we end up making losses. (Interview, 10 May 2016)

While under conventional sharecropping practice in southern Ghana two-thirds of the annual farm produce goes to the landowner and the remaining one-third to the farmer, migrant farmers are getting even lesser of the farm produce in the already unfair produce distribution system following the uptake of REDD+. Unlike the conventional sharecropping practice where farm produce is shared between just the farmer and the landowner, current produce sharing arrangements feature 'new actors' mostly middle men and forest guards who work to shelter the farming activities of migrant smallholder farmers in strategic hideouts in the forest. Although there is no generally agreed system of sharing produce under these 'new' sharecropping arrangements that have evolved, most migrant farmers pointed to the fact that they mostly have to settle all other middle men from their one-third share of the total produce after sharing with the key individual from whom they obtained the land. As observed earlier, this exploitation is deepening largely because, the REDD+ in its design, prioritized some smallholder farmers especially cocoa farmers, most of whom either benefited from the 'admitted farms' provision under the REDD+ or are relatively well networked and able to negotiate access to forestlands at the expense of relatively poor food crop growing migrant farmers. Because migrant farmers have no customarily recognized rights to land compared to native smallholder farmers, they often do not grow cash crops like cocoa and therefore did not benefit from the 'admitted farms' provision and the incentives for small-scale cocoa farmers under the REDD+. Another displaced migrant farmer highlights the unprofitable nature of the new labour relations that underscore farming in forest communities saying:

'Since I lost my land, I have been working as a tree planter with a private plantation development company. I also cultivate on a sharecropping basis with a native of a neighbouring community [...]. Despite this current busy hustle, compared to my life prior to displacement, I can hardly make any profit to take care of family needs these days. (Interview, 2 September 2016)

From the above account, it is evident that, the REDD+ has reshaped existing power relations between migrant and native smallholder farmers, which further acts as an avenue for the exploitation of the former by the latter. Rowe (2015) calls attention to the potential adverse impacts of such unbalanced power relations at the local level arguing that all stakeholders may not have equal access to positions of influence in their struggle to leverage benefits or minimize negative impacts from REDD+.

Whereas a formidable alliance by smallholder farmers would be a potential pathway for seeking redress, the differential manoeuvring prospects available to native and migrant farmers have worked against the formation of any such meaningful community-level smallholder farmer movement. A migrant farmer expressed frustration at the futility in repeated efforts to seek redress from the government. He said:

Even in the midst of this suffering, we are not able to form any strong group to get our voices heard by the government. The influential community members who could join us to make this possible are rather benefitting from this situation. [...] The GFC is aware we are suffering like this, yet they are reluctant in intervening (Interview, 2 September 2016).

This farmer's account recalls Asiyanbi's (2016) description of 'tacit evasion of tenure ambiguities' in which efforts to recognize the tenure rights of local people to forest resources especially in migrant-dominated areas has often been evaded by stakeholders. These dynamics are further contextualized in the next subsection.

5.4. Strategic relegation of local communities and emerging unfair benefit sharing approaches

Following Nel (2015), we argue while the state plays a crucial role in the privatization of forest development under the REDD+, there is a 'tacit reluctance' in ensuring the proper integration of farmers into ongoing carbon forestry activities and the materialization of the widely touted positive gains REDD+ 'promises' local communities. The government through the MLNR and GFC is expected to exercise overall regulatory responsibility in the carbon forest development process. In reality however, like smallholder farmers, local community leaders complained about the passive role of the GFC. In the current REDD+ funding arrangement in Ghana, forest investors are given grants and low-interest loans from the FIP for plantation development (see Ministry of Lands and Natural Resources 2014). Because this funding is not comprehensive, and where investors use their own resources, they tend to maintain absolute control over forest concessions with little room for integration of local farming activities. This is consistent with the observation by Sikor, He, and Lestrelin (2017) that such shifts in natural resource governance often engender new regulatory mechanisms that entrench the control of project financiers and eventually skew benefit sharing arrangements in their favour.

As indicated earlier, although the benefit sharing framework for REDD+ has not been finalized, the government of Ghana has already laid out some broad category of benefits to local communities. These include direct benefits from payments to community CREMA funds and provision of inputs to cocoa farmers, and indirect benefits in the form of corporate social responsibility projects. It is rather ironic that carbon forestry activities under the REDD+ have been ongoing for close to a decade and yet no concrete benefit scheme has been concluded by the government. This reluctance has left local communities in uncertainty as to what they are entitled to and from who to make such claims. While the carbon benefit sharing framework is pending, Insaiddoo et al. (2012) allude to existing benefit sharing arrangements that have characterized the activities of large scale forest investors in off-reserve areas in the High Forest Zone in which 90 percent of total revenue from timber goes to the investor and six percent, two percent and two percent to the landowner, GFC and the adjacent community respectively. Compared to previous state-led landscape reforestation projects such as the MTS in which 40 percent and 10 percent of timber revenue went to farmers and the local communities respectively, it becomes evident that private sector entry has

shaped, and may continue to shape benefit sharing systems to the detriment of local farming communities. A member of the local Unit Committee¹³ described existing unfair timber benefit sharing arrangements saying:

Revenue allocation from forest resources is one of the biggest problems we have had with stakeholders for some years now. It is sad that even today things have even become worse for us. With this new system, our share of timber revenue has decreased. People now resort to other unsustainable backdoor strategies to derive their share from forest resources. (Interview, 12 August 2016)

Traditional leaders lamented about the complex chain of procedures involved in accessing timber revenue and the lack of clarity in terms of which institutions to direct such revenue claims in recent times. A traditional leader said:

Now, even the little timber revenue we are entitled to in recent times is often denied us. Tracing it becomes difficult as we are often tossed up and down in bureaucratic arrangements. We do not even know whether to approach the GFC or private forest companies for benefits. (Interview, 20 August 2016)

Consistent with Hall et al. (2011) typology of 'powers of exclusion', we argue that, the emerging relegation of local communities in forest management is largely due to two powers of exclusion: legitimation and market. By legitimizing itself over community forest resources through statutory provisions that allow the acquisition of community forest lands, the state, in turn leases some of these lands to private investors to develop forest plantations thereby opening community forest resource spaces to capitalist accumulation. Local people end up having no opportunity to plant their own carbon trees and engage meaningfully in the carbon market and more critically, reproduce themselves as smallholders. While researchers and policy makers are still fascinated about the 'hungry farmer paradox' in SSA including Ghana, we stress that under the prevailing carbon forestry regime, the food insecurity situation will worsen if these tenure ambiguities are not promptly addressed.

6. Conclusions and recommendations

The political economy of REDD+ in the Ghanaian context exhibits a set of complex processes, namely displacement, exploitation and corruption. These processes work interactively to distort traditional agricultural land and labour relations in local forest communities. Carbon forest plantation development facilitated corporate control over forest community lands and reinforced the marginalization and exploitation of migrant smallholder farmers in the High Forest Zone. REDD+ activities facilitated the crafty appropriation of the labour and financial resources of migrant farmers under unfair sharecropping arrangements and backdoor land deals by their native counterparts who act as middlemen. The politics of the implementation of the 'admitted farms' provision which provides for the integration of local farming activities into ongoing REDD+ projects, favoured native farmers who possess customarily recognized user rights to community lands to the neglect of migrant farmers who have no stake over community lands. These migrants, most of whom 'escaped' to the forest belt in search of better farming conditions are rather caught up in 'new webs' of poverty and food insecurity as they struggle to reproduce themselves.

These complex political economy dynamics especially the dispossession and exclusion of relatively poorer migrant farmers in

the Ghanaian case, points to the fact that even in the context of general resource access constraints under REDD+, the magnitude of adverse impacts may not be the same for all actors at the local level. The ongoing *hierarchical corruption* and *intimate exploitation* of non-native farmers in the Ghanaian context add a salient extension to Hall et al. (2011) typology of intimate exclusion. Beyond exclusion lies an opportunity for intimate exploitation whereby even among the same category of farmers, relatively powerful groups such as native farmers, tend to deepen the exploitation of their migrant counterparts.

This paper calls for an alternative forest management regime that reconciles local farming activities and forest conservation in a manner that guarantees local people's rights to land and forest resources. We recommend a radical restructuring of the current carbon forest regime away from viewing forest landscapes as 'global resources' to viewing them as 'territories' (McCall, 2016) in order to properly situate and legitimize the entitlements of forest communities. Rather than centralizing community forest lands and carbon rights in the hands of the state and a few forest investors, we call for a Community Forest Management approach (see Agrawal & Angelsen, 2009) in which local communities will lead the implementation of forest conservation activities. Returning forest lands to local communities has the potential to resolve most of the adverse outcomes of REDD+. As demonstrated in our findings, the increased exploitation of food insecure migrant farmers is connected to the widespread displacement and eventual change in conventional labour relations between native and migrant farmers.

We make this recommendation on the premise that apart from the so-called direct and indirect benefits promised local communities under the REDD+, local food production is a fundamental priority that should never be neglected for conservation gains. Indeed, there is mounting evidence that local people, through indigenous knowledge systems, can lead carbon forestry activities in ways that sustainably integrate local livelihood activities and forest conservation. Community-led carbon forestry will therefore promote food security and ensure that local people benefit directly from carbon revenue. While we make this seemingly radical recommendation, we are cognizant of the fact that solutions to the current complexities from the uptake of REDD+ are not forthcoming. That notwithstanding, a good starting point for repossessing customary lands especially in off-reserve areas, will require rigorous community action and advocacy at the grassroots level to seek redress.

In SSA in particular where the diverse land administration systems feature a range of actors including states, transnational corporations, and unique tenure arrangements, it is very crucial for the design and implementation of REDD+ projects to go beyond the universalized expectation that local people will always benefit from carbon forest investments. Stakeholders must therefore hold context very important and understand existing land tenure dynamics in order to align carbon forestry goals with local community needs. Considering the longstanding 'tacit evasion' of tenure ambiguities in local communities by the government of Ghana following the uptake of REDD+, we recommend that the UNFCCC in vetting carbon forestry applications from countries should clarify in detail the prevailing land tenure dynamics, and require governments to make the necessary provisions in cases where local people's rights to forest are not guaranteed. Indeed, environmental conservation and food security are both central to the Sustainable Development Goals, hence the need to pursue them in a coordinated manner. It is important for stakeholders to recognize that a 'hungry' and 'poor' population will not support sustainable environmental conservation and climate change mitigation. Notwithstanding these policy recommendations, political ecologists must actively engage the aggressively changing nature of accumulation engendered by REDD+.

¹³ Local Unit Committees are part of the decentralized governance system in Ghana. Members are elected from the local community to facilitate local level development.

7. Conflicts of interest

None.

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The REDD menace: Resurgent protectionism in Tanzania's mangrove forests

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ABSTRACT

Reduced Emissions from Deforestation and Degradation (REDD+) is being proclaimed as “a new direction in forest conservation” (Anglesen, 2009: 125). This financial incentives-based climate change mitigation strategy proposed by the UNEP, World Bank, GEF and environmental NGOs seeks to integrate forests into carbon sequestration schemes. Its proponents view REDD+ as part of an adaptive strategy to counter the effects of global climate change. This paper combines the theoretical approaches of market environmentalism and environmental narratives to examine the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania to make mangrove forests amenable to markets. Through a case study of a “REDD-readiness” climate change mitigation and adaptation project, we demonstrate how a shift in resource control and management from local to global actors builds upon narratives of environmental change (forest loss) that have little factual basis in environmental histories. We argue that the proponents of REDD+ (Tanzanian state, aid donors, environmental NGOs) underestimate the agency of forest-reliant communities who have played a major role in the making of the delta landscape and who will certainly resist the injustices they are facing as a result of this shift from community-based resource management to fortress conservation.

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1. Introduction

Reduced Emissions from Deforestation and Degradation (REDD+) is a financial incentives-based climate change mitigation initiative designed to compensate national governments and subnational actors in return for demonstrable reductions in carbon emissions from deforestation and degradation and enhancements of terrestrial carbon stocks (Agrawal et al., 2011). This paper examines this “new direction” (Anglesen, 2009) in carbon forestry by analyzing the politics of environmental knowledge that are redefining socio-nature relations in the Rufiji Delta, Tanzania, to be amenable to markets. We investigate the environmental narratives that inform a case study of World Wide Fund for Nature (WWF) and Tanzanian

state carbon forestry projects¹. These narratives portray local resource users, the Warufiji, in negative terms as recent migrants who are destroying the mangrove forests. This mistaken view forms the basis of a resurgent protectionism which aims to expel the

¹ The Rufiji Delta is listed as a WWF Tanzania REDD readiness site for REDD pilot projects, <http://www.reddtz.org/images/110310/a%20map%20showing%20pilot%20areas%20for%20redd%20activities.pdf> (Accessed on 30 November 2011). For a map showing approximate location of REDD related civil society actors (e.g. WWF) in the Rufiji Delta, Tanzania, see United Republic of Tanzania, October 2010, National REDD Information and Communication Strategy 2010–2012, (p. 46), [http://www.reddtz.org/images/Indepthstudy/redd information and communication strategy.pdf](http://www.reddtz.org/images/Indepthstudy/redd%20information%20and%20communication%20strategy.pdf) (Accessed on 30 November 2011). The TZ-REDD Newsletter (Issue 5, September 2011, pg. 14) states “WWF has conducted awareness-raising campaigns on the REDD project in Mbeya, Iringa, and Rufiji Districts” see <http://www.tnrf.org/files/REDDNewsletter5.pdf> (Accessed on 30 November 2011). For the contract between the Norwegian Ministry of Foreign Affairs and the WWF Tanzania Country Office that is “one of nine REDD+ pilot projects undertaken by NGOs under the Tanzania-Norway partnership” with reference to the Rufiji Delta, see http://www.norway.go.tz/PageFiles/253880/WWF_contract.pdf (Accessed 30 November 2011). Information on WWF's “Building Mangrove Resilience” project in the Rufiji Delta can be found at <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed on 30 November 2011).

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Warufiji from lands they have occupied for millennia (Havnevik, 1993; Chami and Mswema, 1997).

Carbon forestry management plans have so far assumed that “forest” is a clearly understood category (Noordwijk and Minang, 2009). We argue that current forest definitions within the context of REDD+ do not take into consideration the environmental history or the agency of forest-reliant communities in the making of forested landscapes. We seek to demonstrate how the Rufiji Delta is a socio-natural landscape shaped by past and present resource management practices, a “forest” definition that complicates the prevailing narratives that inform carbon forestry management.

At the center of our critique is the framing of the “environmental problem” in which the Warufiji are depicted by foresters, environmentalists, and donors as poor stewards of the mangrove forests. We argue that this representation builds upon a “misreading” of the human–environmental history of the Rufiji Delta (e.g. Fairhead and Leach, 1996; Forsyth and Walker, 2008). Our counter-narrative provides an alternative environmental history that presents the Warufiji in a very different light. It also highlights the politics of environmental knowledge in which carbon forestry is presented as a “sustainable” alternative to indigenous resource management practices which are demeaned as “destructive” and “illegal”. We suggest that a major consequence of this ahistorical framing is a paradigmatic shift in natural resource conservation from community-based natural resource management (CBNRM) to fortress conservation, a shift that has been aptly called “resurgent protectionism” (Adams, 2009; Forsyth and Walker, 2008; Wilshusen et al., 2002). The protectionist conservation paradigm views human use of nature as inimical to biodiversity conservation and by extension to carbon storage. This normative view contrasts with more recent approaches that assume that human–environmental interactions can produce sustainably utilized environments (Zimmerer, 2006; Bassett, 2010).

Climate change mitigation plans for the Rufiji Delta currently focus on the anticipated impacts of climate change (sea-level rise) for a particular biophysical exposure unit (mangrove forests) that needs to be offset by adaptation and mitigation strategies to enhance the resilience of that biophysical unit (mangrove reforestation) (O'Brien et al., 2007). Within the context of the Tanzanian state and WWF's climate change “adaptation strategy” (Cook, 2009), mangrove reforestation reduces the ability of Rufiji farmers to cultivate rice for subsistence needs and thus poses a direct threat to their livelihoods. Indeed, after the forests are made more “valuable” for the carbon market (“REDD ready”), the Tanzanian state plans to relocate villagers out of the delta². Although current REDD+ policy frameworks do not explicitly seek to exclude people from living in forests or utilizing forest resources, the proposed eviction plan for the Warufiji is one portentous example of how human rights may be subservient to the monitoring and verification requirements of carbon forestry. The removal of the Warufiji³ “simplifies” the mangrove forests in order to make levels of carbon sequestration “legible” for carbon markets (Scott, 1998). We illustrate how this shift from a CBNRM to an ecosystem-centered vulnerability approach for forest conservation supersedes priorities that seek to balance livelihood

and environmental concerns. In the ecosystem-centered vulnerability approach, the concern with sustainable livelihoods and social vulnerability are of secondary importance.

Our goal in writing this paper is to draw attention to the potential for “lose–lose” scenarios of climate change mitigation and adaptation projects that fail to integrate environmental justice concerns with conservation priorities. This is important as the success of carbon forestry hinges on the compliance of local populations to new power relations implicit in REDD+ policies. We argue that forest-reliant communities will resist these policies to the extent that they undermine local livelihoods and are viewed as unjust. Local resentment and resistance will increase to the extent that carbon forestry projects marginalize those communities that live in proximity to and depend on key resource areas. Resource users in developing countries throughout the world are beginning to organize and demand access to land and their right to a decent livelihood (Perfecto and Vandermeer, 2008). The Warufiji are no exception. They have a history of fiercely resisting claims on their resources and labor by outsiders. By highlighting the environmental historical role of the Warufiji in the making of the delta landscape, we provide insights into the opportunity for local resource users to contribute to the creation of an agricultural and forestry matrix that is socially just and politically stable and that has the potential to conserve biodiversity in the long run (Perfecto and Vandermeer, 2008).

This paper discusses the implications of market-oriented conservation approaches that may threaten equity-oriented projects and the environmental justice dimensions to climate change despite its “rights-based and participatory approaches” (Anglesen, 2009). REDD+ threatens to shift control and management of natural resources from local to national and global actors. REDD+ may also have an unintended consequence of undermining decentralized forest management in Tanzania and elsewhere (Phelps et al., 2010). Our counter-narrative seeks to provide insights into natural resource management alternatives that are more socially just, desirable, and feasible. These alternatives are desirable because they have the potential to address conservation goals and feasible because the environmental history of the Northern Rufiji Delta illuminates the possibilities for sustainably utilized environments.

2. Theoretical approach

The remaking of human–environmental relations for REDD+ in the Rufiji Delta is an ambitious project that involves conceptualizing forest use in ways that are amenable to carbon markets. It entails a significant turnaround in conservation thinking where ecosystem health is prioritized over multiple land-use policies in which local communities assume some resource management authority. Before showing how this “new direction in forest conservation” (Anglesen, 2009) is unfolding in the Rufiji Delta, we introduce two key concepts that inform our theoretical approach: market environmentalism and environmental narratives.

2.1. Market environmentalism

Market environmentalism is the recognition that “nature” (as transformed into raw materials or resources) can be a key constraint on or opportunity for the location and organization of economic activity (Jonas and Bridge, 2003). Production processes based on the use of natural resources pose both obstacles and opportunities for capital and reveal the contradictory political-economic dynamics that shape everyday landscapes through which nature is produced, consumed, and regulated (Henderson, 1998; Jonas and Bridge, 2003). In its production and commodification, nature is enclosed, measured, and given market value (Lovell et al., 2009). This increasing incorporation of ecological conditions into global circuits of capital accumulation via

² Eviction plans are discussed in the “Report of the Meeting of the Division of Forestry and Bee-Keeping with Councillors, Executive Officers of the Wards and Villages in the Wards of Salale, Mtunda, Mabaroni, and Ruaruke in Rufiji District” held in Nyamisati on 3 November 2009 (Personal communication, January 2010). See also “Government Issues Eviction Order to Forest Invaders” Bilham Kimati in the *Tanzania Daily News*, 29 January 2011.

³ For an update see, “Villagers Evicted from Mangrove Site” Finnigan Wa Simbeye, *Tanzania Daily News* 30 October 2011, <http://dailynews.co.tz/home/?n=25016&cat=home> (Accessed on 30 November 2011) and “WWF Fears Backlash on Rufiji Delta Mangrove Forest Initiative” Finnigan Wa Simbeye, *Tanzania Daily News* 14 November 2011, <http://www.dailynews.co.tz/business/?n=25497&cat=business> (Accessed on 30 November 2011).

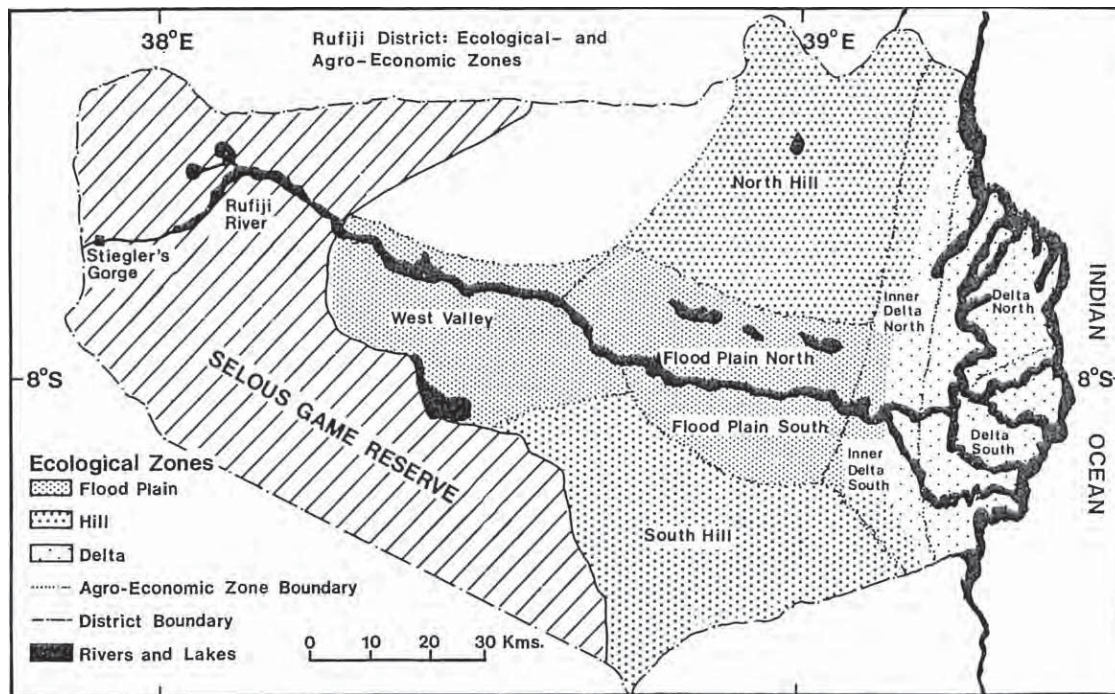


Fig. 1. Ecological and Agro-Economic Zones of the Rufiji District, Tanzania.
Source: Havnevik (1993). Used with permission of the author.

production and commodification has been referred to as “green capitalism” (Prudham, 2009: 1596). An example of green capitalism is the creation of markets for environmental services which effectively turn ecological processes and products into commodities that can be sold. Within this process the important question is not what a commodity is, but rather, what kind of characteristics do things take on when they *become* commodities (Castree, 2003: 277).

Green capitalism approaches view nature and society as conceptually distinct in the context of conservation (McAfee and Shapiro, 2010). It then reconnects them by subsuming ecology within the market economy (McAfee and Shapiro, 2010). The “splitting” of complex ecosystems simplifies them into legally definable and economically tradable property rights (Castree, 2003). This is particularly true for carbon markets. Carbon markets are one of a line of conversions of parts of nature into tradable commodities, including water, biodiversity, fish, and wetlands (Bumpus and Liverman, 2008).

For carbon to be exchanged and generate revenue, carbon reduction must be turned into a tradable commodity (Bumpus and Liverman, 2008). Offsets are generally commodified into saleable units through development of specific emission–reduction projects, the outputs of which can be quantified, owned and traded. Examples include the management of forests specifically to sequester carbon (Bumpus and Liverman, 2008). Complex forest ecosystems must be simplified into discrete processes and objects in order to define, standardize, and universally agree on their carbon content (Boyd, 2009). In the process, a fictitious commodity (Polyani, 1944) is created in the form of “carbon credits” that are generated from emission reductions and international investments in emission reduction projects (Liverman, 2009).

In the course of “selling nature to save it” (McAfee, 1999), elite political and economic actors wield considerable power in negotiating prices and regulating market participation (Liverman, 2004). Many indigenous groups in the global south criticize carbon sequestration projects for their simplified portrayal of terrestrial systems and lack of information on the socio-economic, political, and institutional implications of carbon sequestration (Boyd,

2009). One concern is that carbon trading will allow the global North to maintain high levels of resource consumption by paying southern communities a pittance for offsetting carbon emissions generated by inefficient industries (Liverman, 2009).

2.2. Environmental narratives

The analysis of environmental narratives is a useful approach to examine the ways environmental issues are framed by showing how and why environmental problems are defined the way they are (Taylor and Buttel, 1992). An environmental narrative is a simplified explanation of cause and effect relationships that assigns roles to different actors who are implicated (or not) in an environmental problem. They are stories that simultaneously simplify and stabilize complex and uncertain processes such as “deforestation causes biodiversity loss” (Forsyth and Walker, 2008). Narratives influence the questions asked, the knowledge produced, and the policies and responses that are prioritized (Forsyth, 2003; O’Brien et al., 2007). They also reveal much about the politics of environmental knowledge (Boyd, 2009; Forsyth and Walker, 2008). The knowledge that informs environmental narratives is always conditioned by values, power relations, and institutional histories and commitments. Knowledge production is highly selective in terms of who participates in problem definition and policy making (Scoones, 2009; Forsyth and Walker, 2008). Like all narratives, environmental narratives shape popular perceptions and appeal to policy makers seeking simple solutions (Forsyth and Walker, 2008). It is important, therefore, to consider the broader contexts of legibility and simplification, as well as the political economic conditions that give form and meaning to narratives (Scott, 1998; Watts, 2002).

The case study of the Rufiji Delta contributes to a growing body of literature that illustrates how powerful political interests have embraced the neoliberal project of market environmentalism and employ environmental narratives to design an international response to climate change (Liverman, 2009). As states and international environmental NGOs act on these narratives, these stories transmute into “received ideas” (Leach and Mearns, 1996) and have real effects for local resource users. Mangrove carbon

forestry projects in the Rufiji Delta illustrate these dynamics. Environmental narratives that label human activities as “unnatural” and that portray landscapes in ahistorical terms as pristine or “Edenic” in which nature is emptied of humanity but filled with wildlife and vegetation are used to vilify local subsistence level resource users as mangrove “destroyers” and “invaders” (Neumann, 1998; West et al., 2006). In the following sections, we argue that the Tanzanian state and WWF’s portrayal of human–environmental relations represents a misreading of the environmental history of the Rufiji Delta. In contrast, we offer an historical account that portrays both the landscape and people in a very different light.

3. Rufiji Delta, Tanzania case study

The Rufiji Delta contains the largest continuous block of estuarine mangrove forest in Africa, and is of considerable economic and conservation importance (Bryceson, 2002). Our focus is on carbon forestry projects in the northern Rufiji Delta islands, referred to as the Rufiji Delta North (Fig. 1). Observations and semi-structured interviews in Rufiji Delta villages (mainly Mshinzi and Mchele⁴), with the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT), and WWF Tanzania representatives during doctoral dissertation fieldwork from 2008 to 2009, as well as continual communications with villagers through 2010, inform the case study.

3.1. Mangrove forest governance

All of Tanzania’s mangrove forests have protected status. The Forest Ordinance of 1957 allowed for the creation of forest reserves by government decree after considering any objections by interested parties to this de jure transfer of rights from local communities to the state (United Republic of Tanzania, 1994). The FBD of the MNRT is currently responsible for mangrove forest management. The Tanzanian state has repeatedly used its authority over mangrove forests to exert control over Rufiji Delta communities and resources. For example, on September 2, 1987, the Forestry Division declared a ban on the cutting of all mangroves in the northern Rufiji Delta (Semesi, 1992). To enforce this ban, the state trained and posted forest officers to the area. The 1998 National Forestry Policy was replaced by the 2002 Tanzania Forest Act which forbids any person, without a license or other lawful authority, to cut, burn, or damage mangrove trees in the forest reserve area. This includes a ban on the expansion or opening of new rice farms (Semesi, 1991). Further, the Mangrove Management Plan established in 1991 designates the majority of the north Rufiji Delta mangroves as “total protection zones” which legally restricts forest access to scientific uses and protective functions only (Semesi, 1991). These restrictions remain in force today.

In addition to employing forest guards to enforce its policies, the Tanzanian state established agreements with forest communities to jointly manage the forest reserves. In 1998, the FBD initiated a joint management agreement (JMA) with villages in the Rufiji Delta North Mangrove Forest Reserve (Akida and Blomley, 2006). Communities are divided into villages, which are managed by elected village councils (Blomley et al., 2010). The 2002 Forest Act recognizes two different types of participatory forest management (PFM) (Blomley et al., 2010). The first is community-based forest management (CBFM) that enables village-level communities to establish village, group or private forest reserves on village land in which communities are both forest owners and managers. The second type is joint forest management (JFM) which takes place on reserved forest land that is owned and managed by

the national or district-level governments (typically managed by the FBD). With the state and potentially other forest owners, village-level elected councils and environmental council representatives can sign joint management agreements (JMAs) for sharing the costs and benefits and responsibilities of forest management. Under this arrangement, village-level elected councils are “co-managers” of forests otherwise owned by the district or national governments. In theory, village governments have primary protection and management responsibility of the forest. The Forest Act of 2002, however, does not explicitly state how benefits of forest management under JMA are to be equitably shared with participating communities (Blomley and Iddi, 2009).

In Tanzania, research shows that there are few tangible benefits to villages participating in JMAs, especially in areas of high conservation value (e.g. Vihemäki, 2009 citing Kajembe et al., 2005; Blomley and Ramadhani, 2006). The paradox of the JMA project in the Rufiji Delta is that JMAs are presented as promoting “community participation” with Warufiji villagers, while at the same time the FBD prosecutes these same forest users for planting rice (Bryceson et al., 2005). For example, many Rufiji farmers were restricted from accessing JMA areas to grow rice because of mangrove reforestation policies. Rufiji villagers argue that their restriction has created conflicts and deprived them of their livelihoods (e.g. Bryceson et al., 2005; Akida and Blomley, 2006). Villagers also stated that the FBD now bears the sole responsibility of distributing licenses for logging mangrove poles. Villagers complain that their role as co-managers of forests is not taken seriously:

“We still have no say in how our forests are managed. The foresters still come here, fine us, and put us in jail if we are caught cutting mangroves for our rice fields. (JMA) agreements did not change things for us because we are still restricted from using the forests” (Personal communication, October 2010).

Despite their presence within the delta for over 2000 years, the existence of ancestral burial grounds, and villages that have been formally registered (NEMC, 1997), the Warufiji’s land rights remain highly uncertain. According to the Forest Ordinance of 1957, the Warufiji are regarded as “squatters” as they are occupying land declared as Forest Reserves (NEMC, 1997). Land tenure insecurity in Tanzania is further compounded by the National Land Policy (1995) which explicitly states that the President owns all land in Tanzania in trust for present and future generations and that the state can dispossess customary owners for “public interest” because land is “public property” (Shivji, 2006). Within forest reserves, the Director of the FBD recently stated that villages were registered “illegally and that directives have already been issued for the Commissioner of Lands and respective district councils to de-register the villages according to the Forest Act Cap 323 as revised in 2002” (Rugonzibwa, 2009).

3.2. REDD ready in Rufiji: climate change programs and proposals

The Rufiji Delta mangrove forests have attracted international attention for their conservation importance. The International Union for the Conservation of Nature (IUCN) designated the forests as part of the Rufiji-Mafia-Kilwa Ramsar wetland site in 2004 (IUCN, 2004). At the same time, WWF initiated the Rufiji-Mafia-Kilwa Seascape Program (RUMAKI) (WWF Tanzania, No Date). The RUMAKI Program aimed to address the “fundamental links between environment and poverty and between biodiversity conservation and sustainable livelihood development.”⁵ Initial

⁴ To protect our research subjects, we have changed the names of individuals and communities discussed in this paper.

⁵ See WWF Rumaki, Kilwa, Rufiji Seascape Programme Tanzania Factsheet, July 2004–June 2009, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011).

program goals included the “improved socio-economic well-being of coastal communities through sustainable, participatory, and equitable use and protection of their marine and coastal natural resources.”⁶

WWF recently shifted its emphasis in the Rufiji Delta from conservation-with-development to conserving ecosystem health, in which the human development component is significantly diminished.⁷ With funding from the Global Environmental Facility and the United Nations Environment Program, WWF has created a climate adaptation project called “Coastal Resilience to Climate Change” (Cook, 2009). For this project, WWF is working directly with the FBD (Cook, 2009).

This WWF mangrove conservation program is premised on the urgent need to improve the management and protection of mangroves, which are described as “the most critically threatened ecosystem in the world” (Cook, 2009). The program aims to “protect mangrove forests from the impacts of climate change, particularly sea level rise” (Cook, 2009). Project goals are to assess the vulnerability of mangroves to climate change impacts, and to develop and promote adaptation strategies that respond to these impacts (Cook, 2009). Adaptation strategies include reforestation with “climate smart” mangrove species (Cook, 2009). Project documents declare that one of the main “threats” to the mangroves is rice farming by local people (Cook, 2009).

To prepare for climate change, WWF is working directly with FBD officials at national and district levels to “replant and restore mangrove habitats degraded by illegal rice farming” in the Rufiji Delta North (Cook, 2009). District level WWF “adaptation coordinators” oversee and enforce mangrove reforestation in the Rufiji Delta North (Personal communication, FBD, January 2010). The FBD has been involved in mangrove reforestation in the Rufiji Delta since the establishment of the Mangrove Management Plan (Semesi, 1991). Some villagers describe the mangrove planting scheme as a long standing “tug of war” between themselves and the FBD. Renewed interest by WWF in the Rufiji Delta has intensified mangrove reforestation as a climate change adaptation strategy (Cook, 2009). The “Building Mangrove Resilience” reforestation project includes villages within the Delta North (Fig. 1). Many Rufiji Delta rice farmers stated they are resisting this mangrove reforestation project, particularly in their rice farms, by planting mangrove seedlings upside down or not planting them at all. Some villagers stated that they refused to plant mangroves because they were not given the choice. Villagers declared “tulilazimishwa” in Kiswahili, which translates to “we were forced or obliged” English (Awde, 2000) to plant mangroves. The consensus in one village, Mshinzi, is a formal “rejection” against the mangrove planting project. In another village, Mchele, the village leadership agreed to the project and a small number of villagers participate. The majority, however, are against the project. This reluctant group stated they would consider participating in mangrove planting project as long as they are able to continue rice cultivation, but most refuse to comply.

One villager stated, “How can they [WWF adaptation coordinators and the FBD] tell us to stop planting rice? We are hungry because they have taken away our daily bread.” WWF is aware of the Warufiji’s resistance to previous mangrove reforestation efforts as illustrated in a quote by a Warufiji rice farmer in a 2002 WWF publication, “We are really surprised by this government, we do not know what they are thinking about us.

We are required to plant mangroves in our paddy farms; will they send us food in the future?” (Wood et al., 2000: 320). Directly prior to the 2010 national Tanzanian elections, villagers from Mshinzi stated that mangrove reforestation strategies suddenly changed and they were given the choice to plant mangroves (Personal communication, October 2010). Meetings were held in Mshinzi village and elders warned that the handing out of small funds for planting mangroves was a “common tactic prior to elections” and “after the elections, things will change, and they [the FBD and WWF adaptation coordinators] will be against us [the villagers]” in terms of impeding villagers from farming rice. The village government and environmental council in Mshinzi stated that their decision to object to the project was superseded by higher authorities at the district level. The JMA co-management agreement exemplifies what Chhatre (2008) calls weak political “articulation” reflected in a lack of devolved power for decision making to representative and accountable local actors (Agrawal and Ribot, 1999).

In contrast to the WWF RUMAKI program’s emphasis on poverty alleviation through CBNRM, new carbon forestry management plans are threatening to deepen poverty through dispossession. The Rufiji Delta is listed as one of six WWF Tanzania REDD readiness sites for REDD Pilot Projects.⁸ REDD+ strategies for Tanzania list the “enhancement of state reserve lands” as a way to reverse the “drivers” (e.g. cultivation) of forest deforestation and degradation.⁹ This is exemplified by the FBD’s plans to begin a process of relocating rice farmers out of the delta.¹⁰ The Director of the FBD made a statement in September 2009 that villagers residing in Tabora and Rukwa regions of coastal Tanzania will be evicted for invasions of forest reserves (Rugonzibwa, 2009). The Deputy Minister of MNRT also stated that “eviction exercises will later spread to the rest of the forest reserves countrywide and all settlers in forest reserves would be moved as stipulated by the law” (Rugonzibwa, 2009). Current plans are for farmers to plant trees in areas previously used for rice cultivation until they are relocated out of the delta (Personal communication, January 2010). This will result in evictions of more than 18,000 Rufiji Delta North village residents (Fig. 1).

In order to minimize the political fallout over the controversial eviction plans, the timing of relocations was on hold until the conclusion of the national elections in October 2010¹¹ (Personal communication, December 2009). In the meantime, the FBD and WWF adaptation coordinators organized meetings with villagers in the northern Rufiji Delta to “sensitize” them to the relocation project (Personal communication, January 2010). The FBD informed villagers of “what the consequences will be and how severe they will be” (Personal communication, December 2009). In response to the “sensitizing campaigns,” village elders stated that they were trying to find documentation of their formal objections to the designation of the mangrove forests as Forest Reserves in 1957. Although village elders state that they “were not listened to at that time and there was no outcome,” such documentation is needed to mount a legal case in Tanzanian courts against planned evictions.

We argue that the objective of WWF’s carbon forestry projects¹² and the Tanzanian government’s eviction plans are to make the Rufiji Delta “REDD ready” (Tanzanian REDD Initiative, 2010). The

⁸ See footnote 1, “WWF Tanzania’s REDD Pilot Projects Sites” and related documents.

⁹ Tanzania’s National REDD Strategy Development: Supporting REDD Readiness in Tanzania, November 2009, http://www.reddtz.org/component/option,com_docman/task,doc_download/gid,22/Itemid,18/. (Accessed on 30 November 2011).

¹⁰ See footnote 2, “Report of the Meeting” and “Government Issues Eviction Order to Forest Invaders.” For an update, see footnote 3 “Finnigan Wa Simbeye Tanzania Daily News.”

¹¹ In January 2011, the FBD issued a two-week eviction order to all “invaders of reserved forests countrywide” including the Rufiji Delta (Kimati, 2011). For an update, see footnote 3 “Finnigan Wa Simbeye.”

¹² See footnote 1 carbon forestry programs.

⁶ See footnote 5, “WWF Rufiji, Mafia, Kilwa Seascape Programme.”

⁷ Compare the WWF RUMAKI Seascape project, <http://assets.panda.org/downloads/seascapefactsheet.pdf> (Accessed 30 November 2011), with the WWF “Building Mangrove Resilience” project, <http://www.climateprep.org/2009/12/04/building-mangrove-resilience-to-climate-change/> (Accessed 30 November 2011).

main donor for REDD+ in Tanzania is Norway which has committed NKR 500 million towards the formulation and implementation of a national REDD+ strategy in Tanzania over the next five years. The FBD of the MNRT, with technical support from the Institute of Resource Assessment (IRA), is responsible for coordinating aspects of REDD+ and REDD-readiness activities (Tanzanian REDD Initiative, 2010). The role of WWF in Tanzanian REDD+ projects is outlined in REDD+ project documents, which state that “WWF can have a key role to play in supporting the implementation of the [REDD] strategy”¹³ and “existing NGOs, may be in charge of overseeing the fair distribution of REDD+ funds through village level bodies in Tanzania” (Chiesa et al., 2009: 7). The threat of evictions and loss of access to important resources for livelihood security is another example of how international conservation interests can either directly or indirectly legitimate the state’s use of “force” in resource management and contributes to the disenfranchisement of the Warufiji’s resource claims (Peluso, 1993).

Tanzania is often heralded as the vanguard for local democratic forest resource management, due mostly to its decentralized state institutions (Blomley et al., 2010). Accordingly, Tanzanian REDD+ policies are currently being designed on existing forest management strategies such as joint forest management agreements (JMAS) (Burgess et al., 2010). However, we show how devolved decision-making in policy discourses do not necessarily lead to justice and equity in terms of resource access and actual local-level decision-making. Critiques of decentralized resource governance in Tanzania, particularly within the wildlife sector, are numerous and well documented by a number of scholars (Neumann and Schroeder, 1999; Igoe and Croucher, 2007; Igoe and Brockington, 1999; Goldman, 2003). This case provides a cautionary note for any REDD+ project modeled after a decentralized forestry scheme that is not decentralized in practice. It is a serious shortcoming in the context of REDD+ programs in Tanzania and elsewhere (Thomas and Twyman, 2005).

It is difficult to reconcile Tanzania REDD’s participatory and benefit sharing goals (United Republic of Tanzania, 2010; Tanzanian REDD Initiative, 2010) with the rhetoric, practices, and plans of the Tanzanian state. Indicative of the contradiction between REDD+ policy and Tanzanian forest management is the statement made by the Director of Forestry and Beekeeping Department in November 2009, “I am here to make sure that forests are protected and therefore I will not wait to see these forests turning into deserts and we will do all we can, including the use of force, because for such a serious matter as this one, we do not need negotiations” (Saiboko, 2009).

If REDD+ programs genuinely seek to apply “rights-based and participatory approaches” in practice, then forest-reliant communities’ calls for land tenure security and the development of compliance procedures and accountability mechanisms for its activities in Tanzania must be addressed (Griffiths, 2009). These same communities have been unable to benefit from payment for ecosystem services, such as Clean Development Mechanisms, because their land rights are not legally recognized (Blomley et al., 2010; Yanda, 2009). Therefore, the ambiguity around land tenure in forest reserves in Tanzania such as the Rufiji Delta legitimates concerns over scaling up REDD+ before land tenure is clarified (Sunderlin et al., 2009). In order for villagers to receive compensation directly from REDD+, the “legal quagmire” (Homewood, 2006 citing Shivji, 1994) of land tenure in Tanzania, particularly within Forest Reserves, must be addressed.

3.3. Environmentalists’ narrative of the Rufiji Delta

The conceptualization of carbon forestry projects in the Rufiji Delta builds upon a narrative of environmental change that is shared by international conservation organizations, the Tanzanian state, and aid donors. In this section, we present the common elements that frame this narrative. In the following section we offer an alternative reading of environmental history. Both the narrative and counternarrative demonstrate the centrality of politics and political economy in the framing of environmental problems and solutions.

The environmental narrative used by WWF and the Tanzanian state to support their carbon forestry activities pivots around the problem of adaptation to climate change (Cook, 2009; Wagner and Sallema-Mtui, 2010). The narrative has two major parts. The first is future oriented and predicts that a main consequence of global climate change will be a rise in sea level. The second part underscores the importance of maintaining the integrity of mangrove forests as both a bulwark against rising sea levels as well as to preserve biodiversity. The main problem in preserving the forests and its biodiversity is the presence of people who are viewed as “invaders” and “destroyers” of mangrove forests. Biodiversity loss is attributed primarily to illegal rice cultivation (Cook, 2009).

WWF project documents indicate sea level rise as the main climate change threat to mangrove forests in the Rufiji Delta (Cook, 2009; Wagner and Sallema-Mtui, 2010). The 2007 Intergovernmental Panel on Climate Change (IPCC) estimates a rise in sea level of 18–59 cm by the year 2100 (IPCC, 2007). The impact of sea level rise in the Rufiji Delta could be the loss of coastal habitats as a result of flooding and erosion, and the loss of biological productivity (Ngusaru et al., 2001; Wagner and Sallema-Mtui, 2010). Since mangrove forests are widely viewed as buffering the coasts from higher seas and storms, their preservation is a top climate adaptation priority.

The narrative of causality also paints a picture of relatively recent immigration and forest degradation in the north delta area. “In the past,” the people of the Rufiji Delta cultivated rice in the Rufiji valley flood plain (Ngusaru et al., 2001). After the “devastation” that occurred from a massive flood in 1968,¹⁴ when the Rufiji river level rose by ten feet, President Nyerere ordered the relocation of flood plain communities to the northern part of the delta. This resettlement program was known as the villagization campaign “Operation Rufiji.” The displaced farmers purportedly began clearing mangrove forests to “adapt rice farming in new areas in response to this rather adverse situation” thus causing a new and major threat to the mangrove forest in the Rufiji Delta North (Ngusaru et al., 2001: 10; Wagner and Sallema-Mtui, 2010: 7). The abrupt shift in the main course of the Rufiji River towards the northern part of the delta is also believed to have changed the patterns of erosion, deposition, and salt penetration.

The less saline conditions that were enabled by the aforementioned “northward shift of the Rufiji River flow” allowed farmers to expand rice cultivation into new areas in the Rufiji Delta North (Wood et al., 2000). In addition, the IUCN (2004) reports that the technique for the “environmentally unfriendly” and “illegal practice” of large scale cutting of mangroves for rice farming is said to hinder natural regeneration of mangrove forests due to alterations of the soil microclimate and the lack of seed-bearing trees as seed sources. The FBD Director expressed concern at a Southern African Development Community (SDAC) meeting on

¹⁴ Others argue 1978 marks the time period when the main flow of the Rufiji River was directed northward towards the Delta North (Wagner and Sallema-Mtui, 2010: 35). Also refer to “Report of the Meeting” (footnote 2).

¹³ See footnote 1, “United Republic of Tanzania, October 2010,” p. 19.

REDD in Arusha, Tanzania stating, “the rapid annihilation of the country’s green cover is now going out of control” (Nkwame, 2010). In REDD+ project documents, the Rufiji Delta North is cited as having one of the highest cultivation rates, making it the “main driver” of mangrove deforestation and degradation.¹⁵

The extent of deforestation is reported in a land cover change study by Wang et al. (2003). The authors found a 1769 ha decline in mangrove forest cover in the Rufiji Delta between 1990 (49,799 ha) and 2000 (48,030 ha). Using satellite images, this study attributes “agricultural practices” as the principle cause of mangrove forest loss. The study is cited in Tanzanian REDD+ documents to chart trends in mangrove destruction (Kilahama et al., 2009). This quantitative measure justifies urgency to both protect and reclaim the mangrove forest to the natural state that purportedly characterized the Rufiji Delta prior to the expansion of rice cultivation. The politics that stem from this narrative are the strict protectionist measures, including evictions that currently define Tanzanian forestry policy for the Rufiji Delta. The take home message of the narrative is that rice farming must be stopped and mangrove trees planted if the mangroves are going to provide the critical ecosystem services needed in the context of rising sea-levels and the development of carbon markets.

3.4. An environmental historical and scientific lens of the Rufiji Delta

The environmental narrative that informs Tanzanian REDD project documents and REDD-readiness activities is flawed in three fundamental ways. First, it inaccurately describes the history of movement and settlement of people in the Rufiji Delta North. The narrative paints a picture of a relatively recent immigration of people, but archival records show the delta to be a socio-natural landscape in which farming and intensive logging were widespread since at least the nineteenth century. The area was yielding at least two rice harvests per year and mangrove poles were traded within local, regional, and international circuits. Second, the environmental science and environmental history that informs the narratives are exceedingly shallow. They do not take into account the patchy nature of the Rufiji Delta landscape that is derived in part from the fluvial geomorphology and in part from human use. This patchiness is described by 19th century explorers, colonial foresters, and contemporary environmental historians. Lastly, the threat of sea-level rise for coastal Tanzania is uncertain.

The claim that contemporary rice farmers in the Rufiji Delta North are recent immigrants that date from the villagization campaigns in 1968–1974 is historically and geographically inaccurate. The area where the villagers were planned to be relocated was not in the northern part of the delta, but further inland on higher and infertile escarpments referred to by Havnevik (1993) as North Hill (Fig. 1). Delta residents refused to comply with the government orders to move away from the fertile flood plain they had cultivated for generations (Sandberg, 1974; Sandberg, 2010). Rather than being recent immigrants, the Warufiji have populated the delta for centuries.

The Warufiji’s refusal to leave the area during villagization is consistent with a long history of resistance to outside influences. The British consul to Mozambique, James Elton, visited the Rufiji Delta North in the late-1870s. In Elton’s account of his travels, he stated that the “Rufiji sell but few slaves to the Arabs, who do not care to meddle with them” (Elton, 1879: 100). The most dramatic example of the Warufiji’s resistance to external claims on their labor and resources was their resistance to the forced cotton cultivation policies of the German Colonial Government in 1902. The brutality of forced cultivation and its effects on rural livelihoods led to the largest peasant uprising in colonial Africa

known as the Maji Maji rebellion (1905–1907) in which over 75,000 Africans were killed. Sunseri (2003, 2005, 2009) argues that the Maji Maji rebellion was sparked by the Warufiji’s refusal to recognize the colonial state’s claims to forest resources and their resistance to wage labor as wood cutters and tree planters for German colonial foresters. The Warufiji were also considered by President Nyerere to be the most supportive against the British in the struggle for Independence (Hyden, 1980). In 1996–1997, the Warufiji resisted attempts of foreign investors to build the world’s largest industrial prawn farm in the delta. This history of delta resistance is tremendously important for what we might anticipate if the proposed evictions take place.

In contrast to environmentalists’ portraits of an “Edenic” landscape prior to the 1970s, late 19th century explorers encountered a working landscape in the Rufiji Delta. The history of the region is intimately tied to the development of the coastal Swahili culture based on nearly two thousand years of trading connections between Zanzibari, Somali, Arab, Persian, and Indian traders and the coast (Havnevik, 1993; Chami and Msemwa, 1997). After 1730, the Omani engaged in extensive trading along the East African coast for mangrove poles. James Elton documented extensive settlements and trade during his travels along the Rufiji River in 1879. In the Rufiji Delta North, he described villages as “well built and populous near mangrove creeks in order for the large important trade for copal, ivory, wax, woods, and grain” (Elton, 1879: 91). In 1881, William Beardall was commissioned by the Sultan of Zanzibar to collect information of the country and people of the Rufiji Delta (Beardall, 1881). He described the Rufiji Delta North as “avenues of mangrove trees with inhabitants beginning to get in their second crop of rice” (641). In 1901, the German Captain Prussing also navigated through the same area and described loading places for wood and very suitable land for rice growing (Anonymous, 1901). In 1938, a British colonial forester stated that the area supported native villages, Indian and Arab shops, and some “good agriculture” (Grant, 1938).

Coastal traders highly valued mangrove poles from the Rufiji Delta. In the late 19th century, Rufiji was the main source of the mangrove trade for the Red Sea and Arabia (Sunseri, 2009). In 1899, the Sultan of Zanzibar had the right to exploit the Rufiji Delta for mangrove poles free of charge, despite the area being under control of the German Forest Department. At this time, fleets of Arab and Persian dhows that could load up to two hundred mangrove poles landed in the Rufiji Delta to load wood. Eighty to ninety percent of all wood exported from German East Africa originated in the Rufiji Delta (Schabel, 1990). In a five-month period from 1902 to 1903, the colonial government consumed approximately 280,000 logs of varying lengths for its steam engines (Sunseri, 2009). To maintain these forest resources, silviculture became a common practice. The German Forestry Department planted mangrove species for which demand was greatest. Merchants also prized the bark used for tanning and making resins (Barker, 1936). By the end of German rule, up to 78 percent of all mangroves in German East Africa were leased to bark exploiters (Sunseri, 2009). Mangrove forest exploitation accelerated considerably in the 1940s under British rule. In 1948, a mangrove concession was considered to be a “gold mine” (Havnevik, 1993).

A second theme in the environmental narrative of mangrove forest destruction is centered on flooding. A massive flood is believed to have caused an abrupt change in the Rufiji river course northward bringing freshwater to areas that were previously too saline to cultivate. This component of the narrative neglects the historical accounts of rice cultivation as well as the dynamic ecosystems of river deltas. All river deltas continuously change their flow patterns and courses at differing scales in time and space (Sandberg, 2010). Furthermore, fluctuations and variability in

¹⁵ See footnote 9 “Tanzania’s National REDD Strategy Development.”

flooding has occurred throughout the Rufiji river delta's history with new patterns of flooding every year, particularly during the long rains, that bring fresh water to places that were previously too saline (Marsland, 1938; Havnevik, 1993). Despite a continuous change in the patterns and courses of the Rufiji river delta, all of its river mouths tend to turn northwards as they reach the coast due to the overall net northward long-shore drift.

The Warufiji's complex shifting rice cultivation practices rely on this historical seasonal variability. They combine mangrove silviculture with rice paddy farming by abandoning rice paddy fields when they become too saline due to seasonal changes (small temporal scale) or river course changes (long temporal scale). Thus, Warufiji rice farmers plant and farm rice seasonally in relation to their predictions for salinity changes. It also makes it impossible for the Warufiji to grow rice everywhere at all seasons. Moreover, the closer to the mouth of the Rufiji River the greater the exposure is to salt water intrusion which reduces the area suitable for growing rice. The Warufiji also allow the mangroves to regenerate naturally while preparing new rice fields in less saline areas. Mangroves have a great propensity to regenerate themselves (Primavera, 2009). Natural regeneration of mangrove forests also contributes to higher biodiversity than silviculture, which often involves the planting of just a few species.

This extensive use of the Rufiji Delta North for farming, fishing, logging, and forestry demonstrates that the mangrove forests were a highly utilized environment that could hardly be described as "Edenic." Furthermore, the restrictions placed on mangrove forest land use by the FBD demonstrates how current land use in the Rufiji Delta North is not nearly as extensive as it was during the 18th and 19th centuries and even earlier. This environmental history illustrates how (1) it is problematic to suggest that a single major flood event would cause such an abrupt change in the course and direction of rivers in the Rufiji Delta to allow penetration of freshwater into an entire area it previously did not reach; and (2) Warufiji land use (e.g. rice cultivation) patterns take a mosaic form that mirrored the flooding, silting, and shifting river pattern.

In light of this mosaic land cover pattern, it is difficult to imagine the extent of environmental degradation projected by Wang et al. (2003). Mangrove vegetation is quite patchy, especially across multiple intersecting gradients of elevation, water and salinity levels, soil types, and wave exposure. These gradients affect the species composition, size, and growth patterns of mangrove trees on scales that are much finer than the satellite imagery resolution of 15 m and 30 m used by Wang et al. (2003). It is difficult to define the outer boundaries of a mangrove, and impossible to delineate the variations within a mangrove forest. One indicator of the difficulty in measuring land cover change in Tanzanian mangrove forests is the contradictory data. The World Mangrove Atlas (Spalding et al., 1997; Spalding et al., 2010), indicates that total mangrove forest cover in Tanzania has increased from 1155 km² in 1993 to 1286 km² in 2010.

The anticipated impacts of climate change, particularly sea-level rise, are considered to make conditions even more precarious for mangroves and heighten the urgent need to improve their management and protection (Cook, 2009). Using recent data from the University of Hawaii Sea Level Center, Benjaminsen et al. (2008) show that sea level in Tanzania is not rising. In fact, it appears to be falling. Mean sea level fall in the southern Indian Ocean are also corroborated by Wenzel and Schroter (2010), Woodroffe and Horton (2005), and Woodworth et al., 2007. Falling rates of sea-level are attributed to the rise of the coastline from thousands of years of tectonic plate movements associated with the East African Rift Valley (Benjaminsen et al., 2008). Therefore, at present, the Tanzanian coastline does not appear to be threatened by sea-level rise. Assumptions to the contrary do not take into consideration tectonic plate movements.

The long-standing practice of shifting rice cultivation combined with natural regeneration may have positive implications for biodiversity by creating minor perturbations and small changes and openings within environments as well as new niches for a wider variety of plant and animal species. These subsistence rice farming systems have also been recognized for at least two centuries in the Rufiji Delta and demonstrate that Delta North is an agroecological landscape. Thus, the question arises is what will happen to this complex and relatively stable socio-ecological system when carbon foresters and conservationists supplant the Warufiji in the Rufiji Delta North?

4. Revisioning REDD through an environmental justice lens

This paper has focused on the politically charged issues of environmental justice in the Rufiji Delta of Tanzania in the context of WWF and Tanzanian state carbon forestry programs to make the Rufiji Delta North "REDD ready." We have shown how in the case study of the Rufiji Delta, carbon forestry activities unfolding in anticipation of REDD+ are redolent with environmental injustices that threaten the livelihoods of the Warufiji. Our findings are four-fold. First, this case study validates the social and environmental justice concerns within the global climate change mitigation and adaptation literature associated with carbon forestry (Griffiths, 2009; Sikor et al., 2010). It shows how carbon forestry initiatives are redefining socio-natural relations in ways that threaten access to, control, and management of natural resources. In the process of making the Rufiji Delta "REDD ready" for carbon forestry markets, resource control and management appear to be shifting from local people in the Rufiji Delta to global actors.

Second, the study also demonstrates the ways this local to global shift in resource control and management are legitimated by narratives of environmental change (forest loss; rising sea levels) that have little basis in environmental history. Along with Sunseri (2009), we have demonstrated how the depiction of the Warufiji as invaders and destroyers of mangroves and forest loss as recent and abrupt, "erases the history of these forests as peopled spaces" (184). This misreading of the Rufiji landscape persists because it is central to the framing of environmental problems in ways that allow national and global actors to intervene in the landscape and livelihoods of the Warufiji. When this narrative is placed in the context of rising sea levels, it suggests an urgent need for intervention. In contrast, to this environmental crisis narrative, our case study suggests that the mangrove forests of the Rufiji can be reasonably described as sustainably utilized environments particularly when compared to historical forest use (e.g. timber extraction during pre-colonial and German colonialism). This re-reading of landscape and history reveals the injustices in current interpretations and recommends a conservation-with-development approach that supports existing practices of the Warufiji rather than their forcible removal from the forest.

Our third finding is that the Warufiji are resisting efforts to make the Rufiji Delta North "REDD ready" on the grounds that these efforts will increase their vulnerability and displacement. The Warufiji have a long history of resisting the claims on their labor and resources by outsiders. This begs the question in the formulation of REDD+ strategies, what incentives do REDD+ programs actually provide in order to change a history of resistance? The core issue at stake is the Warufiji's historical rights to land and water resources which national land laws and forest acts sometimes respect and sometimes reject. This is particularly relevant to the ability of REDD+ programs to constrain deforestation without seriously compromising food and livelihood security (Grieg-Gran, 2010).

Lastly, our case study legitimates concerns posed by Phelps et al. (2010), "does REDD+ threaten to recentralize forest

governance?” REDD+ sees decentralization of forest resource management as the key to empowering local communities. However, the Rufiji Delta case study reveals that the Warufiji have very limited representation with accountability and reduced access to significant material resources (Ribot et al., 2008). WWF, on the other hand, gains power by aligning itself with the Forestry and Beekeeping Division, while resisting downward accountability (Poteete and Ribot, 2011). Thus, resistance may be the only means for many Warufiji to defend themselves against the menace of REDD+, if it is implemented based on current carbon forestry governance in the Rufiji Delta. In order for REDD+ to result in both sustainable forestry and poverty reduction, the historical exclusion of forest-reliant communities from land ownership must be addressed. Equitable distribution in the form of securing the Warufiji's land tenure rights to resources is of primary concern. To carbon traders, however, an uninhabited forest greatly simplifies the logistical tasks of monitoring and paying for ecosystem services. The case study of the Rufiji Delta suggests that this “new direction in forest conservation” (Anglesen, 2009) may be overwhelmingly opposed by the people who stand to lose the most from such climate mitigation schemes.

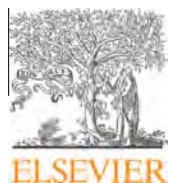
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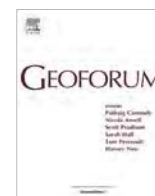
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Virtual nature, violent accumulation: The ‘spectacular failure’ of carbon offsetting at a Ugandan National Park



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ABSTRACT

In East Africa, financially strained governments increasingly experiment with voluntary, market-based carbon offset schemes for enhancing the public management of protected areas. Often, conservationists and governments portray these as ‘triple-win’ solutions for climate change mitigation, biodiversity preservation, and local socioeconomic development. Examining such rhetoric, this paper analyses the rise and decline of an integrated carbon offset and conservation initiative at Mount Elgon National Park in eastern Uganda, involving a partnership between the Uganda Wildlife Authority (UWA) and a Dutch NGO, Face the Future. In doing so, the paper reveals the ways in which the uncompensated dispossession of local residents was a necessary precondition for the project’s implementation. Although external auditors expected the project to sequester 3.73 million tons of carbon dioxide equivalent (tCO₂e) between 1994 and 2034, conflicts forced the scheme to cease reforestation in 2003. Noting this rapid decline, we problematize the ways in which Face the Future and other carbon market intermediaries represented their activities via project documents and websites, obscuring the violence that was necessary for the project’s implementation. In so doing, we argue that the maintenance of a ‘triple win’ spectacle is *itself* integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capacity of carbon market brokers to accumulate exchange value by attracting ‘green’ investors. Consequently, what we term a ‘spectacular failure’ manifests in at least two ways: first, in the unravelling of the heavily mediated spectacle of harmonious, profitable conservation, and, second, in the deleterious nature of the consequences that accrue to local communities and ecosystems alike.

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Introduction

Upon visiting greenseat.nl, the homepage of a Dutch organization that markets carbon offset services to airline, train, and bus passengers, one is immediately greeted with an imperative to ‘travel greener now!’ On this website, and at the mere click of a mouse button, consumers ostensibly pay for both a clear environmental conscience and a healthier atmosphere. At present, GreenSeat markets carbon offsets derived from ‘voluntary’ clean energy projects, such as those involving solar and wind power. Between 1993 and 2003, however, the organization allegedly sold offsets sourced from tree plantations sponsored by a Dutch NGO – now known as ‘Face the Future’ – at Mount Elgon National Park in Uganda (Checker, 2009; Faris, 2007; Lang and Byakola, 2006; Sullivan, 2011).¹ Today,

by contrast, one cannot find mention of this initiative in the websites or organizational literature of either GreenSeat or Face the Future. Similarly, recent studies of conservation at Mount Elgon make little or no mention of the project and its relationship to the history of forest governance in the region (Norgrove and Hulme, 2006; Petursson et al., 2011; Petursson et al., 2013a,b; Sassen and Sheil, 2013; Sassen et al., 2013).² What happened? Examining the disappearance of this project from global ecosystem service markets, this paper analyses the rise and decline of Face the Future’s scheme at Mount Elgon; the problematic ways in which it represented its operations via the internet; and the violence that was simultaneously experienced by local people.

Such an inquiry is warranted, we claim, given that similar attempts to link Ugandan protected areas to a global “economy of repair” (Fairhead et al., 2012, 242) through carbon markets have decidedly exhibited what MacDonald (2013) – following the philosophers Peter Sloterdijk and Slavoj Žižek – terms “cynical

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¹ ‘Face the Future’ was originally known as the Forest Absorbing Carbon Emissions (FACE) Foundation (see also Lang and Byakola (2006) and <http://www.face-thefuture.com>).

² Sassen et al. (2013, 260) note the existence of the UWA-FACE project in a summary table of the last one hundred years of conservation governance at Mount Elgon, but do not further examine or explain its disappearance.

reason”, or strategic attachment to a disingenuous set of rhetorical claims. Differently put, although brokers of the voluntary carbon market frame these initiatives as a ‘triple-win’ for biodiversity conservation, climate change mitigation, and socioeconomic development (National Forestry Authority [NFA], 2011; Uganda Wildlife Authority [UWA], 2011), a growing body of evidence documents the deleterious consequences of forest conservation for local populations in both Uganda and elsewhere in East Africa (Benjaminsen and Bryceson, 2012; Benjaminsen et al., 2013; Beymer-Farris and Bassett, 2012; Brockington, 2002; Gardner, 2012; Igoe and Croucher, 2007; Nel and Hill, 2013; Neumann, 1998; Norgrove and Hulme, 2006). Likewise, NGOs and activists have published controversial accounts of the dispossession of rural populations for Ugandan carbon offset forestry projects in particular (Friends of the Earth, 2012; Lang and Byakola, 2006; Nel and Sharife, 2012), including the notable case of more than 20,000 people allegedly evicted for a project managed by a British firm, the New Forests Company (Carrere, 2009; Oxfam International, 2011). In such instances, it would appear that these exploitative attempts to pursue carbon offset forestry in Uganda are emblematic of both ‘green grabbing’ processes (Fairhead et al., 2012) and the ‘global land grab’ more broadly (e.g. Borras et al., 2011).

The primary objective of this paper, however, is not *only* to present an empirical account of green grabbing. Additionally, we focus on what Corson et al. (2013, 5) term “grabbing green”, or on the various “inter-relations, systemics, logics, and mechanisms” that both UWA and Face the Future have utilized to pursue their respective agendas under a global environmentalist mandate, and how these mechanisms ultimately unravelled. Indeed, these organizations’ representation of carbon offset forestry as a ‘triple win’ is no simple task, as it necessarily entails the enrolment and stabilization of a vast network of actors, technologies, expertise, and institutions. In other words, these projects denote the need for “socially necessary abstractions” (Robertson, 2012, 389), or the conceptual output of processes of measurement and representation that allow certain aspects of ecosystems to be isolated, standardized, and circulated through markets. Crucially, the production of these abstractions is a profoundly *virtual* process, or an attempt “to make the world around us look like and conform to an abstract model of it” (MacDonald and Corson, 2012, 160). Such virtualism has characterized efforts to conserve biodiversity at least since the colonial era (West et al., 2006), in which fundamentally Western or ‘modern’ (Latour, 1993) conceptions of the distinction between nonhuman ‘nature’ and human ‘society’ were territorialized in the form of protected areas (Adams and Hutton, 2007). Yet, new technologies add a novel dimension to these already virtual processes, best encapsulated perhaps by the term “Nature 2.0” (Büscher, 2013). Through conservation websites and blogs, social media platforms like Facebook, Twitter, and Youtube, and the integration of conservation finance into everyday consumptive practices (Igoe, 2013), consumers increasingly experience nature itself as a spectacle, or as a series of consumable images and representations (Sullivan, 2013).³ In many ways, conservation has thus become ‘spectacularized’, generating profits through what we might term ‘spectacular accumulation’ (Igoe, 2010, 378; Tsing, 2000, 139), as it increasingly relies upon an array of mediating technologies to link capital with the often-distant places that it is now meant to conserve.

In relation to the synthesis of carbon offsetting and more conventional forms of biodiversity conservation, spectacular

³ See, for example, the new website launched by the Uganda Wildlife Authority with assistance from USAID’s Sustainable Tourism in the Albertine Rift (STAR) programme, featuring built-in connectivity for a variety of social media platforms, as well as endorsements from TripAdvisor, CNNTravel, National Geographic, and Lonely Planet (<http://ugandawildlife.org/>).

accumulation operates through representations of the presumed global commensurability of greenhouse gas emissions (Bumpus and Liverman, 2011; Fairhead et al., 2012). That is, through a series of abstractions that allow one tonne of carbon dioxide equivalent (tCO₂e) emitted by industry in the Global North to be rendered as precisely equivalent to another sequestered by forests (or via an alternative scheme) in various ‘frontier’ (Tsing, 2005, 59) regions of the Global South. This point should not be misunderstood as a methodological critique – we do not question that forests at least temporarily sequester carbon dioxide in the amounts estimated by project managers, although many analysts have raised salient technical issues related to carbon leakage and permanence (Ascui and Lovell, 2011; Bachram, 2004; Galik and Jackson, 2009; Lovell and Liverman, 2010). Rather, we contribute to this rapidly growing literature by arguing that spectacularization constitutes a *necessary* component of the production of a carbon offset. As we will see, the maintenance of a ‘triple win’ spectacle is itself integral to the management of carbon sequestration projects, as it provides consumers with a form of ‘ethical’ use value, and greatly enhances the capability of carbon market brokers to generate exchange value by attracting ‘green’ investors. Consequently, when these projects fail to maintain a coherent triple-win representation, what we term a ‘spectacular failure’ manifests in two interrelated ways: first, in the unravelling of the heavily mediatized imagery of harmonious, profitable conservation, and, second, in the extent of the deleterious consequences that accrue to local communities and ecosystems alike.

This argument is supported in five sections. First, we examine recent approaches to the political ecology of carbon offsetting, and draw particular attention to the ways in which these processes necessarily involve spectacular forms of accumulation. Second, we highlight the ways in which the violent and uncompensated dispossession of local residents was a necessary precondition for the UWA-FACE project’s implementation, effectively constituting a process of interrelated accumulation and *naturalization* by dispossession. Third, we identify a number of antinomies between the ‘triple-win’ rhetoric that characterized the FACE Foundation’s literature with UWA’s struggles to contain local resistance and legal challenges to conservation in the area. Fourth, we specifically examine the ‘spectacular failure’ of the UWA-FACE project at Mount Elgon, and present findings regarding the impacts of these activities on both forest plantations and local communities. Finally, we conclude with a discussion of the implications of these events for other proposed schemes to trade in carbon offsets over voluntary markets in East Africa and elsewhere.

Virtual nature, or: Why carbon forests have spectacular social lives

Much recent work in political ecology has critically engaged with the production of ostensibly ‘socio-natural’ commodities (Arsel and Büscher, 2012; Büscher and Arsel, 2012; Büscher et al., 2014; Fletcher, 2012; Peluso, 2012; Roth and Dressler, 2012), and especially so within the politicized context of global environmental change (McAfee, 2012; Peet et al., 2011). Following influential conceptualizations by Castree (e.g. 2003b, 2008) and McCarthy and Prudham (2004), these inquiries increasingly share an interest with the ways in which new ‘green’ markets result in both the reproduction of old-, and the generation of new-, inequalities, dispossessions, or restrictions of access to natural resources (Büscher et al., 2012; Fairhead et al., 2012). Interestingly, then, rather than constituting a radical limit for capital accumulation (O’Connor, 1988), this literature interrogates the ways in which the environment frequently now provides a new frontier for the generation of surplus value (Sullivan, 2013), and/or a

'spatial-environmental fix' for the resolution of intertwined economic and ecological crises elsewhere in the capitalist system (Harvey, 2003; Smith, 2007). Consequently, these concerns further compound related discussions about both climate and environmental justice, which seek to prevent the mitigation of largely Northern-induced processes of global environmental change at the expense of vulnerable communities in the developing world (Agarwal and Narain, 1991; Beymer-Farris and Bassett, 2012; Marino and Ribot, 2012).

To understand the complex ways in which these concerns intersect with the production of carbon offsets, however, we must first examine the basic character of these commodities, which is simultaneously both 'social' and 'natural'. For example, Bumpus (2011, 616) notes four distinct, yet simultaneous, 'types' or dimensions of existence for each individual carbon offset:

"the carbon that continues to be emitted by the offset buyer (type 1); the carbon that would have been emitted if it had not been displaced by the project activity (type 2); the lower emissions as a result of the project activity (type 3); and the tCO₂e (type 4) that is produced by the difference in emissions as a result of the project activity and baseline."

Here, we see that a carbon offset is primarily relational or 'hybrid' (Castree, 2003a), as it necessarily problematizes the conceptual nature-society distinction that Bruno Latour (1993, 29) terms the 'modern constitution'. In the case of reforestation projects, for example, tCO₂e have a material existence in the sense that it is possible to measure the amount of carbon dioxide that is stored in a given portion of forest (Ascui and Lovell, 2011). However, a given tCO₂e stored in forests is not, clearly, the very same tCO₂e that was released elsewhere in the world. Consequently, in contrast to the biophysical sequestration of carbon dioxide, the production of a carbon offset is co-dependent on the (often transnational) construction of relationships between those who emit, those who sequester, and the ecosystems and technologies enrolled by both. If one of these components functions as required, but another falters, the carbon offset unravels as an entity and ceases to exist.

Such co-dependency forces proponents of carbon offsetting to constantly engage in acts of "translation" in order to keep these relationships functioning smoothly (Mosse, 2005, 9). Project managers must constantly employ measurement, certification, and accounting technologies in order to assure the consumers of carbon offsets that they are, in fact, purchasing something that exists (Ascui and Lovell, 2011; Lovell and MacKenzie, 2011). Yet, for offsetting arrangements that involve afforestation or reforestation, carbon is 'uncooperative' in the sense that it is significantly more difficult to measure and quantify than with other technologies (Bumpus, 2011). This is particularly true in contrast with, for example, the destruction of industrial gases like nitrous oxide and hydrofluorocarbon-23, which is an inherently more controllable and measurable process (Lovell and Liverman, 2010, 258). In particular, forestry projects are specifically afflicted by the twin problems of 'leakage' and 'permanence'; whereas 'leakage' refers to the possibility that deforestation activities will simply be displaced outside the project area, 'permanence' refers to the omnipresent risk of stored carbon being released through fire, disease, pests, human encroachment, or a variety of other contingencies (Galik and Jackson, 2009; Wunder, 2008). Thus, for Bumpus and Liverman (2011, 210), a carbon offset is best conceived as being created through a process of "hemming in" that involves the use of monitoring procedures, baseline calculations, guarantees of

additionality, and robust offset methodologies. When these components become more loosely coupled, the offset's own existence becomes less certain. Consequently, we again see how the existence of a carbon offset is inseparable from the collective functioning of biophysical systems, mediating technologies, and the 'social work' of monitoring, evaluation, auditing, and disseminating results to prospective consumers through interactive websites, applications, and blogs.

We note, moreover, that it is precisely in relation to the latter task that the business of carbon offsetting necessarily proceeds through practices of spectacular accumulation. Here, we do not draw a simple distinction between 'actual' empirical realities and falsely spectacular representations of these by conservationists and their financiers. Rather, following Igoe's (2010, 376) reading of Debord (1967) and Tsing (2000, 2005), spectacles are "not different and separate from the conditions that they portray, they are produced by them and, in turn, define and reproduce them." As such, we instead encounter a virtual relationship between the biophysical world and instrumental representations of it, wherein the spectacle of 'pristine' carbon-sequestering landscapes enables the generation of resources to both create new enclosures and more effectively govern existing ones. In other words, financial transfers for carbon offsetting must be "imagined" or "conjured" before they can be actualized, creating a situation in which, as Tsing (2000, 118) puts it, "[t]he more spectacular the conjuring, the more possible an investment frenzy."

Hence, although conservationists' attempts to produce such an 'investment frenzy' have rendered a commodified version of African 'nature' more visible to international audiences than ever before, this spectacular set of images and representations is thoroughly fetishized. Of course, for Marx (1995 [1867], 47), commodity fetishism refers to the ways in which capitalist production masks the social relations implicated in the production of a particular good or service, where "the relation of the producers to the sum total of their own labour is presented to them as a social relation, existing not between themselves, but between the products of their labour." In other words, fetishism occurs when commodities are consumed "without reference to the relationships and contexts from which they were produced" (Igoe, 2010, 378). In the case of markets for ecosystem services, therefore, fetishization obscures the ways in which both legal and extra-legal violence and dispossession are often necessary to implement the land use changes required for the production of carbon offsets and similar commodities (Peluso and Lund, 2011; Springer, 2013).

When the political-ecological relations of exploitative carbon offsetting initiatives are rendered visible, however, what we will term a 'spectacular failure' ensues. This entails, first, the unravelling of the heavily mediatized imagery of harmonious, profitable conservation often presented in websites and project documents. Yet, such failures are also 'spectacular' in an additional sense; that is, in the extent to which they reveal an enormous gap between 'representation' and 'execution' in project activities, and the ways in which this gap entails deleterious consequences for local communities and ecosystems alike. Subsequent portions of this paper provide an empirical discussion of such a 'spectacular failure' by analysing a voluntary carbon offset and conservation scheme at Mount Elgon National Park (MENP), known as the Uganda Wildlife Authority-Forest Absorbing Carbon Emissions (UWA-FACE) project. In doing so, we seek to problematize the ways in which the UWA-FACE project represented the political-ecological relations that governed the project's sequestration of carbon dioxide to prospective consumers of the resulting carbon credits.

Naturalization by dispossession? The commodification of carbon sequestration at Mount Elgon, Uganda⁴

In 1992, a Dutch NGO – the Forest Absorbing Carbon Emissions (FACE) Foundation⁵ – approached the Ugandan Ministry of Trade, Tourism, and Industry (MoTTI) with a proposition to reforest degraded sections of the Mount Elgon Forest Park.^{6,7} The FACE Foundation knew that many of Uganda's protected areas were severely degraded during the tumultuous post-independence period, and during the civil war that eventually brought current President Yoweri Museveni to power in 1986. At Mount Elgon, this damage was particularly substantial, as approximately 25,000 ha of the reserve's forest cover were lost during this time (Norgrove and Hulme, 2006; White, 2002). Since Uganda's economy also suffered greatly during this period, few internal revenues were available for the rehabilitation of national parks and forest reserves. Indeed, the World Bank notably ranked Uganda as the worst performing economy in Sub-Saharan Africa for the period between 1961 and 1989 (Norgrove, 2002, 70–71), and the implications for the government's capacity were understandably substantial.

As a result, the MoTTI favorably received the FACE Foundation's interest in Mount Elgon. According to the original contract between these two parties (FACE Foundation, 1992), FACE agreed to cover the costs of reforestation, including those incurred for labor and procurement. In return, the MoTTI and its subsidiary, Uganda National Parks (UNP),⁸ were required to relinquish the rights to market the carbon dioxide stored in the new forest compartments, and to guarantee the security of these new plantations for a period of 99 years. Further, the contract stipulated that these compartments would sequester a minimum of “5500 kg CO₂ per hectare per year” (FACE Foundation, 1992, 7). As noted earlier, carbon credits generated by this scheme were also allegedly marketed via a Dutch organization known as GreenSeat – which sells voluntary carbon offsets to airline, bus, and rail passengers – and its parent organization, the Climate Neutral Group (Checker, 2009, 46; Lang and Byakola, 2006, 9; Sullivan, 2011, 336). As such, prospective consumers were ostensibly invited to “travel greener” by purchasing carbon credits from the FACE Foundation's plantations at Mount Elgon (GreenSeat, 2012).

Presumably unbeknownst to many potential consumers, however, the Dutch Electricity Generating Board (known as ‘N.V. Sep’) originally established the FACE Foundation in 1990 (FACE Foundation, 2000, 2001a). Officially, N.V. Sep's objective was to ensure that the foundation would “provide enough CO₂ credits from afforestation and reforestation projects to offset the CO₂ emissions from a new coal fired power station” in the Netherlands

(Société Générale de Surveillance [SGS] Agrocontrol, 2001, 4).⁹ Although the FACE Foundation formally “decoupled” from N.V. Sep in 2000 (FACE Foundation, 2001a), European electricity firms apparently continued to constitute a large portion of the FACE Foundation's clientele (FACE Foundation, 2000, 2001a). Unsurprisingly, the organization generally downplays this connection with coal-fired electricity generation, and asserts that its main objective “is to establish and protect forests [...] sustainably and responsibly, in suitable areas, wherever in the world, and by so doing to contribute to reducing the amount of CO₂ in the atmosphere” (FACE Foundation, 2001a, 2). Thus, although the organization is ‘non-profit’ in a strictly technical sense, the foundation is only thinly separated from the for-profit apparatus of N.V. Sep and its other clients, who increasingly seek to reduce environmental criticisms of their operations without changing the core of their business practices, perhaps also increasing their competitiveness over firms that are not so ‘environmentally savvy’ in the process.

In the early 1990s, this type of contract was virtually unprecedented in sub-Saharan Africa. Indeed, the world's first voluntary carbon offset arrangement was implemented only a few years prior in 1989, in an agreement signed between the AES Corporation (a US electricity firm) and an agroforestry project in Guatemala managed by CARE International (Bumpus and Liverman, 2008, 133). Also a pioneer, the FACE Foundation had established a carbon offset forestry projects in Ecuador in 1990 (Bumpus, 2004), and perceived Uganda's newfound political stability as a potentially feasible entry-point for expanding their operations to East Africa. Given that the UNFCCC itself was only established after the Rio Earth Summit in 1992, and the Kyoto Protocol even later in 1997, these activities long preceded the ‘compliance’ carbon offset schemes initiated under the framework of the UNFCCC and its Clean Development Mechanism (CDM). As the ensuing discussion aims to show, however, the ‘triple-win’ spectacle of the FACE Foundation's project was undermined by the manner in which its activities were ultimately implemented. Specifically, the violent evictions that characterized this process of (re)naturalization on Mount Elgon suggest that one might accurately describe these events as a form of “primitive accumulation” (Corson and MacDonald, 2012; Kelly, 2011), or environmentally-justified “accumulation by dispossession” (Benjaminsen and Bryceson, 2012; Fairhead et al., 2012). This holds both in relation to the outright enclosure of land and resources, and the alteration of conservation institutions in ways that restricted local access to livelihood-supporting resources such as water, fuelwood, and non-timber forest products – all the while creating new sources of income for UWA and the FACE Foundation.

Accumulation by dispossession, selective history, and the (re)production of ‘nature’ at Mount Elgon

Within a year of the original MoTTI-FACE Foundation contract being signed in November 1992, the Ugandan government resolved to upgrade Mount Elgon to national park status, and to remove ‘encroachers’ from within its boundaries (Gosalamang et al., 2008; Norgrove and Hulme, 2006; White, 2002). Although it is difficult to retrospectively open up the strategic ‘black box’ surrounding this decision (Mosse, 2005, 20), one should note the correlation between financial incentives provided by both the FACE

⁴ Empirical findings in this section are the result of fieldwork conducted by the first author during September–December 2009 and July–December 2011, consisting of 53 semi-structured interviews, content analyses of project documents, and five focus group discussions with UWA-FACE plantation-adjacent communities. First, data on the establishment of UWA-FACE forest compartments at Mount Elgon, their distribution around the protected area, and local encroachment were gathered through semi-structured interviews with employees of the Uganda Wildlife Authority and other Ugandan environmental management agencies, as well as through content analyses of official documents, accounts, and project records.

⁵ The FACE Foundation has since rebranded itself as ‘Face the Future’.

⁶ According to Lang and Byakola (2006, 59), this initial series of negotiations was brokered by one Jan Bettlem, a Dutch national then working as a Technical Advisor for IUCN in Uganda.

⁷ Mount Elgon Forest Reserve was re-designated as a Forest Park in 1991, and as a National Park in 1992–3.

⁸ Uganda National Parks later merged with the Game Department to form the Uganda Wildlife Authority (UWA) in 1996, in accordance with the 1996 Uganda Wildlife Statute.

⁹ In March 2008, the Dutch television programme ‘Zembla’ aired a documentary on Dutch coal-fired electricity and carbon offsetting at Mount Elgon, entitled ‘Het CO₂ Alibi [The CO₂ Alibi]’ (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>). The programme generated significant public controversy in the Netherlands, which in turn paralleled international debates following the publication of a widely-read report by Chris Lang and Timothy Byakola (2006) for the World Rainforest Movement.

Foundation and other donors, such as USAID's (1991) US\$ 30 million National Action Plan for the Environment (NAPE),¹⁰ and the Government of Norway's support to the Mount Elgon Conservation and Development Programme (MECDP), which was first implemented in conjunction with IUCN in 1988 (White and Hinchley, 2001). Indeed, among scholars of conservation and natural resource management in East Africa, substantial debates exist regarding whether such decisions are generally 'organic', or undertaken largely at the behest of international pressures from NGOs and donors (Gibson, 1999; Gosalamang et al., 2008). The reality is complex, and, we assert, arises in response to varying combinations of the interests of political elites, NGOs, multilateral and bilateral donors, and the financial incentives provided by these actors.

In contrast to the multiplicity of these interests, however, the process of upgrading the Mount Elgon Forest Park to a National Park in 1993 was singularly violent. Beginning in 1993, the 25,000 ha of degraded parkland targeted for reforestation by the FACE Foundation were cleared of 'encroachers' by paramilitary UNP rangers and National Resistance Army¹¹ soldiers (Norgrove, 2002; Norgrove and Hulme, 2006; White, 2002). These evictions were reportedly characterized by widespread violence and human rights abuses, and may have involved little or no prior warning at many locations (Himmelfarb, 2012; Hurinet Uganda, 2011; Lang and Byakola, 2006; Norgrove, 2002; Norgrove and Hulme, 2006; Vangen, 2009). While the Ugandan Constitution and relevant land-use legislation afford the right to the state to seize land when it is deemed to be in the national interest (Government of Uganda, 1995; Hunt, 2004; Okuku, 2006), they also stipulate that both due warning and compensation must be provided to evictees. Official records of the evictions were not kept, however, and estimates now vary regarding the exact number of people displaced. For instance, Checker (2009, 45) – reviewing empirical work by Himmelfarb (2006, 16) – claims that the project resulted in the eviction of 6000 people. This figure is also cited by Sullivan (2011, 336). However, Himmelfarb's fieldwork was limited only to a specific portion of the northern edge of Mount Elgon National Park, known as the Benet Resettlement Area, which is located in two of the least populated of the eight districts that currently border the protected area (Uganda Communications Commission [UCC], 2010). Indeed, estimates of human displacement from the national park as a whole tend to be much higher: Vangen (2009, 135) roughly estimates that the overall figure could exceed 150,000 persons. Likewise, Sean White (2002, 2–3) – then IUCN's Chief Technical Advisor for the Mount Elgon region – estimates that the 25,000 ha of encroached forest could have fed as many as 84,000 households, or approximately 580,000 people at current household sizes. Regardless of the exact extent of the evictions, communities were not provided with official compensation either for the loss of land and property, nor for injuries sustained as a result of the evictions (Gosalamang et al., 2008, 44). Finally, one should note that while the bulk of these activities occurred in 1993, lower intensity paramilitary evictions continued over the next decade, and especially when the 1993 boundary was re-gazetted in 2002–3 with financial assistance from the World Bank's Protected Areas Management for Sustainable Use (PAMSU) programme (Cavanagh, 2012; Norgrove and Hulme, 2006; White, 2002). Such paramilitary activities continue to prevent access to land, cultural sites, and forest resources in territory that was formerly occupied by communities.

¹⁰ With this programme, USAID played a crucial role in both financing and conceptualizing Uganda's initiative to regain control over its protected areas. In the original grant document, USAID (1991) emphasizes the need to clearly demarcate the boundaries of reserves, remove existing encroachers, and involve nongovernmental organizations in the management of protected areas.

¹¹ The National Resistance Army was renamed the Uganda People's Defence Forces (UPDF) in 1995, and is Uganda's official military force.

Conversely, the Ugandan government and UNP¹² claim that these evictions were perfectly legal, and that allegations of abuse remain unproven. For UNP, especially, inhabitants of the Mount Elgon Forest Park were perceived as 'squatters' or 'encroachers', who simply and illegally appropriated public land for their own private use (NFA, 2011; UWA, 2009a, 2011). However, this position is complicated by our archival research on Mount Elgon's management history. First, as noted in the original working plan for the Mount Elgon Forest Reserve (Webster, 1954, 6),

"[r]ather unwillingly, the [Forest] Department agreed to a field investigation early in 1940 by an administrative officer and a forest officer. As a result of their recommendations, the [park boundary] line was adjusted in twenty places between Bulago and Bumbo [parishes]. These excisions amounting to about six square miles, were not surveyed nor was the gazetted area or the reserve altered. In addition to the excisions, licenses were issued to about 70 families who were allowed to remain and cultivate in the reserve. These licenses were issued for life and, if the original licensee died, the license could be transferred to one of the sons."

In addition to such excisions, the 1962 *Public Land Act* and 1969 *Public Lands Act* likewise complicated the overarching tenure situation, as both were often interpreted as affording farmers the right to deforest unoccupied public land for agricultural purposes without prior consent from the government or other authorities (Mugambwa, 2007; Petracco and Pender, 2009, 6). Later, land tenure relations were further destabilized by Idi Amin's 1975 Land Reform Decree, which claimed all land in Uganda as state property (Hunt, 2004, 176; Okuku, 2006, 10–11). In some instances, farmers were encouraged to appropriate land as they pleased, the logic being that this would reduce the dependence of rural populations on the state and mitigate the effects of its increasingly dysfunctional management of the national economy. Simultaneously, Amin's government also simply distributed portions of protected areas to supporters when such actions were deemed politically expedient (Turyahabwe and Banana, 2008, 650). Further, as noted by Norgrove and Hulme (2006, 1098), settlement of the forest reserve also occurred during Milton Obote's second regime, during which allegedly corrupt Forest Department officials sold illegitimate land titles to farmers at Mount Elgon. Today, however, many conservationists systematically ignore these inconvenient pieces of Uganda's land tenure history, and instead strategically adopt a legalistic, uncritical, and ahistorical perspective on communities living within protected areas (see, for example, NFA, 2011 or UWA, 2011). Here, we perhaps see what both Peluso and Lund (2011, 674–676) and Springer (2013, 533) describe as 'law's violence', or the ways in which the law itself can be utilized as a tool of dispossession, especially when it overwrites traditional and customary forms of land possession and use.

In light of such violence, one can observe "conservation practice as primitive accumulation" (Kelly, 2011) at Mount Elgon in two distinct forms: (i) in the uncompensated expropriation of land and physical assets; and (ii) in the expropriation of rights of access to common property resources. Indeed, whereas the former component is well documented in the social scientific literature on conservation at Mount Elgon, researchers have frequently analyzed the latter only in the economic sense, as a lost asset for park-adjacent household economies. In a political-economic sense, however, the expropriation of rights to common property also entails the proletarianization of subsistence farmers, or the heightened exposure of their household's demand for basic commodities

¹² UNP and the Game Department merged to form the Uganda Wildlife Authority (UWA) in 1996. Here, we refer to actions undertaken by UNP, as they occurred prior to the passing of the 1996 Uganda Wildlife Statute.

(such as food, fuelwood, herbs, other non-timber forest products) to market forces. Differently put, whereas households would otherwise acquire these inputs by accessing commonly-owned stocks in forest locations, the expropriation of these access rights forces households to acquire such resources through market transactions, and further embeds them within the cash-based economy. In addition, while one could object to the status of conservation enclosure as primitive accumulation on the grounds that it involves the creation of public rather than private property (Kelly, 2011, 687), evictions at Mount Elgon enabled the generation of exchange value through the sale of both carbon offsets and ecotourism experiences. Differently put, while seized land and forests were not privatized, they were certainly commodified and marketized (Castree, 2008). Further, although the expropriated land was converted from customary to public property, the benefit stream resulting therefrom was appropriated by a variety of state, nongovernmental, and private actors.¹³ In essence, then, this constitutes a process of both accumulation and *naturalization* by dispossession, in which the removal of smallholding farmers enabled the production of a 'pristine' landscape for both tourists and brokers of the then-emerging carbon market, such as the FACE Foundation.

Indeed, 'degraded' areas of the forest reserve had not been merely stripped of forest cover. In many cases, communities had established permanent human settlements within the reserve's boundaries, including homesteads, schools, trading centers, and basic health facilities (Himmelfarb, 2012). In the process of evictions, UNP and NRA personnel razed these structures (Norgrove and Hulme, 2006; Vangen, 2009), and it is conceivable that their ruins were still present when reforestation activities began in 1994. Yet, the FACE Foundation continues to deny that its organization's activities have had any impact on land use conflicts at Mount Elgon. For example, when the first author contacted one of the organization's Netherlands-based executives in an attempt to record the FACE Foundation's perspective, he curtly responded as follows:

"If you are doing fieldwork I suggest you contact UWA. [...] We do not have a role in the conflict, but were only involved in a reforestation project" (FACE Foundation executive, email communication, 11.09.2011).

Unsurprisingly, evicted populations resent the violent nature of this process, and do not relish enduring attempts to obscure the relationship between the region's history of uncompensated eviction and existing carbon offset projects. In further developing this discussion, the next section examines the ways in which UWA and the FACE Foundation selectively ignored such inconvenient aspects of the region's resource management history, instead focusing rather disingenuously on the 'benefits' that were said to accrue to local populations.

Maintaining a 'triple-win' spectacle

Despite the exceedingly violent and ongoing nature of this process of naturalization by dispossession, UWA and the FACE Foundation continued to represent their activities as an unreservedly 'triple-win' case of integrated conservation and carbon offsetting. For instance, nearly a decade after large-scale evictions took place on Mount Elgon, the FACE Foundation's 2001 annual report declared that the

"involvement of the owners and local population are crucial factors to the success of projects. Because these parties have a

social and economic interest in maintaining the forest, Face pays much attention to the project region's social-economic context when selecting its locations [...] Besides the sequestration of CO₂, the forest offers other benefits to the local environment, including social and economic development such as employment" (FACE Foundation, 2001a, 2).

In addition, a project brochure describes UWA-FACE's activities at Mount Elgon National Park and related initiative at Kibale National Park thusly:

"The government has re-enforced the integrity of the national parks in the early 1990s. Since 1994 a large number of local tree species are being planted by the projects to rehabilitate the forests and their habitats for plants and animals, therewith enhancing biodiversity. The projects collaborate with IUCN, which supports conservation and sustainable development programs with the adjacent farmer communities [...] The FACE Foundation owns the CO₂ credits, while the forest and all other proceeds belong to UWA" (FACE Foundation, n.d.-a).

Moreover, concerning its rationale for choosing Mount Elgon as a project area, another FACE Foundation annual report simply notes that "one quarter of the area of the national park is damaged. The areas that will not recover naturally in the short term are being replanted by UWA-Face" (FACE Foundation, 2000, 12). Indeed, neither these brochures and annual reports – nor the contracts signed between UWA and FACE (FACE Foundation, 1992, 2001b) – make any mention of the violent and fiercely contested removal of settled agrarian communities from the areas slated for reforestation. Only passing mention of the disputed park boundary can be found in another early, undated project brochure, which somewhat cryptically notes that between "1988 and 1992 the boundary of the forest reserve was resurveyed and planted with eucalyptus trees. Agricultural encroachments were for the greater part terminated, while a sustainable development programme was initiative to improve the local livelihoods" (FACE Foundation, n.d.-b).

Yet, documents produced by the Uganda Wildlife Authority suggest that the scale and character of these evictions may have been well-known to the FACE Foundation. In a retrospective overview of project activities, for example, UWA (2011) argues that the project was necessary precisely as a consequence of agricultural encroachment and settlement of the protected area, and that conflicts arising as a result of evictions posed perhaps the greatest challenge to reforestation activities. "There are conflicts/disagreement about the ownership of land along the Park boundary", the report's authors write, resulting in a "feeling among some of the local communities that they have lost property [...] people feel they have the right to cultivate crops and as such they have sued the government for grabbing their ancestral land" (UWA, 2011, 4).

Here, UWA refers to a series of lawsuits targeting Mount Elgon National Park and the Ugandan Attorney General that were launched by communities in the Manafwa, Sironko, and Kapchorwa districts in the early 2000s. In the latter case, ActionAid and an NGO known as the Uganda Land Alliance supported local communities, which resulted in a favorable consent judgment – delivered in 2005 – that recognized the community as the "historical and indigenous" inhabitants of the Mount Elgon forest (see Cultural Survival, 2005; Okwaare and Hargreaves, 2009). Lawsuits launched by two groups of farmers in Manafwa district and one in Sironko district have also been ongoing for nearly a decade, and court injunctions were granted in the mid-2000s to prevent further evictions and destruction of community property by UWA.

Given that the plaintiffs in each of these cases formally named UWA and its personnel at Mount Elgon as respondents, relevant staff members have been required to attend relevant court proceedings, as the first author witnessed during fieldwork in 2011.

¹³ For a discussion of the ways in which primitive accumulation through conservation often involves the appropriation of benefit streams from land and natural resources rather than the appropriation of those resources *as such*, see also Benjaminsen and Bryceson (2012).

Consequently, UWA retains a detailed understanding of the nature of these conflicts, and their potential impacts on UWA-FACE reforestation activities in the corresponding sections of Sironko and Manafwa districts. And yet, these grievances have not been identified as challenges in sections of relevant annual reports and general management plans that relate to the governance of the UWA-FACE project (see [FACE Foundation, 2000, 2001a,b](#); [UWA, 2000, 2009a,b](#)). In short, the violence entailed in evictions from land slated for reforestation, the launching of lawsuits against UWA, and related conflicts are facts of material significance that appear to have been simply excluded from FACE Foundation documents, thereby preventing prospective consumers and donors from fully appreciating the controversial status of forest conservation at Mount Elgon. Further problematizing these omissions, the next section proposes several related mechanisms that eventually led to the collapse of the project's ability to conceal such conflicts, and thus also to internationally market its carbon offsets to consumers.

Uncooperative carbon, unruly people: Dissecting the 'spectacular failure' of the UWA-FACE project

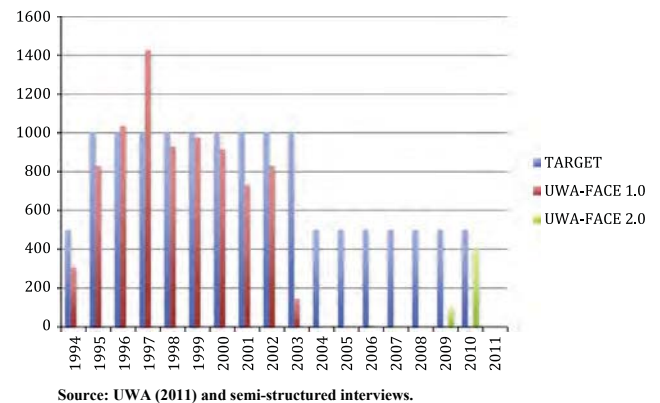
Beginning in 1995, the UWA-FACE¹⁴ project established reforestation targets of 1000 ha per year ([Fig. 1](#)). Generally, these were either achieved or exceeded until the year 2000, after which reforestation activities began to decline. By 2004, UWA-FACE restoration had almost entirely ceased, despite reformulated management targets of 500 ha per year.

Essentially, the decline of the UWA-FACE project began when its managers sought certification from the Forest Stewardship Council (FSC) for its carbon offset operations at Mount Elgon National Park in 2000. By the late 1990s, consumers had already grown sceptical of both the environmental and social benefits of carbon offsetting, and the FACE Foundation felt that such doubts could be allayed if they opened their operations to a rigorous audit. Accordingly, as part of the FSC certification process, the UWA-FACE project was subjected to a series of independent examinations by the Société Générale de Surveillance (SGS) Agrocontrol (and later by SGS Qualifor), one of the world's largest and most respected inspection firms.

In a 2001 appraisal, the assessors concluded – based on the plantations established at the time – that the project would sequester 3.73 million tonnes of carbon dioxide over the first certification period, which was deemed to last until 2034 ([SGS Agrocontrol, 2001, 36–45](#)). Of these, 1.62 million credits were set aside as a 'risk buffer', so that the remaining "2.11 million *virtually risk free* GHG credits...[could be] delivered between 1996 and 2034" – at which time plantations were due for re-inspection ([SGS Agrocontrol, 2001, 9, emphasis added](#)).

Yet, as interceding years have shown, the claim that these credits were "virtually risk free" was highly problematic. Indeed, the SGS auditors themselves originally raised a number of substantive concerns about the future security of UWA-FACE plantations, which led them to propose two "corrective actions" – one major and one minor – before the FSC could grant certification ([SGS Agrocontrol, 2001, 57–58](#)). These concerns revolved around the 'major' lack of a preexisting social impact assessment for UWA-FACE activities, and the 'minor' lack of a robust environmental impact assessment of the project's ability to guarantee the sequestration of carbon dioxide. Regarding the social impacts of the project, the assessors noted, simply, that UWA-FACE's "[s]ocial impact assessment is not adequate. Negative social impacts have not been identified and steps have not been taken to reduce those negative impacts" ([SGS Agrocontrol, 2001, 55](#)). Essentially, it was clear to

¹⁴ After UNP and the Game Department merged to become UWA in 1996, the FACE Foundation's project at Mount Elgon became known as the 'UWA-FACE project' in policy documents ([UWA, 2009b](#); [FACE Foundation, 2001b](#)).



Source: UWA (2011) and semi-structured interviews.

Fig. 1. Actual UWA-FACE reforestation vs. management targets (in hectares).

the assessors that neither UWA nor FACE had seriously considered the implications of widespread local resistance to the project for both the consumers of carbon offsets and their actual climate change mitigation effects.

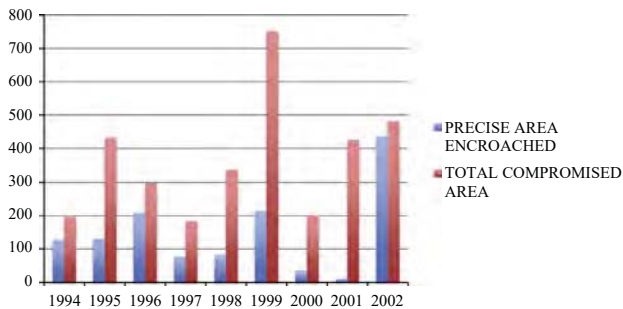
In particular, the auditors raised concerns about "political and social instability", or the ability of both UWA and FACE to protect their new plantations from local encroachment for the proposed period of 99 years. As the report's authors observed,

"[t]he political situation in the land surrounding Mt. Elgon is quite tense. There is a very high population density and land for cultivation is in very short supply. The decision to evict encroachers from the National Park has only served to increase the pressure on land outside the park. There is no doubt that local politicians can gain significant support by successfully arguing for a re-alignment of the park boundaries to afford their constituents access to more land" ([SGS Agrocontrol, 2001, 40](#)).

As noted by [Lang and Byakola \(2006, 27\)](#), it would have been virtually impossible to predict, in the early 1900s, the sort of land use regime that would prevail at Mount Elgon in the year 2000. Population dynamics have undergone massive changes, and the region has witnessed incredibly tumultuous political, economic, and social upheavals since the beginning of the 20th century. Among these were the rise and fall of British colonialism; several periods of civil war and recurring *coups d'état*; state-led programmes of political and ethnic cleansing; bio-political crises (such as the HIV/AIDS pandemic); and chronic environmental-social shocks, such as recurring drought and ensuing famines ([Bunker, 1991](#); [Mamdani, 1976](#)). From this perspective, it is arguably both naïve and potentially misleading to offer guarantees to prospective consumers regarding the future sanctity of forest plantations – in a contested region, nonetheless – until the year 2034, much less 2093.

As hindsight now demonstrates, these concerns were well-founded. From the outset of the project, agricultural encroachment and subsequent deforestation constituted omnipresent problems for UWA-FACE's plantations. Project records show that, even in the 1990s, up to 450 ha per year were compromised by community encroachment ([Fig. 2](#)). By 2004, these reforestation targets had become obviously unsustainable, and were beginning to intermingle with allegations of human rights abuse directed at UWA employees.¹⁵ Further, as noted in the previous section, portions of the land

¹⁵ Here, perhaps the most notable are reports and analysis by [Byakola and Lang \(2006\)](#), [Lang and Byakola \(2006\)](#), [Faris \(2007\)](#), [Honigsbaum \(2007\)](#), and [Checker \(2009\)](#). A highly critical TV programme about the UWA-FACE project was aired by the Dutch programme 'Zembla' in 2008 (available at <http://zembla.incontxt.nl/seizoenen/2008/afleveringen/02-03-2008>), and a documentary film on alleged human rights abuses at Mount Elgon – entitled *Cry from the Ranges* – was released by Hurinet-Uganda in 2009 (available at <http://www.youtube.com/watch?v=OIDTRSOexY>).



Source: UWA (2011) and semi-structured interviews.

Fig. 2. Encroachment into UWA-FACE plantations, 1994–2002.

slated for reforestation had become subject to lawsuits from a number of local communities, and High Court injunctions had made reforestation legally impossible in a number of areas (Hurinet-Uganda, 2011; Okwaare and Hargreaves, 2009).

From a carbon offset marketing perspective, physical encroachment is also compounded by the problem of *de facto* encroachment, or the manner in which carbon offsets become difficult to 'translate' when entire forest compartments are compromised by partial deforestation. For example, while communities physically encroached upon 1137 ha of the UWA-FACE project's approximately 7500 ha of new plantations by the end of 2002, the total area compromised by such encroachment – when measured in compartments that were compromised – amounted to 3308 ha, or approximately 44% of the total reforested area. When encroachment exceeds the allowance of a predetermined 'buffer zone' – which in this case was also 44% of total sequestration capacity (SGS Agrocontrol, 2001) – the amount of carbon sequestered in said compartments may need to be recalculated. Otherwise, the danger arises of issuing carbon credits for environmental services that were not in fact provided. Indeed, when market transactions are involved, to do otherwise would effectively risk engaging in a form of fraud (Bachram, 2004).

In addition, the technical crisis of calculating carbon sequestration is further compounded by the crisis of legitimacy that arises from persistent encroachment. Arguably, the 'spectacle' involved in the construction of a market for carbon offsets relies on the ability of individual projects to maintain 'triple-win' representations of their activities. Consequently, incentives exist for 'distancing' evidence of encroachment from consumers (Kosoy and Corbera, 2010), as such extensive deforestation rightfully poses critical questions of leakage and permanence (Galik and Jackson, 2009), as well as concerns about the human rights and socio-economic wellbeing of adjacent populations. Consequently, one might hypothesize that, rather than retaining equal status, the use value of available tCO₂e offsets quickly declines in relation to increases in experiences with both social contestation and the intentional deforestation of the project area.

Differently put, a significant portion of a carbon offset's use value is ethical or moral in nature. When consumers purchase carbon offsets, they seek not just a reduction in their carbon footprint, but also the right to advertise their membership in a socially and environmentally responsible community. When offsets derive from contested sources, therefore, use value to the consumer proportionally declines. In this sense, the 'conjuring trick' (Tsing, 2000, 118) of carbon offsetting is the production and reproduction of a triple-win representation that purports to simultaneously conserve forests, mitigate climate change, and benefit local people. Individual use value aside, the performance of this spectacle is likewise necessary for the generation of exchange value, given that it is necessary to attract both economic investors and political

supporters. Essentially, then, carbon offsetting reflects what both Tsing (2000) and Igoe (2010) term an 'economy of appearances', insofar as its functioning depends of the circulation of virtual representations rather than simply on the production and sale of tangible goods or services.

Further, when this economy of appearances begins to unravel, we encounter what we have termed a 'spectacular failure'. For example, as a result of the aforementioned contestations and allegations of human rights abuse, no additional trees were planted by the UWA-FACE project between 2004 and 2008. FACE and its financiers were presumably (and understandably) frustrated by the arguable failure of their investment, and UWA was highly cognizant of the negative press being attracted by the scheme. Truly, the manner in which the UWA-FACE project came to a halt during this period is indicative of how vulnerable such initiatives are to the judgments of both the international media and civil society. As one UWA warden explained the decline of the project:

"Their image has been tarnished, so carbon credit operations have halted. You know, it is because of the conflicts and the human rights people crying out, most of them on the internet" (UWA warden, interview 28.07.2011).

Again, since carbon credits enable organizations and individuals to claim 'carbon neutral' status, their primary benefit from the consumer's point of view is that they confer what can be described as 'normative capital', or the right to advertise one's presumably robust ethics. If one overarching lesson from the project's decline can be drawn, therefore, it is this: If the ethical basis on which these carbon credits are 'produced' is challenged – in other words, if they are de-fetishized, de-spectacularized, and have their exploitative political-ecological relations of production exposed – both their use-value for the consumer and exchange value for 'green' investors rapidly decline. To avoid this, above all else, a stable 'translation' (Mosse, 2005) of the social, political, and ecological relations involved in the offset project must be maintained among all actors involved.

Conclusion

This article has critically examined the rise and decline of an integrated carbon offset and conservation scheme at Mount Elgon National Park in eastern Uganda. While the UWA-FACE project advertised itself as a 'triple win' for climate change mitigation, biodiversity conservation, and local development (FACE Foundation, 2001a; UWA, 2009b), a political-ecological and historical analysis of the project suggests that such rhetoric is decidedly selective. The main findings of this analysis are three-fold: First, the original forest restoration agreement, signed between the FACE Foundation and the Ugandan government in 1992, was closely followed by one of the largest-scale forest eviction campaigns in Uganda's post-colonial history. Local people were evicted from the same 25,000 ha of degraded forest that were slated for UWA-FACE rehabilitation, and have not been compensated for the loss of land, property, and livelihoods that accrued as a result, despite potentially valid legal claims to their property. From this perspective, one can therefore perceive the uncompensated dispossession of local people as a simultaneous process of both accumulation and *naturalization* by dispossession, which essentially subsidized the participation of the UWA-FACE project in global carbon offset markets.

Second, in addition to its socially controversial nature, the project was likewise unable to achieve its carbon sequestration objectives. Indeed, only approximately 8000 of 25,000 planned hectares were reforested before the project was forced to cease its operations. By 2004, up to 44% of the project's newly

established forest compartments had been compromised from a carbon offset perspective, and project activities stalled as a result (UWA, 2011). Such levels of encroachment exceeded the 'risk buffer' established by the project's carbon sequestration auditors (SGS Agrocontrol, 2001), resulting in a high degree of uncertainty regarding the quantity of environmental services rendered. It does not appear that public records were made available by either UWA or FACE about carbon credits exchanged through this scheme prior to 2004, however, and it is thus nearly impossible to retroactively verify whether carbon credits were issued for actually existing environmental services.

Third, these findings present a number of second-order implications for similar forest-based carbon offset schemes in East Africa. Of particular interest is the ways in which brokers of the carbon offset market can attempt to conceal deleterious project effects by maintaining a conceptual and geographical disconnection between offset consumers and actual sites of carbon sequestration. In the Mount Elgon case, such efforts are visible in attempts to disassociate the UWA-FACE project from the violent eviction process that was necessary for its establishment. In effect, such disconnection at least temporarily enabled the FACE Foundation and its collaborators to maintain stable 'translations' of offset commodities to consumers and donors, especially in project documents and over the Internet, which obscured the above-discussed social and ecological controversies involved in the project's implementation.

More broadly, and although a now-expansive body of literature interrogates the oppressive nature of both colonial and early post-colonial conservation in Africa (for a review, see Adams and Hutton, 2007), the violence that marks emerging forms of 'green grabbing' remains largely hidden from the international public sphere. Instead, spectacular 'win-win' or 'triple-win' representations of environmental management and land acquisition dominate conventional academic, donor, and policy-based discourses on the subject (Benjaminsen and Svarstad, 2010; Igoe, 2010; Sullivan, 2013). Thus, the rhetoric of integrated conservation and carbon offsetting is always 'future positive' (Mosse, 2005, 1), in that it inexorably advocates for the technical refinement and improvement of projects, as opposed to acknowledging the often-contentious politics implicated in their actual implementation. As noted by Büscher et al. (2012, 16, emphasis original),

"conservation thus becomes an essential contribution to neoliberalism's most profound contradiction: the ability of its proponents to produce and favor discourses that are seemingly free of contradictions [...] A major part of neoliberalism's attractiveness and pervasiveness lies precisely in this ability to hybridize and stimulate consensus-oriented discourses, despite their increasingly contradictory realities."

Indeed, precisely despite evidence of the dispossession and impoverishment of rural populations, organizations such as Face the Future continue to enjoy sterling reputations among Western publics, and are generally presumed to secure environmental management outcomes that conform to their official, allegedly socially responsible rhetoric. Not least, this is evident in the IUCN's (2012) decision to offset the carbon footprint from its 2012 World Conservation Congress in Jeju, South Korea, by purchasing carbon credits from Face the Future's plantations in Indonesia. 'People benefit from the project too,' the IUCN's (2012) press release declared, 'as it creates employment based on forest restoration [...] [i]n short, the project provides a model of how carbon finance can deliver climate change mitigation, while enhancing biodiversity and supporting local livelihoods.' As we have argued, however, the use of these glossy triple-win representations of conservation constitutes a form of 'spectacular accumulation,' given that it generates substantial revenues for government agencies, firms,

and NGOs, but silences a wide range of dissenting voices that cannot be translated into an advertisement for a decidedly neoliberal version of 'nature'. Accordingly, these findings suggest the need for further critical examinations of attempts to link protected areas to a global "economy of repair" (Fairhead et al., 2012) through markets for ecosystem services, which are capable of identifying other cases of 'spectacular failure' in the production and circulation of carbon offsets and other socio-natural commodities.

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Attachment E

Additional Documentation

Attachment to Comment Letter

3-G24





By [Todd Campbell](#)

[Facebook](#)[Twitter](#)[LinkedIn](#)

California has the worst air pollution in the nation and diesel trucks are largely to blame.



#1 Source of Emissions: Diesel Trucks – Emissions are increasing, despite California’s progressive vehicle emissions policy.

Heavy-duty (HD) diesel trucks are the backbone of California’s thriving goods movement economy, but they also deliver a lot of negative impacts to the state. A the largest single source of emissions in California, HD diesel trucks cause smog and unhealthy air for 90% of Californians^[1]. HD diesel trucks emit NOx (oxid of nitrogen) and diesel particulate matter (DPM), **which can cause a range of health issues including asthma, cancer, heart disease, and premature death**. These impacts are particularly pronounced in California’s many disadvantaged communities (DACs) which are already overburdened by HD diesel truck emissions. In addition, HD diesel trucks are one of North America’s largest and most rapidly growing sources of climate-altering greenhouse gas (GHG) emissions which are detrimental to clean air.

California is facing several near-term deadlines to meet the minimum standards set by the federal government for clean and healthy air. **Southern California only has until the end of 2022 to significantly cut smog-forming ozone emissions in order to reach these minimum federal requirements. Failure to meet these federal regulations can trigger fines and penalties, including withholding billions of dollars of federal highway funds.** Of course, this is all in addition to the deadly toll diesel truck exhaust continues to take on the health of thousands of Californians on a daily basis.

Los Angeles Times

Exposure to air pollution linked to higher coronavirus-related death rates



2019 image of the downtown Los Angeles skyline is seen from Griffith Observatory. (Christina House / Los Angeles Times)

By [TONY BARBOZA](#) STAFF WRITER

APRIL 8, 2020
6:24 AM

Americans in communities with higher smog levels are at greater risk of dying from COVID-19, according to a new study that suggests the health damage from the novel coronavirus has been worsened by long-term exposure to air pollution.

Scientists at Harvard T.H. Chan School of Public Health analyzed data on more than 3,000 U.S. counties to link small increases in long-term exposure to fine-particle pollution to substantially higher death rates from the coronavirus.

Researchers calculated long-term average levels of fine-particle pollution — lung-damaging soot also known as PM2.5 — from 2000 to 2016 and compared it to the more than 7,000 COVID-19 deaths that had occurred through April 4. They found that an increase of only one microgram per cubic meter of PM2.5 was associated with a 15% rise in the coronavirus death rate.

Francesca Dominici, a professor of biostatistics at Harvard and coauthor of the study, said her team fast-tracked its research in response to the surge in coronavirus deaths out of a “moral obligation” to help inform the response to the health crisis. The scientists released [their manuscript](#) before publication, while it undergoes peer review, and made public their data and code, hoping that it can be used worldwide to help focus research and prevent deaths.

Dominici said it was, to her knowledge, the first nationwide study to quantify the relationship between coronavirus death rates and exposure to one of the most widespread types of air pollution. She said she wanted to get the information out as soon as possible because it suggests health officials should pay closer attention to limiting the damage in the worst-polluted communities, including many in California, where people’s health has long suffered from poor air quality.

“These are the places where we should really be careful about social distancing measures and they should be even more enforced,” she said. “If COVID infects you, because you have lungs that are already inflamed because you’ve been breathing polluted air for so long, you might experience a worse health outcome than somewhere else.”

The findings come as the Trump administration plows ahead with major environmental rollbacks even as the coronavirus crisis widens. In recent weeks the U.S. Environmental Protection Agency [finalized a major rollback](#) of auto emission standards and announced a sweeping decision to [suspend enforcement](#) on a range of health and environmental protections in response to the pandemic.

The Harvard scientists said their results “underscore the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis,” adding that “we anticipate a failure to do so can potentially increase the COVID-19 death toll and hospitalizations, further burdening our healthcare system and drawing resources away from COVID-19 patients.”

Environmentalists and health groups said the study provides stark new evidence of the shortsightedness of weakening or delaying pollution safeguards during the pandemic.

“These findings illustrate that far too many Americans are facing multiple threats to their lung health at once, and when taken together, these different threats to lung health impacts can amplify each other,” American Lung Assn. President Harold Wimmer said in a statement. “We cannot afford to delay cleanup of dangerous air pollution. In fact, it is more important than ever.”

Dominici said her research was sparked by observations that many of the same underlying health problems that increase risk of death from COVID-19, such as heart and lung disease, are also made worse by long-term exposure to air pollution. The researchers adjusted for other factors such as income, obesity and smoking that are also likely to increase risk of death.

The research team is automating its analysis to rerun as the pandemic continues, Dominici said, “unfortunately, as we expect the number of deaths to increase.”

Many scientists have suspected that bad air makes people [more susceptible to the coronavirus](#), based on past research into similar viruses that showed it increases people’s risk of contracting pneumonia and of developing more severe symptoms once they have it. Research into the SARS coronavirus outbreak in 2003 found that infected patients from regions with higher air pollution were [84% more likely to die](#) than those in less polluted areas.

The results from the Harvard study are “consistent with the limited data that we have on this family of viruses: that it could be a potentially important determinant of severity of the infection,” said Frank Gilliland, a professor of preventive medicine at USC who was not involved in the research. “We know that PM2.5 increases a spectrum of respiratory diseases ... so it wouldn’t be too surprising that it actually has adverse effects on COVID-19.”

Gilliland emphasized the study should be interpreted with caution because it looked at data at the county, rather than the individual level, so the higher death rates in more polluted areas could also reflect other population characteristics unrelated to air pollution.



□

□

□

“This is very early research, but it does suggest that people who live in high-pollution areas really need to follow the recommendations for social distancing and do as much as they can to avoid getting infected and infecting other people,” Gilliland said.

Michael Jerrett, a professor of environmental health science at the UCLA Fielding School of Public Health who read the study, called it “a good first look” and “a potentially important finding given that so many Americans and people all over the world live in areas with unhealthy pollution levels.”

“The main concern is with the likely huge uncertainty with the findings due to undercounting of the deaths in many places,” Jerrett said. “Because testing capacity is still very low, many deaths that were likely due to COVID have not been counted as such, and this has the potential to bias the results.”

The study, he added, “merits replication in other areas, particularly in places like Germany and South Korea, where they have been testing a lot more than we have here.”

Attachment F
Additional Documentation
Attachment to Comment Letter
3-G37



Statement of Organization Recipient Committee

CITY CLERK MORENO VALLEY RECEIVED

CALIFORNIA FORM 410 For Official Use Only

Statement Type: Initial, Amendment, Termination. Includes fields for List I.D. number, Date qualified as committee, and Date of Termination.

1. Committee Information

NAME OF COMMITTEE: MORENO VALLEY JOBS COALITION... STREET ADDRESS, CITY, STATE, ZIP CODE, AREA CODE/PHONE.

2. Treasurer and Other Principal Officers

NAME OF TREASURER: JASON D. KAUNE... NAME OF ASSISTANT TREASURER: JAMES W. CARSON... NAME OF PRINCIPAL OFFICER(S): L. RONARDO DANIEL GONZALEZ...

Attach additional information on appropriately labeled continuation sheets.

3. Verification

I have used all reasonable diligence in preparing this statement and to the best of my knowledge the information contained herein is true and complete. I certify under penalty of perjury under the laws of the State of California that the information is true and correct.

Executed on [DATE] By [SIGNATURE] SIGNATURE OF TREASURER OR ASSISTANT TREASURER. Similar lines for Controlling Officer/Holder.

www.netfile.com

FPPC Form 410 (Jan/2016) FPPC Advice: advice@fppc.ca.gov (866/275-3772) www.fppc.ca.gov

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

Statement of Organization
Recipient Committee

CALIFORNIA FORM 410
Page 2 of 6

INSTRUCTIONS ON REVERSE

COMMITTEE NAME
MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER
DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

I.D. NUMBER
1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S)
MARSHALL SCOTT
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
JOANN STEPHAN
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]



NAME OF OTHER PRINCIPAL OFFICER(S)
GABRIEL COLANGELO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
DANNY SCHWARTZ
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
ROBERT HARRIS
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92557 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
PEDRO HURTADO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]



NAME OF OTHER PRINCIPAL OFFICER(S)
LANCE MARTIN
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92553 [REDACTED]

NAME OF OTHER PRINCIPAL OFFICER(S)
JOE CHACKO
MAILING ADDRESS
[REDACTED]
CITY STATE ZIP CODE AREA CODE/PHONE
MORENO VALLEY CA 92555 [REDACTED]

www.netfile.com

FPPC Form 410 (Jan/2016)
FPPC Advice: advice@fppc.ca.gov (866/275-3772)
www.fppc.ca.gov

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

Statement of Organization Recipient Committee

CALIFORNIA FORM 410

INSTRUCTIONS ON REVERSE

Page 2 of 6

COMMITTEE NAME MORENO VALLEY JOBS COALITION, SUPPORTING JOBS CREATION AND WORKFORCE TRAINING INITIATIVES AND THE WORLD LOGISTICS CENTER DEVELOPMENT, MAJOR FUNDING BY HIGHLAND FAIRVIEW

ID NUMBER 1379766

2a. Additional Officers

NAME OF OTHER PRINCIPAL OFFICER(S) DAVID LARA-TELLEZ MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92555 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) TOM R. GERLE, SR. MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92557 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) ANTONIO REZA MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92553 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) TED BORCKER MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92553 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) IDDO BENZEEVI MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92553 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) MAILING ADDRESS CITY STATE ZIP CODE AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) RAPAEI BRUGUERAS MAILING ADDRESS CITY MORENO VALLEY STATE CA ZIP CODE 92555 AREA CODE/PHONE

NAME OF OTHER PRINCIPAL OFFICER(S) MAILING ADDRESS CITY STATE ZIP CODE AREA CODE/PHONE

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FPPC Form 410 (Jan/2016) FPPC Advice: advice@fppc.ca.gov (866/275-3772) www.fppc.ca.gov

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

Mr. Harris signature as person of standing for HF illegal initiatives used to circumvent CEQA,

NOTICE OF INTENT TO CIRCULATE PETITION

Notice is hereby given by persons whose names appear hereon of their intention to circulate a petition within the territory of the City of Moreno Valley Community Services District for the purpose of repealing Resolution No. 2015-29, enacted by the Board of Directors of the City of Moreno Valley Community Services District on August 19, 2015. A statement of the reasons of the proposed action as contemplated in the petition is as follows:

This measure will help to facilitate the City's ability to obtain the many benefits which the World Logistics Center Project will bring to the City and its residents and as an affirmation of the City Council approval of the Project which is being challenged through lawsuits filed by those who would like to stop the Project for their own interests.



Robert D. Harris

Mr. Dejohnette's application shows planning commission was not his choice and that someone else wrote it in.



City of Moreno Valley Boards and Commissions

CITY CLERK
MORENO VALLEY
RECEIVED

18 FEB -9 PM 4: 33

For City Clerk's Use
Stamp Date and Time Received

Membership Application Form

Name: ARVIN DEJOHNETTE
Home Address: [REDACTED]
MORENO VALLEY CA 92555
How long have you resided in Moreno Valley? 50+ YEARS

CONFIDENTIAL INFORMATION	
Home Phone No.:	Driver's License No.:
Work Phone No.:	Email Address:
Cell Phone No.:	Date of Birth:

Employer Name: Moreno Valley Unified Position: Teacher
Address: 2564 ALEXANDRA BLVD
MORENO VALLEY CA 92553

Board or Commission applying for*: 1st Choice Traffic Safety
2nd Choice Utilities Commission, Planning Commission

*If applying for the Accessibility Appeals Board, please indicate which position you are applying for:
 Physically Challenged Person Person Experienced in Construction Public Member

*If applying for the Utilities Commission, please indicate which position you are applying for:
 Public Member Customer of Moreno Valley Utility Business Customer of Moreno Valley Utility

Why do you wish to serve on this Board and/or Commission?
I want to be involved with the city that I grew up in.

List any education, training, or special skills, you have which may be relevant or of particular benefit to this Board and/or Commission:
Masters in Education, school Administration experience

Explain briefly your understanding of what this Board and/or Commission does, including its powers and limitations.

I understand that this position considers issues surrounding traffic safety in the city such as signage, painting potential hazards for public safety

What do you hope to accomplish by your participation?
I want to be a positive active member on this Commission to assist with maintaining and possibly improving safety in the city of Moreno Valley


Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

Mr. Bruguera's application that concerned me with his literacy and ability to read and comprehend complex documents. He also lists his involvement with the PAC and lists Robert Harris as his reference.

Attachment: Rafael Bruguera-Planning Comm Application (2541 : CITY COUNCIL INTERVIEWS OF

A.1.g

Packet Pg. 18



City of Moreno Valley
Boards and Commissions

Membership Application Form

CITY CLERK
MORENO VALLEY
RECEIVED
17 FEB -3 PM 3:16

For City Clerk's Use
Stamp Date and Time Received

Name: Rafael Bruguera

Home Address: 13768 Peyton Dr.
Moreno Valley, CA 92555

How long have you resided in Moreno Valley? 24 yrs.

CONFIDENTIAL INFORMATION

Home Phone No.: [REDACTED] Driver's License No.: [REDACTED]

Work Phone No.: N/A Cell Phone No.: [REDACTED]

E-mail Address: [REDACTED]

Employer Name: N/A Position: Retired

Address: _____

Board or Commission applying for*: 1st Choice PLANNING Commission
2nd Choice _____

*If applying for the Accessibility Appeals Board, please indicate which position you are applying for:
 Physically Challenged Person Person Experienced in Construction Public Member

*If applying for the Utilities Commission, please indicate which position you are applying for:
 Public Member Customer of Moreno Valley Utility Business Customer of Moreno Valley Utility

Why do you wish to serve on this Board and/or Commission?
I believe that I CAN help being development to our City Moreno Valley. By understanding what's coming to be development. To sort it out between good or bad development.

List any education, training, or special skills, you have which may be relevant or of particular benefit to this Board and/or Commission:
I have skills in Helping homeowners in saving energy.

Explain briefly your understanding of what this Board and/or Commission does, including its powers and limitations.
I believe that a Planning Commission duties are to sort out what's best for the City of Moreno Valley in all fairness. To know when to say yes or no to development.

What do you hope to accomplish by your participation?
HAVING the opportunity to serve my City Moreno Valley. To see development stay in Moreno Valley and have the City to grow.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

A.1.g

Packet Pg. 19

List any employment, volunteer work, or membership in a service/community organization that you have served on, or are now a member of. Please provide the name(s) of the agency(les), contact person, and dates served:

1. Volunteer - I'm a city activist for Development and Jobs.
2. Organization - I'm part of The Job Coalition.
Name - Mr. Robert Harris - phone # 951-299-7465

What other areas of interest do you have in our City government?

I go to City Council meeting and I also go PLANNING Commission meeting.

Would you be available for meetings during the day or evening?

Attendance of at least one (1) meeting is required prior to the appointment.

Date(s) of the meeting(s) attended: JUN. 26, 2017 and many more.

Pursuant to Resolution 2016-43 all board and commission members must be registered voters of the City of Moreno Valley.

I authorize the City of Moreno Valley to obtain and review, on a confidential basis, such information regarding me as may be contained in the California State Summary Criminal History and in records of the California Department of Motor Vehicles. Yes No (The application shall not be considered if the NO box is checked.)

I hereby agree to attend all board or commission meetings, unless excused, and understand that I may be removed for lack of attendance, pursuant to Municipal Code, Subsection 2.06.010(C) which states, "If a member is absent without advance permission of the board or commission or of the appointing authority, from three consecutive regular meetings or from 25% of the duly scheduled meetings of the board or commission within any fiscal year, the membership shall thereupon become vacant and shall be filled as any other vacancy."

CERTIFICATE OF APPLICANT: I certify that all statements in this application are true and complete to the best of my knowledge. I understand that any false statements of material fact will subject me to disqualification or dismissal if appointed. I release the City of Moreno Valley from any liability for the use of the aforesaid information.

[Redacted Signature]

Signature

Feb 03, 2017

Date

Please Note: Applications will be kept on file for potential future vacancies for one year after the application submittal date. Applications are accepted year-round.

Revised 12/27/16

Mr. Robert Harris' application.

A.1.j



Attachment: Robert Harris-Planning Comm Application (2541 : CITY COUNCIL INTERVIEWS OF

City of Moreno Valley

Boards and Commissions

Membership Application Form

CITY CLERK
MORENO VALLEY
RECEIVED

17 FEB -3 PM 4: 10

For City Clerk's Use
Stamp Date and Time Received

Packet Pg. 24

Name: Robert Harris
 Home Address: 10440 Canyon Vista Rd
Moreno Valley, Ca 92557
 How long have you resided in Moreno Valley? 34 years

CONFIDENTIAL INFORMATION

Home Phone No.: [REDACTED] Driver's License No.: [REDACTED]
 Work Phone No.: [REDACTED] Cell Phone No.: [REDACTED]
 E-mail Address: [REDACTED]

Employer Name: Retired Position: RN
 Address: _____

Board or Commission applying for*: 1st Choice Planning Commission
 2nd Choice _____

*If applying for the Accessibility Appeals Board, please indicate which position you are applying for:
 Physically Challenged Person Person Experienced in Construction Public Member

*If applying for the Utilities Commission, please indicate which position you are applying for:
 Public Member Customer of Moreno Valley Utility Business Customer of Moreno Valley Utility

Why do you wish to serve on this Board and/or Commission?
I am a progressive activist. I would like to bring
balance to our City: Homes, Jobs, Recreation
and Medical facilities to serve all of our community
including our aging population.

List any education, training, or special skills, you have which may be relevant or of particular benefit to this Board and/or Commission:
Residential Real Estate, Emergency RN,
Flight Nurse, General aviation Pilot,
Director of Hospital Paramedic program

Explain briefly your understanding of what this Board and/or Commission does, including its powers and limitations.
Planning related to the balanced and growing
needs of the City.

What do you hope to accomplish by your participation?
Help make Moreno Valley a City that the
residence can be proud of. This can be
accomplished by listening to the residents
Developers and Staff recommendations.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

A.1.J

Packet Pg. 25

List any employment, volunteer work, or membership in a service/community organization that you have served on, or are now a member of. Please provide the name(s) of the agency(ies), contact person, and dates served:

Member of Moreno Valley Jobs Coalition
Leo Gonzalez 951-833-3447
Elected Member Riverside County Democratic Central Committee

What other areas of interest do you have in our City government?

City activities
only interested in planning Commission at this time

Would you be available for meetings during the day or evening?

Attendance of at least one (1) meeting is required prior to the appointment.

Date(s) of the meeting(s) attended: all WLC planning Commission hearings

Pursuant to Resolution 2016-43 all board and commission members must be registered voters of the City of Moreno Valley.

I authorize the City of Moreno Valley to obtain and review, on a confidential basis, such information regarding me as may be contained in the California State Summary Criminal History and in records of the California Department of Motor Vehicles. Yes No (The application shall not be considered if the NO box is checked.)

I hereby agree to attend all board or commission meetings, unless excused, and understand that I may be removed for lack of attendance, pursuant to Municipal Code, Subsection 2.06.010(C) which states, "If a member is absent without advance permission of the board or commission or of the appointing authority, from three consecutive regular meetings or from 25% of the duly scheduled meetings of the board or commission within any fiscal year, the membership shall thereupon become vacant and shall be filled as any other vacancy."

CERTIFICATE OF APPLICANT: I certify that all statements in this application are true and complete to the best of my knowledge. I understand that any false statements of material fact will subject me to disqualification or dismissal if appointed. I release the City of Moreno Valley from any liability for the use of the aforesaid information.


[Redacted Signature]

02/03/2017
Date

Please Note: Applications will be kept on file for potential future vacancies for one year after the application submittal date. Applications are accepted year-round.

Joann Stephens application.

CITY CLERK
MORENO VALLEY
RECEIVED
18 FEB 15 PM 1:11



City of Moreno Valley

Boards and Commissions

Membership Application Form

Name: Jo Ann Stephens

Home Address: [REDACTED]

Moreno Valley, CA 92557

How long have you resided in Moreno Valley? 34 yrs

CONFIDENTIAL INFORMATION

Home Phone No.: [REDACTED] Driver's License No.: [REDACTED]

Work Phone No.: [REDACTED] Email Address: [REDACTED]

Cell Phone No.: [REDACTED] Date of Birth: [REDACTED]

Employer Name: Retired Position: _____

Address: _____

Board or Commission applying for*: 1st Choice Planning

2nd Choice _____

*If applying for the Accessibility Appeals Board, please indicate which position you are applying for:
 Physically Challenged Person Person Experienced in Construction Public Member

*If applying for the Utilities Commission, please indicate which position you are applying for:
 Public Member Customer of Moreno Valley Utility Business Customer of Moreno Valley Utility

Why do you wish to serve on this Board and/or Commission?
Get involved with what is being built OR proposed and make sure guidelines are followed. Especially at the planning stages which are the first step to build out.

List any education, training, or special skills, you have which may be relevant or of particular benefit to this Board and/or Commission:

Explain briefly your understanding of what this Board and/or Commission does, including its powers and limitations.
Considers matters that have to do with development & zoning in the city. That are within California Codes.

What do you hope to accomplish by your participation?
Get involved with development with our city.

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

List any employment, volunteer work, or membership in a service/community organization that you have served on, or are now a member of. Please provide the name(s) of the agency (ies), contact person, and dates served:

What other areas of interest do you have in our City government?

I have always played an active roll in what has gone on in Moreno Valley, where it be development or Council elections & City affa

Would you be available for meetings during the day or evening?

Attendance of at least one (1) meeting is required prior to the appointment.

Date(s) of the meeting(s) attended: _____

Pursuant to Resolution 2016-42 all board and commission members must be registered voters of the City of Moreno Valley.

I authorize the City of Moreno Valley to obtain and review, on a confidential basis, such information regarding me as may be contained in the California State Summary Criminal History and in records of the California Department of Motor Vehicles. Yes No (The application shall not be considered if the NO box is checked.)

I hereby agree to attend all board or commission meetings, unless excused, and understand that I may be removed for lack of attendance, pursuant to Municipal Code, Subsection 2.06.010(C) which states, "If a member is absent without advance permission of the board or commission or of the appointing authority, from three consecutive regular meetings or from 25% of the duly scheduled meetings of the board or commission within any fiscal year, the membership shall thereupon become vacant and shall be filled as any other vacancy."

CERTIFICATE OF APPLICANT: I certify that all statements in this application are true and complete to the best of my knowledge. I understand that any false statements of material fact will subject me to disqualification or dismissal if appointed. I release the City of Moreno Valley from any liability for the use of the aforesaid information.

[Redacted Signature]

Signature

2/15/2018
Date

Please Note: Applications will be kept on file for potential future vacancies for one year after the application submittal date. Applications are accepted year-round. All applications are public record; personal information may be redacted to protect applicants' privacy.

Revised December 6, 2017

Attachment: WLC Responses to Comments Prior to PC Hearing_10JUNE2020_Part 2 (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Note to Reader: This MMRP lists the mitigation measures to be implemented by the Revised Final EIR. Changes to the MMRP from that adopted by the City Council in 2015 are shown in Attachment A. Changes to the MMRP from that submitted to the Planning Commission for consideration at the May 14, 2020 Planning Commission hearing are shown in Attachment B.

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1 AESTHETICS						
4.1.6.1A Each Plot Plan application for development along the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing or planned residential zoned uses) shall include a minimum 250-foot setback measured from the City/County zoning boundary line and any building or truck parking/access area within the project. The setback area shall include landscaping, berms, and walls to provide visual screening between the new development and existing residential areas upon maturity of the landscaping materials. The existing olive trees along Redlands Blvd. shall remain in place as long as practical to help screen views of the project site. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before permitting	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1B Each Plot Plan application for development adjacent to Redlands Boulevard, Bay Avenue, or Merwin Street, shall include a plot plan, landscaping plan, and visual rendering(s) illustrating the appearance of the proposed development. The renderings shall demonstrate that views of proposed buildings and trucks can be reasonably screened from view from existing residents upon maturity of planned landscaping and to ensure consistency with the General Plan Objective 7.7. "Effective" screening shall mean that no more than the upper quarter (25%) of a building is visible from existing residences, which shall be achieved through a combination of landscaping, berms, fencing, etc. The location and number of view presentations shall be at the discretion of the Planning Division.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before issuance of certificate of occupancy	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
			Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1C Prior to the issuance of a certificate of occupancy for buildings adjacent to the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing residences at the time of application) the screening required in Mitigation Measure 4.1.6.1A shall be installed in substantial conformance	City Planning Division	Once before issuance of certificate of occupancy.	Prior to issuance of certificate of occupancy.	Review and Approval of Site Plans		Withhold Certificate of Occupancy

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
with the approved plans to the satisfaction of the Planning Official.						
4.1.6.1D Prior to the issuance of permits for any development activity adjacent to Planning Area 30 (74.3 acres in the southwest portion of the Specific plan), the entirety of Planning Area 30 shall be offered to the State of California for open space purposes. In the event that the State does not accept the dedication, the property shall be offered to Western Riverside County Regional Conservation Authority or an established non-profit land conservancy for open space purposes. In the event that none of these organizations accept the dedication, the property may be dedicated to a property owner’s association or may remain in private ownership and may be fenced and access prohibited.	City Planning Division	Once before permitting of any development activity adjacent to Planning Area 30.	Prior to issuance before of any discretionary permit.	Review and Approval of Site Plans.		Withhold Discretionary Permit
4.1.6.3A Each Plot Plan application for development shall include plans and visual rendering(s) illustrating any changes in views of Mount Russell and/or the Badlands, for travelers along SR-60, as determined necessary by the Planning Official. The plans and renderings shall illustrate typical views based on proposed project plans, with the location and number of view presentations to be determined by the Planning Official. These views shall be simulated from a height of six feet from the edge of the roadway travel lane closest to the visual resource. The renderings must demonstrate that the development will preserve at least the upper two thirds (67%) of the vertical view of Mt. Russell from SR-60.	City Planning Division	Once before plot plan review	Prior to issuance of building permit.	Review and Approval of Renderings		Withhold Plot Plan Approval

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1.6.4A Each Plot Plan application for development adjacent to residential development shall include a photometric plot of all proposed exterior lighting demonstrating that the project is consistent with the requirements of Section 9.08.100 of the City Municipal Code. The lighting study shall indicate the expected increase in light levels at the property lines of adjacent residential uses. The study shall demonstrate that the proposed lighting fixtures and/or visual screening meet or exceed City standards regarding light impacts.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Lighting Study		Withhold Building Permit Approval
4.1.6.4B Each Plot Plan application for development shall include an analysis of all proposed solar panels demonstrating that glare from panels will not negatively affect adjacent residential uses or negatively affect motorists along perimeter roadways. Design details to meet these requirements shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Plot Plan		Withhold Plot Plan Approval
4.2 AGRICULTURE						
6.2.1 (Cumulative Impacts) Prior to the issuance of any grading permit affecting land designated as “Farmland of Local importance” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Farmland of Local Significance” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.	City Planning Division	Once before issuance of grading permits on lands that contain farmland of local importance	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.3 Air Quality						
<p>4.3.6.2A Construction equipment maintenance records (including the emission control tier of the equipment) shall be kept on-site during construction and shall be available for inspection by the City of Moreno Valley.</p> <p>a) Off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 off-road emissions standards. A copy of each unit’s certified tier specification shall be available for inspection by the City at the time of mobilization of each applicable unit of equipment.</p> <p>b) During all construction activities, off-road diesel-powered equipment may be in the “on” position not more than 10 hours per day.</p> <p>c) Construction equipment shall be properly maintained according to manufacturer specifications.</p> <p>d) All diesel-powered construction equipment, delivery vehicles, and delivery trucks shall be turned off when not in use. On-site idling shall be limited to three minutes in any one hour.</p> <p>e) Electrical hook ups to the power grid shall be provided for electric construction tools including saws, drills and compressors, where feasible, to reduce the need for diesel-powered electric generators. Where feasible and available, electric tools shall be used.</p> <p>f) The project shall demonstrate compliance with South Coast Air Quality Management District Rule 403 concerning fugitive dust and provide appropriate documentation to the City of Moreno Valley.</p> <p>g) All construction contractors shall be provided information on the South Coast Air Quality Management District Surplus Off-road Opt-In “SOON” funds which provides funds to accelerate cleanup of off-road diesel vehicles.</p> <p>h) Construction on-road haul trucks shall be model year 2010 or newer if diesel-fueled.</p> <p>i) Information on ridesharing programs shall be made available to construction employees.</p>	Land Development Division and Building and Safety Division	As needed during construction	During construction	On-site Inspection of construction maintenance records and data sheets.		Issuance of Stop Work Order

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
j) During construction, lunch options shall be provided onsite. k) A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints per AQMD Standards. l) Off-site construction shall be limited to the hours between 6 a.m. to 8 p.m. on weekdays only. Construction during City holidays shall not be permitted.						
4.3.6.2B Prior to issuance of any grading permits, a traffic control plan shall be submitted to and approved by the City of Moreno Valley that describes in detail the location of equipment staging areas, stockpiling/storage areas, construction parking areas, safe detours around the project construction site, as well as provide temporary traffic control (e.g., flag person) during construction-related truck hauling activities. Construction trucks shall be rerouted away from sensitive receptor areas. Trucks shall use State Route 60 using World Logistics Center Parkway (formerly Theodore Street), Redlands Boulevard (north of Eucalyptus Avenue), and Gilman Springs Road. In addition to its traffic safety purpose, the Construction Staging Plan can minimize traffic congestion and delays that increase idling emissions. A copy of the approved Traffic Control Plan shall be retained on site in the construction trailer.	Transportation Division	Once prior to issuance of grading permits	Prior to issuance of any grading permits	Review and Approval of Traffic Control Plan.		Withhold Grading Permit
4.3.6.2C The following measures shall be applied during construction of the project to reduce volatile organic compounds (VOC): a) Non-VOC containing paints, sealants, adhesives, solvents, asphalt primer, and architectural coatings (where used), or pre-fabricated architectural panels shall be used in the construction of the project to the maximum extent practicable. If such products are not commercially available, products with a VOC content of 100 grams per Liter or lower for both interior and exterior surfaces shall be used. b) Leftover paint shall be taken to a designated hazardous waste center. c) Paint containers shall be closed when not in use. d) Low VOC cleaning solvents shall be used to clean paint application equipment.	Land Development, Building and Safety Division and Planning Division	Throughout construction	During Construction	On-site inspection		Issuance of a Stop Work Order

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
e) Paint and solvent-laden rags shall be kept in sealed containers.						
4.3.6.2D No grading shall occur on days with an Air Quality Index forecast greater than 150 for particulates or ozone as forecasted for the project area (Source Receptor Area 24).	City Land Development Division/Public Works	As needed during construction	During construction	Review of Construction Documentation and On-site Inspection		Issuance of a Stop Work Order
4.3.6.2E The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.3A Prior to issuance of occupancy permits for each warehouse building within the WLCSP, the developer shall demonstrate to the City that vehicles can access the building using paved roads and parking lots and that access on unpaved roads is prohibited.	City Planning Division	Once Before issuing Certificate of Occupancy	Prior to issuance or occupancy permits for each warehouse	Review and Approval of building plans.		Withhold Occupancy Permit
4.3.6.3B The following shall be implemented as indicated: Prior to Issuance of a Certificate of Occupancy a) Signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations and the prohibition of parking in residential areas. b) Signs shall be prominently displayed in all dock and delivery areas advising of the following: engines shall be turned off when not in use; trucks shall not idle for more than three consecutive minutes; telephone numbers of the building facilities manager and the California Air Resources Board to report air quality violations. c) Signs shall be installed at each exit driveway providing directional information to the City’s truck route. Text on the sign shall read “To Truck Route” with a directional arrow. Truck routes shall be clearly marked per the City Municipal Code. On an Ongoing Basis d) Tenants shall maintain records on fleet equipment and	City Planning Division and Building and Safety Public Works Inspector	Once before issuance of any certificate of Occupancy and ongoing basis On an ongoing basis	Prior to issuance of Certificate of Occupancy During on-site inspections	On-site inspections Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals, On-site Inspections Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-		Withhold Certificate of Occupancy Pursuant to City Municipal Code

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>vehicle engine maintenance to ensure that equipment and vehicles are maintained pursuant to manufacturer’s specifications. The records shall be maintained on site and be made available for inspection by the City.</p> <p>e) Tenant’s staff in charge of keeping vehicle records shall be trained/certified in diesel technologies, by attending California Air Resources Board approved courses (such as the free, one-day Course #512). Documentation of said training shall be maintained on-site and be available for inspection by the City.</p> <p>f) Tenants shall be encouraged to become a SmartWay Partner.</p> <p>g) Tenants shall be encouraged to utilize SmartWay 1.0 or greater carriers.</p> <p>h) Tenants’ fleets shall be in compliance with all current air quality regulations for on-road trucks including but not limited to California Air Resources Board’s Heavy-Duty Greenhouse Gas Regulation and Truck and Bus Regulation.</p> <p>i) Information shall be posted in a prominent location available to truck drivers regarding alternative fueling technologies and the availability of such fuels in the immediate area of the World Logistics Center.</p> <p>j) Tenants shall be encouraged to apply for incentive funding (such as the Voucher Incentive Program [VIP], Carl Moyer, etc.) to upgrade their fleet.</p> <p>k) All yard trucks (yard dogs/yard goats/yard jockeys/yard hostlers), landscaping equipment, and industrial sweepers shall be powered by electricity, natural gas, propane, or an equivalent non-diesel fuel. Any off-road engines in the yard trucks and landscaping equipment shall have emissions standards equal to Tier 4 Interim or greater. Any on-road engines in the yard trucks shall have emissions standards that meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025.</p> <p>l) All diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025</p>				specific approvals		

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time.</p> <p>m) All standby emergency generators shall be fueled by natural gas, propane, or any non-diesel fuel.</p> <p>n) Truck and vehicle idling shall be limited to three (3) minutes.</p> <p>o) For each building, the developer shall provide ten electrical outlets for the use of electric auxiliary power units (APUs) to be located at the dock doors near the shipping offices, or an alternate location with access to electrical outlets.</p> <p>p) All industrial sweepers shall be equipped with High-efficiency particulate air (HEPA) filters.</p>						
<p>4.3.6.3C Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a publicly-accessible fueling station shall be operational within the Specific Plan area offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public. Any fueling station shall be placed a minimum of 1000 feet from any off-site sensitive receptors or offsite zoned sensitive uses. This facility may be established in connection with the convenience store required in Mitigation Measure 4.3.6.3D.</p>	City Building and Safety	Once before issuance of building permits	Prior to issuance of building permits for more than 25 million total square feet of logistics warehousing within the WLC Specific Plan	Review and approval of building plans		Withhold building permit
<p>4.3.6.3D Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a site shall be operational within the Specific Plan area offering food and convenience items for purchase by the motoring public. This facility may be established in connection with the fueling station required in Mitigation Measure 4.3.6.3C.</p>	City Building and Safety	Before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold building permit
<p>4.3.6.3E Refrigerated warehouse space is prohibited unless it can be demonstrated that the environmental impacts resulting from the inclusion of refrigerated space and its associated facilities, including, but not limited to, refrigeration units in vehicles serving the logistics warehouse, do not exceed any environmental impact for the entire World Logistics Center identified in the program Environmental Impact Report. Such environmental analysis shall</p>	City Planning Division	Once before plot plan review for any building.	Prior to issuance of any building permit	Review and approval of building plans		Withhold building permit

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
be provided with any warehouse plot plan proposing refrigerated space. Any such proposal shall include electrical hookups at dock doors to provide power for vehicles equipped with Transportation Refrigeration Units (TRUs).						
4.3.6.3F The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.4A The following measures shall be incorporated as conditions to any Plot Plan approval within the Specific Plan: a) All tenants shall be required to participate in Riverside County’s Rideshare Program. b) Storage lockers shall be provided in each building for a minimum of three percent of the full-time equivalent employees based on a ratio of 0.50 employees per 1,000 square feet of building area. Lockers shall be located in proximity to required bicycle storage facilities. c) Class II bike lanes shall be incorporated into the design for all project streets. d) The project shall incorporate pedestrian pathways between on-site uses. e) Site design and building placement shall provide pedestrian connections between internal and external facilities. f) The project shall provide pedestrian connections to residential uses within 0.25 mile from the project site. g) A minimum of two electric vehicle-charging stations for automobiles or light-duty trucks shall be provided at each building. In addition, parking facilities with 200 parking spaces or more shall be designed and constructed so that at least six percent of the total parking spaces are capable of supporting future electric vehicle supply equipment (EVSE) charging locations. Sizing of conduit and service capacity at the time of construction shall be sufficient to install Level 2 Electric Vehicle Supply Equipment (EVSE) or greater.	City Building and Safety, City Planning Division, and Transportation Engineering Division/Public Works	Once before plot plan approval for any building.	Prior to plot plan approval	Review and approval of plot plans		Withhold plot plan approval

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>h) Each building shall provide indoor and/or outdoor - bicycle storage space consistent with the City Municipal Code and the California Green Building Standards Code. Each building shall provide a minimum of two shower and changing facilities for employees.</p> <p>i) Each building shall provide preferred and designated parking for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles equivalent to the number identified in California Green Building Standards Code Section 5.106.5.2 or the Moreno Valley Municipal Code whichever requires the higher number of carpool/vanpool stalls.</p> <p>j) The following information shall be provided to tenants: onsite electric vehicle charging locations and instructions, bicycle parking, shower facilities, transit availability and the schedules, telecommunicating benefits, alternative work schedule benefits, and energy efficiency.</p>						
<p>4.3.6.5A</p> <p>(a) The house at 30220 Dracaea Avenue shall be demolished prior to the issuance of the first grading permit for grading within the World Logistics Center.</p> <p>(b) An air filtration system meeting ASHRSE Standard 52.2 MERV-13 standards shall be offered to the owners of the houses located at 13100 World Logistics Center Parkway (formerly Theodore Street) and 12400 World Logistics Center Parkway (formerly Theodore Street). The developer shall offer to install the air filtration system to the owners of the two properties within two months of the certification of the Final Revised FEIR. Prior to the issuance of the first grading permit within the World Logistics Center, documentation shall be provided to the City confirming that an offer to install the air filtration system has been extended to the owners of each of the two properties. The owners of the two properties shall be under no obligation to accept the offer. Each property owner shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, the</p>	<p>City Building and Safety, City Planning Division</p> <p>City Building and Safety, City Planning Division</p>	<p>Once prior to issuance of first grading permit within the WLC.</p> <p>Prior to issuance of the first grading permit within the WLC.</p>	<p>Prior to issuance of the first grading permit.</p> <p>Initial offer within two months of certifying the Final RSFEIR.</p> <p>Documentation provided prior to issuance of the first grading permit.</p>	<p>Site inspection.</p> <p>Review of documentation.</p>		<p>Withhold grading permits.</p>

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developer shall work with each owner to ensure the air filtration system is properly installed within one year of acceptance.						
4.4 BIOLOGICAL RESOURCES						
4.4.5.2A (Previously included as 4.4.6.2A in the 2015 FEIR) Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter’s goldfields, smooth tarplant, Plummer’s mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review. They may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant’s discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once upon submittal of plot plan application	Prior to approval of Plot Plan	Review and Approval of biological assessment		Withhold Approval of Plot Plan
4.4.5.2B (Previously included as 4.4.6.2B in the 2015 FEIR) Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County Regional Conservation Authority (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the satisfaction of the City Planning Division and Riverside County Regional Conservation Authority (“RCA”).	City Planning Division, Riverside County RCA	Once upon submittal of tentative maps.	Prior to issuance of any tentative maps including or adjacent to MHSCP criteria cells.	Review JPR		Withhold approval of tentative maps
4.4.6.1A All Plot Plan applications within Planning Areas 10 and 12 (i.e., adjacent to the San Jacinto Wildlife Area as shown in Final EIR Volume 2 Figure 4.1.6B) shall provide a 250-foot setback from the southerly property line. Permitted uses within this setback area include landscaping, drainage and water quality facilities,	City Planning Division	Once before plot plan approval	Prior to plot plan approval	Plan check and review of setback area		Withhold Plot Plan approval.

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>4.4.6.1B Each Plot Plan application in Planning Areas 10 and 12 shall provide runoff management and water quality facilities adequate to minimize downstream erosion, maintain water quality standards and retain pre-development flows in a manner meeting the approval of the Moreno Valley and RWQCB requirements. All drainage improvements shall be designed to minimize runoff and erosional impacts on adjacent property. This measure shall be implemented to the satisfaction of the Land Development Division Manager of Public Works.</p>	<p>City Engineering Division and City Land Development Division Manager</p>	<p>Once upon submittal of plot plan application</p>	<p>Prior to approval of plot plan</p>	<p>Review and approval of plot plans within Planning Areas 10 and 12</p>		<p>Withhold approval of plot plan</p>
<p>4.4.6.2A (Previously included as 4.4.6.3A in the 2015 FEIR) Prior to the issuance of grading permits the applicant shall secure a jurisdictional determination from the United States Army Corps of Engineers (USACE) and confirm with the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) if drainage features mapped on the property to be developed are subject to jurisdictional authority. If the features are subject to regulatory protection, the applicant shall secure permit approvals with the appropriate agencies prior to initiation of construction. Compensatory riparian habitat mitigation shall be provided at a minimum ratio of 1: 1 (replacement riparian habitat to impacted riparian habitat) to ensure no net loss of riparian habitat or aquatic resources. It should be noted that this is a minimum recommended ratio but the actual permitting ratio may be higher. These detention basins shall be oversized to accommodate the provision of areas of riparian habitat. Maintenance of the basins shall be limited to that necessary to ensure their drainage and water quality functions while encouraging habitat growth. Riparian habitat mitigation shall be provided concurrent to or prior to impacts. A Compensatory Mitigation Plan shall be prepared for all unavoidable impacts and shall be consistent with the United States Army Corps of Engineers (USACE) / United States Environmental Protection Agency's Compensatory Mitigation for Losses of Aquatic Resources: Final Rule and the United States Army Corps of Engineers Standard Operating Procedure for Determination of Mitigation Ratios.</p> <p>The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife, and</p>	<p>City Planning Division and Land Development Division Manager</p>	<p>Once prior to issuance of grading permits</p>	<p>Prior to the issuance of grading permits</p>	<p>Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.</p>		<p>Withhold grading permit</p>

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<p>Regional Water Quality Control Board to establish the need for permits based on the results of a recent jurisdictional delineation and final design plans for each of the proposed facilities. Consultation with the three agencies shall take place and appropriate permits obtained for project-level development. Compensation for losses associated with the altering of drainages on site shall be in agreement with the permit conditions and in coordination with compensation outlined below.</p> <p>Mitigation shall consist of onsite creation, offsite creation, or purchase of mitigation credits from an approved mitigation bank. As outlined in the WLC programmatic DBESP report, onsite riparian habitat shall be created at a minimum 1: 1 ratio due to the poor quality of onsite habitat. New habitat shall be created within the onsite detention/infiltration basins to the extent allowed by the resource agencies to reduce storm flows, improve water quality, and reduce sediment transport. Habitat creation shall include the installation of mule fat scrub or similar riparian scrub habitat to promote higher quality riparian habitat, but still maintain the basins for their primary role as detention facilities. The use of these areas as conservation areas would require consent from CDFW and the City of Moreno Valley (MM BIO-2b and MM DBESP 1 through 3).</p>						
<p>4.4.6.2B (Previously included as 4.4.6.3B in the 2015 FEIR) As required by the Regional Conservation Authority (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the Regional Conservation Authority prior to project grading permit approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.</p> <p>If impacts to riparian habitat within the WLC site cannot be avoided at the time of specific development, then a separate project level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-</p>	City Planning Division	Once upon submittal of grading permit	Prior to the approval of any grading permit	Review and approval of site-specific DBESP and review and approval of plot plans.		Withhold grading permit approval.

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<p>specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.2A.</p> <p>A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations. Mitigation required for compensation for impacts to riparian/riverine areas shall require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.</p> <p>As outlined in the WLC programmatic DBESP, erosion control improvements shall be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat shall be enhanced within this drain following the installation of the erosion control improvements (MM DBESP 4 and 5).</p>						
<p>4.4.6.2C (Previously included as 4.4.6.3C in the 2015 FEIR) Prior to issuance of any grading permit for any offsite improvements that support development within the WLC site, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City. The Applicant shall consult with the Regional Water Quality Control Board (RWQCB) and California</p>	City Planning Division	Once before issuance of grading permit	Prior to issuance of grading permit	Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.		Withhold Grading Permit

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Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) and United States Army Corps of Engineers to establish the need for permits based on the results of the current stream mapping and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions, with a minimum 1:1 mitigation ratio. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the Regional Water Quality Control Board, U.S. Army Corps. of Engineers, and the California Department of Fish and Wildlife.						
<p>4.4.6.3A (Previously included as 4.4.6.4A in the 2015 FEIR) Pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC), site preparation activities (removal of trees and vegetation) shall be avoided during the nesting season of potentially occurring native and migratory bird species (generally February 1 to August 31). If site preparation activities must occur during the nesting season, a pre-activity field survey shall be conducted by a qualified biologist prior to issuance of grading permits for such development. The survey shall determine if active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code are present in the construction zone. If active nests of these species are found, the applicant shall establish an appropriate buffer zone with no grading or heavy equipment activity within of 500 feet from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed) 250 feet from passerine birds, or 100 feet for sensitive or protected songbird nests. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the setback area at the discretion of the biological monitor in consultation with CDFW. In</p>	City Planning Division	Once before issuance of grading permit	One week prior to issuance of grading permit	<p>If grading activities will take place within nesting season provide written evidence a qualified biologist has been retained by the applicant to conduct an onsite nesting survey prior to grading.</p> <p>If nesting birds are present, biologist will establish a construction buffer zone of a minimum from an active listed species or raptor nest, 300 feet from other sensitive or</p>		Withhold Grading Permit
	City Planning Division	Onsite Inspection	One week prior to issuance of grading permit			Issuance of a stop Work Order

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the event no special status avian species are identified within the limits of disturbance, no further mitigation is required. In the event such species are identified within the limits of ground disturbance, mitigation measure 4.4.6.3B shall also apply. This measure shall be implemented to the satisfaction of the City Planning Division.				protected bird bests (non-listed), or 100 feet for sensitive or protected songbird nests		
4.4.6.3B (Previously included as 4.4.6.4B in the 2015 FEIR) If it is determined that project-related grading or construction will affect nesting migratory bird species, no grading or heavy equipment activity shall take place within the limits established in Mitigation Measure 4.4.6.3A until it has been determined by a qualified biologist that the nest/burrow is no longer active, and all juveniles have fledged the nest/burrow. This measure shall be implemented to the satisfaction of the City Planning Division.	City Planning Division	Once Before Construction and onsite inspection	Prior to disturbance of site	Onsite inspection		Issuance of a Stop Work Order
4.4.6.3C (Previously included as 4.4.6.4C in the 2015 FEIR) The loss of foraging habitat for golden eagle and white-tailed kite will be mitigated by payment of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) fee and the creation of a landscaped setback area adjacent to the SJWA property. First, the payment of the Western Riverside County Multiple Species Habitat Conservation Plan fee shall be required on a project-by-project basis. Second, a 250-foot setback as described in Mitigation Measure 4.4.6.1A shall be established within the WLC site. This area will reduce impacts to raptor species foraging in the adjacent San Jacinto Wildlife Area open space areas.	City Planning Division	Once before issuance of grading permits	Prior to disturbance of site	Written verification of payment of MSHCP fees		Withhold Grading Permit
4.4.6.3D (Previously included as 4.4.6.4D in the 2015 FEIR) A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the WLC site. In the event no burrowing owls are observed within the limits of ground disturbance. no further mitigation is required. If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a	City Planning Division City Planning Division	Once 30-days prior to construction/grading Once 30-days prior to construction/grading	Prior to issuance of any grading permits Prior to issuance of any grading permits and during construction	Review of pre-construction survey for burrowing owls If construction takes place between Feb 1 – Aug 31 and nesting burrowing owl is present, a		Withhold Grading Permits Issuance of a Stop Work Order

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<p>500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged to the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.</p> <p>If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but Owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the Western Riverside County Regional Conservation Authority (RCA). A relocation plan will be required by CDFW, the USFWS, and the RCA if active and/or passive relocation is necessary. The relocation plan shall outline the basic process and provide options for avoidance and mitigation, identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.</p> <p>A relocation plan will be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated following consultation with the CDFW, the USFWS, and the RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include the SJWA, the 250-</p>	<p>City Planning Division</p>	<p>Onsite inspection once 30-days prior to construction/grading</p>	<p>Prior to issuance of any grading permits and during construction</p>	<p>500 ft. construction buffer shall be maintained from the nest until all juveniles have fledged.</p> <p>If construction takes place between Sept 1- Jan 31 and burrowing owl outside the nesting season present, a passive relocation plan shall be prepared by a qualified biologist and approved by the City.</p>		<p>Issuance of a Stop Work Order</p>
	<p>City Planning Division</p>	<p>Onsite inspection once 30-days prior to construction/grading</p>	<p>Prior to issuance of any grading permits and during construction</p>	<p>Written verification a relocation plan has approved by the California Department of Fish and Wildfire.</p>		<p>Issuance of a Stop Work Order</p>

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foot setback area or other suitable onsite or off-site areas). Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor, following consultation with CDFW, the USFWS, and RCA.						
4.4.6.3E (Previously included as 4.4.6.4E in the 2015 FEIR) Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to CDFW and the USFWS for review prior to submission to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the WLC site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas). All costs associated with the relocation, as well as short- and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division following coordination with CDFW and the USFWS.	City Planning Division	Once prior to plot plan approval for development of land including or adjacent to Drainage 9	Prior to plot plan approval	Submittal of a LAPM protocol survey report to the City.		Withhold Plot Plan Approval
4.4.6.3F (Previously included as 4.4.6.4F in the 2015 FEIR) Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan shall identify frequent and infrequent vegetation management requirements (i.e., removal	City Planning Official	Once before approval of any discretionary permits within Planning Areas 10 & 12	Prior to approval of any discretionary permits within planning Areas 10 & 12	Review and approval of a BRMP		Withhold Discretionary Permit

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<p>of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological Resource Management Plan shall also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.5.2A, 4.4.6.3D, and 4.4.6.3E.</p> <p>The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with California Department of Fish and Wildlife. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist to the satisfaction of the City Planning Division.</p>		Onsite inspection				
<p>4.4.6.3G (Previously included as 4.4.6.4G in the 2015 FEIR) Mitigation Measure 4.4.6.1A specifies that a landscape plan shall be submitted with any development proposal for lots adjacent to the San Jacinto Wildlife Area (SJWA) property prior to issuance of a precise grading permit. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the Specific Plan. No plant species listed in Section 6.1.4 or Table 6.2 of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) shall be installed within the setback area. In conjunction with development adjacent to the San Jacinto Wildlife Area (SJWA), cottonwood trees shall be planted within the 250-foot setback area, consistent with the World Logistics Center Specific Plan plant palette (per DBESP MM 8).</p> <p>During construction, the runoff leaving construction areas shall be directed to onsite detention basins and away from downstream drainage features located offsite. All projects within the WLC site shall be required to prepare a Storm Water Pollution Prevention Plan (as outlined in MM 4.9.6.2B). Regarding the 250-foot setback area, pedestrian and vehicular access to areas of riparian/riverine habitat shall be prohibited except for controlled maintenance access. Finally, no grading shall be permitted within conserved riparian/riverine habitat areas except for grading</p>	City Planning Division and Land Development Division Manager	Once before to issuance of a precise grading permit	Prior to issuance of a precise grading permit	Review and approval of landscape.		Withhold Grading Permit

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necessary to establish or enhance habitat areas (DBESP MM 6, 7, 9, and 10)						
4.4.6.3H (Previously included as 4.4.6.4H in the 2015 FEIR) As outlined in Mitigation Measure 4.4.6.1A, development adjacent to the 250-foot open space setback shall have a six-foot chain link fence or similar barrier to help separate human activity and the setback area. Any chain link fencing installed on any properties adjacent to the 250-foot setback area shall have metal mesh installed below and above ground level to prevent animals from accessing new development areas.	City Planning Division	Once before building permits	Prior to issuance of certificate of occupancy	Review and approval of fencing		Withhold plot plan approval Withhold grading permits
4.4.6.3I (Previously included as 4.4.6.4I in the 2015 FEIR) The individual property owner and/or Property Owners Association (POA) as appropriate shall be responsible for maintaining the various onsite landscaped areas, open improved or natural drainage channels, and detention or flood control basins in a manner that provide for fuel management and vector control pursuant to standards maintained by the City Fire Marshall and County Department of Environmental Health – Vector Control Group. This measure requires the individual owner or Property Owners Association (POA) to manage vegetation in and around these areas or improvements so as to not represent a fire hazard as defined by the City Fire Department through the substantial buildup of combustible materials. This measure also requires the individual owner or Property Owners Association to manage vegetation and standing water in drainage channels and basins such that they do not encourage or allow vectors to occur (primarily rats and mosquitoes). Runoff shall not be allowed to stand in channels or basins for more than 72hours without treatment or maintenance to prevent establishment of mosquitoes per published County vector control guidelines and “Best Management Practices for Mosquito Control on California State Properties” which is available from the California West Nile Virus website at http://www.westnile.ca.gov/resources . This measure shall be implemented by the Project Owners Association in consultation with City Fire Department and Riverside County Department of Environmental Health – Vector Control Group	City Fire Department; Land Development Division; and Stormwater Management Section of Public Works	As needed basis	Onsite Inspections during operations	Onsite Inspections		Issuance of Code Enforcement Citations

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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<p>4.4.6.3J (Previously included as 4.4.6.4J in the 2015 FEIR) A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas and/or San Jacinto Wildlife Area (SJWA) lands. The Fuel Management Plan shall be prepared by the project applicant and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan and/or SJWA boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:</p> <ul style="list-style-type: none"> • A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area. • A list of non-native invasive plants that are prohibit from installation. • Maintenance activities and a maintenance schedule. <p>Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas and SJWA lands are adequately protected from expected fire risks.</p>	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan approval and Onsite Inspection		Withhold plot plan approval
<p>4.4.6.3K (Previously included as 4.4.6.4K in the 2015 FEIR) Prior to approval of any plot plans for development adjacent to the SJWA, the applicant shall demonstrate that direct light rays have been contained within the development area, per requirements of the MSHCP Section 6.0 which states, "Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting." This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan and Onsite Inspection		Withhold Plot Plan Approval

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4.5 CULTURAL RESOURCES						
<p>4.5.6.1A Prior to the approval of any grading permit for any of the "Light Logistics" parcels, the parcels shall be evaluated for significance by a qualified archaeologist. A Phase 1 Cultural Resources Assessment shall be conducted by the project archaeologist and an appropriate tribal representative(s) on each of the "Light Logistics" parcel to determine if significant archaeological or historical resources are present.</p> <p>A Phase 2 significance evaluation shall be completed for any of these sites in order to determine if they contain significant archaeological or historical resources. Cultural resources include but are not limited to stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. All resources determined to be prehistoric or historic shall be documented using DPR523 forms for archival research/storage in the Eastern Information Center (EIC). If the particular resource is determined to be not significant, no further documentation is required. If prehistoric resources are determined to be significant, they shall be considered for relocation or archival documentation. If any resource is determined to be significant, a Phase 3 recovery study shall be conducted to recover remaining significant cultural artifacts. If prehistoric archaeological/cultural resources are discovered during the Phase 1 survey and it is determined that they cannot be avoided through site design, they shall be subject to a Phase 2 testing program. The project archaeologist in consultation with appropriate tribal group(s) shall determine the significance of the resource(s) and determine the most appropriate disposition of the resource(s) in accordance with applicable laws, regulations and professional practices (per Cultural Report MM CR-1, MM CR-2, MM CR-7 Table 3, pg. 74).</p>	<p>Planning Division and Land Development Division/Public Works</p>	<p>Once Before Permitting</p>	<p>Prior to the approval of any grading permit for any of the "Light Logistics"</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p>		<p>Withhold grading permit approval</p> <p>Issue stop work order if cultural resources are found</p>

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<p>4.5.6.1B Prior to the issuance of any grading or ground-disturbing permit for construction of off-site improvements a qualified archaeologist shall be retained to prepare a Phase I cultural resource assessment (CRA) of the project site if an up to date Phase I cultural resource assessment is not available for the site at the time of development per Cultural Report MM CR-5, Table 3, pg. 74).</p> <p>Appropriate tribal representatives as identified by the City shall be invited by the Project Archeologist to participate in this assessment.</p> <p>If archaeological resources are discovered during construction activities, no further excavation or disturbance of the area where the resources were found shall occur until a qualified archaeologist evaluates the find. If the find is determined to be a unique archaeological resource, appropriate action shall be taken to (a) plan construction to avoid the archeological sites (the preferred alternative); (b) cap or cover archeological sites with a layer of soil before building on the affected project location; or (c) excavate the site to adequately recover the scientifically consequential information from and about the resource. At the discretion of the project archaeologist, work may continue on other parts of the project site while the unique archaeological resource mitigation takes place. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>If the project archaeologist, in consultation with the monitoring Tribe(s), determines that the find is a unique archaeological resource, the resource site shall be evaluated and recorded in accordance with requirements of the State Office of Historic Preservation (OHP). If the resource is determined to be significant, data shall be collected by the qualified archaeologist and the findings of the report shall be submitted to the City. If the find is determined to be not significant no mitigation is necessary.</p> <p>Should a future project-level analysis show that cultural resource site CA-RIV-3346 will be directly or partially impacted by project-level construction, an Addendum cultural resource report must be prepared and include an analysis of the alternatives associated with mitigation for impacts to this resource following CEQA Guidelines Section 15126.4(b)(3). This information must be</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits for off-site improvements and as Needed During Construction</p>	<p>Prior to the approval of any grading or ground-disturbing permit</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p> <p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>	<p>Withhold Grading Permit or Issuance of Stop Work Order</p>
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<p>included in any project-level CEQA compliance documentation. It should be noted that Phase 3 data recovery is an acceptable mitigation action under CEQA Guidelines Section 15126.4(b)(3)(C) (per Cultural Report MM CR-3, Table 3, pg. 74). Should it be determined through a future project-level EIR analysis that prehistoric cultural resource sites CA-RIV-2993 and/or CA-RIV-3347 shall be directly impacted by future construction, these sites must be Phase 2 tested for significance (per Cultural Report MM CR-4, Table 3, pg. 74).</p>						
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<p>4.5.6.1C Prior to the issuance of any grading permits a qualified archaeologist shall be retained to monitor all grading and shall invite tribal groups to participate in the monitoring. Project-related archaeological monitoring shall include the following requirements per Cultural Report MM CR-6, MM CR-8, Table 3, pg.74):</p> <ol style="list-style-type: none"> 1. All earthmoving shall be monitored to a depth of ten (10) feet below grade by the Project Archaeologist or his/her designated representative. Once all areas of the development project that have been cut to ten (10) feet below existing grade have been inspected by the monitor. the Project Archaeologist may, at his or her discretion, terminate monitoring if and only if no buried cultural resources have been detected; 2. If buried cultural resources are detected, monitoring shall continue until 100 percent of virgin earth within the specific project area has been disturbed and inspected by the Project Archaeologist or his/her designated representative. 3. Grading shall cease in the area of a cultural artifact or potential cultural artifact as delineated by the Project Archaeologist or his/her designated representative. A buffer of at a minimum 25 feet around the cultural item shall be established to allow for assessment of the resource. Grading may continue in other areas of the site while the particular find are investigated; and 4. If prehistoric cultural resources are uncovered during grading, they shall be Phase 2 tested by the Project Archaeologist, and evaluated for significance in accordance with §15064.5(f) of the CEQA Guidelines. Appropriate actions for significant resources as determined by the Phase 2 testing include but are not limited to avoidance or capping, incorporation of the site in green space. parks, or delineation into open space. If such measures are not feasible, Phase 3 data recovery of the significant resource will be required, and curation of recovered artifacts and/or reburial, shall be required. A report associated 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of grading permits</p>	<p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit</p>
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<p>with Phase 2 testing or Phase 3 data recovery must be delivered to the City and, if necessary, the museum where any recovered artifacts have been curated.</p> <p>5. No further grading shall occur in the area of the discovery until the City approves specific actions to protect identified resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p> <p>6. The developer shall make reasonable efforts to avoid, minimize, or mitigate significant adverse impacts on cultural resources. The State Historic Preservation Office (SHPO) and local Native American tribes will be consulted and the Advisory Council on Historic Preservation will be notified within 48 hours of the find in compliance with 36 CFR 800.13(b)(3). This measure shall be implemented to the satisfaction of the Planning Official.</p>						
<p>4.5.6.1D Prior to the issuance of any grading permit the project archaeologist shall invite interested Tribal Group(s) representatives to monitor grading activities. Qualified representatives of the Tribal Group(s) shall be granted access to the project site to monitor grading as long as they provide 48-hour notice to the developer of their desire to monitor, so the developer can make appropriate safety arrangements on the site. This measure shall be implemented to the satisfaction of the Planning Official.</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of any grading permit within 3,750 feet of the southwest corner</p>	<p>Evidence of invitation to Tribal Group Representatives</p>		<p>Withhold Grading Permit</p>
<p>4.5.6.1E It is possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources (archaeological or historical). In the event that buried cultural resources are discovered during grading and no Project Archaeologist or Historian is present, grading operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be retained to determine the most appropriate course of action regarding the resource. The Archeologist shall make recommendations to the City on the actions that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and</p>	<p>Grading Contractor, Land Development Division/Public Works, and Planning Division</p>	<p>As Needed During Construction</p>	<p>During Grading and/or ground disturbing activities</p>	<p>Verification to the City a qualified archaeologist been retained</p>		<p>Issuance a Stop Work Order</p>

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<p>evaluation of the finds in accordance with §15064.5 of the <i>CEQA Guidelines</i>. Cultural resources could consist of, but are not limited to, stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria. If the resources are determined to be unique historic resources as defined under §15064.5 of the <i>CEQA Guidelines</i>, appropriate protective actions for significant resources such as avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds shall be implemented by the project archaeologist and the City.</p> <p>No further grading shall occur in the area of the discovery until the City and Project Archaeologist approve the measures to address these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p>						
<p>4.5.6.2A If any historic resources are found during implementation of Mitigation Measure 4.5.6.1A, the Project Archaeologist or Historian (as appropriate) shall offer any artifacts or resources to the Moreno Valley Historical Society (MVHS) or the Eastern Information Center/County Museum or the Western Science Center in Hemet as appropriate for archival storage. From the time any artifacts are turned over to the Moreno Valley Historical Society or other appropriate historical group, the developer shall have no further responsibility for their management or maintenance.</p>	<p>City Planning Division</p>	<p>As Needed During Construction</p>	<p>During grading</p>	<p>A qualified archaeologist or historian(s) shall be retained by the applicant. A report of findings shall be submitted to the City after the finalization of construction</p>		<p>Issuance of a Stop Work Order</p>
<p>4.5.6.2B As part of construction of the trail segment connecting Redlands Boulevard to the California Department of Fish and Wildlife property, the developer shall contribute \$5,000 to the City for the installation of a historical marker acknowledging the passing of Juan Bautista de Anza through this area during his exploration of California. This measure shall be incorporated into trail plans for this segment which will be subject to review and approval by the City Park and Recreation Department in consultation with the Moreno Valley Historical Society.</p>	<p>City Park and Recreation Department</p>	<p>Once</p>	<p>Prior to approval of trail plans</p>	<p>Review and Approval of Trail Plans Written verification the \$5,000 has been paid</p>		<p>Withhold Approval of Trail Plans</p>

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<p>4.5.6.2C Streets C and E shall follow the historical alignment of Alessandro Boulevard and shall be named Alessandro Boulevard.</p>	<p>City Land Development/ Public Works City Park and Recreation Department</p>	<p>Once prior to issuance of plot plan</p>	<p>Prior to issuance of approval of plot plans for planning Areas along Alessandro boulevard</p>	<p>Review and Approval of Plot Plans</p>		<p>Withhold Plot Plan approval</p>
<p>4.5.6.3A Prior to the issuance of any grading permits, a City-approved Paleontologist shall be retained to conduct paleontological monitoring as needed for all grading related to development. Development monitoring shall include the following actions:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to exceed twenty (20) feet in depth, in areas where fossil-bearing formations are found during grading, and in all areas found to contain, or are suspected of containing, fossil-bearing formations. 2. To avoid construction delays, paleontological monitors shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates if they are unearthed. 3. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. This measure shall be implemented to the satisfaction of the Planning Official. The Project Paleontologist and the Project Archaeologist described in Mitigation Measure 4.5.6.1C may be the same person if he/she meets the qualifications of both positions per Cultural Report MM PR-1, Table 4, pg. 76. 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed during Construction</p>	<p>Prior to issuance of any grading permits for development within the WLCSP</p>	<p>A qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A report of findings shall be submitted to the City after the finalization of construction</p>		<p>Withhold Grading Permit or Issuance of a Stop Work Order</p>
<p>4.5.6.3B Prior to the issuance of any permits for the construction of off-site improvements, a qualified paleontologist shall conduct an assessment for paleontological resources on each off-site improvement location. If any site is determined to have a potential for exposing paleontological resources, the project paleontologist shall monitor off-site grading/excavation, subject</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to issuance of grading permits for construction of any off-site improvements</p>	<p>A Qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A Report</p>		<p>Withhold grading permit or issuance of a stop work order</p>

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<p>to coordination with the City. Development monitoring shall include the following mitigation measures:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to reach fossil-bearing formations during grading. This monitoring must be conducted by the Project Paleontologist in all areas found to or suspected of containing fossil-bearing formations. 2. To avoid construction delays, the Project Paleontologist shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates as they are unearthed. 3. The Project Paleontologist shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. 				<p>of findings shall be submitted to the City after the finalization of construction</p>		
4.6 GEOLOGY AND SOILS						
<p>4.6.6.1A Prior to approval of any projects for development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet, the City shall determine if a detailed fault study of the Casa Loma Fault Zone area is required based on available evidence.</p> <p>If necessary, any additional geotechnical investigations shall be prepared by a qualified geologist and determine if structural setbacks are needed, and shall identify specific remedial earthwork and/or foundation recommendations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site specific investigations, provide any additional necessary mitigation to meet California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that</p>	<p>City Engineer and Project Geologist and Land Development/ Public Works</p> <p>Building and Safety</p>	<p>Once before project approvals</p>	<p>Prior to approval of any projects for future development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the Western boundary along the Mount Russell toe of</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>all structural plans for the project meet current Building Code requirements.</p> <p>Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur. Structures intended for human occupancy shall not be located within any structural setback zone as determined by those studies. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>slope easterly into the site 1 , 500 feet.</p>			
<p>4.6.6.1B Prior to approval of any projects for development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone, the City shall review and approve a geotechnical fault study prepared by a qualified geologist to confirm the alignment and size of any required building setbacks related to the fault zone. If necessary, this study shall identify a “special foundation or grading remediation zone” for the areas supporting structures intended for human occupancy where coseismic deformation (fractures) is observed. This zone shall be determined after subsurface evaluation based on proposed building locations. Specific remedial earthwork and foundation recommendations shall be evaluated as necessary based on proposed building locations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a</p>	<p>City Engineer and Project Geologist; Land Development/ Public Works</p>	<p>Once before approval of any development permits and Prior to Plot Plan Approval</p>	<p>Prior to approval of any projects for future development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone.</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>This study may involve trenching to adequately identify the location of the Claremont segment of the San Jacinto Fault Zone that crosses the eastern portion of the World Logistics Center Specific Plan property. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>						
<p>4.6.6.1C Prior to the approval of grading permits, or permits for construction of off-site improvements, the City shall review and approve plans confirming that the project has been designed to withstand anticipated ground shaking and other geotechnical and soil constraints (e.g., settlement). The project proponent shall submit plans to the City as appropriate for review and approval prior to issuance of grading permits or issuance of permits for the construction of any offsite improvements. This measure shall be implemented to the satisfaction of the City Engineer.</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before issuance of grading permits</p>	<p>Prior to the approval of project grading permits, or permits for construction of off-site improvements</p>	<p>Review and approve grading and construction plans</p>		<p>Withhold Issuance of Grading or Construction Permits</p>
<p>4.6.6.2A Prior to issuance of building permits for any portion of the project site, a site-specific, design level geotechnical investigation for each parcel shall be submitted to the City, which would comply with all applicable state and local code requirements, and includes an analysis of the expected ground motions at the site from known active faults using accepted methodologies. The report shall determine structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. The report shall also determine final design parameters for walls, foundations,</p>	<p>City Engineer and Land Development/ Public Works Building and Safety Division</p>	<p>Once before issuance of building permits</p>	<p>Prior to the issuance of any building permits</p>	<p>Review and approval of a site-specific, design level geotechnical investigation for each parcel</p>		<p>Withhold Building Permits</p>

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<p>provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. These investigations shall identify any site-specific impacts from compressible and expansive soils based on the actual location of individual pads proposed in the future, so that differential movement can be further verified or evaluated in view of the actual foundation plan and imposed fill or structural loads. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>Compliance with this measure will ensure that future buildings are designed to protect the structure and occupants from on-site soil limitations, consistent with State Building Code requirements. This measure shall be implemented to the satisfaction of the City Engineer.</p>						
<p>4.6.6.3B Any cut slopes in excess of five (5) feet in vertical height shall be constructed as “replacement fill slopes” per the project geotechnical report, due to the variable nature of the onsite alluvial soils. This measure shall be implemented to the satisfaction of the City Land Development Division and the City Engineer in consultation with the Project Geologist.</p>	<p>City Land Development Division and City Engineer</p>	<p>Before and after issuance of any grading permit</p>	<p>Prior to issuance and following any grading permit for development within the Specific Plan</p>	<p>Review and approval of grading plans Review of grading prior to issuance of building permit</p>		<p>Withhold Grading Permit Witthold building permit</p>
<p>4.6.6.3C During all grading activities, a geotechnical engineer shall monitor site preparation, removal of unsuitable soils, mapping of all earthwork excavations, approval of imported earth materials, fill placement, foundation installation, and other geotechnical operations. Laboratory testing of subsurface</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before permitting</p>	<p>Prior to issuance of Any discretionary permit for development</p>	<p>Review of additional geotechnical and soils site investigations</p>		<p>Withhold Discretionary Permit</p>

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<p>materials to confirm compacted dry density and moisture content, consolidation potential, corrosion potential, expansion potential, and resistance value (R-value) shall be performed prior to and during grading as appropriate. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>within the Specific Plan</p>		<p>Issuance of a stop work order if necessary</p>
<p>4.7 GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE</p>					
<p>4.7.6.1A The World Logistic Center project shall implement the following requirements to reduce solid waste and greenhouse gas emissions from construction and operation of project development:</p>					
<p>a) After January 1, 2020, development shall divert a minimum of 75 percent of landfill waste. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p>	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Provide verification sheet to the Recycling Coordinator/ Public Works Property Owners. Association or the property owner shall certify the percentage of land fill waste diverted on an annual basis</p>	<p>Pursuant to City Municipal Code</p>
<p>b) After January 1, 2020, recycle and/or salvage at least 75 percent of non-hazardous construction and demolition debris. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Calculations can be done by weight or volume but must be consistent throughout.</p>	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Certification has been submitted to the City. Property Owners Association or the property owner shall certify the percentage of landfill waste diverted on an annual basis.</p>	<p>Pursuant to City Municipal Code</p>
<p>c) The applicant shall submit a Recyclables Collection and Loading Area Plan for construction related materials prior to issuance of a building permit with the Building Division and for operational aspects of the project prior to the issuance of the occupancy permit to the Public Works Department. The plan shall conform to the Riverside County Waste Management Department’s Design Guidelines for Recyclable Collection and Loading Areas.</p>	<p>City Planning Division</p>				<p>Pursuant to City Municipal Code Withhold Certificate of Occupancy</p>

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<p>d) Prior to issuance of certificate of occupancy, the recyclables collection and loading area shall be constructed in compliance with the Recyclables Collection and Loading Area plan.</p>		<p>Once before issuance of building permits</p>	<p>Prior to issuance of building permits</p>	<p>Review and approval of a Recyclables Collection and Loading Area plan</p>		<p>Withhold Certificate of Occupancy</p>
<p>e) Prior to issuance of certificate of occupancy, documentation shall be provided to the City confirming that recycling is available for each building.</p>	<p>City Planning Division</p>		<p>Prior to issuance of occupancy permit</p>	<p>Review and approval of building plans</p>		<p>Withhold Certificate of Occupancy</p>
<p>f) Within six months after occupancy of a building, the City shall confirm that all tenants have recycling procedures set in place to recycle all items that are recyclable, including but not limited to paper, cardboard, glass, plastics, and metals.</p>	<p>City Planning Division</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Building plan review.</p>		
<p>g) The property owner shall advise all tenants of the availability of community recycling and composting services.</p>	<p>Recycling Coordinator/ Public Work</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Compliance with Recyclables Collection and Loading Area Plan</p>		<p>Withhold Certificate of Occupancy</p>
	<p>Recycling Coordinator/ Public Work</p>	<p>Within six months of building occupancy</p>	<p>Within six months after occupancy of building</p>	<p>Review and approval of a Recyclables Collection and Loading Area Plan.</p>		
<p>h) Existing onsite street material shall be recycled for new project streets to the extent feasible.</p>	<p>City Engineer Land Development/ Public Works</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of a Certificate of Occupancy</p>	<p>Written verification will be submitted to the City that the property owner advised all tenants of the availability of community recycling and composting services.</p>		<p>Withhold grading permits</p>
		<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits.</p>	<p>Review and approval of documents including street plans</p>		

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<p>4.7.6.1B (Previously included as Utilities Mitigation Measure 4.16.4.6.1A in the 2015 FEIR for building energy). Each application for a building permit shall include energy calculations to demonstrate compliance with California Energy Efficiency Standards Plans shall follow the following:</p> <ul style="list-style-type: none"> • Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. • Cool pavement materials such as lighter-colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right-of-way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. • Energy-efficient appliances that achieve the 2016 California Appliance Energy Efficiency Standards (e.g., EnergyStar® Appliances) and use of sunlight-filtering window coatings or double-paned windows. 	<p>City Building and Safety, City Planning Division City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1C (Previously included as Utilities Mitigation Measure 4.16.4.6.1B building energy). Prior to the issuance of any building permits within the WLC site, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards, for each new structure. Plans may include but are not necessarily limited to implementing the following as appropriate:</p> <ul style="list-style-type: none"> • High-efficiency air-conditioning with electronic management system (computer) control. • Isolated High-efficiency air-conditioning zone control by floors/separate activity areas. • Use of Energy Star® exit lighting or exit signage. 	<p>City Building and Safety, City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1D (Previously included as Utilities Mitigation Measure 4.16.4.6.1C in the 2015 FEIR for building energy; now modified). Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p>	<p>City Planning Division, City Building and Safety Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>

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<ul style="list-style-type: none"> • Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building or up to the limit allowed by MVU’s restriction on distrusted solar PV connecting to their grid, whichever is greater; • Increase efficiency for buildings by implementing either 10 percent over the 2019 Title 24’s energy-saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict; • Require the equivalent of “Leadership in Energy and Environmental Design Certified” for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval; and • All project rooftops shall be constructed to be solar-ready and be designed to accommodate the additional loads from solar equipment that might be installed at a future date. <p>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</p>						
<p>4.7.7.1 The developer shall mitigate the WLC Project's remaining GHG emissions to net zero by purchasing and retiring offset carbon credits, based upon the amount of GHG emissions set forth in Table 4.7-16 of the Revised Final EIR. Upon the purchase and retirement of offsets carbon credits, no further analysis of GHG emissions will be required, and no further reduction of those emissions will be required.</p> <p>The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of offset carbon credits provided that the following conditions are satisfied:</p> <p>a) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), approved by the California Air Resources Board, such as, but not limited to, Climate Action Reserve, American Carbon Registry or Verra (formerly Verified Carbon Standard). In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and</p>	<p>City Planning Division</p>	<p>Prior to each phase as noted in Timing</p>	<p>Grading offsets shall be purchased and retired prior to issuance of a grading permit</p> <p>Construction offsets shall be purchased and retired prior to issuance of building permits</p> <p>Operational offsets shall be purchased and retired prior to issuance of</p>	<p>Review of written verification</p>		<p>Withhold applicable permit at each phase (grading, building and/or occupancy permit).</p>

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<p>enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City’s Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.</p> <p>b) Timing: The developer shall provide proof to the City that offset carbon credits equal to the amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent.</p>			<p>occupancy permits</p>			
<p>4.8 HAZARDS AND HAZARDOUS MATERIALS</p>						
<p>4.8.6.1A Prior to demolition of any existing structures on the project site, a qualified contractor shall be retained to determine if asbestos-containing materials (ACMs) and/or lead-based paint (LBP) are present. If asbestos-containing materials and/or lead-based paint are present, prior to commencement of demolition, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. In addition, onsite soils shall be tested for contamination by agricultural chemicals. If present, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. This measure</p>	<p>City Building Division</p>	<p>Once Before Permitting and as Needed During Construction</p>	<p>Prior to demolition of any existing rural residences or associated structures</p>	<p>Evidence of qualified contractor provided</p>		<p>Withhold Demolition Permits</p>

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shall be implemented to the satisfaction of the Building Division including written documentation of the disposal of any asbestos-containing materials, lead-based paint, or agricultural chemical residue in conformance with all applicable regulations.						
4.8.6.1B Prior to the issuance of any discretionary permits associated with the proposed fueling facility (“logistic support” site in the LD zone), a risk assessment or safety study that identifies the potential public health and safety risks from accidents at the facility (e.g., fire, tank rupture, boiling liquid, or expanding vapor explosion) shall be submitted to the City for review and approval. This study shall be prepared to industry standards and demonstrate that the facility will not create any significant public health or safety impacts or risks, to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Fire Prevention Bureau and Building and Safety Division Planning Division	Once Before Permitting	Prior to issuance of Any discretionary Permits associated with natural gas fueling facility	Review and Approval of Risk Assessment or Safety Study		Withhold Discretionary Permit
4.8.6.1C Prior to grading for any discretionary permits for development in Planning Areas 9-12 adjacent to the natural gas compressor plant, the applicant shall prepare a risk assessment report analyzing safety conditions relative to the existing compressor plant and planned development. The report must be based on appropriate industry standards and identify the potential hazards from the compressor plant (e.g., fire, explosion) and determine that the distance from the plant to the closest planned buildings in Planning Areas 9-12 is sufficient to protect the safety of workers from accidents that could occur (see Final EIR Volume 2 Figure 4.1.6B) at the compressor plant. This measure shall be implemented to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Building Official and Fire Marshal Planning Division	Once before issuance of discretionary permits for development within Planning Areas 9-12	Prior to issuance of Discretionary permits for Development within Planning Areas 9-12	Review and approval of a risk assessment		Withhold Discretionary Permit
4.8.6.1D Prior to the issuance of any grading permit, the developer shall inform the City of any existing solid waste materials within the development area. In conjunction with grading activities, all solid waste matter within the development area shall be removed by a licensed contractor and disposed of in an approved landfill. A record of the removal and disposal of any waste materials, in compliance with applicable laws and regulations, shall be submitted to the City prior to the issuance of any building permits.	Building and Safety Recycling Coordinator/ Public Works	Once before issuance of grading permits	Prior to issuance of grading permits	Applicant will inform the City in writing of any existing solid waste materials within the development area		Withold building permit until receipt of record of removal and disposal of waste materials Pursuant to City Municipal Code

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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4.9 HYDROLOGY AND WATER QUALITY						
<p>4.9.6.1A Prior to issuance of any building permit within the Specific Plan area, the developer shall construct storm drain pipes and conveyances, as well as, combined detention and infiltration basin(s), bioretention area(s), and spreading area(s) within each proposed watershed, as outlined in the project hydrology plan, to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduce the time of concentration by storing and infiltrating increased runoff for a limited period of time and release the outflow at a rate that does not exceed the pre-development peak flows and velocities for the 2, 5, 10, 25, and 100-year storms and volumes as assessed in the water balance model for historical conditions. For the purpose of this mitigation measure, the term “construct” shall mean to substantially complete construction so as to function for its intended purpose during construction with complete construction prior to occupancy. Field investigations will be conducted to determine the infiltration rate of soils underlying the proposed locations of bioretention areas and detention basins. The infiltration rate of the underlying soils will be used to properly size the bioretention areas and detention basins/infiltration basins to ensure that adequate volumes of runoff, in cumulative total for all bioretention areas and detention basins, are captured and infiltrated. The water balance model will be updated and rerun for the site-specific conditions encountered to confirm the water balance. This measure shall be implemented to the satisfaction of the City Engineer. Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage weir structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow such that the flows exiting the project boundary will return to the sheet flow pattern similar to the existing condition. Detention basins and spreading areas shall be designed to account for the amount of the sediment transported through the project boundary so that the existing sediment carrying capacity is maintained.</p>	<p>Land Development/ Public Works</p>	<p>Prior to Occupancy</p>	<p>Prior to issuance of any development permit</p>	<p>Review and approval of construction documents Field Inspection</p>		<p>Withhold Building Permit</p>
<p>4.9.6.1B The bioretention areas and detention/infiltration basins shall be designed to assure infiltrations rates. The monitoring plan will follow the guidelines presented by the California Storm Water Quality Association (CASQA) in the California Storm Water Best</p>	<p>City Engineer</p>	<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits</p>	<p>Review and approval of a monitoring plan for the detention/ infiltration basins</p>		<p>Withhold Grading Permit</p>

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<p>Management Program (BMP) Handbook, Municipal, January 2003 Section 4, Treatment Control Best Management Programs Fact Sheets TC-11 Infiltration Basin and TC-30 Vegetated Swale)</p> <p>For the Bioretention areas, as needed maintenance activities shall be conducted to remove accumulated sediment that may obstruct flow through the swale. Bioretention areas shall be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. The maintenance activities should occur when sediment on channels and culverts builds up to more than 3 inches (CASQA 2003). The swales will need to be cultivated or rototilled if drawdown takes more than 72 hours.</p> <p>For the Detention/infiltration Basins, a 3-5 year maintenance program shall be implemented mainly to keep infiltration rates close to original values since sediment accumulation could reduce original infiltration rate by 25-50%. Infiltration rates in detention basins will be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. If cumulative infiltration rates of all detention basins drops below the minimum required rates, then the detention basins will be reconditioned to improve infiltration capacity by scraping the bottom of the detention basin, seed or sod to restore groundcover, aerate bottom and dethatch basin bottom (CASQA 2003).</p>	<p>Land development/Public Works</p>	<p>Ongoing during occupancy</p>	<p>Ongoing during occupancy</p>	<p>On-site Inspection</p>		<p>Citation, City Maintenance, Lien and Foreclosure Pursuant to City Municipal Code</p>
<p>4.9.6.2A Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall file a Notice of Intent (NOI) with the Santa Ana Regional Water Quality Control Board to be covered under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit for discharge of storm water associated with construction activities. The project developer shall submit to the City the Waste Discharge Identification Number issued by the State Water Quality Control Board (SWQCB) as proof that the project's Notice of Intent is to be covered by the General Construction Permit has been filed with the State Water Quality Control Board. This measure shall be implemented to the satisfaction of the City Engineer</p>	<p>City Engineer. Land Development/Public Works, and Stormwater Management</p>	<p>Once before issuance of any grading permit</p>	<p>Prior to issuance of any grading permit</p>	<p>Proof of NOI submittal</p>		<p>Withhold Grading Permit</p>
<p>4.9.6.2B Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall submit to the State Water Quality Control Board (SWQCB) a</p>	<p>City of Moreno Valley and the Regional Water</p>	<p>Once before issuance of</p>	<p>Prior to issuance of any grading permit</p>	<p>Written verification of filing a SWPPP by the RWQCB</p>		<p>Withhold Grading Permit</p>

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<p>project-specific Storm Water Pollution Prevention Plan (SWPPP). The Storm Water Pollution Prevention Plan shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the Storm Water Pollution Prevention Plan shall emphasize structural and nonstructural best management practices (BMPs) to control sediment and non-visible discharges from the site. Best Management Practices to be implemented may include (but shall not be limited to) the following:</p> <ul style="list-style-type: none"> • Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary debris basins (if deemed necessary), and other discharge control devices. The construction and condition of the Best Management Practices are to be periodically inspected by the Regional Water Quality Control Board during construction, and repairs would be made as required. • Materials that have the potential to contribute non-visible pollutants to storm water must not be placed in drainage ways and must be placed in temporary storage containment areas. • All loose soil, silt, clay, sand, debris, and other earthen material shall be controlled to eliminate discharge from the site. Temporary soil stabilization measures to be considered include: covering disturbed areas with mulch, temporary seeding, soil stabilizing binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. Stockpiles shall be surrounded by silt fences and covered with plastic tarps. • The Storm Water Pollution Prevention Plan shall include inspection forms for routine monitoring of the site during the construction phase. • Additional required Best Management Practices and erosion control measures shall be documented in the Storm Water Pollution Prevention Plan. • The Storm Water Pollution Prevention Plan would be kept on-site for the duration of project construction and shall be available to the local Regional Water Quality Control Board for inspection at any time. 	<p>Quality Control Board and Land Development/ Public Works</p>	<p>any grading permit And Ongoing as part of routine site inspections</p>	<p>Ongoing</p>	<p>Site inspection</p>		<p>Pursuant to City Municipal Code</p>
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<p>The developer and/or construction contractor for each development area shall be responsible for performing and documenting the application of Best Management Practices identified in the project-specific Storm Water Pollution Prevention Plan. Regular inspections shall be performed on sediment control measures called for in the Storm Water Pollution Prevention Plan. Monthly reports shall be maintained and available for City inspection. An inspection log shall be maintained for the project and shall be available at the site for review by the City of Moreno Valley and the Regional Water Quality Control Board.</p>					
<p>4.9.6.3A Prior to discretionary permit approval for individual plot plans, a site-specific Water Quality Management Plan (WQMP) shall be submitted to the City Land Development Division for review and approval. The Water Quality Management Plan shall specifically identify site design, source control, and treatment control Best Management Practices that shall be used on-site to control pollutant runoff and to reduce impacts to water quality to the maximum extent practicable. The Water Quality Management Plan shall be consistent with the Water Quality Management Plan approved for the overall World Logistics Center Specific Plan project. At a minimum, the site developer shall implement the following site design, source control, and treatment control Best Management Practices as appropriate:</p> <p>Site Design Best Management Practices</p> <ul style="list-style-type: none"> a) Minimize urban runoff. b) Maximize the permeable area. c) Incorporate landscaped buffer areas between sidewalks and streets. d) Maximize canopy interception and water conservation by planting native or drought-tolerant trees and large shrubs. e) Use natural drainage systems. f) Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration. g) Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives. 	<p>City Land Development Division</p>	<p>Once before issuance of any grading or building permits</p> <p>And</p> <p>Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permit approval for individual plot plans</p> <p>Ongoing</p>	<p>Review and Approval of WQMP</p> <p>Site inspection</p>	<p>Withhold Grading or Building Permit</p> <p>Pursuant to City Municipal Code</p>

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<p>h) Minimize impervious footprint.</p> <p>i) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.</p> <p>j) Reduce widths of street where off-street parking is available.</p> <p>k) Minimize the use of impervious surfaces such as decorative concrete, in the landscape design.</p> <p>l) Conserve natural areas.</p> <p>m) Minimize Directly Connected Impervious Areas (DCIAs).</p> <p>n) Runoff from impervious areas will sheet flow or be directed to treatment control Best Management Practices.</p> <p>o) Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas that are planted with native or drought-tolerant trees and large shrubs.</p> <p>Source Control Best Management Practices</p> <p>Source control Best Management Practices are implemented to eliminate the presence of pollutants through prevention. Such measures can be both nonstructural and structural.</p> <p>Non-structural source control Best Management Practices include:</p> <p>a) Education for property owners, operator, tenants, occupants, or employees;</p> <p>b) Activity restrictions;</p> <p>c) Irrigation system and landscape maintenance;</p> <p>d) Common area litter control;</p> <p>e) Street sweeping private streets and parking lots; and</p> <p>f) Drainage facility inspection and maintenance.</p> <p>Structural source control Best Management Practices include:</p> <p>g) MS4 stenciling and signage;</p> <p>h) Landscape and irrigation system design;</p> <p>i) Protect slopes and channels; and</p> <p>j) Properly design fueling areas, trash storage areas, loading docks, and outdoor material storage areas.</p> <p>Treatment Control Best Management Practices</p>						
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<p>Treatment control Best Management Practices supplement the pollution prevention and source control measures by treating the water to remove pollutants before it is released from the project site. The treatment control Best Management Practice strategy for the project is to select Low Impact Development (LID) Best Management Practices that promote infiltration and evapotranspiration, including the construction of infiltration basins, bioretention facilities, and extended detention basins. Where infiltration Best Management Practices are not appropriate, bioretention and/or biotreatment Best Management Practices (including extended detention basins, bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration may be utilized. Harvest and Reuse Best Management Practice will be used to store runoff for later non-potable uses.</p> <p>Site-specific Water Quality Management Plans have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the project are developed, Best Management Practices will be implemented consistent with the goals contained in the Master Water Quality Management Plan. All development within the project will be required to incorporate on-site water quality features to meet or exceed the approved Master Water Quality Management Plan's water quality requirements identified previously.</p>						
<p>4.9.6.3B The Property Owners Association (POA) and all property owners shall be responsible to maintain all onsite water quality basins according to requirements in the guidance Water Quality Management Plan and/or subsequent site-specific Water Quality Management Plans, and established guidelines of the Regional Water Quality Control Board. Failure to properly maintain such basins shall be grounds for suspension or revocation of discretionary operating permits, and/or referral to the Regional Water Quality Control Board for review and possible action. This measure shall be implemented to the satisfaction of the City Land Development Division, in consultation with the City Engineer, and Regional Water Quality Control Board.</p>	<p>City Land Development Division</p>	<p>As Needed</p>	<p>Ongoing</p>	<p>Onsite inspections</p>		<p>Revocation of Discretionary or Operating Permits</p>

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<p>4.9.6.3C Prior to issuance of future discretionary permits for any development along the southern boundary of the World Logistics Center Specific Plan (WLCSP), the project developer of such sites, in cooperation with the Property Owners Association (POA), shall establish and annually fund a Water Quality Mitigation Monitoring Plan (WQMMP) to confirm that project runoff will not have deleterious effects on the adjacent San Jacinto Wildlife Area (SJWA). This program shall include at least quarterly sampling along the southern boundary of the site (i.e., at the identified outlet structures of the project detention basins) during wet season flows and/or when water is present, as well as sampling of any dry-season flows that are observed entering the San Jacinto Wildlife Area property from the project property, including Drainage 9, which is planned to convey only clean off-site flows from north of the World Logistics Center Specific Plan site across Gilman Springs Road. The program shall also include at least twice yearly sampling after completion of construction, and a pre-construction survey must be completed to determine general water quality baseline conditions prior to and during development of the southern portion of the World Logistics Center Specific Plan. This sampling shall be consistent with and/or comply with the requirements of applicable Storm Water Pollution Prevention Plans (SWPPPs) for the development site.</p> <p>The project developer of sites along the southern border of the World Logistics Center Specific Plan shall be responsible for preventing or eliminating any toxic pollutant (not including sediment) found to exceed applicable established public health standards. In addition, the discharge from the project shall not cause or contribute to an exceedance of Receiving Water Quality Objectives for the potential pollutants associated with the project as identified in Table 4.9.J. Once development is complete, the developer shall retain qualified personnel to conduct regular (i.e., at least quarterly) water sampling/testing of any basins and their outfalls to ensure the San Jacinto Wildlife Area will not be affected by water pollution from the project site. This measure shall be implemented to the satisfaction of the City Land Development Division Manager based on consultation with the project developer, Eastern Municipal Water District, the Regional</p>	<p>Land Development Division</p>	<p>Annually And Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permits for any development along the southern boundary of the WLCSP Ongoing</p>	<p>Evidence of Annual Water Quality Monitoring Plan fund Site inspection</p>	<p>Withhold Discretionary Permit Pursuant to City Municipal Code</p>
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Water Quality Control Board-Santa Ana Region, and the Mystic Lake Manager.						
4.10 LAND USE AND PLANNING						
NOT APPLICABLE						
4.11 MINERAL RESOURCES						
NOT APPLICABLE						
4.12 NOISE						
<p>4.12.6.1A Prior to issuance of any discretionary project approvals that allow construction activity, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City’s daytime (except for sensitive receptors located within 500 feet of active construction areas) and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures:</p> <ul style="list-style-type: none"> • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers’ standards. • Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project. • No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends. • A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity. The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may 	City Planning Division	Once And Ongoing as part of routine site inspections	Prior to issuance of any discretionary approvals. Ongoing	Review and Approval of a Noise Reduction Compliance Plan Site inspection		Withhold approvals. Pursuant to City Municipal Code

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<p>be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.</p> <ul style="list-style-type: none"> • Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a “hotline” telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request. • Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51). 						
<p>4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City’s approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development:</p> <p>Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the the Revised Sections of the FEIR remain valid. These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the Revised Sections of the FEIR and shall be used to impose building-specific mitigation on the individually proposed buildings.</p>	<p>City Planning Division</p>	<p>Once before issuance of a certificate of occupancy</p>	<p>Prior to issuance of Discretionary permits for Action 1. Prior to issuance of certificate of occupancy for actions 2 and 3</p>	<p>Review and approval of a noise study</p>		<p>Withhold discretionary approvals</p>

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<p>Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the World Logistics Center site, the Applicant shall implement the mitigation identified in the Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels reaching residential uses at 60 dBA during the daytime hours (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.). Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants.</p> <p>If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a <i>no</i> vote.</p> <p>At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.</p> <p>Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited</p>						
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receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement.						
4.12.6.2B Prior to issuance/approval of any building permits, the centerline of Cactus Avenue Extension will be located no closer than 11449 feet to the residential property lines along Merwin Street. An alternative is to locate the roadway closer to the residences and provide a soundwall along Cactus Avenue Extension. The soundwall location and height should be determined by a Registered Engineer, and the soundwall shall be designed to reduce noise levels to less than 65 CNEL at the residences. The Engineer shall provide calculations and supporting information in a report that will be required to be submitted to and approved by the City prior to issuing permits to construct the road.	City Planning Division	Prior to the approval of a Building permit	Prior to the issuance of building permits	Review and Approval of Building permits		Withhold Building Permits
4.12.6.2C Prior to the approval of any discretionary permits, cumulative impact areas shown in the WLC EIR Noise Study shall be included in the soundwall mitigation program outlined in Mitigation Measures 4.12.6.2A and 4.12.6.2D.	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of soundwall mitigation program		Withhold discretionary permits
4.12.6.2D Prior to issuance of a building permit, the applicant shall demonstrate that the development maintains a buffer with soundwall for noise attenuation at residential/warehousing interface (i.e., western and southwestern boundaries of the project site). To keep the noise levels at nearby residential areas less than typical ambient conditions, the warehousing property line shall be located a minimum of 250 feet from the residential zone boundary, and a 12-foot noise barrier shall be located along the perimeter of the property that faces any residential areas. The 12 foot noise barrier may be a soundwall, berm, or combination of the two. The height shall be measured relative to the pad of the warehouse. This requirement shall be implemented anytime residential areas are within 600 feet of the warehousing property line to insure that a noise level of 45 dBA (Leq) will not be exceeded at the residential zone. This requirement is consistent with Item 10 of Municipal Code Section 9.16.160 Business park/industrial that states, "All manufacturing and industrial uses adjacent to residential land uses shall include a buffer zone and/or noise attenuation wall to reduce outside noise levels".	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold Building Permit

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<p>4.12.6.4A Prior to the issuance of building permits for projects within 1,300 feet of the Southern California Gas Company (SCGC) and San Diego Gas and Electric (SDG&E) blowdown facilities, documentation shall be submitted to the City confirming that sound attenuation devices and/or improvements for the blow-down facilities providing at least a 40 dB reduction in noise levels during blow-down events are available and will be installed for all planned blow-down events. It shall be the responsibility of the developer to fund all sound attenuation improvements to the blow-down facilities required by this measure. It shall also be the responsibility of the developer to coordinate with San Diego Gas and Electric and/or Southern California Gas Company regarding the installation of any sound attenuation devices or improvements on the blow-down facilities at either the San Diego Gas and Electric compressor station or the Southern California Gas Company pipelines. This measure shall be implemented to the satisfaction of the City Land Management Division</p>	<p>City Land Development Division City Planning Division</p>	<p>Once before Permitting</p>	<p>Prior to the issuance of Building permits for projects within 1,300 feet of the SCGC and SDG&E facilities</p>	<p>Review and Approval of Documentation confirming sound attenuation device</p>		<p>Withhold Building Permits</p>
<p>4.13 POPULATION, HOUSING, AND EMPLOYMENT</p>						
<p>NOT APPLICABLE</p>						
<p>4.14 PUBLIC SERVICES AND FACILITIES</p>						
<p>NOT APPLICABLE</p>						
<p>4.15 TRAFFIC AND CIRCULATION</p>						
<p>4.15.7.4A A traffic impact analysis (“TIA”) conforming to the guidelines for TIAs adopted by the City shall be submitted in conjunction with each Plot Plan application within the WLCSP. Prior to the approval of the Plot Plans, the City shall review the Revised TIA to determine if any of the traffic improvements listed in the above tables need to be implemented as part of the plot plan. The TIA prepared for the Revised Sections of the FEIR are required to be completed prior to the issuance of a certificate of occupancy for each building. If the City determines that any of the improvements within Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated into insignificance, then the completion of construction of the improvements prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval</p>	<p>City Engineer</p>	<p>Once before plot plan approval Once prior to Certificate of Occupancy</p>	<p>Prior to plot plan approval Prior to Certificate of Occupancy</p>	<p>Review and Approval of site-specific TIAs Review and Approval of site-specific TIAs</p>		<p>Withhold Plot Plan approval Withhold Certificate of Occupancy</p>

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<p>of the Plot Plan. Construction of improvements within the City shall be subject to reimbursement agreement for those costs that exceed the fair share contribution determined for the specific Plot Plan application. If the City determines that any of the improvements outside Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated to a less than significant level, then the payment of any necessary fair share contribution as prescribed in Mitigation Measure 4.15.7.4E prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. If the City determines that the traffic impacts which will result from the construction or operation of a building will be significantly more adverse than those shown in the Revised TIA, further environmental review shall be conducted prior to the approval of the Plot Plan pursuant to Public Resources Code § 21166 and CEQA Guidelines §15162 to determine what additional mitigation measures, if any, will be required in order to maintain the appropriate levels of service.</p>						
<p>4.15.7.4B As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the dedication of appropriate right-of-way, where feasible, consistent with the Subdivision Map Act for frontage street improvements contained within the World Logistics Center Specific Plan Circulation Map. Required dedications shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Evidence of dedication of right of- way in compliance with Subdivision Map Act</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4C As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the Applicant to construct or to fully fund the transportation measures identified in the development’s TIA (see MM4.15.7.4A) as needed to mitigate the transportation impacts within the city of the Plot Plan development. The payment or construction shall be made prior to the issuance of occupancy permits for the requested development. This condition shall apply only to mitigation measures where a mechanism has been established to collect funds from the project and any other funds to needed to complete the improvements.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>

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<p>4.15.7.4D As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require each project to pay the requisite Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44. Required TUMF payments shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer City Planning Division</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment of TUMF</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4E In order to ensure that all of the Project’s traffic impacts are mitigated to the greatest extent feasible, the Applicant shall contribute its fair share of the cost of the needed traffic improvements that are not within the City as identified in the Revised Traffic Impact Analysis (i.e., under the jurisdiction of other cities, the County of Riverside or Caltrans, pursuant to Mitigation Measure 4.15.7.4F). As used in this mitigation measure, the Applicant’s “fair share” has been determined in compliance with the requirements of the Fee Mitigation Act, Government Code § 66000 et seq., and, pursuant to § 66001(g), does not require that the Applicant be responsible for making up for any existing deficiencies. The fair share mitigation is summarized in Tables 72 through 77 of the TIA located in Appendix F of the RSFEIR.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4F The Applicant shall pay its portion of the fair share of the cost of traffic improvements identified in the Transportation Impact Analysis for those significantly impacted road segments and intersections for each warehouse building within the World Logistics Center if the impacted jurisdiction has established a fair share contribution program prior to the approval of a building-specific plot plan. The City shall determine whether a fair share program exists in the impacted jurisdiction and, if one does exist, require that the appropriate fees are paid by the Applicant, consistent with the requirements below, prior to the issuance of a certificate of occupancy for the building in question. If no fair share program exists or if the existing programs are not consistent with the requirements below, then no payment of fees shall be required. The impacts are to be determined on a road segment or intersection basis. Nothing in this condition requires the payment of a traffic impact fee imposed by another jurisdiction which covers improvement to facilities where the Project does not have a significant impact. Fair-share</p>	<p>City Engineer</p>	<p>Once prior to issuance of building permits for individual buildings.</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair-share programs</p>		<p>Withhold Occupancy Permits</p>

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contributions will be determined on a building-by-building basis as a share of the impact of the Project as a whole (for each segment or intersection where the WLC project as a whole has a significant impact identified in the Revised Sections of the FEIR) as determined by the Revised Traffic Impact Analysis and will be due as each certificate of occupancy is issued. The fair share payments for the significantly impacted road segments and intersections identified in the Revised Sections of the FEIR will be required even though the impact resulting from a specific building does not, by itself, cause a significant impact.

For example, the intersection of Martin Luther King Blvd. and the I-215 northbound ramps (Intersection 85) in the City of Riverside was identified as a place where the World Logistic Center contributes to cumulatively significant impacts, and where the fair share contribution of the World Logistic Center project as a whole was computed to be 6.2%. If the City of Riverside establishes a fair share contribution program consistent with this Mitigation Measure 4.15.7.4F to improve that intersection, then when a certificate of occupancy is to be issued for a 2-million square feet high-cube warehouse in the World Logistic Center (approximately 5% of the entire World Logistic Center project) the amount of the fair share payment due from the Applicant to the City of Riverside would be computed as follows:

Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	% Attributable to the building that is subject to the certificate of occupancy (5%)
A x B x C = D						
A = % attributable to the building that is subject to the certificate of occupancy (%5)						
B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis						
C = Total cost of Improvement						
D = Amount Due						

A similar calculation would be done for each subsequent building, with payments for each due at the time of issuance of the

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<p>certificate of occupancy. As a result, while each building individually would not produce a significant impact, and therefore would not be required to pay any mitigation fees if considered by itself, the total amount of the payments for all of the buildings would be equal to the fair share payment for the entire World Logistic Center to the extent that the responsible jurisdiction has chosen to adopt a fair share contribution funding program consistent with Mitigation Measure 4.15.7.4F.</p>						
<p>4.15.7.4G City shall work directly with WRCOG to request that TUMF funding priorities be shifted to align with the needs of the City, including improvements identified in the TIA. Toward this end, City shall meet regularly with WRCOG.</p>	<p>City Engineer</p>	<p>On-going</p>	<p>Yearly starting with project up and ending with project buildout.</p>	<p>City Engineer provides quarterly updates to the City Council regarding TUMF funding priorities as it relates to the improvements identified in the traffic impact analysis.</p>		<p>None</p>
4.16 UTILITIES AND SERVICE SYSTEMS						
<p>4.16.1.6.1A Prior to approval of a precise grading permit for each plot plan for development within the World Logistics Center Specific Plan (WLCSF), the developer shall submit landscape plans that demonstrate compliance with the World Logistics Center Specific Plan, the State of California Model Water Efficient Landscape Ordinance (AB 1881), and Conservation in Landscaping Act (AB 325). This measure shall be implemented to the satisfaction of the Planning Division. Said landscape plans shall incorporate the following:</p> <ul style="list-style-type: none"> • Use of xeriscape, drought-tolerant, and water-conserving landscape plant materials wherever feasible and as outlined in Section 6.0 of the World Logistics Center Specific Plan; • Use of vacuums, sweepers, and other “dry” cleaning equipment to reduce the use of water for wash down of exterior areas; • Weather-based automatic irrigation controllers for outdoor irrigation (i.e., use moisture sensors); • Use of irrigation systems primarily at night or early morning, when evaporation rates are lowest; 	<p>City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of precise grading permit for each plot plan.</p>	<p>Review and Approval of landscape plans</p>		<p>Withhold precise grading permit.</p>

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<ul style="list-style-type: none"> • Use of recirculation systems in any outdoor water features, fountains, etc.; • Use of low-flow sprinkler heads in irrigation system; • Provide information to the public in conspicuous places regarding outdoor water conservation; and • Use of reclaimed water for irrigation if it becomes available. 					
<p>4.16.1.6.1B All buildings shall include water-efficient design features outlined in Section 4.0 of the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division/Public Works. These design features shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> • Instantaneous (flash) or solar water heaters; • Automatic on and off water faucets; • Water-efficient appliances; • Low-flow fittings, fixtures and equipment; • Use of high-efficiency toilets (1.28 gallons per flush [gpf] or less); • Use of waterless or very low water use urinals (0.0 gpf to 0.25 gpf); • Use of self-closing valves for drinking fountains; • Infrared sensors on drinking fountains, sinks, toilets and urinals; • Low-flow showerheads; • Water-efficient ice machines, dishwashers, clothes washers, and other water-using appliances; • Cooling tower recirculating system where applicable; • Provide information to the public in conspicuous places regarding indoor water conservation; and • Use of reclaimed water for wash down if it becomes available. 	<p>Building and Safety Division Planning Division</p>	<p>Once</p>	<p>Prior to issuance of any building permits.</p>	<p>Review and Approval building plans</p>	<p>Withhold building permit.</p>
<p>4.16.1.6.1C Prior to approval of a precise grading permit for each plot plan, irrigation plans shall be submitted to and approved by the City demonstrating that the development will have separate irrigation lines for recycled water. All irrigation systems shall be designed so that they will function properly with recycled water if it becomes available. This measure shall be implemented to the satisfaction of the City Planning Division and Land Development Division/Public Works.</p>	<p>City Planning Division, Land Development Division/Public Works</p>	<p>Once</p>	<p>Prior to issuance of precise grading permits.</p>	<p>Review irrigation plans</p>	<p>Withhold precise grading permit.</p>

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<p>4.16.1.6.2A Each Plot Plan application for development shall include a concept grading and drainage plan, with supporting engineering calculations. The plans shall be designed such that the existing sediment carrying capacity of the drainage courses exiting the project area is similar to the existing condition. The runoff leaving the project site shall be comparable to the sheet flow of the existing condition to maintain the sediment carrying capacity and amount of available sediment for transport so that no increased erosion will occur downstream. This measure shall be implemented to the satisfaction of the City Land Development Division/Public Works.</p>	<p>Land Development Division/Public Works</p>	<p>Once Concurrent with Plot Plan review and approval.</p>	<p>Prior to issuance of grading permit.</p>	<p>Review and Approval of Grading and Drainage Plans</p>		<p>Withhold Plot Plan Approval</p>
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4.17 Energy (New Section)
 Refer to mitigation measures in Air Quality and GHG.

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

Attachment A

Revisions Since 2015 FEIR

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)



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4.1 AESTHETICS						
4.1.6.1A Each Plot Plan application for development along the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing or planned residential zoned uses) shall include a minimum 250-foot setback measured from the City/County zoning boundary line and any building or truck parking/access area within the project. The setback area shall include landscaping, berms, and walls to provide visual screening between the new development and existing residential areas upon maturity of the landscaping materials. The existing olive trees along Redlands Blvd. shall remain in place as long as practical to help screen views of the project site. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before permitting	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1B Each Plot Plan application for development adjacent to Redlands Boulevard, Bay Avenue, or Merwin Street, shall include a plot plan, landscaping plan, and visual rendering(s) illustrating the appearance of the proposed development. The renderings shall demonstrate that views of proposed buildings and trucks can be reasonably screened from view from existing residents upon maturity of planned landscaping and to ensure consistency with the General Plan Objective 7.7. "Effective" screening shall mean that no more than the upper quarter (25%) of a building is visible from existing residences, which shall be achieved through a combination of landscaping, berms, fencing, etc. The location and number of view presentations shall be at the discretion of the Planning Division.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before issuance of certificate of occupancy	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
			Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1C Prior to the issuance of a certificate of occupancy for buildings adjacent to the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing residences at the time of application) the screening required in Mitigation Measure 4.1.6.1A shall be installed in substantial conformance with the approved plans to the satisfaction of the Planning Official.	City Planning Division	Once before issuance of certificate of occupancy.	Prior to issuance of certificate of occupancy.	Review and Approval of Site Plans		Withhold Certificate of Occupancy

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1.6.1D Prior to the issuance of permits for any development activity adjacent to Planning Area 30 (74.3 acres in the southwest portion of the Specific plan), the entirety of Planning Area 30 shall be offered to the State of California for open space purposes. In the event that the State does not accept the dedication, the property shall be offered to Western Riverside County Regional Conservation Authority or an established non-profit land conservancy for open space purposes. In the event that none of these organizations accept the dedication, the property may be dedicated to a property owner’s association or may remain in private ownership and may be fenced and access prohibited.	City Planning Division	Once before permitting of any development activity adjacent to Planning Area 30.	Prior to issuance before of any discretionary permit.	Review and Approval of Site Plans.		Withhold Discretionary Permit
4.1.6.3A Each Plot Plan application for development shall include plans and visual rendering(s) illustrating any changes in views of Mount Russell and/or the Badlands, for travelers along SR-60, as determined necessary by the Planning Official. The plans and renderings shall illustrate typical views based on proposed project plans, with the location and number of view presentations to be determined by the Planning Official. These views shall be simulated from a height of six feet from the edge of the roadway travel lane closest to the visual resource. The renderings must demonstrate that the development will preserve at least the upper two thirds (67%) of the vertical view of Mt. Russell from SR-60.	City Planning Division	Once before plot plan review	Prior to issuance of building permit.	Review and Approval of Renderings		Withhold Building Permit <u>Plot Plan Approval</u>
4.1.6.4A Each Plot Plan application for development adjacent to residential development shall include a photometric plot of all proposed exterior lighting demonstrating that the project is consistent with the requirements of Section 9.08.100 of the City Municipal Code. The lighting study shall indicate the expected increase in light levels at the property lines of adjacent residential uses. The study shall demonstrate that the proposed lighting fixtures and/or visual screening meet or exceed City standards regarding light impacts.	City Planning Division	Once during plot plan review	Prior to issuance of any building permit <u>Prior to plot plan approval.</u>	Review and Approval of Lighting Study		Withhold <u>Building Permit</u> Plot Plan Approval
4.1.6.4B Each Plot Plan application for development shall include an analysis of all proposed solar panels demonstrating that glare from panels will not negatively affect adjacent residential uses or negatively affect motorists along perimeter roadways. Design	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Plot Plan		Withhold Plot Plan Approval

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details to meet these requirements shall be implemented to the satisfaction of the Planning Official.						
4.2 AGRICULTURE						
4.2.6.1A Prior to the issuance of any grading permit affecting land designated as “Unique Farmland” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Unique Farmland” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.	City Planning Division	Once before issuance of grading permits on lands that contain unique farmland	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit
<u>6.2.1 (Cumulative Impacts)</u> Prior to the issuance of any grading permit affecting land designated as “Farmland of Local importance” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Farmland of Local Significance” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates	City Planning Division	Once before issuance of grading permits on lands that contain <u>unique farmland of local importance</u>	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit

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<u>of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.</u>						
4.3 Air Quality						
<p>4.3.6.2A Construction equipment maintenance records (including the emission control tier of the equipment) shall be kept on-site during construction and shall be available for inspection by the City of Moreno Valley.</p> <p>a) Off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 off-road emissions standards. A copy of each unit’s certified tier specification shall be available for inspection by the City at the time of mobilization of each applicable unit of equipment.</p> <p>b) During all construction activities, off-road diesel-powered equipment may be in the “on” position not more than 10 hours per day.</p> <p>c) Construction equipment shall be properly maintained according to manufacturer specifications.</p> <p>d) All diesel-powered construction equipment, delivery vehicles, and delivery trucks shall be turned off when not in use. On-site idling shall be limited to three minutes in any one hour.</p> <p>e) Electrical hook ups to the power grid shall be provided for electric construction tools including saws, drills and compressors, where feasible, to reduce the need for diesel-powered electric generators. Where feasible and available, electric tools shall be used.</p> <p>f) The project shall demonstrate compliance with South Coast Air Quality Management District Rule 403 concerning fugitive dust and provide appropriate documentation to the City of Moreno Valley.</p> <p>g) All construction contractors shall be provided information on the South Coast Air Quality Management District Surplus Off-road Opt-In “SOON” funds which provides funds to accelerate cleanup of off-road diesel vehicles.</p>	<p><u>Land Development Division and Building and Safety Division</u> City Planning Division</p>	As needed during construction	During construction	On-site Inspection of construction maintenance records and data sheets.		Issuance of Stop Work Order

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<p>h) Construction on-road haul trucks shall be model year 2007 <u>2010</u> or newer <u>if diesel-fueled</u>.</p> <p>i) Information on ridesharing programs shall be made available to construction employees.</p> <p>j) During construction, lunch options shall be provided onsite.</p> <p>k) A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints per AQMD Standards.</p> <p>l) <u>Off-site construction shall be limited to the hours between 6 a.m. to 8 p.m. on weekdays only. Construction during City holidays shall not be permitted.</u></p>						
<p>4.3.6.2B Prior to issuance of any grading permits, a traffic control plan shall be submitted to and approved by the City of Moreno Valley that describes in detail the location of equipment staging areas, stockpiling/storage areas, construction parking areas, safe detours around the project construction site, as well as provide temporary traffic control (e.g., flag person) during construction-related truck hauling activities. Construction trucks shall be rerouted away from sensitive receptor areas. Trucks shall use State Route 60 <u>using World Logistics Center Parkway (formerly Theodore Street)</u>, Redlands Boulevard (north of Eucalyptus Avenue), and Gilman Springs Road. In addition to its traffic safety purpose, the <u>Construction Staging Plan</u> traffic control plan can minimize traffic congestion and delays that increase idling emissions. A copy of the approved Traffic Control Plan shall be retained on site in the construction trailer.</p>	Transportation Division	Once prior to issuance of grading permits	Prior to issuance of any grading permits	Review and Approval of Traffic Control Plan.		Withhold Grading Permit
<p>4.3.6.2C The following measures shall be applied during construction of the project to reduce volatile organic compounds (VOC):</p> <p>a) Non-VOC containing paints, sealants, adhesives, solvents, asphalt primer, and architectural coatings (where used), or pre-fabricated architectural panels shall be used in the construction of the project to the maximum extent practicable. If such products are not commercially available, products with a VOC content of 100 grams per Liter or lower for both interior and exterior surfaces shall be used.</p>	<u>City Engineering, Land Development, Building and Safety Division</u> and Planning Division	Throughout construction	During Construction	On-site inspection		Issuance of a Stop Work Order

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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b) Leftover paint shall be taken to a designated hazardous waste center. c) Paint containers shall be closed when not in use. d) Low VOC cleaning solvents shall be used to clean paint application equipment. e) Paint and solvent-laden rags shall be kept in sealed containers.						
4.3.6.2D No grading shall occur on days with an Air Quality Index forecast greater than 150 for particulates or ozone as forecasted for the project area (Source Receptor Area 24).	City Land Development Division/Public Works	As needed during construction	During construction	Review of Construction Documentation and On-site Inspection		Issuance of a Stop Work Order
4.3.6.2E <u>The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.</u>	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.3A Prior to issuance of occupancy permits for each warehouse building within the WLCSP, the developer shall demonstrate to the City that vehicles can access the building using paved roads and parking lots <u>and that access on unpaved roads is prohibited.</u>	City Planning Division	Once Before Permitting issuing Certificate of Occupancy	Prior to issuance or occupancy permits for each warehouse	Review and Approval of building plans.		Withhold Occupancy Permit
4.3.6.3B The following shall be implemented as indicated: Prior to Issuance of a Certificate of Occupancy a) Signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations and the prohibition of parking in residential areas. b) Signs shall be prominently displayed in all dock and delivery areas advising of the following: engines shall be turned off when not in use; trucks shall not idle for more than three consecutive minutes; telephone numbers of the building facilities manager and the California Air Resources Board to report air quality violations. c) Signs shall be installed at each exit driveway providing directional information to the City’s truck route. Text on the sign shall read “To Truck Route” with a directional arrow.	City Planning Division and Building and Safety Public Works Inspector	Once before issuance of any certificate of Occupancy and ongoing basis On an ongoing basis	Prior to issuance of Certificate of Occupancy During on-site inspections	On-site inspections Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals, On-site Inspections Collection of VIN data will be		Withhold Certificate of Occupancy If any related entitlement has been issued, revocation of the entitlement is warranted Pursuant to City Municipal Code

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<p>Truck routes shall be clearly marked per the City Municipal Code.</p> <p>On an Ongoing Basis</p> <p>d) Tenants shall maintain records on fleet equipment and vehicle engine maintenance to ensure that equipment and vehicles are maintained pursuant to manufacturer’s specifications. The records shall be maintained on site and be made available for inspection by the City.</p> <p>e) Tenant’s staff in charge of keeping vehicle records shall be trained/certified in diesel technologies, by attending California Air Resources Board approved courses (such as the free, one-day Course #512). Documentation of said training shall be maintained on-site and be available for inspection by the City.</p> <p>f) Tenants shall be encouraged to become a SmartWay Partner.</p> <p>g) Tenants shall be encouraged to utilize SmartWay 1.0 or greater carriers.</p> <p>h) Tenants’ fleets shall be in compliance with all current air quality regulations for on-road trucks including but not limited to California Air Resources Board’s Heavy-Duty Greenhouse Gas Regulation and Truck and Bus Regulation.</p> <p>i) Information shall be posted in a prominent location available to truck drivers regarding alternative fueling technologies and the availability of such fuels in the immediate area of the World Logistics Center.</p> <p>j) Tenants shall be encouraged to apply for incentive funding (such as the Voucher Incentive Program [VIP], Carl Moyer, etc.) to upgrade their fleet.</p> <p>k) All yard trucks (yard dogs/yard goats/yard jockeys/yard hostlers), landscaping equipment, and industrial sweepers shall be powered by electricity, natural gas, propane, or an equivalent non-diesel fuel. Any off-road engines in the yard trucks and landscaping equipment shall have emissions standards equal to Tier 4 Interim or greater. Any on-road engines in the yard trucks shall have emissions standards that meet or exceed 2010 engine emission standards</p>				<p>identified as the primary method of verifying truck compliance for future project-specific approvals</p>		

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<p>specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025.</p> <p>l) All diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025 or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time.</p> <p>m) All standby emergency generators shall be fueled by natural gas, propane, or any non-diesel fuel.</p> <p>n) Truck and vehicle idling shall be limited to three (3) minutes.</p> <p>o) <u>For each building, the developer shall provide ten electrical outlets for the use of electric auxiliary power units (APUs) to be located at the dock doors near the shipping offices, or an alternate location with access to electrical outlets.</u></p> <p>p) <u>All industrial sweepers shall be equipped with High-efficiency particulate air (HEPA) filters.</u></p>						
<p>4.3.6.3C Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a publicly-accessible fueling station shall be operational within the Specific Plan area offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public. Any fueling station shall be placed a minimum of 1000 feet from any off-site sensitive receptors or offsite zoned sensitive uses. This facility may be established in connection with the convenience store required in Mitigation Measure 4.3.6.3D.</p>	City Building and Safety	Once before issuance of building permits	Prior to issuance of building permits for more than 25 million total square feet of logistics warehousing within the WLC Specific Plan	Review and approval of building plans		Withhold building permit
<p>4.3.6.3D Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a site shall be operational within the Specific Plan area offering food and convenience items for purchase by the motoring public. This facility may be established in connection with the fueling station required in Mitigation Measure 4.3.6.3C.</p>	City Building and Safety	Before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold building permit

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<p>4.3.6.3E Refrigerated warehouse space is prohibited unless it can be demonstrated that the environmental impacts resulting from the inclusion of refrigerated space and its associated facilities, including, but not limited to, refrigeration units in vehicles serving the logistics warehouse, do not exceed any environmental impact for the entire World Logistics Center identified in the program Environmental Impact Report. Such environmental analysis shall be provided with any warehouse plot plan proposing refrigerated space. Any such proposal shall include electrical hookups at dock doors to provide power for vehicles equipped with Transportation Refrigeration Units (TRUs).</p>	City Planning Division	Once before plot plan review for any building.	Prior to issuance of any building permit	Review and approval of building plans		Withhold building permit
<p>4.3.6.3F <u>The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.</u></p>	<u>SCAQMD</u>	<u>Per ISR Rule</u>	<u>Ongoing</u>	<u>Per ISR Rule</u>		<u>Per ISR Rule and SCAQMD Settlement Agreement</u>
<p>4.3.6.4A The following measures shall be incorporated as conditions to any Plot Plan approval within the Specific Plan:</p> <ul style="list-style-type: none"> a) All tenants shall be required to participate in Riverside County's Rideshare Program. b) Storage lockers shall be provided in each building for a minimum of three percent of the full-time equivalent employees based on a ratio of 0.50 employees per 1,000 square feet of building area. Lockers shall be located in proximity to required bicycle storage facilities. c) Class II bike lanes shall be incorporated into the design for all project streets. d) The project shall incorporate pedestrian pathways between on-site uses. e) Site design and building placement shall provide pedestrian connections between internal and external facilities. f) The project shall provide pedestrian connections to residential uses within 0.25 mile from the project site. g) A minimum of two electric vehicle-charging stations for automobiles or light-duty trucks shall be provided at each building. In addition, parking facilities with <u>200</u> parking 	City Building and Safety, City Planning Division, and Transportation Engineering Division/Public Works	Once before plot plan approval for any building.	Prior to plot plan approval	Review and approval of plot plans		Withhold plot plan approval

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<p>spaces or more shall be designed and constructed so that at least <u>six</u> percent of the total parking spaces are capable of supporting future electric vehicle supply equipment (EVSE) charging locations. <u>Sizing of conduit and service capacity at the time of construction shall be sufficient to install Level 2 Electric Vehicle Supply Equipment (EVSE) or greater.</u></p> <p>h) Each building shall provide indoor and/or outdoor - bicycle storage space consistent with the City Municipal Code and the California Green Building Standards Code. Each building shall provide a minimum of two shower and changing facilities for employees.</p> <p>i) Each building shall provide preferred and designated parking for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles equivalent to the number identified in California Green Building Standards Code Section 5.106.5.2 or the Moreno Valley Municipal Code whichever requires the higher number of carpool/vanpool stalls.</p> <p>j) The following information shall be provided to tenants: onsite electric vehicle charging locations and instructions, bicycle parking, shower facilities, transit availability and the schedules, telecommunicating benefits, alternative work schedule benefits, and energy efficiency.</p>						
<p>4.3.6.5A <u>(a) The house at 30220 Dracaea Avenue shall be demolished prior to the issuance of the first grading permit for grading within the World Logistics Center.</u> <u>(b) An air filtration system meeting ASHRSE Standard 52.2 MERV-13 standards shall be offered to the owners of the houses located at 13100 World Logistics Center Parkway (formerly Theodore Street) and 12400 World Logistics Center Parkway (formerly Theodore Street). The developer shall offer to install the air filtration system to the owners of the two properties within two months of the certification of the Final Revised FEIR. Prior to the issuance of the first grading permit within the World Logistics Center, documentation shall be provided to the City confirming</u></p>	<p><u>City Building and Safety, City Planning Division</u></p> <p><u>City Building and Safety, City Planning Division</u></p>	<p><u>Once prior to issuance of first grading permit within the WLC.</u></p> <p><u>Prior to issuance of the first grading permit within the WLC.</u></p>	<p><u>Prior to issuance of the first grading permit.</u></p> <p><u>Initial offer within two months of certifying the Final RSFEIR.</u></p>	<p><u>Site inspection.</u></p> <p><u>Review of documentation.</u></p>		<p><u>Withhold grading permits.</u></p>

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<p><u>that an offer to install the air filtration system has been extended to the owners of each of the two properties. The owners of the two properties shall be under no obligation to accept the offer. Each property owner shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, the developer shall work with each owner to ensure the air filtration system is properly installed within one year of acceptance.</u></p>			<p><u>Documentation provided prior to issuance of the first grading permit.</u></p>			
4.4 BIOLOGICAL RESOURCES						
<p>4.4.56.2A (Previously included as 4.4.6.2A in the 2015 FEIR) Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter’s goldfields, smooth tarplant, Plummer’s mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, <u>the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review.</u> They may be relocated to the 250-foot setback area outlined in the Specific Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant’s discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.</p>	City Planning Division	Once upon submittal of plot plan application	Prior to approval of Plot Plan	Review and Approval of biological assessment		Withhold Approval of Plot Plan
<p>4.4.56.2B (Previously included as 4.4.6.2B in the 2015 FEIR) Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County Resource <u>Regional Conservation Authority Agency</u> (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the</p>	City Planning Division, <u>Riverside County RCA</u>	Once upon submittal of tentative maps.	Prior to issuance of any tentative maps <u>including or adjacent to MHSCP criteria cells.</u>	Review <u>JPR and approval of biological assessment.</u>		Withhold approval of tentative maps

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satisfaction of the City Planning Division and Riverside County Resource <u>Regional</u> Conservation <u>Authority</u> Agency (“RCA”).						
<p>4.4.6.1A All Plot Plan applications within Planning Areas 10 and 12 (i.e., adjacent to the San Jacinto Wildlife Area as shown in Final EIR Volume 2 Figure 4.1.6B) shall provide a 250-foot setback from the southerly property line. Permitted uses within this setback area include landscaping, drainage and water quality facilities, fences and walls, utilities and utility structures, maintenance access drives, and similar related uses. No logistics buildings or truck access/parking/maneuvering facilities are permitted in this setback area.</p> <p>In addition, logistics buildings within Planning Areas 10 and 12 may not be located within 400 feet of the southerly property line. All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area. This fence/barrier shall have metal mesh installed below and above ground level to prevent animals from moving between the development area and the setback area.</p> <p>Within Planning Areas 10 and 12, all truck activity areas adjacent to the 250-foot <u>setback</u> <u>buffer</u> area along the southern property line shall be enclosed by minimum 11-foot tall solid walls to reduce noise and lighting impacts on the adjacent property. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>A preliminary landscape plan for the 250-foot setback area shall be submitted with all Plot Plan applications for lots adjacent to the California Department of Fish and Wildlife <u>SJWA</u> property. Precise landscape plans shall be submitted with any grading permit for said lots and must be approved prior to the issuance of any building permit on said lots. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the World Logistics Center Specific Plan. No plant species listed in Section 6.1.4 of the Western Riverside County Multiple Species Habitat Conservation Plan shall be installed within the setback area. Cottonwood trees shall be</p>	City Planning Division	Once before <u>plot plan approval</u> issuance of building permits and as needed during construction and operating	Prior to <u>plot plan approval</u> issuance of building permits Prior to issuance of building permits	Plan check and review of setback area On-site inspection of 250-foot minimum setback On-site inspection of 250-foot minimum setback		Withhold <u>Plot Plan approval</u> . Withhold building permits Withhold building permits Withhold building permits
	City Planning Division	Once before issuance of building permits and as needed during construction and operating	Prior to issuance of building permits Prior to issuance of building permits	On-site inspection of 250-foot minimum setback <u>Plot plan/grading plan review</u> .		
	City Land Development Division Manager	Once before issuance of building permits as needed during construction and operating	Prior to issuance of grading permits.	<u>Plot plan/grading plan review</u> .		Withhold <u>grading permit and plot plan approval</u> .
	City Land Development Division Manager	Once before issuance of building permits as needed during construction and operating	Prior to issuance of grading permits.	<u>Plot plan/grading plan review</u> .		Withhold <u>grading permit and plot plan approval</u> .

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planted within the setback area consistent with the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division Manager.		<u>property building permits as needed during construction and operating</u>				
4.4.6.1B Each Plot Plan application in Planning Areas 10 and 12 shall provide runoff management and water quality facilities adequate to minimize downstream erosion, maintain water quality standards and retain pre-development flows in a manner meeting the approval of the City Engineer <u>Moreno Valley and RWQCB requirements</u> . All drainage improvements shall be designed to minimize runoff and erosional impacts on adjacent property. This measure shall be implemented to the satisfaction of the Land Development Division Manager of Public Works.	City Engineering Division and City Land Development Division Manager	Once upon submittal of plot plan application	Prior to approval of plot plan	Review and approval of plot plans within Planning Areas 10 and 12		Withhold approval of plot plan
4.4.6.3A (Previously included as 4.4.6.3A in the 2015 FEIR) Prior to the issuance of grading permits the applicant shall secure a jurisdictional determination from the United States Army Corps of Engineers (USACE) and confirm with the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) if drainage features mapped on the property to be developed are subject to jurisdictional authority. If the features are subject to regulatory protection, the applicant will <u>shall</u> secure permit approvals with the appropriate agencies prior to initiation of construction. Compensatory riparian habitat mitigation will <u>shall</u> be provided at a minimum ratio of 1: 1 (replacement riparian habitat to impacted riparian habitat) to ensure no net loss of riparian habitat or aquatic resources. It should be noted that this is a minimum recommended ratio but the actual permitting ratio may be higher. These detention basins will <u>shall</u> be oversized to accommodate the provision of areas of riparian habitat. Maintenance of the basins will <u>shall</u> be limited to that necessary to ensure their drainage and water quality functions while encouraging habitat growth. Riparian habitat mitigation will <u>shall</u> be provided concurrent to or prior to impacts. A Compensatory Mitigation Plan will <u>shall</u> be prepared for all unavoidable impacts and will <u>shall</u> be consistent with the United States Army Corps of Engineers (USACE) / United States	City Planning Division and Land Development Division Manager	Once prior to issuance of grading permits	Prior to the issuance of grading permits	Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.		Withhold grading permit

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<p>Environmental Protection Agency's Compensatory Mitigation for Losses of Aquatic Resources: Final Rule and the United States Army Corps of Engineers Standard Operating Procedure for Determination of Mitigation Ratios.</p> <p>The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board to establish the need for permits based on the results of a recent jurisdictional delineation and final design plans for each of the proposed facilities. Consultation with the three agencies shall take place and appropriate permits obtained for project-level development. Compensation for losses associated with the altering of drainages on site shall be in agreement with the permit conditions and in coordination with compensation outlined below.</p> <p>Mitigation will <u>shall</u> consist of onsite creation, offsite creation, or purchase of mitigation credits from an approved mitigation bank. As outlined in the WLC programmatic DBESP report, onsite riparian habitat will <u>shall</u> be created at a minimum 1: 1 ratio due to the poor quality of onsite habitat. New habitat will <u>shall</u> be created within the onsite detention/infiltration basins to the extent allowed by the resource agencies to reduce storm flows, improve water quality, and reduce sediment transport. Habitat creation will <u>shall</u> include the installation of mule fat scrub or similar riparian scrub habitat to promote higher quality riparian habitat, but still maintain the basins for their primary role as detention facilities. The use of these areas as conservation areas would require consent from CDFW and the City of Moreno Valley (MM BIO-2b and MM DBESP 1 through 3).</p>						
<p>4.4.6.32B (Previously included as 4.4.6.3B in the 2015 FEIR) As required by the Resource <u>Regional Conservation Authority Agency</u> (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the Resource <u>Regional Conservation Authority Agency</u> prior to project <u>grading permit</u> approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to</p>	<p>City Planning Division</p>	<p>Once upon submittal of plot plan application <u>grading permit</u></p>	<p>Prior to the approval of any plot plans <u>grading permit</u></p>	<p>Review and approval of site-specific DBESP and review and approval of plot plans.</p>		<p>Withhold <u>grading permit approval</u>. <u>Approval of plot plans</u></p>

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<p>riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.</p> <p>If impacts to riparian habitat within the World Logistics Center Specific Plan (WL CSP) <u>WLC site</u> cannot be avoided at the time of specific development, then a separate project level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.32A.</p> <p>A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations. Therefore, mitigation. Mitigation required for compensation for impacts to riparian/ riverine areas will <u>shall</u> require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.</p> <p>As outlined in the WLC programmatic DBESP, erosion control improvements will <u>shall</u> be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat will <u>shall</u> be enhanced within this drain following the installation of the erosion control improvements (MM DBESP 4 and 5).</p>						
<p>4.4.6.32C (Previously included as 4.4.6.3C in the 2015 FEIR) Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan <u>WLC site</u>, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted</p>	<p>City Planning Division</p> <p>City Planning Division</p>	<p>Once before issuance of grading permit</p> <p>Once before issuance of</p>	<p>Prior to issuance of grading permit</p> <p>Prior to issuance of grading permit</p>	<p>Review and Approval of jurisdictional delineation</p> <p>Written verification of USACE approval</p>		<p>Withhold Grading Permit</p> <p>Withhold Grading Permit</p>

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to the U.S. Army Corps of Engineers (USACE), <u>Regional Water Quality Control Board</u> , and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements <u>are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City. will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required. However, permitting through The Applicant shall consult with</u> the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) <u>may still be required for these improvements. The applicant shall consult with and</u> United States Army Corps of Engineers, <u>California Department of Fish and Wildlife and Regional Water Quality Control Board</u> to establish the need for permits based on the results of the <u>current stream mapping 2012 jurisdictional delineation</u> and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions, <u>with a minimum 1:1 mitigation ratio</u> . Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the <u>Regional Water Quality Control Board</u> , <u>U.S. Fish and Wildlife Service</u> , U.S. Army Corps. of Engineers, and the California Department of Fish and Wildlife.		grading permit		of jurisdictional determination and Clean Water Act Section 404 permit.		
4.4.6.43A (Previously included as 4.4.6.4A in the 2015 FEIR) Pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC), site preparation activities (removal of trees and vegetation) shall be avoided during the nesting season of potentially occurring native and migratory bird species (generally February 1 to August 31). If site preparation activities must occur during the nesting season, a pre-activity field survey shall be conducted by a qualified biologist prior to issuance	City Planning Division City Planning Division	Once before issuance of grading permit Onsite Inspection	One week prior to issuance of grading permit	If grading activities will take place within nesting season provide written evidence a qualified biologist has been retained by the applicant to		Withhold Grading Permit Issuance of a stop Work Order

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of grading permits for such development. The survey shall determine if active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code are present in the construction zone. If active nests of these species are found, the developer <u>applicant</u> shall establish an appropriate buffer zone with no grading or heavy equipment activity within of 500 feet from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed) 250 feet from passerine birds, or 100 feet for sensitive or protected songbird nests. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the buffer <u>setback</u> area at the discretion of the biological monitor in consultation with CDFW. In the event no special status avian species are identified within the limits of disturbance, no further mitigation is required. In the event such species are identified within the limits of ground disturbance, mitigation measure 4.4.6.3B4B shall also apply. This measure shall be implemented to the satisfaction of the City Planning Division.			One week prior to issuance of grading permit	conduct an onsite nesting survey prior to grading. If nesting birds are present, biologist will establish a construction buffer zone of a minimum from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed), or 100 feet for sensitive or protected songbird nests		
4.4.6.3B4B (Previously included as 4.4.6.4B in the 2015 FEIR) If it is determined that project-related grading or construction will affect nesting migratory bird species, no grading or heavy equipment activity shall take place within the limits established in Mitigation Measure 4.4.6.3A4A until it has been determined by a qualified biologist that the nest/burrow is no longer active, and all juveniles have fledged the nest/burrow. This measure shall be implemented to the satisfaction of the City Planning Division.	City Planning Division	Once Before Construction and onsite inspection	Prior to disturbance of site	Onsite inspection		Issuance of a Stop Work Order
4.4.6.3C4C (Previously included as 4.4.6.4C in the 2015 FEIR) The loss of foraging habitat for golden eagle and white-tailed kite will be mitigated by payment of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) fee and the creation of a landscaped buffer <u>setback</u> area adjacent to the San Jacinto Wildlife Area property (SJWA) property . First, the payment of the Western Riverside County Multiple Species Habitat Conservation Plan fee will <u>shall</u> be required on a project-by-project basis. Second, a 250-foot setback as described in Mitigation Measure 4.4.6.1A will <u>shall</u> be established within the World Logistics Center Specific Plan area <u>WLC site</u> . This area will	City Planning Division	Once before issuance of grading permits	Prior to disturbance of site	Written verification of payment of MSHCP fees		<u>Withhold</u> Withdraw Grading Permit

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reduce impacts to raptor species foraging in the adjacent San Jacinto Wildlife Area open space areas.						
<p>4.4.6.3D 4D (Previously included as 4.4.6.4D in the 2015 FEIR) A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the project area-WLC site.</p> <p>In the event no burrowing owls are observed within the limits of ground disturbance. no further mitigation is required.</p> <p>If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a 500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged to the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.</p> <p>If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but Owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the Western Riverside County Regional Conservation Authority (RCA). A relocation plan may <u>will</u> be required by California Department of Fish and Wildlife CDFW, the USFWS, and the RCA if active and/or passive relocation is necessary. The relocation plan will <u>shall</u> outline the basic process and provide options for avoidance <u>and mitigation, identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial coists associated with the relocation plan and long-term management of the receiver site.</u> and</p>	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits	Review of pre-construction survey for burrowing owls		Withhold Grading Permits
	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	If construction takes place between Feb 1 – Aug 31 and nesting burrowing owl is present, a 500 ft. construction buffer shall be maintained from the nest until all juveniles have fledged.		Issuance of a Stop Work Order
	City Planning Division	Onsite inspection once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	If construction takes place between Sept 1- Jan 31 and burrowing owl outside the nesting season present, a passive relocation plan shall be prepared by a qualified biologist and approved by the City.		Issuance of a Stop Work Order
	City Planning Division	Onsite inspection once 30-days	Prior to issuance of any grading permits and	Written verification a relocation plan has approved by the		Issuance of a Stop Work Order

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<p>mitigation. Artificial burrows may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.</p> <p>A relocation plan may will be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated <u>following consultation with the CDFW, the USFWS, and the RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include</u> to the SJWA, the 250-foot <u>buffer setback</u> area or other suitable onsite or off-site areas). Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor, <u>following consultation with CDFW, the USFWS, and RCA.</u></p>		prior to construction/grading	during construction	California Department of Fish and Wildfire.		
<p>4.4.6.3E4E (Previously included as 4.4.6.4E in the 2015 FEIR) Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to <u>CDFW and the USFWS for review prior to submission to</u> the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project WLC site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to <u>locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other</u></p>	City Planning Division	Once prior to plot plan approval for development of land including or adjacent to Drainage 9	Prior to plot plan approval	Submittal of a LAPM protocol survey report to the City.		Withhold Approval Plot Plan <u>Approval</u>

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appropriate areas). <u>All costs associated with the relocation, as well as short- and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant, as determined by the United States Fish and Wildlife Service.</u> If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division <u>following coordination with CDFW and the USFWS.</u>						
4.4.6.3F4F (Previously included as 4.4.6.4F in the 2015 FEIR) Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan will <u>shall</u> identify frequent and infrequent vegetation management requirements (i.e., removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological Resource Management Plan will <u>shall</u> also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.56.2A, 4.4.6.3D4D, and 4.4.6.3E4E. The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with <u>California Department of Fish and Wildlife, the San Jacinto Wildlife Area Manager.</u> The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist to the satisfaction of the City Planning Division.	City Planning Official	Once before approval of any discretionary permits within Planning Areas 10 & 12 Onsite inspection	Prior to approval of any discretionary permits within planning Areas 10 & 12	Review and approval of a BRMP		Withhold Discretionary Permit
4.4.6.3G4G (Previously included as 4.4.6.4G in the 2015 FEIR) Mitigation Measure 4.4.6.1A specifies that a landscape plan shall be submitted with any development proposal for lots adjacent to the California Department of Fish and Wildlife (CDFW) San Jacinto Wildlife Area (SJWA) property prior to issuance of a precise grading permit. The landscape plan shall be prepared by a	City Planning Division and Land Development Division Manager	Once before to issuance of a precise grading permit	Prior to issuance of a precise grading permit	Review and approval of landscape.		Withhold Grading Permit

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<p>licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the Specific Plan. No plant species listed in Section 6.1.4 or Table 6.2 of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) shall be installed within the setback area. In conjunction with development adjacent to the San Jacinto Wildlife Area (SJWA), cottonwood trees shall be planted within the 250-foot setback area, consistent with the World Logistics Center Specific Plan plant palette (per DBESP MM 8).</p> <p>During construction, the runoff leaving construction areas will <u>shall</u> be directed to onsite detention basins and away from downstream drainage features located offsite. All projects within the WLCSP will <u>WLC site shall</u> be required to prepare a Storm Water Pollution Prevention Plan (as outlined in MM 4.9.6.2B). Regarding the 250-foot setback area, pedestrian and vehicular access to areas of riparian/riverine habitat will <u>shall</u> be prohibited except for controlled maintenance access. Finally, no grading shall be permitted within conserved riparian/riverine habitat areas except for grading necessary to establish or enhance habitat areas (DBESP MM 6, 7, 9, and 10)</p>						
<p>4.4.6.3H4H (Previously included as 4.4.6.4H in the 2015 FEIR) As outlined in Mitigation Measure 4.4.6.1A, development adjacent to the 250-foot open space setback shall have a six-foot chain link fence or similar barrier to help separate human activity and the buffer <u>setback</u> area. Any chain link fencing installed on any properties adjacent to the 250-foot buffer <u>setback</u> area shall have metal mesh installed below and above ground level to prevent animals from accessing new development areas.</p>	City Planning Division	Once before building permits	Prior to issuance of certificate of occupancy	Review and approval of fencing		<p>Withhold <u>Certificate of Occupancy plot plan approval</u></p> <p><u>Withhold grading permits</u></p>
<p>4.4.6.3I 4I (Previously included as 4.4.6.4I in the 2015 FEIR) The individual property owner and/or Property Owners Association (POA) as appropriate shall be responsible for maintaining the various onsite landscaped areas, open improved or natural drainage channels, and detention or flood control basins in a manner that provide for fuel management and vector control pursuant to standards maintained by the City Fire Marshall and County Department of Environmental Health – Vector Control</p>	City Fire Department; Land Development Division; and Stormwater Management	As needed basis	Onsite Inspections during operations	Onsite Inspections		Issuance of Code Enforcement Citations

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Group. This measure requires the individual owner or Property Owners Association (POA) to manage vegetation in and around these areas or improvements so as to not represent a fire hazard as defined by the City Fire Department through the substantial buildup of combustible materials. This measure also requires the individual owner or Property Owners Association to manage vegetation and standing water in drainage channels and basins such that they do not encourage or allow vectors to occur (primarily rats and mosquitoes). Runoff shall not be allowed to stand in channels or basins for more than 72hours without treatment or maintenance to prevent establishment of mosquitoes per published County vector control guidelines and “Best Management Practices for Mosquito Control on California State Properties” which is available from the California West Nile Virus website at http://www.westnile.ca.gov/resources . This measure shall be implemented by the Project Owners Association in consultation with City Fire Department and Riverside County Department of Environmental Health – Vector Control Group	Section of Public Works					
4.4.6.3I4 (Previously included as 4.4.6.4J in the 2015 FEIR) A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan <u>WLC site</u> adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas <u>and/or San Jacinto Wildlife Area (SJWA) lands</u> . The Fuel Management Plan shall be prepared by the project proponent <u>applicant</u> and submitted for approval to the prior to plot plan approval for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan <u>and/or SJWA</u> boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following: <ul style="list-style-type: none"> • A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area. • A list of non-native invasive plants that are prohibit from installation. 	City Planning Division	Prior to issuance of <u>issuance of Building Permit <u>plot plan approval</u></u>	Prior to issuance of building permit <u>issuance of building permit <u>plot plan approval</u></u>	Review and Approval of Building Permit <u>Building Permit <u>plot plan approval</u></u> and Onsite Inspection	Withhold Building Permit <u>Building Permit <u>plot plan approval</u></u>	

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<ul style="list-style-type: none"> Maintenance activities and a maintenance schedule. <p>Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas <u>and SJWA lands</u> are adequately protected from expected fire risks.</p>						
<p>4.4.6.3K4K (Previously included as 4.4.6.4K in the 2015 FEIR) Prior to approval of any plot plans for development adjacent to the SJWA, the applicant shall demonstrate that direct light rays have been contained within the development area, per requirements of the MSHCP Section 6.0 which states, "Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting." This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Prior to Issuance of Building Permit <u>plot plan approval</u>	Prior to Issuance of Building Permit <u>plot plan approval</u>	Review and Approval of Building Permit <u>plot plan</u> and Onsite Inspection		Withhold Building Permit <u>Plot Plan Approval</u>
4.5 CULTURAL RESOURCES						
<p>4.5.6.1A Prior to the approval of any grading permit for any of the "Light Logistics" parcels, the parcels shall be evaluated for significance by a qualified archaeologist. A Phase 1 Cultural Resources Assessment shall be conducted by the project archaeologist and an appropriate tribal representative(s) on each of the "Light Logistics" parcel to determine if significant archaeological or historical resources are present.</p> <p>A Phase 2 significance evaluation shall be completed for any of these sites in order to determine if they contain significant archaeological or historical resources. Cultural resources include but are not limited to stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. All resources determined to be prehistoric or historic shall be documented using DPR523 forms for archival research/storage in the Eastern Information Center (EIC). If the particular resource is determined to be not significant, no further documentation is required. If prehistoric resources are determined to be significant, they shall be considered for relocation or archival documentation. If any resource is determined to be significant, a Phase 3 recovery study shall be</p>	Planning Division and Land Development Division/Public Works	Once Before Permitting	Prior to the approval of any grading or discretionary permit for any of the "Light Logistics"	Review and Approval of Phase I Cultural Resources Assessment		<p>Withhold <u>grading permit approval</u> Grading or Discretionary Permits</p> <p><u>Issue stop work order if cultural resources are found</u></p>

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<p>conducted to recover remaining significant cultural artifacts. If prehistoric archaeological/cultural resources are discovered during the Phase 1 survey and it is determined that they cannot be avoided through site design, they shall be subject to a Phase 2 testing program. The project archaeologist in consultation with appropriate tribal group(s) shall determine the significance of the resource(s) and determine the most appropriate disposition of the resource(s) in accordance with applicable laws, regulations and professional practices (per Cultural Report MM CR-1, MM CR-2, MM CR-7 Table 3, pg. 74).</p>						
<p>4.5.6.1B Prior to the issuance of any grading or ground-disturbing permit for construction of off-site improvements a qualified archaeologist shall be retained to prepare a Phase I cultural resource assessment (CRA) of the project site if an up to date Phase I cultural resource assessment is not available for the site at the time of development per Cultural Report MM CR-5, Table 3, pg. 74).</p> <p>Appropriate tribal representatives as identified by the City shall be invited by the Project Archeologist to participate in this assessment.</p> <p>If archaeological resources are discovered during construction activities, no further excavation or disturbance of the area where the resources were found shall occur until a qualified archaeologist evaluates the find. If the find is determined to be a unique archaeological resource, appropriate action shall be taken to (a) plan construction to avoid the archeological sites (the preferred alternative); (b) cap or cover archeological sites with a layer of soil before building on the affected project location; or (c) excavate the site to adequately recover the scientifically consequential information from and about the resource. At the discretion of the project archaeologist, work may continue on other parts of the project site while the unique archaeological resource mitigation takes place. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>If the project archaeologist, in consultation with the monitoring Tribe(s), determines that the find is a unique archaeological</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits for off-site improvements and as Needed During Construction</p>	<p>Prior to the approval of any grading or ground-disturbing permit</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p> <p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit or Issuance of Stop Work Order</p>

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<p>resource, the resource site shall be evaluated and recorded in accordance with requirements of the State Office of Historic Preservation (OHP). If the resource is determined to be significant, data shall be collected by the qualified archaeologist and the findings of the report shall be submitted to the City. If the find is determined to be not significant no mitigation is necessary.</p> <p>Should a future project-level analysis show that cultural resource site CA-RIV-3346 will be directly or partially impacted by project-level construction, an Addendum cultural resource report must be prepared and include an analysis of the alternatives associated with mitigation for impacts to this resource following CEQA Guidelines Section 15126.4(b)(3). This information must be included in any project-level CEQA compliance documentation. It should be noted that Phase 3 data recovery is an acceptable mitigation action under CEQA Guidelines Section 15126.4(b)(3)(C) (per Cultural Report MM CR-3, Table 3, pg. 74).</p> <p>Should it be determined through a future project-level EIR analysis that prehistoric cultural resource sites CA-RIV-2993 and/or CA-RIV-3347 shall be directly impacted by future construction, these sites must be Phase 2 tested for significance (per Cultural Report MM CR-4, Table 3, pg. 74).</p>						

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<p>4.5.6.1C Prior to the issuance of any grading permits a qualified archaeologist shall be retained to monitor all grading and shall invite tribal groups to participate in the monitoring. Project-related archaeological monitoring shall include the following requirements per Cultural Report MM CR-6, MM CR-8, Table 3, pg.74):</p> <ol style="list-style-type: none"> 1. All earthmoving shall be monitored to a depth of ten (10) feet below grade by the Project Archaeologist or his/her designated representative. Once all areas of the development project that have been cut to ten (10) feet below <u>existing</u> grade have been inspected by the monitor. the Project Archaeologist may, at his or her discretion, terminate monitoring if and only if no buried cultural resources have been detected; 2. If buried cultural resources are detected, monitoring shall continue until 100 percent of virgin earth within the specific project area has been disturbed and inspected by the Project Archaeologist or his/her designated representative. 3. Grading shall cease in the area of a cultural artifact or potential cultural artifact as delineated by the Project Archaeologist or his/her designated representative. A buffer of at a minimum 25 feet around the cultural item shall be established to allow for assessment of the resource. Grading may continue in other areas of the site while the particular find are investigated; and 4. If prehistoric cultural resources are uncovered during grading, they shall be Phase 2 tested by the Project Archaeologist, and evaluated for significance in accordance with §15064.5(f) of the CEQA Guidelines. Appropriate actions for significant resources as determined by the Phase 2 testing include but are not limited to avoidance or capping, incorporation of the site in green space. parks, or delineation into open space. If such measures are not feasible, Phase 3 data recovery of the significant resource will be required, and curation of recovered 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of grading permits</p>	<p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit</p>

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<p>artifacts and/or reburial, shall be required. A report associated with Phase 2 testing or Phase 3 data recovery must be delivered to the City and, if necessary, the museum where any recovered artifacts have been curated.</p> <p>5. No further grading shall occur in the area of the discovery until the City approves specific actions to protect identified resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p> <p>6. The developer shall make reasonable efforts to avoid, minimize, or mitigate significant adverse impacts on cultural resources The State Historic Preservation Office (SHPO) and local Native American tribes will be consulted and the Advisory Council on Historic Preservation will be notified within 48 hours of the find in compliance with 36 CFR 800.13(b)(3). This measure shall be implemented to the satisfaction of the Planning Official.</p>						
<p>4.5.6.1D Prior to the issuance of any grading permit the project archaeologist shall invite interested Tribal Group(s) representatives to monitor grading activities. Qualified representatives of the Tribal Group(s) shall be granted access to the project site to monitor grading as long as they provide 48-hour notice to the developer of their desire to monitor, so the developer can make appropriate safety arrangements on the site. This measure shall be implemented to the satisfaction of the Planning Official.</p>	City Planning Division	Once before issuance of grading permits and As Needed During Construction	Prior to the issuance of any grading permit within 3,750 feet of the southwest corner	Evidence of invitation to Tribal Group Representatives		Withhold Grading Permit
<p>4.5.6.1E It is possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources (archaeological or historical). In the event that buried cultural resources are discovered during grading and no Project Archaeologist or Historian is present, grading operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be retained to determine the most appropriate course of action regarding the resource. The Archeologist shall make recommendations to the City on the</p>	Grading Contractor, Land Development Division/Public Works, and Planning Division	As Needed During Construction	During Grading and/or ground disturbing activities	Verification to the City a qualified archaeologist been retained		Issuance a Stop Work Order

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<p>actions that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with §15064.5 of the <i>CEQA Guidelines</i>. Cultural resources could consist of, but are not limited to, stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria. If the resources are determined to be unique historic resources as defined under §15064.5 of the <i>CEQA Guidelines</i>, appropriate protective actions for significant resources such as avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds shall be implemented by the project archaeologist and the City.</p> <p>No further grading shall occur in the area of the discovery until the City and Project Archaeologist approve the measures to address these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p>						
<p>4.5.6.2A If any historic resources are found during implementation of Mitigation Measure 4.5.6.1A, the Project Archaeologist or Historian (as appropriate) shall offer any artifacts or resources to the Moreno Valley Historical Society (MVHS) or the Eastern Information Center/County Museum or the Western Science Center in Hemet as appropriate for archival storage. From the time any artifacts are turned over to the Moreno Valley Historical Society or other appropriate historical group, the developer shall have no further responsibility for their management or maintenance.</p>	City Planning Division	As Needed During Construction	During grading	A qualified archaeologist or historian(s) shall be retained by the applicant. A report of findings shall be submitted to the City after the finalization of construction		Issuance of a Stop Work Order

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4.5.6.2B As part of construction of the trail segment connecting Redlands Boulevard to the California Department of Fish and Wildlife property, the developer shall contribute \$5,000 to the City for the installation of a historical marker acknowledging the passing of Juan Bautista de Anza through this area during his exploration of California. This measure shall be incorporated into trail plans for this segment which will be subject to review and approval by the City Park and Recreation Department in consultation with the Moreno Valley Historical Society.	City Park and Recreation Department	Once	Prior to approval of trail plans	Review and Approval of Trail Plans Written verification the \$5,000 has been paid		Withhold Approval of Trail Plans
4.5.6.2C Streets C and E shall follow the historical alignment of Alessandro Boulevard and shall be named Alessandro Boulevard.	City Land Development/ Public Works City Park and Recreation Department	Once prior to issuance of plot plan	Prior to issuance of approval of plot plans for planning Areas along Alessandro boulevard	Review and Approval of Plot Plans		Withhold Plot Plan approval
4.5.6.3A Prior to the issuance of any grading permits, a City-approved Paleontologist shall be retained to conduct paleontological monitoring as needed for all grading related to development. Development monitoring shall include the following actions: <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to exceed twenty (20) feet in depth, in areas where fossil-bearing formations are found during grading, and in all areas found to contain, or are suspected of containing, fossil-bearing formations. 2. To avoid construction delays, paleontological monitors shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates if they are unearthed. 3. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. This measure shall be implemented to the satisfaction of the Planning Official. The Project 	City Planning Division	Once before issuance of grading permits and As Needed during Construction	Prior to issuance of any grading permits for development within the WLCSP	A qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A report of findings shall be submitted to the City after the finalization of construction		Withhold Grading Permit or Issuance of a Stop Work Order

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Paleontologist and the Project Archaeologist described in Mitigation Measure 4.5.6.1C may be the same person if he/she meets the qualifications of both positions per Cultural Report MM PR-1, Table 4, pg. 76.						
<p>4.5.6.3B Prior to the issuance of any permits for the construction of off-site improvements, a qualified paleontologist shall conduct an assessment for paleontological resources on each off-site improvement location. If any site is determined to have a potential for exposing paleontological resources, the project paleontologist shall monitor off-site grading/excavation, subject to coordination with the City. Development monitoring shall include the following mitigation measures:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to reach fossil-bearing formations during grading. This monitoring must be conducted by the Project Paleontologist in all areas found to or suspected of containing fossil-bearing formations. 2. To avoid construction delays, the Project Paleontologist shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates as they are unearthed. 3. The Project Paleontologist shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. 	City Planning Division	Once before issuance of grading permits and As Needed During Construction	Prior to issuance of grading permits for construction of any off-site improvements	A Qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A Report of findings shall be submitted to the City after the finalization of construction		Withhold grading permit or issuance of a stop work order
4.6 GEOLOGY AND SOILS						
<p>4.6.6.1A Prior to approval of any projects for development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet, the City shall determine if a detailed fault study of the Casa Loma Fault Zone area is required based on available evidence.</p>	City Engineer and Project Geologist and Land Development/ Public Works	Once before project approvals	Prior to approval of any projects for future development between Redlands Boulevard and	Review and approval of geotechnical fault study.		Withhold Approval of <u>Projects</u> <u>plot plans and building permits</u>

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<p>If necessary, any additional geotechnical investigations shall be prepared by a qualified geologist and determine if structural setbacks are needed, and shall identify specific remedial earthwork and/or foundation recommendations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site specific investigations, provide any additional necessary mitigation to meet California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements.</p> <p>Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur. Structures intended for human occupancy shall not be located within any structural setback zone as determined by those studies. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>	<u>Building and Safety</u>		Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the Western boundary along the Mount Russell toe of slope easterly into the site 1 ,500 feet.			
4.6.6.1B Prior to approval of any projects for development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone, the City shall review and approve a geotechnical fault study prepared by a qualified geologist to confirm the alignment and size of any required building setbacks related to the fault zone. If necessary, this study shall identify a “special foundation or grading remediation zone” for the areas supporting structures intended for human occupancy where coseismic deformation	City Engineer and Project Geologist; Land Development/ Public Works	Once before approval of any development permits and Prior to Plot Plan Approval	Prior to approval of any projects for future development within or adjacent to the San Jacinto Alquist-Priolo	Review and approval of geotechnical fault study.		Withhold Approval of <u>Projects plot plans and building permits</u>

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<p>(fractures) is observed. This zone shall be determined after subsurface evaluation based on proposed building locations. Specific remedial earthwork and foundation recommendations shall be evaluated as necessary based on proposed building locations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>This study may involve trenching to adequately identify the location of the Claremont segment of the San Jacinto Fault Zone that crosses the eastern portion of the World Logistics Center Specific Plan property. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			Earthquake Fault Zone.			
<p>4.6.6.1C Prior to the approval of grading permits, or permits for construction of off-site improvements, the City shall review and approve plans confirming that the project has been designed to withstand anticipated ground shaking and other geotechnical and soil constraints (e.g., settlement). The project proponent shall submit plans to the City as appropriate for review and approval</p>	City Engineer and Land Development/ Public Works	Once before issuance of grading permits	Prior to the approval of project grading permits, or permits for construction of	Review and approve grading and construction plans		Withhold Issuance of Grading <u>or</u> Construction Permits

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prior to issuance of grading permits or issuance of permits for the construction of any offsite improvements. This measure shall be implemented to the satisfaction of the City Engineer.			off-site improvements			
<p>4.6.6.2A Prior to issuance of building permits for any portion of the project site, a site-specific, design level geotechnical investigation for each parcel shall be submitted to the City , which would comply with all applicable state and local code requirements, and includes an analysis of the expected ground motions at the site from known active faults using accepted methodologies. The report shall determine structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. The report shall also determine final design parameters for walls, foundations, foundation slabs, utilities, roadways, parking lots, sidewalks, and other surrounding related improvements. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p>	<p>City Engineer and Land Development/ Public Works</p> <p><u>Building and Safety Division</u></p>	<p>Once before issuance of <u>Grading building</u> permits</p>	<p>Prior to the issuance of any building permits</p>	<p>Review and approval of a site-specific, design level geotechnical investigation for each parcel</p>		<p>Withhold Building Permits</p>

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<p>4.6.6.3A Each Plot Plan application for development shall include a site-specific, design level geotechnical investigation for each parcel, in compliance with all applicable state and local code requirements, and including an analysis of the expected soil hazards at the site. The report shall determine:</p> <ol style="list-style-type: none"> 1. Structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. 2. The final design parameters for walls, foundations, foundation slabs, utilities, roadways, parking lots, sidewalks, and other surrounding related improvements. <p>Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. These investigations shall identify any site-specific impacts from compressible and expansive soils based on the actual location of individual pads proposed in the future, so that differential movement can be further verified or evaluated in view of the actual foundation plan and imposed fill or structural loads. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional</p>	<p>City Engineer and Land Development/ Public Works</p> <p><u>Building and Safety</u></p>	<p>Once before plot plan approval</p> <p><u>Once before building permit approval</u></p>	<p>Prior to the approval of a Plot Plan for any Development project or associated offsite improvements</p> <p><u>Prior to building permit approval</u></p>	<p>Submittal and Approval of Geotechnical Report</p> <p><u>Review and approval of building plans</u></p>		<p>Withhold Approval of Plot Plan</p> <p><u>Withhold Approval of Building Plans</u></p>

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<p>engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>Compliance with this measure will ensure that future buildings are designed to protect the structure and occupants from on-site soil limitations, consistent with State Building Code requirements. This measure shall be implemented to the satisfaction of the City Engineer.</p>						
<p>4.6.6.3B Any cut slopes in excess of five (5) feet in vertical height shall be constructed as “replacement fill slopes” per the project geotechnical report, due to the variable nature of the onsite alluvial soils. This measure shall be implemented to the satisfaction of the City Land Development Division and the City Engineer in consultation with the Project Geologist.</p>	City Land Development Division and City Engineer	<u>Before and after</u> issuance of any grading permit	Prior to issuance <u>and following</u> of any grading permit for development within the Specific Plan	Review and approval of grading plans <u>Review of grading prior to issuance of building permit</u>		Withhold Grading Permit <u>Withhold building permit</u>
<p>4.6.6.3C During all grading activities, a geotechnical engineer shall monitor site preparation, removal of unsuitable soils, mapping of all earthwork excavations, approval of imported earth materials, fill placement, foundation installation, and other geotechnical operations. Laboratory testing of subsurface materials to confirm compacted dry density and moisture content, consolidation potential, corrosion potential, expansion potential, and resistance value (R-value) shall be performed prior to and during grading as appropriate. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>	City Engineer and Land Development/ Public Works	Once before permitting	Prior to issuance of Any discretionary permit for development within the Specific Plan	Review of additional geotechnical and soils site investigations		Withhold Discretionary Permit <u>Issuance of a stop work order if necessary</u>
4.7 GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE						
<p>4.7.6.1A <u>The World Logistic Center project</u> shall implement the following requirements to reduce solid waste and greenhouse gas emissions from construction and operation of project development:</p> <p>a) Prior to January 1, 2020, divert a minimum of 50 percent of landfill waste generated by operation of the project. After January 1, 2020, development shall divert a minimum of 75 percent of landfill waste. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p>	Recycling Coordinator/ Public Works City Planning Division	Once each calendar year after project approval	January 1 st of each year following project approval	Provide verification sheet to the Recycling Coordinator/ Public Works Planning division Property Owners. Association or the property		Withhold future discretionary approvals Pursuant to City Municipal Code

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<p>b) Prior to January 1, 2020, recycle and/or salvage at least 50 percent of nonhazardous construction and demolition debris. After January 1, 2020, recycle and/or salvage at least 75 percent of non-hazardous construction and demolition debris. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Calculations can be done by weight or volume but must be consistent throughout.</p>	<p><u>Recycling Coordinator/ Public Works City Planning Division</u></p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>owner shall certify the percentage of land fill waste diverted on an annual basis Certification has been submitted to the City.</p> <p>Property Owners Association or the property owner shall certify the percentage of landfill waste diverted on an annual basis.</p>		<p>Implement Land Use and Enforcement Procedures. Pursuant to City Municipal Code</p>
<p>c) The applicant shall submit a Recyclables Collection and Loading Area Plan for construction related materials prior to issuance of a building permit with the Building Division and for operational aspects of the project prior to the issuance of the occupancy permit to the Public Works Department. The plan shall conform to the Riverside County Waste Management Department’s Design Guidelines for Recyclable Collection and Loading Areas.</p>	<p>City Planning Division</p>	<p>Once before issuance of building permits</p>	<p>Prior to issuance of building permits</p>	<p>Review and approval of a Recyclables Collection and Loading Area plan</p>		<p>Pursuant to City Municipal Code Withhold Building permit</p>
<p>d) Prior to issuance of certificate of occupancy, the recyclables collection and loading area shall be constructed in compliance with the Recyclables Collection and Loading Area plan.</p>	<p>City Planning Division</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit Prior to issuance of occupancy permit</p>	<p>Review and approval of building plans Building plan review.</p>		<p>Withhold Certificate of Occupancy</p>
	<p>City Planning Division</p>	<p>Once before issuance of</p>	<p>Prior to issuance of occupancy permit</p>	<p>Compliance with Recyclables</p>		<p>Withhold Certificate of Occupancy</p>

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e) Prior to issuance of certificate of occupancy, documentation shall be provided to the City confirming that recycling is available for each building.	<u>Recycling Coordinator/ Public Work City Planning Division</u>	occupancy permits	Within six months after occupancy of building	Collection and Loading Area Plan		Withhold Certificate of Occupancy
f) Within six months after occupancy of a building, the City shall confirm that all tenants have recycling procedures set in place to recycle all items that are recyclable, including but not limited to paper, cardboard, glass, plastics, and metals.		Within six months of building occupancy		Review and approval of a Recyclables Collection and Loading Area Plan.		Withhold Certificate of Occupancy
g) The property owner shall advise all tenants of the availability of community recycling and composting services.	<u>Recycling Coordinator/ Public Work City Planning Division</u>	Once before issuance of occupancy permits	Prior to issuance of a Certificate of Occupancy	Written verification will be submitted to the City that the property owner advised all tenants of the availability of community recycling and composting services.		Withhold grading permits
h) Existing onsite street material shall be recycled for new project streets to the extent feasible.	City Engineer Land Development/Public Works	Once before issuance of grading permits	Prior to issuance of grading permits.	Review and approval of documents including street plans		

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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<p><u>4.7.6.1B</u> (Previously included as Utilities Mitigation Measure 4.16.4.6.1A in the 2015 FEIR for building energy). Each application for a building permit shall include energy calculations to demonstrate compliance with California Energy Efficiency Standards confirming that each new structure meets applicable Building and Energy Efficiency Standards. The plans shall also ensure that buildings are in conformance with the State Energy Conservation Efficiency Standards for Nonresidential buildings (Title 24, Part). Article 2, California Administrative Code). This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions. Plans shall follow the following:</p> <ul style="list-style-type: none"> • Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. • Cool pavement materials such as lighter-colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right-of-way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. • Energy-efficient appliances that achieve the 2016 California Appliance Energy Efficiency Standards (e.g., EnergyStar® Appliances) and use of sunlight-filtering window coatings or double-paned windows. 	<p><u>City Building and Safety, City Planning Division</u> <u>City Planning Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>
<p><u>4.7.6.1C</u> (Previously included as Utilities Mitigation Measure 4.16.4.6.1B building energy). Prior to the issuance of any building permits within the <u>World Logistics Center Specific Plan WLC site</u>, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards <u>to the Building and Safety and Planning Divisions that’s shows each new structure meets the applicable Building and Energy Efficiency Standards, for each new structure.</u> Plans may include but are not necessarily limited to implementing the following as appropriate:</p>	<p><u>City Building and Safety, City Planning Division</u> <u>City Planning Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>

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<ul style="list-style-type: none"> High-efficiency air-conditioning with electronic management system (computer) control. Isolated High-efficiency air-conditioning zone control by floors/separate activity areas. Use of Energy Star® exit lighting or exit signage. 						
<p>4.7.6.1D (Previously included as Utilities Mitigation Measure 4.16.4.6.1C in the 2015 FEIR for building energy; now modified). Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p> <ul style="list-style-type: none"> Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building or up to the limit allowed by MVU's restriction on <u>distrusted solar PV connecting to their grid, whichever is greater;</u> Increase efficiency for buildings by implementing either 10 percent over the <u>2019</u> Title 24's energy-saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict; Require the equivalent of "Leadership in Energy and Environmental Design Certified" for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval; <u>and</u> <u>All project rooftops shall be constructed to be solar-ready and be designed to accommodate the additional loads from solar equipment that might be installed at a future date.</u> <p><u>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</u></p>	<p>City Planning Division, City Building and Safety Division</p>	<p>Once</p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>
<p>4.7.7.1 The developer shall mitigate the WLC Project's remaining GHG emissions to net zero by purchasing and retiring offset carbon credits, based upon the amount of GHG emissions set forth in Table 4.7-16 of the Revised Final EIR. <u>Upon the purchase and retirement of offsets carbon credits, no further analysis of GHG emissions will be required, and no further reduction of those emissions will be required.</u></p>	<p>City Planning Division</p>	<p><u>Prior to each phase as noted in Timing</u></p>	<p><u>Grading offsets shall be purchased and retired prior to issuance of a grading permit</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold applicable permit at each phase (grading, building and/or occupancy permit).</u></p>

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<p>The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of offset carbon credits provided that the following conditions are satisfied:</p> <p>a) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), approved by the California Air Resources Board, such as, but not limited to, Climate Action Reserve, American Carbon Registry or Verra (formerly Verified Carbon Standard). In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City's Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.</p> <p>b) Timing: The developer shall provide proof to the City that offset carbon credits equal to the amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading,</p>			<p><u>Construction offsets shall be purchased and retired prior to issuance of building permits</u></p> <p><u>Operational offsets shall be purchased and retired prior to issuance of occupancy permits</u></p>			

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<u>construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent.</u>						
4.8 HAZARDS AND HAZARDOUS MATERIALS						
4.8.6.1A Prior to demolition of any existing structures on the project site, a qualified contractor shall be retained to determine if asbestos-containing materials (ACMs) and/or lead-based paint (LBP) are present. If asbestos-containing materials and/or lead-based paint are present, prior to commencement of demolition, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. In addition, onsite soils shall be tested for contamination by agricultural chemicals. If present, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. This measure shall be implemented to the satisfaction of the Building Division including written documentation of the disposal of any asbestos-containing materials, lead-based paint, or agricultural chemical residue in conformance with all applicable regulations.	City Building Division	Once Before Permitting and as Needed During Construction	Prior to demolition of any existing rural residences or associated structures	Evidence of qualified contractor provided		Holding and Not Approving <u>Withhold</u> Demolition Permits
4.8.6.1B Prior to the issuance of any discretionary permits associated with the proposed fueling facility (“logistic support” site in the LD zone), a risk assessment or safety study that identifies the potential public health and safety risks from accidents at the facility (e.g., fire, tank rupture, boiling liquid, or expanding vapor explosion) shall be submitted to the City for review and approval. This study shall be prepared to industry standards and demonstrate that the facility will not create any significant public health or safety impacts or risks, to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Fire Prevention Bureau and Building and Safety Division <u>Planning Division</u>	Once Before Permitting	Prior to issuance of Any discretionary Permits associated with natural gas fueling facility	Review and Approval of Risk Assessment or Safety Study		Withhold Discretionary Permit
4.8.6.1C Prior to grading for any discretionary permits for development in Planning Areas 9-12 adjacent to the natural gas compressor plant, the applicant shall prepare a risk assessment report analyzing safety conditions relative to the existing compressor plant and planned development. The report must be based on appropriate industry standards and identify the potential hazards from the compressor plant (e.g., fire, explosion)	Building Official and Fire Marshal <u>Planning Division</u>	Once before issuance of discretionary permits for development within	Prior to issuance of Discretionary permits for Development within Planning Areas 9-12	Review and approval of a risk assessment		Withhold Discretionary Permit

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and determine that the distance from the plant to the closest planned buildings in Planning Areas 9-12 is sufficient to protect the safety of workers from accidents that could occur (see Final EIR Volume 2 Figure 4.1.6B) at the compressor plant. This measure shall be implemented to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.		Planning Areas 9-12				
4.8.6.1D Prior to the issuance of any grading permit, the developer shall inform the City of any existing solid waste materials within the development area. In conjunction with grading activities, all solid waste matter within the development area shall be removed by a licensed contractor and disposed of in an approved landfill. A record of the removal and disposal of any waste materials, in compliance with applicable laws and regulations, shall be submitted to the City prior to the issuance of any building permits.	<u>Building and Safety</u> Recycling Coordinator/ Public Works	Once before issuance of grading permits	Prior to issuance of grading permits	Applicant will inform the City in writing of any existing solid waste materials within the development area		<u>Withhold building permit until receipt of record of removal and disposal of waste materials</u> <u>Pursuant to City Municipal Code</u>
4.9 HYDROLOGY AND WATER QUALITY						
4.9.6.1A Prior to issuance of any building permit within the Specific Plan area, the developer shall construct storm drain pipes and conveyances, as well as, combined detention and infiltration basin(s), bioretention area(s), and spreading area(s) within each proposed watershed, as outlined in the project hydrology plan, to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduce the time of concentration by storing and infiltrating increased runoff for a limited period of time and release the outflow at a rate that does not exceed the pre-development peak flows and velocities for the 2, 5, 10, 25, and 100-year storms and volumes as assessed in the water balance model for historical conditions. For the purpose of this mitigation measure, the term “construct” shall mean to substantially complete construction so as to function for its intended purpose during construction with complete construction prior to occupancy. Field investigations will be conducted to determine the infiltration rate of soils underlying the proposed locations of bioretention areas and detention basins. The infiltration rate of the underlying soils will be used to properly size the bioretention areas and detention basins/infiltration basins to ensure that adequate volumes of runoff, in cumulative total for all	Land Development/ Public Works	Prior to Occupancy	Prior to issuance of any development permit	Review and approval of construction documents Field Inspection		Withhold Building Permit

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bioretention areas and detention basins, are captured and infiltrated. The water balance model will be updated and rerun for the site-specific conditions encountered to confirm the water balance. This measure shall be implemented to the satisfaction of the City Engineer. Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage weir structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow such that the flows exiting the project boundary will return to the sheet flow pattern similar to the existing condition. Detention basins and spreading areas shall be designed to account for the amount of the sediment transported through the project boundary so that the existing sediment carrying capacity is maintained.						
<p>4.9.6.1B The bioretention areas and detention/infiltration basins shall be designed to assure infiltrations rates. The monitoring plan will follow the guidelines presented by the California Storm Water Quality Association (CASQA) in the California Storm Water Best Management Program (BMP) Handbook, Municipal, January 2003 Section 4, Treatment Control Best Management Programs Fact Sheets TC-11 Infiltration Basin and TC-30 Vegetated Swale)</p> <p>For the Bioretention areas, as needed maintenance activities shall be conducted to remove accumulated sediment that may obstruct flow through the swale. Bioretention areas shall be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. The maintenance activities should occur when sediment on channels and culverts builds up to more than 3 inches (CASQA 2003). The swales will need to be cultivated or rototilled if drawdown takes more than 72 hours.</p> <p>For the Detention/infiltration Basins, a 3-5 year maintenance program shall be implemented mainly to keep infiltration rates close to original values since sediment accumulation could reduce original infiltration rate by 25-50%. Infiltration rates in detention basins will be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. If cumulative infiltration rates of all detention basins drops below the minimum required rates, then the detention basins will be</p>	<p>City Engineer</p> <p>Land development/P ublic Works</p>	<p>Once before issuance of grading permits</p> <p>Ongoing during occupancy</p>	<p>Prior to issuance of grading permits</p> <p>Ongoing during occupancy</p>	<p>Review and approval of a monitoring plan for the detention/ infiltration basins</p> <p>On-site Inspection</p>		<p>Withhold Grading Permit</p> <p><u>Citation, City Maintenance, Lien and Foreclosure Pursuant to City Municipal Code</u></p>

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reconditioned to improve infiltration capacity by scraping the bottom of the detention basin, seed or sod to restore groundcover, aerate bottom and dethatch basin bottom (CASQA 2003).						
4.9.6.2A Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall file a Notice of Intent (NOI) with the Santa Ana Regional Water Quality Control Board to be covered under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit for discharge of storm water associated with construction activities. The project developer shall submit to the City the Waste Discharge Identification Number issued by the State Water Quality Control Board (SWQCB) as proof that the project's Notice of Intent is to be covered by the General Construction Permit has been filed with the State Water Quality Control Board. This measure shall be implemented to the satisfaction of the City Engineer	City Engineer. Land Development/ Public Works, and Stormwater Management	Once before issuance of any grading permit	Prior to issuance of any grading permit	Proof of NOI submittal		Withhold Grading Permit
4.9.6.2B Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall submit to the State Water Quality Control Board (SWQCB) a project-specific Storm Water Pollution Prevention Plan (SWPPP). The Storm Water Pollution Prevention Plan shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the Storm Water Pollution Prevention Plan shall emphasize structural and nonstructural best management practices (BMPs) to control sediment and non-visible discharges from the site. Best Management Practices to be implemented may include (but shall not be limited to) the following: <ul style="list-style-type: none"> Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary debris basins (if deemed necessary), and other discharge control devices. The construction and condition of the Best Management Practices are to be periodically inspected by the Regional Water Quality Control Board during construction, and repairs would be made as required. 	City of Moreno Valley and the Regional Water Quality Control Board and Land Development/ Public Works	Once before issuance of any grading permit <u>And</u> <u>Ongoing as part of routine site inspections</u>	Prior to issuance of any grading permit <u>Ongoing</u>	Written verification of filing a SWPPP by the RWQCB <u>Site inspection</u>	Withhold Grading Permit <u>Pursuant to City Municipal Code</u>	

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<ul style="list-style-type: none"> Materials that have the potential to contribute non-visible pollutants to storm water must not be placed in drainage ways and must be placed in temporary storage containment areas. All loose soil, silt, clay, sand, debris, and other earthen material shall be controlled to eliminate discharge from the site. Temporary soil stabilization measures to be considered include: covering disturbed areas with mulch, temporary seeding, soil stabilizing binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. Stockpiles shall be surrounded by silt fences and covered with plastic tarps. The Storm Water Pollution Prevention Plan shall include inspection forms for routine monitoring of the site during the construction phase. Additional required Best Management Practices and erosion control measures shall be documented in the Storm Water Pollution Prevention Plan. The Storm Water Pollution Prevention Plan would be kept on-site for the duration of project construction and shall be available to the local Regional Water Quality Control Board for inspection at any time. <p>The developer and/or construction contractor for each development area shall be responsible for performing and documenting the application of Best Management Practices identified in the project-specific Storm Water Pollution Prevention Plan. Regular inspections shall be performed on sediment control measures called for in the Storm Water Pollution Prevention Plan. Monthly reports shall be maintained and available for City inspection. An inspection log shall be maintained for the project and shall be available at the site for review by the City of Moreno Valley and the Regional Water Quality Control Board.</p>						
<p>4.9.6.3A Prior to discretionary permit approval for individual plot plans, a site-specific Water Quality Management Plan (WQMP) shall be submitted to the City Land Development Division for review and approval. The Water Quality Management Plan shall specifically identify site design, source control, and</p>	City Land Development Division	Once before issuance of any grading or building permits	Prior to issuance of discretionary permit approval for individual plot plans	Review and Approval of WQMP		Withhold Grading or Building Permit

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<p>treatment control Best Management Practices that shall be used on-site to control pollutant runoff and to reduce impacts to water quality to the maximum extent practicable. The Water Quality Management Plan shall be consistent with the Water Quality Management Plan approved for the overall World Logistics Center Specific Plan project. At a minimum, the site developer shall implement the following site design, source control, and treatment control Best Management Practices as appropriate:</p> <p>Site Design Best Management Practices</p> <ul style="list-style-type: none"> a) Minimize urban runoff. b) Maximize the permeable area. c) Incorporate landscaped buffer areas between sidewalks and streets. d) Maximize canopy interception and water conservation by planting native or drought-tolerant trees and large shrubs. e) Use natural drainage systems. f) Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration. g) Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives. h) Minimize impervious footprint. i) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised. j) Reduce widths of street where off-street parking is available. k) Minimize the use of impervious surfaces such as decorative concrete, in the landscape design. l) Conserve natural areas. m) Minimize Directly Connected Impervious Areas (DCIAs). n) Runoff from impervious areas will sheet flow or be directed to treatment control Best Management Practices. 		<p><u>And</u></p> <p><u>Ongoing as part of routine site inspections</u></p>	<p><u>Ongoing</u></p>	<p><u>Site inspection</u></p>		<p><u>Pursuant to City Municipal Code</u></p>

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<p>o) Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas that are planted with native or drought-tolerant trees and large shrubs.</p> <p>Source Control Best Management Practices</p> <p>Source control Best Management Practices are implemented to eliminate the presence of pollutants through prevention. Such measures can be both nonstructural and structural.</p> <p>Non-structural source control Best Management Practices include:</p> <ul style="list-style-type: none"> a) Education for property owners, operator, tenants, occupants, or employees; b) Activity restrictions; c) Irrigation system and landscape maintenance; d) Common area litter control; e) Street sweeping private streets and parking lots; and f) Drainage facility inspection and maintenance. <p>Structural source control Best Management Practices include:</p> <ul style="list-style-type: none"> g) MS4 stenciling and signage; h) Landscape and irrigation system design; i) Protect slopes and channels; and j) Properly design fueling areas, trash storage areas, loading docks, and outdoor material storage areas. <p>Treatment Control Best Management Practices</p> <p>Treatment control Best Management Practices supplement the pollution prevention and source control measures by treating the water to remove pollutants before it is released from the project site. The treatment control Best Management Practice strategy for the project is to select Low Impact Development (LID) Best Management Practices that promote infiltration and evapotranspiration, including the construction of infiltration basins, bioretention facilities, and extended detention basins. Where infiltration Best Management Practices are not appropriate, bioretention and/or biotreatment Best Management Practices (including extended detention basins,</p>						

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<p>bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration may be utilized. Harvest and Reuse Best Management Practice will be used to store runoff for later non-potable uses.</p> <p>Site-specific Water Quality Management Plans have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the project are developed, Best Management Practices will be implemented consistent with the goals contained in the Master Water Quality Management Plan. All development within the project will be required to incorporate on-site water quality features to meet or exceed the approved Master Water Quality Management Plan's water quality requirements identified previously.</p>						
<p>4.9.6.3B The Property Owners Association (POA) and all property owners shall be responsible to maintain all onsite water quality basins according to requirements in the guidance Water Quality Management Plan and/or subsequent site-specific Water Quality Management Plans, and established guidelines of the Regional Water Quality Control Board. Failure to properly maintain such basins shall be grounds for suspension or revocation of discretionary operating permits, and/or referral to the Regional Water Quality Control Board for review and possible action. This measure shall be implemented to the satisfaction of the City Land Development Division, in consultation with the City Engineer, and Regional Water Quality Control Board.</p>	City Land Development Division	As Needed	Ongoing	Onsite inspections		Revocation of Discretionary or Operating Permits
<p>4.9.6.3C Prior to issuance of future discretionary permits for any development along the southern boundary of the World Logistics Center Specific Plan (WLCSP), the project developer of such sites, in cooperation with the Property Owners Association (POA), shall establish and annually fund a Water Quality Mitigation Monitoring Plan (WQMMP) to confirm that project runoff will not have deleterious effects on the adjacent San Jacinto Wildlife Area (SJWA). This program shall include at least quarterly sampling along the southern boundary of the site (i.e., at the identified outlet structures of the project detention basins) during wet season flows and/or when water is present, as well as sampling</p>	Land Development Division	Annually <u>And</u> <u>Ongoing as part of routine</u>	Prior to issuance of discretionary permits for any development along the southern boundary of the WLCSP <u>Ongoing</u>	Evidence of Annual Water Quality Monitoring Plan fund <u>Site inspection</u>		Withhold Discretionary Permit <u>Pursuant to City Municipal Code</u>

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<p>of any dry-season flows that are observed entering the San Jacinto Wildlife Area property from the project property, including Drainage 9, which is planned to convey only clean off-site flows from north of the World Logistics Center Specific Plan site across Gilman Springs Road. The program shall also include at least twice yearly sampling after completion of construction, and a pre-construction survey must be completed to determine general water quality baseline conditions prior to and during development of the southern portion of the World Logistics Center Specific Plan. This sampling shall be consistent with and/or comply with the requirements of applicable Storm Water Pollution Prevention Plans (SWPPPs) for the development site.</p> <p>The project developer of sites along the southern border of the World Logistics Center Specific Plan shall be responsible for preventing or eliminating any toxic pollutant (not including sediment) found to exceed applicable established public health standards. In addition, the discharge from the project shall not cause or contribute to an exceedance of Receiving Water Quality Objectives for the potential pollutants associated with the project as identified in Table 4.9.J. Once development is complete, the developer shall retain qualified personnel to conduct regular (i.e., at least quarterly) water sampling/testing of any basins and their outfalls to ensure the San Jacinto Wildlife Area will not be affected by water pollution from the project site. This measure shall be implemented to the satisfaction of the City Land Development Division Manager based on consultation with the project developer, Eastern Municipal Water District, the Regional Water Quality Control Board-Santa Ana Region, and the Mystic Lake Manager.</p>		<p><u>site inspections</u></p>				
4.10 LAND USE AND PLANNING						
NOT APPLICABLE						
4.11 MINERAL RESOURCES						
NOT APPLICABLE						

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<p><u>responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request.</u></p> <ul style="list-style-type: none"> • Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51). 						
<p>4.12.6.1B All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers’ standards.</p>	City Planning Division	As Needed During Grading	During site grading and construction	Review of Construction Documents and Onsite Inspection		Issuance of a Stop Work Order
<p>4.12.6.1C Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the Specific Plan (per Noise Study MM N-1, pg. 51).</p>	City Planning Division Transportation Division/Public Works	Once before issuance of grading permits or approval of roadway and utility improvement plans	Prior to any issuance of grading permits or approval of roadway and utility improvement plans	Review and Approval of Construction Documents		Withhold Grading Permits or approval of roadway and utility improvement plans

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4.12.6.1D No grading shall occur within 2,800 feet of residences south of State Route 60 between 8 p.m. and 6 a.m. on weekdays and between 8 p.m. and 7 a.m. on weekends. These restrictions shall be included as part of the Noise Reduction Compliance Plan per Mitigation Measure 4.12.6.1A (per Noise Study MM N-2, pg. 51)	City Planning Division and Land Development/ Public Works	Once Before Permitting and Ongoing during grading	Prior to any discretionary approvals for development in the WLCSP	Review and Approval of Noise Reduction Compliance Plan		Issuance of a Stop Work Order
4.12.6.1E As an alternative to Mitigation Measure 4.12.6.1D, a 12-foot tall temporary construction sound barrier may be installed for residences within 1,580 feet of active nighttime construction areas. The temporary sound barrier shall be constructed of plywood with a total thickness of 15 inches, or a sound blanket wall may be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater. This shall be included as part of the Noise Reduction Compliance Plan required in Mitigation Measure 4.12.6.1A, which shall be reviewed and approved by the City prior to implementation (per Noise Study MM N-2 and N-3, pg. 51 and pg. 52).	City Planning Division	Once Before Permitting	Prior to grading	Review and Approval of Noise Reduction Compliance Plan		Withhold Grading and Building Permits
4.12.6.1F As an alternative to Mitigation Measure 4.12.6.1D and 4.12.6.1E, on-site noise measurements of construction areas may be taken by qualified personnel and specific buffer distances between construction activities and existing residences may be proposed based on actual noise levels. These measurements will be incorporated into the Noise Reduction Compliance Plan required in Mitigation Measure 4.12.6.1A, which shall be reviewed and approved by the City prior to implementation (per Noise Study MM N-2, pg. 51).	City Planning Division	Once Before Permitting	Prior to grading	Review and Approval of Noise Reduction Compliance Plan		Withhold Grading and Building Permits
4.12.6.1G Any discretionary approvals for development that proposes grading within 1,580 feet of occupied residential units shall require that all grading equipment be equipped with residential grade mufflers (or better). All stationary construction equipment shall be placed so that emitted noise is directed away from noise sensitive receptors nearest the site. Additionally, stationary construction equipment shall have all standard acoustic covers in place during operation (per Noise Study MM N-4, pg. 52).	City Planning Division	As Needed During Grading	Prior to any discretionary approvals for Development that proposes grading within 1,580 feet of occupied residential units	Review and Approval of Construction Documents. Require Written Materials from the Applicant or Operator		Issuance of a Stop Work Order

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4.12.6.1H All material stockpiles in connection with any grading operations shall be located at least 1,200 feet from existing residences (per Noise Study MM N-5, pg. 52).	City Planning Division and Land Development/ Public Works	As Needed During Grading	During Grading	On-site Inspection		Issuance of a Stop Work Order
4.12.6.1I All project-related off-site construction shall be limited to 6 a.m. and 8 p.m. on weekdays only. Construction during weekends and City holidays shall not be permitted (per Noise Study MM N-6, pg. 53) to the satisfaction of the Land Development Division/Public Works.	City Land Development Division/ Public Works	Ongoing as needed	During construction	Review and Approval of Construction Documents		Issuance of a Stop Work Order
4.12.6.1J Prior to issuance/approval of any grading permits, off-site construction activities adjacent to residential uses shall provide for installation of 12-foot temporary sound barriers for construction activities lasting more than one month. The sound barrier will reduce noise levels by approximately 10 dB. The temporary sound barrier may be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may be used. If sound blankets are used, the curtains must have a Sound Transmission Class (STC) rating of 27 or greater. No off-site construction is permitted during weekday nighttime hours (8 p.m. to 6 a.m.) or during weekends and City holidays except for emergencies (per Noise Study MM N-7, pg. 53).	City Planning Division	Once before issuance of grading permits.	Prior to the issuance of grading Permits	Evidence of off-site 12-foot temporary sound barrier during construction activities lasting more than 1 month		Withhold Grading Permit
4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City’s approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development: Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the FEIR prepared for the programmatic level entitlement remain valid <u>the Revised Sections of the FEIR remain valid.</u> These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the programmatic <u>Revised Sections of the FEIR</u> and shall be used to impose building-specific mitigation on the individually proposed buildings. Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the	City Planning Division	Once before issuance of a certificate of occupancy	Prior to issuance of Discretionary permits for Action 1. Prior to issuance of certificate of occupancy for actions 2 and 3	Review and approval of a noise study		Withhold Certificate of Occupancy <u>discretionary approvals</u>

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<p>proposed building, including all preceding developments in the specific plan area <u>World Logistics Center site</u>, the Applicant shall implement the mitigation identified in the WLC <u>Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels reaching residential uses at 60 dBA during the daytime hours (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.)</u>. Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement <u>mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation</u> within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants.</p> <p>If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a <i>no</i> vote.</p> <p>At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.</p> <p>Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited</p>						

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receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement. (per Noise Study MM N-8, pg.53).						
4.12.6.2B Prior to issuance/approval of any building permits, the centerline of Cactus Avenue Extension will be located no closer than 11449 feet to the residential property lines along Merwin Street. An alternative is to locate the roadway closer to the residences and provide a soundwall along Cactus Avenue Extension. The soundwall location and height should be determined by a Registered Engineer, and the soundwall shall be designed to reduce noise levels to less than 65 CNEL at the residences. The Engineer shall provide calculations and supporting information in a report that will be required to be submitted to and approved by the City prior to issuing permits to construct the road. (per Noise Study, pg. 51, Cactus Avenue Extension, ID #50).	City Planning Division	Prior to the approval of a Building permit	Prior to the issuance of <u>building permits</u> Any discretionary approvals for development in the WLCSP	Review and Approval of <u>Building discretionary</u> permits		Withhold <u>Building Discretionary</u> Permits
4.12.6.2C Prior to the approval of any discretionary permits, cumulative impact areas shown in the WLC EIR Noise Study shall be included in the soundwall mitigation program outlined in Mitigation Measures 4.12.6.2A and 4.12.6.2D. (per Noise Study MM N-9, pg. 62).	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of soundwall mitigation program		Withhold <u>Building Permit</u> discretionary <u>permits</u>
4.12.6.2D Prior to issuance of a building permit, the applicant shall demonstrate that the development maintains a buffer with soundwall for noise attenuation at residential/warehousing interface (i.e., western and southwestern boundaries of the project site). To keep the noise levels at nearby residential areas less than typical ambient conditions, the warehousing property line shall be located a minimum of 250 feet from the residential zone boundary, and a 12-foot noise barrier shall be located along the perimeter of the property that faces any residential areas. The 12 foot noise barrier may be a soundwall, berm, or combination of the two. The height shall be measured relative to the pad of the warehouse. This requirement shall be implemented anytime residential areas are within 600 feet of the warehousing property line to insure that a noise level of 45 dBA (Leq) will not be exceeded at the residential zone. This requirement is consistent with Item 10 of Municipal Code Section	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold Building Permit

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9.16.160 Business park/industrial that states, "All manufacturing and industrial uses adjacent to residential land uses shall include a buffer zone and/or noise attenuation wall to reduce outside noise levels". (per Noise Study MM N-10, pg.62)						
4.12.6.4A Prior to the issuance of building permits for projects within 1,300 feet of the Southern California Gas Company (SCGC) and San Diego Gas and Electric (SDG&E) blowdown facilities, documentation shall be submitted to the City confirming that sound attenuation devices and/or improvements for the blow-down facilities providing at least a 40 dB reduction in noise levels during blow-down events are available and will be installed for all planned blow-down events. It shall be the responsibility of the developer to fund all sound attenuation improvements to the blow-down facilities required by this measure. It shall also be the responsibility of the developer to coordinate with San Diego Gas and Electric and/or Southern California Gas Company regarding the installation of any sound attenuation devices or improvements on the blow-down facilities at either the San Diego Gas and Electric compressor station or the Southern California Gas Company pipelines. This measure shall be implemented to the satisfaction of the City Land Management Division (per Noise Study MM N-11, pg.65).	City Land Development Division <u>City Planning Division</u>	Once before Permitting	Prior to the issuance of Building permits for projects within 1,300 feet of the SCGC and SDG&E facilities	Review and Approval of Documentation confirming sound attenuation device		Withhold Building Permits
4.13 POPULATION, HOUSING, AND EMPLOYMENT						
NOT APPLICABLE						
4.14 PUBLIC SERVICES AND FACILITIES						
NOT APPLICABLE						
4.15 TRAFFIC AND CIRCULATION						
4.15.7.4A A traffic impact analysis ("TIA") conforming to the guidelines for traffic impact analysis TIAs adopted by the City shall be submitted in conjunction with each Plot Plan application within the <u>WLCSP, World Logistics Center Specific Plan</u> Prior to the approval of the Plot Plans, the City shall review the traffic impact analysis Revised TIA to determine if any of the traffic improvements listed in Final EIR Volume 2 Tables 4.15.AV through 4.15.BA (TIA Tables 74 through 79) of the traffic impact analysis	City Engineer	Once before plot plan approval <u>Once prior to Certificate of Occupancy</u>	Prior to plot plan approval <u>Prior to Certificate of Occupancy</u>	Review and Approval of site-specific TIAs <u>Review and Approval of site-specific TIAs</u>		Withhold Building Permits <u>Withhold Plot Plan approval</u> <u>Withhold Certificate of Occupancy</u>

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<p>prepared for the Program Environmental Impact Report are required to be completed prior to the issuance of a certificate of occupancy for each building. the above tables need to be implemented as part of the plot plan. The TIA prepared for the Revised Sections of the FEIR are required to be completed prior to the issuance of a certificate of occupancy for each building. If the City determines that any of the improvements within Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated into insignificance, then the completion of construction of the improvements prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. Construction of improvements within the City shall be subject to credit/reimbursement agreement for those DIF and/or TUMF eligible costs. <u>costs that exceed the fair share contribution determined for the specific Plot Plan application.</u> If the City determines that any of the improvements outside Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated to a less than significant level, then the payment of any necessary fair share contribution as prescribed in Mitigation Measure 4.15.7.4F prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. If the City determines that the traffic impacts which will result from the construction or operation of a building will be significantly more adverse than those shown in the Program Environmental Impact Report in the Revised TIA, further environmental review shall be conducted prior to the approval of the Plot Plan pursuant to Public Resources Code § 21166 and CEQA Guidelines §15162 to determine what additional mitigation measures, if any, will be required in order to maintain the appropriate levels of service.</p>						
<p>4.15.7.4B As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the dedication of appropriate right-of-way, <u>where feasible</u>, consistent with the Subdivision Map Act for frontage street improvements contained within the World</p>	City Engineer	Once before issuance of occupancy permits	Prior to issuance of occupancy permits	Evidence of dedication of right of- way in compliance with Subdivision Map Act		Withhold Occupancy Permits

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Logistics Center Specific Plan Circulation Map. as shown in this Program EIR Figure 3-10 (or Figure 22 in the TIA prepared for this Program EIR). Required dedications shall be made prior to the issuance of occupancy permits for the requested development.						
4.15.7.4C As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, <u>the City shall require the Applicant to construct or to fully fund the transportation measures identified in the development’s TIA (see MM4.15.7.4A) as needed to mitigate the transportation impacts within the city of the Plot Plan development. The payment or construction shall be made prior to the issuance of occupancy permits for the requested development. This condition shall apply only to mitigation measures where a mechanism has been established to collect funds from the project and any other funds to needed to complete the improvements.</u>	City Engineer	Once before to issuance of occupancy permits	Prior to issuance of occupancy permits	Written verification of payment of DF <u>into adopted fair share programs</u>		Withhold Occupancy Permits
4.15.7.4D As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require each project to pay the requisite Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Sections 3.55.050 and 3.55.060 <u>Chapter 3.44</u> . Required TUMF payments shall be made prior to the issuance of occupancy permits for the requested development.	City Engineer <u>City Planning Division</u>	Once before to issuance of occupancy permits	Prior to issuance of occupancy permits	Written verification of payment of TUMF		Withhold Occupancy Permits
4.15.7.4E In order to ensure that all of the Project’s traffic impacts are mitigated to the greatest extent feasible, the Applicant shall contribute its fair share of the cost of the needed traffic improvements that are not within the City as identified in the <u>Revised</u> Traffic Impact Analysis (i.e., under the jurisdiction of other cities, the County of Riverside or Caltrans, pursuant to Mitigation Measure 4.15.7.4F). As used in this mitigation measure, the Applicant’s “fair share” has been determined in compliance with the requirements of the Fee Mitigation Act, Government Code § 66000 et seq., and, pursuant to § 66001(g), does not require that the Applicant be responsible for making up for any existing deficiencies. <u>The fair share mitigation is summarized in Tables 72 through 77 of the TIA located in Appendix F of the RSFEIR.</u>	City Engineer	Once before to issuance of occupancy permits	Prior to issuance of occupancy Permits	Written verification of payment of DF <u>or TUMF into adopted fair share programs</u>		Withhold Occupancy Permits

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<p>4.15.7.4F The Applicant shall pay its portion of the fair share of the cost of traffic improvements identified in the Transportation Impact Analysis for those significantly impacted road segments and intersections for each warehouse building within the World Logistics Center if the impacted jurisdiction has established a fair share contribution program prior to the approval of a building-specific plot plan. The City shall determine whether a fair share program exists in the impacted jurisdiction and, if one does exist, require that the appropriate fees are paid by the Applicant, consistent with the requirements below, prior to the issuance of a certificate of occupancy for the building in question. If no fair share program exists or if the existing programs are not consistent with the requirements below, then no payment of fees shall be required. The impacts are to be determined on a road segment or intersection basis. Nothing in this condition requires the payment of a traffic impact fee imposed by another jurisdiction which covers improvement to facilities where the Project does not have a significant impact. Fair-share contributions will be determined on a building-by-building basis as a share of the impact of the Project as a whole (for each segment or intersection where the WLC project as a whole has a significant impact identified in the Revised Sections of the FEIR) as determined by the Revised Traffic Impact Analysis and will be due as each certificate of occupancy is issued. The fair share payments for the significantly impacted road segments and intersections identified in the Revised Sections of the FEIR will be required even though the impact resulting from a specific building does not, by itself, cause a significant impact.</p> <p>For example, the intersection of Martin Luther King Blvd. and the I-215 northbound ramps (Intersection 85) in the City of Riverside was identified as a place where the World Logistic Center contributes to cumulatively significant impacts, and where the fair share contribution of the World Logistic Center project as a whole was computed to be 6.2%. If the City of Riverside establishes a fair share contribution program consistent with this Mitigation Measure 4.15.7.4F to improve that intersection, then when a certificate of occupancy is to be issued for a 2-million square feet high-cube warehouse in the World Logistic Center</p>	<p>City Engineer</p>	<p>Once prior to issuance of building permits for individual buildings.</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment of into <u>adopted</u> fair-share fees <u>programs</u></p>		<p>Withhold Occupancy Permits</p>

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<p>(approximately 5% of the entire World Logistic Center project) the amount of the fair share payment due from the Applicant to the City of Riverside would be computed as follows:</p> <table border="1"> <tr> <td>Amount Due</td> <td>=</td> <td>Total cost of Improvement</td> <td>X</td> <td>Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis</td> <td>X</td> <td>% Attributable to the building that is subject to the certificate of occupancy (5%)</td> </tr> <tr> <td colspan="7">A x B x C = D</td> </tr> <tr> <td colspan="7">A = % attributable to the building that is subject to the certificate of occupancy (%5)</td> </tr> <tr> <td colspan="7">B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis</td> </tr> <tr> <td colspan="7">C = Total cost of Improvement</td> </tr> <tr> <td colspan="7">D = Amount Due</td> </tr> </table> <p>A similar calculation would be done for each subsequent building, with payments for each due at the time of issuance of the certificate of occupancy. As a result, while each building individually would not produce a significant impact, and therefore would not be required to pay any mitigation fees if considered by itself, the total amount of the payments for all of the buildings would be equal to the fair share payment for the entire World Logistic Center to the extent that the responsible jurisdiction has chosen to adopt a fair share contribution funding program consistent with Mitigation Measure 4.15.7.4F.</p>	Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	% Attributable to the building that is subject to the certificate of occupancy (5%)	A x B x C = D							A = % attributable to the building that is subject to the certificate of occupancy (%5)							B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis							C = Total cost of Improvement							D = Amount Due												
Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	% Attributable to the building that is subject to the certificate of occupancy (5%)																																										
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<p>4.15.7.4G City shall work directly with Western Riverside Council of Governments-WRCOG to request that Transportation Uniform Mitigation Fee TUMF funding priorities be shifted to align with the needs of the City, including improvements identified in the World Logistics Center Specific Plan traffic impact analysis in the TIA. Toward this end, City shall meet regularly with Western Riverside Council of Governments-WRCOG.</p>	City Engineer	On-going	Yearly starting with project up and ending with project buildout.	City Engineer provides quarterly updates to the City Council regarding TUMF funding priorities as it relates to the improvements identified in the traffic impact analysis.		None																																										

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4.16 UTILITIES AND SERVICE SYSTEMS						
<p>4.16.1.6.1A Prior to approval of a precise grading permit for each plot plan for development within the World Logistics Center Specific Plan (WLCSP), the developer shall submit landscape plans that demonstrate compliance with the World Logistics Center Specific Plan, the State of California Model Water Efficient Landscape Ordinance (AB 1881), and Conservation in Landscaping Act (AB 325). This measure shall be implemented to the satisfaction of the Planning Division. Said landscape plans shall incorporate the following:</p> <ul style="list-style-type: none"> • Use of xeriscape, drought-tolerant, and water-conserving landscape plant materials wherever feasible and as outlined in Section 6.0 of the World Logistics Center Specific Plan; • Use of vacuums, sweepers, and other “dry” cleaning equipment to reduce the use of water for wash down of exterior areas; • Weather-based automatic irrigation controllers for outdoor irrigation (i.e., use moisture sensors); • Use of irrigation systems primarily at night or early morning, when evaporation rates are lowest; • Use of recirculation systems in any outdoor water features, fountains, etc.; • Use of low-flow sprinkler heads in irrigation system; • Provide information to the public in conspicuous places regarding outdoor water conservation; and • Use of reclaimed water for irrigation if it becomes available. 	<u>City Planning Division</u>	<u>Once</u>	<u>Prior to issuance of precise grading permit for each plot plan.</u>	<u>Review and Approval of landscape plans</u>		<u>Withhold precise grading permit.</u>
<p>4.16.1.6.1B All buildings shall include water-efficient design features outlined in Section 4.0 of the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division/Public Works. These design features shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> • Instantaneous (flash) or solar water heaters; • Automatic on and off water faucets; • Water-efficient appliances; • Low-flow fittings, fixtures and equipment; 	<p>Land Development Division/Public Works</p> <p><u>Building and Safety Division</u></p> <p><u>Planning Division</u></p>	Once	Prior to issuance of any building permits.	Review and Approval building plans		Withhold building permit.

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<ul style="list-style-type: none"> • Use of high-efficiency toilets (1.28 gallons per flush [gpf] or less); • Use of waterless or very low water use urinals (0.0 gpf to 0.25 gpf); • Use of self-closing valves for drinking fountains; • Infrared sensors on drinking fountains, sinks, toilets and urinals; • Low-flow showerheads; • Water-efficient ice machines, dishwashers, clothes washers, and other water-using appliances; • Cooling tower recirculating system where applicable; • Provide information to the public in conspicuous places regarding indoor water conservation; and • Use of reclaimed water for wash down if it becomes available. 						
<p>4.16.1.6.1C Prior to approval of a precise grading permit for each plot plan, irrigation plans shall be submitted to and approved by the City demonstrating that the development will have separate irrigation lines for recycled water. All irrigation systems shall be designed so that they will function properly with recycled water if it becomes available. This measure shall be implemented to the satisfaction of the City Planning Division and Land Development Division/Public Works.</p>	City Planning Division, Land Development Division/Public Works	Once	<u>Prior to issuance of precise grading permits.</u>	Review and Approval irrigation plans		Withhold <u>precise</u> grading permit.
<p>4.16.1.6.2A Each Plot Plan application for development shall include a concept grading and drainage plan, with supporting engineering calculations. The plans shall be designed such that the existing sediment carrying capacity of the drainage courses exiting the project area is similar to the existing condition. The runoff leaving the project site shall be comparable to the sheet flow of the existing condition to maintain the sediment carrying capacity and amount of available sediment for transport so that no increased erosion will occur downstream. This measure shall be implemented to the satisfaction of the City Land Development Division/Public Works.</p>	Land Development Division/Public Works	Once Concurrent with Plot Plan review and approval.	Prior to issuance of grading permit.	Review and Approval of Grading and Drainage Plans		Withhold <u>Grading Permit-Plot Plan Approval</u>
<p>4.16.4.6.1A Each application for a building permit shall include energy calculations to demonstrate compliance with the California Energy Efficiency Standards confirming that each new structure meets applicable Building and Energy Efficiency</p>	City Building and Safety Division and	Once prior to issuance of building permit. Once	Prior to issuance of building permit.	Review of construction documents and onsite inspection		Withhold Building Permit. Or withhold Occupancy Permit

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Standards. The plans shall also ensure that buildings are in conformance with the State Energy Conservation Efficiency Standards for Nonresidential buildings (Title 24, Part 6, Article 2, California Administrative Code). This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions. Plans shall show the following: Energy efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. Cool pavement materials such as lighter colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right of way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. Energy efficient appliances that achieve the 2008 Appliance Energy Efficiency Standards (e.g., EnergyStar Appliances) and use of sunlight filtering window coatings or double paned windows.	Planning Division	during on-site inspection				
4.16.4.6.1B Prior to the issuance of any building permits within the World Logistics Center Specific Plan, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards to the Building and Safety and Planning Divisions that shows each new structure meets the applicable Building and Energy Efficiency Standards. Plans may include but are not necessarily limited to implementing the following as appropriate: <ul style="list-style-type: none"> • High efficiency air conditioning with electronic management system (computer) control. • Variable Air Volume air distribution. • Outside air (100 percent) economizer cycle. • Staged compressors or variable speed drives to flow varying thermal loads. • Isolated High efficiency air conditioning zone control by floors/separable activity areas. • Specification of premium efficiency electric motors (i.e., compressor motors, air handling units, and fan coil units). • Use of occupancy sensors in appropriate spaces. 	City Building and Safety Division and Planning Division	Once prior to issuance of building permit.	Prior to issuance of building permit.	Review of construction documents and onsite inspection		Withhold Building Permit.

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<ul style="list-style-type: none"> ● Use of compact fluorescent lamps in place of incandescent lamps. ● Use of cold cathode fluorescent lamps. ● Use of Energy Star exit lighting or exit signage. ● Use of T 8 lamps and electronic ballasts where applications of standard fluorescent fixtures are identified. ● Use of lighting power controllers in association with metal halide or high pressure sodium (high intensity discharge) lamps for outdoor lighting and parking lots. ● Use of skylights (may conflict with installation of solar panels in some instances). ● Consideration of thermal energy storage air conditioning for spaces or hotel buildings, meeting facilities, theaters, or other intermittent use spaces or facilities that may require air conditioning during summer, day peak periods. 						
<p>4.16.4.6.1C Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p> <ol style="list-style-type: none"> 1) Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building; 2) Increase efficiency for buildings by implementing either 10 percent over the 2008 Title 24's energy saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is stricter; and 3) Require the equivalent of "Leadership in Energy and Environmental Design Certified" for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval. <p>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</p>	Building and Safety Division and Planning Division	Once before issuance of building permit.	Prior to the issuance of any building permits	Submittal of energy calculations that show compliance with the California Energy Efficiency Standards		Withhold Building Permit
4.17 Energy (New Section)						
Refer to mitigation measures in Air Quality and GHG.						

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

Attachment B

Revisions Since May 14, 2020

Planning Commission Hearing

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)



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4.1 AESTHETICS						
4.1.6.1A Each Plot Plan application for development along the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing or planned residential zoned uses) shall include a minimum 250-foot setback measured from the City/County zoning boundary line and any building or truck parking/access area within the project. The setback area shall include landscaping, berms, and walls to provide visual screening between the new development and existing residential areas upon maturity of the landscaping materials. The existing olive trees along Redlands Blvd. shall remain in place as long as practical to help screen views of the project site. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before permitting	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1B Each Plot Plan application for development adjacent to Redlands Boulevard, Bay Avenue, or Merwin Street, shall include a plot plan, landscaping plan, and visual rendering(s) illustrating the appearance of the proposed development. The renderings shall demonstrate that views of proposed buildings and trucks can be reasonably screened from view from existing residents upon maturity of planned landscaping and to ensure consistency with the General Plan Objective 7.7. "Effective" screening shall mean that no more than the upper quarter (25%) of a building is visible from existing residences, which shall be achieved through a combination of landscaping, berms, fencing, etc. The location and number of view presentations shall be at the discretion of the Planning Division.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before issuance of certificate of occupancy	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
			Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1C Prior to the issuance of a certificate of occupancy for buildings adjacent to the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing residences at the time of application) the screening required in Mitigation Measure 4.1.6.1A shall be installed in substantial conformance with the approved plans to the satisfaction of the Planning Official.	City Planning Division	Once before issuance of certificate of occupancy.	Prior to issuance of certificate of occupancy.	Review and Approval of Site Plans		Withhold Certificate of Occupancy

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4.1.6.1D Prior to the issuance of permits for any development activity adjacent to Planning Area 30 (74.3 acres in the southwest portion of the Specific plan), the entirety of Planning Area 30 shall be offered to the State of California for open space purposes. In the event that the State does not accept the dedication, the property shall be offered to Western Riverside County Regional Conservation Authority or an established non-profit land conservancy for open space purposes. In the event that none of these organizations accept the dedication, the property may be dedicated to a property owner’s association or may remain in private ownership and may be fenced and access prohibited.	City Planning Division	Once before permitting of any development activity adjacent to Planning Area 30.	Prior to issuance before of any discretionary permit.	Review and Approval of Site Plans.		Withhold Discretionary Permit
4.1.6.3A Each Plot Plan application for development shall include plans and visual rendering(s) illustrating any changes in views of Mount Russell and/or the Badlands, for travelers along SR-60, as determined necessary by the Planning Official. The plans and renderings shall illustrate typical views based on proposed project plans, with the location and number of view presentations to be determined by the Planning Official. These views shall be simulated from a height of six feet from the edge of the roadway travel lane closest to the visual resource. The renderings must demonstrate that the development will preserve at least the upper two thirds (67%) of the vertical view of Mt. Russell from SR-60.	City Planning Division	Once before plot plan review	Prior to issuance of building permit.	Review and Approval of Renderings		Withhold Plot Plan Approval
4.1.6.4A Each Plot Plan application for development adjacent to residential development shall include a photometric plot of all proposed exterior lighting demonstrating that the project is consistent with the requirements of Section 9.08.100 of the City Municipal Code. The lighting study shall indicate the expected increase in light levels at the property lines of adjacent residential uses. The study shall demonstrate that the proposed lighting fixtures and/or visual screening meet or exceed City standards regarding light impacts.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Lighting Study		Withhold Building Permit Approval
4.1.6.4B Each Plot Plan application for development shall include an analysis of all proposed solar panels demonstrating that glare from panels will not negatively affect adjacent residential uses or negatively affect motorists along perimeter roadways. Design	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Plot Plan		Withhold Plot Plan Approval

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details to meet these requirements shall be implemented to the satisfaction of the Planning Official.						
4.2 AGRICULTURE						
6.2.1 (Cumulative Impacts) Prior to the issuance of any grading permit affecting land designated as “Farmland of Local importance” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Farmland of Local Significance” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.	City Planning Division	Once before issuance of grading permits on lands that contain farmland of local importance	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit
4.3 Air Quality						
4.3.6.2A Construction equipment maintenance records (including the emission control tier of the equipment) shall be kept on-site during construction and shall be available for inspection by the City of Moreno Valley. a) Off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 off-road emissions standards. A copy of each unit’s certified tier specification shall be available for inspection by the City at the time of mobilization of each applicable unit of equipment. b) During all construction activities, off-road diesel-powered equipment may be in the “on” position not more than 10 hours per day.	Land Development Division and Building and Safety Division	As needed during construction	During construction	On-site Inspection of construction maintenance records and data sheets.		Issuance of Stop Work Order

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<ul style="list-style-type: none"> c) Construction equipment shall be properly maintained according to manufacturer specifications. d) All diesel-powered construction equipment, delivery vehicles, and delivery trucks shall be turned off when not in use. On-site idling shall be limited to three minutes in any one hour. e) Electrical hook ups to the power grid shall be provided for electric construction tools including saws, drills and compressors, where feasible, to reduce the need for diesel-powered electric generators. Where feasible and available, electric tools shall be used. f) The project shall demonstrate compliance with South Coast Air Quality Management District Rule 403 concerning fugitive dust and provide appropriate documentation to the City of Moreno Valley. g) All construction contractors shall be provided information on the South Coast Air Quality Management District Surplus Off-road Opt-In "SOON" funds which provides funds to accelerate cleanup of off-road diesel vehicles. h) Construction on-road haul trucks shall be model year 2010 or newer if diesel-fueled. i) Information on ridesharing programs shall be made available to construction employees. j) During construction, lunch options shall be provided onsite. k) A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints per AQMD Standards. l) Off-site construction shall be limited to the hours between 6 a.m. to 8 p.m. on weekdays only. Construction during City holidays shall not be permitted. 						
<p>4.3.6.2B Prior to issuance of any grading permits, a traffic control plan shall be submitted to and approved by the City of Moreno Valley that describes in detail the location of equipment staging areas, stockpiling/storage areas, construction parking areas, safe detours around the project construction site, as well as provide temporary traffic control (e.g., flag person) during construction-related truck hauling activities. Construction trucks shall be</p>	Transportation Division	Once prior to issuance of grading permits	Prior to issuance of any grading permits	Review and Approval of Traffic Control Plan.		Withhold Grading Permit

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rerouted away from sensitive receptor areas. Trucks shall use State Route 60 using World Logistics Center Parkway (formerly Theodore Street), Redlands Boulevard (north of Eucalyptus Avenue), and Gilman Springs Road. In addition to its traffic safety purpose, the Construction Staging Plan can minimize traffic congestion and delays that increase idling emissions. A copy of the approved Traffic Control Plan shall be retained on site in the construction trailer.						
<p>4.3.6.2C The following measures shall be applied during construction of the project to reduce volatile organic compounds (VOC):</p> <ul style="list-style-type: none"> a) Non-VOC containing paints, sealants, adhesives, solvents, asphalt primer, and architectural coatings (where used), or pre-fabricated architectural panels shall be used in the construction of the project to the maximum extent practicable. If such products are not commercially available, products with a VOC content of 100 grams per Liter or lower for both interior and exterior surfaces shall be used. b) Leftover paint shall be taken to a designated hazardous waste center. c) Paint containers shall be closed when not in use. d) Low VOC cleaning solvents shall be used to clean paint application equipment. e) Paint and solvent-laden rags shall be kept in sealed containers. 	Land Development, Building and Safety Division and Planning Division	Throughout construction	During Construction	On-site inspection		Issuance of a Stop Work Order
4.3.6.2D No grading shall occur on days with an Air Quality Index forecast greater than 150 for particulates or ozone as forecasted for the project area (Source Receptor Area 24).	City Land Development Division/Public Works	As needed during construction	During construction	Review of Construction Documentation and On-site Inspection		Issuance of a Stop Work Order
4.3.6.2E The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.3A Prior to issuance of occupancy permits for each warehouse building within the WLCSP, the developer shall	City Planning Division	Once Before	Prior to issuance or occupancy	Review and Approval of building		Withhold Occupancy Permit

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demonstrate to the City that vehicles can access the building using paved roads and parking lots and that access on unpaved roads is prohibited.		issuing Certificate of Occupancy	permits for each warehouse	plans.		
<p>4.3.6.3B The following shall be implemented as indicated:</p> <p>Prior to Issuance of a Certificate of Occupancy</p> <p>a) Signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations and the prohibition of parking in residential areas.</p> <p>b) Signs shall be prominently displayed in all dock and delivery areas advising of the following: engines shall be turned off when not in use; trucks shall not idle for more than three consecutive minutes; telephone numbers of the building facilities manager and the California Air Resources Board to report air quality violations.</p> <p>c) Signs shall be installed at each exit driveway providing directional information to the City’s truck route. Text on the sign shall read “To Truck Route” with a directional arrow. Truck routes shall be clearly marked per the City Municipal Code.</p> <p>On an Ongoing Basis</p> <p>d) Tenants shall maintain records on fleet equipment and vehicle engine maintenance to ensure that equipment and vehicles are maintained pursuant to manufacturer’s specifications. The records shall be maintained on site and be made available for inspection by the City.</p> <p>e) Tenant’s staff in charge of keeping vehicle records shall be trained/certified in diesel technologies, by attending California Air Resources Board approved courses (such as the free, one-day Course #512). Documentation of said training shall be maintained on-site and be available for inspection by the City.</p> <p>f) Tenants shall be encouraged to become a SmartWay Partner.</p> <p>g) Tenants shall be encouraged to utilize SmartWay 1.0 or greater carriers.</p> <p>h) Tenants’ fleets shall be in compliance with all current air</p>	<p>City Planning Division and Building and Safety</p> <p>Public Works Inspector</p>	<p>Once before issuance of any certificate of Occupancy and ongoing basis</p> <p>On an ongoing basis</p>	<p>Prior to issuance of Certificate of Occupancy</p> <p>During on-site inspections</p>	<p>On-site inspections</p> <p>Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals,</p> <p>On-site Inspections</p> <p>Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals</p>		<p>Withhold Certificate of Occupancy</p> <p>Pursuant to City Municipal Code</p>

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<p>quality regulations for on-road trucks including but not limited to California Air Resources Board’s Heavy-Duty Greenhouse Gas Regulation and Truck and Bus Regulation.</p> <ul style="list-style-type: none"> i) Information shall be posted in a prominent location available to truck drivers regarding alternative fueling technologies and the availability of such fuels in the immediate area of the World Logistics Center. j) Tenants shall be encouraged to apply for incentive funding (such as the Voucher Incentive Program [VIP], Carl Moyer, etc.) to upgrade their fleet. k) All yard trucks (yard dogs/yard goats/yard jockeys/yard hostlers), landscaping equipment, and industrial sweepers shall be powered by electricity, natural gas, propane, or an equivalent non-diesel fuel. Any off-road engines in the yard trucks and landscaping equipment shall have emissions standards equal to Tier 4 Interim or greater. Any on-road engines in the yard trucks shall have emissions standards that meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025. l) All diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025 or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time. m) All standby emergency generators shall be fueled by natural gas, propane, or any non-diesel fuel. n) Truck and vehicle idling shall be limited to three (3) minutes. o) For each building, the developer shall provide ten electrical outlets for the use of electric auxiliary power units (APUs) to be located at the dock doors near the shipping offices, or an alternate location with access to electrical outlets. p) All industrial sweepers shall be equipped with High-efficiency particulate air (HEPA) filters. 						

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4.3.6.3C Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a publicly-accessible fueling station shall be operational within the Specific Plan area offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public. Any fueling station shall be placed a minimum of 1000 feet from any off-site sensitive receptors or offsite zoned sensitive uses. This facility may be established in connection with the convenience store required in Mitigation Measure 4.3.6.3D.	City Building and Safety	Once before issuance of building permits	Prior to issuance of building permits for more than 25 million total square feet of logistics warehousing within the WLC Specific Plan	Review and approval of building plans		Withhold building permit
4.3.6.3D Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a site shall be operational within the Specific Plan area offering food and convenience items for purchase by the motoring public. This facility may be established in connection with the fueling station required in Mitigation Measure 4.3.6.3C.	City Building and Safety	Before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold building permit
4.3.6.3E Refrigerated warehouse space is prohibited unless it can be demonstrated that the environmental impacts resulting from the inclusion of refrigerated space and its associated facilities, including, but not limited to, refrigeration units in vehicles serving the logistics warehouse, do not exceed any environmental impact for the entire World Logistics Center identified in the program Environmental Impact Report. Such environmental analysis shall be provided with any warehouse plot plan proposing refrigerated space. Any such proposal shall include electrical hookups at dock doors to provide power for vehicles equipped with Transportation Refrigeration Units (TRUs).	City Planning Division	Once before plot plan review for any building.	Prior to issuance of any building permit	Review and approval of building plans		Withhold building permit
4.3.6.3F The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	SCAQMD	Per ISR Rule	Ongoing	Per ISR Rule		Per ISR Rule and SCAQMD Settlement Agreement
4.3.6.4A The following measures shall be incorporated as conditions to any Plot Plan approval within the Specific Plan: a) All tenants shall be required to participate in Riverside County's Rideshare Program.	City Building and Safety, City Planning Division, and Transportation	Once before plot plan approval for any building.	Prior to plot plan approval	Review and approval of plot plans		Withhold plot plan approval

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<p>b) Storage lockers shall be provided in each building for a minimum of three percent of the full-time equivalent employees based on a ratio of 0.50 employees per 1,000 square feet of building area. Lockers shall be located in proximity to required bicycle storage facilities.</p> <p>c) Class II bike lanes shall be incorporated into the design for all project streets.</p> <p>d) The project shall incorporate pedestrian pathways between on-site uses.</p> <p>e) Site design and building placement shall provide pedestrian connections between internal and external facilities.</p> <p>f) The project shall provide pedestrian connections to residential uses within 0.25 mile from the project site.</p> <p>g) A minimum of two electric vehicle-charging stations for automobiles or light-duty trucks shall be provided at each building. In addition, parking facilities with 200 parking spaces or more shall be designed and constructed so that at least six percent of the total parking spaces are capable of supporting future electric vehicle supply equipment (EVSE) charging locations. Sizing of conduit and service capacity at the time of construction shall be sufficient to install Level 2 Electric Vehicle Supply Equipment (EVSE) or greater.</p> <p>h) Each building shall provide indoor and/or outdoor - bicycle storage space consistent with the City Municipal Code and the California Green Building Standards Code. Each building shall provide a minimum of two shower and changing facilities for employees.</p> <p>i) Each building shall provide preferred and designated parking for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles equivalent to the number identified in California Green Building Standards Code Section 5.106.5.2 or the Moreno Valley Municipal Code whichever requires the higher number of carpool/vanpool stalls.</p> <p>j) The following information shall be provided to tenants: onsite electric vehicle charging locations and instructions, bicycle parking, shower facilities, transit availability and the</p>	<p>Engineering Division/Public Works</p>					

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schedules, telecommunicating benefits, alternative work schedule benefits, and energy efficiency.						
<p>4.3.6.5A</p> <p>(a) The house at 30220 Dracaea Avenue shall be demolished prior to the issuance of the first grading permit for grading within the World Logistics Center.</p> <p>(b) An air filtration system meeting ASHRSE Standard 52.2 MERV-13 standards shall be offered to the owners of the houses located at 13100 World Logistics Center Parkway (formerly Theodore Street) and 12400 World Logistics Center Parkway (formerly Theodore Street). The developer shall offer to install the air filtration system to the owners of the two properties within two months of the certification of the Final Revised FEIR. Prior to the issuance of the first grading permit within the World Logistics Center, documentation shall be provided to the City confirming that an offer to install the air filtration system has been extended to the owners of each of the two properties. The owners of the two properties shall be under no obligation to accept the offer. Each property owner shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, the developer shall work with each owner to ensure the air filtration system is properly installed within one year of acceptance.</p>	<p>City Building and Safety, City Planning Division</p> <p>City Building and Safety, City Planning Division</p>	<p>Once prior to issuance of first grading permit within the WLC.</p> <p>Prior to issuance of the first grading permit within the WLC.</p>	<p>Prior to issuance of the first grading permit.</p> <p>Initial offer within two months of certifying the Final RSFEIR.</p> <p>Documentation provided prior to issuance of the first grading permit.</p>	<p>Site inspection.</p> <p>Review of documentation.</p>		<p>Withhold grading permits.</p>
4.4 BIOLOGICAL RESOURCES						
<p>4.4.5.2A (Previously included as 4.4.6.2A in the 2015 FEIR) Each Plot Plan application shall include a focused plant survey of the proposed development site prepared by a qualified biologist to identify if any of the following sensitive plants (i.e., Coulter’s goldfields, smooth tarplant, Plummer’s mariposa lily, or thread-leaved brodiaea) are present. If any of the listed plants are found, <u>the City will consult with the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS). If translocation of the species is deemed appropriate by CDFW and/or USFWS a translocation plan shall be developed and submitted to CDFW and USFWS for review.</u> They may be relocated to the 250-foot setback area outlined in the Specific</p>	<p>City Planning Division</p>	<p>Once upon submittal of plot plan application</p>	<p>Prior to approval of Plot Plan</p>	<p>Review and Approval of biological assessment</p>		<p>Withhold Approval of Plot Plan</p>

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Plan and discussed in Mitigation Measure 4.4.6.1A. Alternatively, at the applicant’s discretion, an impact fee may be paid to the Western Riverside County Regional Conservation Authority (RCA) or other appropriate conservation organizations to offset for the loss of these species. This measure shall be implemented to the satisfaction of the Planning Official.						
4.4.5.2B (Previously included as 4.4.6.2B in the 2015 FEIR) Prior to the approval of any tentative maps for development including or adjacent to any Criteria Cells identified in the Western Riverside County Multiple Species Habitat Conservation Plan, the applicant shall prepare and process a Joint Project Review (JPR) with the Riverside County Resource <u>Regional Conservation Agency Authority</u> (RCA). All criteria cells shall be identified on all such tentative maps. This measure shall be implemented to the satisfaction of the City Planning Division and Riverside County Resource <u>Regional Conservation Agency Authority</u> (“RCA”).	City Planning Division, Riverside County RCA	Once upon submittal of tentative maps.	Prior to issuance of any tentative maps including or adjacent to MHSCP criteria cells.	Review JPR		Withhold approval of tentative maps
<p>4.4.6.1A All Plot Plan applications within Planning Areas 10 and 12 (i.e., adjacent to the San Jacinto Wildlife Area as shown in Final EIR Volume 2 Figure 4.1.6B) shall provide a 250-foot setback from the southerly property line. Permitted uses within this setback area include landscaping, drainage and water quality facilities, fences and walls, utilities and utility structures, maintenance access drives, and similar related uses. No logistics buildings or truck access/parking/maneuvering facilities are permitted in this setback area.</p> <p>In addition, logistics buildings within Planning Areas 10 and 12 may not be located within 400 feet of the southerly property line. All development proposals in Planning Areas 10 and 12 shall include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area. This fence/barrier shall have metal mesh installed below and above ground level to prevent animals from moving between the development area and the setback area.</p> <p>Within Planning Areas 10 and 12, all truck activity areas adjacent to the 250-foot setback area along the southern property line shall be enclosed by minimum 11-foot tall solid walls to reduce</p>	City Planning Division	Once before plot plan approval	Prior to plot plan approval	Plan check and review of setback area		Withhold Plot Plan approval.
	City Planning Division	Once before issuance of building permits and as needed during construction and operating	Prior to issuance of building permits	Plot plan/grading plan review.		Withhold grading permit and plot plan approval.
	City Land Development		Prior to issuance of grading permits.	Plot plan/grading plan review.		

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<p>(replacement riparian habitat to impacted riparian habitat) to ensure no net loss of riparian habitat or aquatic resources. It should be noted that this is a minimum recommended ratio but the actual permitting ratio may be higher. These detention basins shall be oversized to accommodate the provision of areas of riparian habitat. Maintenance of the basins shall be limited to that necessary to ensure their drainage and water quality functions while encouraging habitat growth. Riparian habitat mitigation shall be provided concurrent to or prior to impacts. A Compensatory Mitigation Plan shall be prepared for all unavoidable impacts and shall be consistent with the United States Army Corps of Engineers (USACE) / United States Environmental Protection Agency's Compensatory Mitigation for Losses of Aquatic Resources: Final Rule and the United States Army Corps of Engineers Standard Operating Procedure for Determination of Mitigation Ratios.</p> <p>The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board to establish the need for permits based on the results of a recent jurisdictional delineation and final design plans for each of the proposed facilities. Consultation with the three agencies shall take place and appropriate permits obtained for project-level development. Compensation for losses associated with the altering of drainages on site shall be in agreement with the permit conditions and in coordination with compensation outlined below.</p> <p>Mitigation shall consist of onsite creation, offsite creation, or purchase of mitigation credits from an approved mitigation bank. As outlined in the WLC programmatic DBESP report, onsite riparian habitat shall be created at a minimum 1: 1 ratio due to the poor quality of onsite habitat. New habitat shall be created within the onsite detention/infiltration basins to the extent allowed by the resource agencies to reduce storm flows, improve water quality, and reduce sediment transport. Habitat creation shall include the installation of mule fat scrub or similar riparian scrub habitat to promote higher quality riparian habitat, but still maintain the basins for their primary role as detention facilities.</p>						

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<p>The use of these areas as conservation areas would require consent from CDFW and the City of Moreno Valley (MM B10-2b and MM DBESP 1 through 3).</p>						
<p>4.4.6.2B (Previously included as 4.4.6.3B in the 2015 FEIR) As required by the Resource—Regional Conservation Agency Authority (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the Resource—Regional Conservation Agency Authority prior to project grading permit approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.</p> <p>If impacts to riparian habitat within the WLC site cannot be avoided at the time of specific development, then a separate project level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.2A.</p> <p>A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations. Mitigation required for compensation for impacts to riparian/riverine areas shall require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.</p>	<p>City Planning Division</p>	<p>Once upon submittal of grading permit</p>	<p>Prior to the approval of any grading permit</p>	<p>Review and approval of site-specific DBESP and review and approval of plot plans.</p>		<p>Withhold grading permit approval.</p>

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As outlined in the WLC programmatic DBESP, erosion control improvements shall be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat shall be enhanced within this drain following the installation of the erosion control improvements (MM DBESP 4 and 5).						
<p>4.4.6.2C (Previously included as 4.4.6.3C in the 2015 FEIR) Prior to issuance of any grading permit for any offsite improvements that support development within the WLC site, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE), <u>Regional Water Quality Control Board</u>, and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements <u>are deemed by the regulatory agencies to not require regulatory permits/agreements, a written copy of this determination shall be submitted to the City, will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required. The Applicant shall consult with</u> However, permitting through the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) <u>may still be required for these improvements. The applicant shall consult with and</u> United States Army Corps of Engineers, <u>California Department of Fish and Wildlife and Regional Water Quality Control Board</u> to establish the need for permits based on the results of the <u>current stream mapping 2012 jurisdictional delineation</u> and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions with a minimum 1:1 mitigation ratio. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure</p>	City Planning Division	Once before issuance of grading permit	Prior to issuance of grading permit	Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.		Withhold Grading Permit

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shall be implemented to the satisfaction of the City Planning Division in consultation with the <u>Regional Water Quality Control Board</u> , U.S. Fish and Wildlife Service , U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife.						
<p>4.4.6.3A (Previously included as 4.4.6.4A in the 2015 FEIR) Pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC), site preparation activities (removal of trees and vegetation) shall be avoided during the nesting season of potentially occurring native and migratory bird species (generally February 1 to August 31). If site preparation activities must occur during the nesting season, a pre-activity field survey shall be conducted by a qualified biologist prior to issuance of grading permits for such development. The survey shall determine if active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code are present in the construction zone. If active nests of these species are found, the applicant shall establish an appropriate buffer zone with no grading or heavy equipment activity within of 500 feet from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed) 250 feet from passerine birds, or 100 feet for sensitive or protected songbird nests. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the setback area at the discretion of the biological monitor in consultation with CDFW. In the event no special status avian species are identified within the limits of disturbance, no further mitigation is required. In the event such species are identified within the limits of ground disturbance, mitigation measure 4.4.6.3B shall also apply. This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Once before issuance of grading permit	One week prior to issuance of grading permit	<p>If grading activities will take place within nesting season provide written evidence a qualified biologist has been retained by the applicant to conduct an onsite nesting survey prior to grading.</p> <p>If nesting birds are present, biologist will establish a construction buffer zone of a minimum from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed), or 100 feet for sensitive or protected songbird nests</p>		Withhold Grading Permit
	City Planning Division	Onsite Inspection	One week prior to issuance of grading permit			Issuance of a stop Work Order
<p>4.4.6.3B (Previously included as 4.4.6.4B in the 2015 FEIR) If it is determined that project-related grading or construction will affect nesting migratory bird species, no grading or heavy equipment activity shall take place within the limits established in Mitigation Measure 4.4.6.3A until it has been determined by a qualified biologist that the nest/burrow is no longer active, and</p>	City Planning Division	Once Before Construction and onsite inspection	Prior to disturbance of site	Onsite inspection		Issuance of a Stop Work Order

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all juveniles have fledged the nest/burrow. This measure shall be implemented to the satisfaction of the City Planning Division.						
4.4.6.3C (Previously included as 4.4.6.4C in the 2015 FEIR) The loss of foraging habitat for golden eagle and white-tailed kite will be mitigated by payment of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) fee and the creation of a landscaped setback area adjacent to the SJWA property. First, the payment of the Western Riverside County Multiple Species Habitat Conservation Plan fee shall be required on a project-by-project basis. Second, a 250-foot setback as described in Mitigation Measure 4.4.6.1A shall be established within the WLC site. This area will reduce impacts to raptor species foraging in the adjacent San Jacinto Wildlife Area open space areas.	City Planning Division	Once before issuance of grading permits	Prior to disturbance of site	Written verification of payment of MSHCP fees		Withhold Grading Permit
<p>4.4.6.3D (Previously included as 4.4.6.4D in the 2015 FEIR) A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the WLC site.</p> <p>In the event no burrowing owls are observed within the limits of ground disturbance. no further mitigation is required.</p> <p>If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a 500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged to the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.</p> <p>If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but owls are not nesting or in the process of</p>	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits	Review of pre-construction survey for burrowing owls		Withhold Grading Permits
	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	If construction takes place between Feb 1 – Aug 31 and nesting burrowing owl is present, a 500 ft. construction buffer shall be maintained from the nest until all juveniles have fledged.		Issuance of a Stop Work Order
	City Planning Division	Onsite inspection once 30-days prior to	Prior to issuance of any grading permits and during construction	If construction takes place between Sept 1- Jan 31 and burrowing owl outside the nesting		Issuance of a Stop Work Order

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<p>nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the Western Riverside County Regional Conservation Authority (RCA). A relocation plan may will be required by California Department of Fish and Wildlife CDFW, the USFWS, and the RCA if active and/or passive relocation is necessary. The relocation plan shall outline the basic process and provides options for avoidance and mitigation, identify short- and long-term habitat management needs of the receiver site, and identify the entity responsible for all financial costs associated with the relocation plan and long-term management of the receiver site. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.</p> <p>A relocation plan will may be required by California Department of Fish and Wildlife if active or passive relocation is necessary. Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated <u>following consultation with the CDFW, the USFWS, and RCA, to habitat deemed suitable by CDFW, the USFWS, and RCA (which may include to the SJWA, the 250-foot setback area or other suitable on-site or off-site areas).</u> Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor, <u>following consultation with CDFW, the USFWS, and RCA.</u></p>	City Planning Division	<p>construction/grading</p> <p>Onsite inspection once 30-days prior to construction/grading</p>	Prior to issuance of any grading permits and during construction	<p>season present, a passive relocation plan shall be prepared by a qualified biologist and approved by the City.</p> <p>Written verification a relocation plan has approved by the California Department of Fish and Wildfire.</p>		Issuance of a Stop Work Order
<p>4.4.6.3E (Previously included as 4.4.6.4E in the 2015 FEIR) Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to <u>CDFW and the USFWS for review prior to submission to</u> the City. If the affected drainage is not occupied,</p>	City Planning Division	Once prior to plot plan approval for development of land including or	Prior to plot plan approval	Submittal of a LAPM protocol survey report to the City.		Withhold Plot Plan Approval

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<p>the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the WLC site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to <u>locations pre-approved by CDFW and the USFWS (which may include to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas).</u> as determined by the United States Fish and Wildlife Service. All costs associated with the relocation, as well as short- and long-term management and monitoring of the receiver site shall be the responsibility of the Project Applicant. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division <u>following coordination with CDFW and the USFWS.</u></p>		adjacent to Drainage 9				
<p>4.4.6.3F (Previously included as 4.4.6.4F in the 2015 FEIR) Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan shall identify frequent and infrequent vegetation management requirements (i.e., removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological Resource Management Plan shall also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.5.2A, 4.4.6.3D, and 4.4.6.3E.</p> <p>The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with <u>California Department of Fish and Wildlife</u>the San Jacinto Wildlife Area Manager. The Biological Resource Management Plan shall cover</p>	City Planning Official	Once before approval of any discretionary permits within Planning Areas 10 & 12 Onsite inspection	Prior to approval of any discretionary permits within planning Areas 10 & 12	Review and approval of a BRMP		Withhold Discretionary Permit

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all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist to the satisfaction of the City Planning Division.						
<p>4.4.6.3G (Previously included as 4.4.6.4G in the 2015 FEIR) Mitigation Measure 4.4.6.1A specifies that a landscape plan shall be submitted with any development proposal for lots adjacent to the San Jacinto Wildlife Area (SJWA) property prior to issuance of a precise grading permit. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the Specific Plan. No plant species listed in Section 6.1.4 or Table 6.2 of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) shall be installed within the setback area. In conjunction with development adjacent to the San Jacinto Wildlife Area (SJWA), cottonwood trees shall be planted within the 250-foot setback area, consistent with the World Logistics Center Specific Plan plant palette (per DBESP MM 8).</p> <p>During construction, the runoff leaving construction areas shall be directed to onsite detention basins and away from downstream drainage features located offsite. All projects within the WLC site shall be required to prepare a Storm Water Pollution Prevention Plan (as outlined in MM 4.9.6.2B). Regarding the 250-foot setback area, pedestrian and vehicular access to areas of riparian/riverine habitat shall be prohibited except for controlled maintenance access. Finally, no grading shall be permitted within conserved riparian/riverine habitat areas except for grading necessary to establish or enhance habitat areas (DBESP MM 6, 7, 9, and 10)</p>	City Planning Division and Land Development Division Manager	Once before to issuance of a precise grading permit	Prior to issuance of a precise grading permit	Review and approval of landscape.		Withhold Grading Permit
<p>4.4.6.3H (Previously included as 4.4.6.4H in the 2015 FEIR) As outlined in Mitigation Measure 4.4.6.1A, development adjacent to the 250-foot open space setback shall have a six-foot chain link fence or similar barrier to help separate human activity and the setback area. Any chain link fencing installed on any properties adjacent to the 250-foot setback area shall have metal mesh</p>	City Planning Division	Once before building permits	Prior to issuance of certificate of occupancy	Review and approval of fencing		Withhold plot plan approval Withhold grading permits

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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installed below and above ground level to prevent animals from accessing new development areas.						
4.4.6.3I (Previously included as 4.4.6.4I in the 2015 FEIR) The individual property owner and/or Property Owners Association (POA) as appropriate shall be responsible for maintaining the various onsite landscaped areas, open improved or natural drainage channels, and detention or flood control basins in a manner that provide for fuel management and vector control pursuant to standards maintained by the City Fire Marshall and County Department of Environmental Health – Vector Control Group. This measure requires the individual owner or Property Owners Association (POA) to manage vegetation in and around these areas or improvements so as to not represent a fire hazard as defined by the City Fire Department through the substantial buildup of combustible materials. This measure also requires the individual owner or Property Owners Association to manage vegetation and standing water in drainage channels and basins such that they do not encourage or allow vectors to occur (primarily rats and mosquitoes). Runoff shall not be allowed to stand in channels or basins for more than 72hours without treatment or maintenance to prevent establishment of mosquitoes per published County vector control guidelines and “Best Management Practices for Mosquito Control on California State Properties” which is available from the California West Nile Virus website at http://www.westnile.ca.gov/resources . This measure shall be implemented by the Project Owners Association in consultation with City Fire Department and Riverside County Department of Environmental Health – Vector Control Group	City Fire Department; Land Development Division; and Stormwater Management Section of Public Works	As needed basis	Onsite Inspections during operations	Onsite Inspections		Issuance of Code Enforcement Citations
4.4.6.3J (Previously included as 4.4.6.4J in the 2015 FEIR) A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas <u>and/or San Jacinto Wildlife Area (SJWA) lands</u> . The Fuel Management Plan shall be prepared by the project applicant and submitted for approval to the prior to plot plan approval for those projects on the southern and	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan approval and Onsite Inspection		Withhold plot plan approval

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<p>eastern Western Riverside County Multiple Species Habitat Conservation Plan <u>and/or SJWA</u> boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:</p> <ul style="list-style-type: none"> • A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area. • A list of non-native invasive plants that are prohibit from installation. • Maintenance activities and a maintenance schedule. <p>Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas <u>and SJWA lands</u> are adequately protected from expected fire risks.</p>						
<p>4.4.6.3K (Previously included as 4.4.6.4K in the 2015 FEIR) Prior to approval of any plot plans for development adjacent to the SJWA, the applicant shall demonstrate that direct light rays have been contained within the development area, per requirements of the MSHCP Section 6.0 which states, "Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting." This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Prior to plot plan approval	Prior to plot plan approval	Review and Approval of plot plan and Onsite Inspection		Withhold Plot Plan Approval

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4.5 CULTURAL RESOURCES						
<p>4.5.6.1A Prior to the approval of any grading permit for any of the "Light Logistics" parcels, the parcels shall be evaluated for significance by a qualified archaeologist. A Phase 1 Cultural Resources Assessment shall be conducted by the project archaeologist and an appropriate tribal representative(s) on each of the "Light Logistics" parcel to determine if significant archaeological or historical resources are present.</p> <p>A Phase 2 significance evaluation shall be completed for any of these sites in order to determine if they contain significant archaeological or historical resources. Cultural resources include but are not limited to stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. All resources determined to be prehistoric or historic shall be documented using DPR523 forms for archival research/storage in the Eastern Information Center (EIC). If the particular resource is determined to be not significant, no further documentation is required. If prehistoric resources are determined to be significant, they shall be considered for relocation or archival documentation. If any resource is determined to be significant, a Phase 3 recovery study shall be conducted to recover remaining significant cultural artifacts. If prehistoric archaeological/cultural resources are discovered during the Phase 1 survey and it is determined that they cannot be avoided through site design, they shall be subject to a Phase 2 testing program. The project archaeologist in consultation with appropriate tribal group(s) shall determine the significance of the resource(s) and determine the most appropriate disposition of the resource(s) in accordance with applicable laws, regulations and professional practices (per Cultural Report MM CR-1, MM CR-2, MM CR-7 Table 3, pg. 74).</p>	<p>Planning Division and Land Development Division/Public Works</p>	<p>Once Before Permitting</p>	<p>Prior to the approval of any grading permit for any of the "Light Logistics"</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p>		<p>Withhold grading permit approval</p> <p>Issue stop work order if cultural resources are found</p>

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<p>4.5.6.1B Prior to the issuance of any grading or ground-disturbing permit for construction of off-site improvements a qualified archaeologist shall be retained to prepare a Phase I cultural resource assessment (CRA) of the project site if an up to date Phase I cultural resource assessment is not available for the site at the time of development per Cultural Report MM CR-5, Table 3, pg. 74).</p> <p>Appropriate tribal representatives as identified by the City shall be invited by the Project Archeologist to participate in this assessment.</p> <p>If archaeological resources are discovered during construction activities, no further excavation or disturbance of the area where the resources were found shall occur until a qualified archaeologist evaluates the find. If the find is determined to be a unique archaeological resource, appropriate action shall be taken to (a) plan construction to avoid the archeological sites (the preferred alternative); (b) cap or cover archeological sites with a layer of soil before building on the affected project location; or (c) excavate the site to adequately recover the scientifically consequential information from and about the resource. At the discretion of the project archaeologist, work may continue on other parts of the project site while the unique archaeological resource mitigation takes place. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>If the project archaeologist, in consultation with the monitoring Tribe(s), determines that the find is a unique archaeological resource, the resource site shall be evaluated and recorded in accordance with requirements of the State Office of Historic Preservation (OHP). If the resource is determined to be significant, data shall be collected by the qualified archaeologist and the findings of the report shall be submitted to the City. If the find is determined to be not significant no mitigation is necessary.</p> <p>Should a future project-level analysis show that cultural resource site CA-RIV-3346 will be directly or partially impacted by project-level construction, an Addendum cultural resource report must be prepared and include an analysis of the alternatives associated with mitigation for impacts to this resource following CEQA Guidelines Section 15126.4(b)(3). This information must be</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits for off-site improvements and as Needed During Construction</p>	<p>Prior to the approval of any grading or ground-disturbing permit</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p> <p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>	<p>Withhold Grading Permit or Issuance of Stop Work Order</p>
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<p>included in any project-level CEQA compliance documentation. It should be noted that Phase 3 data recovery is an acceptable mitigation action under CEQA Guidelines Section 15126.4(b)(3)(C) (per Cultural Report MM CR-3, Table 3, pg. 74). Should it be determined through a future project-level EIR analysis that prehistoric cultural resource sites CA-RIV-2993 and/or CA-RIV-3347 shall be directly impacted by future construction, these sites must be Phase 2 tested for significance (per Cultural Report MM CR-4, Table 3, pg. 74).</p>						
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Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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<p>4.5.6.1C Prior to the issuance of any grading permits a qualified archaeologist shall be retained to monitor all grading and shall invite tribal groups to participate in the monitoring. Project-related archaeological monitoring shall include the following requirements per Cultural Report MM CR-6, MM CR-8, Table 3, pg.74):</p> <ol style="list-style-type: none"> 1. All earthmoving shall be monitored to a depth of ten (10) feet below grade by the Project Archaeologist or his/her designated representative. Once all areas of the development project that have been cut to ten (10) feet below existing grade have been inspected by the monitor. the Project Archaeologist may, at his or her discretion, terminate monitoring if and only if no buried cultural resources have been detected; 2. If buried cultural resources are detected, monitoring shall continue until 100 percent of virgin earth within the specific project area has been disturbed and inspected by the Project Archaeologist or his/her designated representative. 3. Grading shall cease in the area of a cultural artifact or potential cultural artifact as delineated by the Project Archaeologist or his/her designated representative. A buffer of at a minimum 25 feet around the cultural item shall be established to allow for assessment of the resource. Grading may continue in other areas of the site while the particular find are investigated; and 4. If prehistoric cultural resources are uncovered during grading, they shall be Phase 2 tested by the Project Archaeologist, and evaluated for significance in accordance with §15064.5(f) of the CEQA Guidelines. Appropriate actions for significant resources as determined by the Phase 2 testing include but are not limited to avoidance or capping, incorporation of the site in green space. parks, or delineation into open space. If such measures are not feasible, Phase 3 data recovery of the significant resource will be required, and curation of recovered artifacts and/or reburial, shall be required. A report associated 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of grading permits</p>	<p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit</p>
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<p>with Phase 2 testing or Phase 3 data recovery must be delivered to the City and, if necessary, the museum where any recovered artifacts have been curated.</p> <p>5. No further grading shall occur in the area of the discovery until the City approves specific actions to protect identified resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p> <p>6. The developer shall make reasonable efforts to avoid, minimize, or mitigate significant adverse impacts on cultural resources. The State Historic Preservation Office (SHPO) and local Native American tribes will be consulted and the Advisory Council on Historic Preservation will be notified within 48 hours of the find in compliance with 36 CFR 800.13(b)(3). This measure shall be implemented to the satisfaction of the Planning Official.</p>						
<p>4.5.6.1D Prior to the issuance of any grading permit the project archaeologist shall invite interested Tribal Group(s) representatives to monitor grading activities. Qualified representatives of the Tribal Group(s) shall be granted access to the project site to monitor grading as long as they provide 48-hour notice to the developer of their desire to monitor, so the developer can make appropriate safety arrangements on the site. This measure shall be implemented to the satisfaction of the Planning Official.</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to the issuance of any grading permit within 3,750 feet of the southwest corner</p>	<p>Evidence of invitation to Tribal Group Representatives</p>		<p>Withhold Grading Permit</p>
<p>4.5.6.1E It is possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources (archaeological or historical). In the event that buried cultural resources are discovered during grading and no Project Archaeologist or Historian is present, grading operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be retained to determine the most appropriate course of action regarding the resource. The Archeologist shall make recommendations to the City on the actions that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and</p>	<p>Grading Contractor, Land Development Division/Public Works, and Planning Division</p>	<p>As Needed During Construction</p>	<p>During Grading and/or ground disturbing activities</p>	<p>Verification to the City a qualified archaeologist been retained</p>		<p>Issuance a Stop Work Order</p>

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<p>evaluation of the finds in accordance with §15064.5 of the <i>CEQA Guidelines</i>. Cultural resources could consist of, but are not limited to, stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria. If the resources are determined to be unique historic resources as defined under §15064.5 of the <i>CEQA Guidelines</i>, appropriate protective actions for significant resources such as avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds shall be implemented by the project archaeologist and the City.</p> <p>No further grading shall occur in the area of the discovery until the City and Project Archaeologist approve the measures to address these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p>						
<p>4.5.6.2A If any historic resources are found during implementation of Mitigation Measure 4.5.6.1A, the Project Archaeologist or Historian (as appropriate) shall offer any artifacts or resources to the Moreno Valley Historical Society (MVHS) or the Eastern Information Center/County Museum or the Western Science Center in Hemet as appropriate for archival storage. From the time any artifacts are turned over to the Moreno Valley Historical Society or other appropriate historical group, the developer shall have no further responsibility for their management or maintenance.</p>	City Planning Division	As Needed During Construction	During grading	A qualified archaeologist or historian(s) shall be retained by the applicant. A report of findings shall be submitted to the City after the finalization of construction		Issuance of a Stop Work Order
<p>4.5.6.2B As part of construction of the trail segment connecting Redlands Boulevard to the California Department of Fish and Wildlife property, the developer shall contribute \$5,000 to the City for the installation of a historical marker acknowledging the passing of Juan Bautista de Anza through this area during his exploration of California. This measure shall be incorporated into trail plans for this segment which will be subject to review and approval by the City Park and Recreation Department in consultation with the Moreno Valley Historical Society.</p>	City Park and Recreation Department	Once	Prior to approval of trail plans	Review and Approval of Trail Plans Written verification the \$5,000 has been paid		Withhold Approval of Trail Plans

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<p>4.5.6.2C Streets C and E shall follow the historical alignment of Alessandro Boulevard and shall be named Alessandro Boulevard.</p>	<p>City Land Development/ Public Works City Park and Recreation Department</p>	<p>Once prior to issuance of plot plan</p>	<p>Prior to issuance of approval of plot plans for planning Areas along Alessandro boulevard</p>	<p>Review and Approval of Plot Plans</p>		<p>Withhold Plot Plan approval</p>
<p>4.5.6.3A Prior to the issuance of any grading permits, a City-approved Paleontologist shall be retained to conduct paleontological monitoring as needed for all grading related to development. Development monitoring shall include the following actions:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to exceed twenty (20) feet in depth, in areas where fossil-bearing formations are found during grading, and in all areas found to contain, or are suspected of containing, fossil-bearing formations. 2. To avoid construction delays, paleontological monitors shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates if they are unearthed. 3. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. This measure shall be implemented to the satisfaction of the Planning Official. The Project Paleontologist and the Project Archaeologist described in Mitigation Measure 4.5.6.1C may be the same person if he/she meets the qualifications of both positions per Cultural Report MM PR-1, Table 4, pg. 76. 	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed during Construction</p>	<p>Prior to issuance of any grading permits for development within the WLCSP</p>	<p>A qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A report of findings shall be submitted to the City after the finalization of construction</p>		<p>Withhold Grading Permit or Issuance of a Stop Work Order</p>
<p>4.5.6.3B Prior to the issuance of any permits for the construction of off-site improvements, a qualified paleontologist shall conduct an assessment for paleontological resources on each off-site improvement location. If any site is determined to have a potential for exposing paleontological resources, the project paleontologist shall monitor off-site grading/excavation, subject</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits and As Needed During Construction</p>	<p>Prior to issuance of grading permits for construction of any off-site improvements</p>	<p>A Qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A Report</p>		<p>Withhold grading permit or issuance of a stop work order</p>

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<p>to coordination with the City. Development monitoring shall include the following mitigation measures:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to reach fossil-bearing formations during grading. This monitoring must be conducted by the Project Paleontologist in all areas found to or suspected of containing fossil-bearing formations. 2. To avoid construction delays, the Project Paleontologist shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates as they are unearthed. 3. The Project Paleontologist shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. 				<p>of findings shall be submitted to the City after the finalization of construction</p>		
<p>4.6 GEOLOGY AND SOILS</p>						
<p>4.6.6.1A Prior to approval of any projects for development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet, the City shall determine if a detailed fault study of the Casa Loma Fault Zone area is required based on available evidence.</p> <p>If necessary, any additional geotechnical investigations shall be prepared by a qualified geologist and determine if structural setbacks are needed, and shall identify specific remedial earthwork and/or foundation recommendations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site specific investigations, provide any additional necessary mitigation to meet California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that</p>	<p>City Engineer and Project Geologist and Land Development/ Public Works</p> <p>Building and Safety</p>	<p>Once before project approvals</p>	<p>Prior to approval of any projects for future development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the Western boundary along the Mount Russell toe of</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>all structural plans for the project meet current Building Code requirements.</p> <p>Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur. Structures intended for human occupancy shall not be located within any structural setback zone as determined by those studies. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>slope easterly into the site 1 , 500 feet.</p>			
<p>4.6.6.1B Prior to approval of any projects for development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone, the City shall review and approve a geotechnical fault study prepared by a qualified geologist to confirm the alignment and size of any required building setbacks related to the fault zone. If necessary, this study shall identify a “special foundation or grading remediation zone” for the areas supporting structures intended for human occupancy where coseismic deformation (fractures) is observed. This zone shall be determined after subsurface evaluation based on proposed building locations. Specific remedial earthwork and foundation recommendations shall be evaluated as necessary based on proposed building locations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a</p>	<p>City Engineer and Project Geologist; Land Development/ Public Works</p>	<p>Once before approval of any development permits and Prior to Plot Plan Approval</p>	<p>Prior to approval of any projects for future development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone.</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of plot plans and building permits</p>

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<p>registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>This study may involve trenching to adequately identify the location of the Claremont segment of the San Jacinto Fault Zone that crosses the eastern portion of the World Logistics Center Specific Plan property. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>						
<p>4.6.6.1C Prior to the approval of grading permits, or permits for construction of off-site improvements, the City shall review and approve plans confirming that the project has been designed to withstand anticipated ground shaking and other geotechnical and soil constraints (e.g., settlement). The project proponent shall submit plans to the City as appropriate for review and approval prior to issuance of grading permits or issuance of permits for the construction of any offsite improvements. This measure shall be implemented to the satisfaction of the City Engineer.</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before issuance of grading permits</p>	<p>Prior to the approval of project grading permits, or permits for construction of off-site improvements</p>	<p>Review and approve grading and construction plans</p>		<p>Withhold Issuance of Grading or Construction Permits</p>
<p>4.6.6.2A Prior to issuance of building permits for any portion of the project site, a site-specific, design level geotechnical investigation for each parcel shall be submitted to the City, which would comply with all applicable state and local code requirements, and includes an analysis of the expected ground motions at the site from known active faults using accepted methodologies. The report shall determine structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. The report shall also determine final design parameters for walls, foundations,</p>	<p>City Engineer and Land Development/ Public Works Building and Safety Division</p>	<p>Once before issuance of building permits</p>	<p>Prior to the issuance of any building permits</p>	<p>Review and approval of a site-specific, design level geotechnical investigation for each parcel</p>		<p>Withhold Building Permits</p>

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<p>provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. These investigations shall identify any site-specific impacts from compressible and expansive soils based on the actual location of individual pads proposed in the future, so that differential movement can be further verified or evaluated in view of the actual foundation plan and imposed fill or structural loads. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>Compliance with this measure will ensure that future buildings are designed to protect the structure and occupants from on-site soil limitations, consistent with State Building Code requirements. This measure shall be implemented to the satisfaction of the City Engineer.</p>						
<p>4.6.6.3B Any cut slopes in excess of five (5) feet in vertical height shall be constructed as “replacement fill slopes” per the project geotechnical report, due to the variable nature of the onsite alluvial soils. This measure shall be implemented to the satisfaction of the City Land Development Division and the City Engineer in consultation with the Project Geologist.</p>	<p>City Land Development Division and City Engineer</p>	<p>Before and after issuance of any grading permit</p>	<p>Prior to issuance and following any grading permit for development within the Specific Plan</p>	<p>Review and approval of grading plans Review of grading prior to issuance of building permit</p>		<p>Withhold Grading Permit Witthold building permit</p>
<p>4.6.6.3C During all grading activities, a geotechnical engineer shall monitor site preparation, removal of unsuitable soils, mapping of all earthwork excavations, approval of imported earth materials, fill placement, foundation installation, and other geotechnical operations. Laboratory testing of subsurface</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before permitting</p>	<p>Prior to issuance of Any discretionary permit for development</p>	<p>Review of additional geotechnical and soils site investigations</p>		<p>Withhold Discretionary Permit</p>

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<p>materials to confirm compacted dry density and moisture content, consolidation potential, corrosion potential, expansion potential, and resistance value (R-value) shall be performed prior to and during grading as appropriate. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>			<p>within the Specific Plan</p>		<p>Issuance of a stop work order if necessary</p>
<p>4.7 GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE</p>					
<p>4.7.6.1A The World Logistic Center project shall implement the following requirements to reduce solid waste and greenhouse gas emissions from construction and operation of project development:</p>					
<p>a) After January 1, 2020, development shall divert a minimum of 75 percent of landfill waste. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p>	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Provide verification sheet to the Recycling Coordinator/ Public Works Property Owners. Association or the property owner shall certify the percentage of land fill waste diverted on an annual basis</p>	<p>Pursuant to City Municipal Code</p>
<p>b) After January 1, 2020, recycle and/or salvage at least 75 percent of non-hazardous construction and demolition debris. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Calculations can be done by weight or volume but must be consistent throughout.</p>	<p>Recycling Coordinator/ Public Works</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Certification has been submitted to the City. Property Owners Association or the property owner shall certify the percentage of landfill waste diverted on an annual basis.</p>	<p>Pursuant to City Municipal Code</p>
<p>c) The applicant shall submit a Recyclables Collection and Loading Area Plan for construction related materials prior to issuance of a building permit with the Building Division and for operational aspects of the project prior to the issuance of the occupancy permit to the Public Works Department. The plan shall conform to the Riverside County Waste Management Department’s Design Guidelines for Recyclable Collection and Loading Areas.</p>	<p>City Planning Division</p>				<p>Pursuant to City Municipal Code Withhold Certificate of Occupancy</p>

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<p>d) Prior to issuance of certificate of occupancy, the recyclables collection and loading area shall be constructed in compliance with the Recyclables Collection and Loading Area plan.</p>		<p>Once before issuance of building permits</p>	<p>Prior to issuance of building permits</p>	<p>Review and approval of a Recyclables Collection and Loading Area plan</p>		<p>Withhold Certificate of Occupancy</p>
<p>e) Prior to issuance of certificate of occupancy, documentation shall be provided to the City confirming that recycling is available for each building.</p>	<p>City Planning Division</p>		<p>Prior to issuance of occupancy permit</p>	<p>Review and approval of building plans</p>		<p>Withhold Certificate of Occupancy</p>
<p>f) Within six months after occupancy of a building, the City shall confirm that all tenants have recycling procedures set in place to recycle all items that are recyclable, including but not limited to paper, cardboard, glass, plastics, and metals.</p>	<p>City Planning Division</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Building plan review.</p>		
<p>g) The property owner shall advise all tenants of the availability of community recycling and composting services.</p>	<p>Recycling Coordinator/ Public Work</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permit</p>	<p>Compliance with Recyclables Collection and Loading Area Plan</p>		<p>Withhold Certificate of Occupancy</p>
	<p>Recycling Coordinator/ Public Work</p>	<p>Within six months of building occupancy</p>	<p>Within six months after occupancy of building</p>	<p>Review and approval of a Recyclables Collection and Loading Area Plan.</p>		
<p>h) Existing onsite street material shall be recycled for new project streets to the extent feasible.</p>	<p>City Engineer Land Development/ Public Works</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of a Certificate of Occupancy</p>	<p>Written verification will be submitted to the City that the property owner advised all tenants of the availability of community recycling and composting services.</p>		<p>Withhold grading permits</p>
		<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits.</p>	<p>Review and approval of documents including street plans</p>		

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<p>4.7.6.1B (Previously included as Utilities Mitigation Measure 4.16.4.6.1A in the 2015 FEIR for building energy). Each application for a building permit shall include energy calculations to demonstrate compliance with California Energy Efficiency Standards Plans shall follow the following:</p> <ul style="list-style-type: none"> • Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. • Cool pavement materials such as lighter-colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right-of-way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. • Energy-efficient appliances that achieve the 2016 California Appliance Energy Efficiency Standards (e.g., EnergyStar® Appliances) and use of sunlight-filtering window coatings or double-paned windows. 	<p>City Building and Safety, City Planning Division City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1C (Previously included as Utilities Mitigation Measure 4.16.4.6.1B building energy). Prior to the issuance of any building permits within the WLC site, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards, for each new structure. Plans may include but are not necessarily limited to implementing the following as appropriate:</p> <ul style="list-style-type: none"> • High-efficiency air-conditioning with electronic management system (computer) control. • Isolated High-efficiency air-conditioning zone control by floors/separate activity areas. • Use of Energy Star® exit lighting or exit signage. 	<p>City Building and Safety, City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>
<p>4.7.6.1D (Previously included as Utilities Mitigation Measure 4.16.4.6.1C in the 2015 FEIR for building energy; now modified). Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p>	<p>City Planning Division, City Building and Safety Division</p>	<p>Once</p>	<p>Prior to issuance of building permits.</p>	<p>Review of written verification</p>		<p>Withhold building permit.</p>

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<ul style="list-style-type: none"> • Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building or up to the limit allowed by MVU’s restriction on distrusted solar PV connecting to their grid, whichever is greater; • Increase efficiency for buildings by implementing either 10 percent over the 2019 Title 24’s energy-saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict; • Require the equivalent of “Leadership in Energy and Environmental Design Certified” for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval; and • All project rooftops shall be constructed to be solar-ready and be designed to accommodate the additional loads from solar equipment that might be installed at a future date. <p>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</p>						
<p>4.7.7.1 The developer shall mitigate the WLC Project's remaining GHG emissions to net zero by purchasing and retiring offset carbon credits, based upon the amount of GHG emissions set forth in Table 4.7-16 of the Revised Final EIR. Upon the purchase and retirement of offsets carbon credits, no further analysis of GHG emissions will be required, and no further reduction of those emissions will be required.</p> <p>The developer, in its sole discretion, shall demonstrate its reduction of GHG emissions through the purchase and retirement of offset carbon credits provided that the following conditions are satisfied:</p> <p>a) Offset Carbon Credits: A developer shall provide proof to the City's Planning Official that purchased offset credits were registered with, and retired by, an Offset Project Registry, as defined in 17 California Code of Regulations § 95802(a), approved by the California Air Resources Board, such as, but not limited to, Climate Action Reserve, American Carbon Registry or Verra (formerly Verified Carbon Standard). In order to prove that the offset carbon credits provided are real, permanent, additional, quantifiable, verifiable, and</p>	<p>City Planning Division</p>	<p>Prior to each phase as noted in Timing</p>	<p>Grading offsets shall be purchased and retired prior to issuance of a grading permit</p> <p>Construction offsets shall be purchased and retired prior to issuance of building permits</p> <p>Operational offsets shall be purchased and retired prior to issuance of</p>	<p>Review of written verification</p>		<p>Withhold applicable permit at each phase (grading, building and/or occupancy permit).</p>

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<p>enforceable, as those terms are defined in 17 California Code of Regulations § 95802(a), and have been retired, the developer shall provide the City’s Planning Official with (i) the protocol used to develop those credits, (ii) the third-party verification report concerning those credits, and (iii) the unique serial numbers of those credits showing that they have been retired.</p> <p>b) Timing: The developer shall provide proof to the City that offset carbon credits equal to the amount of GHG emissions resulting from the grading, construction and operation of facilities within the WLC have been purchased and retired as follows: (i) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from grading shall be a condition of the issuance of a grading permit. (ii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the construction of a facility shall be a condition of the issuance of a building permit for the facility. (iii) The purchase and retirement of offset carbon credits required to mitigate the GHG emissions resulting from the operation of a facility shall be a condition of the issuance of a certificate of occupancy, temporary or permanent, for the facility. The developer shall also have the right, at any time, to purchase and retire offset carbon credits for some or all of the grading, construction and operation of facilities in the WLC Project in advance of the issuance of grading or construction permits or certificates of occupancy, temporary or permanent.</p>			<p>occupancy permits</p>			
<p>4.8 HAZARDS AND HAZARDOUS MATERIALS</p>						
<p>4.8.6.1A Prior to demolition of any existing structures on the project site, a qualified contractor shall be retained to determine if asbestos-containing materials (ACMs) and/or lead-based paint (LBP) are present. If asbestos-containing materials and/or lead-based paint are present, prior to commencement of demolition, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. In addition, onsite soils shall be tested for contamination by agricultural chemicals. If present, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. This measure</p>	<p>City Building Division</p>	<p>Once Before Permitting and as Needed During Construction</p>	<p>Prior to demolition of any existing rural residences or associated structures</p>	<p>Evidence of qualified contractor provided</p>		<p>Withhold Demolition Permits</p>

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shall be implemented to the satisfaction of the Building Division including written documentation of the disposal of any asbestos-containing materials, lead-based paint, or agricultural chemical residue in conformance with all applicable regulations.						
4.8.6.1B Prior to the issuance of any discretionary permits associated with the proposed fueling facility (“logistic support” site in the LD zone), a risk assessment or safety study that identifies the potential public health and safety risks from accidents at the facility (e.g., fire, tank rupture, boiling liquid, or expanding vapor explosion) shall be submitted to the City for review and approval. This study shall be prepared to industry standards and demonstrate that the facility will not create any significant public health or safety impacts or risks, to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Fire Prevention Bureau and Building and Safety Division Planning Division	Once Before Permitting	Prior to issuance of Any discretionary Permits associated with natural gas fueling facility	Review and Approval of Risk Assessment or Safety Study		Withhold Discretionary Permit
4.8.6.1C Prior to grading for any discretionary permits for development in Planning Areas 9-12 adjacent to the natural gas compressor plant, the applicant shall prepare a risk assessment report analyzing safety conditions relative to the existing compressor plant and planned development. The report must be based on appropriate industry standards and identify the potential hazards from the compressor plant (e.g., fire, explosion) and determine that the distance from the plant to the closest planned buildings in Planning Areas 9-12 is sufficient to protect the safety of workers from accidents that could occur (see Final EIR Volume 2 Figure 4.1.6B) at the compressor plant. This measure shall be implemented to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Building Official and Fire Marshal Planning Division	Once before issuance of discretionary permits for development within Planning Areas 9-12	Prior to issuance of Discretionary permits for Development within Planning Areas 9-12	Review and approval of a risk assessment		Withhold Discretionary Permit
4.8.6.1D Prior to the issuance of any grading permit, the developer shall inform the City of any existing solid waste materials within the development area. In conjunction with grading activities, all solid waste matter within the development area shall be removed by a licensed contractor and disposed of in an approved landfill. A record of the removal and disposal of any waste materials, in compliance with applicable laws and regulations, shall be submitted to the City prior to the issuance of any building permits.	Building and Safety Recycling Coordinator/ Public Works	Once before issuance of grading permits	Prior to issuance of grading permits	Applicant will inform the City in writing of any existing solid waste materials within the development area		Withold building permit until receipt of record of removal and disposal of waste materials Pursuant to City Municipal Code

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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4.9 HYDROLOGY AND WATER QUALITY						
<p>4.9.6.1A Prior to issuance of any building permit within the Specific Plan area, the developer shall construct storm drain pipes and conveyances, as well as, combined detention and infiltration basin(s), bioretention area(s), and spreading area(s) within each proposed watershed, as outlined in the project hydrology plan, to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduce the time of concentration by storing and infiltrating increased runoff for a limited period of time and release the outflow at a rate that does not exceed the pre-development peak flows and velocities for the 2, 5, 10, 25, and 100-year storms and volumes as assessed in the water balance model for historical conditions. For the purpose of this mitigation measure, the term “construct” shall mean to substantially complete construction so as to function for its intended purpose during construction with complete construction prior to occupancy. Field investigations will be conducted to determine the infiltration rate of soils underlying the proposed locations of bioretention areas and detention basins. The infiltration rate of the underlying soils will be used to properly size the bioretention areas and detention basins/infiltration basins to ensure that adequate volumes of runoff, in cumulative total for all bioretention areas and detention basins, are captured and infiltrated. The water balance model will be updated and rerun for the site-specific conditions encountered to confirm the water balance. This measure shall be implemented to the satisfaction of the City Engineer. Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage weir structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow such that the flows exiting the project boundary will return to the sheet flow pattern similar to the existing condition. Detention basins and spreading areas shall be designed to account for the amount of the sediment transported through the project boundary so that the existing sediment carrying capacity is maintained.</p>	<p>Land Development/ Public Works</p>	<p>Prior to Occupancy</p>	<p>Prior to issuance of any development permit</p>	<p>Review and approval of construction documents Field Inspection</p>		<p>Withhold Building Permit</p>
<p>4.9.6.1B The bioretention areas and detention/infiltration basins shall be designed to assure infiltrations rates. The monitoring plan will follow the guidelines presented by the California Storm Water Quality Association (CASQA) in the California Storm Water Best</p>	<p>City Engineer</p>	<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits</p>	<p>Review and approval of a monitoring plan for the detention/infiltration basins</p>		<p>Withhold Grading Permit</p>

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<p>Management Program (BMP) Handbook, Municipal, January 2003 Section 4, Treatment Control Best Management Programs Fact Sheets TC-11 Infiltration Basin and TC-30 Vegetated Swale)</p> <p>For the Bioretention areas, as needed maintenance activities shall be conducted to remove accumulated sediment that may obstruct flow through the swale. Bioretention areas shall be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. The maintenance activities should occur when sediment on channels and culverts builds up to more than 3 inches (CASQA 2003). The swales will need to be cultivated or rototilled if drawdown takes more than 72 hours.</p> <p>For the Detention/infiltration Basins, a 3-5 year maintenance program shall be implemented mainly to keep infiltration rates close to original values since sediment accumulation could reduce original infiltration rate by 25-50%. Infiltration rates in detention basins will be monitored at the beginning and end of each wet season to assess any degradation in infiltration rates. If cumulative infiltration rates of all detention basins drops below the minimum required rates, then the detention basins will be reconditioned to improve infiltration capacity by scraping the bottom of the detention basin, seed or sod to restore groundcover, aerate bottom and dethatch basin bottom (CASQA 2003).</p>	<p>Land development/Public Works</p>	<p>Ongoing during occupancy</p>	<p>Ongoing during occupancy</p>	<p>On-site Inspection</p>		<p>Citation, City Maintenance, Lien and Foreclosure Pursuant to City Municipal Code</p>
<p>4.9.6.2A Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall file a Notice of Intent (NOI) with the Santa Ana Regional Water Quality Control Board to be covered under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit for discharge of storm water associated with construction activities. The project developer shall submit to the City the Waste Discharge Identification Number issued by the State Water Quality Control Board (SWQCB) as proof that the project's Notice of Intent is to be covered by the General Construction Permit has been filed with the State Water Quality Control Board. This measure shall be implemented to the satisfaction of the City Engineer</p>	<p>City Engineer. Land Development/Public Works, and Stormwater Management</p>	<p>Once before issuance of any grading permit</p>	<p>Prior to issuance of any grading permit</p>	<p>Proof of NOI submittal</p>		<p>Withhold Grading Permit</p>
<p>4.9.6.2B Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall submit to the State Water Quality Control Board (SWQCB) a</p>	<p>City of Moreno Valley and the Regional Water</p>	<p>Once before issuance of</p>	<p>Prior to issuance of any grading permit</p>	<p>Written verification of filing a SWPPP by the RWQCB</p>		<p>Withhold Grading Permit</p>

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<p>project-specific Storm Water Pollution Prevention Plan (SWPPP). The Storm Water Pollution Prevention Plan shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the Storm Water Pollution Prevention Plan shall emphasize structural and nonstructural best management practices (BMPs) to control sediment and non-visible discharges from the site. Best Management Practices to be implemented may include (but shall not be limited to) the following:</p> <ul style="list-style-type: none"> • Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary debris basins (if deemed necessary), and other discharge control devices. The construction and condition of the Best Management Practices are to be periodically inspected by the Regional Water Quality Control Board during construction, and repairs would be made as required. • Materials that have the potential to contribute non-visible pollutants to storm water must not be placed in drainage ways and must be placed in temporary storage containment areas. • All loose soil, silt, clay, sand, debris, and other earthen material shall be controlled to eliminate discharge from the site. Temporary soil stabilization measures to be considered include: covering disturbed areas with mulch, temporary seeding, soil stabilizing binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. Stockpiles shall be surrounded by silt fences and covered with plastic tarps. • The Storm Water Pollution Prevention Plan shall include inspection forms for routine monitoring of the site during the construction phase. • Additional required Best Management Practices and erosion control measures shall be documented in the Storm Water Pollution Prevention Plan. • The Storm Water Pollution Prevention Plan would be kept on-site for the duration of project construction and shall be available to the local Regional Water Quality Control Board for inspection at any time. 	<p>Quality Control Board and Land Development/ Public Works</p>	<p>any grading permit And Ongoing as part of routine site inspections</p>	<p>Ongoing</p>	<p>Site inspection</p>		<p>Pursuant to City Municipal Code</p>
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<p>The developer and/or construction contractor for each development area shall be responsible for performing and documenting the application of Best Management Practices identified in the project-specific Storm Water Pollution Prevention Plan. Regular inspections shall be performed on sediment control measures called for in the Storm Water Pollution Prevention Plan. Monthly reports shall be maintained and available for City inspection. An inspection log shall be maintained for the project and shall be available at the site for review by the City of Moreno Valley and the Regional Water Quality Control Board.</p>					
<p>4.9.6.3A Prior to discretionary permit approval for individual plot plans, a site-specific Water Quality Management Plan (WQMP) shall be submitted to the City Land Development Division for review and approval. The Water Quality Management Plan shall specifically identify site design, source control, and treatment control Best Management Practices that shall be used on-site to control pollutant runoff and to reduce impacts to water quality to the maximum extent practicable. The Water Quality Management Plan shall be consistent with the Water Quality Management Plan approved for the overall World Logistics Center Specific Plan project. At a minimum, the site developer shall implement the following site design, source control, and treatment control Best Management Practices as appropriate:</p> <p>Site Design Best Management Practices</p> <ul style="list-style-type: none"> a) Minimize urban runoff. b) Maximize the permeable area. c) Incorporate landscaped buffer areas between sidewalks and streets. d) Maximize canopy interception and water conservation by planting native or drought-tolerant trees and large shrubs. e) Use natural drainage systems. f) Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration. g) Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives. 	<p>City Land Development Division</p>	<p>Once before issuance of any grading or building permits</p> <p>And</p> <p>Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permit approval for individual plot plans</p> <p>Ongoing</p>	<p>Review and Approval of WQMP</p> <p>Site inspection</p>	<p>Withhold Grading or Building Permit</p> <p>Pursuant to City Municipal Code</p>

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<p>h) Minimize impervious footprint.</p> <p>i) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.</p> <p>j) Reduce widths of street where off-street parking is available.</p> <p>k) Minimize the use of impervious surfaces such as decorative concrete, in the landscape design.</p> <p>l) Conserve natural areas.</p> <p>m) Minimize Directly Connected Impervious Areas (DCIAs).</p> <p>n) Runoff from impervious areas will sheet flow or be directed to treatment control Best Management Practices.</p> <p>o) Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas that are planted with native or drought-tolerant trees and large shrubs.</p> <p>Source Control Best Management Practices</p> <p>Source control Best Management Practices are implemented to eliminate the presence of pollutants through prevention. Such measures can be both nonstructural and structural.</p> <p>Non-structural source control Best Management Practices include:</p> <p>a) Education for property owners, operator, tenants, occupants, or employees;</p> <p>b) Activity restrictions;</p> <p>c) Irrigation system and landscape maintenance;</p> <p>d) Common area litter control;</p> <p>e) Street sweeping private streets and parking lots; and</p> <p>f) Drainage facility inspection and maintenance.</p> <p>Structural source control Best Management Practices include:</p> <p>g) MS4 stenciling and signage;</p> <p>h) Landscape and irrigation system design;</p> <p>i) Protect slopes and channels; and</p> <p>j) Properly design fueling areas, trash storage areas, loading docks, and outdoor material storage areas.</p> <p>Treatment Control Best Management Practices</p>						
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<p>Treatment control Best Management Practices supplement the pollution prevention and source control measures by treating the water to remove pollutants before it is released from the project site. The treatment control Best Management Practice strategy for the project is to select Low Impact Development (LID) Best Management Practices that promote infiltration and evapotranspiration, including the construction of infiltration basins, bioretention facilities, and extended detention basins. Where infiltration Best Management Practices are not appropriate, bioretention and/or biotreatment Best Management Practices (including extended detention basins, bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration may be utilized. Harvest and Reuse Best Management Practice will be used to store runoff for later non-potable uses.</p> <p>Site-specific Water Quality Management Plans have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the project are developed, Best Management Practices will be implemented consistent with the goals contained in the Master Water Quality Management Plan. All development within the project will be required to incorporate on-site water quality features to meet or exceed the approved Master Water Quality Management Plan's water quality requirements identified previously.</p>						
<p>4.9.6.3B The Property Owners Association (POA) and all property owners shall be responsible to maintain all onsite water quality basins according to requirements in the guidance Water Quality Management Plan and/or subsequent site-specific Water Quality Management Plans, and established guidelines of the Regional Water Quality Control Board. Failure to properly maintain such basins shall be grounds for suspension or revocation of discretionary operating permits, and/or referral to the Regional Water Quality Control Board for review and possible action. This measure shall be implemented to the satisfaction of the City Land Development Division, in consultation with the City Engineer, and Regional Water Quality Control Board.</p>	<p>City Land Development Division</p>	<p>As Needed</p>	<p>Ongoing</p>	<p>Onsite inspections</p>		<p>Revocation of Discretionary or Operating Permits</p>

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<p>4.9.6.3C Prior to issuance of future discretionary permits for any development along the southern boundary of the World Logistics Center Specific Plan (WLCSP), the project developer of such sites, in cooperation with the Property Owners Association (POA), shall establish and annually fund a Water Quality Mitigation Monitoring Plan (WQMMP) to confirm that project runoff will not have deleterious effects on the adjacent San Jacinto Wildlife Area (SJWA). This program shall include at least quarterly sampling along the southern boundary of the site (i.e., at the identified outlet structures of the project detention basins) during wet season flows and/or when water is present, as well as sampling of any dry-season flows that are observed entering the San Jacinto Wildlife Area property from the project property, including Drainage 9, which is planned to convey only clean off-site flows from north of the World Logistics Center Specific Plan site across Gilman Springs Road. The program shall also include at least twice yearly sampling after completion of construction, and a pre-construction survey must be completed to determine general water quality baseline conditions prior to and during development of the southern portion of the World Logistics Center Specific Plan. This sampling shall be consistent with and/or comply with the requirements of applicable Storm Water Pollution Prevention Plans (SWPPPs) for the development site.</p> <p>The project developer of sites along the southern border of the World Logistics Center Specific Plan shall be responsible for preventing or eliminating any toxic pollutant (not including sediment) found to exceed applicable established public health standards. In addition, the discharge from the project shall not cause or contribute to an exceedance of Receiving Water Quality Objectives for the potential pollutants associated with the project as identified in Table 4.9.J. Once development is complete, the developer shall retain qualified personnel to conduct regular (i.e., at least quarterly) water sampling/testing of any basins and their outfalls to ensure the San Jacinto Wildlife Area will not be affected by water pollution from the project site. This measure shall be implemented to the satisfaction of the City Land Development Division Manager based on consultation with the project developer, Eastern Municipal Water District, the Regional</p>	<p>Land Development Division</p>	<p>Annually And Ongoing as part of routine site inspections</p>	<p>Prior to issuance of discretionary permits for any development along the southern boundary of the WLCSP Ongoing</p>	<p>Evidence of Annual Water Quality Monitoring Plan fund Site inspection</p>		<p>Withhold Discretionary Permit Pursuant to City Municipal Code</p>
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Water Quality Control Board-Santa Ana Region, and the Mystic Lake Manager.						
4.10 LAND USE AND PLANNING						
NOT APPLICABLE						
4.11 MINERAL RESOURCES						
NOT APPLICABLE						
4.12 NOISE						
<p>4.12.6.1A Prior to issuance of any discretionary project approvals that <u>allow construction activity</u>, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City’s daytime <u>(except for sensitive receptors located within 500 feet of active construction areas)</u> and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures:</p> <ul style="list-style-type: none"> • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers’ standards. • Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project. • No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends. • A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity. The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may 	City Planning Division	Once And Ongoing as part of routine site inspections	Prior to issuance of any discretionary approvals. Ongoing	Review and Approval of a Noise Reduction Compliance Plan Site inspection		Withhold approvals. Pursuant to City Municipal Code

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

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<p>be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.</p> <ul style="list-style-type: none"> • Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a “hotline” telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request. • Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51). 						
<p>4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City’s approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development:</p> <p>Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the the Revised Sections of the FEIR remain valid. These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the Revised Sections of the FEIR and shall be used to impose building-specific mitigation on the individually proposed buildings.</p>	<p>City Planning Division</p>	<p>Once before issuance of a certificate of occupancy</p>	<p>Prior to issuance of Discretionary permits for Action 1. Prior to issuance of certificate of occupancy for actions 2 and 3</p>	<p>Review and approval of a noise study</p>		<p>Withhold discretionary approvals</p>

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<p>Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the World Logistics Center site, the Applicant shall implement the mitigation identified in the Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels reaching residential uses at 60 dBA during the daytime hours (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.). Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants.</p> <p>If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a <i>no</i> vote.</p> <p>At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.</p> <p>Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited</p>						
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receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement.						
4.12.6.2B Prior to issuance/approval of any building permits, the centerline of Cactus Avenue Extension will be located no closer than 11449 feet to the residential property lines along Merwin Street. An alternative is to locate the roadway closer to the residences and provide a soundwall along Cactus Avenue Extension. The soundwall location and height should be determined by a Registered Engineer, and the soundwall shall be designed to reduce noise levels to less than 65 CNEL at the residences. The Engineer shall provide calculations and supporting information in a report that will be required to be submitted to and approved by the City prior to issuing permits to construct the road.	City Planning Division	Prior to the approval of a Building permit	Prior to the issuance of building permits	Review and Approval of Building permits		Withhold Building Permits
4.12.6.2C Prior to the approval of any discretionary permits, cumulative impact areas shown in the WLC EIR Noise Study shall be included in the soundwall mitigation program outlined in Mitigation Measures 4.12.6.2A and 4.12.6.2D.	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of soundwall mitigation program		Withhold discretionary permits
4.12.6.2D Prior to issuance of a building permit, the applicant shall demonstrate that the development maintains a buffer with soundwall for noise attenuation at residential/warehousing interface (i.e., western and southwestern boundaries of the project site). To keep the noise levels at nearby residential areas less than typical ambient conditions, the warehousing property line shall be located a minimum of 250 feet from the residential zone boundary, and a 12-foot noise barrier shall be located along the perimeter of the property that faces any residential areas. The 12 foot noise barrier may be a soundwall, berm, or combination of the two. The height shall be measured relative to the pad of the warehouse. This requirement shall be implemented anytime residential areas are within 600 feet of the warehousing property line to insure that a noise level of 45 dBA (Leq) will not be exceeded at the residential zone. This requirement is consistent with Item 10 of Municipal Code Section 9.16.160 Business park/industrial that states, "All manufacturing and industrial uses adjacent to residential land uses shall include a buffer zone and/or noise attenuation wall to reduce outside noise levels".	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold Building Permit

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<p>4.12.6.4A Prior to the issuance of building permits for projects within 1,300 feet of the Southern California Gas Company (SCGC) and San Diego Gas and Electric (SDG&E) blowdown facilities, documentation shall be submitted to the City confirming that sound attenuation devices and/or improvements for the blow-down facilities providing at least a 40 dB reduction in noise levels during blow-down events are available and will be installed for all planned blow-down events. It shall be the responsibility of the developer to fund all sound attenuation improvements to the blow-down facilities required by this measure. It shall also be the responsibility of the developer to coordinate with San Diego Gas and Electric and/or Southern California Gas Company regarding the installation of any sound attenuation devices or improvements on the blow-down facilities at either the San Diego Gas and Electric compressor station or the Southern California Gas Company pipelines. This measure shall be implemented to the satisfaction of the City Land Management Division</p>	<p>City Land Development Division City Planning Division</p>	<p>Once before Permitting</p>	<p>Prior to the issuance of Building permits for projects within 1,300 feet of the SCGC and SDG&E facilities</p>	<p>Review and Approval of Documentation confirming sound attenuation device</p>		<p>Withhold Building Permits</p>
<p>4.13 POPULATION, HOUSING, AND EMPLOYMENT</p>						
<p>NOT APPLICABLE</p>						
<p>4.14 PUBLIC SERVICES AND FACILITIES</p>						
<p>NOT APPLICABLE</p>						
<p>4.15 TRAFFIC AND CIRCULATION</p>						
<p>4.15.7.4A A traffic impact analysis (“TIA”) conforming to the guidelines for TIAs adopted by the City shall be submitted in conjunction with each Plot Plan application within the WLCSP. Prior to the approval of the Plot Plans, the City shall review the Revised TIA to determine if any of the traffic improvements listed in the above tables need to be implemented as part of the plot plan. The TIA prepared for the Revised Sections of the FEIR are required to be completed prior to the issuance of a certificate of occupancy for each building. If the City determines that any of the improvements within Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated into insignificance, then the completion of construction of the improvements prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval</p>	<p>City Engineer</p>	<p>Once before plot plan approval Once prior to Certificate of Occupancy</p>	<p>Prior to plot plan approval Prior to Certificate of Occupancy</p>	<p>Review and Approval of site-specific TIAs Review and Approval of site-specific TIAs</p>		<p>Withhold Plot Plan approval Withhold Certificate of Occupancy</p>

World Logistics Center – Mitigation Monitoring and Reporting Program

<p>of the Plot Plan. Construction of improvements within the City shall be subject to reimbursement agreement for those costs that exceed the fair share contribution determined for the specific Plot Plan application. If the City determines that any of the improvements outside Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated to a less than significant level, then the payment of any necessary fair share contribution as prescribed in Mitigation Measure 4.15.7.4E prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. If the City determines that the traffic impacts which will result from the construction or operation of a building will be significantly more adverse than those shown in the Revised TIA, further environmental review shall be conducted prior to the approval of the Plot Plan pursuant to Public Resources Code § 21166 and CEQA Guidelines §15162 to determine what additional mitigation measures, if any, will be required in order to maintain the appropriate levels of service.</p>						
<p>4.15.7.4B As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the dedication of appropriate right-of-way, where feasible, consistent with the Subdivision Map Act for frontage street improvements contained within the World Logistics Center Specific Plan Circulation Map. Required dedications shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer</p>	<p>Once before issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Evidence of dedication of right of- way in compliance with Subdivision Map Act</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4C As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the Applicant to construct or to fully fund the transportation measures identified in the development’s TIA (see MM4.15.7.4A) as needed to mitigate the transportation impacts within the city of the Plot Plan development. The payment or construction shall be made prior to the issuance of occupancy permits for the requested development. This condition shall apply only to mitigation measures where a mechanism has been established to collect funds from the project and any other funds to needed to complete the improvements.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>

World Logistics Center – Mitigation Monitoring and Reporting Program

<p>4.15.7.4D As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require each project to pay the requisite Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Chapter 3.44. Required TUMF payments shall be made prior to the issuance of occupancy permits for the requested development.</p>	<p>City Engineer City Planning Division</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy permits</p>	<p>Written verification of payment of TUMF</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4E In order to ensure that all of the Project’s traffic impacts are mitigated to the greatest extent feasible, the Applicant shall contribute its fair share of the cost of the needed traffic improvements that are not within the City as identified in the Revised Traffic Impact Analysis (i.e., under the jurisdiction of other cities, the County of Riverside or Caltrans, pursuant to Mitigation Measure 4.15.7.4F). As used in this mitigation measure, the Applicant’s “fair share” has been determined in compliance with the requirements of the Fee Mitigation Act, Government Code § 66000 et seq., and, pursuant to § 66001(g), does not require that the Applicant be responsible for making up for any existing deficiencies. The fair share mitigation measures are summarized in Tables 72 through 77 of the TIA located in Appendix F of this RSFEIR, 4.15.1 to 4.15.13.</p>	<p>City Engineer</p>	<p>Once before to issuance of occupancy permits</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair share programs</p>		<p>Withhold Occupancy Permits</p>
<p>4.15.7.4F The Applicant shall pay its portion of the fair share of the cost of traffic improvements identified in the Transportation Impact Analysis for those significantly impacted road segments and intersections for each warehouse building within the World Logistics Center if the impacted jurisdiction has established a fair share contribution program prior to the approval of a building-specific plot plan. The City shall determine whether a fair share program exists in the impacted jurisdiction and, if one does exist, require that the appropriate fees are paid by the Applicant, consistent with the requirements below, prior to the issuance of a certificate of occupancy for the building in question. If no fair share program exists or if the existing programs are not consistent with the requirements below, then no payment of fees shall be required. The impacts are to be determined on a road segment or intersection basis. Nothing in this condition requires the payment of a traffic impact fee imposed by another jurisdiction which covers improvement to facilities where the Project does not have a significant impact. Fair-share</p>	<p>City Engineer</p>	<p>Once prior to issuance of building permits for individual buildings.</p>	<p>Prior to issuance of occupancy Permits</p>	<p>Written verification of payment into adopted fair-share programs</p>		<p>Withhold Occupancy Permits</p>

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contributions will be determined on a building-by-building basis as a share of the impact of the Project as a whole (for each segment or intersection where the WLC project as a whole has a significant impact identified in the Revised Sections of the FEIR) as determined by the Revised Traffic Impact Analysis and will be due as each certificate of occupancy is issued. The fair share payments for the significantly impacted road segments and intersections identified in the Revised Sections of the FEIR will be required even though the impact resulting from a specific building does not, by itself, cause a significant impact.

For example, the intersection of Martin Luther King Blvd. and the I-215 northbound ramps (Intersection 85) in the City of Riverside was identified as a place where the World Logistic Center contributes to cumulatively significant impacts, and where the fair share contribution of the World Logistic Center project as a whole was computed to be 6.2%. If the City of Riverside establishes a fair share contribution program consistent with this Mitigation Measure 4.15.7.4F to improve that intersection, then when a certificate of occupancy is to be issued for a 2-million square feet high-cube warehouse in the World Logistic Center (approximately 5% of the entire World Logistic Center project) the amount of the fair share payment due from the Applicant to the City of Riverside would be computed as follows:

Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	% Attributable to the building that is subject to the certificate of occupancy (5%)
A x B x C = D						
A = % attributable to the building that is subject to the certificate of occupancy (%5)						
B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis						
C = Total cost of Improvement						
D = Amount Due						

A similar calculation would be done for each subsequent building, with payments for each due at the time of issuance of the

World Logistics Center – Mitigation Monitoring and Reporting Program

<p>certificate of occupancy. As a result, while each building individually would not produce a significant impact, and therefore would not be required to pay any mitigation fees if considered by itself, the total amount of the payments for all of the buildings would be equal to the fair share payment for the entire World Logistic Center to the extent that the responsible jurisdiction has chosen to adopt a fair share contribution funding program consistent with Mitigation Measure 4.15.7.4F.</p>						
<p>4.15.7.4G City shall work directly with WRCOG to request that TUMF funding priorities be shifted to align with the needs of the City, including improvements identified in the TIA. Toward this end, City shall meet regularly with WRCOG.</p>	<p>City Engineer</p>	<p>On-going</p>	<p>Yearly starting with project up and ending with project buildout.</p>	<p>City Engineer provides quarterly updates to the City Council regarding TUMF funding priorities as it relates to the improvements identified in the traffic impact analysis.</p>		<p>None</p>
<p>4.16 UTILITIES AND SERVICE SYSTEMS</p>						
<p>4.16.1.6.1A Prior to approval of a precise grading permit for each plot plan for development within the World Logistics Center Specific Plan (WLCSF), the developer shall submit landscape plans that demonstrate compliance with the World Logistics Center Specific Plan, the State of California Model Water Efficient Landscape Ordinance (AB 1881), and Conservation in Landscaping Act (AB 325). This measure shall be implemented to the satisfaction of the Planning Division. Said landscape plans shall incorporate the following:</p> <ul style="list-style-type: none"> • Use of xeriscape, drought-tolerant, and water-conserving landscape plant materials wherever feasible and as outlined in Section 6.0 of the World Logistics Center Specific Plan; • Use of vacuums, sweepers, and other “dry” cleaning equipment to reduce the use of water for wash down of exterior areas; • Weather-based automatic irrigation controllers for outdoor irrigation (i.e., use moisture sensors); • Use of irrigation systems primarily at night or early morning, when evaporation rates are lowest; 	<p>City Planning Division</p>	<p>Once</p>	<p>Prior to issuance of precise grading permit for each plot plan.</p>	<p>Review and Approval of landscape plans</p>		<p>Withhold precise grading permit.</p>

World Logistics Center – Mitigation Monitoring and Reporting Program

<ul style="list-style-type: none"> • Use of recirculation systems in any outdoor water features, fountains, etc.; • Use of low-flow sprinkler heads in irrigation system; • Provide information to the public in conspicuous places regarding outdoor water conservation; and • Use of reclaimed water for irrigation if it becomes available. 					
<p>4.16.1.6.1B All buildings shall include water-efficient design features outlined in Section 4.0 of the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division/Public Works. These design features shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> • Instantaneous (flash) or solar water heaters; • Automatic on and off water faucets; • Water-efficient appliances; • Low-flow fittings, fixtures and equipment; • Use of high-efficiency toilets (1.28 gallons per flush [gpf] or less); • Use of waterless or very low water use urinals (0.0 gpf to 0.25 gpf); • Use of self-closing valves for drinking fountains; • Infrared sensors on drinking fountains, sinks, toilets and urinals; • Low-flow showerheads; • Water-efficient ice machines, dishwashers, clothes washers, and other water-using appliances; • Cooling tower recirculating system where applicable; • Provide information to the public in conspicuous places regarding indoor water conservation; and • Use of reclaimed water for wash down if it becomes available. 	<p>Building and Safety Division Planning Division</p>	<p>Once</p>	<p>Prior to issuance of any building permits.</p>	<p>Review and Approval building plans</p>	<p>Withhold building permit.</p>
<p>4.16.1.6.1C Prior to approval of a precise grading permit for each plot plan, irrigation plans shall be submitted to and approved by the City demonstrating that the development will have separate irrigation lines for recycled water. All irrigation systems shall be designed so that they will function properly with recycled water if it becomes available. This measure shall be implemented to the satisfaction of the City Planning Division and Land Development Division/Public Works.</p>	<p>City Planning Division, Land Development Division/Public Works</p>	<p>Once</p>	<p>Prior to issuance of precise grading permits.</p>	<p>Review irrigation plans</p>	<p>Withhold precise grading permit.</p>

World Logistics Center – Mitigation Monitoring and Reporting Program

<p>4.16.1.6.2A Each Plot Plan application for development shall include a concept grading and drainage plan, with supporting engineering calculations. The plans shall be designed such that the existing sediment carrying capacity of the drainage courses exiting the project area is similar to the existing condition. The runoff leaving the project site shall be comparable to the sheet flow of the existing condition to maintain the sediment carrying capacity and amount of available sediment for transport so that no increased erosion will occur downstream. This measure shall be implemented to the satisfaction of the City Land Development Division/Public Works.</p>	<p>Land Development Division/Public Works</p>	<p>Once Concurrent with Plot Plan review and approval.</p>	<p>Prior to issuance of grading permit.</p>	<p>Review and Approval of Grading and Drainage Plans</p>		<p>Withhold Plot Plan Approval</p>
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4.17 Energy (New Section)
 Refer to mitigation measures in Air Quality and GHG.

Attachment: WLC MMRP 10JUNE2020 Exhibit A 2015 and Exhibit B M2020 (4074 : World Logistics Center)

RESOLUTION NO. 2020-20

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, APPROVING AND ADOPTING A MITIGATION MONITORING REPORTING PROGRAM AND STATEMENT OF OVERRIDING CONSIDERATIONS AND CERTIFYING THE REVISED FINAL ENVIRONMENTAL IMPACT REPORT FOR THE WORLD LOGISTICS CENTER

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and;

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively “HF”) have legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit “A-1” and as illustrated in the depiction set forth in Exhibit “A-2” (the “Subject Property”) of the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs Initiative,” which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support uses on the land subject to the World Logistics Center Specific Plan; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the “WLC Land Benefit Initiative” to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, which was approved by the City Council on August 19, 2015, after certification of the World Logistics Center Final Programmatic Environmental Impact Report (“FEIR”); and

WHEREAS, the certification of the FEIR and the approval of the Tentative Parcel Map were ordered set aside by a judgment of the Riverside Superior Court in June, 2018; and

WHEREAS, a Revised Final Environmental Impact Report (“Revised Final EIR”) has been prepared for the “Project,” as collectively described and depicted in the World Logistics Center Land Use and Zoning Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, the Revised Final EIR contains the information required by CEQA Guidelines Section 15132, including without limitation the FEIR and all revisions and additions thereto; comments and recommendations received on the Revised Sections of the FEIR (“RSFEIR”) and the Draft Recirculated RSFEIR; list of persons, organizations, and public agencies commenting on the RSFEIR and the Draft Recirculated RSFEIR; and the City’s responses to significant environmental points raised in the review and consultation process on RSEIR and the Draft Recirculated RSFEIR; and

WHEREAS, the Revised Final EIR finds and concludes that all potentially significant environmental impacts from implementation of the Project have been identified in the Revised Final EIR and, with the implementation of the mitigation measures defined and set forth in the Mitigation Monitoring and Reporting Program, will be mitigated to a less-than-significant level, except for those certain impacts identified in the Revised Final EIR as being unavoidable; and

WHEREAS, the Revised Final EIR finds and concludes that the Project will have certain significant environmental effects which would remain significant even after implementation of all feasible mitigation measures identified in the Revised Final EIR, including the reasonable range of alternatives identified in the Revised Final EIR, as more particularly described in Exhibit B (“Statement of Overriding Considerations”), attached hereto and incorporated herein by this reference; and

WHEREAS, CEQA Guidelines Section 15093 (Statement of Overriding Considerations) provides that CEQA requires the decision-making entity to balance the economic, legal, social, technological or other benefits, including region or state-wide environmental benefits (collectively, “Project Benefits”), of a proposed project against its unavoidable environmental risks when determining whether to approve the project, and if the Project Benefits of a proposed project outweigh the unavoidable and adverse environmental effects, the adverse environmental effects may be considered “acceptable;” and

WHEREAS, when the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the records and that a

Statement of Overriding Considerations be supported by substantial evidence in the record.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. RECITALS AND EXHIBITS

That the foregoing Recitals and attached Exhibits are true and correct and are hereby incorporated by this reference.

Section 2. EVIDENCE AND ADMINISTRATIVE RECORD

That the Planning Commission has considered all of the evidence submitted into the administrative record for the Project, including, but not limited to, the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein
- (b) Title 9 (“Planning and Zoning”) of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Riverside County Superior Court’s Ruling on Peremptory Writ of Mandate, filed February 8, 2018;
- (d) Riverside County Superior Court’s Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018;
- (e) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5t 689;
- (f) Draft Environmental Impact Report, dated February 2013;
- (g) Final Programmatic Environmental Impact Report, Volume 1 - Responses to Comments, dated May, 2015;
- (h) Final Programmatic Environmental Impact Report, Volume 2 – Revised Draft Environmental Impact Report, dated May 2015;
- (i) Final Programmatic Environmental Impact Report, Volume 3 – Final Environmental Impact Report, dated May 2015;
- (j) Revised Sections of the Final Environmental Impact Report, dated July 2018;
- (k) Draft Recirculated Revised Sections of the Final Environmental Impact Report, dated December 2019;
- (l) Draft Recirculated Revised Sections of the Final Environmental Impact Report, Appendix, dated December 2019;
- (m) Responses to Comments on the Revised Sections of the RSFEIR and Draft Recirculated RSFEIR, dated April, 2020;
- (n) Draft Development Agreement by and between the City and HF, its application and all documents, records and references contained therein;
- (o) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” that was unanimously

- approved by the City Council on November 24, 2015, and which remains valid;
- (p) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through its adoption of the World Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015, and which remain valid;
 - (q) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015, and which remain valid;
 - (r) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015, and which repeal remains valid;
 - (s) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015, and which remains valid;
 - (t) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015, and which remain valid;
 - (u) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015, and which remains valid;
 - (v) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto, which was approved by the City Council on November 24, 2015, which approval has been vacated;
 - (w) The Planning Commission Staff Report and Staff presentation and all documents, records and references related thereto submitted or provided at the May 14, 2020, Planning Commission Public Hearing;
 - (x) Testimony and/or comments from HF and its representatives submitted or provided at the May 14, 2020, Planning Commission Public Hearing; and
 - (y) Testimony and/or comments from all persons that were provided at, or prior to, the May 14, 2020, Planning Commission Public Hearing.

Section 3. APPROVAL AND ADOPTION OF MITIGATION MONITORING AND REPORTING PROGRAM AND SUBSTANTIAL EVIDENCE

That Planning Commission hereby finds that all potentially significant environmental impacts from implementation of the Project have been identified in the Revised Final EIR and, with the implementation of the mitigation measures defined and set forth in the Mitigation Monitoring and Reporting Program in Exhibit A, will be mitigated to a less-than-significant level, except for those certain impacts identified in the Revised Final EIR as being unavoidable and based on the substantial evidence included in the Recitals, Exhibits and Evidence contained in Administrative Record, as set forth and described hereinabove, the Planning Commission hereby approves and adopts the Mitigation Monitoring and Reporting Program, as set forth and described in Exhibit A, attached hereto, including the findings set forth therein.

Section 4. APPROVAL AND ADOPTION OF THE STATEMENT OF OVERRIDING CONSIDERATIONS AND SUPPORTING EVIDENCE

That the Planning Commission hereby finds that economic, social, and environmental considerations of the proposed Project outweigh the unavoidable significant adverse impacts described in the Revised Final EIR and based on the substantial evidence in the Recitals, Exhibits and Evidence contained in the Administrative Record, as set forth and described hereinabove, the Planning Commission hereby approves and adopts the Statement of Overriding Considerations, as set forth and described in Exhibit B, attached hereto, including the findings set forth therein.

Section 5. CEQA COMPLIANCE

That the Revised Final EIR was prepared in compliance with CEQA and the CEQA Guidelines and that the Planning Commission has complied with CEQA's procedural and substantive requirements.

Section 6. NO NEW INFORMATION

That no new significant information as defined by CEQA Guidelines Section 15088.5, has been received by the Planning Commission after the circulation of the RSFEIR and Draft Recirculated RSFEIR that would require further recirculation and that all of the information added to the Revised Final EIR merely clarifies, amplifies or makes insignificant modifications to an already adequate FEIR, RSFEIR and Draft Recirculated RSFEIR pursuant to CEQA Guidelines Section 15088.5(b).

Section 7. APPROVAL AND CERTIFICATION OF REVISED FINAL ENVIRONMENTAL IMPACT REPORT

That based on substantial evidence in the Recitals, Exhibits and Evidence contained in the Administrative Record, as set forth and described hereinabove, the

Mitigation Monitoring And Reporting Program and findings set forth therein, and the Statement of Overriding Considerations and findings set forth therein, supporting evidence contained therein, the Planning Commission hereby approves and certifies the Revised Final Environmental Impact Report as having been completed in compliance with CEQA, as attached hereto as Exhibit C.

Section 8. INDEPENDENT JUDGMENT AND ANALYSIS

That the Revised Final EIR reflects the City of Moreno Valley as Lead Agency and the Planning Commission’s independent judgment and analysis.

Section 9. NOTICE OF DETERMINATION

That a Notice of Determination shall be filed and posted, as required by CEQA.

Section 10. EFFECTIVE DATE

That this Resolution shall take effect immediately upon its adoption.

Section 11. SEVERABILITY

That if any provision, section, paragraph, sentence or word of Resolution be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words as hereby adopted shall remain in full force and effect.

Section 12. CERTIFICATION.

That the Secretary of the Planning Commission shall certify to the passage of this Resolution and shall cause the same to be transmitted to the City Council for its consideration.

Section 13. REPEAL OF CONFLICTING PROVISIONS.

That all provisions of any resolution in effect prior to the effective date of this Resolution as adopted by the Planning Commission that are in conflict with the provisions of this Resolution, are hereby repealed.

PASSED, APPROVED, AND ADOPTED on this 14th day of May, 2020.

CITY OF MORENO VALLEY
PLANNING COMMISSION

Attachment: Planning Commission 2020-20 RFEIR Resolution May 14, 2020 (4074 : World Logistics Center)

Patricia Korzec, Chairperson

ATTEST:

Patty Nevins, Planning Official
Secretary to the Planning Commission

APPROVED AS TO FORM:

Steven B. Quintanilla
Interim City Attorney

Attachment: Planning Commission 2020-20 RFEIR Resolution May 14, 2020 (4074 : World Logistics Center)

EXHIBIT A
MITIGATION MONITORING AND REPORTING PROGRAM

Attachment: Planning Commission 2020-20 RFEIR Resolution May 14, 2020 (4074 : World Logistics Center)

EXHIBIT B
STATEMENT OF OVERRIDING CONSIDERATIONS

EXHIBIT C
REVISED FINAL ENVIRONMENTAL IMPACT REPORT

Attachment: Planning Commission 2020-20 RFEIR Resolution May 14, 2020 (4074 : World Logistics Center)

World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4.1 AESTHETICS						
4.1.6.1A Each Plot Plan application for development along the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing or planned residential zoned uses) shall include a minimum 250-foot setback measured from the City/County zoning boundary line and any building or truck parking/access area within the project. The setback area shall include landscaping, berms, and walls to provide visual screening between the new development and existing residential areas upon maturity of the landscaping materials. The existing olive trees along Redlands Blvd. shall remain in place as long as practical to help screen views of the project site. This measure shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before permitting	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
		Once before issuance of certificate of occupancy	Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1B Each Plot Plan application for development adjacent to Redlands Boulevard, Bay Avenue, or Merwin Street, shall include a plot plan, landscaping plan, and visual rendering(s) illustrating the appearance of the proposed development. The renderings shall demonstrate that views of proposed buildings and trucks can be reasonably screened from view from existing residents upon maturity of planned landscaping and to ensure consistency with the General Plan Objective 7.7. "Effective" screening shall mean that no more than the upper quarter (25%) of a building is visible from existing residences, which shall be achieved through a combination of landscaping, berms, fencing, etc. The location and number of view presentations shall be at the discretion of the Planning Division.	City Planning Division	Once before permitting	Prior to Plot Plan Approval	Plot Plan Review		Withhold Building Permits
		Once before issuance of certificate of occupancy	Prior to issuance of Building permit	Building Permit		Withhold Plot Plan Approval
			Prior to issuance of certificate of occupancy	On-site inspection		Withhold Certificate of Occupancy
4.1.6.1C Prior to the issuance of a certificate of occupancy for buildings adjacent to the western, southwestern, and eastern boundaries of the project (i.e., adjacent to existing residences at the time of application) the screening required in Mitigation Measure 4.1.6.1A shall be installed in substantial conformance with the approved plans to the satisfaction of the Planning Official.	City Planning Division	Once before issuance of certificate of occupancy.	Prior to issuance of certificate of occupancy.	Review and Approval of Site Plans		Withhold Certificate of Occupancy

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4.1.6.1D Prior to the issuance of permits for any development activity adjacent to Planning Area 30 (74.3 acres in the southwest portion of the Specific plan), the entirety of Planning Area 30 shall be offered to the State of California for open space purposes. In the event that the State does not accept the dedication, the property shall be offered to Western Riverside County Regional Conservation Authority or an established non-profit land conservancy for open space purposes. In the event that none of these organizations accept the dedication, the property may be dedicated to a property owner’s association or may remain in private ownership and may be fenced and access prohibited.	City Planning Division	Once before permitting of any development activity adjacent to Planning Area 30.	Prior to issuance before of any discretionary permit.	Review and Approval of Site Plans.		Withhold Discretionary Permit
4.1.6.3A Each Plot Plan application for development shall include plans and visual rendering(s) illustrating any changes in views of Mount Russell and/or the Badlands, for travelers along SR-60, as determined necessary by the Planning Official. The plans and renderings shall illustrate typical views based on proposed project plans, with the location and number of view presentations to be determined by the Planning Official. These views shall be simulated from a height of six feet from the edge of the roadway travel lane closest to the visual resource. The renderings must demonstrate that the development will preserve at least the upper two thirds (67%) of the vertical view of Mt. Russell from SR-60.	City Planning Division	Once before plot plan review	Prior to issuance of building permit.	Review and Approval of Renderings		Withhold Building Permit <u>Plot Plan Approval</u>
4.1.6.4A Each Plot Plan application for development adjacent to residential development shall include a photometric plot of all proposed exterior lighting demonstrating that the project is consistent with the requirements of Section 9.08.100 of the City Municipal Code. The lighting study shall indicate the expected increase in light levels at the property lines of adjacent residential uses. The study shall demonstrate that the proposed lighting fixtures and/or visual screening meet or exceed City standards regarding light impacts.	City Planning Division	Once during plot plan review	Prior to issuance of any building permit <u>Prior to plot plan approval.</u>	Review and Approval of Lighting Study		Withhold Building Permit <u>Plot Plan Approval</u>
4.1.6.4B Each Plot Plan application for development shall include an analysis of all proposed solar panels demonstrating that glare from panels will not negatively affect adjacent residential uses or negatively affect motorists along perimeter roadways. Design details to meet these requirements shall be implemented to the satisfaction of the Planning Official.	City Planning Division	Once during plot plan review	Prior to plot plan approval.	Review and Approval of Plot Plan		Withhold Plot Plan Approval

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4.2 AGRICULTURE						
4.2.6.1A Prior to the issuance of any grading permit affecting land designated as “Unique Farmland” (Figure 4.2.2 in the World Logistics Center Environmental Impact Report), an Agricultural Conservation Easement shall be recorded over land of equivalent or better agricultural economic productivity of the offsite easement property compared to the World Logistics Center property. The analysis will include a comparison of the project’s “Unique Farmland” considering its relative economic potential as the best measure of productivity (i.e., net profitability per acre or potential net rental income per acre). It will include a consideration of various important physical factors including location and accessibility, soils and topography, micro and macro climatic conditions, water availability and quality, as well as local practices, good farm management and cultural (growing) costs. The form and content of this easement, as well as the estimates of agricultural productivity, shall be reviewed and approved in advance by the Planning Official.	City Planning Division	Once before issuance of grading permits on lands that contain unique farmland	Prior to issuance of any grading permits.	City review of form and content of agricultural easement proposed by the developer. And City receives written verification of an agricultural easement.		Withhold Grading Permit
4.3 Air Quality						
<p>4.3.6.2A Construction equipment maintenance records (including the emission control tier of the equipment) shall be kept on-site during construction and shall be available for inspection by the City of Moreno Valley.</p> <p>a) Off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 off-road emissions standards. A copy of each unit’s certified tier specification shall be available for inspection by the City at the time of mobilization of each applicable unit of equipment.</p> <p>b) During all construction activities, off-road diesel-powered equipment may be in the “on” position not more than 10 hours per day.</p> <p>c) Construction equipment shall be properly maintained according to manufacturer specifications.</p> <p>d) All diesel-powered construction equipment, delivery vehicles, and delivery trucks shall be turned off when not in use. On-site idling shall be limited to three minutes in any one hour.</p> <p>e) Electrical hook ups to the power grid shall be provided for electric construction tools including saws, drills and</p>	<p><u>Land Development Division and Building and Safety Division</u> City Planning Division</p>	As needed during construction	During construction	On-site Inspection of construction maintenance records and data sheets.		Issuance of Stop Work Order

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<p>compressors, where feasible, to reduce the need for diesel-powered electric generators. Where feasible and available, electric tools shall be used.</p> <p>f) The project shall demonstrate compliance with South Coast Air Quality Management District Rule 403 concerning fugitive dust and provide appropriate documentation to the City of Moreno Valley.</p> <p>g) All construction contractors shall be provided information on the South Coast Air Quality Management District Surplus Off-road Opt-In “SOON” funds which provides funds to accelerate cleanup of off-road diesel vehicles.</p> <p>h) Construction on-road haul trucks shall be model year 2007 <u>2010</u> or newer <u>if diesel-fueled</u>.</p> <p>i) Information on ridesharing programs shall be made available to construction employees.</p> <p>j) During construction, lunch options shall be provided onsite.</p> <p>k) A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints per AQMD Standards.</p> <p>l) <u>Off-site construction shall be limited to the hours between 6 a.m. to 8 p.m. on weekdays only. Construction during City holidays shall not be permitted.</u></p>						
<p>4.3.6.2B Prior to issuance of any grading permits, a traffic control plan shall be submitted to and approved by the City of Moreno Valley that describes in detail the location of equipment staging areas, stockpiling/storage areas, construction parking areas, safe detours around the project construction site, as well as provide temporary traffic control (e.g., flag person) during construction-related truck hauling activities. Construction trucks shall be rerouted away from sensitive receptor areas. Trucks shall use State Route 60 <u>using World Logistics Center Parkway (formerly Theodore Street)</u>, Redlands Boulevard (north of Eucalyptus Avenue), and Gilman Springs Road. In addition to its traffic safety purpose, the <u>Construction Staging Plan</u> traffic control plan can minimize traffic congestion and delays that increase idling emissions. A copy of the approved Traffic Control Plan shall be retained on site in the construction trailer.</p>	Transportation Division	Once prior to issuance of grading permits	Prior to issuance of any grading permits	Review and Approval of Traffic Control Plan.		Withhold Grading Permit
<p>4.3.6.2C The following measures shall be applied during construction of the project to reduce volatile organic compounds (VOC):</p>	<u>City Engineering Land</u>	Throughout construction	During Construction	On-site inspection		Issuance of a Stop Work Order

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<p>a) Non-VOC containing paints, sealants, adhesives, solvents, asphalt primer, and architectural coatings (where used), or pre-fabricated architectural panels shall be used in the construction of the project to the maximum extent practicable. If such products are not commercially available, products with a VOC content of 100 grams per Liter or lower for both interior and exterior surfaces shall be used.</p> <p>b) Leftover paint shall be taken to a designated hazardous waste center.</p> <p>c) Paint containers shall be closed when not in use.</p> <p>d) Low VOC cleaning solvents shall be used to clean paint application equipment.</p> <p>e) Paint and solvent-laden rags shall be kept in sealed containers.</p>	<p><u>Development, Building and Safety Division</u> and Planning Division</p>					
<p>4.3.6.2D No grading shall occur on days with an Air Quality Index forecast greater than 150 for particulates or ozone as forecasted for the project area (Source Receptor Area 24).</p>	<p><u>City Land Development Division/Public Works</u></p>	<p>As needed during construction</p>	<p>During construction</p>	<p>Review of Construction Documentation and On-site Inspection</p>		<p>Issuance of a Stop Work Order</p>
<p>4.3.6.2E <u>The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.</u></p>	<p><u>SCAQMD</u></p>	<p><u>Per ISR Rule</u></p>	<p><u>Ongoing</u></p>	<p><u>Per ISR Rule</u></p>		<p><u>Per ISR Rule and SCAQMD Settlement Agreement</u></p>
<p>4.3.6.3A Prior to issuance of occupancy permits for each warehouse building within the WLCSP, the developer shall demonstrate to the City that vehicles can access the building using paved roads and parking lots <u>and that access on unpaved roads is prohibited.</u></p>	<p>City Planning Division</p>	<p>Once Before <u>Permitting issuing Certificate of Occupancy</u></p>	<p>Prior to issuance or occupancy permits for each warehouse</p>	<p>Review and Approval of building plans.</p>		<p>Withhold Occupancy Permit</p>
<p>4.3.6.3B The following shall be implemented as indicated: Prior to Issuance of a Certificate of Occupancy</p> <p>a) Signs shall be prominently displayed informing truck drivers about the California Air Resources Board diesel idling regulations and the prohibition of parking in residential areas.</p> <p>b) Signs shall be prominently displayed in all dock and delivery areas advising of the following: engines shall be turned off when not in use; trucks shall not idle for more than three consecutive minutes; telephone numbers of the building</p>	<p>City Planning Division and Building and Safety</p> <p>Public Works Inspector</p>	<p>Once before issuance of any certificate of Occupancy and ongoing basis</p> <p>On an ongoing basis</p>	<p>Prior to issuance of Certificate of Occupancy</p> <p>During on-site inspections</p>	<p>On-site inspections</p> <p>Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals,</p>		<p>Withhold Certificate of Occupancy</p> <p>If any related entitlement has been issued, revocation of the entitlement is warranted Pursuant to City</p>

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<p>facilities manager and the California Air Resources Board to report air quality violations.</p> <p>c) Signs shall be installed at each exit driveway providing directional information to the City’s truck route. Text on the sign shall read “To Truck Route” with a directional arrow. Truck routes shall be clearly marked per the City Municipal Code.</p> <p>On an Ongoing Basis</p> <p>d) Tenants shall maintain records on fleet equipment and vehicle engine maintenance to ensure that equipment and vehicles are maintained pursuant to manufacturer’s specifications. The records shall be maintained on site and be made available for inspection by the City.</p> <p>e) Tenant’s staff in charge of keeping vehicle records shall be trained/certified in diesel technologies, by attending California Air Resources Board approved courses (such as the free, one-day Course #512). Documentation of said training shall be maintained on-site and be available for inspection by the City.</p> <p>f) Tenants shall be encouraged to become a SmartWay Partner.</p> <p>g) Tenants shall be encouraged to utilize SmartWay 1.0 or greater carriers.</p> <p>h) Tenants’ fleets shall be in compliance with all current air quality regulations for on-road trucks including but not limited to California Air Resources Board’s Heavy-Duty Greenhouse Gas Regulation and Truck and Bus Regulation.</p> <p>i) Information shall be posted in a prominent location available to truck drivers regarding alternative fueling technologies and the availability of such fuels in the immediate area of the World Logistics Center.</p> <p>j) Tenants shall be encouraged to apply for incentive funding (such as the Voucher Incentive Program [VIP], Carl Moyer, etc.) to upgrade their fleet.</p> <p>k) All yard trucks (yard dogs/yard goats/yard jockeys/yard hostlers), landscaping equipment, and industrial sweepers shall be powered by electricity, natural gas, propane, or an equivalent non-diesel fuel. Any off-road engines in the yard trucks and landscaping equipment shall have emissions standards equal to Tier 4 Interim or greater. Any on-road</p>				<p>On-site Inspections</p> <p>Collection of VIN data will be identified as the primary method of verifying truck compliance for future project-specific approvals</p>		<p><u>Municipal Code</u></p>

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<p>engines in the yard trucks shall have emissions standards that meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025.</p> <p>l) All diesel trucks entering logistics sites shall meet or exceed 2010 engine emission standards specified in California Code of Regulations Title 13, Article 4.5, Chapter 1, Section 2025 or be powered by natural gas, electricity, or other diesel alternative. Facility operators shall maintain a log of all trucks entering the facility to document that the truck usage meets these emission standards. This log shall be available for inspection by City staff at any time.</p> <p>m) All standby emergency generators shall be fueled by natural gas, propane, or any non-diesel fuel.</p> <p>n) Truck and vehicle idling shall be limited to three (3) minutes.</p> <p>o) <u>For each building, the developer shall provide ten electrical outlets for the use of electric auxiliary power units (APUs) to be located at the dock doors near the shipping offices, or an alternate location with access to electrical outlets.</u></p> <p>p) <u>All industrial sweepers shall be equipped with High-efficiency particulate air (HEPA) filters.</u></p>						
<p>4.3.6.3C Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a publicly-accessible fueling station shall be operational within the Specific Plan area offering alternative fuels (natural gas, electricity, etc.) for purchase by the motoring public. Any fueling station shall be placed a minimum of 1000 feet from any off-site sensitive receptors or offsite zoned sensitive uses. This facility may be established in connection with the convenience store required in Mitigation Measure 4.3.6.3D.</p>	City Building and Safety	Once before issuance of building permits	Prior to issuance of building permits for more than 25 million total square feet of logistics warehousing within the WLC Specific Plan	Review and approval of building plans		Withhold building permit
<p>4.3.6.3D Prior to the issuance of building permits for more than 25 million square feet of logistics warehousing within the Specific Plan area, a site shall be operational within the Specific Plan area offering food and convenience items for purchase by the motoring public. This facility may be established in connection with the fueling station required in Mitigation Measure 4.3.6.3C.</p>	City Building and Safety	Before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold building permit
<p>4.3.6.3E Refrigerated warehouse space is prohibited unless it can be demonstrated that the environmental impacts resulting from the inclusion of refrigerated space and its associated facilities,</p>	City Planning Division	Once before plot plan	Prior to issuance of any building	Review and approval of building plans		Withhold building permit

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including, but not limited to, refrigeration units in vehicles serving the logistics warehouse, do not exceed any environmental impact for the entire World Logistics Center identified in the program Environmental Impact Report. Such environmental analysis shall be provided with any warehouse plot plan proposing refrigerated space. Any such proposal shall include electrical hookups at dock doors to provide power for vehicles equipped with Transportation Refrigeration Units (TRUs).		review for any building.	permit			
<u>4.3.6.3F</u> The project shall comply with the SCAQMD proposed Indirect Source Rule for any warehouses that are constructed after the rule goes into effect. This rule is expected to reduce NOX and PM10 emissions during construction and operation. Emission reductions resulting from this rule were not included in the project analysis.	<u>SCAQMD</u>	<u>Per ISR Rule</u>	<u>Ongoing</u>	<u>Per ISR Rule</u>		<u>Per ISR Rule and SCAQMD Settlement Agreement</u>
<u>4.3.6.4A</u> The following measures shall be incorporated as conditions to any Plot Plan approval within the Specific Plan: a) All tenants shall be required to participate in Riverside County's Rideshare Program. b) Storage lockers shall be provided in each building for a minimum of three percent of the full-time equivalent employees based on a ratio of 0.50 employees per 1,000 square feet of building area. Lockers shall be located in proximity to required bicycle storage facilities. c) Class II bike lanes shall be incorporated into the design for all project streets. d) The project shall incorporate pedestrian pathways between on-site uses. e) Site design and building placement shall provide pedestrian connections between internal and external facilities. f) The project shall provide pedestrian connections to residential uses within 0.25 mile from the project site. g) A minimum of two electric vehicle-charging stations for automobiles or light-duty trucks shall be provided at each building. In addition, parking facilities with <u>200</u> parking spaces or more shall be designed and constructed so that at least <u>six</u> percent of the total parking spaces are capable of supporting future electric vehicle supply equipment (EVSE) charging locations. <u>Sizing of conduit and service capacity at the time of construction shall be sufficient to install Level 2 Electric Vehicle Supply Equipment (EVSE) or greater.</u>	City Building and Safety, City Planning Division, and Transportation Engineering Division/Public Works	Once before plot plan approval for any building.	Prior to plot plan approval	Review and approval of plot plans		Withhold plot plan approval

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<p>h) Each building shall provide indoor and/or outdoor - bicycle storage space consistent with the City Municipal Code and the California Green Building Standards Code. Each building shall provide a minimum of two shower and changing facilities for employees.</p> <p>i) Each building shall provide preferred and designated parking for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles equivalent to the number identified in California Green Building Standards Code Section 5.106.5.2 or the Moreno Valley Municipal Code whichever requires the higher number of carpool/vanpool stalls.</p> <p>j) The following information shall be provided to tenants: onsite electric vehicle charging locations and instructions, bicycle parking, shower facilities, transit availability and the schedules, telecommunicating benefits, alternative work schedule benefits, and energy efficiency.</p>						
<p>4.3.6.5A <u>(a) The house at 30220 Dracaea Avenue shall be demolished prior to the issuance of the first grading permit for grading within the World Logistics Center.</u> <u>(b) An air filtration system meeting ASHRSE Standard 52.2 MERV-13 standards shall be offered to the owners of the houses located at 13100 World Logistics Center Parkway (formerly Theodore Street) and 12400 World Logistics Center Parkway (formerly Theodore Street). The developer shall offer to install the air filtration system to the owners of the two properties within two months of the certification of the Final Revised FEIR. Prior to the issuance of the first grading permit within the World Logistics Center, documentation shall be provided to the City confirming that an offer to install the air filtration system has been extended to the owners of each of the two properties. The owners of the two properties shall be under no obligation to accept the offer. Each property owner shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, the developer shall work with each owner to ensure the air filtration system is properly installed within one year of acceptance.</u></p>	<p><u>City Building and Safety, City Planning Division</u></p> <p><u>City Building and Safety, City Planning Division</u></p>	<p><u>Once prior to issuance of first grading permit within the WLC.</u></p> <p><u>Prior to issuance of the first grading permit within the WLC.</u></p>	<p><u>Prior to issuance of the first grading permit.</u></p> <p><u>Initial offer within two months of certifying the Final RSFEIR.</u></p> <p><u>Documentation provided prior to issuance of the first grading permit.</u></p>	<p><u>Site inspection.</u></p> <p><u>Review of documentation.</u></p>		<p><u>Withhold grading permits.</u></p>

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include a minimum six-foot tall chain link fence or similar barrier to separate warehouse activity from the setback area. This fence/barrier shall have metal mesh installed below and above ground level to prevent animals from moving between the development area and the setback area.	City Land Development Division Manager	permits and as needed during construction and operating	Prior to issuance of building permits	<u>Plot plan/grading plan review.</u>		
Within Planning Areas 10 and 12, all truck activity areas adjacent to the 250-foot <u>setback</u> <u>buffer</u> area along the southern property line shall be enclosed by minimum 11-foot tall solid walls to reduce noise and lighting impacts on the adjacent property. This measure shall be implemented to the satisfaction of the Planning Official.	City Land Development Division Manager	Once before issuance of building permits as needed during construction and operating	Prior to issuance of grading permits.	<u>Plot plan/grading plan review.</u>		<u>Withhold grading permit and plot plan approval.</u>
A preliminary landscape plan for the 250-foot setback area shall be submitted with all Plot Plan applications for lots adjacent to the California Department of Fish and Wildlife <u>SJWA</u> property. Precise landscape plans shall be submitted with any grading permit for said lots and must be approved prior to the issuance of any building permit on said lots. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the World Logistics Center Specific Plan. No plant species listed in Section 6.1.4 of the Western Riverside County Multiple Species Habitat Conservation Plan shall be installed within the setback area. Cottonwood trees shall be planted within the setback area consistent with the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division Manager.	City Land Development Division Manager	Once before issuance of grading permits for Plot Plans adjacent to the <u>SJWA</u> property. building permits as needed during construction and operating	Prior to issuance of grading permits.	<u>Plot plan/grading plan review.</u>		<u>Withhold grading permit and plot plan approval.</u>
4.4.6.1B Each Plot Plan application in Planning Areas 10 and 12 shall provide runoff management and water quality facilities adequate to minimize downstream erosion, maintain water quality standards and retain pre-development flows in a manner meeting the approval of the City Engineer <u>Moreno Valley and RWQCB requirements</u> . All drainage improvements shall be designed to minimize runoff and erosional impacts on adjacent property. This measure shall be implemented to the satisfaction of the Land Development Division Manager of Public Works.	City Engineering Division and City Land Development Division Manager	Once upon submittal of plot plan application	Prior to approval of plot plan	Review and approval of plot plans within Planning Areas 10 and 12		Withhold approval of plot plan

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<p>4.4.6.32A Prior to the issuance of grading permits the applicant shall secure a jurisdictional determination from the United States Army Corps of Engineers (USACE) and confirm with the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) if drainage features mapped on the property to be developed are subject to jurisdictional authority. If the features are subject to regulatory protection, the applicant will <u>shall</u> secure permit approvals with the appropriate agencies prior to initiation of construction. Compensatory riparian habitat mitigation will <u>shall</u> be provided at a minimum ratio of 1: 1 (replacement riparian habitat to impacted riparian habitat) to ensure no net loss of riparian habitat or aquatic resources. It should be noted that this is a minimum recommended ratio but the actual permitting ratio may be higher. These detention basins will <u>shall</u> be oversized to accommodate the provision of areas of riparian habitat. Maintenance of the basins will <u>shall</u> be limited to that necessary to ensure their drainage and water quality functions while encouraging habitat growth. Riparian habitat mitigation will <u>shall</u> be provided concurrent to or prior to impacts. A Compensatory Mitigation Plan will <u>shall</u> be prepared for all unavoidable impacts and will <u>shall</u> be consistent with the United States Army Corps of Engineers (USACE) / United States Environmental Protection Agency's Compensatory Mitigation for Losses of Aquatic Resources: Final Rule and the United States Army Corps of Engineers Standard Operating Procedure for Determination of Mitigation Ratios.</p> <p>The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board to establish the need for permits based on the results of a recent jurisdictional delineation and final design plans for each of the proposed facilities. Consultation with the three agencies shall take place and appropriate permits obtained for project-level development. Compensation for losses associated with the altering of drainages on site shall be in agreement with the permit conditions and in coordination with compensation outlined below.</p> <p>Mitigation will <u>shall</u> consist of onsite creation, offsite creation, or purchase of mitigation credits from an approved mitigation bank. As outlined in the WLC programmatic DBESP report, onsite riparian habitat will <u>shall</u> be created at a minimum 1: 1 ratio due</p>	<p>City Planning Division and Land Development Division Manager</p>	<p>Once prior to issuance of grading permits</p>	<p>Prior to the issuance of grading permits</p>	<p>Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.</p>		<p>Withhold grading permit</p>

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to the poor quality of onsite habitat. New habitat will <u>shall</u> be created within the onsite detention/infiltration basins to the extent allowed by the resource agencies to reduce storm flows, improve water quality, and reduce sediment transport. Habitat creation will <u>shall</u> include the installation of mule fat scrub or similar riparian scrub habitat to promote higher quality riparian habitat, but still maintain the basins for their primary role as detention facilities. The use of these areas as conservation areas would require consent from CDFW and the City of Moreno Valley (MM BIO-2b and MM DBESP 1 through 3).						
<p>4.4.6.32B As required by the Resource Conservation Agency (RCA), a program-level Determination of a Biological Equivalent or Superior Preservation (DBESP) for impacts to Riverine/Riparian habitat has been prepared and shall be approved by the Resource Conservation Agency prior to project <u>grading permit</u> approval. The Determination of a Biological Equivalent or Superior Preservation includes a general discussion of mitigation options for impacts to riverine/riparian areas as well as general location and size of the mitigation area and includes a monitoring program.</p> <p>If impacts to riparian habitat within the World Logistics Center Specific Plan (WLCSP) <u>WLC site</u> cannot be avoided at the time of specific development, then a separate project level Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared to identify project-specific impacts to riparian habitat and incorporate mitigation options identified in Mitigation Measure 4.4.6.32A.</p> <p>A project-level Determination of a Biological Equivalent or Superior Preservation for each specific development shall be prepared to document measures to reduce impacts to riparian/riverine habitats in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The project-level Determination of a Biological Equivalent or Superior Preservation shall include specific measures to reduce impacts to riparian areas and provide mitigation in the form of onsite preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at offsite or onsite locations.</p>	City Planning Division	Once upon submittal of plot plan application <u>grading permit</u>	Prior to the approval of any plot plans <u>grading permit</u>	Review and approval of site-specific DBESP and review and approval of plot plans.	Withhold <u>grading permit approval</u> . Approval of plot plans	

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<p>Therefore, mitigation. Mitigation required for compensation for impacts to riparian/ riverine areas will shall require a minimum of 1:1 mitigation ratio of riparian/riverine mitigation land.</p> <p>As outlined in the WLC programmatic DBESP, erosion control improvements will shall be installed within Drainage 9 to reduce sediment transport, and additional riparian habitat will shall be enhanced within this drain following the installation of the erosion control improvements (MM DBESP 4 and 5).</p>						
<p>4.4.6.3C Prior to issuance of any grading permit for any offsite improvements that support development within the World Logistics Center Specific Plan <u>WLC site</u>, the developer shall retain a qualified biologist to prepare a jurisdictional delineation (JD) for any drainage channels affected by construction of the offsite improvements. This jurisdictional delineation shall be submitted to the U.S. Army Corps of Engineers (USACE) and California Department of Fish and Wildlife (CDFW) for review and concurrence. If the offsite improvements will not affect any identified jurisdictional areas, no United States Army Corps of Engineers permitting is required. However, permitting through the Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (i.e., Streambed Alteration Agreement) may still be required for these improvements. The applicant shall consult with United States Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board to establish the need for permits based on the results of the 2013 <u>2013</u> jurisdictional delineation and final design plans for each of the proposed the facilities. Consultation with the three agencies shall take place and appropriate permits obtained. Compensation for losses associated with any altered offsite drainages shall be in agreement with the permit conditions, <u>with a minimum 1:1 mitigation ratio</u>. Any landscaping associated with these offsite improvements shall use only native species to help protect biological resources residing within or traveling through these drainages per Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Table 6.1.2. This measure shall be implemented to the satisfaction of the City Planning Division in consultation with the U.S. Fish and Wildlife Service, U.S. Army Corps. of Engineers, and the California Department of Fish and Wildlife.</p>	<p>City Planning Division</p> <p>City Planning Division</p>	<p>Once before issuance of grading permit</p> <p>Once before issuance of grading permit</p>	<p>Prior to issuance of grading permit</p> <p>Prior to issuance of grading permit</p>	<p>Review and Approval of jurisdictional delineation</p> <p>Written verification of USACE approval of jurisdictional determination and Clean Water Act Section 404 permit.</p>	<p>Withhold Grading Permit</p> <p>Withhold Grading Permit</p>	

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>4.4.6.43A Pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC), site preparation activities (removal of trees and vegetation) shall be avoided during the nesting season of potentially occurring native and migratory bird species (generally February 1 to August 31). If site preparation activities must occur during the nesting season, a pre-activity field survey shall be conducted by a qualified biologist prior to issuance of grading permits for such development. The survey shall determine if active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code are present in the construction zone. If active nests of these species are found, the developer <u>applicant</u> shall establish an appropriate buffer zone with no grading or heavy equipment activity within of 500 feet from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed) 250 feet from passerine birds, or 100 feet for sensitive or protected songbird nests. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the <u>buffer setback</u> area at the discretion of the biological monitor in consultation with CDFW. In the event no special status avian species are identified within the limits of disturbance, no further mitigation is required. In the event such species are identified within the limits of ground disturbance, mitigation measure 4.4.6.3B4B shall also apply. This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Once before issuance of grading permit	One week prior to issuance of grading permit	<p>If grading activities will take place within nesting season provide written evidence a qualified biologist has been retained by the applicant to conduct an onsite nesting survey prior to grading.</p> <p>If nesting birds are present, biologist will establish a construction buffer zone of a minimum from an active listed species or raptor nest, 300 feet from other sensitive or protected bird nests (non-listed), or 100 feet for sensitive or protected songbird nests</p>		Withhold Grading Permit
	City Planning Division	Onsite Inspection	One week prior to issuance of grading permit			Issuance of a stop Work Order
<p>4.4.6.3B4B If it is determined that project-related grading or construction will affect nesting migratory bird species, no grading or heavy equipment activity shall take place within the limits established in Mitigation Measure 4.4.6.3A4A until it has been determined by a qualified biologist that the nest/burrow is no longer active, and all juveniles have fledged the nest/burrow. This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Once Before Construction and onsite inspection	Prior to disturbance of site	Onsite inspection		Issuance of a Stop Work Order
<p>4.4.6.3C4C The loss of foraging habitat for golden eagle and white-tailed kite will be mitigated by payment of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) fee and the creation of a landscaped <u>buffer setback</u> area adjacent to the San Jacinto Wildlife Area property (SJWA) property. First, the payment of the Western Riverside County</p>	City Planning Division	Once before issuance of grading permits	Prior to disturbance of site	Written verification of payment of MSHCP fees		<u>Withhold</u> Withdraw Grading Permit

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Multiple Species Habitat Conservation Plan fee will <u>shall</u> be required on a project-by-project basis. Second, a 250-foot setback as described in Mitigation Measure 4.4.6.1A will <u>shall</u> be established within the World Logistics Center Specific Plan area <u>WLC site</u> . This area will reduce impacts to raptor species foraging in the adjacent San Jacinto Wildlife Area open space areas.						
4.4.6.3D 4D A pre-construction clearance survey for burrowing owl shall be conducted by a qualified biologist no more than thirty (30) days prior to any grading or ground disturbing activities within the project area <u>WLC site</u> . In the event no burrowing owls are observed within the limits of ground disturbance. no further mitigation is required.	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits	Review of pre-construction survey for burrowing owls		Withhold Grading Permits
If construction is to be initiated during the breeding season (February 1 through August 31) and burrowing owl is determined to occupy any portion of the disturbance area during the 30-day pre-construction survey, construction activity shall maintain a 500-foot buffer area around any active nest/burrow until it has been determined that the nest/burrow is no longer active, and all juveniles have fledged to the nest/burrow. If this avoidance buffer cannot be maintained, consultation with the California Department of Fish and Wildlife (CDFW) shall take place and an appropriate avoidance distance established. No disturbance to active burrows shall occur without appropriate permitting through the Migratory Bird Treaty Act and/or California Department of Fish and Wildlife.	City Planning Division	Once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	If construction takes place between Feb 1 – Aug 31 and nesting burrowing owl is present, a 500 ft. construction buffer shall be maintained from the nest until all juveniles have fledged.		Issuance of a Stop Work Order
If active burrowing owl burrows are detected outside the breeding season (September through January), or within the breeding season but Owls are not nesting or in the process of nesting, active and/or passive relocation may be conducted following consultation with the California Department of Fish and Wildlife. A relocation plan may be required by California Department of Fish and Wildlife if active and/or passive relocation is necessary. The relocation plan will <u>shall</u> outline the basic process and provide options for avoidance. and mitigation. Artificial burrows may be constructed within the buffer area south of the World Logistics Center Specific Plan. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor in consultation with CDFW.	City Planning Division	Onsite inspection once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	If construction takes place between Sept 1- Jan 31 and burrowing owl outside the nesting season present, a passive relocation plan shall be prepared by a qualified biologist and approved by the City.		Issuance of a Stop Work Order
A relocation plan may be required by California Department of Fish and Wildlife if active or passive relocation is necessary.						

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Artificial burrows may be constructed within appropriate burrowing owl habitat within the proposed open space/conservation area (Planning Area 30), a 74.3-acre area in the southwest portion of the Specific Plan. This area abuts the Lake Perris State Recreation Area (LPSRA) which is already in conservation. If suitable habitat is not present in Planning Area 30, owls may be relocated to the SJWA, the 250-foot buffer <u>setback</u> area or other suitable onsite or off-site areas. Construction activity may occur within 500 feet of the burrows at the discretion of the biological monitor.	City Planning Division	Onsite inspection once 30-days prior to construction/grading	Prior to issuance of any grading permits and during construction	Written verification a relocation plan has approved by the California Department of Fish and Wildfire.		Issuance of a Stop Work Order
4.4.6.3E 4.4.6.3F Prior to the approval of any Plot Plans proposing the development of land including or adjacent to Drainage 9, a protocol survey for the Los Angeles Pocket Mouse (LAPM), including 100 feet upstream and downstream of the affected reach shall be prepared by a qualified biologist and submitted to the City. If the affected drainage is not occupied, the area is considered not to be occupied and development can continue without further action. If the species is found within the specific survey area, no development shall occur until an appropriate mitigation fee is paid or appropriate amount of land set aside on the project <u>WLC</u> site or off site to compensate for any loss of occupied Los Angeles Pocket Mouse habitat. Alternatively, individuals may be relocated to the 250-foot setback zone along the southern boundary of the property identified in Mitigation Measure 4.4.6.1A, or other appropriate areas as determined by the United States Fish and Wildlife Service. If necessary, this measure shall also be coordinated with Mitigation Measure 4.4.6.2B regarding preparation and processing of a Determination of a Biological Equivalent or Superior Preservation report. This measure shall be implemented to the satisfaction of the City Planning Division.	City Planning Division	Once prior to plot plan approval for development of land including or adjacent to Drainage 9	Prior to plot plan approval	Submittal of a LAPM protocol survey report to the City.		Withhold Approval <u>Approval</u> Plot Plan <u>Approval</u>
4.4.6.3F 4.4.6.3F Prior to approval of any discretionary permits for development within Planning Areas 10 and 12, a Biological Resource Management Plan (BRMP) shall be prepared to prescribe how the 250-foot setback area outlined in Mitigation Measure 4.4.6.1A will be developed and maintained. This plan will <u>shall</u> identify frequent and infrequent vegetation management requirements (i.e., removal of invasive plants) and the planting and maintaining trees to provide roosting and nesting opportunities for raptors and other birds. The Biological	City Planning Official	Once before approval of any discretionary permits within Planning Areas 10 & 12 Onsite inspection	Prior to approval of any discretionary permits within planning Areas 10 & 12	Review and approval of a BRMP		Withhold Discretionary Permit

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<p>Resource Management Plan will <u>shall</u> also describe how relocation of listed or sensitive species will occur from other locations as outlined in Mitigation Measures 4.4.5.2A, 4.4.6.3D4D, and 4.4.6.3E4E.</p> <p>The Biological Resource Management Plan shall be reviewed and approved by the Planning Official in consultation with the San Jacinto Wildlife Area Manager. The Biological Resource Management Plan shall cover all the land within the 250-foot setback zone within Planning Areas 10 and 12. Implementation of the plan shall be supervised by a qualified biologist to the satisfaction of the City Planning Division.</p>						
<p>4.4.6.3G4G Mitigation Measure 4.4.6.1A specifies that a landscape plan shall be submitted with any development proposal for lots adjacent to the California Department of Fish and Wildlife (CDFW) San Jacinto Wildlife Area (SJWA) property prior to issuance of a precise grading permit. The landscape plan shall be prepared by a licensed landscape architect in consultation with a qualified biologist and shall be consistent with the design standards contained in the Specific Plan. No plant species listed in Section 6.1.4 or Table 6.2 of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) shall be installed within the setback area. In conjunction with development adjacent to the San Jacinto Wildlife Area (SJWA), cottonwood trees shall be planted within the 250-foot setback area, consistent will the World Logistics Center Specific Plan plant palette (per DBESP MM 8).</p> <p>During construction, the runoff leaving construction areas will <u>shall</u> be directed to onsite detention basins and away from downstream drainage features located offsite. All projects within the WLCSP will <u>WLC site shall</u> be required to prepare a Storm Water Pollution Prevention Plan (as outlined in MM 4.9.6.2B). Regarding the 250-foot setback area, pedestrian and vehicular access to areas of riparian/riverine habitat will <u>shall</u> be prohibited except for controlled maintenance access. Finally, no grading shall be permitted within conserved riparian/riverine habitat areas except for grading necessary to establish or enhance habitat areas (DBESP MM 6, 7, 9, and 10)</p>	City Planning Division and Land Development Division Manager	Once before to issuance of a precise grading permit	Prior to issuance of a precise grading permit	Review and approval of landscape.		Withhold Grading Permit

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4.4.6.3H4H As outlined in Mitigation Measure 4.4.6.1A, development adjacent to the 250-foot open space setback shall have a six-foot chain link fence or similar barrier to help separate human activity and the buffer setback area. Any chain link fencing installed on any properties adjacent to the 250-foot buffer setback area shall have metal mesh installed below and above ground level to prevent animals from accessing new development areas.	City Planning Division	Once before building permits	Prior to issuance of certificate of occupancy	Review and approval of fencing		Withhold Certificate of Occupancy plot plan approval <u>Withhold grading permits</u>
4.4.6.3I 4 The individual property owner and/or Property Owners Association (POA) as appropriate shall be responsible for maintaining the various onsite landscaped areas, open improved or natural drainage channels, and detention or flood control basins in a manner that provide for fuel management and vector control pursuant to standards maintained by the City Fire Marshall and County Department of Environmental Health – Vector Control Group. This measure requires the individual owner or Property Owners Association (POA) to manage vegetation in and around these areas or improvements so as to not represent a fire hazard as defined by the City Fire Department through the substantial buildup of combustible materials. This measure also requires the individual owner or Property Owners Association to manage vegetation and standing water in drainage channels and basins such that they do not encourage or allow vectors to occur (primarily rats and mosquitoes). Runoff shall not be allowed to stand in channels or basins for more than 72hours without treatment or maintenance to prevent establishment of mosquitoes per published County vector control guidelines and “Best Management Practices for Mosquito Control on California State Properties” which is available from the California West Nile Virus website at http://www.westnile.ca.gov/resources . This measure shall be implemented by the Project Owners Association in consultation with City Fire Department and Riverside County Department of Environmental Health – Vector Control Group	City Fire Department; Land Development Division; and Stormwater Management Section of Public Works	As needed basis	Onsite Inspections during operations	Onsite Inspections		Issuance of Code Enforcement Citations
4.4.6.3I4 A Fuel Management Plan shall be prepared on a project-by-project basis for those Planning Areas adjacent to the south and east boundary of the World Logistics Center Specific Plan WLC site adjacent to Western Riverside County Multiple Species Habitat Conservation Plan Conservation Areas. The Fuel Management Plan shall be prepared by the project proponent <u>applicant</u> and submitted for approval prior to plot plan approval	City Planning Division	Prior to issuance of Building Permit plot plan approval <u>Building Permit plot plan approval</u>	Prior to issuance of building permit plot plan approval <u>plot plan approval</u>	Review and Approval of Building Permit plot plan approval <u>Building Permit plot plan approval</u> and Onsite Inspection		Withhold Building Permit plot plan approval <u>Building Permit plot plan approval</u>

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<p>for those projects on the southern and eastern Western Riverside County Multiple Species Habitat Conservation Plan boundary. Per the Western Riverside County Multiple Species Habitat Conservation Plan guidelines, the Fuel Management Plan shall include the following:</p> <ul style="list-style-type: none"> • A plant palette of adequate plant species that may be planted within the Fuel Management Area, which will be approved by a biologist familiar with the plant requirements of the area. • A list of non-native invasive plants that are prohibit from installation. • Maintenance activities and a maintenance schedule. <p>Fuel modification zones shall be mapped and include an impact assessment as required under California Environmental Quality Act guidelines for a project-level analysis. The plan shall demonstrate that the adjacent Western Riverside County Multiple Species Habitat Conservation Plan Areas are adequately protected from expected fire risks.</p>						
<p>4.4.6.3K4K Prior to approval of any plot plans for development adjacent to the SJWA, the applicant shall demonstrate that direct light rays have been contained within the development area, per requirements of the MSHCP Section 6.0 which states, "Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting." This measure shall be implemented to the satisfaction of the City Planning Division.</p>	City Planning Division	Prior to Issuance of Building Permit <u>plot plan approval</u>	Prior to Issuance of Building Permit <u>plot plan approval</u>	Review and Approval of Building Permit <u>plot plan</u> and Onsite Inspection		Withhold <u>Building Permit</u> <u>Plot Plan Approval</u>
4.5 CULTURAL RESOURCES						
<p>4.5.6.1A Prior to the approval of any grading permit for any of the "Light Logistics" parcels, the parcels shall be evaluated for significance by a qualified archaeologist. A Phase 1 Cultural Resources Assessment shall be conducted by the project archaeologist and an appropriate tribal representative(s) on each of the "Light Logistics" parcel to determine if significant archaeological or historical resources are present.</p> <p>A Phase 2 significance evaluation shall be completed for any of these sites in order to determine if they contain significant archaeological or historical resources. Cultural resources include but are not limited to stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic</p>	Planning Division and Land Development Division/Public Works	Once Before Permitting	Prior to the approval of any grading or discretionary permit for any of the "Light Logistics"	Review and Approval of Phase I Cultural Resources Assessment		<p>Withhold <u>grading permit approval</u> <u>Grading or Discretionary Permits</u></p> <p><u>Issue stop work order if cultural resources are found</u></p>

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<p>dumpsites. All resources determined to be prehistoric or historic shall be documented using DPR523 forms for archival research/storage in the Eastern Information Center (EIC). If the particular resource is determined to be not significant, no further documentation is required. If prehistoric resources are determined to be significant, they shall be considered for relocation or archival documentation. If any resource is determined to be significant, a Phase 3 recovery study shall be conducted to recover remaining significant cultural artifacts. If prehistoric archaeological/cultural resources are discovered during the Phase 1 survey and it is determined that they cannot be avoided through site design, they shall be subject to a Phase 2 testing program. The project archaeologist in consultation with appropriate tribal group(s) shall determine the significance of the resource(s) and determine the most appropriate disposition of the resource(s) in accordance with applicable laws, regulations and professional practices (per Cultural Report MM CR-1, MM CR-2, MM CR-7 Table 3, pg. 74).</p>						
<p>4.5.6.1B Prior to the issuance of any grading or ground-disturbing permit for construction of off-site improvements a qualified archaeologist shall be retained to prepare a Phase I cultural resource assessment (CRA) of the project site if an up to date Phase I cultural resource assessment is not available for the site at the time of development per Cultural Report MM CR-5, Table 3, pg. 74).</p> <p>Appropriate tribal representatives as identified by the City shall be invited by the Project Archeologist to participate in this assessment.</p> <p>If archaeological resources are discovered during construction activities, no further excavation or disturbance of the area where the resources were found shall occur until a qualified archaeologist evaluates the find. If the find is determined to be a unique archaeological resource, appropriate action shall be taken to (a) plan construction to avoid the archeological sites (the preferred alternative); (b) cap or cover archeological sites with a layer of soil before building on the affected project location; or (c) excavate the site to adequately recover the scientifically consequential information from and about the resource. At the</p>	<p>City Planning Division</p>	<p>Once before issuance of grading permits for off-site improvements and as Needed During Construction</p>	<p>Prior to the approval of any grading or ground-disturbing permit</p>	<p>Review and Approval of Phase I Cultural Resources Assessment</p> <p>Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities</p>		<p>Withhold Grading Permit or Issuance of Stop Work Order</p>

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<p>discretion of the project archaeologist, work may continue on other parts of the project site while the unique archaeological resource mitigation takes place. This measure shall be implemented to the satisfaction of the Planning Official.</p> <p>If the project archaeologist, in consultation with the monitoring Tribe(s), determines that the find is a unique archaeological resource, the resource site shall be evaluated and recorded in accordance with requirements of the State Office of Historic Preservation (OHP). If the resource is determined to be significant, data shall be collected by the qualified archaeologist and the findings of the report shall be submitted to the City. If the find is determined to be not significant no mitigation is necessary.</p> <p>Should a future project-level analysis show that cultural resource site CA-RIV-3346 will be directly or partially impacted by project-level construction, an Addendum cultural resource report must be prepared and include an analysis of the alternatives associated with mitigation for impacts to this resource following CEQA Guidelines Section 15126.4(b)(3). This information must be included in any project-level CEQA compliance documentation. It should be noted that Phase 3 data recovery is an acceptable mitigation action under CEQA Guidelines Section 15126.4(b)(3)(C) (per Cultural Report MM CR-3, Table 3, pg. 74).</p> <p>Should it be determined through a future project-level EIR analysis that prehistoric cultural resource sites CA-RIV-2993 and/or CA-RIV-3347 shall be directly impacted by future construction, these sites must be Phase 2 tested for significance (per Cultural Report MM CR-4, Table 3, pg. 74).</p>						

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<p>4.5.6.1C Prior to the issuance of any grading permits a qualified archaeologist shall be retained to monitor all grading and shall invite tribal groups to participate in the monitoring. Project-related archaeological monitoring shall include the following requirements per Cultural Report MM CR-6, MM CR-8, Table 3, pg.74):</p> <ol style="list-style-type: none"> All earthmoving shall be monitored to a depth of ten (10) feet below grade by the Project Archaeologist or his/her designated representative. Once all areas of the development project that have been cut to ten (10) feet below <u>existing</u> grade have been inspected by the monitor. the Project Archaeologist may, at his or her discretion, terminate monitoring if and only if no buried cultural resources have been detected; If buried cultural resources are detected, monitoring shall continue until 100 percent of virgin earth within the specific project area has been disturbed and inspected by the Project Archaeologist or his/her designated representative. Grading shall cease in the area of a cultural artifact or potential cultural artifact as delineated by the Project Archaeologist or his/her designated representative. A buffer of at a minimum 25 feet around the cultural item shall be established to allow for assessment of the resource. Grading may continue in other areas of the site while the particular find are investigated; and If prehistoric cultural resources are uncovered during grading, they shall be Phase 2 tested by the Project Archaeologist, and evaluated for significance in accordance with §15064.5(f) of the CEQA Guidelines. Appropriate actions for significant resources as determined by the Phase 2 testing include but are not limited to avoidance or capping, incorporation of the site in green space. parks, or delineation into open space. If such measures are not feasible, Phase 3 data recovery of the significant resource will be required, and curation of recovered artifacts and/or reburial, shall be required. A report associated with Phase 2 testing or Phase 3 data recovery must be delivered to the City and, if necessary, the museum where any recovered 	City Planning Division	Once before issuance of grading permits and As Needed During Construction	Prior to the issuance of grading permits	Provide evidence to the City that a qualified archaeological monitor has been retained to oversee all ground altering activities		Withhold Grading Permit

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<p>artifacts have been curated.</p> <p>5. No further grading shall occur in the area of the discovery until the City approves specific actions to protect identified resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p> <p>6. The developer shall make reasonable efforts to avoid, minimize, or mitigate significant adverse impacts on cultural resources The State Historic Preservation Office (SHPO) and local Native American tribes will be consulted and the Advisory Council on Historic Preservation will be notified within 48 hours of the find in compliance with 36 CFR 800.13(b)(3). This measure shall be implemented to the satisfaction of the Planning Official.</p>						
<p>4.5.6.1D Prior to the issuance of any grading permit the project archaeologist shall invite interested Tribal Group(s) representatives to monitor grading activities. Qualified representatives of the Tribal Group(s) shall be granted access to the project site to monitor grading as long as they provide 48-hour notice to the developer of their desire to monitor, so the developer can make appropriate safety arrangements on the site. This measure shall be implemented to the satisfaction of the Planning Official.</p>	City Planning Division	Once before issuance of grading permits and As Needed During Construction	Prior to the issuance of any grading permit within 3,750 feet of the southwest corner	Evidence of invitation to Tribal Group Representatives		Withhold Grading Permit
<p>4.5.6.1E It is possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources (archaeological or historical). In the event that buried cultural resources are discovered during grading and no Project Archaeologist or Historian is present, grading operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be retained to determine the most appropriate course of action regarding the resource. The Archeologist shall make recommendations to the City on the actions that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and</p>	Grading Contractor, Land Development Division/Public Works, and Planning Division	As Needed During Construction	During Grading and/or ground disturbing activities	Verification to the City a qualified archaeologist been retained		Issuance a Stop Work Order

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<p>evaluation of the finds in accordance with §15064.5 of the <i>CEQA Guidelines</i>. Cultural resources could consist of, but are not limited to, stone artifacts, bone, wood, shell, or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria. If the resources are determined to be unique historic resources as defined under §15064.5 of the <i>CEQA Guidelines</i>, appropriate protective actions for significant resources such as avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds shall be implemented by the project archaeologist and the City.</p> <p>No further grading shall occur in the area of the discovery until the City and Project Archaeologist approve the measures to address these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the City where they would be afforded long-term preservation to allow future scientific study.</p>						
<p>4.5.6.2A If any historic resources are found during implementation of Mitigation Measure 4.5.6.1A, the Project Archaeologist or Historian (as appropriate) shall offer any artifacts or resources to the Moreno Valley Historical Society (MVHS) or the Eastern Information Center/County Museum or the Western Science Center in Hemet as appropriate for archival storage. From the time any artifacts are turned over to the Moreno Valley Historical Society or other appropriate historical group, the developer shall have no further responsibility for their management or maintenance.</p>	City Planning Division	As Needed During Construction	During grading	A qualified archaeologist or historian(s) shall be retained by the applicant. A report of findings shall be submitted to the City after the finalization of construction		Issuance of a Stop Work Order
<p>4.5.6.2B As part of construction of the trail segment connecting Redlands Boulevard to the California Department of Fish and Wildlife property, the developer shall contribute \$5,000 to the City for the installation of a historical marker acknowledging the passing of Juan Bautista de Anza through this area during his exploration of California. This measure shall be incorporated into trail plans for this segment which will be subject to review and approval by the City Park and Recreation Department in consultation with the Moreno Valley Historical Society.</p>	City Park and Recreation Department	Once	Prior to approval of trail plans	Review and Approval of Trail Plans Written verification the \$5,000 has been paid		Withhold Approval of Trail Plans

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<p>4.5.6.2C Streets C and E shall follow the historical alignment of Alessandro Boulevard and shall be named Alessandro Boulevard.</p>	City Land Development/ Public Works City Park and Recreation Department	Once prior to issuance of plot plan	Prior to issuance of approval of plot plans for planning Areas along Alessandro boulevard	Review and Approval of Plot Plans		Withhold Plot Plan approval
<p>4.5.6.3A Prior to the issuance of any grading permits, a City-approved Paleontologist shall be retained to conduct paleontological monitoring as needed for all grading related to development. Development monitoring shall include the following actions:</p> <ol style="list-style-type: none"> 1. Monitoring must occur in areas where excavations are expected to exceed twenty (20) feet in depth, in areas where fossil-bearing formations are found during grading, and in all areas found to contain, or are suspected of containing, fossil-bearing formations. 2. To avoid construction delays, paleontological monitors shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates if they are unearthed. 3. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of specimens. 4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources. This measure shall be implemented to the satisfaction of the Planning Official. The Project Paleontologist and the Project Archaeologist described in Mitigation Measure 4.5.6.1C may be the same person if he/she meets the qualifications of both positions per Cultural Report MM PR-1, Table 4, pg. 76. 	City Planning Division	Once before issuance of grading permits and As Needed during Construction	Prior to issuance of any grading permits for development within the WLCSP	A qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A report of findings shall be submitted to the City after the finalization of construction		Withhold Grading Permit or Issuance of a Stop Work Order
<p>4.5.6.3B Prior to the issuance of any permits for the construction of off-site improvements, a qualified paleontologist shall conduct an assessment for paleontological resources on each off-site improvement location. If any site is determined to have a potential for exposing paleontological resources, the project paleontologist shall monitor off-site grading/excavation, subject to coordination with the City. Development monitoring shall include the following mitigation measures:</p>	City Planning Division	Once before issuance of grading permits and As Needed During Construction	Prior to issuance of grading permits for construction of any off-site improvements	A Qualified paleontologist(s) shall be retained by the applicant to monitor full time during the duration of ground disturbing activities. A Report		Withhold grading permit or issuance of a stop work order

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<p>1. Monitoring must occur in areas where excavations are expected to reach fossil-bearing formations during grading. This monitoring must be conducted by the Project Paleontologist in all areas found to or suspected of containing fossil-bearing formations.</p> <p>2. To avoid construction delays, the Project Paleontologist shall be equipped to salvage fossils and remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates as they are unearthed.</p> <p>3. The Project Paleontologist shall be empowered to temporarily halt or divert equipment to allow removal of specimens.</p> <p>4. Monitoring may be reduced if the potentially fossiliferous units described herein are not present, or, if present, are determined upon exposure and examination by the Project Paleontologist to have low potential to contain fossil resources.</p>				of findings shall be submitted to the City after the finalization of construction		

4.6 GEOLOGY AND SOILS

<p>4.6.6.1A Prior to approval of any projects for development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet, the City shall determine if a detailed fault study of the Casa Loma Fault Zone area is required based on available evidence.</p> <p>If necessary, any additional geotechnical investigations shall be prepared by a qualified geologist and determine if structural setbacks are needed, and shall identify specific remedial earthwork and/or foundation recommendations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site specific investigations, provide any additional necessary mitigation to meet California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements.</p> <p>Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final</p>	<p>City Engineer and Project Geologist and Land Development/ Public Works</p> <p><u>Building and Safety</u></p>	Once before project approvals	Prior to approval of any projects for future development between Redlands Boulevard and Theodore Street, south of Dracaea Avenue (projected east from Redlands Boulevard), and the area south of Alessandro from the Western boundary along the Mount Russell toe of slope easterly into the site 1,500 feet.	Review and approval of geotechnical fault study.		Withhold Approval of <u>Projects</u> <u>plot plans and building permits</u>
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<p>report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur. Structures intended for human occupancy shall not be located within any structural setback zone as determined by those studies. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>						
<p>4.6.6.1B Prior to approval of any projects for development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone, the City shall review and approve a geotechnical fault study prepared by a qualified geologist to confirm the alignment and size of any required building setbacks related to the fault zone. If necessary, this study shall identify a “special foundation or grading remediation zone” for the areas supporting structures intended for human occupancy where coseismic deformation (fractures) is observed. This zone shall be determined after subsurface evaluation based on proposed building locations. Specific remedial earthwork and foundation recommendations shall be evaluated as necessary based on proposed building locations. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction</p>	<p>City Engineer and Project Geologist; Land Development/ Public Works</p>	<p>Once before approval of any development permits and Prior to Plot Plan Approval</p>	<p>Prior to approval of any projects for future development within or adjacent to the San Jacinto Alquist-Priolo Earthquake Fault Zone.</p>	<p>Review and approval of geotechnical fault study.</p>		<p>Withhold Approval of <u>Projects plot plans and building permits</u></p>

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<p>permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>This study may involve trenching to adequately identify the location of the Claremont segment of the San Jacinto Fault Zone that crosses the eastern portion of the World Logistics Center Specific Plan property. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>						
<p>4.6.6.1C Prior to the approval of grading permits, or permits for construction of off-site improvements, the City shall review and approve plans confirming that the project has been designed to withstand anticipated ground shaking and other geotechnical and soil constraints (e.g., settlement). The project proponent shall submit plans to the City as appropriate for review and approval prior to issuance of grading permits or issuance of permits for the construction of any offsite improvements. This measure shall be implemented to the satisfaction of the City Engineer.</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before issuance of grading permits</p>	<p>Prior to the approval of project grading permits, or permits for construction of off-site improvements</p>	<p>Review and approve grading and construction plans</p>		<p>Withhold Issuance of Grading <u>or</u> <u>Construction</u> Permits</p>
<p>4.6.6.2A Prior to issuance of building permits for any portion of the project site, a site-specific, design level geotechnical investigation for each parcel shall be submitted to the City, which would comply with all applicable state and local code requirements, and includes an analysis of the expected ground motions at the site from known active faults using accepted methodologies. The report shall determine structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. The report shall also determine final design parameters for walls, foundations, foundation slabs, utilities, roadways, parking lots, sidewalks, and other surrounding related improvements. Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional</p>	<p>City Engineer and Land Development/ Public Works</p> <p><u>Building and Safety Division</u></p>	<p>Once before issuance of <u>Grading building</u> permits</p>	<p>Prior to the issuance of any building permits</p>	<p>Review and approval of a site-specific, design level geotechnical investigation for each parcel</p>		<p>Withhold Building Permits</p>

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necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.						
<p>4.6.6.3A Each Plot Plan application for development shall include a site-specific, design level geotechnical investigation for each parcel, in compliance with all applicable state and local code requirements, and including an analysis of the expected soil hazards at the site. The report shall determine:</p> <ol style="list-style-type: none"> 1. Structural design requirements as prescribed by the most current version of the California Building Code, including applicable City amendments, to ensure that structures can withstand ground accelerations expected from known active faults. 2. The final design parameters for walls, foundations, foundation slabs, utilities, roadways, parking lots, sidewalks, and other surrounding related improvements. <p>Project plans for foundation design, earthwork, and site preparation shall incorporate all of the mitigations in the site-specific geotechnical investigations. In addition, the project structural engineer shall review the site-specific investigations, provide any additional necessary mitigation to meet the California Building Code requirements, and incorporate all applicable mitigations from the investigation into the structural design plans and shall ensure that all structural plans for the project meet current Building Code requirements. These investigations shall identify any site-specific impacts from</p>	<p>City Engineer and Land Development/ Public Works</p> <p><u>Building and Safety</u></p>	<p>Once before plot plan approval</p> <p><u>Once before building permit approval</u></p>	<p>Prior to the approval of a Plot Plan for any Development project or associated offsite improvements</p> <p><u>Prior to building permit approval</u></p>	<p>Submittal and Approval of Geotechnical Report</p> <p><u>Review and approval of building plans</u></p>		<p>Withhold Approval of Plot Plan</p> <p><u>Withhold Approval of Building Plans</u></p>

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<p>compressible and expansive soils based on the actual location of individual pads proposed in the future, so that differential movement can be further verified or evaluated in view of the actual foundation plan and imposed fill or structural loads. Additionally, a registered geotechnical engineer shall review each site-specific geotechnical investigation, approve the final report, and require compliance with all geotechnical mitigations contained in the investigation in the plans submitted for the grading, foundation, structural, infrastructure, and all other relevant construction permits. The City Building Division shall review and approve plans to confirm that the siting, design and construction of all structures and facilities are in accordance with the regulations established in the California Building Code (California Code of Regulations, Title 24), and/or professional engineering standards appropriate for the seismic zone in which such construction may occur.</p> <p>Compliance with this measure will ensure that future buildings are designed to protect the structure and occupants from on-site soil limitations, consistent with State Building Code requirements. This measure shall be implemented to the satisfaction of the City Engineer.</p>						
<p>4.6.6.3B Any cut slopes in excess of five (5) feet in vertical height shall be constructed as “replacement fill slopes” per the project geotechnical report, due to the variable nature of the onsite alluvial soils. This measure shall be implemented to the satisfaction of the City Land Development Division and the City Engineer in consultation with the Project Geologist.</p>	<p>City Land Development Division and City Engineer</p>	<p><u>Before and after</u> issuance of any grading permit</p>	<p>Prior to issuance and following of any grading permit for development within the Specific Plan</p>	<p>Review and approval of grading plans</p> <p><u>Review of grading prior to issuance of building permit</u></p>		<p>Withhold Grading Permit</p> <p><u>Withhold building permit</u></p>
<p>4.6.6.3C During all grading activities, a geotechnical engineer shall monitor site preparation, removal of unsuitable soils, mapping of all earthwork excavations, approval of imported earth materials, fill placement, foundation installation, and other geotechnical operations. Laboratory testing of subsurface materials to confirm compacted dry density and moisture content, consolidation potential, corrosion potential, expansion potential, and resistance value (R-value) shall be performed prior to and during grading as appropriate. This measure shall be implemented to the satisfaction of the City Engineer in consultation with the Project Geologist.</p>	<p>City Engineer and Land Development/ Public Works</p>	<p>Once before permitting</p>	<p>Prior to issuance of Any discretionary permit for development within the Specific Plan</p>	<p>Review of additional geotechnical and soils site investigations</p>		<p>Withhold Discretionary Permit</p> <p><u>Issuance of a stop work order if necessary</u></p>

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4.7 GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE						
4.7.6.1A <u>The World Logistic Center project</u> shall implement the following requirements to reduce solid waste and greenhouse gas emissions from construction and operation of project development:						
<p>a) Prior to January 1, 2020, divert a minimum of 50 percent of landfill waste generated by operation of the project. After January 1, 2020, development shall divert a minimum of 75 percent of landfill waste. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p>	<p>Recycling Coordinator/ Public Works City Planning Division</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Provide verification sheet to the Recycling Coordinator/ Public Works Planning <u>Division</u> Property Owners. Association or the property owner shall certify the percentage of land fill waste diverted on an annual basis Certification has been submitted to the City.</p>		<p>Withhold future discretionary approvals <u>Pursuant to City Municipal Code</u></p>
<p>b) Prior to January 1, 2020, recycle and/or salvage at least 50 percent of nonhazardous construction and demolition debris. After January 1, 2020, recycle and/or salvage at least 75 percent of non-hazardous construction and demolition debris. In January of each calendar year after project approval the developer and/or Property Owners Association shall certify the percentage of landfill waste diverted on an annual basis.</p> <p>Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Calculations can be done by weight or volume but must be consistent throughout.</p>	<p><u>Recycling Coordinator/ Public Works</u> City Planning Division</p>	<p>Once each calendar year after project approval</p>	<p>January 1st of each year following project approval</p>	<p>Property Owners Association or the property owner shall certify the percentage of landfill waste diverted on an annual basis.</p>		<p>Implement Land Use and Enforcement Procedures. <u>Pursuant to City Municipal Code</u></p>
<p>c) The applicant shall submit a Recyclables Collection and Loading Area Plan for construction related materials prior to issuance of a building permit with the Building Division and for operational aspects of the project prior to the issuance of the occupancy permit to the Public Works Department. The</p>	<p>City Planning Division</p>	<p>Once before issuance of building permits</p>	<p>Prior to issuance of building permits</p>	<p>Review and approval of a Recyclables Collection and Loading Area plan</p>		<p><u>Pursuant to City Municipal Code</u> Withhold Building permit</p>

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plan shall conform to the Riverside County Waste Management Department’s Design Guidelines for Recyclable Collection and Loading Areas.						Withhold Certificate of Occupancy
d) Prior to issuance of certificate of occupancy, the recyclables collection and loading area shall be constructed in compliance with the Recyclables Collection and Loading Area plan.	City Planning Division	Once before issuance of occupancy permits	Prior to issuance of occupancy permit Prior to issuance of occupancy permit	Review and approval of building plans Building plan review.		Withhold Certificate of Occupancy
e) Prior to issuance of certificate of occupancy, documentation shall be provided to the City confirming that recycling is available for each building.	City Planning Division	Once before issuance of occupancy permits	Prior to issuance of occupancy permit	Compliance with Recyclables Collection and Loading Area Plan		Withhold Certificate of Occupancy
f) Within six months after occupancy of a building, the City shall confirm that all tenants have recycling procedures set in place to recycle all items that are recyclable, including but not limited to paper, cardboard, glass, plastics, and metals.	<u>Recycling Coordinator/ Public Work City Planning Division</u>	Within six months of building occupancy	Within six months after occupancy of building	Review and approval of a Recyclables Collection and Loading Area Plan.		Withhold Certificate of Occupancy
g) The property owner shall advise all tenants of the availability of community recycling and composting services.	<u>Recycling Coordinator/ Public Work City Planning Division</u>	Once before issuance of occupancy permits	Prior to issuance of a Certificate of Occupancy	Written verification will be submitted to the City that the property owner advised all tenants of the availability of community recycling and composting services.		Withhold grading permits
h) Existing onsite street material shall be recycled for new project streets to the extent feasible.	City Engineer Land Development/Public Works	Once before issuance of grading permits	Prior to issuance of grading permits.	Review and approval of documents including street plans		

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<p><u>4.7.6.1B (Previously included as Utilities Mitigation Measure 4.16.4.6.1A for building energy).</u> Each application for a building permit shall include energy calculations to demonstrate compliance with California Energy Efficiency Standards confirming that each new structure meets applicable Building and Energy Efficiency Standards. The plans shall also ensure that buildings are in conformance with the State Energy Conservation Efficiency Standards for Nonresidential buildings (Title 24, Part), Article 2, California Administrative Code). This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions. Plans shall follow the following:</p> <ul style="list-style-type: none"> • Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. • Cool pavement materials such as lighter-colored pavement materials, porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right-of-way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. • Energy-efficient appliances that achieve the 2016 California Appliance Energy Efficiency Standards (e.g., EnergyStar® Appliances) and use of sunlight-filtering window coatings or double-paned windows. 	<p><u>City Building and Safety, City Planning Division City Planning Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>
<p><u>4.7.6.1C (Previously included as Utilities Mitigation Measure 4.16.4.6.1B building energy).</u> Prior to the issuance of any building permits within the <u>World Logistics Center Specific Plan WLC site</u>, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards <u>to the Building and Safety and Planning Divisions that’s shows each new structure meets the applicable Building and Energy Efficiency Standards, for each new structure.</u> Plans may include but are not necessarily limited to implementing the following as appropriate:</p> <ul style="list-style-type: none"> • High-efficiency air-conditioning with electronic management system (computer) control. • Isolated High-efficiency air-conditioning zone control by floors/separate activity areas. 	<p><u>City Building and Safety, City Planning Division City Planning Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>

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<ul style="list-style-type: none"> Use of Energy Star® exit lighting or exit signage. 						
<p>4.7.6.1D (Previously included as Utilities Mitigation Measure 4.16.4.6.1C building energy; now modified). Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p> <ul style="list-style-type: none"> Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building or up to the limit allowed by MVU’s restriction on <u>distrusted solar PV connecting to their grid, whichever is greater;</u> Increase efficiency for buildings by implementing either 10 percent over the <u>2019</u> Title 24’s energy-saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is more strict; Require the equivalent of “Leadership in Energy and Environmental Design Certified” for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval; <u>and</u> <u>All project rooftops shall be constructed to be solar-ready and be designed to accommodate the additional loads from solar equipment that might be installed at a future date.</u> <p><u>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</u></p>	<p><u>City Planning Division, City Building and Safety Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of building permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold building permit.</u></p>
<p>4.7.7.1 To mitigate the WLC Project’s GHG emissions to net zero and to remove uncertainty as to how GHG emissions should be accounted for, the following mitigation, Mitigation Measure 4.7.7.1, shall apply. Mitigation Measure 4.7.7.1 shall read as follows:</p> <p><u>The developer shall mitigate the WLC Project’s GHG emissions to net zero by providing offsets and/or carbon credits, where the amount of GHG emissions to be mitigated is either “Total Uncapped” GHG emissions from Table 4.7-8 or “Project Emissions” from new Table 4.7-16, depending on the outcome of the appeal in <i>Paulek v. Moreno Valley Community Services District (“Paulek”).</i> If the trial court’s judgment in <i>Paulek</i> is affirmed after the appellate process is completed or if the appeal is dismissed, then the GHG emissions to be mitigated to net zero will be the “Total Uncapped” GHG emissions from Table 4.7-8. If the trial</u></p>	<p><u>City Planning Division</u></p>	<p><u>Once</u></p>	<p><u>Prior to issuance of certificate of occupancy permits.</u></p>	<p><u>Review of written verification</u></p>		<p><u>Withhold Certificate of Occupancy permit.</u></p>

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<p><u>court's judgment is reversed after the appellate process is completed, then the amount of GHG emissions to be mitigated to net zero will be the "Project Emissions" shown on Table 4.7-16. Upon the provision of offsets and/or the retirement of carbon credits, no further analysis of capped and uncapped GHG emissions will be required, and no further reduction of those emissions will be required.</u></p> <p><u>The developer shall provide the city with any combination of qualified offsets and/or carbon credits in its sole determination provided that the following conditions are satisfied:</u></p> <p>a) <u>Offsets: A developer shall provide proof of offsets to reduce or sequester GHG emissions (as distinguished from carbon credits) to the City's Planning Official that the offsets are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency.</u></p> <p>b) <u>Carbon Credits: A developer shall provide proof to the City's Planning Official that the carbon credits represent reductions in GHG emissions that are real, permanent, additional, quantifiable, verifiable, and enforceable by an appropriate agency. Credits registered by a carbon registry approved by the California Air Resources Board, such as, but not limited to, the Climate Action Reserve, American Carbon Registry, Verra (formerly Verified Carbon Standard) or GHG Reduction Exchange (GHG RX), shall be conclusively presumed to meet all of the criteria set forth above.</u></p> <p>c) <u>Timing: The developer shall provide the City with offsets and/or carbon credits equal to the proportionate amount of GHG emissions for the facilities proposed in each plot plan (by square footage as compared to the total square footage of the project) as a condition of the issuance of a certificate of occupancy for such facilities, using either Table 4.7-8 or Table 4.7-16, as appropriate. The City shall retire the carbon credits upon their receipt. The developer shall have the right at any time to provide such offsets and/or carbon credits in advance of the issuance of any certificate of occupancy for any of the facilities in the WLC Project.</u></p>						

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4.8 HAZARDS AND HAZARDOUS MATERIALS						
4.8.6.1A Prior to demolition of any existing structures on the project site, a qualified contractor shall be retained to determine if asbestos-containing materials (ACMs) and/or lead-based paint (LBP) are present. If asbestos-containing materials and/or lead-based paint are present, prior to commencement of demolition, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. In addition, onsite soils shall be tested for contamination by agricultural chemicals. If present, these materials shall be removed and transported to an appropriate landfill by a licensed contractor. This measure shall be implemented to the satisfaction of the Building Division including written documentation of the disposal of any asbestos-containing materials, lead-based paint, or agricultural chemical residue in conformance with all applicable regulations.	City Building Division	Once Before Permitting and as Needed During Construction	Prior to demolition of any existing rural residences or associated structures	Evidence of qualified contractor provided		Holding and Not Approving <u>Withhold</u> Demolition Permits
4.8.6.1B Prior to the issuance of any discretionary permits associated with the proposed fueling facility (“logistic support” site in the LD zone), a risk assessment or safety study that identifies the potential public health and safety risks from accidents at the facility (e.g., fire, tank rupture, boiling liquid, or expanding vapor explosion) shall be submitted to the City for review and approval. This study shall be prepared to industry standards and demonstrate that the facility will not create any significant public health or safety impacts or risks, to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Fire Prevention Bureau and Building and Safety Division <u>Planning Division</u>	Once Before Permitting	Prior to issuance of Any discretionary Permits associated with natural gas fueling facility	Review and Approval of Risk Assessment or Safety Study		Withhold Discretionary Permit
4.8.6.1C Prior to grading for any discretionary permits for development in Planning Areas 9-12 adjacent to the natural gas compressor plant, the applicant shall prepare a risk assessment report analyzing safety conditions relative to the existing compressor plant and planned development. The report must be based on appropriate industry standards and identify the potential hazards from the compressor plant (e.g., fire, explosion) and determine that the distance from the plant to the closest planned buildings in Planning Areas 9-12 is sufficient to protect the safety of workers from accidents that could occur (see Final EIR Volume 2 Figure 4.1.6B) at the compressor plant. This measure shall be implemented to the satisfaction of the City Building and Safety Division and the Fire Prevention Bureau.	Building Official and Fire Marshal <u>Planning Division</u>	Once before issuance of discretionary permits for development within Planning Areas 9-12	Prior to issuance of Discretionary permits for Development within Planning Areas 9-12	Review and approval of a risk assessment		Withhold Discretionary Permit

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<p>4.8.6.1D Prior to the issuance of any grading permit, the developer shall inform the City of any existing solid waste materials within the development area. In conjunction with grading activities, all solid waste matter within the development area shall be removed by a licensed contractor and disposed of in an approved landfill. A record of the removal and disposal of any waste materials, in compliance with applicable laws and regulations, shall be submitted to the City prior to the issuance of any building permits.</p>	<p><u>Building and Safety</u> Recycling Coordinator/ Public Works</p>	<p>Once before issuance of grading permits</p>	<p>Prior to issuance of grading permits</p>	<p>Applicant will inform the City in writing of any existing solid waste materials within the development area</p>		<p><u>Withhold building permit until receipt of record of removal and disposal of waste materials</u></p> <p>Pursuant to City Municipal Code</p>
<p>4.9 HYDROLOGY AND WATER QUALITY</p>						
<p>4.9.6.1A Prior to issuance of any building permit within the Specific Plan area, the developer shall construct storm drain pipes and conveyances, as well as, combined detention and infiltration basin(s), bioretention area(s), and spreading area(s) within each proposed watershed, as outlined in the project hydrology plan, to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduce the time of concentration by storing and infiltrating increased runoff for a limited period of time and release the outflow at a rate that does not exceed the pre-development peak flows and velocities for the 2, 5, 10, 25, and 100-year storms and volumes as assessed in the water balance model for historical conditions. For the purpose of this mitigation measure, the term “construct” shall mean to substantially complete construction so as to function for its intended purpose during construction with complete construction prior to occupancy. Field investigations will be conducted to determine the infiltration rate of soils underlying the proposed locations of bioretention areas and detention basins. The infiltration rate of the underlying soils will be used to properly size the bioretention areas and detention basins/infiltration basins to ensure that adequate volumes of runoff, in cumulative total for all bioretention areas and detention basins, are captured and infiltrated. The water balance model will be updated and rerun for the site-specific conditions encountered to confirm the water balance. This measure shall be implemented to the satisfaction of the City Engineer. Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage weir structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow such that</p>	<p>Land Development/ Public Works</p>	<p>Prior to Occupancy</p>	<p>Prior to issuance of any development permit</p>	<p>Review and approval of construction documents Field Inspection</p>		<p>Withhold Building Permit</p>

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City the Waste Discharge Identification Number issued by the State Water Quality Control Board (SWQCB) as proof that the project's Notice of Intent is to be covered by the General Construction Permit has been filed with the State Water Quality Control Board. This measure shall be implemented to the satisfaction of the City Engineer						
<p>4.9.6.2B Prior to issuance of any grading permit for development in the World Logistics Center Specific Plan, the project developer shall submit to the State Water Quality Control Board (SWQCB) a project-specific Storm Water Pollution Prevention Plan (SWPPP). The Storm Water Pollution Prevention Plan shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the Storm Water Pollution Prevention Plan shall emphasize structural and nonstructural best management practices (BMPs) to control sediment and non-visible discharges from the site. Best Management Practices to be implemented may include (but shall not be limited to) the following:</p> <ul style="list-style-type: none"> • Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary debris basins (if deemed necessary), and other discharge control devices. The construction and condition of the Best Management Practices are to be periodically inspected by the Regional Water Quality Control Board during construction, and repairs would be made as required. • Materials that have the potential to contribute non-visible pollutants to storm water must not be placed in drainage ways and must be placed in temporary storage containment areas. • All loose soil, silt, clay, sand, debris, and other earthen material shall be controlled to eliminate discharge from the site. Temporary soil stabilization measures to be considered include: covering disturbed areas with mulch, temporary seeding, soil stabilizing binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. Stockpiles shall be surrounded by silt fences and covered with plastic tarps. • The Storm Water Pollution Prevention Plan shall include inspection forms for routine monitoring of the site during the construction phase. 	City of Moreno Valley and the Regional Water Quality Control Board and Land Development/ Public Works	<p>Once before issuance of any grading permit</p> <p><u>And</u></p> <p><u>Ongoing as part of routine site inspections</u></p>	<p>Prior to issuance of any grading permit</p> <p><u>Ongoing</u></p>	<p>Written verification of filing a SWPPP by the RWQCB</p> <p><u>Site inspection</u></p>		<p>Withhold Grading Permit</p> <p><u>Pursuant to City Municipal Code</u></p>

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<ul style="list-style-type: none"> Additional required Best Management Practices and erosion control measures shall be documented in the Storm Water Pollution Prevention Plan. The Storm Water Pollution Prevention Plan would be kept on-site for the duration of project construction and shall be available to the local Regional Water Quality Control Board for inspection at any time. <p>The developer and/or construction contractor for each development area shall be responsible for performing and documenting the application of Best Management Practices identified in the project-specific Storm Water Pollution Prevention Plan. Regular inspections shall be performed on sediment control measures called for in the Storm Water Pollution Prevention Plan. Monthly reports shall be maintained and available for City inspection. An inspection log shall be maintained for the project and shall be available at the site for review by the City of Moreno Valley and the Regional Water Quality Control Board.</p>						
<p>4.9.6.3A Prior to discretionary permit approval for individual plot plans, a site-specific Water Quality Management Plan (WQMP) shall be submitted to the City Land Development Division for review and approval. The Water Quality Management Plan shall specifically identify site design, source control, and treatment control Best Management Practices that shall be used on-site to control pollutant runoff and to reduce impacts to water quality to the maximum extent practicable. The Water Quality Management Plan shall be consistent with the Water Quality Management Plan approved for the overall World Logistics Center Specific Plan project. At a minimum, the site developer shall implement the following site design, source control, and treatment control Best Management Practices as appropriate:</p> <p>Site Design Best Management Practices</p> <ol style="list-style-type: none"> Minimize urban runoff. Maximize the permeable area. Incorporate landscaped buffer areas between sidewalks and streets. Maximize canopy interception and water conservation by planting native or drought-tolerant trees and large shrubs. 	City Land Development Division	<p>Once before issuance of any grading or building permits</p> <p><u>And</u></p> <p><u>Ongoing as part of routine site inspections</u></p>	<p>Prior to issuance of discretionary permit approval for individual plot plans</p> <p><u>Ongoing</u></p>	<p>Review and Approval of WQMP</p> <p><u>Site inspection</u></p>		<p>Withhold Grading or Building Permit</p> <p><u>Pursuant to City Municipal Code</u></p>

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<p>e) Use natural drainage systems.</p> <p>f) Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.</p> <p>g) Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.</p> <p>h) Minimize impervious footprint.</p> <p>i) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.</p> <p>j) Reduce widths of street where off-street parking is available.</p> <p>k) Minimize the use of impervious surfaces such as decorative concrete, in the landscape design.</p> <p>l) Conserve natural areas.</p> <p>m) Minimize Directly Connected Impervious Areas (DCIAs).</p> <p>n) Runoff from impervious areas will sheet flow or be directed to treatment control Best Management Practices.</p> <p>o) Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas that are planted with native or drought-tolerant trees and large shrubs.</p> <p>Source Control Best Management Practices</p> <p>Source control Best Management Practices are implemented to eliminate the presence of pollutants through prevention. Such measures can be both nonstructural and structural.</p> <p>Non-structural source control Best Management Practices include:</p> <p>a) Education for property owners, operator, tenants, occupants, or employees;</p> <p>b) Activity restrictions;</p> <p>c) Irrigation system and landscape maintenance;</p> <p>d) Common area litter control;</p> <p>e) Street sweeping private streets and parking lots; and</p> <p>f) Drainage facility inspection and maintenance.</p> <p>Structural source control Best Management Practices include:</p> <p>g) MS4 stenciling and signage;</p>						

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<p>h) Landscape and irrigation system design; i) Protect slopes and channels; and j) Properly design fueling areas, trash storage areas, loading docks, and outdoor material storage areas.</p> <p>Treatment Control Best Management Practices</p> <p>Treatment control Best Management Practices supplement the pollution prevention and source control measures by treating the water to remove pollutants before it is released from the project site. The treatment control Best Management Practice strategy for the project is to select Low Impact Development (LID) Best Management Practices that promote infiltration and evapotranspiration, including the construction of infiltration basins, bioretention facilities, and extended detention basins. Where infiltration Best Management Practices are not appropriate, bioretention and/or biotreatment Best Management Practices (including extended detention basins, bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration may be utilized. Harvest and Reuse Best Management Practice will be used to store runoff for later non-potable uses.</p> <p>Site-specific Water Quality Management Plans have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the project are developed, Best Management Practices will be implemented consistent with the goals contained in the Master Water Quality Management Plan. All development within the project will be required to incorporate on-site water quality features to meet or exceed the approved Master Water Quality Management Plan's water quality requirements identified previously.</p>						
<p>4.9.6.3B The Property Owners Association (POA) and all property owners shall be responsible to maintain all onsite water quality basins according to requirements in the guidance Water Quality Management Plan and/or subsequent site-specific Water Quality Management Plans, and established guidelines of the Regional Water Quality Control Board. Failure to properly maintain such basins shall be grounds for suspension or revocation of discretionary operating permits, and/or referral to the Regional Water Quality Control Board for review and possible action. This</p>	City Land Development Division	As Needed	Ongoing	Onsite inspections		Revocation of Discretionary or Operating Permits

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measure shall be implemented to the satisfaction of the City Land Development Division, in consultation with the City Engineer, and Regional Water Quality Control Board.						
<p>4.9.6.3C Prior to issuance of future discretionary permits for any development along the southern boundary of the World Logistics Center Specific Plan (WLCSP), the project developer of such sites, in cooperation with the Property Owners Association (POA), shall establish and annually fund a Water Quality Mitigation Monitoring Plan (WQMMP) to confirm that project runoff will not have deleterious effects on the adjacent San Jacinto Wildlife Area (SJWA). This program shall include at least quarterly sampling along the southern boundary of the site (i.e., at the identified outlet structures of the project detention basins) during wet season flows and/or when water is present, as well as sampling of any dry-season flows that are observed entering the San Jacinto Wildlife Area property from the project property, including Drainage 9, which is planned to convey only clean off-site flows from north of the World Logistics Center Specific Plan site across Gilman Springs Road. The program shall also include at least twice yearly sampling after completion of construction, and a pre-construction survey must be completed to determine general water quality baseline conditions prior to and during development of the southern portion of the World Logistics Center Specific Plan. This sampling shall be consistent with and/or comply with the requirements of applicable Storm Water Pollution Prevention Plans (SWPPPs) for the development site.</p> <p>The project developer of sites along the southern border of the World Logistics Center Specific Plan shall be responsible for preventing or eliminating any toxic pollutant (not including sediment) found to exceed applicable established public health standards. In addition, the discharge from the project shall not cause or contribute to an exceedance of Receiving Water Quality Objectives for the potential pollutants associated with the project as identified in Table 4.9.J. Once development is complete, the developer shall retain qualified personnel to conduct regular (i.e., at least quarterly) water sampling/testing of any basins and their outfalls to ensure the San Jacinto Wildlife Area will not be affected by water pollution from the project site. This measure shall be implemented to the satisfaction of the City Land Development Division Manager based on consultation with the</p>	Land Development Division	<p>Annually</p> <p><u>And</u></p> <p><u>Ongoing as part of routine site inspections</u></p>	<p>Prior to issuance of discretionary permits for any development along the southern boundary of the WLCSP</p> <p><u>Ongoing</u></p>	<p>Evidence of Annual Water Quality Monitoring Plan fund</p> <p><u>Site inspection</u></p>		<p>Withhold Discretionary Permit</p> <p><u>Pursuant to City Municipal Code</u></p>

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project developer, Eastern Municipal Water District, the Regional Water Quality Control Board-Santa Ana Region, and the Mystic Lake Manager.						
4.10 LAND USE AND PLANNING						
NOT APPLICABLE						
4.11 MINERAL RESOURCES						
NOT APPLICABLE						
4.12 NOISE						
<p>4.12.6.1A Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. <u>The NRCP shall be prepared by a qualified acoustical consultant describing how noise reduction measures shall be implemented to reduce the noise exposure on sensitive receptors adjacent to onsite and offsite construction areas. The noise reduction measures shall be implemented so that construction activities do not exceed the City's daytime and nighttime average hourly noise standard of 60 dBA Leq and 55 dBA Leq, respectively. The construction noise reduction measures shall include, but not be limited to, the following measures:</u></p> <ul style="list-style-type: none"> • All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers' standards. • <u>Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the project.</u> • <u>No construction activity shall occur within 800 feet of residences between 8 p.m. and 7 a.m. on weekdays and weekends.</u> • <u>A 12-foot tall temporary construction sound barrier blocking the line-of-sight of construction activity to any residential receptor located within 800 feet of active construction areas shall be installed prior to commencement of any construction activity.</u> The temporary sound barrier shall be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may 	City Planning Division	Once <u>And</u> <u>Ongoing as part of routine site inspections</u>	Prior to issuance of any discretionary approvals. <u>Ongoing</u>	Review and Approval of a Noise Reduction Compliance Plan <u>Site inspection</u>		Withhold approvals. <u>Pursuant to City Municipal Code</u>

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<p>be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater.</p> <ul style="list-style-type: none"> <u>Distribute to the potentially affected residences and other sensitive receptors within 500 feet of project construction boundary a “hotline” telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule. Records of any complaints and corrective action shall be stored at the site and available to the City upon request.</u> Prior to issuance of any discretionary project approvals, a Noise Reduction Compliance Plan (NRCP) shall be submitted to and approved by the City. The Noise Reduction Compliance Plan shall show the limits of nighttime construction in relation to any then-occupied residential dwellings and shall be in conformance with City standards. Conditions shall be added to any discretionary projects requiring that the limits of nighttime grading be shown on the Noise Reduction Compliance Plan and all grading plans submitted to the City (per Noise Study MM N-2, pg. 51). 						
4.12.6.1B All construction equipment, fixed or mobile, shall be equipped with operating and maintained mufflers consistent with manufacturers’ standards.	City Planning Division	As Needed During Grading	During site grading and construction	Review of Construction Documents and Onsite Inspection		Issuance of a Stop Work Order
4.12.6.1C Construction vehicles shall be prohibited from using Redlands Boulevard south of Eucalyptus Avenue to access on-site construction for all phases of development of the Specific Plan (per Noise Study MM N-1, pg. 51).	City Planning Division Transportation Division/Public Works	Once before issuance of grading permits or approval of roadway and utility improvement plans	Prior to any issuance of grading permits or approval of roadway and utility improvement plans	Review and Approval of Construction Documents		Withhold Grading Permits or approval of roadway and utility improvement plans

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4.12.6.1D No grading shall occur within 2,800 feet of residences south of State Route 60 between 8 p.m. and 6 a.m. on weekdays and between 8 p.m. and 7 a.m. on weekends. These restrictions shall be included as part of the Noise Reduction Compliance Plan per Mitigation Measure 4.12.6.1A (per Noise Study MM N 2, pg. 51)	City Planning Division and Land Development/ Public Works	Once Before Permitting and Ongoing during grading	Prior to any discretionary approvals for development in the WL CSP	Review and Approval of Noise Reduction Compliance Plan		Issuance of a Stop Work Order
4.12.6.1E As an alternative to Mitigation Measure 4.12.6.1D, a 12 foot tall temporary construction sound barrier may be installed for residences within 1,580 feet of active nighttime construction areas. The temporary sound barrier shall be constructed of plywood with a total thickness of 15 inches, or a sound blanket wall may be used. If sound blankets are used, they must have a Sound Transmission Class (STC) rating of 27 or greater. This shall be included as part of the Noise Reduction Compliance Plan required in Mitigation Measure 4.12.6.1A, which shall be reviewed and approved by the City prior to implementation (per Noise Study MM N 2 and N 3, pg. 51 and pg. 52).	City Planning Division	Once Before Permitting	Prior to grading	Review and Approval of Noise Reduction Compliance Plan		Withhold Grading and Building Permits
4.12.6.1F As an alternative to Mitigation Measure 4.12.6.1D and 4.12.6.1E, on-site noise measurements of construction areas may be taken by qualified personnel and specific buffer distances between construction activities and existing residences may be proposed based on actual noise levels. These measurements will be incorporated into the Noise Reduction Compliance Plan required in Mitigation Measure 4.12.6.1A, which shall be reviewed and approved by the City prior to implementation (per Noise Study MM N 2, pg. 51).	City Planning Division	Once Before Permitting	Prior to grading	Review and Approval of Noise Reduction Compliance Plan		Withhold Grading and Building Permits
4.12.6.1G Any discretionary approvals for development that proposes grading within 1,580 feet of occupied residential units shall require that all grading equipment be equipped with residential grade mufflers (or better). All stationary construction equipment shall be placed so that emitted noise is directed away from noise sensitive receptors nearest the site. Additionally, stationary construction equipment shall have all standard acoustic covers in place during operation (per Noise Study MM N 4, pg. 52).	City Planning Division	As Needed During Grading	Prior to any discretionary approvals for Development that proposes grading within 1,580 feet of occupied residential units	Review and Approval of Construction Documents. Require Written Materials from the Applicant or Operator		Issuance of a Stop Work Order
4.12.6.1H All material stockpiles in connection with any grading operations shall be located at least 1,200 feet from existing residences (per Noise Study MM N 5, pg. 52).	City Planning Division and Land	As Needed During Grading	During Grading	On-site Inspection		Issuance of a Stop Work Order

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	Development/ Public Works					
4.12.6.1 All project related off-site construction shall be limited to 6 a.m. and 8 p.m. on weekdays only. Construction during weekends and City holidays shall not be permitted (per Noise Study MM N-6, pg. 53) to the satisfaction of the Land Development Division/Public Works.	City Land Development Division/Public Works	Ongoing as needed	During construction	Review and Approval of Construction Documents		Issuance of a Stop Work Order
4.12.6.1 Prior to issuance/approval of any grading permits, off-site construction activities adjacent to residential uses shall provide for installation of 12 foot temporary sound barriers for construction activities lasting more than one month. The sound barrier will reduce noise levels by approximately 10 dB. The temporary sound barrier may be constructed of plywood with a total thickness of 1.5 inches, or a sound blanket wall may be used. If sound blankets are used, the curtains must have a Sound Transmission Class (STC) rating of 27 or greater. No off-site construction is permitted during weekday nighttime hours (8 p.m. to 6 a.m.) or during weekends and City holidays except for emergencies (per Noise Study MM N-7, pg. 53).	City Planning Division	Once before issuance of grading permits.	Prior to the issuance of grading Permits	Evidence of off site 12 foot temporary sound barrier during construction activities lasting more than 1 month		Withhold Grading Permit
4.12.6.2A When processing future individual buildings under the World Logistics Center Specific Plan, as part of the City’s approval process, the City shall require the Applicant to take the following three actions for each building prior to approval of discretionary permits for individual plot plans for the requested development: Action 1: Perform a building-specific noise study to ensure that the assumptions set forth in the FEIR prepared for the programmatic level entitlement remain valid <u>the Revised Sections of the FEIR remain valid.</u> These procedures used to conduct these noise analyses shall be consistent with the noise analysis conducted in the programmatic <u>Revised Sections of the FEIR</u> and shall be used to impose building-specific mitigation on the individually proposed buildings. Action 2: If the building-specific analyses identify that the proposed development triggers the need for mitigation from the proposed building, including all preceding developments in the specific plan area World Logistics Center site , the Applicant shall implement the mitigation identified in the WLC <u>Revised Sections of the FEIR to reduce the identified impacts to comply with the Moreno Valley Municipal Code, which sets maximum sound levels</u>	City Planning Division	Once before issuance of a certificate of occupancy	Prior to issuance of Discretionary permits for Action 1. Prior to issuance of certificate of occupancy for actions 2 and 3	Review and approval of a noise study		Withhold <u>Certificate of Occupancy</u> <u>discretionary approvals</u>

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<p><u>reaching residential uses at 60 dBA during the daytime hours (8:00 a.m. – 10:00 p.m.) and 55 dBA during nighttime hours (10:01 p.m. – 7:59 a.m.).</u> Prior to implementing the mitigation, the Applicant shall send letters by registered mail to all property owners and non-owner occupants of properties that would benefit from the proposed mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation asking them to provide a position either in favor of or in opposition to the proposed noise abatement mitigation within 45 days. Each property shall be entitled to one vote on behalf of owners and one vote per dwelling on behalf of non-owner occupants.</p> <p>If more than 50% of the votes from responding benefited receptors oppose the abatement, the abatement will not be considered reasonable. Additionally, for noise abatement to be located on private property, 100% of owners of property upon which the abatement is to be placed must support the proposed abatement. In the case of proposed noise abatement on private property, no response from a property owner, after three attempts by registered mail, is considered a <i>no</i> vote.</p> <p>At the completion of the vote at the end of the 45-day period, the Applicant shall provide the tentative results of the vote to all property owners by registered mail. During the next 15 calendar days following the date of the mailing, property owners may change their vote. Following the 15-day period, the results of the vote will be finalized and made public.</p> <p>Action 3: Upon consent from benefited receptors and property owners, the Applicant shall post a bond for the cost of the construction of the necessary mitigation as estimated by the City Engineer to ensure completion of the mitigation. The certificate of occupancy permits shall be issued upon posting of the bond or demonstration that 50% of the votes from responding benefited receptors oppose the abatement or, if the abatement is located on private property, any property owners oppose the abatement. (per Noise Study MM-N-8, pg.53).</p>						
<p>4.12.6.2B Prior to issuance/approval of any building permits, the centerline of Cactus Avenue Extension will be located no closer than 11449 feet to the residential property lines along Merwin Street. An alternative is to locate the roadway closer to the</p>	City Planning Division	Prior to the approval of a Building permit	Prior to the issuance of <u>building permits</u> Any discretionary	Review and Approval of <u>Building discretionary</u> permits		Withhold <u>Building Discretionary</u> Permits

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residences and provide a soundwall along Cactus Avenue Extension. The soundwall location and height should be determined by a Registered Engineer, and the soundwall shall be designed to reduce noise levels to less than 65 CNEL at the residences. The Engineer shall provide calculations and supporting information in a report that will be required to be submitted to and approved by the City prior to issuing permits to construct the road. (per Noise Study, pg. 51, Cactus Avenue Extension, ID #50).			approvals for development in the WLCSP			
4.12.6.2C Prior to the approval of any discretionary permits, cumulative impact areas shown in the WLC EIR Noise Study shall be included in the soundwall mitigation program outlined in Mitigation Measures 4.12.6.2A and 4.12.6.2D. (per Noise Study MM N-9, pg. 62).	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of soundwall mitigation program		Withhold Building Permit <u>discretionarily permits</u>
4.12.6.2D Prior to issuance of a building permit, the applicant shall demonstrate that the development maintains a buffer with soundwall for noise attenuation at residential/warehousing interface (i.e., western and southwestern boundaries of the project site). To keep the noise levels at nearby residential areas less than typical ambient conditions, the warehousing property line shall be located a minimum of 250 feet from the residential zone boundary, and a 12-foot noise barrier shall be located along the perimeter of the property that faces any residential areas. The 12 foot noise barrier may be a soundwall, berm, or combination of the two. The height shall be measured relative to the pad of the warehouse. This requirement shall be implemented anytime residential areas are within 600 feet of the warehousing property line to insure that a noise level of 45 dBA (Leq) will not be exceeded at the residential zone. This requirement is consistent with Item 10 of Municipal Code Section 9.16.160 Business park/industrial that states, "All manufacturing and industrial uses adjacent to residential land uses shall include a buffer zone and/or noise attenuation wall to reduce outside noise levels". (per Noise Study MM N-10, pg. 62)	City Planning Division	Once before issuance of building permits	Prior to issuance of building permits	Review and approval of building plans		Withhold Building Permit
4.12.6.4A Prior to the issuance of building permits for projects within 1,300 feet of the Southern California Gas Company (SCGC) and San Diego Gas and Electric (SDG&E) blowdown facilities, documentation shall be submitted to the City confirming that sound attenuation devices and/or improvements for the blow-down facilities providing at least a 40 dB reduction in noise levels	City Land Development Division <u>City Planning Division</u>	Once before Permitting	Prior to the issuance of Building permits for projects within 1,300 feet	Review and Approval of Documentation confirming sound attenuation device		Withhold Building Permits

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World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
during blow-down events are available and will be installed for all planned blow-down events. It shall be the responsibility of the developer to fund all sound attenuation improvements to the blow-down facilities required by this measure. It shall also be the responsibility of the developer to coordinate with San Diego Gas and Electric and/or Southern California Gas Company regarding the installation of any sound attenuation devices or improvements on the blow-down facilities at either the San Diego Gas and Electric compressor station or the Southern California Gas Company pipelines. This measure shall be implemented to the satisfaction of the City Land Management Division (per Noise Study MM N-11, pg.65).			of the SCGC and SDG&E facilities			
4.13 POPULATION, HOUSING, AND EMPLOYMENT						
NOT APPLICABLE						
4.14 PUBLIC SERVICES AND FACILITIES						
NOT APPLICABLE						
4.15 TRAFFIC AND CIRCULATION						
4.15.7.4A A traffic impact analysis (“TIA”) conforming to the guidelines for traffic impact analysis TIAs adopted by the City shall be submitted in conjunction with each Plot Plan application within the WLCSP, World Logistics Center Specific Plan Prior to the approval of the Plot Plans, the City shall review the traffic impact analysis Revised TIA to determine if any of the traffic improvements listed in Final EIR Volume 2 Tables 4.15.AV through 4.15.BA (TIA Tables 74 through 79) of the traffic impact analysis prepared for the Program Environmental Impact Report are required to be completed prior to the issuance of a certificate of occupancy for each building. the above tables need to be implemented as part of the plot plan. The TIA prepared for the Revised Sections of the FEIR are required to be completed prior to the issuance of a certificate of occupancy for each building. If the City determines that any of the improvements within Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated into insignificance, then the completion of construction of the improvements prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. Construction of	City Engineer	Once before plot plan approval <u>Once prior to Certificate of Occupancy</u>	Prior to plot plan approval <u>Prior to Certificate of Occupancy</u>	Review and Approval of site-specific TIAs <u>Review and Approval of site-specific TIAs</u>		Withhold Building Permits Withhold Plot Plan approval <u>Withhold Certificate of Occupancy</u>

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improvements within the City shall be subject to credit/reimbursement agreement for those DIF and/or TUMF eligible costs. <u>costs that exceed the fair share contribution determined for the specific Plot Plan application.</u> If the City determines that any of the improvements outside Moreno Valley are required to be constructed in order to ensure that the traffic impacts which will result from the construction and operation of the building will be mitigated to a less than significant level, then the payment of any necessary fair share contribution as prescribed in Mitigation Measure 4.15.7.4F prior to the issuance of a Certificate of Occupancy for the building shall be made a Condition of Approval of the Plot Plan. If the City determines that the traffic impacts which will result from the construction or operation of a building will be significantly more adverse than those shown in the Program Environmental Impact Report in the Revised TIA, further environmental review shall be conducted prior to the approval of the Plot Plan pursuant to Public Resources Code § 21166 and CEQA Guidelines §15162 to determine what additional mitigation measures, if any, will be required in order to maintain the appropriate levels of service.						
4.15.7.4B As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require the dedication of appropriate right-of-way, <u>where feasible</u> , consistent with the Subdivision Map Act for frontage street improvements contained within the World Logistics Center Specific Plan Circulation Map. as shown in this Program EIR Figure 3-10 (or Figure 22 in the TIA prepared for this Program EIR). Required dedications shall be made prior to the issuance of occupancy permits for the requested development.	City Engineer	Once before issuance of occupancy permits	Prior to issuance of occupancy permits	Evidence of dedication of right of- way in compliance with Subdivision Map Act		Withhold Occupancy Permits
4.15.7.4C As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, <u>the City shall require the Applicant to construct or to fully fund the transportation measures identified in the development's TIA (see MM4.15.7.4A) as needed to mitigate the transportation impacts within the city of the Plot Plan development. The payment or construction shall be made prior to the issuance of occupancy permits for the requested development. This condition shall apply only to mitigation measures where a mechanism has been established to collect</u>	City Engineer	Once before to issuance of occupancy permits	Prior to issuance of occupancy permits	Written verification of payment of DIF <u>into adopted fair share programs</u>		Withhold OccupancyPermits

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World Logistics Center – Mitigation Monitoring and Reporting Program

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<u>funds from the project and any other funds to needed to complete the improvements.</u>						
4.15.7.4D As a condition of approval for individual development permits processed in the future under the World Logistics Center Specific Plan, the City shall require each project to pay the requisite Transportation Uniform Mitigation Fee (TUMF) as set forth in Municipal Code Sections 3.55.050 and 3.55.060 <u>Chapter 3.44</u> . Required TUMF payments shall be made prior to the issuance of occupancy permits for the requested development.	City Engineer <u>City Planning Division</u>	Once before to issuance of occupancy permits	Prior to issuance of occupancy permits	Written verification of payment of TUMF		Withhold Occupancy Permits
4.15.7.4E In order to ensure that all of the Project’s traffic impacts are mitigated to the greatest extent feasible, the Applicant shall contribute its fair share of the cost of the needed traffic improvements that are not within the City as identified in the <u>Revised</u> Traffic Impact Analysis (i.e., under the jurisdiction of other cities, the County of Riverside or Caltrans, pursuant to Mitigation Measure 4.15.7.4F). As used in this mitigation measure, the Applicant’s “fair share” has been determined in compliance with the requirements of the Fee Mitigation Act, Government Code § 66000 et seq., and, pursuant to § 66001(g), does not require that the Applicant be responsible for making up for any existing deficiencies. <u>The fair share mitigation is summarized in Tables 72 through 77 of the TIA located in Appendix F of the RSFEIR.</u>	City Engineer	Once before to issuance of occupancy permits	Prior to issuance of occupancy Permits	Written verification of payment of DF <u>or TUMF into adopted fair share programs</u>		Withhold Occupancy Permits
4.15.7.4F The Applicant shall pay its portion of the fair share of the cost of traffic improvements identified in the Transportation Impact Analysis for those significantly impacted road segments and intersections for each warehouse building within the World Logistics Center if the impacted jurisdiction has established a fair share contribution program prior to the approval of a building-specific plot plan. The City shall determine whether a fair share program exists in the impacted jurisdiction and, if one does exist, require that the appropriate fees are paid by the Applicant, consistent with the requirements below, prior to the issuance of a certificate of occupancy for the building in question. If no fair share program exists or if the existing programs are not consistent with the requirements below, then no payment of fees shall be required. The impacts are to be determined on a road segment or intersection basis. Nothing in this condition requires the payment of a traffic impact fee imposed by another jurisdiction which covers improvement to facilities where the	City Engineer	Once prior to issuance of building permits for individual buildings.	Prior to issuance of occupancy Permits	Written verification of payment of into <u>adopted fair-share fees-programs</u>		Withhold Occupancy Permits

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<p>Project does not have a significant impact. Fair-share contributions will be determined on a building-by-building basis as a share of the impact of the Project as a whole (for each segment or intersection where the WLC project as a whole has a significant impact identified in the Revised Sections of the FEIR) as determined by the Revised Traffic Impact Analysis and will be due as each certificate of occupancy is issued. The fair share payments for the significantly impacted road segments and intersections identified in the Revised Sections of the FEIR will be required even though the impact resulting from a specific building does not, by itself, cause a significant impact.</p> <p>For example, the intersection of Martin Luther King Blvd. and the I-215 northbound ramps (Intersection 85) in the City of Riverside was identified as a place where the World Logistic Center contributes to cumulatively significant impacts, and where the fair share contribution of the World Logistic Center project as a whole was computed to be 6.2%. If the City of Riverside establishes a fair share contribution program consistent with this Mitigation Measure 4.15.7.4F to improve that intersection, then when a certificate of occupancy is to be issued for a 2-million square feet high-cube warehouse in the World Logistic Center (approximately 5% of the entire World Logistic Center project) the amount of the fair share payment due from the Applicant to the City of Riverside would be computed as follows:</p>						

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Mitigation Measure No. / Implementing Action							Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
Amount Due	=	Total cost of Improvement	X	Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis	X	%						
A x B x C = D												
A = % attributable to the building that is subject to the certificate of occupancy (%5)												
B = Total World Logistics Center fair share (6.2%) as determined by Traffic Impact Analysis												
C = Total cost of Improvement												
D = Amount Due												
<p>A similar calculation would be done for each subsequent building, with payments for each due at the time of issuance of the certificate of occupancy. As a result, while each building individually would not produce a significant impact, and therefore would not be required to pay any mitigation fees if considered by itself, the total amount of the payments for all of the buildings would be equal to the fair share payment for the entire World Logistic Center to the extent that the responsible jurisdiction has chosen to adopt a fair share contribution funding program consistent with Mitigation Measure 4.15.7.4F.</p>												
<p>4.15.7.4G City shall work directly with Western Riverside Council of Governments WRCOG to request that Transportation Uniform Mitigation Fee TUMF funding priorities be shifted to align with the needs of the City, including improvements identified in the World Logistics Center Specific Plan traffic impact analysis in the TIA. Toward this end, City shall meet regularly with Western Riverside Council of Governments WRCOG.</p>							City Engineer	On-going	Yearly starting with project up and ending with project buildout.	City Engineer provides quarterly updates to the City Council regarding TUMF funding priorities as it relates to the improvements identified in the traffic impact analysis.		None
4.16 UTILITIES AND SERVICE SYSTEMS												
<p>4.16.1.6.1A Prior to approval of a precise grading permit for each plot plan for development within the World Logistics Center Specific Plan (WLCSF), the developer shall submit landscape plans that demonstrate compliance with the World Logistics Center Specific Plan, the State of California Model Water Efficient</p>							<u>City Planning Division</u>	<u>Once</u>	<u>Prior to issuance of precise grading permit for each plot plan.</u>	<u>Review and Approval of landscape plans</u>		<u>Withhold precise grading permit.</u>

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
<p>Landscape Ordinance (AB 1881), and Conservation in Landscaping Act (AB 325). This measure shall be implemented to the satisfaction of the Planning Division. Said landscape plans shall incorporate the following:</p> <ul style="list-style-type: none"> • Use of xeriscape, drought-tolerant, and water-conserving landscape plant materials wherever feasible and as outlined in Section 6.0 of the World Logistics Center Specific Plan; • Use of vacuums, sweepers, and other “dry” cleaning equipment to reduce the use of water for wash down of exterior areas; • Weather-based automatic irrigation controllers for outdoor irrigation (i.e., use moisture sensors); • Use of irrigation systems primarily at night or early morning, when evaporation rates are lowest; • Use of recirculation systems in any outdoor water features, fountains, etc.; • Use of low-flow sprinkler heads in irrigation system; • Provide information to the public in conspicuous places regarding outdoor water conservation; and • Use of reclaimed water for irrigation if it becomes available. 						
<p>4.16.1.6.1B All buildings shall include water-efficient design features outlined in Section 4.0 of the World Logistics Center Specific Plan. This measure shall be implemented to the satisfaction of the Land Development Division/Public Works. These design features shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> • Instantaneous (flash) or solar water heaters; • Automatic on and off water faucets; • Water-efficient appliances; • Low-flow fittings, fixtures and equipment; • Use of high-efficiency toilets (1.28 gallons per flush [gpf] or less); • Use of waterless or very low water use urinals (0.0 gpf to 0.25 gpf); • Use of self-closing valves for drinking fountains; • Infrared sensors on drinking fountains, sinks, toilets and urinals; • Low-flow showerheads; 	<p>Land Development Division/Public Works</p> <p><u>Building and Safety Division</u></p> <p><u>Planning Division</u></p>	Once	Prior to issuance of any building permits.	Review and Approval building plans		Withhold building permit.

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<ul style="list-style-type: none"> Water-efficient ice machines, dishwashers, clothes washers, and other water-using appliances; Cooling tower recirculating system where applicable; Provide information to the public in conspicuous places regarding indoor water conservation; and Use of reclaimed water for wash down if it becomes available. 						
<p>4.16.1.6.1C Prior to approval of a precise grading permit for each plot plan, irrigation plans shall be submitted to and approved by the City demonstrating that the development will have separate irrigation lines for recycled water. All irrigation systems shall be designed so that they will function properly with recycled water if it becomes available. This measure shall be implemented to the satisfaction of the City Planning Division and Land Development Division/Public Works.</p>	City Planning Division, Land Development Division/Public Works	Once	Prior to issuance of precise grading permits.	Review and Approval irrigation plans		Withhold precise grading permit.
<p>4.16.1.6.2A Each Plot Plan application for development shall include a concept grading and drainage plan, with supporting engineering calculations. The plans shall be designed such that the existing sediment carrying capacity of the drainage courses exiting the project area is similar to the existing condition. The runoff leaving the project site shall be comparable to the sheet flow of the existing condition to maintain the sediment carrying capacity and amount of available sediment for transport so that no increased erosion will occur downstream. This measure shall be implemented to the satisfaction of the City Land Development Division/Public Works.</p>	Land Development Division/Public Works	Once Concurrent with Plot Plan review and approval.	Prior to issuance of grading permit.	Review and Approval of Grading and Drainage Plans		Withhold Grading Permit. Plot Plan Approval
<p>4.16.4.6.1A Each application for a building permit shall include energy calculations to demonstrate compliance with the California Energy Efficiency Standards confirming that each new structure meets applicable Building and Energy Efficiency Standards. The plans shall also ensure that buildings are in conformance with the State Energy Conservation Efficiency Standards for Nonresidential buildings (Title 24, Part 6, Article 2, California Administrative Code). This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions. Plans shall show the following: Energy-efficient roofing systems, such as “cool” roofs, that reduce roof temperatures significantly during the summer and therefore reduce the energy requirement for air conditioning. Cool pavement materials such as lighter colored pavement materials,</p>	City Building and Safety Division and Planning Division	Once prior to issuance of building permit. Once during on-site inspection	Prior to issuance of building permit.	Review of construction documents and onsite inspection		Withhold Building Permit. Or withhold Occupancy Permit

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porous materials, or permeable or porous pavement, for all roadways and walkways not within the public right of way, to minimize the absorption of solar heat and subsequent transfer of heat to its surrounding environment. Energy-efficient appliances that achieve the 2008 Appliance Energy Efficiency Standards (e.g., EnergyStar Appliances) and use of sunlight-filtering window coatings or double-paned windows.						
<p>4.16.4.6.1B Prior to the issuance of any building permits within the World Logistics Center Specific Plan, each project developer shall submit energy calculations used to demonstrate compliance with the performance approach to the California Energy Efficiency Standards to the Building and Safety and Planning Divisions that shows each new structure meets the applicable Building and Energy Efficiency Standards. Plans may include but are not necessarily limited to implementing the following as appropriate:</p> <ul style="list-style-type: none"> ● High efficiency air conditioning with electronic management system (computer) control. ● Variable Air Volume air distribution. ● Outside air (100 percent) economizer cycle. ● Staged compressors or variable speed drives to flow varying thermal loads. ● Isolated High efficiency air conditioning zone control by floors/separable activity areas. ● Specification of premium efficiency electric motors (i.e., compressor motors, air handling units, and fan coil units). ● Use of occupancy sensors in appropriate spaces. ● Use of compact fluorescent lamps in place of incandescent lamps. ● Use of cold cathode fluorescent lamps. ● Use of Energy Star exit lighting or exit signage. ● Use of T 8 lamps and electronic ballasts where applications of standard fluorescent fixtures are identified. ● Use of lighting power controllers in association with metal halide or high pressure sodium (high intensity discharge) lamps for outdoor lighting and parking lots. ● Use of skylights (may conflict with installation of solar panels in some instances). ● Consideration of thermal energy storage air conditioning for spaces or hotel buildings, meeting facilities, theaters, or 	City Building and Safety Division and Planning Division	Once prior to issuance of building permit.	Prior to issuance of building permit.	Review of construction documents and onsite inspection		Withhold Building Permit.

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other intermittent use spaces or facilities that may require air conditioning during summer, day peak periods.						
<p>4.16.4.6.1C Prior to the issuance of a building permit, new development shall demonstrate that each building has implemented the following:</p> <p>1) Install solar panels with a capacity equal to the peak daily demand for the ancillary office uses in each warehouse building;</p> <p>2) Increase efficiency for buildings by implementing either 10 percent over the 2008 Title 24’s energy saving requirements or the Title 24 requirements in place at the time the building permit is approved, whichever is stricter; and</p> <p>3) Require the equivalent of “Leadership in Energy and Environmental Design Certified” for the buildings constructed at the World Logistics Center based on Leadership in Energy and Environmental Design Certified standards in effect at the time of project approval.</p> <p>This measure shall be implemented to the satisfaction of the Building and Safety and Planning Divisions.</p>	Building and Safety Division and Planning Division	Once before issuance of building permit.	Prior to the issuance of any building permits	Submittal of energy calculations that show compliance with the California Energy Efficiency Standards		Withhold Building Permit
<p>4.17 Energy (New Section)</p> <p>Refer to mitigation measures in Air Quality and GHG.</p>						

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Facts, Findings and Statement of Overriding Considerations
Regarding the Environmental Effects of the
World Logistics Center
(State Clearinghouse No. 2012021045)

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I. INTRODUCTION

The Planning Commission of the City of Moreno Valley (this “Commission”), in certifying the Revised Final Environmental Report (“Revised Final EIR”) for the World Logistics Center (WLC) Project (the “Project”) for the construction of up to approximately 40.4 million square feet of warehouse distribution uses classified as Logistics Development (LD) and 200,000 square feet of warehousing-related uses classified as “Light Logistics” (LL) on 2,535 acres within the WLC Specific Plan area, makes the Findings described below and adopts the Statement of Overriding Considerations presented at the end of the Findings. The Revised Final EIR was prepared by the City of Moreno Valley (“City”) acting as lead agency pursuant to the California Environmental Quality Act (“CEQA”). Hereafter, unless specifically identified, the Notice of Preparation (“NOP”), Notice of Availability & Completion (“NOA/NOC”), Draft EIR (“DEIR”), Technical Studies, Final EIR containing Responses to Comments and textual revisions to the Draft EIR (“FEIR”), the Revised Sections of the Final EIR (“RSFEIR”), the Draft Recirculated Sections of the RSFEIR (“Recirculated Sections”), Responses to Comments, and Errata will be referred to collectively herein as the “EIR” These Findings are based on the entire record before this Commission, including above-referenced documents, in addition to Resolution Exhibit B, Mitigation Monitoring and Reporting Program (MMRP), Section VI, Statement of Overriding Considerations, and other information presented to the Commission and part of the administrative record. This Commission adopts the facts and analyses in the Revised Final EIR, which are summarized below for convenience. The omission of some detail or aspect of the Revised Final EIR does not mean that it has been rejected by this Commission.

II. PROJECT SUMMARY

A. PROJECT DESCRIPTION

1. Site Location

The Project is located in the eastern portion of the City of Moreno Valley (also referred to as the “Rancho Belago” portion of the City), in northwestern Riverside County, within the World Logistics Center (WLC) Specific Plan area. The Project site is immediately south of State Route 60 (SR-60), between Redlands Boulevard and Gilman Springs Road (the easterly City limit), extending to the northern boundary of the San Jacinto Wildlife Area. The major roads that currently provide access to the Project site are Redlands Boulevard, World Logistics Parkway, Alessandro Boulevard, and Gilman Springs Road.

The WLC Project area is located in portions of Sections 1, 12, and 13 of Township 3 South, Range 3 West; and portions of Sections 6, 7, 8, 9, 16, 17, 18, 19, 20, and 21 of Township 3 South, Range 2 West, as depicted on the U.S. Geological Survey (USGS) 7.5-minute series Sunnymead and El Casco, California quadrangles.

2. Project Description

The World Logistics Center (WLC) project is located on 2,610 acres in the Rancho Belago area at the eastern end of Moreno Valley, south of SR-60, east of Redlands Boulevard, west of Gilman Springs Road and north of the San Jacinto Wildlife Area. The site currently has a General Plan designation of Business Park/Light Industrial and zoning designations of WLCSP-LD (World Logistics Center Specific Plan –

Logistics Development) and WLCSP-LL (World Logistics Center Specific Plan – Light Logistics). The site is subject to the adopted World Logistics Center Specific Plan (WLC Specific Plan) which authorizes the construction and operation of 40,600,000 square feet of logistics facilities and associated infrastructure and 74.3 acres of open space.

The land use entitlements for the WLC project that are in place include the General Plan and zoning designations, the WLC Specific Plan, and a request for annexation of 85 acres of unincorporated land in Riverside County into the City – the annexation pre-zoning having been adopted in November 2015, through the initiative process. The discretionary approvals that will be considered by the City as part of the current approval process consist of a development agreement and Parcel Map 36457.

3. Actions Covered by the EIR

The Revised Final EIR provides information to allow a reasoned decision concerning the following discretionary and non-discretionary approvals:

- Implementation of the World Logistics Center Specific Plan.
- Approval of the Development Agreement between the Project applicants, collectively Highland Fairview, and the City of Moreno Valley, in order to provide certainty for the future development of the Project for those parcels owned by Highland Fairview.
- Approval of a Tentative Parcel Map, subdividing a portion of the Project site into large parcels. This map is for financing purposes only and does not create any development rights for the subdivided properties. Subsequent subdivision applications will be required prior to the development of any buildings on the site.
- Approval of grading plans, plot plans, building plans, infrastructure plans and related approvals for construction and operation of individual buildings within each development area.

Approvals and permits required by other agencies include:

a. County of Riverside

- Local Agency Formation Commission (LAFCO): Annexation of 85-acre parcel.
- Flood Control and Water Conservation District: Amend Storm Drain Master Plan.

b. Other Affected Agencies

- Western Riverside Council of Governments: Transportation Uniform Mitigation Fee (TUMF) Contributions.
- Eastern Municipal Water District: Water Service Agreements.
- Developer will make “fair share” contributions to development impact fee programs if established by the cities of Riverside, Perris, and Redlands for local road and intersection improvements identified in the programmatic Traffic Impact Assessment (TIA) included with the RSFEIR (Revised Final EIR Part 3, Appendix F). This item is subject to review and approval by the City Transportation Division.

c. State of California

- Regional Water Quality Control Board: Water Quality Permitting.
- Department of Transportation (Caltrans): Encroachment Permits for SR-60 Developer will make “fair share” contributions to a development impact free program if established by Caltrans for future development of improvements to State Route 60 as identified in the programmatic Traffic Impact Assessment (TIA) included with the RSFEIR (Revised Final EIR Part 3, Appendix F).
- California Department of Fish and Wildlife: Streambed Alteration Agreements.

d. Federal Agencies

- U.S. Army Corps of Engineers: Clean Water Act Permitting and associated federal agency consultation.

B. PROJECT OBJECTIVES

The Project Objectives include the following:

- Create substantial employment opportunities for the citizens of Moreno Valley and surrounding communities.
- Provide the infrastructure plan necessary to meet current market demands and to support the City’s Economic Development Action Plan.
- Create a major logistics center with good regional and freeway access.
- Implement design standards and development guidelines to ensure a consistent and attractive appearance throughout the entire Project.
- Implement a master plan for the entire Project area to ensure that the Project is efficient and business-friendly to accommodate the next-generation of logistics buildings.
- Provide a major logistics center to accommodate a portion of the ever-expanding trade volumes at the Ports of Los Angeles and Long Beach
- Create a Project that will provide a balanced approach to the City’s fiscal viability, economic expansion, and environmental integrity.
- Provide the infrastructure improvements required to meet Project needs in an efficient and cost-effective manner.
- Encourage new development consistent with regional and municipal service capabilities.
- Significantly improve the City’s jobs/housing balance and help reduce unemployment within the City.
- Provide thousands of construction job opportunities during the Project’s buildout phase.
- Provide appropriate transitions between on-site and off-site uses.

III. ENVIRONMENTAL REVIEW AND PUBLIC PARTICIPATION

The City has conducted an extensive review of this Project which included the DEIR, FEIR, RSFEIR, Recirculated Sections and supporting technical studies, along with public review and comment period first during the circulation of the Notice of Preparation, then through the circulation of the DEIR, circulation of the FEIR, and circulation of the RSFEIR and Recirculated Sections for public review and comment. The following is a summary of the environmental review of this Project:

- On February 25, 2012, the City circulated a Notice of Preparation (“NOP”) that identified the environmental issues that the City anticipated would be analyzed in the Project’s DEIR to the State Clearinghouse, responsible agencies, and other interested parties.
- On March 12, 2012, the City conducted a public scoping meeting to allow members of the public to provide comments and input regarding the scope and content of the DEIR.
- The NOP public review period ran for 30 days, from February 25, 2012 to March 26, 2012. Written comments on the NOP were received from 27 different agencies, organizations, and individuals. The scope of the issues identified in the comments expressing concern included potential impacts associated with:
 - Aesthetics
 - Air Quality
 - Alternatives
 - Biological Resources
 - Cultural Resources
 - Greenhouse Gases
 - Geology & Soils
 - Hazards
 - Hydrology
 - Land Use
 - Noise
 - Population & Housing
 - Public Services
 - Traffic
 - Utilities

Based on the comments received pursuant to the NOP, it was determined that all environmental issues needed to be addressed in depth in the DEIR.

- As required by the California Environmental Quality Act (CEQA) Guidelines Section 15087, a Notice of Completion (NOC) of the DEIR State Clearinghouse No. 2012021045 for the WLC Project was filed with the State Clearinghouse on July 17, 2012, and the Notice of Availability (NOA) of the DEIR was filed with the Riverside County Clerk on July 18, 2012.
- The DEIR was circulated for public review for a period of 63 days, from February 4, 2013 to April 8, 2013. Copies of the DEIR were distributed to all Responsible Agencies and to the State Clearinghouse in addition to various public agencies, citizen groups, and interested individuals. Copies of the DEIR were also made available for public review at the City Planning Department, at one area library, and on the internet. A total of one-hundred and forty-four (144) comment letters were received during the public review period commenting on the DEIR and WLC Project. Twenty-three (23) of the comment letters received were from Federal, State, regional, or local agencies. Fifteen (15) comment letters were received from private organizations or conservation groups, and one-hundred and six (106) letters were received from individuals. In addition, several letters/emails from individuals and one letter from the City of Redlands were received well after the close of the public review period. The

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- City prepared specific responses to all comments. The responses to comments are included in FEIR, Revised Final EIR Part 4 Volume 1.
- On May 1, 2015 in accordance with *Public Resources Code* Section 21092.5, the City provided written responses to public agencies that commented on the DEIR.
 - On August 2015, the City Council held a public hearing to consider the Project and staff recommendations. The Council, after considering written comments and oral testimony on the FEIR, determined that no new information was presented that would require recirculation of the FEIR. Following public testimony, submission of additional written comments, and staff recommendations, the Council certified the FEIR as having been completed in compliance with CEQA, adopted Facts, Findings and the Statement of Overriding Considerations, and the further recommendations in the Staff Report, and approved the Project.
 - In September 2015, a number of lawsuits were filed challenging the City Council certification of the FEIR and the approvals granted for the construction and operation of the WLC.
 - In November 2015, the City Council, in response to initiative petitions submitted to it for the GPA, Zone Change, the WLC Specific Plan and the Development Agreement, adopted an ordinance which vacated approvals for those entitlements granted in August, and then reapproved the GPA, the Zone Change, the WLC Specific Plan and the Development Agreement. *The WLC, through the WLC Specific Plan, is entitled for 40.6 million square feet of logistics and associated land uses and infrastructure on the 2,610-acre Project site.*
 - In February 2016, lawsuits were filed challenging the use of the initiative process to adopt the Development Agreement. The trial judgement rejected the challenges (later overturned on appeal).
 - On February 8, 2018, the Honorable Sharon Waters, Judge of the Riverside Superior Court, found five deficiencies in the FEIR. The key findings from Judge Waters' ruling are quoted below:

Energy Impacts: “The FEIR must provide a comparison of feasible, cost-effective renewable energy technologies in the Energy Impacts analysis”.

Biological Impacts: “The FEIR should remove all references to and consideration of the 910 acres of SJWA and MSHCP lands as “buffer zone” or “CDFW Conservation Buffer Area” in the Biological Resources and Habitat Impacts analysis”.

Noise Impacts: “The FEIR must provide an analysis of construction noise over ambient levels; provide adequate analysis on construction noise impacts on nearby homes; address the inadequacy of mitigation measures, which fail to include performance standards or ways to reduce construction noise”.

Agricultural Impacts: “The FEIR and the resolution certifying the FEIR require clarification as to whether loss of locally important farmland will have a significant direct or cumulative impact on agriculture and, if significant, the FEIR must either explain how proposed mitigation will reduce the impact or why other mitigation is not feasible”.

Cumulative Impacts: “The FEIR should include consideration of recently constructed and proposed large warehouse projects in the summary of projections method and should analyze

- whether individually significant impacts may be cumulative considerable”.
- In June 2018, a judgement was entered, and a writ issued which ordered the City to set aside the certification of the FEIR. The Revised Sections of the FEIR (RSFEIR), was prepared to correct the deficiencies identified in the February 2018 ruling.
 - In July 2018, the RSFEIR was circulated to the public for review and comment.
 - In August 2018, the Court of Appeal, Fourth Appellate District, Division One, reversed the trial court judgment in the lawsuits attacking the use of the initiative process to approve the Development Agreement, holding that the initiative process could not be used to approve the Development Agreement, and directed the trial court to issue a writ of mandate ordering the City to vacate its November 2015 approval of the Development Agreement. The Court of Appeal’s decision did not affect the validity of the WLC Specific Plan, the GPA, the rezoning or the request for annexation adopted through the initiative process, all of which are still in effect.
 - On August 15, 2019, the U.S. Environmental Protection Agency’s approval of the use of the California EMFAC2017 air quality analysis model resulted in requiring revisions to portions of the RSFEIR. Because the RSFEIR utilized EMFAC2014 for the Project and cumulative analyses for air quality, greenhouse gas, and energy evaluations, these portions of the RSFEIR using EMFAC2014 were addressed in Draft Recirculated Sections of the RSFEIR (“Recirculated Sections”) using EMFAC2017. Other environmental analyses were also added to the Recirculated Sections.
 - In December 2019, the Recirculated Sections were circulated to the public for review and comment (Revised Final EIR Part 2).
 - On April 30, 2020 in accordance with *Public Resources Code* Section 21092.5, the City provided written responses to public agencies that commented on the Recirculated Sections (Revised Final EIR Part 2) and RSFEIR (Revised Final EIR Part 3).
 - On May 2, 2020, the Final Responses to Comments and Errata was published, providing written responses to all comments received on the RSFEIR and the Recirculated Sections (Revised Final EIR Part 1a).
 - On May 14, 2020, the Planning Commission held a public hearing to consider the Project and staff recommendations. The Commission, after considering written comments and oral testimony on the Revised Final EIR, determined that no new information was presented that would require recirculation of the Revised Final EIR. Following public testimony, submission of additional written comments, and staff recommendations, the Commission certified the Revised Final EIR, adopted Facts, Findings and the Statement of Overriding Considerations, and the further recommendations in the Staff Report, and approved the Parcel Map and recommended that the City Council approve the Development Agreement.
 - The Revised Final EIR serves to evaluate the environmental effects of the construction and operation of the World Logistics Center project.

IV. INDEPENDENT JUDGMENT FINDING

The Applicant originally retained the independent consulting firm of LSA Associates, Inc. (“LSA”) to prepare the FEIR for the Project. LSA prepared the FEIR under the supervision, direction and review of the City with the assistance of an independent peer review by Dr. Timothy Krantz, University of Redlands, and Fehr & Peers for the Traffic Impact Analysis. Environmental Science Associates (ESA) was later retained to prepare the RSFEIR and Recirculated Sections. The Applicant retained Kimley-Horn and Associates to assist in reviewing the RSFEIR, Recirculated Sections, and Responses to Comments. The City of Moreno Valley is the Lead Agency for the preparation of the Revised Final EIR, as defined by CEQA, Public Resources Code Section 21067. This Commission has received and reviewed the Revised Final EIR prior to certifying the Revised Final EIR and prior to making any decision to approve or disapprove the Parcel Map.

Finding: Consistent with Public resources Code Section 21082.1 CEQA and Section 15084 of the CEQA Guidelines, the City has conducted its own independent review and analyses of the Revised Final EIR, and circulated draft and proposed final documents, including the responses to comments and the Errata. The Revised Final EIR reflects the City’s independent judgment.

A. GENERAL FINDING ON MITIGATION MEASURES

In preparing for the consideration of the Parcel Map, part of the Project, City staff incorporated the mitigation measures set forth in the Revised Final EIR as applicable to that approval for the Project. In the event that the approvals do not use the exact wording of the mitigation measures recommended in the Revised Final EIR, in each such instance, the adopted mitigation measures incorporated into approvals are intended to be identical or substantially similar to the mitigation measure set forth in the MMRP (Exhibit B to the Resolution). Any minor revisions were made for the purpose of improving clarity or to better define the intended purpose.

Finding: Sections 4.8 and 4.9 of the Development Agreement require the developer of the Project to construct or pay for all necessary traffic improvements and a fire station, all as needed, as a result of the development of the Project. In return, section 1.5, 4.8, and 4.9 of the Development Agreement exempts the Project from the payment of development impact fees ordinarily imposed under Municipal Code sections 3.42.030, 040, and 060. These exemptions shall remain in effect only as long as the Development Agreement, is in effect. If the Development Agreement is approved but does not become effective or if it is approved and does become effective and is terminated for any reason, the requirements that the Project pay development impact fees under Municipal Code sections 3.42.030, .040, .050, and .060 shall become effective.

Unless specifically stated to the contrary in these findings, it is this Commission’s intent to adopt all mitigation measures recommended in the Revised Final EIR which are applicable to the Project. If a measure has, through error, been omitted from the Approvals or from these Findings, and that measure is not specifically reflected in these Findings, that measure shall be deemed to be adopted pursuant to this paragraph. In addition, unless specifically stated to the contrary in these Findings, all Approvals repeating, or rewording mitigation measures recommended in the Revised Final EIR are intended to be substantially

similar to the mitigation measures identified in the Revised Final EIR and as shown in the MMRP (Resolution Exhibit B) and are found to be equally effective in avoiding or lessening the identified environmental impact. In each instance, the Approvals contain the final wording for the mitigation measures.

V. ENVIRONMENTAL IMPACTS AND FINDINGS

City staff reports, the Revised Final EIR, written and oral testimony at public meetings or hearings, these facts, findings, and statement of overriding considerations, and other information in the administrative record, serve as the basis for the City's environmental determination.

The detailed analysis of environmental impacts defined as potentially significant by CEQA and mitigation measures for the Project is presented in the Revised Final EIR Parts 2, 3 and 4. Responses to comments on the DEIR, along with copies of the comments, are provided in the Revised Final EIR Part 4 Volume 1 (regarding comments on the 2015 DEIR) and Revised Final EIR Part 1 (regarding comments on the 2018 RSFEIR and the 2019 Recirculated Sections).

The DEIR evaluated fourteen major environmental categories for potential impacts including Aesthetics, Agricultural Resources, Air Quality, Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use, Noise, Population and Housing, Public Services and Facilities (including Recreation), Transportation, Utilities and Service Systems, and Greenhouse Gases and Global Climate Change. Both Project-specific and cumulative impacts were evaluated. In addition, the analysis of potentially significant environmental impacts and mitigation measures were further evaluated and/or updated within the RSFEIR and Recirculated Sections, and associated Responses to Comments and Errata, in response to the February 2018 court ruling noted above, and described in detail within the Revised Final EIR Part 1, Topical Response C.

Of these fourteen major environmental categories, the Commission concurred with the conclusions in the Revised Final EIR that the issues and sub issues discussed in Sections V.A and V.B below were either less-than-significant without mitigation or could be mitigated below a level of significance. For the remaining potential environmental impacts that could not feasibly be mitigated below a level of significance discussed in Section V.C, the authority to impose a feasible mitigation measure is vested in another jurisdiction and overriding considerations exist which made these potential impacts acceptable to the Commission. Based on the entire record and having considered the unavoidable adverse impacts of the Project, the City hereby determines that all feasible mitigation has been adopted to reduce or avoid the potentially significant impacts identified in the Revised Final EIR and that no additional feasible mitigation is available to further reduce significant impacts.

A. LESS-THAN-SIGNIFICANT ENVIRONMENTAL IMPACTS NOT REQUIRING MITIGATION

The Moreno Valley Planning Commission hereby finds that the following potential environmental impacts of the Project are less-than-significant and therefore do not require the imposition of mitigation measures.

1. Agricultural and Forestry Resources

a. Forest Land Zoning

Potential Significant Impact: Whether the Project would conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)).

Findings: Potential impacts of the Project related to forest land zoning were analyzed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to forest land and timberland; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3 and the California Department of Forestry and Fire Protection, there are no areas designated as forest land or timberland on the Project site. Therefore, no significant impacts would occur from the implementation of the Project. (Revised Final EIR Part 3 pg. 4.2-8).

b. Loss or Conversion of Forest Land

Potential Significant Impact: Whether the Project would result in the loss of forest land or conversion of forest land to non-forest use.

Findings: Potential impacts of the Project related to the loss or conversion of forest land are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to the loss or conversion of forest land; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3 and the California Department of Forestry and Fire Protection, there are no areas of forest land on the Project site. Therefore, no significant impacts would occur from the implementation of the Project (Revised Final EIR Part 3, pg. 4.2-8).

c. Existing Zoning and Williamson Act

Potential Significant Impact: Whether the Project would conflict with existing zoning for agricultural use or a Williamson Act contract.

Findings: Potential impacts of the Project related to conflicts with existing zoning for agricultural uses or Williamson Act properties are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. Based on the

entire record before us, this Commission finds that development of the Project will not result in conflicts with existing agricultural zoning or an existing Williamson Act contract; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.2 of the Revised Final EIR Part 3, while some portions of the 2,610-acre Project site are currently used for agriculture, there were no Williamson Act contracts on either the Project site or any adjacent properties. According to Section 4.2 of the Revised Final EIR Part 3, agriculture is allowed in most areas of the City as an interim land use until it is replaced by development (Revised Final EIR Part 3, pg. 4.2-9). Currently, the City's updated 2019 General Plan Land Use Map shows that there are no agricultural zones identified on the Project site or on any of the surrounding properties. In addition, the Moreno Valley Map Viewer¹ that provides geographic and parcel information via Geographic Information System (GIS) data does not identify the Project site's zoning for agricultural uses. Because the Project would not conflict with any Williamson Act contracts and is consistent with the General Plan's land use and zoning designations, the impacts related to this issue would be less than significant and no mitigation is required. (Revised Final EIR Part 3, pg. 4.2-9).

d. Farmland Conversion

Potential Significant Impact: Whether the Project would result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural land use.

Findings: Potential loss of Farmland (Prime Farmland, Unique Farmland or Farmland of Statewide Importance) is discussed in the Revised Final EIR Part 3, Section 4.2. Based on the entire record before us, this Commission finds that development of the Project will not result in the loss of any Farmland; therefore, no mitigation is required.

Facts in Support of the Finding: According to Section 4.2 of the Revised Final EIR Part 3, while portions of the Project site are currently used for agriculture, there is no land currently designated as Farmland, on the 2,610-acre Project site or in the 104-acre off-site improvement area. Because the Project would not convert any on-site or off-site land designated as Farmland the Project's impacts related to this issue would be less than significant, and no mitigation is required (Revised Final EIR, Part 3, pgs. 4.2-9 and 4.2-10).

¹ Accessed February 2, 2020. Retrieved from: https://moval.geocortex.com/Html5Viewer/index.html?viewer=comv_hv

e. **Conversion of Farmland to Non-Agricultural Uses**

Potential Significant Impact: Whether the Project would involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use, or conversion of forest land to non-forest use.

Finding: The current agricultural status of the Project site and potential impacts of the Project related to conversion of the Project site to non-agricultural uses are discussed in detail in Section 4.2 of the Revised Final EIR Part 3. The 25 acres of Unique Farmland identified in the FEIR were determined to be Farmland of Local Importance in 2017. The Project would convert approximately 2,361 acres that are designated as Farmland of Local Importance, approximately 2,200 acres of which are being farmed, to nonagricultural uses (Revised Final EIR, Part 3 pg. 4.2-10). However, results of the California Land Evaluation and Site Assessment (LESA) Model indicated a less than significant impact and therefore the conversion of the currently farmed land does not require mitigation. Based on the entire record before us, this Commission finds that potentially significant impacts related to conversion of farmland to non-agricultural use would be a less than significant level without implementation of mitigation.

Facts in Support of the Finding: In addition to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) designations, Riverside County has established a program through which it classifies various land within the County as Locally Important Farmland. The state uses the County's determination to identify Farmland of Local Importance for its FMMP designations. The factors used by Riverside County to define Locally Important Farmland are provided in Section 4.2.1.1 of the Revised Final EIR, Part 3.

The LESA Model. The California LESA Model was developed to provide lead agencies with an optional methodology to ensure that potentially significant effects on the environment from agricultural land conversions are quantitatively and consistently considered in the environmental review process (Public Resources Code Section 21095), including in CEQA reviews. The California LESA Model evaluates measures of soil resource quality, a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, the factors are rated, weighted, and combined, resulting in a single numeric score. The project score becomes the basis for making a determination of a project's potential significance.

To assess potential agricultural resource impacts that may result from development of the World Logistics Center site, the LESA model was run by WSP for the 2,610-acre project area. The total LESA score for the Project is 60.4, which is considered significant unless either the Land Evaluation (LE) sub-score or the Site Assessment (SA) sub-score is less than 20. The LE sub-score is 40.9 and the SA sub-score is 19.5, indicating a less than significant impact and therefore does not require mitigation (Revised Final EIR Part 3, pg. 4.2-11).

An independent analysis was conducted on the potential agricultural resource impacts that may result from development of the World Logistics Center site. The LESA model was run by the Agribusiness, Natural Resources & Energy Practice Group of Cushman & Wakefield Western, Inc. (C&WW) for the 2,610-acre Project area. The total LESA score for the project is 58.9, which is considered significant only if the LE and

SA sub-scores are each greater than 20. The LE sub-score is 40.9 and the SA sub-score is 18.0, indicating a less than significant impact and therefore does not require mitigation (Revised Final EIR Part 3, pg. 4.2-11).

The majority of the World Logistics Center Project site is currently designated as Farmland of Local Importance by the state's FMMP as determined by the County. The County's maps do not reflect the City's General Plan Land Use Map, which shows no agricultural designations in the City (Revised Final EIR Part 3, pg. 4.2-12).

Implementation of the Project would result in the permanent conversion of approximately 2,200 acres currently used for dry farming to non-agricultural uses and would result in the permanent conversion of approximately 2,361 acres of land designated as Farmland of Local Importance. While this could have an effect on accelerating the loss of other existing agricultural land, portions of the state-owned lands to the south likely will continue in agricultural production. Likewise, there is no other agricultural use in the Zone of Influence (term used in the State LESA Model) and a majority of the land in that zone is vacant (i.e., in the Badlands to the east and portions of the San Jacinto Wildlife Area and the Lake Perris State Recreation Area to the south). The conversion of agricultural lands to urban uses is supported by the City's General Plan policies, as discussed in Section 4.2 of the Revised Final EIR Part 3. The entire Project site and adjacent lands have been designated for urban uses for nearly 20 years by the City, and the area designated Farmland of Local Importance within the Specific Plan area has been permanently converted to nonagricultural urban uses. Therefore, Project implementation will result in less than significant impacts to conversion of Farmland of Local Importance. No mitigation is required.

2. Air Quality

a. Odors

Potential Significant Impact: Whether the Project would create objectionable odors affecting a substantial number of people.

Findings: Potential impacts of the Project related to odors are discussed in detail in Section 4.3 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to objectionable odors; therefore, no mitigation is required.

Facts in Support of the Findings: As stated in Section 4.3.5.1 of the Revised Final EIR Part 4 Volume 3, diesel exhaust and volatile organic compounds (VOCs) would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from the Project site and therefore should not reach an objectionable level at the nearest sensitive receptors. Diesel exhaust would also be emitted during operation of the Project from the long-haul trucks that would visit the Project site. However, the concentrations would not be at a level to result in a negative odor response at nearby sensitive or worker receptors. In addition, modern emission control systems on diesel vehicles since 2007 virtually eliminate diesel's characteristic odor. Further, Project mitigation requires that 2010 or newer diesel vehicles be used during construction.

During blow-down maintenance activities, natural gas odors will be present around the SDG&E Compressor Plant located adjacent to the Project site. When the southernmost portion of the WLC Specific Plan area is developed, these odors will occasionally be detectable from the industrial warehouse properties adjacent to the SDG&E facility. These odors will be infrequent and odorized natural gas will not be present in high concentrations. Therefore, potential odor impacts from the adjacent natural gas operations are considered to be less than significant and do not require mitigation.

South Coast Air Quality Management District (SCAQMD) Rule 402 dictates that air pollutants discharged from any source shall not cause injury, nuisance, or annoyance to the health, safety, or comfort of the public. While the application of architectural coatings and installation of asphalt may generate odors, these odors are temporary and not likely to be noticeable beyond the Project boundaries. SCAQMD Rules 1108 and 1113 identify standards regarding the application of asphalt and architectural coatings, respectively.

SCAQMD Rule 1108 sets limitations on ROG (reactive organic gases), which are similar to and interchangeable with VOCs content in asphalt. This rule is applicable to any person who supplies, sells, offers for sale, or manufactures any asphalt materials for use in the South Coast Air Basin. Rule 1113 of the SCAQMD deals with the selling and application of architectural coatings. Rule 1113 is applicable to any person who supplies, sells, offers for sale, or manufactures any architectural coating for use in the Basin that is intended to be applied to buildings, pavements, or curbs. This rule is also applicable to any person who applies or solicits the application of any architectural coating within the Basin. Rule 1113 sets limits on the amount of VOC emissions allowed for all types of architectural coatings, along with a time table for tightening the emissions standards in the future. Compliance with Rule 1113 means that architectural coatings used during construction would have VOC emissions that comply with these limits.

Adherence to applicable provisions of these rules is standard for all development within the Basin. In addition, conditions for the design of waste storage areas on the site would be established through the permit process to ensure enclosures are appropriately designed and maintained to prevent the proliferation of odors. Solid waste generated by the on-site uses will be collected by a contracted waste hauler, ensuring that any odors resulting from on-site uses would be adequately managed.

b. Long-Term Microscale (CO Hot Spot) Emissions

Potential Significant Impact: Whether the Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

For carbon monoxide (CO), the applicable thresholds are:

- California State one-hour CO standard of 20.0 ppm; and
- California State eight-hour CO standard of 9.0 ppm.

Findings: Potential impacts of the Project related to long-term microscale (CO Hot Spot) emissions are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to long-term microscale (CO Hot Spot) emissions; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.3 of the Revised Final EIR Part 2, vehicular trips associated with the development of the World Logistics Center Project could contribute to congestion at intersections and along roadway segments in the Project vicinity resulting in potential local CO “hot spot” impacts. The primary mobile source pollutant of local concern is CO, which is a direct function of vehicle travel speeds and idling time and, thus, traffic flow conditions. CO transport is extremely limited; it disperses rapidly with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthful levels affecting local sensitive receptors (residents, schoolchildren, etc.). High CO concentrations are typically associated with roadways or intersections operating at unacceptable levels of service or with very high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project’s effect on local CO levels.

For this Project analysis, the intersections with the highest traffic volumes and the LOS E or F before mitigation were identified for 2025 using information from the table in the Traffic Impact Assessment (TIA) “Intersection LOS under 2025 Plus Project Phase 1 Conditions.” The intersections with the greatest LOS before mitigation were also identified for buildout using information from the table in the TIA “Intersection LOS under 2040 Plus Build-out Conditions.”

The CO concentrations were estimated using the CALINE4 model using 2025 and 2035 emission factors. The emission factors are for “all” vehicle classes and are not adjusted for a project-specific fleet to provide a worst-case scenario. In addition, the emission factors do not take into account the Project mitigation reductions from requiring that all diesel trucks are model year 2010 or newer (Revised Final EIR Part 2, pg. 4.3-35).

As shown in Revised Final EIR Part 2 Table 4.3-6: *Carbon Monoxide Concentrations at Intersections, 2025* and Table 4.3-7: *Carbon Monoxide Concentrations at Intersections, 2035*, the estimated 1-hour and 8-hour average CO concentrations from Project-generated and cumulative traffic plus the background concentrations are below the State and Federal standards (Revised Final EIR Part 2, pgs. 4.3-35 to 4.3-36). No CO hot spots are anticipated because of traffic-generated emissions by the Project in combination with other anticipated development in the area. Therefore, the mobile emissions of CO from the Project are not anticipated to contribute substantially to an existing or projected air quality violation of CO. Therefore, according to this criterion, air pollutant emissions during operation would result in a less than significant impact. No mitigation is required (Revised Final EIR Part 2, pgs. 4.3-34 to 4.3-35).

c. Acute and Chronic Non-Cancer Health Risk Emission Impacts

Potential Significant Impact: Whether the Project would have the potential to result in impacts to sensitive receptors with regards to acute and chronic non-cancer health risk impacts. For non-cancer health risk hazard index (HI); the applicable threshold is a cumulative increase for any target organ system exceeding 1.0 at any receptor location.

Findings: Potential impacts of the Project related to acute and chronic non-cancer health risk emission impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to acute and chronic non-cancer health risks related to Project emissions; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.3 of the Revised Final EIR Part 2, the construction and operation of the Project would not emit any toxic chemicals in any significant quantity other than vehicle exhaust. While there may be other toxic substances in use on-site, risk would be negligible due to intermittent use (i.e., chemicals from periodic maintenance), dispersion of chemicals throughout the project site, and compliance with State and Federal handling regulations.

Exposure to diesel exhaust can have immediate (acute) health effects, such as irritation of the eyes, nose, throat, and lungs, and can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. However, according to the rulemaking on *Identifying Particulate Emissions from Diesel-Fueled Engines as a Toxic Air Contaminant* (CARB 1998), the available data from studies of humans exposed to diesel exhaust are not sufficient for deriving an acute non-cancer Reference Exposure Level (REL).

The analysis, however, does derive an estimate of acute non-cancer risks by examining the acute health effects of the various toxic components that comprise diesel and gasoline emissions. There is specific guidance for estimating the acute non-cancer hazards from these toxic components based on chemical profiles established by the CARB which was used in the revised analysis to determine the Project's acute non-cancer hazards.

To determine the Project's *chronic* non-cancer hazard impact, the highest annual emissions concentrations were determined covering the years 2020 (the commencement of Project construction) to 2035 (the full build-out of the Project). In this regard, the highest annual average concentrations prior to mitigation determined through air dispersion modeling occurred at an existing residence located within the Project boundaries. This concentration was due to the impacts of emissions from the off-road construction equipment and operation equipment. This level of impact results in a chronic non-cancer HI of 0.14. This HI is less than the SCAQMD's significance level of 1.0, and is, therefore, less than significant. The estimation of the *acute* non-cancer HI requires the estimation of the maximum 1-hour impacts of toxic air contaminants (TAC) components in organic gases and particulate matters (PM) emissions. For Project construction, estimates of the maximum 1-hour ROG and PM exhaust emissions were derived from the Project's peak daily construction equipment emissions; for Project operation, estimates of the Project's maximum 1-hour ROG and PM emissions were derived from the Project's peak hour traffic data along the nearly 230 roadway segments contained within the study area and then speciated or broken down into the various TAC components by fuel type, gasoline and diesel, and emission type (i.e., exhaust, evaporative, brake wear and tire wear). The acute non-cancer HI was determined by using the highest annual emissions concentrations assuming that the project would be constructed between 2020 and 2034 and full operation starts in 2035. Based on this information, the maximum acute non-cancer HI found at any receptor within the model domain prior to mitigation was 0.07 during any year of project construction and operation, which is less than the SCAQMD's non-cancer HI of 1.0, and, therefore, is less than significant without mitigation. Therefore, the potential for short-term acute and chronic exposure from TAC emissions are considered to be less than significant and no mitigation is required. (Revised Final EIR Part 2, pgs. 4.3-64 to 4.3-65).

d. Odors - Cumulative

Potential Significant Impact: Whether the Project's contribution to cumulative objectionable odors would be cumulatively considerable.

Findings: Potential cumulative impacts related to odors are discussed in detail in Section 6.3 of the Revised Final EIR Part 2, pg. 6.3-34 to 6.3-35. Based on the entire record before us, this Commission finds that there will be no cumulative impacts related to objectionable odors; therefore, no mitigation is required.

Facts in Support of the Findings: Section 6.3 of the Revised Final EIR Part 2 examined the environmental documents of cumulative projects to determine whether respective projects would result in excessive nuisance odors, as defined under the California Code of Regulations and Section 41700 of the California Health and Safety Code. Of the 173 environmental documents that were evaluated (173 environmental documents were available for the 359 cumulative projects), all found that the respective projects would not create objectionable odors that will affect a substantial number of people and many projects were found to have a less than significant impact or no impact at all. None of the projects were of the type described by the SCAQMD as being associated with substantial odors such as agricultural uses, wastewater treatment plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. Furthermore, Project-specific impacts would be less than significant and would not exceed the AQMD's significance threshold for odors. Therefore, impacts associated with this issue would be considered cumulatively less than significant and no mitigation is required. (Revised Final EIR Part 2 pgs. 6.3-34 to 6.3-35)

e. Cumulative CO Hot Spot Impacts

Potential Significant Impact: Whether the Project's contribution to cumulative impacts associated with the violation of any air quality standard would be cumulatively considerable.

Findings: Potential impacts of the Project related to cumulative CO hot spot impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that no significant cumulative impacts related to CO hot spot impacts will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: As identified in Section 4.3.5.2 of the Revised Final EIR Part 2, no significant CO hot spot impacts would occur as a result of the Project. The SCAQMD anticipates that CO emissions in the future will decrease with advances in technology. As previously identified, background concentrations in future years are anticipated to continue to decrease as the concerted effort to improve regional air quality progresses. Therefore, ambient CO concentrations, from cumulative projects, in the future years would generally be lower than existing conditions.

Of the 173 environmental documents (173 environmental documents were available for the 359 cumulative projects) that were reviewed, all projects found that no hot spot impacts would occur with their respective projects. Similar to the Project, intersections within the highest traffic volumes and worst LOS were identified and evaluated. No exceedances of significance thresholds were estimated. The traffic volumes utilized in the analysis include other past, present, and reasonably foreseeable projects expected to be constructed by the time Project Phase 1 and buildout is to occur (Revised Final EIR Part 3, Appendix F, pg. 1). Furthermore, Project-

specific impacts would be less than significant and would not exceed the AQMD's significance threshold for CO hot spot emissions. Based on the analysis and SCAQMD methodology, it is reasonable to assume that a less than significant cumulative CO impact would occur. No mitigation is required. (Revised Final EIR Part 2 pgs. 6.3-35 and 6.3-36).

f. Cumulative Non-Cancer Hazard Index

Potential Significant Impact: Whether the Project's contribution to the cumulative exposure of substantial pollutant concentrations on sensitive receptors would be cumulatively considerable with regard to non-cancer hazard index (HI)s.

Findings: Potential impacts of the Project related to cumulative non-cancer hazard index are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that no significant cumulative impacts related to non-cancer acute and chronic hazard impacts will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: The SCAQMD uses the same significance thresholds for project-specific and cumulative health risk impacts. The only case where the significance thresholds for project-specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. The project-specific (project increment) significance threshold is $HI > 1.0$ while the cumulative (facility-wide) is $HI > 3.0$. Because the cumulative HRA included emissions from both the Project and the 359 cumulative projects, the cancer risks and chronic HIs calculated are the cumulative health risk values that will be compared to the selected cumulative HRA threshold. In terms of non-cancer thresholds, the non-cancer HI value at each of the modeled receptor locations is less than SCAQMD cumulative threshold of 3.0. Therefore, the Project is expected to have a less than significant cumulative impact (Revised Final EIR Part 2, pg. 6.3-48 through pg. 6.3-49).

3. Biological Resources

a. Adopted Policies and Ordinances

Potential Significant Impact: Whether the Project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Findings: Potential impacts of the Project related to adopted policies and ordinances are discussed in detail in Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in conflict with local policies or ordinances and, therefore, no mitigation is required.

Facts in Support of the Findings: As detailed in Section 4.4 of the Revised Final EIR Part 3, City policies or ordinances identified in the General Plan protecting biological resources are summarized in Table 4.4-5: General Plan and Municipal Code Biological Resource Policies (Revised Final EIR Part 3, pg. 4.4-59 to 4.4-60) As detailed in Table 4.4-5, the Project is consistent with local policies and ordinances protecting biological resources that apply to the Project area. Compliance with State and Federal regulations to ensure protection and preservation of significant biological resources, and the implementation of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) are the applicable policies/ programs that the Project

must implement. As there are no other local policies or ordinances regarding the protection of biological resources identified by the City or other local jurisdiction applicable to the Project site, no impact would occur, and no mitigation is required. (Revised Final EIR Part 3, pgs. 4.4-59 to 4.4-60).

b. Habitat Fragmentation/Wildlife Movement

Potential Significant Impact: Whether the Project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Findings: Potential impacts of the Project related to habitat fragmentation/wildlife movement are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in habitat fragmentation or interfere with wildlife movement; therefore, no mitigation is required.

Facts in Support of the Findings: Habitat fragmentation occurs when a single, contiguous habitat area is divided into two or more areas, or where an action isolates two or more new areas from each other. Isolation of habitat occurs when wildlife cannot move freely from one portion of the habitat to another or to/from one habitat type to another. Habitat fragmentation may occur when a portion of one or more habitats is converted into another habitat, as when scrub habitats are converted into annual grassland habitat because of frequent burning. Wildlife movement includes seasonal migration along corridors, as well as daily movements for foraging. Examples of migration corridors may include areas of unobstructed movement for deer, riparian corridors providing cover for migrating birds, routes between breeding waters and upland habitat for amphibians, and between roosting and feeding areas for birds (Revised Final EIR Part 3, pg. 4.4-64).

According to Section 4.4 of the Revised Final EIR Part 3, the Project area contains no significant cover of native plant communities and currently experiences heavy disturbance associated with agricultural activities. Additionally, the Project area is adjacent to State Route 60 (SR-60) and Gilman Springs Road on the north and east and is bordered by urban development on the west. The nearest linkage area as identified under the MSHCP is Proposed Linkage 5 and is located approximately 3 miles north of the Project and approximately 3.6 miles south of the Project is Proposed Constrained Link 20. The development of the Project area will not impede the movement of any wildlife; therefore, the Project will not affect any wildlife movement corridor.

The San Jacinto Wildlife Area (SJWA) currently provides foraging habitat for various resident and migratory wildlife species. The southern portion of the Project site adjacent to the SJWA lands has been actively farmed for decades and is regularly disked. The northern portion of the SJWA is designated as open space and no development is proposed for this area.

Although the Project area does not contain any designated wildlife movement corridors or MSHCP linkages (i.e., MSHCP, City General Plan, etc.) it is likely that wildlife moves through adjacent properties such as the SJWA and the Mystic Lake area to the south, the Badlands area to the east and the Lake Perris State Recreation Area to the southwest. The MBA original Project biological report concluded, updated in 2018 by ESA's surveys, that development of the Project as proposed would not directly have any significant impact on wildlife movement in the area and would not fragment habitat or adversely affect wildlife movement through the

surrounding areas because the Project site contains limited vegetation cover and minimal resource value for wildlife moving between habitat blocks.

The biological report also determined that the WLC site would not impede or minimize any significant wildlife corridor for the target species associated within the Reche Canyon/Badlands Area plan, which include Bell's sage sparrow (*Amphispiza belli belli*), cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), bobcat (*Lynx rufus*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), mountain lion (*Puma concolor*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), Stephens' kangaroo rat (*Dipodomys stephensi*), and Nevin's barberry (*Berberis nevinii*). In addition, although not required, Drainage 9, comprising the most suitable habitat in the eastern portion of the Project site, is being retained to allow for wildlife movement between the Badlands and the SJWA (e.g., relatively natural channel conditions with 50-foot setbacks on either side of the channel through the Project site property). Therefore, impacts related to wildlife movement are less than significant, and no mitigation is needed. (Revised Final EIR Part 3, pg. 4.4-64).

4. Cultural Resources

a. Human Remains

Potential Significant Impact: Whether the Project would disturb any human remains, including those interred outside of formal cemeteries.

Findings: Potential impacts of the Project related to human remains are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts to human remains; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site is currently undeveloped. No evidence suggesting the Project site has been utilized in the past for human burials has been identified. In the unlikely event that human remains are discovered during grading or construction activities within the Project site, compliance with State law (Health and Safety Code §7050.5) (HSC §7050.5) would be required. State law requires that no further disturbance shall occur until the County Coroner has made determination of the origin and disposition pursuant to Public Resources Code 5097.98. Because adherence to provisions of HSC §7050.5 is required of all development projects, and because adherence to the requirements in State law sufficiently mitigates for potential impacts to human remains, no significant impact related to this issue will occur. Because potential impacts associated with this issue are less than significant, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.5-16 to 4.5-17).

b. Cumulative Cultural Resources Impacts – Human Remains

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would disturb any human remains, including those interred outside of formal cemeteries.

Findings: Potential cumulative impacts to Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that

development of the Project will not result in significant cumulative impacts related to human remains; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative ground disturbance in Western Riverside County could disturb human burials. Potentially cumulative projects would be subject to the State laws that protect human remains such as Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Because these State laws have been adopted to protect human remains, compliance with them would assure that cumulative impacts related to the disturbance of human remains would be less than significant. Because there is no evidence of human burials on the Project site and ground disturbing activities on the Project site would be subject to the State laws cited above, the Project's less-than-significant incremental contribution to potential cumulative impacts on human burials would not cause or contribute to a significant cumulative effect. (Revised Final EIR Part 3, pg. 6.5-2 to 6.5-21).

5. Geology and Soils

a. Landslides and Rockfalls

Potential Significant Impact: Whether the Project would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Findings: Potential impacts of the Project related to landslides and rockslides are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to landslides and rockslides that may result in loss, injury or death; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, a large older landslide has been mapped primarily off-site on the northeasterly flanks of Mount Russell, near the southwest portion of the property. The landslide appears to have originated on the higher slopes off-site, and moved northeast, partially onto the subject property. The Specific Plan designates 74.3 acres in the southwestern portion of the property as open space. This 74.3 acres includes the steepest slopes on-site (i.e., the Mount Russell foothills), which will reduce the potential for significant landslide or rockfall impacts on the Project to less than significant levels; therefore, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-12).

b. Soil Erosion or Loss of Top Soil

Potential Significant Impact: Whether the Project would result in substantial soil erosion or the loss of topsoil.

Findings: Potential impacts of the Project related to soil erosion or loss of topsoil are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts due to soil erosion or loss of topsoil; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, development of the site would require the movement of on-site soils. Portions of the site have been and are

being used for dry farming, and several rural residences are present. Prior to the issuance of grading permits, the Project proponent will be required to prepare and submit detailed grading plans as each phase is developed. These plans will be prepared in conformance with applicable standards of the City's Grading Ordinance. Construction of off-site utility and roadway improvements will also result in the movement of soil. Plans are not available at this time for off-site improvements, but that construction will be subject to the same permitting and plan checking processes.

Development of the site and related off-site improvements would involve the disturbance of more than one acre; therefore, the Project is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. A Storm Water Pollution Prevention Plan (SWPPP) will also be required to address erosion and discharge impacts associated with the proposed on-site grading. Compliance with storm water regulations include minimizing storm water contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

Additionally, a preliminary Water Quality Management Plan (WQMP) was prepared for the WLC Specific Plan and contains the post-construction measures, which will help reduce potential impacts to soil erosion to less than significant levels and identifies measures to treat and/or limit the entry of contaminants into the storm drain system. The WQMP is incorporated by reference and/or attached to the Project's SWPPP as the Post-Construction Management Plan.

As soils covering the Project site have a slight-to-high erosion hazard potential and because the Project would be required to adhere to the City's Grading Ordinance, obtain an NPDES Permit, and prepare an SWPPP and a WQMP, construction and operational impacts associated with soil erosion hazards are considered to be less than significant, and no mitigation is required.

Grading for off-site improvements would require subsequent grading permits or related approvals from both the City and County of Riverside, depending on the improvement and its location. Most roadway and intersection improvements will occur within existing rights-of-way or on land that has been previously disturbed. The SWPPP and the WQMP establish performance standards for future development, and implementation the identified measures in those plans will reduce potential erosion impacts to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.6-13 to 4.6-15).

c. Septic Tanks

Potential Significant Impact: Whether the Project would have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Findings: Potential impacts of the Project related to septic tanks are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to soils that may be incapable of supporting septic tanks or alternative wastewater disposal systems; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, all buildings within the Project will be connected to existing wastewater facilities (sewer) owned and operated by the Eastern Municipal Water District. Septic tanks will not be used anywhere within the Project; therefore, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-15).

d. Seismic-Related Ground Failure

Potential Significant Impact: Whether the Project would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground failure.

Findings: Potential impacts of the Project related to seismic-related ground failure are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to seismic-related ground failure; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, the Project site is located within Seismic Zone 4 as defined by the Uniform Building Code (UBC). Exhibit S4 of the Safety Element of the City's General Plan indicates that the Project site is not located in an area susceptible to landslides or slope instability. The Project site lies on relatively flat terrain ($\pm 2\%$ grade) and no landslide areas or mass movement were observed on-site. The only steep topographical features are located in the southwest corner of the Project area. This area is designated for Open Space uses and is not proposed for development.

The Project does not propose any activity known to cause damage by subsidence (e.g., oil, gas, or groundwater extraction). Settlement generally occurs within areas of loose, granular soils with relatively low density. The Project site is underlain by relatively dense alluvial and dense sedimentary bedrock materials at depth and the potential for settlement is considered low. Because the Project site does not exhibit characteristics of a high potential for subsidence or settlement, impacts are considered less than significant. No mitigation is required.

The potential for liquefaction generally occurs during strong ground shaking within relatively cohesionless loose sediments where the groundwater is typically less than 50 feet below the surface. Because the Project site does not exhibit characteristics of a high potential for liquefaction induced settlement (i.e., relatively dense soils with groundwater levels in excess of 100 feet), impacts are considered less than significant. No mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.6-16).

e. Cumulative Geology Impacts – Landslides and Rockfalls

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant cumulative impacts related to landslides or rockfalls; therefore, no mitigation is required.

Facts in Support of the Findings: The Project site includes one area that encompasses the lower slopes of Mount Russell. The Project designates these slope areas as Open Space, which would reduce the potential for landslide or rockfalls to less than significant.

Because projects in the cumulative scenario would not expose people or structures to landslides or rockfall impacts, the Project's incremental less-than-significant contribution to potential cumulative effects would not alone cause or create a significant cumulative effect relating to the exposure of people and structures to landslide or rockfall impacts. As a result, the cumulative projects in conjunction with the World Logistics Center project do not constitute a cumulatively considerable effect on exposure of persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides (Revised Final EIR Part 3, pg. 6.6-13 through pg. 6.6-14).

c. Cumulative Geology Impacts – Soil Erosion or Loss of Topsoil

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a cumulative significant impact on substantial soil erosion or the loss of topsoil.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant cumulative impacts with respect to soil erosion or loss of topsoil; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario have the potential to result in short-term erosion of surface soils; however, as appropriate, the cumulative projects include the implementation of erosion control features that comply with National Pollutant Discharge Elimination System (NPDES) and SCAQMD Rule 403 (fugitive dust) requirements and would reduce erosion to less than significant. In addition, those projects include improvements that would not increase long-term erosion of on-site soils and therefore, would result in less than significant impacts.

The implementation of the proposed Project includes specific components to reduce potential impacts of soil erosion or loss of topsoil during construction activities. These components are identified in Section 4.6.5.2 of the Revised Final EIR Part 4 Volume 3. With the implementation of these construction measures/ components, the Project would result in a less than significant soil erosion or loss of topsoil impact. In assessing the cumulative projects in conjunction with the Project, the implementation of erosion control features that would be required to obtain grading permits would reduce the cumulative soil erosion or loss of topsoil impact to less than significant. Further, the Project's incremental less-than-significant contribution to potential cumulative impacts associated with soil erosion or the loss of topsoil alone would not cause a significant cumulative impact. Thus, cumulative erosion and topsoil impacts would not be cumulatively considerable during construction.

Long-term operations of projects in the cumulative scenario have the potential to cause soil erosion or loss of topsoil if soil stabilization measures are not incorporated into ongoing operations. However, based on review of the environmental documentation for the cumulative related projects, each project identifies that the implementation of the urban uses on the project site would result in less than significant soil erosion impacts,

or each project would incorporate soil stabilization measures to reduce soil erosion impacts to less than significant. In assessing the cumulative related projects in conjunction with the Project, the implementation of soil stabilization measures for those projects that require those measures such as the WLC Project, the potential cumulative long-term soil erosion impact would be less than significant. Because the Project includes various detention/retention, treatment and soil stabilization measures to reduce potential long-term soil erosion or the loss of topsoil with the measures identified in Section 4.6.5.2 of the Revised Final EIR Part 4 Volume 3, the Project would not cause a significant cumulative impact. Thus, cumulative erosion and topsoil impacts would not be cumulatively considerable during operation (Revised Final EIR Part 3, pg. 6.6-13 through pg. 6.4-14).

d. Cumulative Geology Impacts – Seismic-Related Ground Failure

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground failure.

Findings: Potential cumulative impacts to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant cumulative impacts related to seismic ground failure; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, persons or structures associated with projects in the cumulative scenario could be exposed to geologic conditions that cause ground failure during seismic events. These potential geologic conditions include landslides, settlement, subsidence, or liquefaction, and potential ground failure that could expose people or structures to these effects. The exposure to these impacts could result in significant impacts; however, each of the cumulative projects would be subject to the City of Moreno Valley’s grading requirements and building codes. Compliance with these requirements would reduce potential effects to less than significant.

The Project site is located in an area of the City that is not subject to settlement, subsidence or liquefaction. In addition, the majority of the Project site lies on relatively flat terrain. There is one portion of the site that includes steep topographic features that could be subject to landslides; however, the Project designates this area for Open Space (Planning Area 30). In considering the implementation of the Project in combination with the cumulative related projects, no significant cumulative effect of exposing persons and structures to potential seismic ground failure would result. Therefore, impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-15).

6. Hazards and Hazardous Materials

a. Within Two Miles of a Public Airport or Within an Airport Land Use Plan or Within Two Miles of a Private Airport

Potential Significant Impact: Whether the Project would result in a safety hazard for people residing or working in the Project area or be located within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area.

Findings: Potential impacts of the Project related to safety hazards associated with proximity to public and private airports are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the nearest airport to the Project area is March Air Reserve Base (MARB), approximately 5.5 miles to the southwest. The airfield is operated by two entities, MARB (military) and March Inland Port Airport Authority (quasi- governmental/private). In addition, Perris Valley Airport is located approximate 15 miles southwest of the Project area. Perris Valley Airport is a private airport that is open to the public and is utilized for skydiving and ballooning activities. The WLC Project area is not located within the Airport Influence Area for either airport. Given the distance of the WLC Project area to both airports in the vicinity, the development of the WLC Project area as proposed would not result in private airport safety hazards for people residing or working in the WLC Project area. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-15).

e. Existing or Proposed Schools

Potential Significant Impact: Whether the Project would emit hazardous emissions or handle acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Findings: Potential impacts of the Project related to existing or proposed schools are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant hazardous materials impacts related to existing or proposed schools; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, there are no existing school facilities within one-quarter of a mile of the Project area. The nearest existing school is Calvary Chapel Christian School which is located approximately 1.17 miles northwest of the Project. There is one proposed elementary school site that is located within one-quarter mile of the WLC Project area. The site for proposed Wilmot Elementary School is located on Bay Avenue at Wilmot Street, approximately 0.25-mile west of the Project area.

The amount and type of materials that would be used during Project construction (building and infrastructure) or stored in the high-cube logistics distribution center after construction is unknown at this time. While the warehouse facilities themselves are not expected to utilize acutely hazardous materials, the possibility exists that such materials could be stored or transported to and from the Project site. For the purposes of this analysis, it is assumed that the Project will handle substances that may be acutely hazardous. The handling of hazardous materials or emission of hazardous substances in accordance with the Hazardous Materials Business Emergency Plan (HMBEP) as required by applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials or emissions of hazardous substance near existing or proposed schools are less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.8-15 through 4.8-16).

f. Routine Transport, Use, or Disposal of Hazardous Materials, Reasonably Foreseeable Upset and Accident Conditions

Potential Significant Impact: Whether the Project would create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials, or create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Findings: Potential impacts of the Project related to the routine transport, use, or disposal of hazardous materials and reasonably foreseeable upset and accident conditions are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to the routine transport, use, or disposal of hazardous materials and reasonably foreseeable upset and accident conditions; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, exposure to hazardous materials during the operation of the on-site uses may result from (1) the improper handling or use of hazardous substances; (2) transportation accidents; or (3) an unforeseen event (e.g., fire, flood, or earthquake). The severity of any such exposure is dependent upon the type and amount of the hazardous material involved; the timing, location, and nature of the event; and the sensitivity of the individual or environment affected.

Truck-Related Risks. The regulation of the transport of hazardous materials on State highways is governed by the United States Department of Transportation (USDOT), as described in Title 49 of the Code of Federal Regulations and by Title 13 of the California Code of Regulations. Appropriate documentation for all hazardous waste that is transported in connection with Project site activities would be provided as required by hazardous materials regulations. Hazardous waste produced on-site is subject to requirements associated with accumulation time limits, proper storage locations and containers, and proper labeling. Additionally, for removal of hazardous waste from the site, hazardous waste generators are required to use a certified hazardous waste transportation company, which must ship hazardous waste to a permitted facility for treatment, storage, recycling, or disposal. Compliance with applicable regulations would reduce impacts associated with the use, transport, storage, and sale of hazardous materials. The enforcement of applicable local, State, and Federal standards, ordinances, and regulations will ensure that potential impacts associated with environmental and health hazards related to an accidental release of hazardous materials are less than significant and no mitigation is required.

Freeway Accident Risks. According to the California Department of Transportation's Traffic Accident Surveillance and Analysis System (TASAS) report, there are approximately 105 accidents per year along a 3.75-mile stretch of SR-60 between Nason Street and Gilman Springs Road in the general vicinity of the Project area. The data were derived for the three-year span of January 1, 2008, to December 31, 2010.² During this period, there were 316 accidents (average of 105 per year) along SR-60 (both westbound and eastbound). Of the 316 accidents, approximately 15.8 percent involved trucks (tractor/trailer). There were 127 eastbound

² California Department of Transportation, TSAR – Accident Summary 1/1/08-12/31/10

accidents (19 or 15% involving trucks) and 189 westbound accidents (31 or 16.4% involving trucks). It is possible that congestion on the freeway might result in some WLC Specific Plan- related trucks exiting the freeway at off-ramps other than World Logistics Center Parkway or attempting to enter the freeway at on-ramps if the drivers see or hear on their radios that the freeway is congested. In most instances, drivers will use the shortest route indicated on GPS system maps or the route(s) they have used previously, regardless of traffic conditions at the time. In addition, due to the type of uses planned within the WLC Specific Plan area, much of the Project-related traffic will be accessing the WLC site during off-peak times, so the chances of congestion or accidents occurring during the time they are accessing the site would be reduced. The accident database contains no information on whether the truck was the cause of a particular accident or the time of day, the vehicles involved, if hazmat spills occurred, if trucks or other vehicles detoured off the freeway, etc. Without these data, it is overly speculative to extrapolate any particular conclusions. Despite the lack of specific evidence regarding freeway accidents, it is reasonable to conclude that potential environmental impacts in this regard will be less than significant given the regulation of truck traffic on freeways according to State and Federal laws, and truck restrictions on local streets according to the City's Municipal Code (i.e., truck route enforcement) and no mitigation is necessary.

Land Use-Related Hazmat Risks. Both the Federal Government and the State of California require all businesses that handle more than a specified amount of hazardous materials or extremely hazardous materials, to submit a Hazardous Materials Business Emergency Plan (HMBEP) to the local Certified Unified Program Agency (CUPA). The CUPA with responsibility for the City of Moreno Valley is the County of Riverside Community Health Agency, Department of Environmental Health. The HMBEP must include an inventory of the hazardous materials used in the facility, and emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. The HMBEP must also include the Material Safety Data Sheet for each hazardous and potentially hazardous substance used. The Material Safety Data Sheets summarize the physical and chemical properties of the substances and their health impacts. The plan also requires immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information of all company emergency coordinators of the business, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel.

HMBEPs are designed to be used by responding agencies, such as the Moreno Valley Fire Department, to allow for a quick and accurate evaluation of each situation for an appropriate response. HMBEPs are also used during a fire to quickly assess the types of chemical hazards that firefighting personnel may have to deal with, and to make decisions as to whether or not the surrounding areas need to be evacuated. Compliance with existing law will ensure that no significant impacts pertaining to the creation of hazards affecting the public will occur. The handling of hazardous materials in accordance with the HMBEP as required by applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials are less than significant and no mitigation is required.

Though the uses in the Project area are not expected to utilize acutely hazardous materials in their daily operation, a potential for an accidental release of hazardous materials into the environment is present at the

Project site as it is at any commercial, retail, or industrial site. Compliance with the identified State and Federal transportation safety standards will govern the handling of hazardous materials during truck and freight transfer operations. These standards include procedures to contain, report, and remediate any accidental spill or release of hazardous materials. The handling of hazardous materials in accordance with all applicable local, State, and Federal standards, ordinances, and regulations will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials at the Project site will be less than significant and no mitigation is required.

Hazardous On-site Facilities. The Project site is adjacent to a regional natural gas compressor station operated by San Diego Gas & Electric (SDG&E). At present, the plant occupies a 19-acre site, surrounded by 174 acres of SDG&E-owned open space. There is additional open space around the plant, consisting of land owned by the CDFW as part of the SJWA. There are no plans to expand or otherwise modify the plant and/or its open space zone, which is considered adequate at this time to protect public health and safety, including users of the SJWA and new employees and users of the new warehouses associated with the WLC Specific Plan.

There will be sufficient setback from the plant to future warehouse uses (e.g., 1,000 feet). No development or change in operation has been announced for the property within the SJWA. Existing safety conditions will continue relative to the gas facility as it relates to the SJWA. Compliance with established safety laws and regulations regarding the natural gas facilities will reduce the potential impact to a less than significant level and no mitigation is required.

The Southern California Gas Company (SCGC) operates a natural gas metering station on a one-acre site located one-quarter mile north of the SDG&E Compressor Plant. The land plan will provide 1,000 feet setback from the SCGC station as an additional setback between these uses. These setbacks appear sufficient to protect future uses/users within the WLC Specific Plan area if upset conditions were to occur at this station. Compliance with established safety laws and regulations regarding natural gas plants is expected to reduce this potential impact to a less than significant level and no mitigation is required. The site also contains two natural gas lines that cross the central and southern portions of the site in an east-west direction. They range in size from 16 to 36 inches in diameter and carry natural gas under medium and high pressure. As development occurs in areas with buried natural gas lines, the Project proponent will be required to negotiate with the involved utility provider as to whether these pipelines can be relocated or need to be protected in place. Future development is required to maintain clearance for pipelines depending on their contents and size, in consultation with the serving utility provider. As long as these design restrictions are implemented during the site design and construction process, no significant impacts are expected. However, if a catastrophic accident were to occur involving one or more natural gas lines on-site, there could be property damage and loss of life. While the chance of occurrence is low, there are potential safety risks, mainly to Project employees, if such an accident were to occur. Compliance with established safety laws and regulations regarding pipelines is expected to reduce this potential impact to a less than significant level and no mitigation is required.

Off-site Improvements. A number of off-site improvements will be needed to serve the Project, including three reservoirs, various water, sewer, and drainage improvements within existing rights-of-way, and the SR-60/World Logistics Center Parkway interchange. None of these facilities is expected to create significant hazards or risks to public health or safety. These facilities will require standard improvement plan approvals

through the City of Moreno Valley and/or County of Riverside. Based on these plan reviews, no significant hazard-related impacts are expected, and no mitigation is required.

Hunting Accidents. Immediately south of the Project area is the SJWA, where limited hunting is permitted. Hunting in these areas requires a hunting license issued by the State. The Fish and Game Code provides strict regulations on hunting, including limits on hours, time of year, quantity, and firearms.

Hunting on State lands, such as the SJWA, can only be done with shotguns that are smaller in size (higher in gauge) than 10-gauge shotguns. In addition, Federal law allows no more than three shells in the chamber of the shotgun at any given time during hunting. The SJWA is patrolled by CDFW wardens to ensure that all hunting rules and regulations are followed. The private hunt clubs are also governed by similar rules and regulations to ensure the safety of their members and the general public.

Given the proximity of the Project area to the nearby hunting areas, it is appropriate to consider the possibility of stray gunfire as a possible risk to future employees, visitors, and facilities on the Project site. Accident conditions that could arise from the nearby hunting activities are expected to be less than significant for the following reasons: the most intensive operations at the high-cube logistics center would be during off-peak hours when there is no hunting; the hunting on the adjacent areas to the south of the WLC Project area is in accordance with all applicable local, State, and Federal standards and regulations; and the range for the allowed firearms (shotguns smaller than 10-gauge) would be 60 yards or less providing a safe distance for development to occur in the WLC Project area, which would be a safe distance from the actual hunting areas. It should also be noted that the Specific Plan provides for a minimum 250-foot setback along the southern boundary of the Specific Plan property, which is greater than the minimum safe distance described above. Impacts are less than significant, and no mitigation is required.

Valley Fever. During processing of the Highland Fairview Corporate Park EIR, a local resident expressed concern regarding Valley Fever (*Coccidiomycosis*), a disease caused by fungus spores (*Coccidioides immitis*). The WLC Specific Plan site is adjacent to the Highland Fairview Corporate Park site. These fungal spores most typically lie dormant in relatively undisturbed soil with native vegetation cover in the Central Valley of California.

The likelihood of these spores to occur at this site is remote. The soil at the Project site is not undisturbed and has little, if any, native vegetation cover. The site consists primarily of disturbed agricultural soils (i.e., regularly tilled and occasionally irrigated) and had virtually no native vegetative cover. The local soils will be extensively disturbed during grading and would be regularly watered to control dust. Erosion control measures will be implemented immediately following grading. Under these conditions, it is unlikely that *Coccidioides immitis* spores would survive in the soil. This potential impact appears minimal and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.8-16 to 4.8-20).

g. Located on a List of Hazardous Materials Sites

Potential Significant Impact: Whether the Project would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Findings: Potential impacts of the Project related to being located on a hazardous materials site is discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to development occurring on a hazardous materials site; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the Project area is not listed in any of the searched regulatory databases provided by Environmental Data Resources (EDR). This included a review of Federal, State, and local environmental databases for information pertaining to documented and/or suspected contaminated sites, known handlers or generators of hazardous waste, waste disposal facilities, releases of regulated hazardous substances and/or petroleum products within specified search distances. Analysis of soil samples obtained during the limited site characterizations conducted as part of the Phase I Environmental Site Assessments (ESAs) indicated there were trace concentrations of pesticides present in near surface soils at some of the sample locations. However, the pesticide concentrations were below the EPA's Preliminary Remediation Goals, for residential properties. No further sampling was deemed necessary and unrestricted use of the property is warranted. Since neither the Project site nor areas in the vicinity of the Project site are listed on any of the hazardous materials sites as defined by Government Code Section 65962.5, there would be a less than significant impact and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-20).

e. Conflict with Emergency Response Plans

Potential Significant Impact: Whether the Project would impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation

Findings: Potential impacts of the Project related to emergency response plan conflicts are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to emergency response plan conflicts; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley adopted its Local Hazard Mitigation Plan (LHMP) on October 4, 2011. This document identifies known hazards throughout the community and identifies strategies for which to prepare for and respond to these hazards if and when it is necessary. Figure 12-2 of the LHMP maps primary and alternative evacuations routes out of Moreno Valley. There are three (3) routes that either run through or along the Project area that are identified as primary evacuation routes: Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard. The Project will be designed, constructed, and maintained in accordance with applicable standards associated with vehicular access, ensuring that adequate emergency access and evacuation will be provided. Construction activities that may temporarily restrict vehicular traffic would be required to implement appropriate measures to facilitate the passage of persons and vehicles through/around any required road closures. Compliance with existing regulations for emergency access and evacuation will ensure that impacts related to this issue are less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-20).

f. Wildland Fire Risk

Potential Significant Impact: Whether the Project would expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Findings: Potential impacts of the Project related to wildland fire risk are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to wildland fire risk; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley is subject to both wildland and urban fires. Wildfires in particular pose a threat to the northern and eastern portions of the City, near the WLC Project area. Moreno Valley's LHMP documents that three wildland fires have occurred within the WLC Project area since 2003. Although the Project area is not within a mapped fire hazard area, the Badlands directly east of the Project area are considered a High Fire Hazard Area. Development of the eastern portion of the Project could expose persons or property to wildland fire risks given the proximity of the Project area adjacent to a High Fire Hazard Area. Regardless of this proximity, all new structures in the Project area must be constructed in compliance with Title 24 of the California Code of Regulations to safeguard life and property from fire hazards, including the installation of automated fire suppression systems. Compliance with these standards would be enforced during building permit review and the construction inspection period. In addition, no development will be allowed within the San Jacinto Fault Zone, which runs parallel and just west of Gilman Springs Road; this area of limited development will provide a fuel or fire break to help protect future occupied uses within the WLC Specific Plan.

Six fire stations presently serve the City of Moreno Valley and a seventh will be built on the Project site. Station No. 58, the Moreno Beach station, is the closest station to the Project area (approximately a quarter of a mile directly west). Given the proximity of Station No. 58, the construction of the on-site fire station and with all new structures constructed in compliance with Fire and Building Code regulations, the susceptibility and exposure of the Project to wildland fires would be limited and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-21).

g. Cumulative Hazards and Hazardous Materials Impacts

1. Within Two Miles of a Public Airport or Within an Airport Land Use Plan or Within Two Miles of a Private Airport

Potential Significant Impact: Whether the Project would result in a significant cumulative impacts related to safety hazards for people residing or working in the Project area or be located within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area.

Findings: Potential cumulative impacts of the Project related to safety hazards associated with proximity to public and private airports are discussed in detail in Section 4.8 of the Revised Final EIR Part 4, Volume 3.

Based on the entire record before us, the Planning Commission finds that development of the Project will not result in significant cumulative impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: The WLC Project area is not located within the Airport Influence Area for either airport. Given the distance of the WLC Project area to both airports in the vicinity, the development of the WLC Project area as proposed would not result in private airport safety hazards for people residing or working in the WLC Project area. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.8-15).

2. **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school**

Potential Significant Impact: Whether the Project would create a significant cumulative impact related to emitting hazardous emissions or handle acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Findings: Potential impacts of the Project related to safety hazards associated with the emission or handling of hazardous materials are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project will not result in cumulative significant impacts related to hazardous materials within an existing or proposed school; therefore, no mitigation is required.

Facts in Support of the Findings: The handling of hazardous materials or emission of hazardous substances in accordance with the Hazardous Materials Business Emergency Plan (HMBEP) as required by applicable local, State, and Federal standards, ordinances, and regulations would ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials or emissions of hazardous substance near existing or proposed schools would be less than significant. The project would not contribute to cumulative safety hazards for school-age children within ¼-mile of the project because the nearest existing school is 1.17 miles from the Project site, and the nearest proposed school site is the Wilmot Elementary School, located on Bay Avenue at Wilmot Street, approximately 0.25 mile west of the Project area. Therefore, the Project would not cause or contribute to any potential significant cumulative impacts to existing or proposed schools located within 0.25 miles from the Project.

Many of the cumulative projects would use, handle, store, and/or transport hazardous materials or require demolition of structures containing such materials within ¼-mile of a proposed school. Some of the cumulative projects may be on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5. However, each cumulative project would be required to comply with existing Federal, State, and local regulations related to hazardous material sites, including cleanup sites, and hazardous materials generators. As such, cumulative development would account for clean-up of many existing hazardous conditions and would not result in significant cumulative impacts related to the exposure of students to hazardous emissions within 0.25-mile of a proposed school (Revised Final EIR Part 3, pg. 6.8-14).

3. **Create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials, Reasonably Foreseeable Upset and Accident Conditions**

Potential Significant Impact: Whether the Project would create a significant cumulative hazard to the public through the routine transport, use, or disposal of hazardous materials? Would the project create a significant cumulative hazard to the public or the environment through reasonably foreseeable upset and accident?

Findings: Potential impacts of the Project related to safety hazards associated with routine transport, use, or disposal of hazardous materials are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project will not result in significant cumulative impacts related to airport safety hazards; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.8 of the Revised Final EIR Part 3, the Project's incremental less than significant contribution, in combination with the impacts of other cumulative projects, could create a significant impact related to this issue. For example, the substantial increase in trucks in and around the WLC site would incrementally increase the risks of accidents involving truck-related fuels (e.g., fire or explosion). However, the number of trucks containing hazardous materials on the road in a given area at any given time would be difficult if not impossible to calculate, and it would be likewise difficult to estimate the number and/or location of accidental spills and leaks, which, by their nature, are accidental or unplanned occurrences, it would be impossible to predict the specific occurrence of such events on the project site. Despite these uncertainties, it is reasonable to assume that with an increase in vehicles transporting hazardous materials would incrementally increase the potential for accidents on a regional basis. However, the enforcement of applicable local, State, and Federal standards, ordinances, and regulations will ensure that potential cumulative impacts associated with environmental and health hazards related to an accidental release of hazardous materials would be less than significant (Revised Final EIR Part 3, pg. 6.8-15)

4. **Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;**

Potential Significant Impact: Whether the Project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant cumulative hazard to the public or the environment?

Findings: Potential impacts of the Project related to sites included on a hazardous materials sites are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds the Project is not located on a site compiled pursuant to Government Code Section 65962.5, therefore, no mitigation is required.

Facts in Support of the Findings: Several cumulative projects could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment. However, these projects would be required to comply with existing Federal, State, and local regulations related to hazardous material sites, including

cleanup sites, and hazardous materials generators. As such, cumulative development would account for clean-up of many existing hazardous conditions and would not result in cumulatively significant impacts.

The Project site is not located on a site compiled pursuant to Government Code Section 65962.5. As a result, the Project's contribution to potential cumulative impacts related to development on a hazardous materials site would not cause or contribute to a significant cumulative effect (Revised Final EIR Part 3, pg. 6.8-16).

5. **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation;**

Potential Significant Impact: Whether the Project would cumulatively impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation.

Findings: Potential impacts of the Project cumulatively-related impairment of an adopted emergency response plan are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not contribute a significant impact to an adopted emergency response plan or emergency evacuation and would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: It is anticipated that cumulative projects would request the appropriate approvals and be in conformance with applicable codes and regulations. Therefore, cumulative development would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Cumulative impacts involving wildfires consists of future development adjacent to a High Fire Hazard Area. The risk to each future project is based on the location and interface between urbanized area and wildland areas. The risks associated with development in these areas can only be reduced through conformance with Fire and Building Code regulations, it is anticipated that cumulative development would not create a significant and cumulative impact associated with wildland fire hazards. As a result, the Project's incremental impact is less than significant and its contribution to any potential impacts related to emergency response and evacuation would not cause or contribute to a significant cumulative impact.

6. **Expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

Potential Significant Impact: Whether the Project would expose people or structures to a significant cumulative risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Findings: Potential impacts of the Project related to wildland fire risks are discussed in detail in Section 6.8 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not create significant contribution to cumulative human and structural risks associated with wildland fires; therefore, no mitigation is required.

Facts in Support of the Findings: Development of the eastern portion of the Project site could expose persons or property to wildland fire risks given the proximity of the Project area adjacent to a High Fire Hazard Area.

Regardless of this proximity, all new structures in the Project area must be constructed in compliance with Title 24 of the California Code of Regulations to safeguard life and property from fire hazards, including the installation of automated fire suppression systems. Compliance with these standards would be enforced during building permit review and the construction inspection period. In addition, no development would be allowed within the San Jacinto Fault Zone, which runs parallel to, and west of Gilman Springs Road; this area of limited development would serve as a fuel or fire break to help protect future occupied uses within the Project area. Compliance with existing standards, codes and regulations for fire safety would ensure that cumulative impacts related to this issue would be less than significant. The Project's incremental less-than-significant contribution, in combination with the impacts of other cumulative projects, would not cause or contribute to significant cumulative impacts related to risks from wildland fires (Revised Final EIR Part 3, pg. 6.8-17).

7. Hydrology, Drainage, and Water Quality

a. Seismic Flooding-Related Impacts

Potential Significant Impact: Whether the Project would expose people or structure to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Findings: Potential impacts of the Project related to seismic flooding-related impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to seismic flooding-related impacts; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, because neither the Project site nor the Project's off-site improvement areas are not identified as being located within the City's mapped dam inundation area; therefore, the Project would not result in the exposure of people or structures to risk of loss, injury, or death involving flooding as a result of failure of either the Poorman Reservoir (Pigeon Pass Dam) or Lake Perris Dam. Impacts related to this issue would be less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4. 9-26 to 4.9-28)

h. Seismic-Related Impacts

Potential Significant Impact: Whether the Project would expose people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Findings: Potential impacts of the Project related to seismic-related impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to loss, injury, or death involving inundation by seiche, tsunami, or mudflow; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, the Project area is not at risk of inundation by a tsunami as it is located approximately 56 miles from the Pacific Ocean. The Project area is located approximately 2.5 miles northeast of Lake Perris. Lake Perris is an enclosed body of water and could be subject to a seiche during a seismic event. However, a seiche event would not affect the Project area because water levels in the lake are not high enough to overtop the Perris Dam in the

event of a seiche.¹ The Perris Dam has been designed to prevent seiche phenomena due to the region's high seismicity. In addition, the topography between the Specific Plan area and Lake Perris has multiple hills and valleys. Given these factors, impacts associated with seiche events are less than significant for the WLC Project.

Except for the far southwest corner, the Project site is located in a gently sloping area where landslides and mudslides would not occur. No development is proposed on the steep slopes of Mount Russell in the southwesterly portion of the property, which is included in the 74.3 acres of open space designated within the WLC Specific Plan. Therefore, a less than significant impact associated with exposure of people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow would occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-27).

c. Groundwater

Potential Significant Impact: Whether the Project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin and there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Findings: Potential impacts of the Project related to groundwater impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to interference with groundwater recharge such that the Project may impede sustainable groundwater management of the basin; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, based on the Water Supply Assessment (WSA) prepared for the Project by the Eastern Municipal Water District (EMWD), water demand for the proposed on-site uses would total approximately 1,991.25 acre-feet per year (AFY).³ The EMWD considers this a worst-case estimate based on the total acres and amount of square footage of logistics uses proposed by the Project. This estimate does not take into account the Project landscaping design with xeriscape drought-tolerant landscaping and on-site collection of runoff and channeling it to landscaped areas to minimize irrigation on the interior of the Project site. The Project will obtain water service from the EMWD. It is anticipated that the Project would primarily utilize imported water purchased from Metropolitan Water District of Southern California (MWDSC). In the event that the supply of imported water is reduced, it would be supplemented with new local supply projects during multiple dry years, if needed. The WSA prepared for the Project indicates that development of the Project will not include groundwater for water supply. Rather, this Project, as well as other new developments in the EMWD's service area, will be supplied exclusively with imported water provided by MWDSC. The imported water may be treated by MWDSC as untreated water and subsequently treated by the EMWD or recharged into the basin for later withdrawal.

The Project will not substantially interfere with groundwater recharge due to the Project implementation of bioretention areas and detention basins with infiltration capacity that mitigates the impact of reduced pervious

³ *Water Supply Assessment Report for the World Logistics Center Specific Plan in Moreno Valley*, Eastern Municipal Water District, March 21, 2012.

areas. Bioretention areas and detention basins will be implemented in addition to the remaining impervious areas. The only use of groundwater may be to support continued agriculture on portions of the WLC Specific Plan property that have not yet been developed. The EMWD developed the West San Jacinto Groundwater Basin Management Plan (Plan) to help ensure that local groundwater resources are conserved, and groundwater overdraft does not occur, based on projections of future growth and expected water supply conditions. The Plan projects the water consumption demands of existing and future development based on rates of growth assumed by regional planning organizations (i.e., SCAG and WRCOG) and estimates water demand versus available supply under different water supply scenarios (e.g., multiple dry years).

Based on the State Water Supply analysis provided in the Revised Final EIR, the WLC Project is not expected to interfere with groundwater recharge activities or groundwater supplies. Impacts associated with this issue are less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.9-28 to 4.9-30).

d. 100-Year Flooding Impacts

Potential Significant Impact: Whether the Project would place within a 100-year flood hazard area structures that would impede or redirect flood flows or place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Findings: Potential impacts of the Project related to 100-year flood events are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts related to 100-year flooding events; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) identify areas subject to flooding during the 100-year storm.⁴ Based on these FIRM maps, the Project site does not fall within a 100-year flood zone.⁵ Because the Project site does not lie within a 100-year floodplain impacts related to this issue are less than significant. No mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.9-30 to 4.9-32).

e. Hydrology and Water Quality Cumulative Impacts

1. **Would the Project expose people or structure to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?**

⁴ The term “100-year” is a measure of the size of the flood, not how often it occurs. The “100-year flood” is a flooding event that has a one percent chance of occurring in any given year.

⁵ FEMA DFIRM Data, 2008.

Potential Significant Impact: Whether the Project would expose people or structure to a significant cumulative risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Findings: Potential cumulative impacts of the Project related to flooding, including flooding as a result of the failure of a levee or dam are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not cause or contribute to a significant cumulative effect associated with the exposure of people or structures to potential flooding from the failure of a levee or dam; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the Project site and off-site improvement areas could be subject to potential flooding due to a failure of the nearest dam. The nearest dams to the Project site are Pigeon Pass Dam at Poorman’s Reservoir located approximately five miles northwest of the Project site and Lake Perris Dam located approximately four miles southwest of the Project site. Although cumulative development could be exposed to inundation flooding, the Project is not within anticipated inundation areas of either dam or any other dam as mapped within the City of Moreno Valley General Plan Final Program EIR. Therefore, the implementation of the Project would not contribute to the exposure of people or structures to risk of loss, injury, or death involving flooding as a result of failure of either the Poorman Reservoir (Pigeon Pass Dam) or Lake Perris Dam. Therefore, the Project would not cause or contribute to any cumulative effect associated with the exposure of people or structures to flooding (Revised Final EIR Part 3, pg. 6.9-25 through 6.9-26).

2. **Would the Project expose people or structure to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?**

Potential Significant Impact: Whether the project would expose people or structure to a significant cumulative risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Findings: Potential cumulative impacts of the Project related to safety hazards associated with significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not cause or contribute to a significant cumulative impact relating to the exposure of people or structures to potential significant cumulative inundation impacts from seiche, tsunami, or mudflow; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the Project site and off-site improvement areas would not be subject to potential inundation by seiche or tsunami. As described in Section 4.9.5.2, the nearest enclosed body of water that could be subjected to seiche conditions is Lake Perris, but the Perris Dam has been designed to prevent seiche phenomena. The watershed is not located near the Pacific Ocean which is where tsunami risks occur. Therefore, cumulative development would not expose people or structures to inundation flooding due to seiche or tsunamis. As a result, the Project would not cause or contribute to any significant cumulative seiche or tsunami inundation impacts. Cumulative development within the watershed could expose people and structures to mudflow inundation due to the presence of steep slopes within the watershed. This exposure could result in significant cumulative impacts.

However, because the Project site as well as off-site improvement areas do not have steep slopes, the Project's contribution to potential cumulative mudflow inundation impacts would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.9-26).

3. **Would the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to the depletion of groundwater supplies or interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Findings: Potential cumulative impacts of the Project related to the depletion of groundwater supplies or interference with of groundwater recharge are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not cause or contribute to a significant cumulative depletion of groundwater supplies or the interference with groundwater recharge; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the Eastern Municipal Water District (EMWD) service area is planned to be supplied exclusively with imported water provided by the Metropolitan Water District. Therefore, cumulative development would not deplete groundwater supplies from use of groundwater. As a result, the Project would not contribute to cumulative impacts to groundwater supplies. Cumulative development would reduce the amount of pervious surfaces within the EMWD service area. This reduction of potential groundwater infiltration areas could cause a significant impact on groundwater recharge. However, because the Project includes the implementation of bioretention areas and detention basins that would provide for infiltration opportunities, the Project's contribution to potential significant cumulative groundwater infiltration impacts would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.9-26 through 6.9-27).

4. **Would the Project place within a 100-year flood hazard area structures that would impede or redirect flood flows?**

Would the Project place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to the placement of structures within a 100-year flood hazard area that would impede or redirect flood flows or the placement of housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Findings: Potential cumulative impacts of the Project related to the placement of structures on 100-year flood hazard areas are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record

before us, this Planning Commission finds that development of the Project would not cause or contribute to significant cumulative impacts relating to the placement of structures within a 100-year flood hazard area that would impede or redirect flood flows; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed that encompasses the project site and off-site improvement areas include areas subject to 100-year storms according to the FEMA FIRM maps. Therefore, cumulative development could expose structures or housing to flood hazards and result in significant cumulative flood hazard impacts. However, because the Project site and off-site improvements are not located in any areas subject to flooding during a 100-year storm, the implementation of the Project would not cause or contribute to any potential significant cumulative flood hazard to structures or housing (Revised Final EIR Part 3, pg. 6.9-27).

5. **Would the Project substantially alter the existing local drainage patterns of the site and substantially increase the rate or amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on-site or off-site?**

Would the Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to existing local drainage patterns of the site and substantially increasing the rate or amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on-site or off-site or create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Findings: Potential impacts of the Project related to the alteration of existing local drainage patterns and creation of runoff water are discussed in detail in Section 6.9 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not cause or contribute to significant cumulative impacts to erosion, siltation, or flooding due to alterations of existing drainages or exceedance of drainage capacities or the addition of pollutant runoff; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative development within the watershed will result in an increase in impervious surfaces in addition to changes in land use and associated pollutant runoff characteristics. Increased impervious surfaces are likely to alter existing hydrology by potentially increasing surface water runoff and increase potential pollutant loads. Following are the evaluations of cumulative hydrology and cumulative erosion, siltation and flooding impacts.

Hydrology

The proposed Project is located in the San Jacinto River watershed and is tributary to two separate sub-watershed areas, the Perris Valley Storm Drain (PVSD) Watershed and the SJWA watershed, prior to flows reaching the San Jacinto River. For the area to the west, the PVSD is the most downstream drainage facility

that the WLC Project is tributary to before flows reach the San Jacinto River. It is necessary to consider the downstream drainage areas and their facilities when evaluating cumulative impacts for hydrology. The PVSD is a major drainage facility draining a large area including the City of Moreno Valley and any flow impacts to the facility would be important to analyze the effects. For this reason, on the west side, the area tributary to the PVSD was selected as the geographic area for the cumulative impacts analysis. On the east side, flows drain to the SJWA before reaching the San Jacinto River. The SJWA is an important habitat and water feature within the watershed and it is necessary to analyze any potential flow impacts to the area. For this reason, for flows draining to the east, the area tributary to the SJWA was chosen as the geographic area for considering potential cumulative effects. This area includes the upstream portion of the San Jacinto Watershed as the SJWA extends to the south side of the San Jacinto River.

As discussed in Section 4.9 of the Revised Final EIR, runoff from the western portion of the Project site flows west toward the Perris Valley Storm Drain (PVSD), while runoff from the eastern portion of the Project site flows south into Mystic Lake, and (during times of high storm flow), reaches the San Jacinto River south of the San Jacinto Wildlife Area. Table 6.9-1 identifies the cumulative projects that are located in each watershed (Revised Final EIR Part 3, pg. 6.9-28).

PVSD Watershed Area

The volume of runoff after the Project is constructed would be less than the existing volume of runoff and the amount of infiltration and groundwater recharge would increase by a small amount, which would provide a net benefit to groundwater recharge. The proposed Project's drainage improvements would be designed to have sufficient capacity to accommodate and convey storm water runoff flows generated by the Project as well as expected future storm water runoff flows associated with buildout of the Moreno Master Drainage Plan (MDP) area. All of the cumulative projects in the Moreno MDP and Sunnymead MDP areas would be required to mitigate flows to equal to or less than existing and/or demonstrate that storm drain capacity is available to service their anticipated flows and that their project is consistent with the MDPs. The Project's compliance with the Moreno MDP meets this requirement. In addition, there would be zero hydrologic impact on downstream drainage facilities due to the Project; therefore, the Project would not contribute to any cumulative impacts. As such, cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.9-28 through 6.9-29).

SJWA Watershed Area

The portion of the Project site located east of the topographic divide drains to the SJWA. In addition to the Project, one current and one potential project are tributary to the SJWA. They are the Badlands Landfill Improvements Project located north of the Project site and the Quail Ranch Specific Plan project located southeast of the Project site. Runoff from the Badlands Landfill flows through the Project site. The hydrologic study for the Project considered flows from the Badlands Landfill. The Badlands Landfill Improvement project does not change the pervious cover of the site. As such, flows from the Landfill Improvements Project would not increase above existing and would be consistent with the existing flows north of the Project.

Downstream of the Project site, the Quail Ranch Specific Plan Project is proposed. This cumulative Project consists of a planned residential community. Currently, there are no specific details on this cumulative project.

Stormwater flows generated by the cumulative project site could increase. However, the developer would be required to alleviate any increase in flows leaving the site and demonstrate that the cumulative Project does not increase storm flows such as peak flow, velocities, and volume for each of the 2, 5, 10, 25, and 100-year storms. The cumulative Project would be required to demonstrate that storm drain capacity is available to service the anticipated flows and that the Project is consistent with the MDPs. As such, cumulative downstream capacity impacts within the SJWA watershed area would be less than significant. Because the Project would reduce storm flows leaving the Project site so that they do not exceed existing flows, the Project's contribution to potential cumulative erosion and siltation impacts within the SJWA watershed area would be less than significant (Revised Final EIR Part 3, pg. 6.9-29).

8. Land Use and Planning

a. Conflict with Any Applicable Habitat or Natural Community Conservation Plan

Potential Significant Impact: Whether the Project would conflict with any applicable habitat conservation plan or natural community conservation plan.

Findings: Potential impacts of the Project related to the conflict with any applicable habitat conservation plan are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts due to a conflict with any applicable habitat or natural community conservation plan; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.10 in the Revised Final EIR Part 4 Volume 3, the Project site is located within the MSHCP area, Mead Valley and Reche Canyon/Badlands Plan Area. Portions of the Project area occur in 14 criteria cells of the MSHCP. The Project site is not located within any special linkage areas identified by the MSHCP. The Project applicant, the City, and the County are required to use the Joint Project Review (JPR) process established in the MSHCP to identify and acquire habitat as part of the development review process. The JPR process involves negotiations between a landowner and the Western Riverside County Regional Conservation Authority (RCA) so the County can acquire land with important habitat or other biological resources while providing fair compensation and/or reasonable development opportunities on the remaining land for the landowner.

The Project site is located within areas requiring burrowing owl surveys, within the MSHCP Criteria Area Species Survey Area (CASSA), and Narrow Endemic Plant Species Survey Area (NEPSSA). Because the Project site is within an MSHCP CASSA and is considered to be a covered activity, the Project is subject to provisions of the MSHCP. In particular, the Project proponent will be required to provide payment of mitigation fees and adhere to the BMPs found in Appendix C of the MSHCP. Pursuant to agreements with the U.S. Fish and Wildlife Service (USFWS) and the CDFW, the payment of the mitigation fees and compliance provisions of the MSHCP provides full mitigation under CEQA, the Federal Endangered Species Act (FESA), and the California Endangered Species Act (CESA) for impacts to the species and habitats covered by the MSHCP. Since the City has adopted the MSHCP and its requirements and provisions, and since the Project is within Moreno Valley, the WLC Project would be required to adhere to applicable MSHCP requirements and

fees. Therefore, the WLC Project was determined to be consistent with the MSHCP. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-11 to 4.10-12).

b. Conflict with Land Use Plans, Policies, or Regulations (Regional)

Potential Significant Impact: Whether the Project would conflict with any applicable regional land use plan, policy, or regulation of any agency with jurisdiction over the Project (including but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential impacts of the Project related to the conflict with any applicable land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant impacts due to a conflict with any applicable regional land use plan, policies, or regulations; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.10 in the Revised Final EIR Part 4 Volume 3, pursuant to *CEQA Guidelines* Section 15125 (d), the Project's Revised Final EIR includes an evaluation of the consistency of the WLC Project with pertinent goals and policies of relevant adopted local and regional plans. The analysis evaluates the Project against all the applicable regional planning documents and processes which include: airport regulations associated with MARB and Riverside County Airports; Southern California Council of Governments' (SCAG) 2008 Regional Comprehensive Plan (RCP), Regional Transportation Plan (RTP), and Compass Growth Vision; SCAG's 2012 RTP and Sustainable Communities Plan, Santa Ana Water Quality Control Plan (Basin Plan); Riverside County Drainage Area Management Plan (DAMP); and EMWD's Urban Water Management Plan (UWMP).

The analysis in the Revised Final EIR demonstrates that the Project is generally consistent with the goals of SCAG's Regional Comprehensive Plan, Compass Plan and Regional Transportation Plan in that it seeks to add employment in an area that has historically been "jobs poor," which will help reduce worker commute trips from Moreno Valley over the long term. The Project is generally consistent with these plans because the Project will generate fewer emissions than the previously approved Moreno Highland Specific Plan, and it will provide for a better balance of jobs versus housing in Moreno Valley, which will incrementally improve regional commuting directions and distances by providing almost 24,000 new jobs (direct, indirect and induced) in an area previously planned for housing. No other conflicts with the applicable plans were identified. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-12 to 4.10-26).

c. Conflict with Applicable Land Use Plans, Policies, or Regulations (Local)

Potential Significant Impact: Whether the Project would conflict with any applicable local land use plan, policy, or regulation of any agency with jurisdiction over the Project (including but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential impacts of the Project related to the conflict with any applicable land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Part 4 Volume 3. Based on the

entire record before us, this Commission finds that development of the Project will not result in significant impacts due to a conflict with any applicable local land use plan, policies, or regulations; therefore, no mitigation is required.

NOTE: As discussed in Section I, Introduction, the Project's Specific Plan has been adopted and therefore, the Project is consistent with the General Plan and zoning which currently show the site as the World Logistics Center.

Potential impacts of the Project related to the conflict with any applicable local land use plans, policies, or regulations are discussed in detail in Section 4.10 of the Revised Final EIR Parts 3 and 4 Volume 3. The Project is consistent with the City's General Plan, which shows the site as World Logistics Center Specific Plan, and its goals and policies. It will add significant employment opportunities, facilitate significant economic growth, establish well-planned attractive new development, establish a broader and more stable tax base for the City, expand recreational trail systems, increase permanent open space, provide for alternative forms of transportation, implement extensive sustainable design features and advance the progress of the City's annexation program. These are specifically identified and discussed in Section VI of this document including statements about how the Project helps the City to achieve these goals, objectives and policies.

Facts in Support of the Findings: The Project is consistent with the goals, objectives, and policies of the City of Moreno Valley General Plan. According to the Figure 2-2, *Land Use Map*⁶ updated in October 2019, the land is currently planned for Business Park (BP), and zoning land use designations of WLCSP-LD (World Logistics Center Specific Plan – Logistics Development) and WLCSP – LL (World Logistics Center Specific Plan – Light Logistics). This would allow the development of the WLC Project which will introduce 40.6 million square feet of logistics warehousing onto existing agricultural land that is adjacent to existing residential uses to the west and the San Jacinto Wildlife Area to the south.

Housing Element. During the NOP period, several group representatives expressed concern that the WLC Specific Plan would eliminate 7,700 housing units in the Moreno Highlands Specific Plan that would have to be replaced elsewhere in the City. The City adopted an updated Housing Element in February 2011 identifying the Moreno Highlands area as a potential location for future jobs-producing land uses rather than housing (affordable or otherwise).

The 2011 Housing Element update indicated the Moreno Highlands area would likely be rezoned to support employment-generating uses rather than housing. It also stated that “pursuing any land use changes with the Moreno Highlands Specific Plan area will not hinder the City's ability to meet its Regional Housing Needs Allocation (RHNA) obligations.” The term RHNA refers to the Regional Housing Needs Allocation (affordable housing allocations) from the SCAG. The State Department of Housing and Community Development (HCD) certified the City's Housing Element on May 31, 2011.

⁶ City of Moreno Valley. (2019). *Moreno Valley General Plan; Figure 2-2: Land Use Map*. Figure accessed from: http://www.moreno-valley.ca.us/city_hall/general-plan/landuse-map.pdf

In April 2011 and April 2013, the City adopted its Economic Development Action Plan, which also identified the eastern part of the City as a potential area for major job-producing land uses. The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (“Study”) prepared by David Taussig & Associates, Inc., in 2014 concluded that the WLC Project would generate 24,000 jobs/ employees to the area, which includes the creation of direct, indirect, and induced jobs/employees to the City. (Revised Final EIR Part 4 Volume 3, Appendix O)

The City’s 2006 Housing Element identified the Moreno Highlands Specific Plan as a potential source of vacant land that could accommodate possible future residential growth in the City. However, in 2011 the City updated its Housing Element and (i) anticipated possible land use changes from mixed-use and residential to jobs producing warehouses in the eastern part of the City, and (ii) concluded that redesignating the entire land east of Redlands Boulevard to the eastern City border for warehouse uses would not impede the City’s Housing Element Objectives. The HCD certified the City’s Housing Element as compliant with State law on May 31, 2011. In February 2014, the Housing Element was updated again, however this update did not include any changes relating to the Moreno Highlands property.

Therefore, because the land use and zoning designations for the Project site are in full compliance with all applicable plans, policies, and regulations and would not impede the City’s housing goals as set forth in its Housing Element, no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.10-26-34).

d. Cumulative Land Use Impacts

1. Would the proposed WLC Project conflict with any applicable habitat conservation plan or natural community conservation plan?

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to conflicts with any applicable habitat conservation plan or natural community conservation plan.

Findings: Potential cumulative impacts of the Project related to the conflict with any applicable habitat conservation plan or natural community conservation plan are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not contribute to a significant cumulative effect relating to conflicts with a habitat or natural community conservation plan; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative projects are located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the Stephens’ Kangaroo Rat (SKR) Habitat Conservation Plan (HCP) areas. Based on a review of each of the potentially cumulative projects, each that would be subject to the MSHCP and/or SKR HCP would be required to pay a fee to sustain the plant and wildlife populations within the MSHCP and the species population in the SKR HCP areas.

Projects subject to the MSHCP are required to pay a fee that will eventually result in an MSHCP Conservation Area in excess of 500,000 acres and focuses on conservation of 146 species including amphibians, reptiles, birds, mammals, invertebrates, and plants. Certain species require additional measures to ensure that the population of the species is sustained. Because each of the cumulative projects within the MSHCP area is

required to comply with the provisions of the MSHCP, no significant cumulative impact would result. In addition, since the Project also would be required to comply with the MSHCP, the Project's incremental impact on the species within the MSHCP would not combine with the incremental impacts of the other cumulative projects to cause or contribute to a significant cumulative impact.

Projects subject to the SKR HCP are required to pay a fee so that the funds can be used to acquire and permanently conserve, maintain and fund the conservation, preservation, restoration and enhancement of SKR occupied habitat. The implementation of the HCP has demonstrated the acquisition of habitat and sustaining the population of the SKR. Therefore, implementation of the cumulative projects would not result in a significant cumulative impact. In addition, because the Project also would be subject to the SKR HCP, including the requirement to pay a conservation fee, the Project's incremental impact on the SKR program would not combine with the incremental impacts of the other cumulative projects to cause or contribute to a significant cumulative impact (Revised Final EIR Part 3, pg. 6.10-14).

2. **Would the Project conflict with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Regional)**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts relating to conflicts with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential cumulative impacts of the Project related to the conflict with any applicable regional land use plan, policy, or regulation of an agency with jurisdiction are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not contribute to potential significant cumulative impacts related to conflicts with regional plans or policies; therefore, no mitigation is required.

Facts in Support of the Findings: The Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) includes policies that provide a strong commitment to reduce emissions from traffic and transportation. The RTP/SCS provides a blueprint for improving quality of life for residents by providing more choices for where they will live, work, play, and how they will move around. Many of the cumulative projects include the development of residential uses within the City of Moreno Valley. These projects are expected to be consistent with some of the policies identified in the RTP/SCS; however, cumulatively, the cumulative projects are not assisting in reducing potential commute traffic emissions. Therefore, development of the cumulative projects could result in significant cumulative impacts. With the implementation of the Project, approximately 25,000 new jobs would be eventually created, which would nearly double the number of jobs within the City. This increase in jobs would positively affect commute patterns for residents within the City as well as within the region by reducing commuter trips. The Project is consistent with the applicable policies of

the RTP/SCS. Because the Project would be consistent with the applicable RTP/SCS policies, the project would not contribute to any adverse cumulative conflicts associated with the RTP/SCS.

SCAGs Regional Comprehensive Plan's (RCP) overall goal is to reinvigorate the region's economy, avoid social and economic inequities and the geographical dislocation of communities, and to maintain the region's quality of life. Because the applicability of the RCP is to projects of "regional significance," the cumulative projects that include warehousing would be applicable. These warehousing projects would result in the creation of employment opportunities that would assist the City in balancing the current housing rich condition. These cumulative projects could modify commuting patterns to reduce overall vehicle miles travelled. These projects of "regional significance" would be consistent with the RCP and therefore would be less than cumulatively significant. The Project is also considered a project of "regional significance." The Project's anticipated increase of approximately 25,000 new employment opportunities would also modify commuting patterns so that overall vehicle miles travelled could be reduced. Because the Project would be consistent with the policies of the RCP, the Project would not contribute to potential adverse cumulative impacts to the implementation of the RCP.

Overall, the Project would not contribute to potential adverse cumulative impacts related to the implementation of the policies of the applicable regional plans (Revised FEIR Part 3, pg. 6.10-15).

3. **Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Local)**

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Findings: Potential cumulative impacts of the Project related to the conflict of any applicable land use plan, policy, or regulation of an agency with jurisdiction are discussed in detail in Section 6.10 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that development of the Project would not contribute to potential significant cumulative conflicts with the City of Moreno Valley General Plan; therefore, no mitigation is required.

Facts in Support of the Findings: Cumulative projects (including MV 4 and MV 24, for example) were consistent with the City's General Plan as they were proposed; others required amendments to the City's General Plan to become compliant. Based on a review of the available environmental documents for the cumulative projects that included an amendment, the amended land uses were still consistent with the goals, policies and objectives of the City's General Plan. The cumulative projects resulted in less than significant environmental effects related to the City's General Plan land use goals, policies and objectives.

As stated in Section 4.10.5.3 of the Final EIR, the Project originally sought amendments to the General Plan; however, in November 2015, the City Council approved the proposed amendments through the initiative process. Even prior to the adoption, the FEIR identified that the Project was consistent with the goals, policies and objectives of the General Plan. Therefore, the Project would not contribute to any potential cumulative impacts relating to consistency with the City of Moreno Valley General Plan (Revised Final EIR Part 3, pg. 6.10-16).

9. Mineral Resources

a. Loss of Statewide, Regional, or Locally Important Mineral Resources

Potential Significant Impacts: Whether the Project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plans.

Findings: Potential impacts of the Project relating to mineral resources are discussed in detail in Section 4.11 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to mineral resources will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.11 of the Revised Final EIR Part 4, Volume 3, lands within the City of Moreno Valley and its Sphere of Influence are designated Mineral Resources Zone–3 (MRZ-3) and MRZ-4, which are not defined as significant mineral resource areas. No sites have been designated as locally-important mineral resource recovery sites on any local plan.⁷ In addition, Figure OS-5 of the Riverside County General Plan shows that the Project area is also located within MRZ-3. The development of the Project site would not result in the loss of identified regional or local mineral resources, conversion of an identified mineral resource use, or conflict with existing mineral resource extraction activities. Therefore, the development of the Project site would not result in a loss of statewide, regional, or locally important mineral resources. No impacts associated with this issue would occur and no mitigation is required. (Revised Final EIR Part 4 Volume 3 pg. 4.11-3).

b. Cumulative Mineral Resource Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and foreseeable future projects would have significant cumulative impacts related to mineral resources.

Findings: Potential cumulative impacts of the Project related to mineral resource are discussed in detail in Section 4.11 of the Revised Final EIR Part 4 Volume 3 and Section 6.11 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that development of the Project will not result in significant cumulative impacts related to mineral resources; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.11 of the Revised Final EIR Part 4 Volume 3, the cumulative area for mineral resources is the City of Moreno Valley and part of western Riverside County. As population levels increase in the region, greater demand for aggregate and other mineral materials will be placed on mineral resources, especially sand and gravel. Similarly, development pressures in areas where these

materials are known or expected to occur would result in the loss of availability of these mineral resources. However, because the Project site is not identified as a significant source of sand/gravel deposits and development subsequent to the adoption of the land use actions on any of the sites would not decrease the local or regional availability of mineral resources, potential future development of any of the sites would have no significant cumulative mineral resources impact. (Revised Final EIR Part 4 Volume 3, pg. 4.11-3 and 4.11-4). Further, because the Project would result in no impact related to the loss of availability of a known mineral resource that would be of valued to the region and the residents of the state or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan, it could not cause or contribute to any potential cumulative impact. (Revised FEIR Part 3, pg. 6.11-1.)

10. Noise

a. Groundborne Vibration or Groundborne Noise Impacts

Potentially Significant Impact: Whether the Project would result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.⁷

Findings: Potential impacts of the Project relating to groundborne vibration and groundborne noise is discussed in detail in Section 4.12 of Revised Final EIR Part 4, Volume 3. Based on the entire record before use, this Commission finds that no significant impacts related to groundborne vibration and groundborne noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.12 of the Revised Final EIR Part 4, Volume 3, roadways in the vicinity of the Project area are either paved or would be paved as the area develops and would not result in Project traffic driving over rough or dirt roads. Well maintained roads typically do not result in substantial vibration levels. Even roads with irregularities typically only generate substantial levels of vibration very near, less than 50 feet from the irregularity. Construction activities that would occur within the WLC Specific Plan area are not anticipated to require blasting or pile driving. Roadway vibrations are typically not perceptible more than 50 feet from the roadway except in very unusual circumstances. Generally, the interface between the soft tire of a truck or automobile will not generate significant vibration unless the road is in poor shape (e.g., potholes or pavement joints). Therefore, impacts associated with this issue are anticipated to be less than significant, and no mitigation is required (Revised Final EIR Part 4, Volume 3, pg. 4.12-34).

b. Airport Noise

Potentially Significant Impact: Whether a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would result in exposure of people residing or working in the Project area to excessive noise levels or if a Project within the vicinity of a private airstrip, would expose people residing or working in the Project area to excessive noise levels.

Findings: Potential impacts of the Project relating to airport noise are discussed in detail in Section 4.12 of Revised FEIR Part 4, Volume 3. Based on the entire record before use, this Commission finds that no

⁷ “Groundbourne noise” is the noise radiating from structures as a result of groundbourne vibrations. It is absent when groundbourne vibrations are small.

significant impacts related to airport noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.12 of the Revised FEIR Part 4, Volume 3, the Project area is located approximately 5.5 miles northeast of the March Airfield (MAF) and is not located within two miles of a private airstrip. The MAF is a joint-use airport, used for both military and civilian purposes. The March Air Reserve Base (MARB) is the military operator of the MAF and March Inland Port (MIP) is the civilian operator of the airport. This facility is anticipated to play an increasingly important role in the transportation of goods and cargo for the Southern California region. Existing flight patterns affect a large portion of the City of Moreno Valley, along a path that affects the western portion of the City in a northwest/southeast alignment. Aircraft operations from the airport currently contribute intermittent single-event noise.

There is potential for single-event noise exposure levels from MAF activity to affect the Project. The exposure levels will vary dependent upon the type of aircraft and flight track flown for each operation at MAF. However, the Project is not identified as being within the noise or safety contours delineated for the MAF. In addition, the Project is not considered to contain sensitive receptors and, therefore, the impacts from these single-event noise levels are considered to be below the level of significance. The City's exterior noise standard for industrial uses is 70 dBA CNEL. MAF noise levels are less than 60 dB CNEL within the Project area. Therefore, the Project would not have the potential to expose people to excessive noise levels from airport operations. Therefore, no significant noise impacts would occur regarding these issues from implementation of the Project, and no mitigation is required (Revised Final EIR Part 4, Volume 3, pg. 4.12-35).

c. Cumulative Groundborne Vibration

Potentially Significant Impact: Whether the Project's contribution to the cumulative exposure of persons to or generation of excessive groundborne vibration levels would be cumulatively considerable.

Findings: Potential impacts of the Project relating to groundborne vibration is discussed in detail in Section 4.12 of Revised Final EIR Part 4 and potential cumulative impacts are discussed in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before use, this Commission finds that there is no potential for cumulative impacts with respect to groundborne vibration; therefore, no mitigation is required.

Facts in Support of the Findings: As discussed in Section 6.12 of the Revised Final EIR Part 3, two cumulative projects are located at distances that could undergo construction activities during the project's construction period: P06-158/Gascon and MV-6: Highland Fairview Corporate Park, and MV-126: TTM 33222. Due to the rapid attenuation characteristics of ground-borne vibration and distance from each of the Related Projects to the Project site, there is no potential for cumulative construction impacts with respect to ground-borne vibration. Therefore, cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.12-23).

The Project's operations would include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce vibration. In addition, the primary sources of transient vibration would include truck circulation within the proposed parking

areas and internal drive aisles. Ground-borne vibration generated by each of the above-mentioned activities would generate up to approximately 0.005 in/sec at 50 feet from the source. The potential vibration levels from all Project operational sources at the closest existing sensitive receptor locations would be less than the significance threshold of 0.5 in/sec peak particle velocity (PPV) significance threshold for potential residential building damage and 0.1 in/sec PPV significance threshold for human annoyance. As such, vibration impacts associated with operation of the Project would be below the significance threshold and would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.12-23).

d. Cumulative Airport Noise

Potentially Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to exposure of people to excessive airport noise levels.

Findings: Potential cumulative impacts of the Project relating to airport noise are discussed in detail in Section 6.12 of Revised Final EIR Part 3. Based on the entire record before use, this Commission finds that no significant cumulative impacts related to airport noise will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.12 of the Revised Final EIR Part 3, the Project area is located approximately 5.5 miles northeast of the March Airfield (MAF) and is not located within two miles of a private airstrip. The MAF is a joint-use airport, used for both military and civilian purposes. The March Air Reserve Base (MARB) is the military operator of the MAF and March Inland Port (MIP) is the civilian operator of the airport. This facility is anticipated to play an increasingly important role in the transportation of goods and cargo for the Southern California region. Existing flight patterns affect a large portion of the City of Moreno Valley, along a path that affects the western portion of the City in a northwest/southeast alignment. Aircraft operations from the airport currently contribute intermittent single-event noise.

There is potential for single-event noise exposure levels from MAF activity to affect the Project. The exposure levels will vary dependent upon the type of aircraft and flight track flown for each operation at MAF. However, the Project is not identified as being within the noise or safety contours delineated for the MAF. In addition, the Project is not considered to contain sensitive receptors and, therefore, the impacts from these single-event noise levels are considered to be below the level of significance. The City's exterior noise standard for industrial uses is 70 dBA CNEL. MAF noise levels are less than 60 dB CNEL within the Project area. Therefore, the Project would not have the potential to expose people to excessive noise levels from airport operations in the cumulative setting. Therefore, no cumulative significant noise impacts would occur regarding these issues from implementation of the Project, and no mitigation is required (Revised Final EIR Part 3, pg. 6.12-24).

e. Cumulative Long-Term Utility Noise

Potential Significant Impact: Whether the Project's contribution to long-term utility noise impacts in excess of City standards is less than cumulatively considerable.

Findings: Potential cumulative impacts related to long-term utility noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before use, this Commission finds that there is no potential for cumulative impacts with respect to long-term utility noise; therefore, no mitigation is required.

Facts in Support of the Findings: There is one existing SDG&E compressor station and two existing SCGC facilities located adjacent to the WLC Specific Plan area.

The L_{eq} noise level generated by the compressor station does not exceed 60 dBA L_{eq} beyond the property lines of the facility. For SCGC blow-down events, noise generated could reach as high as 130 dBA just outside the fence line of the southern facility and in excess of 135 dB just outside the fence line of the northern facility. People within approximately 250 feet of the blow-down points would be exposed to noise levels greater than 115 dBA. No sensitive receptors are located such that noise levels from the compressor station and on-site project activity would result in cumulatively considerable impacts. Therefore, noise impacts associated with the operation of the compressor station in conjunction with Project operations would not be cumulative considerable and would be less than significant. (Revised Final EIR Part 3 pg. 6.12-31)

SCGC blow-down events also have the potential to produce groundborne vibration. However, the effect of the blow-down groundborne vibration would be limited to within 100 feet of the equipment and would not be perceived beyond the facility fence line, resulting in a less than significant impact and no mitigation is required. (Revised Final EIR Part 3 pg. 6.12-31)

11. Population and Housing

a. Population Growth

Potential Significant Impact: Whether the Project would induce substantial unplanned population growth in an area, either directly (e.g., new homes and businesses) or indirectly (e.g., extension of roads and infrastructure).

Findings: Potential impacts of the Project related to population growth are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to population growth will occur as a result of development of the Project and, therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.13 of the Revised Final EIR Part 4 Volume 3, population projections developed by SCAG estimate the City's population will reach approximately 213,700 persons by the year 2020 and approximately 255,200 persons by the year 2035. The extent to which the new jobs created by a Project are filled by existing residents is a factor that tends to reduce the growth-inducing effect of a Project. Construction of the WLC Project will create short-term construction jobs. These short-term positions are anticipated to be filled by workers who, for the most part, reside in the Project area; therefore, construction of the WLC Project will not generate a permanent increase in population within the Project area.

An economic study of the Project prepared by DTA concluded that the WLC Project could generate up to 20,307 new direct on-site jobs within the City.⁹ In addition to the projected on-site job creation, the DTA study

estimates the WLC Project could generate new off-site jobs (i.e., indirect/induced employment) in all industries of the economy. The DTA study also estimated that an additional 7,386 indirect/induced jobs could be created in the County, of which 3,693 jobs were projected to be within the City as a result of Project implementation. While the specific location of the potential additional indirect/induced jobs created within the County cannot be specifically determined, it is reasonable to assume that some percentage of these jobs will be support service jobs and are likely to be located in the WLC Project vicinity, and therefore the City.

The WLC Project does not include a residential component. The WLC Project is located within an area that is currently largely vacant and previously planned for a mix of residential, commercial, business park, and open space land uses.

The WLC Specific Plan supplanted the approved Moreno Highlands Specific Plan (MHSP) Project that did have a residential component. The EIR for that project indicated it would have increased the City's population by 17,019 persons over 15 years (7,736 units \times 2.2 persons/unit). However, because the City is considered housing rich (and jobs poor) by SCAG, the loss of that projected population growth is not considered a significant impact and, in fact, a number of State policies (e.g., SB 375) encourage the creation and development of jobs-producing development in areas with poor jobs/housing numbers such as that which exists in the City.

Currently, there are six single-family homes in various locations on the Property along with associated ranch/farm buildings. Streets, water and sewer utilities, and municipal services would be extended to serve the WLC Project. The WLC Project may benefit other development projects in the Project area by the installation of infrastructure (e.g., roads and utilities), but is not expected to induce substantial population growth into the area since there would be no large areas of vacant land left in the east end of the City (south of SR-60) that could be developed with residential uses.

It should be understood that the actual eventual number of employees generated by the Project will vary depending on a variety of economic factors (e.g., actual companies that relocate and current hiring conditions). The projected employment estimate also does not take into account relocation of existing employees from other jurisdictions as a result of existing businesses relocating into the WLC Project. However, these would be counted as "new" employees for the City of Moreno Valley. For the purposes of this analysis, the Revised Final EIR used 20,307 direct employees working at the WLC or one employee per 2,000 square feet as a conservative estimate (in terms of environmental impacts) for future employment growth from the Project's development.

The new employment opportunities resulting from development of the high-cube logistics warehouse and general warehouse uses will raise the City's current jobs-to-housing ratio by providing additional jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, due to the City's projected jobs/housing ratio, it is reasonable to assume and therefore expect that some percentage of these jobs would be filled by persons already living within the City or near the Project area. Therefore, no significant increase in population of the City would result from the development or operation of the WLC Project, resulting in a less than significant impact associated with growth inducement and no mitigation is required.

Indirect City Population Impacts Related to Fiscal and Economic Changes. If the WLC Project is not built, it could be argued that the City may experience a financial impact from the loss of higher property tax, sales tax, and other revenues related to growth and development.

Potential economic impacts that may occur with Project implementation include permanent employment (direct on-site and indirect/induced), permanent output (gross receipts; total direct output plus output produced by suppliers and employee spending), and construction jobs over 15 years.

The DTA study indicates that the creation of new jobs will lead to more consumer spending by employees in existing retail establishments within the City, as well as new retail development that will be attracted to the City as a result of this spending. Job creation also results in increased tax revenues to the City through increased property taxes and sales taxes associated with development of the WLC Project. However, it is important to note that because of the difference in timing of the development of the various phases of the WLC Project, the number of employees summarized above will not be realized all at once.

Development of the WLC Project is projected to create approximately 16,521 construction-related full-time equivalent (FTE) jobs within the City. Similar to recurring employment (i.e., permanent), it is likely that some percentage of these jobs will be associated with support services and are likely to be located in the vicinity of the WLC Project and therefore within the City.

The WLC Project does not include a residential component, so it would not directly generate additional new housing. Employees of the Project that choose to live in the City would likely utilize the existing supply of housing within the City.

Based on the potential increase in jobs (additional 20,307 direct jobs) within the City and no substantial increase in population as a result of the Project, the City's jobs-to-housing ratio would improve from the 2011 ratio of 0.47 to 0.91, thus achieving a greater jobs-to-housing balance within the City. Similarly, the potential new County employees that may be generated by the WLC Project would increase the total County employment to 571,799 from 551,492 resulting in a ratio of 0.74 from 0.69.

As development of the WLC Project is expected to occur over the course of many years, the jobs-to-housing ratio will not significantly change immediately. The City's current jobs-to-housing ratio is exceptionally low when compared to SCAG standards; therefore, the need for employment is immediate. A balance between jobs and housing within the City would have a positive impact by decreasing costs associated with commuting and traffic congestion. It also provides savings to consumers in the operation and maintenance of automobiles and saving to local public agencies in terms of the need to construct and maintain new road improvements.

Based on the foregoing discussion, implementation of the WLC Project would not result in a deficit in the City's General Fund even after City costs to provide public services to the development are considered. The estimated surplus is approximately \$5.7 million annually, which is about two times the projected annual City General Fund costs. Additionally, the WLC Project is expected to generate sizeable, substantial, and lasting employment, wages, output, and revenues for the City and region. Therefore, potential fiscal and economic changes that could affect the City's population or housing are considered to be less than significant, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.13-11 to 4.13-17).

b. Displace Substantial Housing/People

Potential Significant Impact: Whether the Project would displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere.

Findings: Potential impacts of the Project related to displacement of housing or people are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to displacement of housing or people will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.13 of the Revised Final EIR Part 4 Volume 3, the WLC Project site currently contains seven rural residences. At the Commission meeting on May 22, 2012, some of the existing residents stated that they did not want to be included in the Specific Plan. After deliberation, the Commission decided to include the rural properties in the Specific Plan in the interest of comprehensive land planning for the WLC property. These properties continue as non-conforming uses, and the WLC Specific Plan designates these properties as “Light Logistics” (LL), which allows for future industrial-related uses (vehicle storage, light assembly, etc.). In this way, the WLC Specific Plan does not remove or displace any of the existing residents or residences from the Project site. As large warehouse buildings are developed near or adjacent to these residences, it may become less desirable to reside within the WLC Specific Plan area; however, the Project itself does not cause housing displacement.

Therefore, impacts to the seven on-site residences would not be considered a significant housing impact. For these reasons, the WLC Specific Plan will not have significant population or housing impacts related to displacing substantial numbers of people or existing housing.

The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (“Study”) prepared by DTA in 2014 concluded that the WLC Project would generate 20,307 direct jobs/employees to the City. Section 4.13.5.3 of the 2015 FEIR determined that the WLC Project is consistent with the 2011 Housing Element, and it will not displace substantial numbers of existing housing or necessitate the construction of replacement housing elsewhere. Therefore, no significant displacement impacts relative to people or housing are expected to occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.13-18 to 4.13-19).

c. Cumulative Population and Housing Impacts

Potential Significant Impact: Whether the Project could cause an increase in population and housing that is substantial in relation to the past, current, and probable future projects.

Findings: Potential impacts of the Project related to cumulative impacts of the Project on housing or population are discussed in detail in Section 4.13 of the Revised Final EIR Part 4 Volume 3 and Section 6.13 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that no significant impacts related to cumulative impacts on housing or population will occur as a result of development of the Project and, therefore, no mitigation is required.

Fact Supporting the Findings: The cumulative area for the discussion of population and housing impacts is the City of Moreno Valley. The development of the WLC Project site is governed by the existing WLC Specific Plan. The Project would not contribute to substantial population growth and therefore would not result in an increased demand on the current or future housing in the region. In addition, the Moreno Valley area is considered housing rich and jobs poor by the Southern California Association of Governments, so the loss of population (and planned housing) would actually be a regional benefit according to its Regional Transportation Plan. The Project may result in an influx of new workers who would need to locate temporarily or permanently in the area, but the City has an overabundance of existing housing stock due to current market conditions. Implementation of the WLC Project would actually benefit population and housing conditions relative to employment and jobs/housing ratio and, therefore, not result in cumulatively adverse impacts to population or housing. The WLC Project would also not significantly induce growth into areas where growth was not previously anticipated since the WLC Project area represents the last largest remaining vacant land in the City of Moreno Valley. (Revised Final EIR Part 4 Volume 3, pg. 6.13-1 to 6.13-10).

12. Public Services and Facilities

a. Law Enforcement Services and Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered law enforcement facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential impacts of the Project related to law enforcement services and facilities are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to law enforcement services or facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the WLC Specific Plan requires building and site design characteristics that specifically support police services by encouraging buildings that are safe and can be secured by design, fencing, security services, etc. The WLC Specific Plan design guidelines are consistent with the goals of the General Plan relative to police protection and site design. In addition, future development within the WLC Specific Plan will be required to comply with the City's Development Impact Fee (DIF) requirements as new development is constructed. It is anticipated that DIF revenues will help fund additional equipment needs and increased property taxes would help fund increased service or staffing needs. Therefore, the Project will have less than significant impacts relative to police service, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-4 to 4.14-7).

b. Fire Protection Services and Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered fire-fighting facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential impacts of the Project related to fire-fighting services and facilities are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to fire protection or facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the WLC Specific Plan will dedicate a new 1.5-acre urban fire station site within its boundaries to allow for expansion of fire protection services as the Project develops (see WLC Specific Plan Section 2.2.6). The WLC Specific Plan indicates the new fire station will be at the north end of Planning Area 11. The WLC Specific Plan also requires building and site design characteristics that specifically support fire services by encouraging buildings that are safe and can be secured by design, fencing, security services, etc. The WLC Specific Plan design guidelines are consistent with the goals of the General Plan relative to fire protection and site design. Finally, future development within the WLC Specific Plan area will be required to comply with the City's DIF requirements as new development is constructed. Therefore, the Project will have less than significant impacts relative to fire protection service, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-10 to 4.14-13).

c. School Facilities

Potential Significant Impact: Whether the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities, the construction of which could cause significant environmental impacts.

Findings: Potential impacts of the Project related to school facilities are discussed in detail in Section of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to school facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, the Project contains no residential development, so it would not cause a significant increase in the local population that would increase the number of students attending local schools. Since payment of the school impact fees is required of all projects within Moreno Valley Unified School District and San Jacinto Unified School District boundaries, impacts to school services and facilities would not occur. The WLC Project is also consistent with the applicable General Plan policies as it will assist in the provision of adequate school facilities by providing legally required development impact fees. Accordingly, impacts to the environment resulting from new or expanded school facilities would not occur, resulting in a less than significant impact and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pg. 4.14-15 to 4.14-17).

d. Parks, Recreation, and Trails

Potential Significant Impact: Whether the Project would result in increased use of existing neighborhood and regional parks or other recreational facilities (e.g., trails) where substantial physical deterioration would occur or be accelerated or result in construction or expansion of recreational facilities that would have an adverse physical effect on the environment.

Findings: Potential impacts of the Project related to parks, recreation, and trails are discussed in detail in Section 4.14 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to parks, recreation, or trails will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.14 of the Revised Final EIR Part 4 Volume 3, there is a potential for the Project to indirectly generate new residents in the City, although predicting the exact number would be too speculative. Increases in the City's population from future residential development will help fund new parks and trails through dedications of land and the payment of Development Impact Fees.

In November 2015, the City Council approved a General Plan Amendment to the Master Plan of Trails to reduce the extent of trail systems in the area to reflect the change from a residential neighborhood (Moreno Highlands) to a non-residential neighborhood (World Logistics Center). Trail linkages are provided in the WLC Project to extend existing trail routes from the western edge of the Project to the east, providing for future linkages to Gilman Springs Road, to the Lake Perris State Recreation Area, and to the San Jacinto Wildlife Area.

Implementation of these new trails and the General Plan Amendment (i.e., revised Master Plan of Trails) will allow the Project to be consistent with the General Plan policies relative to trails. The Project is consistent with the City General Plan policies relative to parks, recreation, and trails.

The WLC Specific Plan provides connections to existing trails to the west and southwest, and a connection to and trailhead for a future planned trail in the San Jacinto Wildlife Area south of the site, as outlined in Section 3.4.2, *Multi-Use Trails*, and as shown on Figure 3-17 of the Specific Plan. In addition, future development within the WLC Specific Plan area will pay applicable DIFs to offset any potential impacts to parks or recreational services. Based on this, the Project will not create significant impacts on parks, recreation, or trails.

The Project does not include the construction or expansion of a recreational facility since it would not create any substantial demands on recreational facilities. The Project would have a less than significant impact on population or housing; therefore, no new demand on existing park facilities would occur, and no expansion of existing parks or the construction of new parks would be required. (Revised Final EIR Part 4 Volume 3, pgs. 4.14-17 to 4.14.25).

e. Cumulative Public Services and Facilities and Parks, Recreation, and Trails Impacts

Law Enforcement Services and Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered law enforcement facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Findings: Potential cumulative impacts of the Project related to law enforcement services and facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, the

Planning Commission finds that the Project contribution to significant environmental effects from new or altered law enforcement facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for police protection services is the City of Moreno Valley. Police protection services for the City, including the project and cumulative development, is provided by the City of Moreno Valley Police Department (MVPD), which contracts police services from the Riverside County Sheriff's Department (RCSD).

In general, impacts to the MVPD services and facilities during the construction of cumulative development would be addressed as part of each cumulative project's development review process conducted by the City. During construction of cumulative development, equipment and building materials could be temporarily stored on the cumulative project sites, which could result in theft, graffiti, and vandalism. Many cumulative project sites are located in areas of moderate to high vehicular activity from nearby streets. In addition, the construction sites of the cumulative projects would be fenced along the perimeters, when applicable, with the height and fence materials subject to review and approval by the City. Temporary lane closures may be required for right-of-way frontage improvements and utility construction. However, these closures would be temporary in nature and in the event of partial lane closures, both directions of travel on area roadways and access to the cumulative project sites would be maintained. Due to their proximity to the Project site, should project construction occur concurrently with the construction of cumulative projects MV-4, MV-5, MV-6, and MV-126, coordination with these construction sites would be implemented through each cumulative project's respective construction traffic management plan, if applicable, which would ensure emergency access and traffic flow are maintained on adjacent right-of-ways. In addition, construction-related traffic generated by the cumulative development would not significantly impact the MVPD responses within the vicinities of the cumulative projects as emergency vehicles normally have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic.

According to the MVPD, there are no planned improvements for the MVPD facilities.^{1,2} If expanded police facilities were determined warranted by the MVPD, and were foreseeable, the impacts of the construction and operation of such a station would be analyzed at that time under CEQA as a project independent of the cumulative development. Moreover, the expansion of any police station would likely be on an infill lot potentially less than an acre in size. Generally, development associated with typical police stations is unlikely to result in significant unavoidable impacts, and projects involving the construction or expansion of a police station are typically anticipated to be addressed pursuant to CEQA through the use of a Class 32 categorical infill exemptions (CEQA Guidelines Section 15332) or (mitigated) negative declarations since they are likely relatively small structures on infill parcels. Accordingly, the need for additional police protection services as part of an unplanned or expanded police station at this time is not an environmental impact of a project or one that a project is required to be mitigated.

It is expected that the cumulative projects (particularly those of a larger nature) would be subject to discretionary review by the MVPD on a project-by-project basis to ensure that sufficient security measures are implemented to reduce potential impacts to police protection services. Many of the cumulative projects would also be expected, when applicable, to provide on-site security, personnel and/or design features for their

residents and patrons per standard development practices for the given uses. Further, the City would collect development impact fees from the cumulative projects that would be used to fund the MVPD expenditures as necessary to offset any cumulative incremental impact from each cumulative project on police protection services. The protection of public safety is the first responsibility of local government, and local officials have an obligation to give priority to the provision of adequate public safety services, which are typically financed through the City general funds.

With regard to emergency response times, cumulative projects would introduce new uses which would generate additional traffic in the vicinity of the cumulative development. Traffic from the cumulative development could have the potential to affect emergency vehicle response times to the cumulative project sites and surrounding properties due to travel time delays caused by the additional traffic. Emergency vehicles would access the cumulative project sites directly from the surrounding roadways. The drivers of emergency vehicles have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. As such, emergency access to the vicinity of cumulative development would be maintained at all times, and the increase in cumulative traffic generated by cumulative development would not significantly impact emergency vehicle response times. Further, consistent with the *City of Hayward v. Trustees of California State University*, 242 Cal.App.4th 833 (2015), potential impacts on emergency response times are not an environmental impact that CEQA requires a project to mitigate.

The Project is located in an area of high vehicular activity and would provide construction fencing and private security during construction. As such, the Project would not cause a significant impact to police protection services during construction. Therefore, the Project's contribution to cumulative impacts during construction on the MVPD's emergency response would not be cumulatively considerable.

The Project would be designed and operated per applicable standards required by the City for new development in regard to public safety. The Project would be required to pay the applicable development impact fees to the City. Similar to cumulative development, the drivers of emergency vehicles would have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. Therefore, the Project's contribution to cumulative impacts to MVPD facilities would not be cumulatively considerable. Therefore, the Project would result in a less than cumulatively considerable contribution to the need for the construction of new, or expanded police facilities and, as such, cumulative impacts on police protection services would be less than significant. (Revised Final EIR Part 3, pg. 6.14-19 through 6.14-20).

Fire Protection

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection.

Findings: Potential cumulative impacts of the Project related to fire protection services and facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that no significant cumulative impacts related to fire protection services or facilities will occur as a result of development of the project; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for fire protection is the City of Moreno Valley. Fire protection for the City, including the Project and cumulative development, is provided by the City of Moreno Valley Fire Department (MVFD), which contracts with the Riverside County Fire Department (RCFD).

In general, impacts to the MVFD services and facilities during the construction of cumulative development would be addressed as part of each cumulative project's development review process conducted by the City. Construction activities associated with cumulative development may temporarily increase the demand for fire protection and emergency medical services, and may cause the occasional exposure of combustible materials, such as wood, plastics, sawdust, covering and coatings, to heat sources including machinery and equipment sparking, exposed electrical lines, welding activities, and chemical reactions in combustible materials and coatings. However, in compliance with the requirements of the California Occupational Safety and Health Administration (OSHA), all construction managers and personnel of cumulative development would be trained in fire prevention and emergency response. Further, fire suppression equipment specific to construction of the cumulative development would be maintained on the cumulative project sites. As applicable, all cumulative construction activities would be required to comply with the 2013 California Building Code (CBC); the 2013 California Fire Code (CFD); and the City's Fire Code.

Construction activities may involve temporary lane closures of right-of-way frontage improvements and utility construction. However, these closures would be temporary in nature and in the event of partial lane closures, both directions of travel on area roadways and access to the cumulative project sites would be maintained. Due to their proximity to the Project site, should project construction occur concurrently with the construction of cumulative projects MV-4, MV-5, MV-6, and MV-126, coordination with these construction sites would be implemented through each cumulative project's respective construction traffic management plan, if applicable, which would ensure emergency access and traffic flow are maintained on adjacent right-of-ways. In addition, construction-related traffic generated by the cumulative development would not significantly impact MVFD response within the vicinities of the cumulative projects as emergency vehicles normally have a variety of options for avoiding traffic, such using sirens to clear a path of travel or driving in the lanes of opposing traffic.

During operation, although the cumulative demand on MVFD services would increase, cumulative impacts on fire protection and emergency medical services would be reduced through each cumulative project's regulatory compliance and site-specific design and safety features. Each cumulative project would be subject to the required review by the MVFD for compliance with Fire Code and Building Code regulations related to emergency response, emergency access, fire flow, and fire safety that would reduce potential cumulative impacts to fire protection and emergency services. Further, the City would collect development impact fees from cumulative projects that would be used to fund MVFD expenditures as necessary to offset any cumulative incremental impact from each cumulative project on fire protection services. The protection of public safety is the first responsibility of local government, and local officials have an obligation to give priority to the provision of adequate public safety services, which are typically financed through the City general funds.

Cumulative project sites which are located in Very High Fire Severity Zone (VHFSZ) and susceptible to wildland fire hazards would adhere to the special construction features set forth in Chapter 7A of the CBC. Further, any significant risk of loss, injury, or death involving wildland fires, would be minimized to the

maximum extent feasible through implementation of cumulative project-specific fuel modification plans, if applicable, that would be subject to review and approval by the MVFD.

The Project would be subject to the required review of the MVFD for compliance with the Fire Code and Building Code regulations related to emergency response, emergency access, fire flow, and fire safety that would reduce potential impacts to fire protection and emergency services. The Project includes a future 1.5-acre urban fire station within its boundaries to be dedicated to the City to help offset increased fire service needs. The new fire station will be located at the north end of Planning Area 11 and is required to be built during Phase I. Placement of the new fire station is subject to review and approval by the Fire Chief. As portions of the Project site are located within a State-designated VHFSZ, the Project would comply with Chapter 7A of the CBC. Further, the Project would be required to pay the applicable development impact fees to the City. Compliance with payment of fees could further offset the cumulative impact from the cumulative projects on the Project's proposed fire station. Therefore, the Project would result in a less than cumulatively considerable contribution to the need for the construction of new, or expanded fire facilities and, as such, cumulative impacts on fire protection services would be less than significant (Revised Final EIR Part 3, 6.14-21 through 6.14-22).

Schools

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for schools.

Findings: Potential cumulative impacts of the Project related to school facilities are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's contribution to significant environmental effects from new or altered school facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: Construction of the cumulative development would require the participation of construction employees who would be hired from a mobile regional construction work force that moves from project to project. Typically, construction workers pass through various development projects on an intermittent basis as their particular trades are required. Given the mobility and short durations of work at a particular site, and a large construction labor pool that can be drawn upon in the region, construction employees would not be expected to relocate their residences within this region or move from other regions as a result of their work on the cumulative development. Accordingly, construction of cumulative development is not anticipated to generate new students needing to attend local schools within the MVUSD or SJUSD.

The MVUSD and SJUSD monitors enrollment numbers at all schools within their districts. Seating shortages can be addressed through changes in attendance boundaries and new/expanded school facilities. Nonetheless, cumulative development is expected to generate students that would attend local schools within the MVUSD and SJUSD. As such, this cumulative development could require new or expanded school facilities. The cumulative projects would be required to pay development fees for schools to the MVUSD or SJUSD prior to the issuance of grading permits pursuant to SB 50. Pursuant to Government Code Section 65995, the payment

of developer fees would be considered full and complete mitigation of schools impacts by cumulative development.

Construction of the Project is not anticipated to generate new students needing to attend local school within the MVUSD or SJUSD. The project does not include residential uses but is expected to generate approximately 15,000 to 25,000 new jobs in the City. According to Section 4.14.3.5 of the Revised Final EIR Part 4 Volume 3, it is speculative to estimate how many workers would actually live within the City and how many would commute from the surrounding area. Although the exact number is speculative, any increase is not expected to be substantial and would not generate significant new demands related to the need for new or altered schools. Further, the Project would be required to pay development fees pursuant to SB 50. Therefore, the Project's contribution to cumulative impacts to school facilities would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.14-23).

Parks, Recreation, and Trails.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for parks, recreation, and trails.

Findings: Potential cumulative impacts of the Project related to parks, recreation, and trails are discussed in detail in Section 6.14 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's contribution to the deterioration of existing park, recreation and trail facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: Most park visits originate from residential uses. Typically, employees are engaged in their work during the day and do not contribute substantial demand for parks. If employees use the parks, such usage would occur during the week rather the weekend. Construction workers may visit a park to eat lunch or for recreation after a day of work. Cumulative development would increase the residential and visitor population which could create new demand on parks and recreation space in the vicinities of the cumulative projects. Some cumulative projects could include recreational facilities and open space features that would serve cumulative project residents and guests and would thereby reduce cumulative demand on public parks. Pursuant to the Quimby Act, the City would require the dedication of land, or the payment of fees for park and/or recreational facilities from the cumulative projects to offset any cumulative incremental impact from each cumulative project on parks, recreation, and trails. Therefore, with the dedication of land, or the payment of development fees, cumulative development would not substantially deteriorate or accelerate the deterioration of recreational facilities or resources.

The Project includes the development of a master-planned logistics center; no residential development is proposed. There is a potential for the Project to indirectly generate new residents in the City, although predicting the exact number would be too speculative. Trail linkages are provided as part of the Project for future linkages to Gilman Springs Road, to the Lake Perris State Recreation Area, and to the San Jacinto Wildlife Area. Future development within the Project site will pay the applicable development impact fees for

parks or recreational services. Therefore, the Project’s contribution to cumulative impacts to parks, recreation, and trails would be less than cumulatively considerable.

The Project would result in less than cumulatively considerable contribution to increased use of existing neighborhood and regional parks or other recreational facilities where substantial physical deterioration would occur or be accelerated. As such, cumulative impacts on parks, recreation, and trails would be less than significant (Revised Final EIR Part 3, pg. 6.14-24).

13. Transportation

Introduction

As discussed in Section 1, Introduction, the Revised Final EIR reflects information found in the 2015 FEIR, the July 2018 RSFEIR and the responses to comments on both. The Revised Final EIR Part 3 found the discussion of transportation impacts to be in compliance with CEQA. The FEIR and the RSFEIR relied upon the then governing CEQA Guidelines, including Appendix G for applicable thresholds of significance, using the Level of Service (LOS), a measure of delay,

In 2013 (effective January 1, 2014), the Legislature adopted SB 743, a new CEQA provision with respect to the criteria for determining the significance of transportation impacts of projects, mandating the preparation of revisions to the CEQA Guidelines, including the potential use of “vehicles miles traveled” (VMT) or other metrics to evaluate transportation impacts. (Cal. Publ. Res. Code § 21099.) In response to Section 21099, the 2018 revisions to the CEQA Guidelines included Section 15064.3, entitled “Determining the Significance of Transportation Impacts” which defines VMT as “the amount and distance of automobile travel attributable to a project. (Section 15064.3(a).) Importantly, under Section 21099, with the certification of the new Guidelines, “automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment” under CEQA. Thus, as of December 2018, “automobile delay” is not to be considered a significant impact on the environment under CEQA. (See *Citizens for Positive Growth & Preservation v. City of Sacramento*, 43 Cal.App.5th 609, 626 (2019) (court applied Section 21099 or “existing law,” holding that impacts on LOS or “automobile delay” cannot constitute a significant environmental impact under CEQA.)

CEQA Guidelines. Section 15007(b) states:

“Amendments to the Guidelines apply prospectively only. New requirements in amendments will apply to steps in the CEQA process not yet undertaken by the date when agencies must comply with the amendments.”

Section 15007(c) clarifies the timing for implementing Guideline amendments with respect to documents sent out for public review prior to the effective date of the amendments, but proposed for certification after the effective date of the amendments:

“If a document meets the content requirements in effect when the document is sent out for public review, the document shall not need to be revised to conform to any new content requirements in Guideline amendments taking effect before the document is finally approved.”

On April 23, 2020, the City of Moreno Valley Planning Commission adopted Resolution No. 2020-18 and recommended that specified VMT thresholds be adopted by the City Council, pursuant to SB743. However, the City’s new VMT thresholds are not yet in effect, until such time as they are adopted by the City Council.

These Findings consider Section 21099 and the proposed City’s new VMT thresholds. When the FEIR, Revised Final EIR Part 4 Volume 3 was certified in 2015 and when the RSFEIR, Revised Final EIR Part 3 was circulated for public review in July 2018, the use of “Level of Service” criteria was an accepted threshold of significance for the evaluation of transportation impacts and LOS criteria were relied upon in those documents. In addition, although the transportation section was updated in the July 2018 RSFEIR, the transportation section of the 2015 FEIR, Revised Final EIR Part 4, Volume 3 was upheld by the Superior Court (see Topical Response C to the December 2019 Recirculated Draft RSFEIR). Accordingly, for consistency with those prior CEQA documents and in conformance with the Superior Court’s decision, these Findings consider “Level of Service” criteria for purposes of evaluating the significance of transportation impacts. In addition, however, these Findings also consider transportation impacts based on the City’s proposed VMT thresholds. However, because the RSFEIR and the Draft Recirculated RSFEIR were sent out for public review before the effective date of CEQA Guidelines Section 15064.3, VMT is not considered to be a significant impact under CEQA. Therefore, the analysis of the Project’s VMT impact is provided for information purposes only.

Qualitative Considerations Regarding VMT

Internal Trip Capture. The 2018 TIA does not assume any internal trip capture, as a conservative estimate of total daily trips, and therefore provides a conservative estimate of VMT. The Project is a master-planned logistics campus with forward-thinking provisions to take advantage of modern technology, logistics and telecommunications. Based on other similar logistics campuses in the United States and globally, it is anticipated that a number of its larger tenants will seek to minimize external truck traffic (and therefore reducing VMT) by collaborating on tenant to tenant supply needs, some of which will be met through transferring supplies between tenants within WLC, without leaving the campus. In addition, it is WLC anticipated that industry clusters will form, where several similar industries would co-locate to provide added efficiencies in logistics, including allowing for internal fulfillment of material shipping needs, again avoiding external trips and associated VMT. The net effect of this VMT reduction through internal trip capture is difficult to estimate and was therefore not factored into the VMT analysis. However, there is reasonably foreseeable certainty that some level of internal trip capture will occur.

Efficiencies in Logistics Operations. In addition to internal trip capture, it is reasonably foreseeable that some WLC tenants will coordinate inbound and outbound truck shipments to combine loads, minimize empty inbound and outbound trucks, and collaborate in other ways to maximize logistics efficiencies and minimize shipping costs, in part by minimizing the frequency of truck shipments, thereby reducing truck trips and associated VMT. As with internal trip capture, although this is difficult to estimate and therefore was not factored into the EIR, it is reasonable to expect some level of truck trip and VMT reduction due to efficiencies in logistics operations with a large master-planned campus such as WLC.

Employee commute trips. Most often an important strategy for reducing VMT in a community is to improve the local jobs/housing balance by increasing the number of employment opportunities. As such, it is reasonable

to expect that increasing local employment opportunities will reduce the average commuter trip lengths of residents, resulting in a net decrease to regional net VMT. This is discussed at length within the Revised Final EIR Part 3 (pages 4.15-50 through page 4.15-51), as well as in Response to Comment 2-F1-15 and Response to Comment 2-F1-46 (addressing The Sustainable Freight Action Plan) of the Responses to Comments to the 2019 Recirculated Sections, Revised Final EIR Part 2, and the supplemental VMT memo provided as Attachment A to these Findings.

Truck trips related to shipping activities. Page 4 of the Office of Planning and Research (OPR) concerning VMT analysis guidance indicates that, although heavy vehicle traffic can be included for analysis convenience, the provided analysis requirements are specific to passenger-vehicles and light duty trucks.⁸ While it may be appropriate to consider heavy vehicle traffic if directed by the lead agency, it is generally understood that Interstate commerce and related heavy vehicle traffic are regulated by the federal government as it relates to commerce. Irrespective of this and considering that the end-users are unknown at this time (so the nature of the business enterprise and its probable origins and destinations are unknown), it is reasonable to assume that the ultimate end users will select this location, at least in part, as to how it affects their transportation costs. Most often businesses which have shipping as a significant part of their operations are sensitive to transportation costs and their relative proximity to customers and suppliers. Accordingly, it is reasonable to assume that warehouses are often located in a manner to reduce VMT given that it is the interest of the business.

Discussion of Transportation Findings

a. Air Traffic Patterns

Potential Significant Impact: Whether the Project would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Findings: Potential impacts of the Project related to air traffic patterns are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the information contained in the Revised Final EIR, the Project is allowed to occur within Airport Influence III of the March Inland Port (MIP) and this Planning Commission finds that no significant impacts related to air traffic patterns will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, airport facilities within the vicinity of the Project site include the March Air Field (MAF), which is part of the March Air Reserve Base (MARB). The MARB Redevelopment Project Area includes the entire 6,500-acre former active duty base area, and approximately 450 acres adjacent to the base in the industrial area of the City of Moreno Valley. To implement the MARB Redevelopment Project Area and to facilitate the transition of a portion of the MARB from military to civilian uses, the March Joint Powers Authority, (March JPA) consisting of the County of Riverside and the Cities of Moreno Valley, Perris, and Riverside, was formed. The March JPA along with the U.S. Air Force pursued the establishment of March Air Field as a joint use airport.

The Department of the Defense (Air Force) completed an Air Installation Compatible Use Zone (AICUZ) study for MARB in 1998 (updated in 2005). The AICUZ study was designed and is intended to aid in the

⁸ http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf (accessed March 31, 2020).

development of compatible land uses in non-government areas surrounding military airfields to protect public safety and health. The study established three zones based on potential crash patterns: a Clear Zone and two Accident Potential Zones (APZs). The Clear Zone reaches from along the extended runway centerline to a distance of 3,000 feet, APZ 1 extends from 3,000 feet to 8,000 feet, and APZ II extends from 8,000 feet to 15,000 feet. According to the AICUZ, outside of the Clear Zone and APZs “the risk of aircraft accidents is not significant enough to warrant special consideration in land use planning.” The Project site is not located within a Clear Zone, APZ 1, or APZ 2 for MAF as designated by the Air Force 2005 AICUZ Study. In addition to the AICUZ, Airport Influence Area boundaries around MAF have been adopted by County of Riverside Airport Land Use Commission (ALUC) in its Airport Land Use Plan (ALUP). Portions of the Project within the foothills are located within the High Terrain Area of Influence.

The Project site is approximately 5.5 miles east of MAF. A portion of the Project is in the foothills to the south of where Brodiaea Avenue ends, over to World Logistics Center Parkway, and is located within the High Terrain Influence Area. As part of the standard process for development within High Terrain Influence Areas for MAF, Projects are required to be reviewed by the ALUC for consistency with the ALUP when objects are higher than 35 feet. As a standard condition imposed during ALUC reviews, development located within the boundaries of the High Terrain Influence Area are required to provide navigation easements. Development that is allowed to occur within the High Terrain Airport Influence Area would not include any features that would alter air traffic patterns or the level of air traffic; therefore, a less than significant air safety impact would occur, and no mitigation is required. (Revised Final EIR Part 3, pp. 4.15-47 to 4.15-48).

b. Design Features or Incompatible Uses

Potential Significant Impact: Whether the Project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Findings: Potential impacts of the Project related to design features or incompatible uses are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that no significant impacts related to design features or incompatible uses will occur as a result of development of the Project and, therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, the design of roadways must provide adequate sight distance and traffic control measures. This provision is normally realized through roadway design to facilitate roadway traffic flows. Roadway improvements in and around the Project site would be designed and constructed to satisfy all City and Caltrans requirements for street widths, corner radii, intersection control as well as incorporate design standards tailored specifically to Project access requirements. Adherence to applicable City requirements would ensure the Project would not include any sharp curves or dangerous intersections.

Temporary impacts associated with the construction of infrastructure improvements included as a part this Project may temporarily restrict vehicular traffic or cause temporary hazards. The construction of infrastructure would coincide with roadway improvements, which would include road or lane closures as well as the presence of construction workers and equipment on public roads. Construction operations would be required to implement adequate measures to facilitate the passage of people and vehicles through/around any required

road or lane closures. Site-specific activities, such as temporary construction activities, are finalized on a project-by-project basis by the City and are required to ensure adequate traffic flow. At the time of approval of any site-specific plans required for the construction of infrastructure as a part of typical conditions of approval, the Project would be required to implement measures that would maintain traffic flow and access. In the absence of a roadway design hazard, no impact would occur; therefore, no mitigation is required.

As identified in the Project TIA, the Project would not produce a significant safety risk and appropriate safety features are already present on roads near local schools. Other than Perris Boulevard, which would experience a small number of Project trucks (22 and 25 medium and heavy-duty trucks in the a.m. and p.m. peak hours, respectively), none of the other truck routes would result in Project trucks traveling near local schools. The safety impact of Project-related passenger cars along streets near local schools was also evaluated by reviewing existing pedestrian facilities and collecting pedestrian counts at the intersections along Project truck routes. All pedestrian crossings at signalized intersections near schools are protected. Crosswalks near schools are striped in yellow (per the California Manual on Traffic Control Devices page 1,282). In most cases, sidewalks exist along roadways and lead to the striped, protected crosswalks at the intersections. Intersection and roadway features along Project truck routes were reviewed and it was determined that adequate pedestrian amenities already exist in the form of protected crossings, crosswalks, curb ramps, and pedestrian signals. For these reasons, Project passenger cars and trucks would not create unsafe conflicts with pedestrians. (Revised Final EIR Part 3 pgs. 4.15-48 to 4.15-49). Therefore, project implementation would cause a less than significant impact due to design hazard features.

c. Inadequate Emergency Access

Potential Significant Impact: Whether the Project would result in inadequate emergency access.

Findings: Potential impacts of the Project related to emergency access are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that no significant impacts related to emergency access will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, construction activities that may temporarily restrict vehicular traffic would be required to implement adequate measures to facilitate the passage of people and vehicles through/around any required road closures. Site-specific activities such as temporary construction activities are finalized on a project-by-project basis by the City and are required to ensure adequate emergency access.

The roadway improvements that will take place as a part of this Project will improve the traffic circulation in the area. For example, emergency vehicles that currently pass through the site using either World Logistics Parkway or Alessandro Boulevard would continue to have those routes available to them, and these roads will be upgraded to arterial standards within the Project limits. Access to Alessandro Boulevard would be provided by a connection to Redlands Boulevard at Cactus Avenue instead of a direct extension to Alessandro Boulevard. The change would not lengthen the distance between Gilman Springs Road and the Riverside Community Regional Medical Center on Cactus Avenue or the route to and from the Kaiser Moreno Valley Community Hospital on Iris Avenue. The extension of Eucalyptus Avenue through the Project area would

improve access between the Project site and the nearest existing fire station (the Moreno Beach fire station). As a condition of approval, the Project will also be required to construct a fire station on site.

These roadway improvements of the Project would enhance the ability of emergency vehicles to access the Project as well as the surrounding properties. Access to the Project site is designed to accommodate large trucks with trailers used for the distribution of goods to and from the warehouses. This would provide ample vehicular access for emergency vehicles. During the operational phase of the Project, on-site access would be required to comply with standards established by the City Public Works Department. The size and location of fire suppression facilities (e.g., hydrants) and fire access routes would be required to conform to Fire Department standards. As required of all development in the City, the operation of the Project would conform to applicable Uniform Fire Code standards. The submittal of such plans would be considered a condition of approval, which would be part of the permitting process initiated by the applicant and approved by the City in accordance with City standards. As with any development, access to and through the Project would be required to comply with the required street widths, as determined in the California Building Code (CBC), Master Plan of Streets, and the Uniform Fire Code. Therefore, implementation of the Project would not significantly impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; therefore, no mitigation is required. (Revised Final EIR Part 3 pp. 4.15-49)

d. Alternative Transportation

Potential Significant Impact: Whether the Project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Findings: Potential impacts of the Project related to alternative transportation are discussed in detail in Section 4.15 of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that no significant impacts related to alternative transportation will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.15 of the Revised Final EIR Part 3, the Project would result in the development of employment opportunities and would therefore reduce vehicle miles traveled for the region. The provision of additional employment options in proximity to existing residential development in the City will help reduce local vehicle miles traveled as the employment generated by the Project slowly improves the City's job/housing ratio, and more local jobs are created for City residents.

Although there is currently no transit service in the Project area, the proposed Project would be designed to accommodate bus access on all Project streets. Bus turnouts and shelters would be provided at all active bus stops. It is expected that transit service would be provided once the Project reaches a transit-supportable level of operations. Candidate streets for future bus routes within the project limits are Eucalyptus Avenue, Street C, Street E, and Street F as shown in WLC Specific Plan Figure 3-14 of the Revised Final EIR Part 3. Therefore, the proposed project is consistent with City policies encouraging alternative transportation.

The WLC Specific Plan provides for connections to existing trails to the west along Redlands Boulevard, and to the southwest along Cactus Avenue. In addition, the WLC Specific Plan provides for a new trail connection

from the southwest corner of the site around the land designated as open space under the WLC Specific Plan, to connect to a future planned “trailhead” at the northwest corner of the state-owned property to the south. The WLC Specific Plan also includes a “loop” trail segment through the WLC Specific Plan along Street F to Eucalyptus Avenue and back to Redlands Boulevard (see Revised Final EIR Part 4 Volume 3 Figure 3-12, Non-Vehicular Circulation). In addition, the Project will be conditioned to provide sidewalks and landscaping treatments to allow for pedestrian access throughout the site. With these planned improvements, the Project will have less than significant impacts regarding non-vehicular circulation and no mitigation is required. Refer to discussion above for additional discussion regarding VMT and the Project’s relationship to SB743.

e. Freeway Impacts from Truck Trips to the Ports of Los Angeles and Long Beach.

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the freeway system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that the Project would result in a less than significant impact for freeways segments from truck trips to the Ports of Los Angeles and Long Beach and no mitigation is required.

Facts in Support of the Findings: The potential for traffic impacts along the SR-60 and SR-91 corridors was assessed by manually adding the forecasts for WLC trucks under 2040 buildout conditions to and from the port to the No-Project condition from the SCAG model. Because the ports and the freeways leading to them are in Los Angeles County, the threshold of significance for the analysis was taken from the Los Angeles County Congestion Management Program (CMP). The CMP states that a significant impact would be deemed to occur if the project increased demand on a highway by at least 2 percent causing LOS F or, if the highway facility already operates at LOS F, then a significant impact would be deemed to occur if the project increases traffic demand by 2 percent or more of capacity.

The Revised Final EIR Section 4.15.6.5 included an analysis of the Project’s impacts to each section of the SR-60 and SR-91 corridors and in each direction, for both the a.m. and p.m. peak periods, for the 2018, 2025, and 2040 scenarios. The addition of the WLC traffic would increase freeway traffic volume ranging from 0.03 percent to 0.48 percent of non-project traffic, and therefore would not cause a significant impact on any segment of these freeways.

14. Utilities and Service Systems

a. Construction or Expansion of Water Treatment Facility

Potential Significant Impact: Whether the Project would require the construction of new water treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

Findings: Potential impacts of the Project related to construction or expansion of water treatment facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before

us, this Commission finds that no significant impacts that would cause the construction or expansion of water treatment facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the Metropolitan Water District has analyzed the reliability of water delivery through the State Water Project (SWP) and the Colorado River Aqueduct. Metropolitan's Integrated Resources Plan and 2010 and 2015 Regional Urban Water Management Plan conclude that, with the storage and transfer programs developed by Metropolitan, there will be a reliable source of water to serve its member agencies' needs through 2040.⁹

All necessary water distribution facilities would be installed simultaneously with required roadway frontage improvements for each phase of development of the WLC Project. Therefore, the connection to the existing water delivery system would not result in substantial disturbance of existing roadways or water facilities. As previously identified, the potable water demand that would be required for the WLC Project would total 1,991.25 acre-feet per year (AFY). The amount of water demand would be within the existing available supply even with a reduction in deliveries from the State Water Project (SWP). Imported sources of water will be supplemented by an increase in desalination of brackish groundwater, recycled water use, and water use efficiency, and implementation of aggressive conservation measures by the EMWD. The WLC Project would not require the construction of new water treatment facilities or expansion of existing facilities, which could cause significant environmental effects. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-13 to 4.16-15).

b. Wastewater Treatment Requirements

Potential Significant Impact: Whether the Project would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB).

Findings: Potential impacts of the Project related to construction or expansion of water treatment facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts that would exceed wastewater treatment requirements of the applicable RWQCB as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, The WLC Project would result in a connection to the sewer line underlying Redlands Boulevard in the vicinity of the intersection of Redlands Boulevard and Brodiaea Avenue. It is anticipated that all wastewater generated by the WLC Project would be routed to and treated by the Moreno Valley Regional Water Reclamation Facility (MVRWRF). The MVRWRF is a publicly owned treatment works (POTW), so operational discharge flows treated at the MVRWRF would be required to comply with waste discharge requirements contained within the waste discharge requirements for that facility. Compliance with condition or permit requirements established by the City, and waste discharge requirements at the MVRWRF would ensure that discharges into the wastewater treatment facility system from the operation of the WLC Project would not exceed applicable Santa Ana RWQCB wastewater treatment requirements. Expected wastewater flows from the WLC Project will not

⁹ Metropolitan Water District of Southern California. 2015 Urban Water Management Plan. Available online: https://wuedata.water.ca.gov/public/uwmp_attachments/9284070670/Metropolitan%20Water%20District%20of%20Southern%20California%202015%20UWMP.pdf. [Accessed April 2020]

exceed the capabilities of the serving treatment plant, so no significant impact related to this issue would occur and no mitigation would be required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-28).

c. Wastewater Treatment Capacity and/or New or Expanded Wastewater Treatment Facilities

Potential Significant Impact: Whether the Project would result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it lacks adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments or require the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to adequate water supply are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to wastewater treatment capacity or need for new or expanded wastewater treatment facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project would connect to the existing sewer pipeline underlying Redlands Boulevard in the vicinity of the intersection of Redlands Boulevard and Brodiaea Avenue. Wastewater flows from the WLC Project site would be handled by the EMWD and would be conveyed to the MVRWRF located in the southwestern portion of the City, southwest of the WLC Project site. Current capacity at this facility is 16 million gallons per day (mgd)¹⁰ with an existing average inflow of approximately 11.2 mgd.¹¹ Under current conditions, the average daily surplus treatment capacity is approximately 4.5 mgd. Generally, water use, and wastewater flows are related in that wastewater is generated from indoor water uses.

Based on a square footage of 40.6 million, the wastewater generated from the logistics uses on the site is 812,000 gallons per day (gpd). An additional 5,100 gpd of flow was added to account for the in-Project fueling station. Thus, the total wastewater generated from the site is 817,100 (0.82 mgd). The additional wastewater treatment demand of 0.82 mgd resulting from development of the WLC Project totals approximately 18.2 percent of current surplus treatment capacity. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd (Revised Final EIR Part 3, pg. 6.16-45). Impacts associated with wastewater facilities would be less than significant because the amount of wastewater generated by the Project would be within the existing surplus treatment capacity at the MVRWRF. The WLC Project would not require the construction of new wastewater treatment facilities or expansion of existing facilities, which could cause

¹⁰ 5.13 *Public Services and Utilities*, City of Moreno Valley General Plan Final EIR, July 2006.

¹¹ Eastern Municipal Water District Moreno Valley Regional Water Reclamation Facility, <http://www.emwd.org/modules/showdocument.aspx?documentid=1423>, website accessed April May 4, 2020. .

significant environmental effects. Therefore, impacts associated with wastewater facilities would be less than significant and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-29).

d. Solid Waste Facilities

Potential Significant Impact: Whether the Project would be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs.

Findings: Potential impacts of the Project related to solid waste facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to solid waste facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project is anticipated to generate approximately 104.6 tons of solid waste per day (38,164 tons/year).¹² Solid waste from the WLC Project would be hauled by Waste Management of Inland Valley and transferred to the Badlands Sanitary Landfill, located in Moreno Valley. The Badlands Sanitary Landfill has a daily permitted throughput of 4,800 tons per day, a remaining capacity of 15,748,799 cubic yards, and an estimated closure date of 2022.¹³

The volume of solid waste generated by the WLC Project per day represents 2.6 percent of the current permitted throughput and 4.5 percent of the current surplus capacity at the Badlands Sanitary Landfill. As adequate daily surplus capacity exists at the receiving landfill, development of the WLC Project would not significantly affect current operations or the expected lifetime of the landfill serving the Project area. No significant solid waste disposal impact would occur, and no mitigation is required. (Revised Final EIR Part 4 Volume 3, pgs. 4.16-32 to 4.16-33).

e. Solid Waste Reduction

Potential Significant Impact: Whether the Project would fail to comply with applicable Federal, State, and local statutes and regulations related to solid waste.

Findings: Potential impacts of the Project related to solid waste reduction are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that no significant impacts related to solid waste reduction will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley is responsible for meeting the requirements of AB 939 and SB 1016, which includes a 50 percent reduction in disposal by the start of 2000 and preparation of a solid waste reduction plan to help

¹² South Coast Air Quality Management District. CalEEMod Manual, Appendix D, Table 10.1, Solid Waste Disposal Rate for Unrefrigerated Warehouse. <http://www.aqmd.gov/caleemod/user's-guide>. Calculation: 0.94 tons/thousand square feet/year × 40,600 thousand square feet = 38,164 tons per year.

¹³ Badlands Sanitary Landfill Facility/Site Summary Details, CalRecycle website, <https://www2.calrecycle.ca.gov/swfacilities/Directory/33-AA-0006>, website accessed April 2020.

reduce the amount of solid waste disposed of at the landfills. Various programs are implemented by the City of Moreno Valley to satisfy the mandated reduction in solid waste.

The WLC Project would be required to coordinate with the waste hauler to develop collection of recyclable materials for the Project on a common schedule as set forth in applicable local, regional, and State programs. Recyclable materials that would be recycled by the Project include paper products, glass, aluminum, and plastic. Additionally, the Project would be required to comply with applicable elements of AB 1327, Chapter 18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, State, and Federal solid waste disposal standards, thereby ensuring that the solid waste stream to the Badlands Sanitary Landfill is reduced in accordance with existing regulations. Impacts are considered less than significant and require no mitigation. (Revised Final EIR Part 4 Volume 3, pg. 4.16-33 to 4.16-34).

f. Cumulative Impacts – Public Services

Water Supply

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts associated with the construction of new water treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

Findings: Potential cumulative impacts related to new or expanded water treatment facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project’s incremental contribution to environmental effects associated with the construction of new water treatment facilities or expansion of existing facilities would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: According to Revised Final EIR Part 4 Volume 3 Section 4.16, the Project would require the construction of new water reservoirs to serve each of three water pressure zones (1967, 1860, and 1764). All three reservoir sites are located outside of the Specific Plan boundary. As development proceeds within the Project area, new waterlines, ranging in size from 12 to 24 inches, will be constructed in the existing and future street rights-of-way to connect the future water tanks to the development area. The water system will require a new pump station at the 1764 reservoir and an upgrade to the existing EMWD pump station near Cottonwood Avenue and Redlands Boulevard. All water facilities for the Project would be constructed to EMWD standards and would be subject to a Plan of Service approval by EMWD (Specific Plan Section 3.5.1). Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts and were analyzed in Chapters 4.0, 5.0 and 6.0 of the Revised Final EIR Part 3. None of those sections identified construction or operation of the Project’s new or expanded water facilities as resulting in significant impacts

Annually, a 5-year Capital Improvement Plan (CIP) is prepared by the EMWD. The EMWD’s CIP outlines specific projects and their funding sources. Each project is also submitted individually to the Board for authorization and approval. This allows the EMWD to match needed facilities with development trends accurately. Funding for the EMWD’s microfiltration plants, distribution pipes, and the recharge and recovery

program is listed in the most recent EMWD CIP. Development and construction of the cumulative scenario would be included in the most recent EMWD CIP. Each applicant also would have to fund the costs of the water-related infrastructure needed to serve a particular site. All new facilities proposed or necessitated by projects in the cumulative scenario would be subject to applicable CEQA review and would be required to comply with all applicable laws and regulations protecting environmental resources. Cumulative project CEQA documents within the district boundary have been reviewed and the findings have been incorporated into this analysis.

Overall, the impacts of the Project would not combine with other projects in the cumulative scenario to cause or contribute to a significant cumulative impact to water treatment facilities (Revised Final EIR Part 3, pg. 6.16-33).

Adequate Water Supply

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to sufficient water supplies from existing entitlements and resources or are new or expanded entitlements needed.

Findings: Potential cumulative impacts of the Project related to sufficient water supplies are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution to cumulative demand on water supplies requiring the need for new or expanded entitlements would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The WSA prepared for the project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY. The EMWD considers this a "worst-case" estimate based on the total acres and amount of square footage of warehousing proposed by the Project. Taking into account the proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan would be substantially less than the worst-case EMWD estimate. As identified in Table 4.16.A of the Revised Final EIR Part 4 Volume 3, anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for the proposed Project would total 0.93 and 0.66 percent of the EMWD's 2015 and 2035 supplies under worst-case conditions. The demand estimated for this Project is substantially less and therefore still within the limit of growth projected in the 2015 UWMP.

Existing and future development within the EMWD's service area would demand additional quantities of water. The Project, along with any projects in the cumulative scenario, would be required to provide availability and commitment letters demonstrating sufficient water resources and access to available water facilities prior to building permit issuance. The 2015 UWMP addresses the water supply sources, projected demand, and supply reliability for Eastern EMWD service area. The 2015 UWMP estimates population within the EMWD service area to increase to 1,111,729 persons by the year 2035. Increases in population, square footage, and intensity of uses would contribute to increases in the overall regional water demand. The anticipated conversion of water-intensive uses (e.g., agriculture) and the implementation of existing water conservation measures and recycling programs would reduce the need for increased water supply. Demand

projections for EMWD were developed using information about planned development and land use (UWMP 2015) and would include the water demand for the cumulative projects listed in Table 6.16-1. CEQA documents for projects in the cumulative scenario have been reviewed and the findings have been incorporated into the cumulative impact analysis.

Based on the information provided in the 2015 UWMP, EMWD has the ability to meet current and projected water demand through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from MWD with existing supply resources. Planned local supplies will supplement imported supplies and improve reliability for EMWD and the region. In addition, adherence to regulations would ensure that cumulative projects would not result in a demand for water that exceeds existing entitlements and resources, or any new or expanded water-related infrastructure would be funded by the respective applicant. Therefore, projects in the cumulative scenario, together with the Project, would not cause significant cumulative impacts associated with adequate water service and supplies (Revised Final EIR Part 3, pg. 6.16-33 through 6.16.-34).

Storm Water Drainage Requirements

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts from the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related storm water drainage requirements are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution to environmental effects from the construction of new storm water drainage facilities or expansion of existing facilities would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for storm water drainage facilities is the watershed the project site is located in. The Revised Final EIR Part 4 Volume 3, Section 4.16, analyzes the storm water drainage facilities necessary to serve the Project site. To reduce flows to below or equal to pre-development conditions, the on-site storm water flows would be routed to a series of on-site detention and infiltration basins by phase before flows are routed off site. While the increase in impervious surfaces attributable to the proposed WLC project would contribute to a greater volume and higher velocity of storm water flows, the proposed WLC project's detention and infiltration basins would accept and accommodate runoff that would result from Project construction at pre-project conditions.

Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts as identified were analyzed in Chapters 4.0, 5.0 and 6.0 of the Revised Final EIR Part 4 Volume 3. None of those sections identified construction or operation of the Project's new storm water drainage facilities as resulting in significant impacts. All new storm water drainage facilities proposed or necessitated by cumulative projects would be subject to applicable CEQA review and would be required to comply with all applicable laws and

regulations protecting environmental resources. CEQA documents prepared for projects in the cumulative scenario have been reviewed and the findings have been incorporated into this analysis.

The impacts of the Project would not combine with the impacts of other projects in the cumulative scenario to cause or contribute to significant cumulative impacts resulting from construction of storm water drainage facilities. As such, cumulative impacts to stormwater drainage facilities would be less than significant.

Wastewater Treatment Requirements

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts resulting from exceedances of wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Findings: Potential cumulative impacts of the Project related wastewater treatment requirements are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution would not cause or contribute to any significant cumulative impact resulting from exceedance of wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative area for wastewater-related issues is the MVRWRF service area. Cumulative population increases and development within the area serviced by the MVRWRF would increase the overall regional demand for wastewater treatment service. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd. The MVRWRF is expected to have adequate capacity to service the City's wastewater needs through 2030. Any proposed changes to capacity of the MVRWRF or any facility maintained by EMWD are reviewed throughout the year. EMWD has a funding and construction mechanism in place that ensures improvements to EMWD facilities occurs in a timely manner. This funding mechanism is referred to as EMWD's Sewer Financial Participation Charge Program. For all new development within the EMWD service area, the Sewer Financial Participation Charge is allocated to assist in the financing of any future collection and disposal facilities and any future sewer treatment plant facilities. Cumulative development would not exceed the capacity of the wastewater treatment system because the MVRWRF would expand as growth occurred. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been incorporated into this analysis.

The proposed Project would not require the expansion of existing wastewater infrastructure: only connections to existing infrastructure would be required by the Project. By adhering to the wastewater treatment requirements established by the Santa Ana RWQCB through the NPDES permit, wastewater from the Project site that is processed through the MVRWRF would meet established standards. As the wastewater from all development within the service area of the MVRWRF would be similarly treated under the NPDES, no cumulatively significant exceedance of wastewater treatment requirements would occur (Revised Final EIR Part 3, pg. 6.16-36).

Wastewater Treatment Capacity and/or New or Expanded Wastewater Treatment Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts based on a determination by the wastewater treatment provider, which serves or may serve the cumulative projects, that it lacks adequate capacity to serve the cumulative demand in addition to the provider's existing commitments; or

Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related wastewater treatment capacity and/or new or expanded wastewater treatment facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution to impacts on wastewater treatment capacity would not cause or contribute to a significant cumulative effect. Additionally, the project's contribution to environmental effects from the construction of new wastewater treatment facilities or expansion of existing facilities would be less than cumulatively considerable; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative area for wastewater-related issues is the MVRWRF service area. Cumulative population increases and development within the area serviced by the MVRWRF would increase the overall regional demand for wastewater treatment service. The previous treatment capacity at the MVRWRF was 16 mgd. Improvements to this facility have increased capacity at this facility to 21 mgd. Ultimate expansion of this facility is expected to be 41 mgd. The MVRWRF is expected to have adequate capacity to service the City's wastewater needs through 2030. Any proposed changes to capacity of the MVRWRF or any facility maintained by EMWD are reviewed throughout the year. EMWD has a funding and construction mechanism in place that ensures improvements to EMWD facilities occurs in a timely manner. This funding mechanism is referred to as EMWD's Sewer Financial Participation Charge Program. For all new development within the EMWD service area, the Sewer Financial Participation Charge is allocated to assist in the financing of any future collection and disposal facilities and any future sewer treatment plant facilities. Cumulative development would not exceed the capacity of the wastewater treatment system because the MVRWRF would expand as growth occurred.

The proposed Project would not cause or contribute to a cumulatively significant impact on wastewater infrastructure because the proposed Project would not combine with the demands of other projects in the cumulative scenario to require the expansion of existing infrastructure. The Project would require only connections to existing infrastructure. Potential significant environmental impacts associated with such construction include air quality, traffic, biological resources, cultural resources, noise, hydrology, water quality, and other impacts as identified were analyzed in Chapters 4.0 and 6.0 of the Revised Final EIR Part 4 Volume 3. None of those sections identified construction or operation of the Project's new or expanded wastewater infrastructure as resulting in significant impacts. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis.

By adhering to the wastewater treatment requirements established by the Santa Ana RWQCB through the NPDES permit, wastewater from the Project site that is processed through the MVRWRF would meet established standards. As the wastewater from all development within the service area of the MVRWRF would be similarly treated under the NPDES, no cumulatively significant exceedance of Santa Ana RWQCB wastewater treatment requirements would occur. As such, cumulative impacts to wastewater treatment facilities would be less than significant (Revised Final EIR Part 3, pg. 6.16-37).

g. Solid Waste Facilities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to insufficient permitted landfill capacity to accommodate the project's solid waste disposal needs.

Findings: Potential cumulative impacts of the Project related to solid waste facilities are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution to landfill impacts would not cause or contribute to a significant cumulative effect; therefore, no mitigation is required.

Facts in Support of the Findings: The cumulative impact geographic area for solid waste services is the City of Moreno Valley. Solid waste disposal and recycling services for the proposed project site would be provided by Waste Management of the Inland Empire. Waste Management of the Inland Empire separates and markets recyclable materials collected within its service area. The project, in combination with other cumulative projects, would increase the amount of solid waste being transferred to landfills within the City. The volume of solid waste generated by the proposed WLC project per day represents 2.6 percent of the current permitted throughput and 4.5 percent of the current surplus capacity at the Badlands Sanitary Landfill. As adequate daily surplus capacity exists at the receiving landfill, development of the proposed project would not significantly affect current operations or the expected lifetime of the landfill serving the project area. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis.

AB 939 mandates the reduction of solid waste disposal in landfills. While the Badlands Sanitary Landfill has an estimated closure date of 2024, as previously identified, the City's waste hauler will also use other County landfills in the area (e.g., Lamb Canyon Landfill and El Sobrante Landfill). The estimated closure date of the Lamb Canyon Landfill is 2023 and the estimated closure date of the El Sobrante Landfill is 2030. With planned expansion activities of landfills in the Project vicinity and projected growth rates contained in the City's General Plan EIR, sufficient landfill capacity would exist to accommodate future disposal needs through City buildout in 2030. Buildout of the City General Plan would not create demands for solid waste services that would exceed the capabilities of the County's waste management system. Therefore, although the Project and cumulative projects would result in an increase in the amount of solid waste sent to landfills, compliance with state and local waste diversion requirements would contribute to the longevity of existing and proposed landfills that would serve the projects and ensure that cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.16-37 through 6.16-38).

h. Solid Waste Reduction

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have significant cumulative impacts related to compliance with applicable federal, state, and local statutes and regulations related to solid waste.

Findings: Potential cumulative impacts of the Project related to solid waste reductions are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, the Planning Commission finds that the Project's incremental contribution to cumulative solid waste regulation impacts would not cause or contribute to a significant cumulative impact; therefore, no mitigation is required.

Facts in Support of the Findings: The Project, in combination with other cumulative projects, would increase the amount of solid waste being transferred to landfills within the City. Federal, State and local governments have enacted a variety of laws and established programs to deal with the transport, use, storage, and disposal of hazardous materials to reduce the risks to public health and the environment. AB 939 and SB 1016 mandates the reduction of solid waste disposal in landfills. While the Badlands Sanitary Landfill has an estimated closure date of 2024, as previously identified, the City's waste hauler will also use other County landfills in the area (e.g., Lamb Canyon Landfill and El Sobrante Landfill). Additionally, the proposed project would be required to comply with applicable elements of AB 1327, Chapter 18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, State, and Federal solid waste disposal standards. CEQA documents for other projects in the cumulative scenario have been reviewed and the findings have been considered in this analysis. The estimated closure date of the Lamb Canyon Landfill is 2023 and the estimated closure date of the El Sobrante Landfill is 2030. With planned expansion activities of landfills in the project vicinity and projected growth rates contained in the City's General Plan EIR, sufficient landfill capacity would exist to accommodate future disposal needs through City buildout in 2030. Buildout of the City General Plan would not create demands for solid waste services that would exceed the capabilities of the County's waste management system. Therefore, although the Project and cumulative projects would result in an increase in the amount of solid waste sent to landfills, compliance with state and local waste diversion requirements would contribute to the longevity of existing and proposed landfills that would serve the projects and ensure that cumulative impacts would be less than significant (Revised Final EIR Part 3, pg. 6.16-38).

i. Cumulative Impacts to Water Supply Services

Potential Significant Impact: Whether the Project could result in cumulative impacts to the water supply.

Findings: Potential impacts of the Project related to cumulative impacts to water supply impacts are discussed in detail in Section 6.16 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that no significant impacts related to cumulative water supply services will occur as a result of development of the Project; therefore, no mitigation is required.

Facts in Support of the Findings: According to Section 6.16 of the Revised Final EIR Part 3, the cumulative impact geographic area for water supply is the EMWD service area. Cumulative projects also could result in potential water supply impacts, and incrementally increase the long-term demand for water service.

The WSA prepared for the Project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY. The EMWD considers this a “worst-case” estimate based on the total acres and amount of square footage of warehousing proposed by the Project. Taking into account the proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan would be substantially less than the worst-case EMWD estimate. Anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for the proposed Project would total 0.93 and 0.66 percent of the EMWD’s 2015 and 2035 supplies under worst-case conditions. The demand estimated for this Project is substantially less and therefore still within the limit of growth projected in the 2015 UWMP.

Existing and future development within the EMWD’s service area would demand additional quantities of water. The 2015 UWMP addresses the water supply sources, projected demand, and supply reliability for Eastern EMWD service area. The 2015 UWMP estimates population within the EMWD service area to increase to 1,111,729 persons by the year 2035. Increases in population, square footage, and intensity of uses would contribute to increases in the overall regional water demand. The anticipated conversion of water-intensive uses (e.g., agriculture) and the implementation of existing water conservation measures and recycling programs would reduce the need for increased water supply. Demand projections for EMWD were developed using information about planned development and land use (UWMP 2015) and would include the water demand for the cumulative projects. CEQA documents for projects in the cumulative scenario have been reviewed and the findings have been incorporated into the cumulative impact analysis.

Based on the information provided in the 2015 UWMP, EMWD has the ability to meet current and projected water demand through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from MWD with existing supply resources. Planned local supplies will supplement imported supplies and improve reliability for EMWD and the region. In addition, adherence to regulations would ensure that cumulative projects would not result in a demand for water that exceeds existing entitlements and resources, or any new or expanded water-related infrastructure would be funded by the respective applicant. Therefore, projects in the cumulative scenario, together with the Project, would not cause significant cumulative impacts associated with adequate water service and supplies. No mitigation measures are required.

15. Cumulative Energy

a. Cumulative Energy Consumption – Electricity

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to electricity consumption, supply, energy standards and expansion of facilities.

Findings: Potential cumulative impacts of the Project regarding energy consumption are discussed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that no significant cumulative impacts to electricity consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: The geographic context for the cumulative analysis of electricity is Moreno Valley Utility’s (MVU) service area. Electricity demand for all cumulative projects located within the MVU’s

service area has been estimated. Growth within this geography is anticipated to increase the demand for electricity and the need for infrastructure, such as new or expanded facilities.

The cumulative projects would require electricity for water conveyance during ground-moving activities which would require a relatively large amount of water to cover the affected construction areas. Electrical consumption due to the conveyance of water used for dust control is presented in Table 6.17-2 (Revised Final EIR Part 2, as revised by Section 4, Errata, of the Revised Final EIR Part 1, pg. 821 to 823).

Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City would increase electricity consumption during Project construction and operation and may cumulatively increase the need for electricity supplies. Estimated electrical use for the cumulative projects do not take into account electricity use from electric vehicle (EV) charging stations as the specifics of EV stations are not known for the cumulative projects.

Water use related to dust control is regulated under SCAQMD's Rule 402 and 403 and is required to limit fugitive particulate matter generated by construction activities. The Project would be in compliance with Rules 402 and 403 and would require a relatively large amount of water to cover the entire acreage of the Project site. The expected electricity consumption associated with water use during construction equates to only 0.43 percent of MVU's forecasted sales for 2020 (expected starting year of construction).

MVU forecasts that its peak demand in 2037, the latest available forecast from the Integrated Resource Plan (IRP), would be approximately 231,555 MWh/year. The Project's estimated net new electrical consumption would account for between 74 to 113 percent of MVU's projected electricity sales in 2024 depending on the electric vehicle (EV) penetration scenario. Total energy consumption from all cumulative projects is estimated at 565,690 MWh annually and is 161 percent of MVU's forecasted sales in 2037 (Section 4, Errata, of the Revised Final EIR Part 1, pg. 819). Nonetheless, as the utility provider for the Project and cumulative projects, MVU has determined that the increased electricity demand would be minor compared to existing supply and infrastructure within its service area and would be consistent with growth expectations for its service area. MVU's 2018 IRP predicts an increase in electricity demand over a 10-year period that is planned to be met by increasing solar, wind, and geothermal power, and supplementing with natural gas as needed. MVU's IRP specifically mentions the World Logistics Center and states that, "a portion of the anticipated demand [of the Project] is incorporated in MVU's load forecast. MVU will monitor development progress at the World Logistics Center and other local projects to determine potential impacts to customer energy requirements".¹⁴ MVU forecasts projected growth in the region and with its 2018 IRP already has plans in place that account for future development including the Project and cumulative projects.

Furthermore, like the Project, other future development projects would be expected to incorporate energy conservation features, comply with applicable regulations including CALGreen and State energy standards under Title 24, and incorporate mitigation measures, as necessary. As discussed above and based on evidence from MVU, the Project would not have a cumulatively considerable impact on existing energy resources either individually or incrementally when considering the anticipated growth in the service area. Accordingly, the

¹⁴ Moreno Valley Utility, Integrated Resource Plan (2015).

impacts related to electricity consumption would not be cumulatively considerable, and thus would be less than significant and no mitigation is required.

b. Cumulative Energy Consumption – Natural Gas

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to natural gas consumption, supply, energy standards and expansion of facilities.

Findings: Potential cumulative impacts of energy consumption are discussed in detail in Section 6.17 of the Revised FEIR Part 2. Based on the entire record before us, this Commission finds that no significant cumulative impacts to natural gas consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: The geographic context for the cumulative analysis of natural gas is Southern California Gas’s (So Cal Gas) service area. All of the cumulative projects identified by the traffic impact analysis (TIA) are in So Cal Gas’ service area. Growth within this geography is not anticipated to increase the demand for natural gas and the need for infrastructure, such as new or expanded facilities.

Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City could increase natural gas consumption during Project construction and operation and may cumulatively increase the need for natural gas supplies.

Though electricity usage is predicted to rise, natural gas demand is expected to decline overall from 2016-2035 accounting for population and economic growth as well as efficiency improvements and the State’s transition away from fossil fuel-generated electricity to increased renewable energy. SoCalGas predicts a decline in every sector (residential, industrial, commercial, electricity generation, and vehicular), with the exception of wholesale and international gas sales to Mexico. The 2016 California Gas Report states, “SoCalGas projects total gas demand to decline at an annual rate of 0.6% from 2016 to 2035. The decline in throughput demand is due to modest economic growth, CPUC-mandated energy efficiency (EE) standards and programs, renewable electricity goals, the decline in commercial and industrial demand, and conservation savings linked to Advanced Metering Infrastructure (AMI).”¹⁵ Buildout of the Project and cumulative projects in the Statewide service area is not expected to increase natural gas consumption and the need for natural gas supplies from building energy.

Natural gas consumption from the Project was compared to Statewide natural gas fuel consumption since natural gas as a fuel can be procured from anywhere and is not limited to the service provider’s resources. The Project would not generate any natural gas use for building operations, as shown in Table 6.17-3 (in Section 6.17 of the Revised Final EIR Part 2, as revised by Section 4, Errata, of the Revised Final EIR Part 1, pg. 827 to 830). Natural gas consumption would primarily be from operation of on-site equipment and the planned CNG/LNG fueling station which will be publicly accessible and are included as transportation fuels. From a cumulative standpoint, natural gas consumption from all cumulative projects (including the Project) would be

¹⁵ California Gas and Electric Utilities, *2016 California Gas Report*.
<https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf>. Accessed May 2018.

3,239,659 MMBtu or 0.37 percent of the SoCalGas's total natural gas use (Section 4, Errata, of the Revised Final EIR Part 1, pg. 830).

Although future development projects would result in use of nonrenewable natural gas resources which could limit future availability, the use of such resources would be on a relatively small scale and would be consistent with regional and local growth expectations for SoCal Gas's service area and would not strain Statewide natural gas resources. Further, like the Project, other future development projects would be expected to incorporate energy conservation features, comply with applicable regulations including CALGreen and State energy standards in Title 24, and incorporate mitigation measures, as necessary. While initially the Project and cumulative projects could result in increased natural gas demand compared to existing uses on each specific project site, the overall demand for natural gas over time is expected to decline due to increases in regional natural gas efficiencies and the transition to renewable energy on a statewide basis displacing fossil fuels including natural gas. Therefore, the Project would not have a cumulatively considerable impact related to natural gas consumption, and impacts would be less than significant, and no mitigation is required.

c. Cumulative Energy Consumption – Transportation Energy

Potential Significant Impact: Whether the Project would contribute to cumulative environmental impacts related to transportation energy consumption, supply, energy standards and expansion of facilities.

Findings: Potential cumulative impacts of energy consumption are discussed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that no significant cumulative impacts to transportation energy consumption, supply, energy standards and expansion of facilities will occur as a result of development of the Project; therefore, no mitigation is required.

Fact Supporting the Findings: Buildout of the Project, the cumulative projects, and additional growth forecasted to occur in the City could increase gasoline, diesel, and natural gas consumption during Project construction and operation, and may cumulatively increase the need for supplies.

As stated in the traffic impact analysis (TIA) (Revised Final EIR Part 3, Appendix F, pg. 93), approximately 80 percent of the vehicles entering or leaving warehouse sites are passenger cars, mostly used for commute trips by employees of the warehouses. The WLC would create much needed local jobs, which would affect commute patterns in the area by reducing VMT because people would work closer to where they live. Thus, the TIA demonstrates that regional VMT is reduced due to the net effect the Project has on regional automobile travel. Nonetheless, buildout of the Project and cumulative projects in the region would be expected to increase overall VMT; however, the effect on transportation fuel demand would be minimized by future improvements to vehicle fuel economy pursuant to federal and state regulations. By 2025, vehicles are required to achieve 54.5 mpg (based on USEPA measurements), which is a 54 percent increase from the 2012-2016 standard of 35.5 mpg. As discussed in detail in Section 4.07, *Greenhouse Gas Emissions*, the Project would be consistent with the 2016 RTP/SCS for the region. Cumulative projects would need to demonstrate consistency with the goals in the 2016 RTP/SCS and incorporate project design features or mitigation measures as required under CEQA, which would also ensure cumulative projects contribute to transportation energy efficiency.

According to the USEIA's International Energy Outlook 2016, the global supply of crude oil, other liquid hydrocarbons, and biofuels is expected to be adequate to meet the world's demand for liquid fuels through 2040.¹⁶ CARB's analyses and the State's 2017 Climate Change Scoping Plan show a 45 percent decrease in fossil fuel demand by 2030.¹⁷ The State's Mobile Source Strategy aims to displace fossil fuel reliant vehicles with 1.5 million zero emission vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2030.¹⁸ Considering the State's goals of displacing transportation fuels, overall fossil fuel use will decrease and the current refining capacity would be sufficient to support the demand of the Project and cumulative projects (Revised FEIR Part 2, Section 6.17, pg. 6.17-22).

The Project's annual gas and diesel consumption from construction would represent approximately 0.57 percent of County diesel sales and 0.005 percent of County gasoline sales in 2018.¹⁹ Cumulative construction consumption for diesel and gasoline would result in 25 million gallons of diesel and 15 million gallons of gasoline representing approximately 9 percent of county diesel and 1 percent of county gasoline respectively (Section 6.17, Revised Final EIR Part 2, pg. 6.17-22). The Project's annual gas and diesel consumption from operational activities would represent approximately 0.02 percent of county diesel sales and 0.003 percent of county gasoline sales in 2018.²⁰ Cumulative construction and operational consumption for diesel and gasoline would result in 80 million gallons of diesel and 147 million gallons of gasoline representing approximately 29 percent of county diesel and 14 percent of county gasoline respectively (Section 4, Errata, of the Revised Final EIR Part 1, pg. 853). The Project's transportation fuel consumption from construction and operations consists of 7 percent of the total overall cumulative consumption of projects (total consumption of cumulative projects plus the proposed Project). Therefore, as the Project would incorporate land use characteristics consistent with state goals for reducing VMT and would represent a small fraction of transportation sales, the Project would not have a cumulatively considerable impact related to transportation energy, and impacts would be less than significant.

B. ENVIRONMENTAL IMPACTS MITIGATED TO A LEVEL OF LESS-THAN-SIGNIFICANT

Public Resources Code Section 21081 states that no public agency shall approve or carry out a project for which an EIR has been completed which identifies one or more significant effects unless the public agency makes one or more of the following findings:

¹⁶ EIA, International Energy Outlook 2016, [https://www.eia.gov/outlooks/ieo/pdf/0484\(2016\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2016).pdf); Accessed April 2018.

¹⁷ CARB, *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*, November, 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf; Accessed May 2018.

¹⁸ CARB, *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*, November, 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf; Accessed May 2018.

¹⁹ California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed September 2019. Diesel is adjusted to account for retail (52%) and non-retail (48%) diesel sales.

²⁰ California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed September 2019. Diesel is adjusted to account for retail (52%) and non-retail (48%) diesel sales.

- I. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1).
- II. Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency. (Finding 2).
- III. Specific economic, legal, social, technological, or other considerations make infeasible the mitigation measures or alternatives identified in the EIR, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment. (Finding 3).

Certain of the following issues from the environmental categories analyzed in the Revised Final EIR, including aesthetics, air quality (cancer risk), biological resources, cultural and paleontological resources, hazards and hazardous materials, hydrology, drainage, water quality, noise (short-term construction during the night), transportation (local intersections), utilities, and global climate change (individually and cumulatively) were found to be potentially significant, but can be mitigated to a less-than-significant level with the imposition of mitigation measures. This Planning Commission hereby finds pursuant to *Public Resources Code* Section 21081 that all potentially significant impacts listed below can and will be mitigated to below a level of significance by imposition of the mitigation measures in the Revised Final EIR; and that these mitigation measures are included as Conditions of Approval and set forth in the Mitigation Monitoring and Reporting Program (MMRP) adopted by this Planning Commission. Specific findings of this Planning Commission for each category of such impacts are set forth in detail below.

1. Cumulative Agricultural Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use, or conversion of forest land to non-forest use.

Findings: Potential impacts of the Project related to cumulative agricultural impacts are discussed in detail in Section 6.2.3 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to the cumulative loss of farmland would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the Planning Commission and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.2 of the Revised Final EIR Part 3, implementation of the Project would result in the permanent conversion of approximately 2,200 acres currently used for dry farming to non-agricultural uses and would result in the permanent loss of approximately 2,361 acres of land designated as Farmland of Local Importance.

Implementation of the cumulative related projects includes farmlands that are proposed to be converted to a non-agricultural use with two resulting in potential impacts that would remain significant and unavoidable subsequent to mitigation. Many of the remaining cumulative projects within the cumulative geographic area for agriculture include residential or commercial type projects, and the associated environmental documents found the impacts to be less than significant. Because there are cumulative related projects that would result

in significant farmland conversion impacts, the cumulative related projects would result in significant cumulative impacts due to the conversion of an agricultural use to a non-agricultural use.

The implementation of **Mitigation Measure 6.2.1** however would conserve agricultural land that is as productive as the onsite designated Farmland of Local Importance. This measure would conserve land located off-site that has equivalent or better agricultural economic productivity compared to the agricultural economic productivity of the Project site. Although cumulative related projects would cause a significant and unavoidable impact, the implementation of this measure would reduce the project's contribution to the cumulative impact on Farmlands and land designated as Farmland of Local Importance to less than cumulatively considerable.

2. Aesthetics

a. Light and Glare

Potentially Significant Impact: Whether the Project has the potential to introduce a significant new source of light and glare into the Project area.

Finding: Potential impacts of the Project related to light and glare impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Planning Commission finds that potentially significant impacts related to light and glare would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, development of the Project site would introduce numerous new sources of light and glare into the area in the form of street lighting, parking lots, and security lighting for the buildings and nighttime traffic.

The WLC Specific Plan requires that all site lighting be oriented downward so as to not project direct light rays upward into the sky or onto adjacent properties. The development of the Project will cause a significant increase in light and glare in the area. This new lighting will incrementally affect nighttime conditions in the area.

Exterior surfaces of the concrete tilt-up structure would be finished with a combination of architectural coatings, trim, and/or other building materials such as concrete and brushed metal. The Project will incrementally increase the amount of daytime glare in the Project area by introducing windows and metal fixtures into the area. All development in the City, which includes light generated from warehouse buildings and parking lots, is required to adhere to lighting requirements contained in the City's Municipal Code (Section 9.08.100 Lighting), which states that any outdoor lighting associated with nonresidential uses shall be shielded and directed away from the surrounding residential uses. Such lighting shall not exceed one-quarter (0.25) foot-candle at property lines and shall not blink, flash, oscillate, or be of unusually high intensity or brightness. Lighting in parking areas and drive aisles must be at least 1.0-foot candle and cannot exceed a maximum of 8.0-foot candles.

Adherence to the City’s Zoning Code would help reduce potential building or parking lighting impacts, but the location of industrial uses adjacent to residential uses would not reduce potential lighting impacts on adjacent residential uses to less than significant levels prior to the implementation of mitigation measures.

The WLC Specific Plan also requires the installation of roof-mounted solar panels on future warehouse buildings and these panels may produce unintended glare to the southeast, south, and southwest of the site, depending on the angle of the sun, the number and location of panels, and the degree to which the building parapet blocks views of the panels from surrounding land uses. Without additional information, this impact is determined to be potentially significant and requires mitigation.

Light and glare impacts of the Project can be reduced to less than significant levels by compliance with the lighting requirements of the City Municipal Code and implementation of **Mitigation Measures 4.1.6.4A** and **4.1.6.4B**. (Revised Final EIR Part 4 Volume 3 pgs. 4.1-80 to 4.1-82).

b. Cumulative Aesthetics – Light and Glare

Potential Significant Impact: Whether the Project could result in cumulative impacts in connection with past, present, and probable future projects create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Findings: Potential cumulative impacts of the Project-related aesthetics are discussed in detail in Section 6.1 Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that potentially significant impacts related to cumulative aesthetics would be reduced to a less than significant level, with implementation of Mitigation Measures Mitigation Measures 4.1.6.1A, 4.1.6.1B, 4.1.6.4A, and 4.1.6.4B. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Fact Supporting the Findings: The Project in conjunction with the cumulative development of other projects could significantly degrade the existing visual character (including light and glare) of the area, including both daytime glare and nighttime lighting. Development of cumulative projects within the eastern Moreno Valley area would result in the conversion of open space/vacant land to urbanized land uses. The environmental document for MV-3 identified existing visual character/light and glare, and surroundings as being a significant and unavoidable impact. Because MV-3 identified significant and unavoidable impacts to the existing visual character, cumulative development within the cumulative geographic areas for aesthetics would result in a significant cumulative impact associated with visual character.

Development of the Project would substantially alter the existing character and create light and glare impacts from conversions of the Project site from open space to an urbanized setting with many large logistics buildings. Because the Project would result in a significant impact on the visual character and light and glare from development of the area and cumulative development will also result in a significant impact on visual character, the Project’s contribution to cumulative impacts to/ the existing visual character and surroundings would be cumulatively considerable, prior to the application of mitigation.

The Project will be required to comply with the City’s General Plan, the City’s Municipal Code (Section 9.08.100, Lighting) and the WLC Specific Plan’s development guidelines for lighting and building materials. Mitigation Measures 4.1.6.1A and 4.1.6.1B would help reduce related visual impacts. Mitigation Measures 4.1.6.4A and 4.1.6.4B will help reduce light and glare associated with the new buildings near the San Jacinto Wildlife Area to the south. Mitigation Measure 4.1.6.4A requires a photometric plot of all proposed exterior lighting demonstrating that the Project is consistent with the requirements of Section 9.08.100 of the Municipal Code. The lighting study will be required to indicate the expected increase in light levels at the property lines of the adjacent residential uses. Mitigation Measure 4.1.6.4B requires an analysis of proposed solar panels demonstrating the glare from the panels will not negatively affect adjacent residential uses or motorists along perimeter roadways. Therefore, with compliance with the City’s General Plan, the City’s Municipal Code, and implementation of the mitigation measures, the Project’s contribution to cumulative light and glare impacts would be less than cumulatively considerable. (Revised Final EIR Part 2, pg. 6.1-9 to pg. 6.1-10)

3. Air Quality

a. Cancer Risk and Cancer Burden

Potential Significant Impact Whether the Project would expose residential receptors to substantial pollutant concentrations resulting in cancer risk impacts.

Finding: Potential impacts of the Project related to cancer risk and cancer burden impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that potentially significant impacts related to cancer risk impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: As set forth in Section 4.3 of the Revised Final EIR Part 2, adverse health effects related to cancer would exist, in the absence of mitigation, as a result of the construction and operation of the Project.

As noted in Section 4.3.3, Methodology, the Project Health Risk Assessment (HRA) examined the following condition for impacts to both sensitive/residential and worker receptors: Project Development condition which evaluates the impacts of Project-related construction and operational traffic diesel PM emissions as if the Project were built out in accordance with its proposed phased construction and operational buildout schedule commencing with the construction of Phase 1 in 2020 and the full build-out in 2035. This HRA has been provided to allow decision-makers to see the cancer-related impacts of the World Logistics Center project based on in the assumption that new technology diesel exhaust causes cancer, contrary to what was found by the HEI study. The mitigation conditions require that all diesel-fueled haul trucks during construction be 2010 or newer, that diesel trucks accessing the Project during operation be model year 2010 or newer, and that all on-site equipment greater than 50 horsepower be Tier 4 (see MM 4.3.6.2A[h] and MM 4.3.6.2A[a], respectively), and that the installation of air filtration system meeting ASHRAE Standard 52.2 MERV-13 standards are installed for specified residential units (MM 4.3.6.5A) (Revised Final EIR Part 2,pg. 4.3-72).

For reference, a risk level of 1 in a million implies a likelihood that up to one person, out of one million equally exposed people would contract cancer if exposed continuously (24 hours per day) to the specific concentration of TAC emissions over the duration of the exposure. This risk would be an excess cancer risk that is in addition to any cancer risk borne by a person not exposed to these air toxics (USEPA, 2017).

Table 4.3-26 presents the estimated unmitigated cancer risks for the 30-year exposure scenario that starts from the beginning of Project construction (Construction + Operation HRA), which uses updated construction and operational emissions values. The results are provided separately for Project construction emissions, operational emissions, and the total project emissions prior to the application of emission mitigation. Table 4.3-27 shows the estimated unmitigated cancer risk for the 30-year residential exposure scenario that starts from the beginning of Project full operation in 2035 (Operational HRA), which used the 2035 emission levels to represent the emissions for 2035 to 2064.

On the basis of the results shown in Table 4.3-26, the overlap of Project construction and operation would exceed the SCAQMD's cancer risk significance threshold of an incremental increase of 10 in a million prior to the application of mitigation and would represent a significant impact. Table 4.3-27 shows that during full Project operation, the estimated maximum cancer risk would exceed the 10 in a million threshold within and outside of the Project boundary and would represent a significant impact. Overall, without mitigation, the Project is expected to have a significant impact mainly due to diesel PM emissions from construction and heavy-duty diesel truck activities. Figures 4.4-3 and 4.3-4 show the incremental cancer risks for the Project location. The figures show the results prior to the application of mitigation (Revised Final EIR Part 2, pg. 4.3-65 to 4.3-68).

The mitigation measures previously identified under other impact sections are required (**Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E**) to reduce construction and operational emissions of criteria pollutants and would reduce the estimated cancer risks associated with the Project. Additionally, Mitigation Measure 4.3.6.5A is required to ensure that a significant health risk does not occur at on-site residential receptors during 30 years of full Project operations. Therefore, with mitigation measures implemented, impacts regarding cancer risks and cancer burdens will be mitigated to less to significant (Revised Final EIR Part 2, pg. 4.3-72 to 4.3-79).

b. Cancer Risks – On-site and Off-site Workers (25-year)

Potential Significant Impact: Whether the Project would expose on-site and off-site workers including school staff to substantial pollutant concentrations resulting in cancer risk impacts.

Findings: Potential impacts of the Project related to cancer risk impacts on on-site and off-site workers are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that potentially significant impacts related to cancer risk to on-site and off-site workers would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: As described in Section 4.3.3, Methodology, a multi-pollutant Health Risk Assessment (HRA) was conducted for the Project. The HRA examined the following condition for impacts to both sensitive/residential and worker receptors:

Project Development condition which evaluates the impacts of Project-related construction and operational traffic emissions as if the Project were built out in accordance with its proposed phased construction and operational buildout schedule commencing with the construction of Phase 1 in 2020 and the full build-out in 2035 (Revised Final EIR Part 2, pg 4.3-23).

The HRA has been provided to allow decision makers and the public to see the cancer-related impacts of the World Logistics Center project based on the assumption that new technology diesel exhaust causes cancer, contrary to what was found by the HEI study. The mitigation conditions require that all diesel-fueled haul trucks during construction be 2010 or newer, diesel trucks accessing the Project during operation be model year 2010 or newer, and that all on-site equipment greater than 50 horsepower be Tier 4 (see MM 4.3.6.2A[h] and MM 4.3.6.2A[a], respectively).

To be conservative, the HRA relied on EMFAC2017 to determine the breakdown of vehicle types and fuel types and did not consider the potential reductions in TACs emissions and health risks from increased penetration of zero-emission vehicles (ZEVs). The increased penetration of ZEVs is speculative, but likely given rapid technology advancement and more stringent legislation. For example, the HRA assumed that the 2035 heavy-duty truck fleet would be made up of 89 percent diesel, 9 percent gasoline, 3 percent natural gas, and 0 percent electric. According to the WLC Transportation Energy Technical Report (Revised Final EIR Part 2, Appendix E pg. 11 to 14)), a Medium electric vehicle (EV) Penetration scenario projects that the heavy-duty truck fleet could consist of 22 percent electric and a High EV Penetration scenario projects that the heavy-duty truck fleet could consist of 30 percent electric by 2035. Therefore, accounting for the High EV Penetration scenario would result in a greatly reduced health risk impact than what has been calculated in this analysis set forth in the Revised Final EIR.

Estimates of worker exposures were prepared based on the assumption of a 25-year exposure duration for 250 days per year and 8 hours per day. Note that the Office of Environmental Health Hazards Assessment (OEHHA) early-in-life age factors do not apply to worker receptors. The highest worker cancer risk estimates prior to the application of mitigation is approximately 10.9 in one million for the construction + operational scenario and 3.8 in one million for the full operational scenario, both at one on-site location. Therefore, cancer risk for worker receptors anywhere in the HRA's study area is greater than the 10 in one million significance thresholds. Projected impacts are potentially significant without mitigation.

The mitigation measures identified under other air quality impact sections are required (Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E) in addition to Mitigation Measure 4.3.6.5A to reduce construction and operational emissions of criteria pollutants and reduce the estimated cancer risks associated with the Project.

Table 4.3-28 and Figure 4.3-5 of the Revised Final EIR Part 2 show the estimated cancer risks for workers for the construction and operation HRA, with mitigation, and Tables 4.3-29 and 4.3-30, and Figure 4.3-6 show the cancer risks for the full operation HRA after application of mitigation. As noted, the cancer risks are

substantially lower after mitigation, and the SCAQMD cancer risk significance threshold would not be exceeded at any of the on-site or off-site receptors within the study area. The highest worker cancer risk estimates after the application of mitigation is approximately 1.8 in one million for the construction + operational scenario and 1.6 in one million for the full operational scenario. Therefore, cancer risk for worker receptors anywhere in the HRA's study area is less than the 10 in one million significance threshold with the implementation of mitigation and are less than significant. (Revised Final EIR Part 2, pgs. 4.3-66 to 4.3-78).

c. Cancer Risks – Schools

Potential Significant Impact: Whether the Project would expose schools (students) to substantial pollutant concentrations resulting in cancer risk impacts.

Findings: Potential impacts of the Project related to cancer risk impacts on school children are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that potentially significant impacts related to cancer risk to schools would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Refer to “Facts in Support of Findings” for “Cancer Risks – On-site and Off-site Workers” for a background discussion in regard to the HRA. Cancer risk estimates at school sites in the area were prepared assuming a 9-year exposure during construction and operation as well as operation at full buildout. Prior to the application of the mitigation, the maximum cancer risk is at Ridgecrest Elementary School for the construction + operational scenario and would be approximately 12.6 in a million. Similarly, the maximum cancer risk for the full operational scenario is 3.54 in one million is at Bear Valley Elementary School. Therefore, maximum impacts at schools are greater than the 10 in one million significance threshold prior to mitigation and are potentially significant without mitigation.

With the implementation of the mitigation measures previously identified above (**Mitigation Measures 4.1.6.1A, 4.3.6.2A, 4.3.6.2B, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.3E**) the maximum cancer risk would be approximately 3.0 in one million at the Ridgecrest Elementary School for both the construction + operational scenario and the full operational scenario and maximum cancer risk would be reduced to 1.8 in one million for the construction + operational scenario and 0.54 in one million for the full operational scenario at the Bear Valley Elementary School. Therefore, maximum impacts at schools are less than the 10 in one million significance threshold with the implementation of mitigation and are less than significant (Revised Final EIR Part 2, pgs. 4.3- 66 to 4.3-78).

4. Biological Resources

a. Endangered and Threatened Species

Potential Significant Impact: Whether the Project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as endangered or threatened in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to endangered and threatened species are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to endangered and threatened species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the Planning Commission and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, of the special-status plant and animal species that have the potential to occur within the general vicinity of the Project area, 17 plant and animal species are designated as endangered or threatened by State and/or Federal authorities (Table 4.4-6 of Revised Final EIR Part 3, pg. 4.4-65). The Coastal California gnatcatcher was observed but no other species are believed to be present on the Project site. However, it is possible the listed birds may utilize the SJWA on a seasonal basis.

Coastal California gnatcatcher is a Covered Species in the MSHCP and is considered Adequately Conserved. Consistent with the MSHCP requirements, **Mitigation Measure 4.4.6.3A** prevents suitable habitat from disturbance during the breeding season. Active bird nests are protected by both the Migratory Bird Treaty Act (MBTA) and sections of the California Fish and Game Code.

The potential for occurrence determination was based on the results of focused biological resource surveys, and/or the lack of suitable habitat within the Project site for the referenced species. No Federal or State endangered/threatened species besides the Coastal California gnatcatcher were detected on the Project site during the focused biological resource surveys. However, to err on the side of caution, it is reasonable to conclude that, at a minimum, indirect impacts to listed species may be significant, and mitigation is required. The 250-foot setback identified in **Mitigation Measure 4.4.6.1A** with an additional 400-foot building setback from the southerly property line, for logistics buildings within Planning Areas 10 and 12 will effectively mitigate potential indirect impacts of air pollutants, including diesel particulate matter, on wildlife within the SJWA. Furthermore, according to the Revised Final EIR Part 3 Section 4.4, pgs. 4.4-66 to 4.4-68, operational and construction noise would not require additional mitigation due to the increased setback and would not exceed 60 dB within the SJWA.

In terms of invasive species, the WLC Specific Plan landscaping palette does not include any of the invasive plant species listed in Section 6.1.4 of the MSHCP (Table 6-2), and **Mitigation Measure 4.4.6.3G** will ensure that no on-site landscaping along the southern boundary of the Project site conflicts with MSHCP invasive plant guidelines.

Future development within the WLC site will have to comply with the off-site lighting restrictions outlined in Section 4.3 of the WLC Specific Plan, including the requirement that direct light rays from all lighting fixtures be directed downward, illuminate only the building or space intended, and do not spill onto adjacent properties (Section 9.08.100 Lighting 5.5.2.1). This will also apply to Project-related development in Planning Areas 10 and 12, which will help minimize lighting impacts on biological species in the adjacent SJWA land. All on-site lighting will also have to comply with the new night lighting guidelines in Section 9.08.100 of the City's Municipal Code, which limits off-site impacts to 0.25 foot-candles. As development occurs within the Project,

adherence to these design guidelines and restrictions will help ensure that night lighting increases will not result in significant indirect lighting impacts on native wildlife within the SJWA.

For example, the Specific Plan requires that streetlights, parking lot lighting, and other project-related illumination sources be positioned, directed, and shielded to avoid “direct light spill” into MSHCP conservation areas including those contained within Existing Core H to the south of the WLC site, and Proposed Core 3 (Section 6.1.1, Proposed Core 3) to the east of the WLC site. Lighting installed according to the WLC Specific Plan will be consistent with MSHCP guidelines. The Project will also have to comply with the City’s new Dark Sky Lighting Ordinance, which reduces spillover light to 0.25 foot-candles at five feet from the adjacent property lines.

In addition to night lighting issues associated with construction and operation, the proposed facilities are to include roof-mounted photovoltaic panels to provide electricity for the facilities and aid in the sustainability of the Project and reduce additional GHG emissions. There is a potential for glare from these panels to confuse migratory birds into attempting to land in the area of the panels. However, the Project design calls for the use of low glare and high solar transmission films to increase solar capacity and prevent unnecessary glare, so this impact would be less than significant (Revised Final EIR Part 3, pgs. 4.4-68 to 4.4-69). Deteriorated water quality can result in impacts to endangered and threatened species. The implementation of water quality BMPs summarized here and detailed in Sections 4.9.6.1 and 4.9.6.2 (Revised Final EIR Part 4) will reduce impacts to biological resources. Toxics Water Quality Development plans for the WLC project will include Water Quality Best Management Practices (BMPs) such as vegetated earthen channels, storm drain stenciling, street sweeping, and education, and Detention basins will be designed to filter potential toxics from storm water. Section 4.9.6.2, Operational Water Quality Impacts (Revised Final EIR Part 4), also requires the regular removal of any contaminated materials from the detention basins to protect downstream water quality. These BMPs will be implemented as part of the storm water pollution prevention measures for the Project, in accordance with all appropriate NPDES requirements. Development of the WLC project will result in the additional use of hazardous materials in limited quantities associated with normal logistics use such as janitorial and cleaning products, solvents, herbicides, and insecticides. However, compliance with regulations, standards, and guidelines established by the Environmental Protection Agency (EPA), State, County, and local agencies relating to the storage, use, and disposal of hazardous waste will reduce the potential risk of hazardous materials exposure to downstream water and reduce the potential risk to endangered and threatened species (Revised Final EIR Part 3, pgs. 4.4-69 to 4.4-70).

Local wildlife (i.e., within the SJWA) may be exposed to vehicular exhaust and diesel particulates and toxic air contaminants from truck exhaust as the WLC project builds out. New development will produce significant amounts of diesel-related air pollutants that will be released into the atmosphere, including gases and particles of various sizes. Diesel emissions contain thousands of pollutant species, and the composition depends on the fuel, vehicle, and driving conditions. The main public health concerns are from fine and ultrafine particulate matter, black or elemental carbon, polyaromatic hydrocarbons (PAHs) like phenanthrene, metallic ashes, gases like nitrogen dioxide, aldehydes like acetaldehyde, acrolein, and crotonaldehyde, volatile organic compounds like benzene and 1,3-butadiene, etc. One of the research limitations is that some health effects from these pollutants take a long time, in some cases even a lifetime, to exhibit themselves.

These pollutant species can also be emitted from other sources, so in complex urban environments, it can be difficult to trace individual sources of air pollution. In this case, air quality is relatively good, and the only major activity is agriculture, so the increase in most of these pollutant species would predominantly be the result of new warehouse uses within the Project. Research suggests that wildlife may be more susceptible to air pollutant impacts than humans, due to their smaller size, higher respiration rates, smaller lung capacities, ingestion of local plant materials that have also been exposed, higher metabolic rates, etc., although some factors like shorter lifespans would reduce the length of exposure over time. For these reasons and for the purposes of the analysis in the Revised Final EIR, it was assumed that animals within the SJWA would be at least as susceptible to health effects from air pollution, including diesel exhaust, as humans.

In 2002, the EPA compiled a wide range of scientific studies on the health effects of diesel exhaust, including non-carcinogenic effects of diesel exhaust on laboratory animals. Studies found that diesel particulate matter (diesel PM) had a limited effect on the survival and growth of rats and mice when exposed to diesel PM for short periods of time. However, rats, mice and hamsters all experienced increased lung to body-weight ratios when exposed to 1.5 mg/m³ diesel PM concentrations for extended periods of time. Several studies looked at behavior effects in animals and found that juvenile rats exposed to diesel emissions (DE) exhibited a decreased ability to move around on their own, and negatively affected their learning in adulthood.

Extended exposure to diesel emissions caused negative effects on the pulmonary functions of rats, hamsters, cats and monkeys. Depending on the species, DE levels of 1.5–11.7 mg/m³ affected lung mechanical properties, diffusing capacity, lung volumes, and ventilator performance of the subject animal. The ability of rats to clear their airways was also severely impaired by diesel PM concentrations of 1 mg/m³ or greater. Data on the effect of diesel PM on airway clearance in other animals were limited, but the pathological effects of diesel PM seemed to be dependent on the relative rates of pulmonary deposition and clearance (rate of breathing) of the subject animal. The studies also showed that diesel PM can reduce an animal's resistance to respiratory infections. Diesel PM can begin to impair an animal's immune system in as little as 2–6 hours with exposures of 5–8 mg/m³ of diesel PM. The testing data also suggested that diesel PM may be a factor in increased allergic reactions in animals.

When comparing filtered versus non-filtered DE, studies found that diesel particulates are the main cause of noncancerous health effects. However, they could not determine if diesel PM acts additively with the gas, or whether it combines with the gases to create different effects. The studies also found that other airborne contaminants (e.g., criteria pollutants) can be altered by diesel PM when absorbed by the diesel particles and increase the physical health effects caused by the diesel PM and other contaminants. These increased health risks were only found in laboratory settings. There was no evidence for DE interacting with other contaminants in normal urban atmospheric settings except for the impaired ability of animals to resist respiratory tract infections. No other noncancerous effects were found in any of the studies.

Chapter 7 of the EPA document includes studies that concluded diesel emissions also have carcinogenic effects on animals. Studies indicated that DE and/or diesel PM did result in increased cases of cancer in laboratory animals as well as humans. Rats experienced a trend of increased tumor growth when exposed to concentrations of DE exceeding $1 \times 10^4 \text{ mg} \times \text{hr/m}^3$. Because tumors were induced at high concentrations it is believed that they are caused by the lungs experiencing particle overload. The studies also examined the effect

of filtered exhaust and discovered that it did not cause tumors. They concluded that filtered exhaust either was not a carcinogenic or had low cancer potency (Revised Final EIR Part 3, pgs. 4.4-70 to 4.4-72).

As a result of the advances in emission control technology, USEPA, CARB, and other government and industry stakeholders commissioned a series of studies called the Advanced Collaborative Emissions Study (ACES). Phase 3 of ACES evaluated whether emissions from new technology diesel engines cause cancer or other health effects. Specifically, it evaluated the health impacts of a 2007-compliant engine equipped with a diesel particulate filter. HEI found chronic exposure to NTDE did not induce tumors or pre-cancerous changes in the lung and did not increase tumors that were considered to be related to NTDE in any other tissue in laboratory rats. The study also confirmed that the concentrations of particulate matter and toxic air pollutants emitted from NTDE are more than 90 percent lower than emissions from traditional older diesel engine. Rats are the most sensitive laboratory animal species for evaluation of older technology diesel engines (pre-model year 2007), because of their sensitivity to high concentrations of particles (present in older technology diesel engines), compared with other species (including humans) (Revised Final EIR Part 2, pg. 4.3-18 to 4.3-19).

Based upon the previously described information, the 250-foot setback identified in **Mitigation Measure 4.4.6.1A**, will effectively mitigate potential indirect impacts of air pollutants, including diesel particulate matter, on wildlife within the SJWA. Compliance with the off-site lighting guidelines of the Specific Plan, compliance with the night lighting standards in Section 9.08.100 of the City Municipal Code, and implementation of Aesthetics **Mitigation Measure 4.1.6.4A** will help reduce lighting impacts on the SJWA to less than significant levels. In addition, **Mitigation Measure 4.4.5.2A**, **4.4.6.1B** and **4.4.6.3G** will help assure that potential impacts to listed or sensitive plant species remain at less than significant levels.

b. Adopted Habitat Conservation Plans

Potential Significant Impact: Whether the proposed Project would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Finding: Potential impacts of the Project related to compliance with the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) and the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) are discussed in detail in Section 4.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts with the species protected by these Plans would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, the Project site is within the SKR HCP Fee Area. The SKR is relatively widespread throughout the SKR HCP Fee Area, but the main blocks of occupied habitat are concentrated in several Core Areas that must be conserved. The Project site is not within an SKR Core Area. The long-term SKR HCP provides Take Authorization for the SKR within its boundaries. The core reserves established by the SKR HCP will be managed as part of the MSHCP Conservation Area consistent with the provisions of the SKR HCP. Focused surveys for SKR will not be

required for this Project because the Project lies within the SKR Fee Area; therefore, no requirements under the SKR HCP other than payment of a local mitigation fee are required.

The Project area is located within the Reche Canyon/Badlands Area of the MSHCP. Development of the Project area would not conflict with the conservation goals established by the MSHCP for Cell Group X or Cell Group E. In addition, no conflict from development would occur in relation to the Reche Canyon/Badlands Area Plan, the Area Plan Subunit 4, the Area Plan Subunit 3, Proposed Core 3, or Existing Core H.

The WLC site is adjacent to Cell Group D and Proposed Core 3, however, it is not near any Linkages identified in the MSHCP. It is adjacent to the SJWA and, therefore, is subject to the Project guidelines provided in MSHCP Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface). The Project is also required to adhere to the Best Management Practices (BMPs) found in Appendix C of the MSHCP.

The WLC project does not propose to alter land use in any way that would adversely affect Cores, Linkages, or Reserve Assembly within the Reche Canyon/Badlands Area Plan. The WLC project is not located within any Amphibian, Mammalian, or Special Linkage Areas identified by the MSHCP. The Project is in an area requiring burrowing owl surveys, is within the MSHCP Criteria Area Species Survey Area (CASSA) and is within the Narrow Endemic Plant Species Survey Area (NEPSSA).

The MSHCP and its Implementation Agreement contain a fee mitigation program pursuant to which local agencies collect development impact fees and remit such fees to the Riverside Conservation Authority (RCA). These fees are in turn used to acquire lands that are suitable for habitat preservation for species covered by the MSHCP. Payment of the local MSHCP mitigation fee will be required of the Project prior to the issuance of building permits. The MSHCP provides that payment of the fee completely mitigates a project's environmental impacts.

From available information, potential indirect impacts to avian and other biological resources within the SJWA will be reduced to less than significant levels by the creation of a 250-foot on-site setback in **Mitigation Measure 4.4.6.1A**. Project design features and associated setbacks previously described will reduce Project impacts to adjacent biological resources to less than significant levels. As required by the October 17, 2014 Joint Project Review with the RCA, the WLC Project must implement the guidelines contained in MSHCP Section 6.1.4 related to controlling adverse effects for development adjacent to the MSHCP Conservation Area, of which there are seven specific conditions. Therefore, the WLC project would have a less than significant impact in regard to the MSHCP.

Participation in the MSHCP and payment of the MSHCP fee provides compensation for the loss of raptor foraging habitat due to approved projects. A project proponent is required to participate as outlined in the MSHCP, so that loss of raptor foraging habitat is considered to be less than significant and no mitigation is required.

Narrow Endemic Plant Species. No Narrow Endemic plant species are anticipated to occur in the WLC site, but compliance with **Mitigation Measure 4.4.5.2A** will assure there will be no significant impacts to these plant species.

Criteria Area Plant Species. No Criteria Area plant species are anticipated to occur on the WLC site, but compliance with **Mitigation Measure 4.4.5.2A** will assure there will be no significant impacts to these plant species.

Riparian/Riverine Areas and Vernal Pools. Drainage Features 7, 8, 9, 12, and 15 contain riparian/riverine areas, as designated by the MSHCP. The Project area does not contain habitat suitable for covered riparian species, such as least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo. No vernal pools or ephemeral ponds were observed on the Project site area and no suitable habitat for any fairy shrimp species was identified on-site. No additional mitigation regarding vernal pools or vernal pool species is required. A programmatic-level Determination of Biologically Equivalent or Superior Preservation (DBESP) was prepared by MBA in 2013 to outline specific requirements for Project-related impacts to these features in the future. A building-specific DBESP will be required in connection with the development of each building within the WLC.

Specific Plan Design Features. The Project is consistent with the major MSHCP requirements relative to core areas, criteria cells, threatened and endangered species. In addition, the Project complies with the MSHCP guidelines for urban/wildland interface, riparian/riverine areas, or related setback (with implementation of **Mitigation Measure 4.4.6.1A**). In addition, future development will be required to demonstrate that it is also consistent with all MSHCP requirements, including indirect impacts such as lighting, noise, and air pollution effects.

Regulatory Compliance. Stephens' kangaroo rats have a low potential to occur within the study area. While the study area is not within the SKR Core Reserve Area, the SKR HCP Implementing Agreement requires payment for loss of habitat within defined areas. The entire Project site lies within the fee area. An assessment of individual actions for development within the WLC Specific Plan would be required prior to any implementation. The number of acres of disturbance associated with the development and any off-site improvements shall require payment to comply with the SKR HCP. In addition, prior to issuance of a grading permit for the development of each building within the WLC, the applicants will be required to pay the mandatory MSHCP mitigation fee. The mitigation fee is a per-acre fee for commercial or industrial development. **Mitigation Measures 4.4.6.1A** and **4.4.6.1B** will also help reduce potential direct and indirect impacts to biological resources covered by the MSHCP.

With implementation of **Mitigation Measures 4.4.6.1A, 4.4.6.1B, 4.4.6.2B, 4.4.5.2A, and 4.4.5.2B** potential impacts related to the species protected by the MSHCP will be reduced to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-60 to 4.4-63).

c. Jurisdictional Delineation, Riparian Habitat or Other Sensitive Natural Communities

Potential Significant Impact: Whether a Project would have a substantial adverse effect on federally protected waters or wetlands as defined by Section 404 of the Clean Water Act (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Whether the proposed Project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CSFW) or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to jurisdictional land, riparian habitat, and sensitive natural communities' impacts are discussed in detail in Section 4.4 of the Revised Final EIR Parts 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to jurisdictional land, riparian habitat, and sensitive natural communities' impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.4 of the Revised Final EIR Part 3, drainages in the WLC site were investigated and delineated by MBA in March 2012 and updated in 2013. A total of 15 primary drainage features, sub-drainages or tributaries were identified and evaluated for jurisdiction under Section 404 and 401 of the CWA as administered by the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB), respectively; Porter Cologne as administered by the RWQCB; and Section 1600 of the Fish and Game Code as administered by the CDFW.

The MBA 2013 report concludes that two of the drainages on the Project site are under the jurisdiction of the USACE (Drainages 12 and 15), and several additional drainages are under the jurisdiction of the CDFW and RWQCB (Drainages 7, 8, 9, 12, and 15).

Drainage Feature 12 and 15 are likely subject to USACE jurisdiction. However, if any portion of Drainage Features 12 and 15 are affected by WLC Project construction activities or flood control improvements in the future, then regulatory permitting may be required (Revised Final EIR Part 3, pgs. 4.4-74 to 4.4-75).

Drainage Feature 7, 8, 9, 12, and 15 within the WLC Project are considered riparian/riverine areas, as defined by MSHCP. If impacts to any of these areas cannot be avoided, a DBESP report and relevant mitigation will be required by the RCA.

The Project area does not contain habitat suitable for sensitive riparian species, such as least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo. Additionally, no vernal pools or ephemeral ponds were observed on the Project area and no suitable habitat for any fairy shrimp species was identified on-site.

Raptor Foraging Habitat. The WLC Specific Plan area and off-site facilities contain flat, open areas with sparse vegetation, which could be considered foraging habitat for some raptor species. Due to the regular, heavy disturbance associated with the various agricultural activities in the WLC Specific Plan area and off-site facilities resulting in a rather limited prey base, and the limited size of the site in relation to the expansive foraging habitat in the near vicinity including both the CDFW Conservation Area and the SJWA, Lake Perris State Recreational Area and the extensive Badlands to the east, the foraging habitat on-site is considered marginally suitable and an adverse but not significant impact to raptor foraging habitat is anticipated.

Several drainages on the Project site are under the jurisdiction of the USACE, CDFW, or RWQCB. Therefore, **Mitigation Measures 4.4.6.2A through 4.4.6.2C** will help ensure there will be no significant impacts to riparian areas associated with Waters of the U.S. or Waters of the State as a result of future development within the Project.

With implementation of **Mitigation Measures 4.4.6.1A, 4.4.6.1B and 4.4.6.2A** through **4.4.6.2C**, potential impacts to riparian habitat or other sensitive natural communities, including on-site drainages, will be reduced to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-75 to 4.4-77).

d. Candidate, Non-listed Sensitive, or Other Special Status Species

Potential Significant Impact: Whether the Project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

Finding: Potential impacts of the Project related to candidate, non-listed sensitive, or other special status species impacts are discussed in detail in Section 4.4 of the Revised Final EIR Parts 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to candidate, non-listed sensitive, or other special status species impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: According to Section 4.4 of the Revised Final EIR Part 3, no USFWS designated Critical Habitat for any species is located within the Project area; therefore, no further action with regard to Critical Habitat is necessary.

Los Angeles Pocket Mouse. Focused surveys for the Los Angeles Pocket Mouse (LAPM) were conducted in August 2005, June 2010, June 2012, July 2013, and May 2018. Suitable habitat was found within Drainage Feature 9, one of the main drainage features located in the eastern end of the WLC site. In its MSHCP Consistency Report, MBA concluded that LAPM is absent from the WLC site, which is substantiated by the ESA May 2018 surveys. However, the WLC Specific Plan indicates this drainage will remain in its present natural condition, except for the southern end as it becomes the Street H channel and outlets to the SJWA land to the south. Extensive surveys were completed in 2005, 2010, 2012, 2013, and 2018, which concluded that the LAPM was not present. In addition, there is no suitable habitat between the known occurrence of the LAPM and the WLC SITE. The known populations of the LAPM are located within the southern portion of the SJWA, which is more than 2 miles from the southern WLC site boundary. The area between the known recorded occurrences of the LAPM and the WLC site have been actively disked farmland in the past and a 500-foot wide area along the southern WLC site boundary continues to be actively disked. Therefore, there is no habitat connectivity between the known occurrences of the LAPM and the WLC site. However, to ensure that no impacts occur, **Mitigation Measure 4.4.6.3E** is included in the MMRP.

Migratory or Nesting Birds. The 2013 MBA report found the extensive agriculture plant communities in the WLC Specific Plan area and off-site facilities provide suitable nesting habitat for ground-nesting avian species such as western meadowlark (*Sturnella neglecta*) and burrowing owl. Suitable habitat for shrub and tree nesting species such as red-tailed hawk, black phoebe (*Sayornis nigricans*), and house finch occur along the edges of existing development surrounding the WLC Specific Plan area and off-site facilities as well as isolated, remnant patches of vegetation in undisturbed portions of the WLC Specific Plan and off-site facilities.

Therefore, portions of the WLC Specific Plan area and off-site facilities and immediately adjacent to the WLC Specific Plan area and off-site facilities provide suitable nesting habitat for migratory birds protected under the MBTA and California Fish and Game Code.

The Project area contains suitable nesting habitat for several tree-, shrub-, and ground-nesting avian species. Therefore, MBA recommended construction activities avoid the avian nesting season, from February to August, if possible. If construction activity must take place during the nesting season, a pre-construction nesting bird survey will be conducted prior to any ground disturbance activities. The survey can be conducted in conjunction with the pre-construction survey for burrowing owl.

If passerine birds are found to be nesting or if there is evidence of nesting behavior within 250 feet of the impact area, a 250-foot setback will be required around the nest where no vegetation disturbance will be permitted. For raptor species such as hawks and owls, this setback should be expanded to 500 feet. A qualified biologist will be required to closely monitor nests until it is determined that they are no longer active, at which time construction activity in the vicinity of nests could continue. Construction activity may proceed within the buffer area at the discretion of the biological monitor. **Mitigation Measures 4.4.6.3A** through **4.4.6.3C** will ensure that impacts are less than significant.

Burrowing Owl. For those species that are not covered by the take and incidental take provisions of the MSHCP (e.g., burrowing owl), the MSHCP requirements dictate that further protective action be taken. While no burrowing owls were identified within the Project's area of disturbance, because suitable habitat is present within the Project area for the burrowing owl and because the species is highly mobile, a potential exists that, at some future date prior to Project development, this species may occupy the development sites. This is a potentially significant impact requiring mitigation. **Mitigation Measure 4.4.6.3D** will ensure that impacts are less than significant.

All burrowing owl observations within the Project site prior to 2018 are associated with artificially created berms. The recorded sightings have been within a bank of an existing drainage feature, a berm within the recently constructed detention basin associated with the Skechers Building (Drainage 3), and a roadside berm just south of Alessandro Boulevard. Burrowing owl was observed in 2018 in the eastern drainage within the proposed 250-foot setback area. The proposed detention basins will be constructed with similar manufactured berms. Based on historic observations of burrowing owl within the WLC site, it is reasonable to assume that construction of similar berms will continue to provide optimum burrow habitat for resident burrowing owls.

In addition, since there have been no recorded occurrences of burrowing owl in the northern portion of the SJWA there is no concern for competition with other burrowing owls. It is reasonable to assume that the created detention basins will provide more than a sufficient amount of foraging habitat to support a single pair of burrowing owls. The southern 250-feet of the WLC site will not contain any building development and construction activities will be restricted to detention basins and associated access roads. Mitigation Measure 4.4.6.1A discusses the 250-foot setback required for areas developed adjacent to the San Jacinto Wildlife Area. (Revised Final EIR Part 3 pgs. 4.4-78 to 4.4-79).

Plant Survey Areas. The Project limits are within MSHCP Survey Area 10 of the Narrow Endemic Plant Species' Survey Areas (NEPSSA) and MSHCP Survey Area 9 of the Criteria Area Sensitive Plant Species' Survey Areas (CASSA) for plant species. The MSHCP requires that a habitat site assessment (HSA) be conducted for all proposed developments within NEPSSAs and CASSAs. The HSA for most NEPSSA and CASSA plants must be done during a normal rainfall year and/rainy season. If it is determined during the HSA that suitable soils and/or growing conditions are present on-site to support identified NEPSSA species, a focused plant survey is required during the plant species blooming period.

Habitat suitability of the site for NEPSSA and CASSA species is detailed in the General Biological Resources and MSHCP Compliance Report (Final EIR, Volume 3 Appendix E). None of the species analyzed in the NEPSSA or CASSA is anticipated to occur on the WLC Project site. The implementation of the WLC Project would not affect the habitat or result in a direct impact for any special status plant species. **Mitigation Measure 4.4.5.2A** will ensure that impacts are less than significant.

WLC Specific Plan design features: The WLC Specific Plan area does not contain any design features relative to sensitive species or birds, other than the landscape palette that contains all native and/or drought-tolerant plants that may be utilized by birds tolerant of human activity.

In summary, implementation of **Mitigation Measures 4.4.5.2A, 4.4.6.1A, and 4.4.6.4A** through **4.4.6.4K** would reduce impacts to burrowing owl, migratory bird species, and Los Angeles pocket mouse to less than significant levels. (Revised Final EIR Part 3, pgs. 4.4-77 to 4.4-79).

e. Cumulative Biological Impact – Adversely Affect Endangered or Threatened Species.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect, either directly or indirectly or through habitat modifications, on any species identified as endangered or threatened in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to threatened or endangered species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: There are 17 plant and animal species that are designated as endangered or threatened by State and/or Federal authorities that have the potential to occur within the general vicinity of the Project area (Table 4.4-6) and the MSHCP area. Only the coastal California gnatcatcher has been observed within the Project site. Coastal California gnatcatcher is a Covered Species in the MSHCP and is considered Adequately Conserved. Consistent with the MSHCP requirements, **Mitigation Measure 4.4.6.4A** prevents suitable habitat from disturbance during the breeding season.

Consistency with the MSHCP would provide assurance that the Project would be in compliance with the provisions of the federal Endangered Species Act, the California Endangered Species Act, and the Natural

Community Conservation Planning Act; and would adequately provide for the conservation and protection of the covered species adequately conserved and their habitats in the MSHCP Plan Area.

The Project site and off-site facilities are located within the fee area of the SKR HCP. The SKR HCP is managed as part of the MSHCP Conservation Area and significant cumulative impacts to SKR are addressed through adherence to the Stephens' kangaroo rat HCP's Implementing Agreement and payment of the County's per-acre mitigation fee.

Cumulative projects that would occur on previously undeveloped land supporting endangered or threatened species would be required to identify and mitigate any potentially significant impacts to those biological resources. Cumulative projects within the MSHCP Plan Area would be subject to consistency with the MSHCP as well as subject to consistency for any relevant HCPs. The combined construction of projects within the vicinity of the Project could deprive some species of a significant amount of habitable space. Related projects that would potentially affect threatened or endangered species would also be subject to the same regulatory requirements as the Project. These determinations would be made on a case-by-case basis, and the effects of cumulative development on sensitive species would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, cumulative adverse effects on threatened and endangered species would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.4A, 4.4.6.1A and 4.4.6.1 B** would reduce potential impacts to listed endangered and threatened species. Mitigation Measures 4.4.6.1A and 4.4.6.1B includes development setbacks from the SJWA northern boundary and water quality and erosion control facilities to minimize downstream impacts. Mitigation Measures 4.4.6.4A requires avoidance of impacts to nesting birds, including the Federally Threatened coastal California gnatcatcher. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-34 through pg. 6.4-36).

f. Cumulative Biological Impact – Adversely Affect Candidate, Non-listed Sensitive, or Special-Status Species.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect, either directly or indirectly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that

potentially significant impacts related to a candidate, sensitive, or special status species would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The WLC Specific Plan area overlaps with the MSHCP Survey Areas for Narrow Endemic Plant Species as well as Criteria Area Sensitive Plant Species. Focused surveys for these species did not produce positive findings within the Project site and these species are not anticipated to occur. The implementation of the WLC Project would not affect the habitat or result in a direct impact for any special status plant species.

Focused surveys for Los Angeles pocket mouse did not find this species within the Project site and the closest known location for the species is in the southern portion of the SJWA for which there is no suitable habitat connection. However, **Mitigation Measure 4.4.6.4E** is recommended to prevent impacts to the species from occurring with the implementation of the Specific Plan as suitable habitat was identified within Drainage Feature 9 on the Project site.

Burrowing owl has been observed within the WLC site on several occasions, most recently in 2018. The MSHCP requires specific protective action for this species; as such, **Mitigation Measure 4.4.6.4D** provides for pre-construction surveys and the preparation of a relocation plan if burrowing owl is found. In addition, the construction of berms around detention basins where burrowing owls have been observed to use will provide nesting opportunities and the conservation of 74.3 acres within the Specific Plan area will provide the potential to construct artificial burrows for use in the relocation plan.

Migratory and nesting birds are known from the Project site because suitable nesting habitat is available for several bird species. **Mitigation measure 4.4.6.4A** is recommended to minimize potential impacts to nesting birds.

Raptor foraging habitat will be lost through the construction of the WLC and cumulative projects. The MSHCP incorporates suitable raptor foraging habitat within the MSHCP conservation areas. As a result of conservation planning within the MSHCP area enabled through the contribution of fees required for approved development, cumulative impacts to raptor foraging habitat will not be considerable.

The combined construction of projects within the vicinity of the Project could deprive some species of a significant amount of habitable space. Related projects that would potentially affect local or regional candidate, sensitive, or special status species subject to the same regulatory requirements as the Project. Therefore, cumulative adverse effects on local or regional candidate, sensitive, or special status species would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize

cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.4A through 4.4.6.4K** would reduce potential impacts to candidate, non-listed sensitive, or special-status species. **Mitigation Measures 4.4.6.4A through 4.4.6.4K** includes protection for nesting birds, including burrowing owl, development of a resource management plan, landscape buffer adjacent to the SJWA, and payment of impact fee to the MSHCP. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-36 through pg. 6.4-38).

g. Cumulative Biological Impact – Adversely Affect Riparian Habitat or Other Sensitive Natural Communities

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant cumulative impacts related to riparian habitat or other sensitive natural community would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Riparian or riverine areas are lands that contain habitat dominated by trees, shrubs, and persistent emergent plants, which occur close to or depend upon soil moisture from a nearby water source; or areas with fresh water flowing during all or a portion of the year. Drainage Feature 7, 8, 9, 12, and 15 within the WLC Project are considered riparian/riverine areas, as defined by MSHCP. If impacts to any of these areas cannot be avoided, a Determination of Biologically Equivalent or Superior Preservation (DBESP) report and relevant mitigation will be required.

Mitigation Measure 4.4.6.3A will help ensure there will be no significant impacts to riparian areas associated with Waters of the State as a result of future development within the Project. In addition, **Mitigation Measure 4.4.6.3B** will provide mitigation in the form of on-site preservation of riparian areas and/or a combination of compensation through purchase and placement of lands with riparian/riverine habitat into permanent conservation through a conservation easement and/or restoration or enhancement efforts at off-site or on-site locations. The intent of the regulatory permitting for Waters of State is a no net loss of these resources and cumulative impacts would be less than considerable.

Cumulative projects that would potentially affect habitat would also be subject to the same requirements of CEQA as the Project. These determinations would be made on a case-by-case basis, and the effects of cumulative development on riparian habitat or other sensitive natural communities would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. With the implementation of

the MSHCP Conservation Areas, sustainable populations for covered species within conserved habitats would result and cumulative impacts would be less than considerable. Therefore, for the reasons described above, cumulative adverse effects on sensitive habitat would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on the SJWA.

Implementation of **Mitigation Measures 4.4.6.3A through 4.4.6.3C** would reduce potential impacts to riparian habitat or other sensitive natural communities. **Mitigation Measures 4.4.6.3A through 4.4.6.3C** includes the requirement to obtain regulatory jurisdictional permits, creation or enhancement of riparian resources, development of a resource management plan, and demonstration that the mitigation resources are equivalent or better than the jurisdictional resources impacted. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-38 through pg. 6.4-39).

h. Cumulative Biological Impact – Adversely Affect Federally Protected Wetlands or Waters of the U.S.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a substantial adverse effect on federally protected wetlands or waters of the U.S. as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to federally protected wetlands or waters of the U.S. would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: A total of 15 primary drainage features were identified during this survey and a number of sub-drainages or tributaries were also identified. Jurisdiction for each drainage and/or sub-drainage or tributary was evaluated for jurisdiction under Section 404 and 401 of the Clean Water Act (CWA) as administered by USACE and RWQCB, respectively. Two of the 15 features are subject to the jurisdiction of the USACE and/or RWQCB. In addition, no jurisdictional wetlands or isolated wetlands were identified within the Project site. **Mitigation Measure 4.4.6.3A** will help ensure there will be no significant impacts to riparian areas associated with Waters of the U.S. as a result of future development within the Project. In addition, there would be no net loss of riparian resources.

Related projects that would potentially affect wetlands would also be subject to the same requirements of the Project with respect to the MSHCP. These determinations would be made on a case-by-case basis, and the effects of cumulative development on wetlands would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, cumulative adverse effects on wetlands would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on Federally protected wetlands or Waters of the United States.

Implementation of **Mitigation Measures 4.4.6.3A through 4.4.6.3C** would reduce impacts to federally protected wetlands or waters of the U.S. **Mitigation Measures 4.4.6.3A through 4.4.6.3C** includes the requirement to obtain regulatory jurisdictional permits, creation or enhancement of riparian resources, development of a resource management plan, and demonstration that the mitigation resources are equivalent or better than the jurisdictional resources impacted. Through the implementation of mitigation stated above, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-39 through pg. 6.4-40).

i. Cumulative Biological Impact – Interfere with Wildlife Movement.

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native or resident migratory wildlife corridors or impede the use of native wildlife nursery sites.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to wildlife movement would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project area contains no significant cover of native plant communities and currently experiences heavy disturbance associated with agricultural activities. Additionally, the Project area is adjacent to SR-60 and Gilman Springs Road on the north and east and is bordered by urban development on the west. The nearest linkage area as identified under the MSHCP is Proposed Linkage 5 and is located approximately 3 miles north of the Project and approximately 3.6 miles south of the Project is Proposed Constrained Link 20. Development of the Project would not directly have any significant impact on wildlife movement in the area and would not fragment habitat or adversely affect wildlife movement through the surrounding areas. It is determined that the Project would not impede or minimize any significant wildlife

corridor for the target species associated within the Reche Canyon/Badlands Area plan. None of the cumulative projects would interfere with wildlife movement in the region.

Direct and indirect impacts of the Project on the MSHCP and SJWA would be less than significant with mitigation, and the regional (cumulative) implications of the Project can be addressed through the fee payment program of the MSHCP because it provides a regional and comprehensive approach to conservation planning. Through the implementation of the stated mitigation for Project-specific impacts, and the payment of required MSHCP mitigation fees, no significant cumulative effect on biological resources would result from the development of the proposed uses with implementation of the identified program mitigation measures.

Related projects that would potentially affect wildlife movement would be subject to the same requirements of CEQA as the Project. These determinations would be made on a case-by-case basis, and the effects of cumulative development on wildlife movement would be mitigated to the extent feasible in accordance with CEQA and other applicable legal requirements. Therefore, for the reasons described above, cumulative adverse effects on wildlife movement would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources.

Implementation of Mitigation Measures 4.4.6.1A, 4.4.6.1B, 4.4.6.2A through 4.4.6.2C, and 4.4.6.3A through 4.4.6.3K would reduce conflicts with adopted habitat conservation plans and impacts to biological resources. Through the implementation of the above mitigation measures, the Project contribution to potential cumulative impacts would be less than cumulatively considerable. (Revised Final EIR Part 3, pg. 6.4-40 through pg. 6.4-41).

j. Cumulative Biological Impact – Conflict with Adopted Policies, Ordinances or Habitat Conservation Plans

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Findings: Potential impacts of the Project related to cumulative biological impacts are discussed in detail in Section 6.4 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to consistency with adopted policies, ordinances or habitat conservation plans would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The WLC Project site is located within the MSHCP, the Project site is located within the Reche Canyon/Badlands Area of the MSHCP. Development of the Project site would not conflict with the conservation goals established by the MSHCP for Cell Group X or Cell Group E. In addition, no conflict from development would occur in relation to the Reche Canyon/Badlands Area Plan, the Area Plan Subunit 4, the Area Plan Subunit 3, Proposed Core 3, or Existing Core H.

No development is proposed within the portion of the Project site that lies adjacent to Cell Group D and the SJWA. Development that will be adjacent to the SJWA property may cause significant indirect impacts to species within the SJWA. The Project site is not adjacent to any Cores or Linkages identified in the MSHCP. However, it is adjacent to the SJWA and is subject to the project guidelines provided in MSHCP Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface). The Project is also required to adhere to the Best Management Practices (BMPs) found in Appendix C of the MSHCP.

The Project is not located within any Amphibian, Mammalian, or Special Linkage Areas identified by the MSHCP. The Project is in an area requiring burrowing owl surveys, is within the MSHCP Criteria Area Species Survey Area (CASSA) and is within the Narrow Endemic Plant Species Survey Area (NEPSSA). Surveys the CASSA and NEPSSA resulted in the lack of observation of these species. Burrowing owl has been observed within the Project site.

The WLC Project site is located within the Stephen's Kangaroo Rat (SKR) Habitat Conservation Plan (HCP). Core Areas have been designated for the conservation of this species; however, the Project site is not located within an SKR Core Area.

The effects of the Project, in combination with other cumulative projects in the geographic area, could combine to cause or contribute to significant cumulative effects to biological resources. In particular, identified cumulative projects that are located within or near the northern portion of the San Jacinto Wildlife Area could have significant effects on special status species, sensitive vegetation communities, and wildlife movement documented in the MSHCP and the San Jacinto Wildlife Area Management Plan. It should be noted that cumulative projects are required to adhere to and be consistent with the goals and objectives established in the MSHCP, including the payment of MSHCP fees. Therefore, cumulative adverse effects on resource protection policies would be less than significant.

The CEQA documents identified in Tables 6.4-1 and 6.4-2 have been reviewed to determine if the identified cumulative projects in conjunction with the Project could result in cumulatively considerable effect on biological resources. All cumulative projects are required to comply with the MSHCP and pay applicable MSHCP fees which are in turn utilized by the RCA to implement programs and habitat acquisition to minimize cumulative impacts to biological resources. As a result, the cumulative projects in conjunction with the World Logistics Center Project do not constitute a cumulatively considerable effect on adopted policies, ordinances or habitat conservation plans.

Implementation of **Mitigation Measures 4.4.6.2A and 4.4.6.2B** would reduce conflicts with adopted habitat conservation plans that the Project is subject to. **Mitigation Measures 4.4.6.2A and 4.4.6.2B** includes the requirement to conduct a focused plant survey, and demonstration to the Riverside County Regional Conservation Authority compliance with the provisions of the MSHCP. Through the implementation of the

above mitigation measures, the Project contribution to potential cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.4-41 through pg. 6.4-42).

5. Cultural Resources

a. Prehistoric Cultural Resources

Potential Significant Impact: Whether the Project could have an adverse effect on significant archaeological resource pursuant to CEQA Guidelines Section 15064.5.

Finding: Potential impacts of the Project related to archaeological resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to archaeological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: Based on Section 4.5 of the Revised Final EIR Part 4 Volume 3, a reconnaissance pedestrian-survey for the Project site was conducted in November 2007. Although the Project site is located within the Moreno Hills Complex, no archaeological resources were identified on the Project site during the field survey, and the cultural resource assessment concluded the Project would have no significant impacts; however, there is a potential for Project grading to disturb previously undiscovered cultural resources. While there is no recorded or surface evidence that archaeological resources are present on-site, the Project is located in an area with a high potential of containing prehistoric archaeological resources. Therefore, a potential exists that excavation and construction activities may uncover previously undetected prehistoric or historic cultural resources. Adherence to **Mitigation Measures 4.5.6.1A** through **4.5.6.1E** would reduce potential impacts to archaeological resources to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.5-17 to 4.5-21)

b. Historic Resources

Potential Significant Impact: Whether the Project could have a significant adverse effect on historic resources.

Findings: Potential impacts of the Project related to historic resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to historic resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site contains two previously identified historic sites: CA-RIV-4201H and CA-RIV-4210H. Both of these are historic-era homesteads and previously contained farm buildings and related out-buildings. They were located in the eastern portion of the Specific Plan area, but MBA could find no remains of these facilities

or related artifacts. The MBA report concludes the buildings were demolished and/or their materials removed for disposal or reuse at some point in the past.

There are seven rural residential structures and associated out-buildings currently present on the project site, and one (APN 478-220-009) near Redlands Boulevard contains a farm building that was built around 1900 and may be one of the oldest surviving buildings of the historic Moreno community.²¹ No other evidence of past structures or unique features was identified; however, access to the seven rural residential properties was not available at the time of survey, and it appears from general observations, historical aerial photographs, and historical records that one or more of these buildings may be older than 40 years. Without more information, there is a possibility that removal of these buildings could represent a significant impact to historic structures, features, or resources, and mitigation is required.

In addition, historical evidence indicates Juan Bautista de Anza traveled through the project area (i.e., along the base of Mt. Russell from south to northwest), which should be acknowledged as part of the trail proposed within the Specific Plan.

Alessandro Boulevard was designated as a City Landmark in 1988 (Resolution CPAB 88-2). Resolution CPAB 88-2 was designed to assure the maintenance, enhancement, or protection of a street of historical significance. Over the years various portions of Alessandro Boulevard have been modernized to enhance traffic flow throughout the City, but the original routing has remained unchanged. Alessandro Boulevard within the WLC Specific Plan area would retain its original alignment but the roadway would be enhanced to serve modern traffic needs. This has been done in multiple areas along Alessandro Boulevard in the past to better serve the needs of the community. These changes have not impacted the integrity of the landmark status, as the significance of the Landmark status is associated with the original location of the boulevard since 1890 and the retention of the original name of the boulevard across the City. These aspects would remain, and the impacts would not be considered significant since the California Register requires that a resource possess integrity, which is defined as “the authenticity of a historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance” (California Office of Historic Preservation 1999). To retain integrity, a resource should have its original location, design, setting, materials, workmanship, feeling, and association. Which of these factors is most important depends on the particular criterion under which the resource is considered eligible for listing (California Office of Historic Preservation 1999). Alessandro Boulevard integrity is retained in the original location, however, design, setting, materials feeling have changed over time through modifications to the road throughout the City and thus the impacts are not significant.

Approximately 1,350 feet of Alessandro Boulevard east of Merwin Street would be closed to through traffic to keep trucks from using Alessandro Boulevard through the residential neighborhood between Merwin Street and Wilmot Street. The loss of this portion of Alessandro Boulevard would not have a significant impact on the landmark status of the road, as the name would continue to be employed and the original routing would be retained throughout. These are the two key characters of the landmark status. This portion of road would be

²¹ ¹⁸ *Cultural Resources Assessment*, Michael Brandman Associates, Inc., September 2014.

open to hikers and bikers and the closure will be designed to keep access open to non-vehicular users. Both the original route and name would be retained in keeping with the main aspects of the landmark designation.

Implementation of **Mitigation Measures 4.5.6.1A, 4.5.6.2A, and 4.5.6.2B**, will help reduce potential impacts to historical resources to less than significant levels. (Revised Final EIR Part 4 Volume 3 pgs. 4.5-21 to 4.5-26).

c. Paleontological Resources

Potential Significant Impact: Whether the Project could have an adverse effect on significant paleontological resource or site or unique geologic feature.

Findings: Potential impacts of the Project related to paleontological resource impacts are discussed in detail in Section 4.5 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to paleontological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. Implementation of **Mitigation Measures 4.5.6.3A and 4.5.6.3B** will reduce the impact to unique paleontological resource or unique geologic feature to less than significant.

Facts in Support of the Findings: According to Section 4.5 of the Revised Final EIR Part 4 Volume 3, the Project site is located within an area that has a high potential to contain near-surface Pleistocene fossils.²² The paleontological literature search indicated that there is potential for significant, nonrenewable resources that to encountered during on-site construction activities. Therefore, a paleontological resources impact mitigation program (PRIMP), including excavation monitoring by a qualified paleontologist, is required for earthmoving activities in Pleistocene sediments on the Project site with potential to contain significant, nonrenewable paleontological resources. Although no paleontological resources were identified on-site during the field survey, because of the location of the Project site and associated sensitivity for paleontological resources, the potential exists that paleontological resources maybe uncovered during construction. Adherence to the **Mitigation Measures 4.5.6.3A and 4.5.6.3B** will reduce potential impacts to paleontological resources to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.5- 26 to 4.5-27).

d. Cumulative Cultural Resources Impacts – Archaeological Resources

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to archaeological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid

²² *Ibid.*

the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative projects within Western Riverside County would involve ground disturbance that could result in a significant impact to archaeological resources. Some of the cumulative projects have incorporated design features to avoid potential effects to known archaeological resources; however, potential significant cumulative impacts could occur to unknown archaeological resources. Although no known resources are located within the Project area, ground disturbing activities could result in a significant impact to unknown archaeological resources. Therefore, the Project’s contribution to potential significant cumulative impacts would be cumulatively considerable.

Typical mitigation measures implemented by the cumulative projects to reduce potential impacts to unknown archaeological resources include archeological monitoring, Native American tribal representation during monitoring, and protocols for treatment of discovered resources. These measures typically reduce potential impacts to unknown archaeological resources to less than significant.

Implementation of the recommended mitigation measures reduces potential impacts to archaeological resources. Mitigation Measures 4.5.6.1A and 4.5.6.1B includes Phase 1 cultural resources assessments of parcels that have not been assessed, significance evaluation of any resources encountered, and development of appropriate treatment or mitigation. Mitigation measures 4.5.6.1C and 4.5.6.1D include the retention of an archaeological monitor to observe all grading activities, with invitation of a Native American tribal representative to participate in monitoring. Mitigation measure 4.5.6.1E includes protocols to be followed should resources be discovered, including resource evaluation and appropriate treatment for significant resources. Through the implementation of the above mitigation measures, the Project’s incremental contribution to potential significant cumulative impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-21 to 6.5-22).

e. Cumulative Cultural Resources Impacts – Historic Resources

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to historic resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative related projects within Western Riverside County would involve ground disturbance that could impact above-ground structures that are of historic-age and meet the criteria of historic resources. Ground disturbance could

also result in impacts to unknown historic resources that are located below ground. The construction activities associated with cumulative development could result in a potential significant cumulative impact. Typical mitigation measures implemented by projects in the cumulative scenario to reduce potential impacts to historical resources include proper curation and recordation of the recovered historic resources. These measures typically reduce potential impacts to historical resources to less than significant.

The implementation of the Project would contribute to potential cumulative impacts to historic resources. Because the Project includes the removal of seven rural residential structures and associated out-buildings that may be of historic-age, impacts on these structures, features or resources could be significant. In addition, the Project also includes effects on other structures of historic-age such as two previously identified historic sites containing farm buildings and related out-buildings as well as Alessandro Boulevard which was constructed across the site in the 1890s. The Project's incremental contribution to cumulative historic impacts would be cumulatively considerable.

Implementation of the recommended mitigation measures reduces the Project's contribution to historic cumulative impacts. The implementation of **Mitigation Measure 4.5.6.2A** would include the proper curation of recovered historic resources. The implementation of **Mitigation Measure 4.5.6.2B** would include the installation of a historical marker along a historic trail. **Mitigation Measure 4.5.6.2C** includes an alignment of an on-site road along the historical alignment of Alessandro Boulevard. With the implementation of these mitigation measures, the Project's contribution to potentially significant cumulative historic impacts would be less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-22 to 6.5-23).

f. Cumulative Cultural Resources Impacts – Paleontological Resources

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Findings: Potential cumulative impacts of the Project-related cultural resources are discussed in detail in Section 6.5 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to paleontological resources would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.5 of the Revised Final EIR Part 3, cumulative projects within Western Riverside County would involve ground disturbance that could cause adverse impacts to paleontological resources. Potential impacts from projects in the cumulative scenario that could impact the same fossil-bearing geologic units as the Project would be considered significant. These units include older Pleistocene alluvium and the San Timoteo formation, both of which have been assigned a moderate paleontological sensitivity because they have yielded paleontological resources in the past. Potential impacts from the implementation of projects in the cumulative scenario could result in significant cumulative impacts. The typical mitigation measures implemented by the cumulative related projects to reduce potential impacts

to paleontological resources are paleontological monitoring and properly curating resources that are found. These measures typically reduce potential impacts to paleontological resources to less than significant.

Because the Project would result in ground disturbance that could affect paleontological resources within the Pleistocene alluvium and the San Timoteo formation, the Project's contribution to cumulative paleontological resources impacts would be cumulatively considerable.

Implementation of mitigation measures would reduce the Project's contribution to potential cumulative impacts to paleontological resources. The implementation of **Mitigation Measure 4.5.6.3A** includes the presence of a City-approved paleontologist to monitor excavation activities and salvage/collect fossils. **Mitigation Measure 4.5.6.3B** provides for the paleontological assessment of off-site improvements area and the implementation of monitoring protocols, where appropriate. Through the implementation of these mitigation measures, the Project's contribution to potential significant cumulative impacts to paleontological resources would not be cumulatively considerable (Revised Final EIR Part 3, pg. 6.5-23).

6. Geology and Soils

a. Fault Rupture

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to fault rupture.

Findings: Potential impacts of the Project related to fault rupture impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to fault rupture would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4 Volume 3, the western portion of the site is crossed by the City of Moreno Valley Seismic Zone, a postulated trace of the Casa Loma Fault and the Farm Road Strand. A detailed fault investigation was performed by Leighton for these projected faults. Although no active faulting was observed, some local discontinuous fracturing was observed and documented. Because of the potential for ground movements in this area, mitigation is required.

State law prohibits the construction and placement of habitable structures²³ over the trace of an active fault pursuant to the Alquist-Priolo Act. The A-P Earthquake Fault Zone is located on the eastern border of the project site. Trenching conducted by Leighton across the Claremont Segment of the San Jacinto Fault in the eastern area of the project site identified the location of a portion of the fault; however, the entire length of the fault through the Project site was not trenched. Although no habitable structure can be located on an active

²³ ²⁰ California Code of Regulations, Section 3601 states, "A structure for human occupancy is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year."

fault per State law, fault rupture hazard represents a potential significant seismic hazard on-site that would require mitigation.

Implementation of **Mitigation Measures 4.6.6.1A** through **4.6.6.1C** will ensure fault rupture hazards are reduced to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.6-17 to 4.6-20).

b. Ground Shaking

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to ground shaking.

Findings: Potential impacts of the Project related to ground shaking impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to ground shaking would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4, Volume 3, Southern California is a seismically active area and, therefore, will continue to be subject to ground shaking resulting from seismic activity on regional faults. Ground shaking from earthquakes associated with nearby and more distant faults is expected to occur during the lifetime of the Project. The level of potential ground motion is considered moderate to high in the City of Moreno Valley and, therefore, in the project area.

In accordance with the City's General Plan Safety Element (Objective 6.1),²⁴ Project development will require geological and geotechnical investigations by State-licensed professionals. The geotechnical investigations will provide design considerations and earthwork recommendations to ensure that ground shaking impacts are appropriately mitigated. In addition, California Code of Regulations (CCR), Title 24, also known as the California Building Standards Code (CBC), contains building design and construction requirements relating to fire and life safety, and structural safety. The CBC also includes standards designed to ensure that structures within California are built to withstand expected levels of seismic activity for each earthquake region throughout the State. Specifically, Part 2 of Title 24, including Chapters 4, 16-18, and Appendix J provide guidance regarding grading, soils, and construction techniques related to seismic protection. These codes are provided to protect public safety and ensure that all structures built in the State can withstand anticipated seismic ground shaking and other related geotechnical and soils constraints. Implementation of **Mitigation Measure 4.6.6.2A** will ensure ground shaking impacts caused by earthquakes are reduced to a less than significant level. (Revised Final EIR Part 4 Volume 3 pgs. 4.6-20 to 4.6-21).

c. Unstable Soils

Potential Significant Impact: Whether the future development permitted by the Project would locate development in an area susceptible to unstable soils.

²⁴ Moreno Valley General Plan, Chapter 9 Goals and Objectives, pg. 9-30.

Findings: Potential impacts of the Project related to unstable soil impacts are discussed in detail in Section 4.6 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to unstable soils would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.6 of the Revised Final EIR Part 4, Volume 3, expansive soils generally have a substantial amount of clay particles, which can give up water (shrink) or absorb water (swell). The change in the volume exerts stress on buildings and other loads placed on these soils. The extent or range of the shrink/swell is influenced by the amount and kind of clay present in the soil. Expansive soils can be widely dispersed, and they can occur in hillside areas as well as low-lying alluvial basins. On-site soils (Dv and Wb soils) are identified as having a moderate to low shrink-swell potential. Because the potential exists to locate development on moderately expansive soils, impacts are considered significant and mitigation is required. In accordance with the City's General Plan Safety Element (Implementation Measure I.E.1) and as indicated previously, development of the Project will require geological and geotechnical investigations by State-licensed professionals. To ensure impacts from expansive soils are addressed for specific development sites, adherence to **Mitigation Measures 4.6.6.3A through 4.6.6.3C** is required to reduce impacts from unstable soils to less than significant. (Revised Final EIR Part 4, Volume 3 pg. 4.6-21 to 4.6-23)

d. Cumulative Geology Impacts – Fault Rupture

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zone Maps issued by the State Geologist for the area or based on other substantial evidence of a known fault.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant cumulative impacts related to fault rupture would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, the San Jacinto Fault Zone and its associated fault segments are located within the eastern portion of the City of Moreno Valley. According to the City of Moreno Valley General Plan EIR, no other active fault zone is located within the City. Based on a review of projects in the cumulative scenario, San Jacinto Wildlife Area Land Management Plan is the only related project that is located in the immediate vicinity of the San Jacinto Fault Zone. A portion of the Land Management Plan encompasses the area immediately south of the Project site and is located within the City of Moreno Valley. This portion of the Land Management Plan includes a potential

for a water storage project that would involve construction of enclosed berms to hold water and an on-site pipeline. However, based on information from the San Jacinto Wildlife Area Land Management Plan EIR, the water storage project would not be located on any of the mapped earthquake fault zones and would thus be unlikely subject to fault rupture. Therefore, no significant cumulative effect would result relating to surface rupture impacts exposing persons and structures to significant effects and the Project's impacts would be less than cumulatively considerable.

Implementation of **Mitigation Measures 4.6.6.1A through 4.6.6.1C** will require subsurface evaluations to determine the implementation of structural setbacks, remedial earthwork and/or foundation recommendations if site-specific geotechnical investigations confirm the locations of the fault alignments in the areas of proposed land uses. The implementation of these mitigation measures would reduce the Project's potential fault rupture impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-15 through pg. 6.6-16).

e. Cumulative Geology Impacts – Ground Shaking

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would expose persons or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant cumulative impacts related to ground shaking would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario could be subject to ground shaking resulting from seismic activity on regional and local faults. The level of potential ground motion from faults is considered moderate to high in the City of Moreno Valley. Based on a review of the environmental documents prepared for the cumulative projects, the structures proposed by each project would be required to be designed in accordance with the California Building Code and the City of Moreno Valley Building Code to preclude adverse effects to the structures and persons associated with strong seismic ground-shaking. The amount of ground shaking would be dependent on the earthquake size, location and distance. Ground shaking would be greater with larger and closer earthquakes. Cumulative projects could expose persons and structures to significant cumulative seismic ground shaking impacts.

The implementation of the Project could also subject persons and structures to ground shaking from seismic activity on regional and local faults. Section 4.6.6.2 of Revised Final EIR Part 4 Volume 3 identifies that the exposure of the proposed structures and persons to seismic activity would be potentially significant. Therefore, the combination of impacts of the Project and other projects in the cumulative scenario would result in a cumulative significant impact. Given the size of the Project and the number of people and scope of structures it would include, the Project's contribution to the significant cumulative impact associated with exposing persons and structures to strong seismic ground shaking impacts could be cumulatively considerable.

Implementation of **Mitigation Measure 4.6.6.2A** requires structural design parameters for the proposed improvements in accordance with the California Building Code, including applicable City amendments as indicated based on site-specific geotechnical investigations. The implementation of this measure would reduce the Project's contribution to the potential significant cumulative exposure of persons and structures to seismic ground shaking impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-16 through pg. 6.6-17).

f. Cumulative Geology Impacts – Unstable Soils

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would be located on expansive soil, creating substantial risks to life or property.

Findings: Potential cumulative impacts related to geologic resources are discussed in detail in Section 6.6 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant cumulative impacts related to unstable soils would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 6.6 of the Revised Final EIR Part 3, projects in the cumulative scenario would include structural development on soils that have a low to moderate shrink/swell potential that could result in unstable soils. Areas where soils have a moderate shrink/swell potential could result in expansive soil impacts that would be significant. However, based on a review of the cumulative projects, the implementation of special construction techniques and compliance with the California Building Code would reduce expansive soil impacts to less than significant.

The implementation of the Project could include structures on soils with moderate shrink/swell and cause potential significant impacts to persons and structures. Therefore, the combination of the Project's incremental impacts together with the impacts of other projects in the cumulative scenario would result in a cumulative significant expansive soil impact. Given the size of the Project and the number of people it would include, the Project's contribution to exposing persons and structures to expansive soil impacts would be cumulatively considerable.

Implementation of **Mitigation Measures 4.6.6.3A through 4.6.6.3C** require structural design parameters for the proposed improvements in accordance with the California Building Code, including applicable City amendments. These design parameters would be implemented based on site-specific geotechnical investigations. The implementation of these measures would reduce the Project's contribution to the potential significant cumulative exposure of persons and structures to expansive soil impacts to less than cumulatively considerable (Revised Final EIR Part 3, pg. 6.6-17).

7. Greenhouse Gas Emissions, Climate Change, and Sustainability

a. Greenhouse Gas Emissions

Potential Significant Impact: Whether the Project could have a significant adverse effect due to the generation of greenhouse gas emissions (GHGs).

Findings: Potential impacts of the Project related to Greenhouse Gas Emissions impacts are discussed in detail in Section 4.7 of the Revised Final EIR Parts 2 and 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to Greenhouse Gas Emissions impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program

Facts in Support of the Findings: According to the Revised Final EIR Part 2 Section 4.7, future development that could occur on the Project site could generate GHG emissions during construction and operation activities. Most of the Project's GHG emissions (transportation and electricity) are covered under the AB 32 California cap-and-trade program and are therefore "capped" GHG emissions. Based on a comparison of the Project to the South Coast Air Quality Management District tiered interim GHG significance criteria, the most applicable South Coast Air Quality Management District thresholds for the uncapped GHG emissions is the Industrial at 10,000 metric tons of carbon dioxide equivalents (MT CO₂e) per year. In September 2013, the SCAQMD adopted two Negative Declarations stating that GHG emissions subject to the CARB cap-and-trade program (so called "capped" emissions) do not count against the 10,000 MT CO₂e significance threshold the SCAQMD applies when acting as a lead agency. The consideration of only uncapped GHG emissions to determine the significance of those emissions under CEQA used by the SCAQMD and the San Joaquin Valley Air Pollution Control District (SJVAPCD) was validated in *Association of Irrigated Residents v. Kern County Board of Supervisors*, 17 Cal. App. 5th 708 (2017). The Revised Final EIR's GHG analysis properly relied on compliance with California's cap-and-trade program to conclude that GHG emissions would be less than significant.

As shown in Table 4.7-7 of the Revised Final EIR Part 2, the uncapped GHG emissions at Buildout (2035) for the Project is 22,974 MT CO₂e per year and exceeds the SCAQMD threshold; therefore, the Project GHG emissions are significant before mitigation. With implementation of mitigation measures, the Project's uncapped GHG emissions would be reduced to 8,562 MT CO₂e which is less than significant. In order to ensure that the Project complies with and would not conflict with or impede the implementation of reduction goals identifies in AB 32, the Governor's EO S-3-05 and other strategies to help reduce GHGs to the level proposed by the Governor, Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, 4.7.6.1D, 4.16.1.6.1A, 4.16.1.6.1B, and 4.16.1.6.1C shall be implemented. (Revised Final EIR Part 2, pgs. 4.7-34-20 to 4.7-40)

In addition to the above Mitigations Measures, new Mitigation Measure 4.7.7.1 would mitigate either "Total Uncapped" GHG emissions from Table 4.7-8 or "Project Emissions" from new Table 4.7-16. With this new Mitigation Measure 4.7.7.1, the WLC Project's GHG emissions will be reduced to net zero either with without consideration on the cap-and-trade program, contingent on the outcome of an appeal of the Superior Court's ruling on the FEIR's application of California's cap-and-trade program to the analysis of GHG emissions for the construction and operation of the WLC Project. Therefore, Project emissions would not exceed the SCAQMD's significance threshold of 10,000 MT CO₂e per year and would not contribute to a significant cumulative impact. (Revised Final EIR Part 1, pg. 35).

b. Greenhouse Gas Plan, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project could be inconsistent with greenhouse gas plans, policies and regulations.

Findings: Potential impacts of the Project related to greenhouse gas plan, policy, regulation consistency impacts are discussed in detail in Section 4.7 of the Revised Final EIR Parts 2 and 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to Greenhouse Gas Emissions impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure identified below is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to the Revised Final EIR Part 2 Section 4.7, implementation of the Project could result in the development of an approximately 40.6 million square feet of logistics distribution facilities. The Project includes a variety of physical attributes and operational programs that would help reduce operational-source pollutant emissions from worker commuting, including GHG emissions. Similar to the discussion of cumulative air quality impacts, the Project may employ workers locally from the City. This has the benefit of improving the local jobs/housing balance leading to air quality benefits in terms of shorter trip lengths, which lead to lower GHG emissions than if the workforce was derived from distant locations.

Future development that would occur under the Project would be consistent with greenhouse gas emission reduction strategies and policies, including the City's Climate Change Strategy. The Project would implement the Mitigation Measures listed above to reduce its contribution to GHG emissions and to ensure it does not conflict with or impede implementation of reduction goals identified in AB 32, Governor's Executive Order S-3-05, and other strategies to help reduce GHGs to the level proposed by the Governor. In addition, the Project would also be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. Since the Project is consistent with these policies, including being required to mitigate its GHG emissions to net zero, the Project is consistent with greenhouse gas plans, policies, and regulations and impacts are less than significant after mitigation. (Revised Final EIR Part 2, pgs. 4.7-41 to 4.7-47)

c. Cumulative Greenhouse Gas Emissions Impacts

Potential Significant Impact: Whether the Project in connection with past, current, and probable future projects would have a cumulative significant impact from greenhouse gas emissions.

Findings: Potential cumulative impacts of the Project-related greenhouse gas emissions (GHG) are discussed in detail in Section 6.7 Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that potentially significant impacts related to cumulative greenhouse gas emissions would be reduced to a less than significant level, with implementation of **Mitigation Measures 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, 4.7.6.1D, 4.7.6.1E.1 or 4.7.6.1E.2, and 4.7.7.1**. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Cumulative effects to greenhouse gas (GHG) emissions, climate change and sustainability are described in Section 6.7 of the Revised Final EIR Part 2. As part of the GHG cumulative analysis a review of available environmental documents for projects within the Project vicinity was conducted. Approximately 359 projects were identified in the vicinity of the Project and are listed in Table 6.7-1. Out of those 359 projects, approximately 173 environmental documents were available. All 173 were reviewed to identify quantitative emissions for construction and operation of the respective projects; however, not all environmental documents contained emissions for construction and operation. Emissions from all of the identified cumulative projects were calculated based on available information and methodologies. Cumulative construction and operational emissions are provided in Table 6.7-2 in Section 6.7 of the Revised Final EIR Part 2.

During construction, the Project would emit GHGs mainly from direct sources such as combustion of fuels from worker, vendor, haul vehicles and construction equipment. Section 4.7.6.1 Greenhouse Gas Emissions of the Revised Final EIR Part 2 found that construction of the Project would contribute approximately 18,770 MT CO_{2e} in its first year of construction and up to approximately 23,511 mt CO_{2e} per year of construction during the 15-year construction period. Over the 15-year construction period the Project would emit a total of 221,727 MT CO_{2e}. The SCAQMD recommends that construction emissions be averaged over a 30-year period. Average over a 30-year period results in approximately 7,391 MT CO_{2e} per year. In addition, out of the 359 cumulative projects that were evaluated during preparation of the Recirculated Sections, Revised Final EIR Part 2, 68 were found to be completed or currently undergoing construction as of November 2019. Therefore, 291 potentially cumulative projects that could undergo construction activities during the Project's 15-year construction period.

The SCAQMD recommends that construction-related GHG emissions be amortized over a project's 30-year lifetime in order to include these emissions as part of a project's annualized lifetime total emissions, so that GHG reduction measures will address construction GHG emissions as part of a project's overall GHG reduction strategies. In accordance with this methodology, the estimated construction GHG emissions have been amortized over a 30-year period and are included in the annualized operational GHG emissions.

Operational or long-term emissions occur over the life of the Project. CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32 and SB 32. The program began on January 1, 2012, placing GHG emissions limits on capped sectors (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 MT CO_{2e} per year), and enforcing compliance obligations beginning with 2013 emissions. Vehicle fuels were placed under the cap in 2015, and with the passage of AB 398, the program was extended through 2030. The cap-and-trade program allocates emissions permits across covered entities in each sector. As shown in Section 4.7.6.1 Greenhouse Gas Emissions of the Revised Final EIR Part 2, the Project's unmitigated uncapped emissions at full buildout in 2035 are approximately 22,974 MT CO_{2e} per year which are over the SCAQMD's significance threshold of 10,000 MT CO_{2e} per year.

The quantitative analysis of operation and construction emissions utilized the SCAQMD's Interim CEQA GHG Significance Thresholds to determine the respective project's level of significance. Significance thresholds for each project were determined based on land use. The projects that were identified as either

residential or commercial projects are considered part of the SCAQMD’s draft threshold for residential/commercial projects and 3,000 MT CO_{2e} per year was used in each of the greenhouse assessments. The projects that were identified as industrial/warehouses were compared against a threshold of 10,000 MT CO_{2e} for industrial projects. Of the 359 projects analyzed, 94 projects exceeded their given threshold and 261 projects were below threshold. Given that the unmitigated Project and 94 of the cumulative projects are over threshold, impacts would be potentially significant and cumulatively considerable. (Revised Final EIR Part 2, pgs. 6.7-13 to 6.7-14)

In addition to the above Mitigations Measures, new Mitigation Measure 4.7.7.1 would mitigate either “Total Uncapped” GHG emissions from Table 4.7-8 or “Project Emissions” from new Table 4.7-16. With this new Mitigation Measure 4.7.7.1, the WLC Project’s GHG emissions will be reduced to net zero either with without consideration of the cap-and-trade program, contingent on the outcome of an appeal of the Superior Court’s ruling on the FEIR’s application of California’s cap-and-trade program to the analysis of GHG emissions for the construction and operation of the WLC Project. Therefore, Project emissions would not exceed the SCAQMD’s significance threshold of 10,000 MT CO_{2e} per year and would not contribute to a significant cumulative impact. (Revised Final EIR Part 1, pg. 35 of the Response to Comments document)

d. Cumulative Aesthetics – Light and Glare

Potential Significant Impact: Whether the Project could result in cumulative impacts in connection with past, present, and probable future projects to create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Findings: Potential cumulative impacts of the Project with respect to light and glare aesthetics are discussed in detail in Section 6.1 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that the Project’s potentially significant cumulative impacts related to light and glare aesthetics would be reduced to a less than significant level, with implementation of Mitigation Measures 4.1.6.1A, 4.1.6.1B, 4.1.6.4A, and 4.1.6.4B. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Fact Supporting the Findings: The Project in conjunction with the cumulative development could significantly degrade the existing visual character (including light and glare) of the area, including both daytime glare and nighttime lighting. Development of cumulative projects within the eastern Moreno Valley area would result in the conversion of open space/vacant land to urbanized land uses, including projects identified as MV-3 and MV-4, both large warehouse projects, both of which could contribute to cumulative aesthetic impacts. (Revised Final EIR Part 3, Table 6.1-1, pg. 6.1-4.). The environmental document for MV-3 identified existing visual character/light and glare, and surroundings as being a significant and unavoidable impact, and the visual change introduced by MV-4’s warehouse could contribute to cumulative aesthetic impacts. Accordingly, cumulative development within the cumulative geographic areas for aesthetics would result in a significant cumulative impact associated with visual character.

Development of the Project would substantially alter the existing character and create light and glare impacts from conversions of the Project site from open space to an urbanized setting with many large logistics

buildings. Because the Project would result in a significant impact on the visual character and light and glare from development of the area and cumulative development will also result in a significant impact on visual character, the Project's contribution to cumulative impacts to the existing visual character and surroundings would be cumulatively considerable, prior to the application of mitigation.

The Project will be required to comply with the City's General Plan, the City's Municipal Code (Section 9.08.100, Lighting) and the WLC Specific Plan's development guidelines for lighting and building materials. Mitigation Measures 4.1.6.1A and 4.1.6.1B would help reduce related visual impacts. Mitigation Measures 4.1.6.4A and 4.1.6.4B will help reduce light and glare associated with the new buildings near the San Jacinto Wildlife Area to the south. Mitigation Measure 4.1.6.4A requires a photometric plot of all proposed exterior lighting demonstrating that the Project is consistent with the requirements of Section 9.08.100 of the Municipal Code. The lighting study will be required to indicate the expected increase in light levels at the property lines of the adjacent residential uses. Mitigation Measure 4.1.6.4B requires an analysis of proposed solar panels demonstrating the glare from the panels will not negatively affect adjacent residential uses or motorist along perimeter roadways. Therefore, with compliance with the City's General Plan, the City's Municipal Code, and implementation of the mitigation measures, the Project's contribution to cumulative light and glare impacts would be less than cumulatively considerable and less than significant. (Revised Final EIR Part 2, pg. 6.1-9 to pg. 6.1-10)

8. Hazards and Hazardous Materials

a. On-site Conditions Involving Hazardous Materials

Potential Significant Impact: Whether the Project could through the demolition of the existing on-site rural residential structures involve hazardous materials (ACM and LBP) and possibly soil contamination from past agricultural chemical use and may involve hazardous materials (LNG/CNG).

Findings: Potential impacts of the Project related to on-site conditions involving hazardous materials are discussed in detail in Section 4.8 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to on-site conditions involving hazardous materials would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.8 of the Revised Final EIR Part 4, Volume 3, due to the suspected age of the rural residential structures on the site, it is possible that demolition of these structures may involve asbestos-containing materials (ACMs) and/or lead-based paint (LBP). Demolition of these structures may need to be supervised or conducted by contractors certified to remove and dispose of ACMs and/or LBP.

Also, because the site was previously farmed the on-site soils may contain pesticides. Prior to grading, soil testing shall be performed to determine if in fact these areas contain any significant levels of agricultural chemicals in the soil, and, if so, they will be remediated by a licensed contractor.

In addition, the Specific Plan proposes a liquefied natural gas/compressed natural gas (LNG/CNG) fueling station to be constructed on approximately 3,000 square feet somewhere in the eastern portion of the Logistics Development (LD) land use area in the Specific Plan. This LNG/CNG facility is referred to as “logistics support” in the Specific Plan. It would provide natural gas to fuel heavy and light-duty trucks serving the Project. Since this facility would store natural gas under liquefied and compressed conditions, there is a potential for fire and/or explosion involving natural gas.

Implementation of **Mitigation Measures 4.8.6.1A** through **4.8.6.1D**, impacts associated with potential hazardous materials in existing rural residential structures or from the proposed natural gas fueling facility will be reduced to less than significant levels. (Revised Final EIR Part 4 Volume 3 pg. 4.8-22 to 4.8-23).

9. Hydrology, Drainage, and Water Quality

a. Drainage Pattern and Capacity-Related Impacts

Potential Significant Impact: Whether the Project may significantly increase off-site runoff.

Findings: Potential impacts of the Project related to off-site runoff impacts are discussed in detail in Section 4.9 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to off-site runoff would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, Due to the construction of impervious surfaces on the Project site, post-development flows will be higher than the pre-development flows. To avoid a significant impact to the existing drainage capacity, the post-development flows, volumes, and velocities coming from the Project site must be managed to be equal to or less than pre-development flows volumes, and velocities.²⁵ As required by **Mitigation Measure 4.9.6.1A**, flows will be reduced to below or equal to pre-development conditions by routing the on-site stormwater flows through a series of on-site detention and infiltration basins before flows are released off-site. The existing stormwater runoff discharge rate for the undeveloped project site is 7,720 cubic feet per second (cfs). With the installation of the on-site detention basins, culverts, and energy dissipaters included in the project, expected discharges would be at a rate of 6,835 cfs, which is less than the existing condition. With the installation of the storm drain system facilities outlined in CH2M Hill’s hydrology reports (Appendix J, Revised Final EIR Part 4, Volume 3) and implementation of the **Mitigation Measure 4.9.6.1A**, the buildout of the project will convey storm flows safely through the region in accordance with Riverside County Flood Control requirements and will not result in flooding or additional erosion within the project area or any downstream areas, including the Perris Valley Storm Drain Channel. (Revised Final EIR Part 4, Volume 3, pg. 4.9-49)

²⁵ As part of the MS4 Permit issuance requirements, projects must identify any Hydrologic Conditions of Concern and demonstrate that changes to hydrology are minimized to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion, sedimentation or stream habitat.

Development of the WLC Project site will increase impervious surfaces on the Project site due to the construction of the Project's buildings, roadways, and associated improvements. While the resultant increase in impervious surfaces would contribute to a greater volume and higher velocities of storm flow, **Mitigation Measure 4.9.6.1A** requires the WLC Project site's drainage system be designed to accept and accommodate runoff that would result from the Project construction at or better than historic, or pre-development, conditions, as outlined in the Project's Master Plan of Drainage. **Mitigation Measure 4.9.6.1B** provides for the operation and maintenance of these facilities to ensure that they will be maintained. (Revised Final EIR Part 4, Volume 3, pg. 4.9-32 to 4.9-51).

b. Construction-Related Water Quality Impacts

Potential Significant Impact: Whether the Project could violate water quality standards or waste discharge requirements during construction phases of the Project in form of increased soil erosion, sedimentation, or storm water discharges.

Findings: Potential impacts of the Project related to the violation of water quality standards or waste discharge requirements are discussed in detail in Section 4.9 of the Revised Final EIR Part 4, Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts to construction-related water quality would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4, Volume 3, the construction and grading phases of the Project site would require the disturbance of surface soils and removal of existing orange groves and vegetative cover. During the construction period, grading and excavation activities would result in exposure of soil to storm runoff, potentially causing erosion and sediment in runoff. If not managed through Best Management Practices (BMPs), the runoff could cause erosion and increased sedimentation in local drainage ways such as the Quincy Channel. The potential for chemical releases is present at most construction sites in the form of fuels, solvents, glues, paints, and other building construction materials. However, implementation of construction practices and adherence to existing water quality regulations and **Mitigation Measures 4.9.6.2A** and **4.9.6.2B** would reduce these impacts to a less than significant level. (Revised Final EIR Part 4, Volume 3 pgs. 4.9-52 to 4.9-54).

c. Operational-Related Water Quality Impacts

Potential Significant Impact: Whether the Project could violate water quality standards or waste discharge requirements during the operational phases of the Project in the form of increased soil erosion, sedimentation, or urban runoff.

Findings: Potential impacts of the Project related to the violation of water quality standards or waste discharge requirements are discussed in detail in Section 4.9 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts to operational-related water quality would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1).

Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.9 of the Revised Final EIR Part 4 Volume 3, during the operational phase of any urban use, the major source of pollution in stormwater runoff will be contaminants that have accumulated on the land surface over which runoff passes. Storm runoff from the roadways, parking lots, and commercial and industrial buildings can carry a variety of pollutants such as sediment, petroleum products, commonly utilized construction materials, landscaping chemicals, and (to a lesser extent) trace metals such as zinc, copper, lead, cadmium, and iron, which may lead to the degradation of storm water in downstream channels. Runoff from landscaped areas may contain elevated levels of phosphorus, nitrogen, and suspended solids. Oil and other hydrocarbons from vehicles are also expected in storm water runoff.

Pollutant concentrations in urban runoff are variable depending on storm intensity, land use, elapsed time since previous storms, and the volume of runoff generated in a given area that reaches receiving waters. Pollutant concentrations are typically highest during the first major rainfall event after the dry season, known as the “first-flush.” The Master Water Quality Management Plan (WQMP) prepared for the project identifies pollutants and hydrologic conditions of concern that may be associated with the implementation of the project.

Site-specific WQMPs have not been prepared at this time as no site-specific development project has been submitted to the City for approval. When specific projects within the Project are developed, BMPs will be implemented consistent with the goals contained in the Master WQMP. All development within the Project will be required to incorporate on-site water quality features to meet or exceed the approved Master WQMP’s water quality requirements identified previously. This would include the design based on the appropriate pollutant loads for the project from all sources including climate change.

The project will comply with the *Water Quality Management Plan for the Santa Ana Region of Riverside County* (approved by the Santa Ana Regional Water Quality Control Board October 22, 2012), which requires the use of Low Impact Development (LID) BMPs that maximize infiltration, harvest and use, evapotranspiration and/or bio-treatment. Flows from the Project will be treated first by LID BMPs where the flow will be infiltrated, evapotranspired, or treated. As required by **Mitigation Measure 4.9.6.1A**, the treated flows will then be reduced to below or equal to pre-development conditions by routing the on-site storm water flows through a series of on-site detention and infiltration basins before flows are released off-site. These basins will provide incidental infiltration and secondary treatment downstream of the LID BMPs. All runoff from the site will be treated by LID BMPs and then routed through the detention and infiltration basins before it leaves the Project area and into Mystic Lake and the San Jacinto Wildlife Area.

The Project will comply with the Nutrient Total Maximum Daily Load (TMDL) for Lake Elsinore and Canyon Lake by implementing LID-based BMPs. According to the *Comprehensive Nutrient Reduction Plan for Lake Elsinore and Canyon Lake* (prepared for Riverside County Flood Control and Water Conservation District by CDM Smith, January 28, 2013 in compliance with Order No. R8-2010-0033, NPDES Permit No. CAS618033), “Post construction LID based BMPs required for new development and significant redevelopment projects are the only structural watershed based BMPs currently included in the Comprehensive Nutrient Reduction Plan (CNRP). The newly developed WQMP requirements ensure that a portion of the wet weather runoff will be

contained on-site for all future development projects subject to WQMP requirements. Implementation of WQMP requirements over time coupled with the in-lake remediation projects are expected to provide sufficient mitigation of nutrients.”

The proposed Project incorporates on-site drainage control structures and programs sufficient to meet the applicable Federal, State, and local water quality requirements. Through the use of site design BMPs, source control BMPs (e.g., street and parking lot sweeping and vacuuming), and treatment control BMPs (e.g., infiltration basins and pervious pavement), the resulting pollutant loads coming from the Project will be reduced, thereby reducing pollutants discharged from urban storm water runoff to surface water bodies. Compliance with the requirements of the NPDES permit, which include implementation of the BMPs outlined in the WQMP, will be enforced by the City during the ongoing operation of the Project. Implementation of **Mitigation Measures 4.9.6.3A through 4.9.6.3C** will help to reduce potential water quality impacts resulting from storm water and urban runoff to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-55 to 4.9-64)

10. Noise

a. Short-Term Construction Noise – Nighttime Construction

Potential Significant Impact: Whether noise levels from grading and other construction activities for the Project may range up to 93 dBA at the closest residences southeast of the Project site for very limited times when construction occurs near the Project’s boundary and whether construction-related noise impacts from the Project would be potentially significant.

Finding: Potential impacts of the Project related to short-term construction noise impacts are discussed in detail in Section 4.12 of the Revised Final EIR Part 3, pgs. 4.12-16 to 4.12-26. Based on the entire record before us, this Commission finds that potentially significant impacts related to nighttime short-term construction noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Finding: On-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical work day, the equipment would be operating at different locations within the various plots of the project site and would not likely be operating concurrently. However, for a more conservative approximation of construction noise levels to which the nearest sensitive receptor would be exposed, it is assumed that two of the loudest pieces of construction equipment would be operating at the same time and located within the Project Plots nearest to a sensitive receptor. The nearest sensitive receptors are the existing on-site residences, which would be located approximately 25 feet from construction activity of various Plots. As a worst-case scenario, it has been assumed that all existing on-site residences will remain on-site throughout construction.

Based on the list of the construction equipment that would be used at each of the Plots, it was assumed that the two loudest pieces of off-road equipment (a paver and scraper) would have a combined noise level of 85 dBA Leq from a distance of 50 feet (FHWA, 2006a). Using this reference noise level and a 7.5 dB per doubling of distance attenuation rate, the noise exposure level at representative locations around the Project site were calculated. In some cases, construction of various Plots occurring concurrently would expose sensitive receptors to noise levels that would exceed the City's 55 dBA Leq nighttime exterior noise standard. Specifically, impacts would occur at existing residences located within and to the west of the project area. Affected receptors are all located within City of Moreno Valley boundaries.

Based on these projections, anticipated worst-case construction noise levels would regularly be exceeded at residences within and near the Project area. Based on an Leq noise level of 85 dBA Leq at 50 feet and an attenuation rate of 7.5 dB per doubling of distance, an observer would need to be at a distance of 500 feet from an active Project construction area to experience a noise level of 60 dBA Leq, or 800 feet for a noise level of 55 dBA Leq. Therefore, the on-site construction of the Project would result in the exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley Noise Ordinance and would result in a significant impact.

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a Noise Reduction Compliance Plan (NRCP), which is expected to attenuate construction noise levels by a minimum of 10 dB. Table 4.12-8 shows mitigated construction noise levels at sensitive receptors in the vicinity of on-site construction areas. In addition, Mitigation Measure 4.12.6.1A prohibits construction activity within 800 feet of any sensitive receptor outside of the allowable hours of 7:00 a.m. to 8:00 p.m. As shown in table 4.12-8, at distances greater than 800 feet, construction noise would not exceed the City's nighttime exterior noise standard of 55 dBA Leq. Therefore, impacts would be less than significant with mitigation incorporated for nighttime construction.

b. Long-term Operational Noise

Potential Significant Impact: Whether the Project would cause exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley General Plan, Moreno Valley Municipal Code, or applicable standards of other agencies and whether long-term operational noise impacts from the Project would be potentially significant.

Finding: Potential impacts of the Project related to long-term operational noise impacts are discussed in detail in Section 4.12 of the Revised Final EIR Part 4, pg. 4.12-56 to 4.12-57. Based on the entire record before us, this Commission finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The City of Moreno Valley Noise Ordinance requires that noise levels remain below 55 dBA (Leq) during nighttime hours. To achieve this noise level, the warehouse property line

would only need to be 100 feet from the nearest residential property and no soundwall would need to be present.

Another consideration is whether the proposed activity levels will be substantially higher than current ambient conditions. No matter what is developed in the Specific Plan area, ambient conditions would be higher in future years due to higher levels of traffic and activity. Ambient noise levels were measured at seven sites that could border the World Logistics Center (i.e., Measurement Sites 3 through 9). The nighttime ambient noise levels (Leq) ranged from 35.8 to 61.8 dBA with an average for the sites of 46.6 dBA. To keep the noise levels at nearby residential areas less than typical ambient conditions, the logistics property line will be located a minimum distance of 250 feet and a 12-foot soundwall will be located along the perimeter of the Property that faces any residential areas. This would keep the logistic use noise to less than 45 dBA (Leq) at the residences. The implementation of this setback between logistics uses and noise sensitive uses has been included as **Mitigation Measure 4.12.6.1A**. (Revised Final EIR, Part 4 pgs. 4.12-56 to 4.12-57).

c. Long-Term Utility Noise

Potential Significant Impact: Whether the Project would cause exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley General Plan, Moreno Valley Municipal Code, or applicable standards of other agencies.

Finding: Potential impacts of the Project related to long-term utility noise impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 4. Based on the entire record before us, this Commission finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which would lessen the significant effects on the environment (Finding 1). Each mitigation measure is adopted by this Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: There are no utility facilities located within the WLC Specific Plan area. There is one existing SDG&E compressor station and two existing SCGC facilities located adjacent to the WLC Specific Plan area.

The worst-case compressor station operational characteristics will result in a maximum noise level just above 65 CNEL within the Project area proposed for development (i.e., not open space). Typical commercial construction results in buildings that achieve at least a 20-dB reduction of outdoor noise levels. Therefore, an office use exposed to the highest noise level from the compressor station will be just above 45 CNEL and below the 50 CNEL limit prescribed by the City's General Plan, resulting in a less than significant impact and no mitigation is required. (Figure 4.12.3, Revised Final EIR Part 4, pg. 4.12-17).

The Leq noise level generated by the compressor station does not exceed 60 dBA Leq beyond the property lines of the facility. Therefore, the compressor station is not considered a noise disturbance based on City criteria. Operation of the compressor station would not result in any interior noise levels exceeding the limits established by the City in the General Plan. Therefore, noise impacts associated with the operation of the compressor station would be less than significant and no mitigation is required (Figure 4.12-4, Revised Final EIR Part 4, pg. 4.12-19).

The maximum noise level from a blow-down at the SDG&E compressor station within the WLC Specific Plan area proposed for development (i.e., the Logistics Development land use) is 100 dBA. A person would need to be exposed to this level for more than two hours in a day before permanent hearing loss would be expected. As discussed above, blow-down events at the SDG&E compressor station typically do not last longer than 90 seconds. Therefore, the SDG&E blow-down events will not result in a significant impact to the uses proposed within the WLC Specific Plan area, and no mitigation is required (Figure 4.12-5, Revised Final EIR Part 4, pg 4.12-21).

For SCGC blow-down events, noise generated could reach as high as 130 dBA just outside the fence line of the southern facility and in excess of 135 dB just outside the fence line of the northern facility. People within approximately 250 feet of the blow-down points would be exposed to noise levels greater than 115 dBA, which would likely cause permanent hearing damage regardless of the exposure time. The SCGC blow-downs could last as long as 90 minutes. It is anticipated that people exposed to noise levels greater than 102 dBA, within approximately 1,300 feet from the blow-down point could experience permanent hearing loss based on this event duration. Noise generated by SCGC blow-down events has the potential to cause permanent hearing loss in persons in the developed area of the Project. This is a significant impact and mitigation is required (Revised Final EIR Part 4, pg. 4.12-57). Mitigation Measure 4.12.6.4A (Revised Final EIR Part 4, Volume 3, pg. 4.12-58) requires that a minimum 40 dB reduction in noise levels during blow-down events are available and will be installed prior to the issuance of building permits for projects within 1,300 feet of the SCGC and SDG&E blow-down facilities. With implementation of mitigation, SCGC blow-down events would not result in noise levels that could cause permanent hearing loss and the project would not be significantly affected by noise from the SCGC facilities, resulting in a less than significant impact.

SCGC blow-down events also have the potential to produce groundborne vibration. However, the effect of the blow-down groundborne vibration would be limited to within 100 feet of the equipment and would not be perceived beyond the facility fence line, resulting in a less than significant impact and no mitigation is required (Revised Final EIR Part 4, pg 4.12-57 to 4.12-59).

d. Cumulative Long-Term Operational Noise

Potential Significant Impact: Whether the Project's contribution to the cumulative exposure of persons to long-term operational noise would be cumulatively considerable.

Finding: The Project's cumulative contribution to long-term operational noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to long-term operational noise impacts would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: On-site operational noises are individual noise occurrences and are not typically additive in nature. It is extremely unlikely that adjacent properties will generate noises that would be additive in nature because of two important reasons. First, the noise sources would have to be adjacent or in close proximity to one another in order for the noises to intermingle. Second, the sensitive receptor or receptors

would also have to be adjacent to or in close proximity to the noise generators. Because the project assumes 24-hour operations, it is conservatively assumed that the geographic limit for cumulative on-site operational noise would include the three cumulative projects located adjacent to the Project site. Cumulative project MV-126 consists of residential uses and would therefore not generate noise levels equivalent to the Project. Assuming that the remaining two cumulative projects (MV-5 and MV-6) would generate noise at the same time as the Project and at distances and levels that would be additive in nature, a significant cumulative noise impact at sensitive receptors could occur.

As discussed in Section 4.12.6.3 of the Revised Final EIR Part 4 Volume 3 (pg. 4.12-56 to 4.12-57), on-site operational activity would include noise from truck delivery, loading/unloading activities at the loading areas, heating, ventilation, and air-conditioning equipment and other noise-producing activities within the parking lot. On-site activity would generate noise levels of up to 56.9 dBA L_{eq} at a distance of 50 feet. Related Projects MV-5 and MV-6 do not have CEQA documents in which on-site operational noise has been analyzed. Therefore, assuming that operation of Related Projects MV-5 and MV-6 would consist of similar on-site activity as the Project, Table 6.12-6 summarizes the potential cumulative noise level increases at this receptor (referred to as R5 in Section 4.12). As discussed in Section 6.12 of the Revised Final EIR Part 3 (pg. 6.12-30), cumulative on-site noise levels would not result in perceptible increases in ambient noise (3 dBA). Therefore, on-site Project operations would not result in cumulatively considerable on-site operational noise impacts.

With regard to on-site residential uses, the Project would result in significant impacts at on-site residential uses. However, the nearest on-site residence to cumulative projects MV-5 and MV-6 is located at a distance greater than 2,400 feet. At this distance on-site, operational noise at MV-5 and MV-6 would be negligible. Therefore, cumulative impacts would not occur. In addition, Section 4.12.6.3 of the Revised Final EIR Part 4, Volume 3 (pg. 4.12-56 to 4.12-57) determined that impacts to on-site residential uses would be less than significant with implementation of Mitigation Measure 4.12.6.2D.

Implementation of Mitigation Measure 4.12.6.2D would eliminate any noise impacts on off-site residential areas due to the operation of logistic activities. Through the provision of a 250-foot setback, berms, and/or soundwalls, noise levels at the nearest residences would be reduced to below the City's thresholds. Therefore, with adherence to the identified mitigation measure, off-site impacts associated with this issue would be less than significant and would be less than cumulatively considerable.

11. Transportation

These Findings consider Public Resources Code Section 21099 and the City's proposed new VMT thresholds. When the FEIR (Revised Final EIR Part 4, Volume 3), was certified in 2015 and when the RSFEIR (Revised Final EIR Part 3) was circulated for public review in 2018, the use of "Level of Service" (LOS) criteria was an accepted CEQA threshold of significance for the evaluation of transportation impacts and LOS criteria were relied upon in those documents. In addition, although the transportation section was updated in the RSFEIR, the transportation section of the FEIR was upheld by the Superior Court (see Topical Response C in the Revised Final EIR Part 1a). Accordingly, for consistency with those prior CEQA documents and in conformance with the Superior Court's decision, these Findings consider "Level of Service" criteria for purposes of evaluating the significance of transportation impacts. In addition, however, these revised Findings

also consider transportation impacts based on the VMT thresholds as proposed by City staff for adoption of the City Council. As of this date, the City Council has not adopted VMT thresholds and such threshold are only required for consideration in CEQA analysis for draft environmental documents released after July 1, 2020.

a. Intersection and Roadway Level of Service (Within the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that many of the Project’s potentially significant impacts under existing traffic conditions would be reduced to a less than significant level for roadway segments and intersections located within the City of Moreno Valley. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Traffic Impact Analysis (TIA, Revised Final EIR Part 3, Appendix F) discusses Project-related impacts to the intersection and roadway level of service (LOS) under the following development scenarios:

- 1) Existing baseline conditions (2018) plus Phase 1 of the Project
- 2) Existing baseline conditions (2018) plus Buildout of the Project
- 3) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2025 plus Phase 1 of the Project
- 4) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2040 plus Buildout of the Project

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if an impact is potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. As discussed further below, all direct Project impacts to locations within the City of Moreno Valley are mitigated to less than significant levels.

Intersection LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for the study area intersections are summarized in Table 26 of the Revised Final EIR Part 3, Appendix F (pg. 123), showing that 19 intersections would operate at unacceptable LOS. Table 27 (pg. 129) shows there are 15 study intersections where Phase 1 of the Project would have a significant impact. Of those 15 study intersections, 3 are located within the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for the study area intersections are summarized in Table 35 of the Revised Final EIR Part 3, Appendix F (pg. 161), showing that 25 intersections would operate at unacceptable LOS. Table 36 (pg. 167) shows there are 17 study intersections where buildout of the Project would have a significant impact. Of those 17 intersections, 5 are located within the City of Moreno Valley.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for the study area intersections are summarized in Table 49 of the Revised Final EIR Part 3, Appendix F (pg. 229), showing that 26 intersections would operate at unacceptable LOS. Table 50 (pg. 235) shows there are 13 study intersections where Phase 1 of the Project would have a significant impact. Of those 13 intersections, 3 are located within the City of Moreno Valley.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 63 of the Revised Final EIR Part 3, Appendix F (pg. 300), showing that 72 intersections would operate at unacceptable LOS. Table 64 (pg. 306) shows there are 30 study intersections where buildout of the Project would have a significant impact. Of those 30 intersections, 17 are located within the City of Moreno Valley.

Roadway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in Table 25 of the Revised Final EIR Part 3, Appendix F (pg. 104). Table 25 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, one is located within the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 34 of the Revised Final EIR Part 3, Appendix F (pg. 142). Table 34 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, one is located within the City of Moreno Valley.

2025 Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in table 48 of the Revised Final EIR Part 3, Appendix F (pg. 210). Table 48 shows that all study segments would operate at acceptable LOS, and no Project impacts would occur.

2040 Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 62 of the Revised Final EIR Part 3, Appendix F (pg. 280). Table 62 shows that one roadway segment would operate at unacceptable LOS and that the Project would worsen conditions, resulting in a significant impact. This segment is not within the jurisdiction of the City of Moreno Valley.

Project- related and cumulative impacts to locations outside the City of Moreno Valley are discussed in the Unavoidable Significant Impacts section of these Findings.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.C** require the applicant to construct or fund all required improvements to mitigate Project impacts to roadways and intersections within the City of Moreno Valley. With implementation of these mitigation measures, direct impacts on study area roadway segments and intersections located within the City of Moreno Valley would be reduced to less than significant.

b. Cumulative Transportation Impacts - Intersection Level of Service (Within the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause a cumulatively considerable increase in traffic on the street system within the City of Moreno Valley that is substantial in relation to the without Project (i.e., No-Project) scenario.

Findings: Potential cumulative impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 6.15 and Appendix F of the Revised Final EIR Part 3. Based on the entire record before us, this Planning Commission finds that the Project's potentially significant cumulative impacts on the street system would be reduced to a less than significant level for intersections located within the City of Moreno Valley (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: Section 6.15 of the Revised Final EIR Part 3 and the Traffic Impact Analysis (TIA) in Appendix F discuss cumulative impacts of the Project to the intersection level of service (LOS). The cumulative impacts of the Project were determined by comparing the LOS of the study facilities under the 2040 No-Project and 2040 Plus Project Build-out Scenarios.

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if impacts are potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands.

Intersection LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 6.15-3 in the Revised Final EIR Part 3 and in Table 76 on page 343 within the TIA, showing that 26 intersections would have unacceptable LOS and one roadway segment would have unacceptable LOS and resulting in significant cumulative impacts. Of the 26 intersections, 16 are located within the City of Moreno Valley.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.C** requires the applicant to construct or fund all required mitigation for the Project's cumulative impacts on intersections and roadways within the City

of Moreno Valley as identified in Section 6.15 and Appendix F of the Revised Final EIR Part 3. With implementation of these mitigation measures, the Project's cumulative impacts on intersections located within the City of Moreno Valley would be reduced to less than significant.

12. Utilities and Service Systems

a. Adequate Water Supply

Potential Significant Impact: Whether the Project could result in the lack of sufficient water supplies available to serve the Project from existing entitlements.

Findings: Potential impacts of the Project related to water supply are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to adequate water supply would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4, Volume 3, the Eastern Municipal Water District (EMWD) has determined that it will be able to provide adequate water supply to meet the potable water demand for the Project in addition to existing and future users. The WSA prepared for the Project by the EMWD concluded that the water demand for the proposed on-site uses would be approximately 1,991.25 AFY.²⁶ The EMWD considers this a "worst-case" estimate based on the total acres and amount of square footage of warehousing proposed by the Project. This estimate does not take into account the Project landscaping design with xeriscape (drought-tolerant plants) and on-site collection of runoff and channeling it to landscaped areas to minimize irrigation on the interior of the project site. For example, the "Water Budget Technical Memorandum" prepared by CH2MHill (see EIR Appendix N) in September 2011 for the WLC Project indicates that actual water usage of on-site buildings, based on the specific development characteristics of the WLC Specific Plan, would be on the order of 450 AFY which is less than a quarter of the amount estimated by EMWD; however, this estimate does not include on-site irrigation of landscaping and could only be achieved if all on-site landscaping was irrigated by collection and distribution of on-site runoff from roofs and hardscape areas.

Taking into account the Project's proposed water xeriscape landscaping plan, it is likely that actual water use for development within the WLC Specific Plan will be substantially less than the worst-case EMWD estimate. Therefore, for the purposes of analysis in this EIR, both the CH2MHill figure of 450 AFY and the EMWD's worst-case estimate of 1,991 AFY figure were used relative to water consumption. Under either scenario, the anticipated water demand for the WLC Project is substantially less than what is identified above for the General Plan land uses and what was used in the formulation of the 2010 and 2015 UWMPs. Anticipated water supplies in the EMWD total 213,900 and 302,200 AFY in 2015 and 2035, respectively. The water demand required for the WLC Project would total 0.93 and 0.66 percent of the EMWD's 2015 and 2035 supplies under worst-case

²⁶ *Water Supply Assessment Report for the World Logistics Center Specific Plan in Moreno Valley*, Eastern Municipal Water District, March 21, 2012.

conditions. The demand estimated for this project is substantially less and therefore still within the limit of growth projected in the 2010 and 2015 UWMPs.

Implementation of the **Mitigation Measures 4.16.1.6.1A** through **4.16.1.6.1C** will reduce impacts to water supply over the long term to less than significant levels. (Revised Final EIR Part 4, Volume 3, pgs. 4.16-15 through 4.16-22).

b. Storm Water Drainage Requirements

Potential Significant Impact: Whether the Project could result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to new storm water drainage facilities are discussed in detail in Section 4.16 of the Revised Final EIR Part 4 Volume 3. Based on the entire record before us, this Commission finds that potentially significant impacts related to the construction of storm water drainage systems would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the Project would route storm water flows from the Project site into existing storm drains to the west and the San Jacinto Wildlife Area to the south after flows are routed through a combination of water quality basins and sand filters. Due to the installation of impervious surfaces on the Project site, the post-development flows would be higher than the pre-development flows. To avoid a significant impact to the existing drainage capacity, the post-development flows coming from the Project site are required to be equal to or less than pre-development flows. To reduce flows to below or equal to pre-development conditions, the on-site storm water flows would be routed to the on-site detention basins²⁶ before flows are routed off-site. While the increase in impervious surfaces attributable to the Project would contribute to a greater volume and higher velocity of storm water flows, the Project's water quality basins would accept and accommodate runoff that would result from Project construction at pre-Project conditions.

As identified in the Preliminary Hydrology Calculations prepared for the Project, to adequately contain and store the greatest volume that would be generated, the Project site would require a minimum storage volume of 13.6 acre-feet. The proposed amount of storage area (20.3 acre-feet) is greater than the required amount of storage area. Based on this, it appears there is excess capacity of 6.7 acre-feet (20.3 acre-feet – 13.6 acre-feet = 6.7 acre-feet) of storage area available from the on-site detention basins; therefore, the Project appears to have adequate drainage capacity that would result in post-development flows being reduced to pre-development flows before leaving the Project site. However, to ensure that impacts associated with on-site drainage capacity are reduced to a less significant level, the **Mitigation Measures 4.9.6.1A** and **4.9.6.1B** and **4.16.1.6.2A** has been identified to reduce potential impacts to less than significant levels. (Revised Final EIR Part 4 Volume 3, pgs. 4.9-22 to 4.9-25).

13. Energy

a. Energy Consumption and Generation

Potential Significant Impact: Whether the Project would result in energy use and consumption that would cause wasteful, inefficient, and unnecessary consumption of energy.

Findings: Potential impacts of the Project related to energy consumption are discussed in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that the Project's potentially significant cumulative impacts related to energy consumption would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: During construction, electrical power would be consumed to construct the Project. Electricity would be supplied by the Moreno Valley Utility (MVU), with electrical service extended to specific construction sites from existing infrastructure throughout the WLC site area, as warranted. Specifically, construction offices and security lighting are expected to be powered by MVU-provided electricity. However, diesel-powered generators are expected to be used to power tools in remote portions of the construction sites (diesel use discussed below). The City's Noise Ordinance generally restricts construction during nighttime hours (See Section 4.12.3, the City of Moreno Valley Noise Ordinance as well as Section 4.12, Noise, in the Revised Final EIR Part 3), which would minimize the need for nighttime lighting.

However, on-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical workday, the equipment would be operating at different locations within the various plots of the Project site and would be largely intermittent. Should 24-hour concrete pouring occur, the Project would use light carts powered by diesel to illuminate pouring areas. The light carts used for continuous pouring are included in the construction transportation energy analysis on Revised Final EIR Part 2, pg. 4.17-26.

The Project would require electricity for water conveyance during ground-moving activities. The Project site spans 2,600+ acres and would require a relatively large amount of water to cover the affected construction areas. Water use related to dust control is regulated under SCAQMD's Rules 402 and 403 and is required to limit fugitive particulate matter generated by construction activities. The Project would be in compliance with Rules 402 and 403 and would require a relatively large amount of water to cover the entire acreage of the project site. However, the expected electricity consumption associated with water use equates to only 0.74 percent of MVU's forecasted sales for 2020 (expected starting year of construction). The electrical demand would vary throughout the construction period based on the construction activities being conducted. Additionally, when not in use, electrical equipment would be powered off to avoid unnecessary energy consumption.

Therefore, since electricity from water conveyance represents a relatively negligible percentage of total electricity use, and night construction activities would be intermittent and would not require electricity, construction activities would not result in the wasteful, inefficient, and unnecessary consumption of electricity, and impacts would be less than significant. In addition, Natural gas is not expected to be consumed in any substantial quantities during construction of the WLC project. Therefore, related to the consumption of natural gas during construction, the Project would have no impact.

In terms of transportation energy, compliance with the anti-idling regulation and the use of cleaner, more energy efficiency construction equipment would reduce the project's annual average diesel fuel usage. As discussed previously, construction of the Project would utilize fuel-efficient equipment consistent with state and federal regulations and would comply with State measures to reduce the inefficient, wasteful, and unnecessary consumption of energy. While these regulations are intended to reduce construction emissions, compliance with them would also result in energy savings. In addition, the Project would implement a construction waste management plan to divert 50 percent of mixed construction and demolition debris to City certified construction and demolition waste processors, consistent with the AB 341. Implementation of the construction waste management plan will likely reduce truck trips to landfills and/or material recovery facilities and increase the amount recycling and reuse of materials.

Based on the available data, construction would utilize energy for necessary on-site activities and to transport construction materials and demolition debris to and from the Project site. As discussed above, idling restrictions and the use of cleaner, energy-efficient equipment would result in less fuel combustion and energy consumption and thus result in the efficient use of the Project's construction-related energy. Construction of the WLC project would benefit from California's Pavley/Advanced Clean Car (ACC) standards that are designed to result in more efficient use of transportation fuels, because they would affect the vehicles used by workers and any light-duty trucks used by vendors or haulers. These vehicle efficiency standards are the most stringent in the nation and among the most stringent in the world. In addition, the Project would reduce fuel use by requiring that construction equipment greater than 50 horsepower be USEPA Tier 4 emissions compliant and by limiting on-site idling of all diesel-powered construction equipment, delivery vehicles, and delivery trucks to three minutes in any one hour, as specified in **Mitigation Measure 4.3.6.2A**.

Transportation fuel usage during construction represents approximately 0.0051 percent of annual gasoline usage and 0.57 percent of annual diesel usage within Riverside County, respectively, representing a small fraction of the County's total fuel demand. In conjunction with California's stringent vehicle efficiency standards, the Project would not result in the wasteful, inefficient, and unnecessary consumption of energy.

During operations, the Project will implement commitments and strategies to lower electricity consumption needed for buildings (e.g., lighting, cooling, power equipment, and water conveyance). In 2025, electrical demand will be lowered with implementation of sustainability measures such as high-efficiency lighting and appliances, skylights, and motion sensors, etc. As discussed above, the Project would comply with and exceed the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 sf (representing more than 99 percent of total project square footage at buildout) will be LEED certified. Reliance on grid-supplied power is further offset by the generation of 12 MW of power through on-site rooftop solar photovoltaic (PV) panels. As discussed in the Revised Final EIR Part 1, pg. 48

through 52 (Topical Response E), current MVU rules impose limitations on solar PV capacity. Thus, the Project + Low Electric Vehicle (EV) Penetration (Scenario A) uses approximately 14 percent less electricity than the baseline demand scenario. In 2035, the Project + Low EV Penetration Scenario would use approximately 16 percent less electricity than the 2035 Baseline Scenario.

Although the Project + Medium EV Penetration Scenario would require more power than the Project + Low EV Penetration Scenario, the net electrical demand on MVU would still be 11 percent less than the Baseline Scenario for 2025 due to the energy conservation measures and on-site solar PV generation. For 2035, electricity use would be 12 percent more than the Baseline Scenario due to the much higher EV penetration rates for light-duty passenger cars and medium-duty vehicles consistent with the 2016 Mobile Source Strategy.

The feasibility of using medium and heavy-duty EVs for delivery of goods to or from the WLC is, to a great extent, dependent on the nature of the warehousing operations. For example, many warehouses implement the “drop and drag” procedure, where a truck will bring goods to the facility, and the trailer (or sea-going cargo container) will be disconnected and left on-site for the lengthy process of unloading. An empty trailer may be connected, and the truck quickly departs to return to its point of origin. Conversely, an out-bound truck is usually scheduled to retrieve a delivery load only once the container/trailer is full. Thus, trucks are not on-site or idle for long enough times to obtain a meaningful battery charge. Medium-duty and heavy-duty zero-emission trucks are in the very early stages of commercially market deployment and currently cost substantially more than conventionally fueled trucks, and current funding assistance programs do not fully offset that cost difference (ESA and CALSTART, 2018). Given that the future tenants of the WLC are not known and cannot be identified at this time, it would be speculative to assume the High EV Penetration Scenario would be practicable or feasible by 2025 or by 2035.

In regard to forecasting, such as done with EV penetration rates to generate the scenarios evaluated, the California Supreme Court commented that an agency is required to forecast only to the extent that an activity could be reasonably expected under the circumstances. The Court recognized that an agency cannot be expected to predict the future course of governmental regulation or exactly what information scientific advances may ultimately reveal. *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal. 3d 376. Therefore, in light of the changes to market and regulatory drivers that would have to occur to make medium and heavy-duty EVs widely implemented and feasible by 2025 or 2035 to the now unknown future tenants of the WLC, the potential for the electrical demand projected under the Project + High EV Penetration Scenario to materialize is highly speculative. CEQA Guidelines Section 15145 states “If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact.” Therefore, any effects to energy resources from achieving the Project + High EV Penetration Scenario would be highly speculative, and associated analyses are presented in the Revised Final EIR for informational purposes only.

MVU forecasts that its peak demand in 2025, would be approximately 231,555 MWh per year. This is approximately 25 percent higher than the 185,000 MWh that MVU sold to all customers in its area for the 2015-2016 fiscal year. As shown in Table 4.17-4, the WLC project’s estimated electrical consumption would account for between 74 and 113 percent of MVU’s projected electricity sales depending on the EV penetration scenario for Phase 1 (2025). However, MVU’s 2018 Integrated Resources Plan (IRP) anticipates growth in the

region and specifically considers the electrical demand generated by energy-intensive account focused in the logistics industry. The IRP states that large energy-intensive projects like the WLC project are included in the projected growth. Therefore, it is reasonable to assume that MVU's existing and planned electricity supplies could support the project's electricity demand calculated for the Project + Low EV Penetration (Scenario A) and the Project + Medium EV Penetration (Scenario B) by 2025. Any determination of MVU's need for additional capacity beyond what is planned would be speculative and depend on the cumulative demand within MVU's service area.

MVU's electrical generation is derived from a mix of non-renewable and renewable sources such as coal, natural gas, solar, geothermal, wind, and hydropower. MVU's 2018 Power Integrated Resources Plan identifies adequate resources to support future generation capacity, and a new 115 kV substation is proposed to be constructed within the WLC site. With regard to renewable energy sources, the Project would use electricity provided by MVU, which MVU is required to meet the 2050 Renewable Portfolio Standard. MVU's current source of renewable resources include wind, solar, and hydroelectric and account for 17 percent of MVU's overall energy mix for 2017 (the most current year data is available for). The Project itself is incorporating renewable energy sources with a minimum of 14.1 MW of rooftop solar at buildout to achieve a net-zero energy use for the estimated office demands. At full buildout WLC will feature the equivalent of twenty-seven 60,000 square-foot net-zero office buildings. To put this in context, the entire State of California has about 190 net-zero commercial buildings that are currently verified or designed as of 2017 (CPUC, 2017). This solar commitment would be within the solar PV limitations set by MVU.

In addition to the solar commitment the WLC project would implement energy performance improvement measures to exceed the current minimum Title 24 requirements after Phase 1 and full buildout. Although the Project would result in moderate increases in annual electrical demand compared to MVU's current supply, for the low and medium EV penetration scenarios, MVU is committed to meeting the Project's electricity demand through a future IRP update and planning process. Therefore, with the incorporation of these features, operation of the Project would not result in the wasteful, inefficient, or unnecessary consumption of electricity, would not cause a need for additional capacity regionally or locally, and would not affect electricity resources to the extent that electricity demand can reasonably be projected and assessed.

EMFAC2017 assumes that by 2025, natural gas-powered large trucks (Heavy Heavy Duty Trucks and Medium Heavy Duty Trucks) would represent 2.2 percent of all large trucks in the South Coast Air Basin region. By 2035, the natural gas-powered large truck population slightly increases to 2.5 percent. The natural gas vehicle population at the Project would remain constant for each EV penetration scenario. The WLC project (all scenarios) would also include regularly operating propane-powered yard trucks and CNG-powered forklifts that are typical of large warehouse facilities. Additionally, the Project would include a Compressed Natural Gas/Liquid Natural Gas (CNG/LNG) fueling station on-site that would be publicly available for refueling. As presented in Table 4.17-11, the natural gas use from operational vehicles and the CNG/LNG fueling station would represent approximately 0.037 percent of the statewide natural gas consumption. The analysis assumes a conservative estimate of 204 trucks completely refueling per day based on trip rates presented in the WLC project's traffic study. The traffic study bases trip rates on Institute of Transportation Engineer's code for a gas station with convenience store that has a relatively high trip rate. CNG fueling stations would likely have

less daily visits than a traditional gas station, making the analysis even more conservative. The operational vehicles are also based on conservative assumptions of maximum operating hours of 7 hours for propane-powered yard trucks and 4 hours for CNG forklifts. Realistically, all of the yard trucks would not be operating simultaneously or continuously for 7 hours and forklifts would be used intermittently for the unloading and loading of warehousing goods. Furthermore, the analysis above represents additional natural gas use from vehicles and does not account for CNG/LNG trucks displacing diesel- or gasoline-powered vehicles. In actuality, the CNG/LNG trucks may displace fossil-fueled trucks on the Project site. Even with the conservative assumptions for trip rates, volumes, non-displacement, and operating hours, and without considering the potential benefit of offsetting other vehicle fuels, the natural gas use from operational vehicles and the CNG/LNG fueling station represent a negligible percent of the State's total natural gas use.

According to SoCal Gas data, natural gas sales have been relatively stable over the past three years with a slight increase from 287 billion cubic feet in 2014 to 294 billion cubic feet in 2016. Southern California's natural gas supply is predominantly sourced from out of state with a small portion originating in California. Sources of natural gas are obtained from locations throughout the western United States as well as Canada. According to the US Energy Information Administration (EIA), the United States has approximately 85 years of natural gas reserves based on consumption in 2015. Statewide compliance with energy efficiency standards is expected to result in more efficient use of natural gas and therefore reduced consumption in future years. It is anticipated that SoCal Gas' existing and planned natural gas supplies would be sufficient to support the project's natural gas use and that the CNG/LNG fueling station would have a negligible effect on the natural gas supply.

Operation of the WLC project would benefit from California's Pavley/ACC standards that are designed to result in more efficient use of transportation fuels. These vehicle efficiency standards are the most stringent in the nation and among the most stringent in the world. Operation of the Project would require very small amounts of natural gas to be consumed by vehicles at the site, and in conjunction with California's stringent vehicle efficiency standards, would not result in the wasteful, inefficient, and unnecessary consumption of natural gas. Overall, construction and operations of the Project would not cause a significant waste, inefficient, nor unnecessary consumption of energy, therefore, impacts would be less than significant (Revised Final EIR Part 2, pp. 4.17-25 to pg. 4.17-37).

b. Construction or Expansion of Electrical and Natural Gas Facilities

Potential Significant Impact: Whether the Project could result in the construction or expansion of electrical and natural gas facilities, the construction of which could cause significant environmental effects.

Findings: Potential impacts of the Project related to construction or expansion of natural gas facilities impacts are discussed in detail in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that the Project's potentially significant cumulative impacts related construction or expansion of electrical and natural gas facilities would be reduced to a less than significant level, with implementation of Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.16.1.6.1A, 4.16.1.6.1C, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, and 4.7.6.1D. Changes or alterations have been required in, or incorporated into, the

Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: According to Section 4.16 of the Revised Final EIR Part 4 Volume 3, the WLC Project would consume approximately 376,426 megawatt-hours (MWh) of electricity and almost 14.6 million cubic feet of natural gas per year. The estimated electrical demand assumes no on-site electrical generation by photovoltaic panels.

The WLC Specific Plan requires future installation of solar photovoltaic panels on the roof of each warehouse building to offset the energy demands of the office portion of the building. Utility improvements are based on a “worst-case” assumption that on-site solar electrical generation is not available and electrical service would have to be provided by Moreno Valley Utility (MVU). In addition, partial or complete connection to the existing electrical grid may be necessary even with roof-mounted solar photovoltaic panels so there is redundancy (backup) in case of an emergency or during nighttime when no on-site power is being generated (i.e., some warehouses may operate 24/7). At this time, it is not anticipated that any uses will install sufficient on-site power generation and storage to be totally independent of the existing electrical grid.

A number of Southern California Edison (SCE) facilities would still require relocation and expansion of MVU facilities in order to provide network backup (i.e., if the solar generation equipment were to fail) and accommodate the potential increase in electrical demand no matter the contribution of project alternative energy generated. Power poles, guy poles, and guy anchors for the existing overhead 115 kV line along World Logistics Center Parkway and Gilman Springs Road will need to be relocated at the time these roadways are widened. The portion of the existing 115 kV line along Eucalyptus Avenue may also need to be relocated into the new Eucalyptus Avenue alignment between World Logistics Center Parkway and Gilman Springs Road at the time the roadway is constructed. The existing 115 kV line along Brodiaea Avenue may be able to be protected in place except for a few hundred feet where the transmission line intersects with the new Merwin Street, which will need to be relocated to accommodate street and storm drain channel improvements.

The existing 12 kV overhead power distribution lines along Redlands Boulevard will need to be undergrounded when the roadway is developed to its ultimate width. The existing 12 kV overhead power feeder lines located along World Logistics center Parkway and Alessandro Boulevard will need to be relocated and undergrounded as these roadway improvements take place during the development of the WLC project. The existing 12 kV overhead power feeder line running south along Virginia Street to the Moreno Compressor Station (planned as Open Space) will be protected in place. The existing overhead service lines from the World Logistics Center parkway 12 kV line along Dracaea Avenue to the east and along Cottonwood Avenue to the west can be abandoned when existing on-site residences served by these facilities are abandoned. Per SCE requirements, SCE 12 kV undergrounded lines cannot be in a common trench with MVU facilities and require a separate underground facility with a minimum 6 feet from other utility lines.

Based on the *Technical Memorandum – Dry Utilities World Logistics Center, Moreno Valley, CA*, (Revised Final EIR Appendix N Utility Specialists, September 2014) prepared for the WLC project, construction of the first three logistics buildings that would occur during the initial phase of construction can be served by the existing MVU substation at Cottonwood Avenue and Moreno Beach Drive, as long as capacity is still available

at that station. Subsequent construction of buildings in Phase 1 will require the expansion of this substation. The expansion that would occur to meet this demand would be the addition of two new 28 MW transformer units which can be accommodated within the existing substation property. New 12 kV underground feeder circuits, including trenching, conduit, electrical vaults, and conductors will need to be installed from the substation to the WLC Project site. These improvements will occur along Cottonwood Avenue, along Moreno Beach Drive, and along Alessandro Boulevard, Brodiaea Avenue, and Cactus Avenue. These improvements are expected to take place concurrently with roadway construction.

To meet the WLC Project's ultimate annual demand of 376,426 MW, a new 112 MW substation will be constructed within the Project site at a central location near one of SCE's 115 kV transmission lines that will feed power to the substation. The *Dry Utilities* memo for the Project indicates two potential locations; the first adjacent to the SCE transmission lines along Gilman Springs Road, and the other adjacent to the SCE transmission lines along Brodiaea Avenue. Impacts of constructing the new station at either of these on-site locations will be the same. All MVU primary distribution conductors within the Project will be installed within underground conduits and vaults within the public roadway rights-of-way or within easements as a joint trench with telephone, cable television, and natural gas. Since the installation or relocation of electrical facilities would take place concurrently with roadway construction and/or within dedicated easements, or protected in place, the construction of these facilities would not result in any additional significant environmental effects.

Relocation of natural gas transmission lines within the WLC site into public street rights-of-way and easements will be necessary to support site development and grading. These include 11,100 feet of the 30-inch gas pipeline in Cottonwood Avenue from Redlands Boulevard to World Logistics Center Parkway and then southeast to the Virginia Street and Alessandro Boulevard intersection; 1,900 feet of 30-inch gas line from Gilman Springs Road at Lisa Lane southwest to Alessandro Boulevard; 1,000 feet of 16-inch gas line owned by Questar from Gilman Springs Road southwest to Alessandro Boulevard and 4,000 feet of 16-inch gas line owned by Questar on the Maltby Avenue alignment from Merwin Street to World Logistics Center Parkway. The remaining transmission gas lines are anticipated to be protected in place within the proposed streets or easements between buildings. The regulator station located at the southeast corner of Gilman Springs Road and Laurene Lane east of the WLC project area will need to be relocated as part of the widening of this road. The gas facility on Alessandro Boulevard and Virginia Street will remain in place as the Project develops in this area. The SDG&E natural gas compression station on Virginia Street south of the Project site, known as the Moreno Compressor Station, along with a smaller facility on Virginia Street at Boadicea Avenue will be protected in place. Since the installation or relocation of natural gas facilities would take place concurrently with roadway construction and or within dedicated easements, or protected in place, the construction of these facilities would not result in any additional significant environmental effects (Revised Final EIR Part 2, pg. 4.17-37 to pg. 4.17-39).

c. Energy Standards, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project would conflict with any applicable energy standards, policies, or regulations which may cause significant environmental effects.

Findings: Potential impacts of the Project related to energy regulations were analyzed in detail in Section 4.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Commission finds that the Project’s potentially significant cumulative impacts related to energy standards, policy and regulation consistency would be reduced to a less than significant level, with implementation of Mitigation Measures 4.3.6.2A, 4.3.6.3B, 4.3.6.4A, 4.16.1.6.1A, 4.16.1.6.1C, 4.7.6.1A, 4.7.6.1B, 4.7.6.1C, and 4.7.6.1D. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project would comply with applicable CARB regulations restricting the idling of heavy-duty diesel motor vehicles and governing the accelerated retrofitting, repowering, or replacement of heavy-duty diesel on- and off-road equipment. As discussed in Section 4.7, Greenhouse Gas Emissions, CARB has adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. The measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than five minutes at any given time. While intended to reduce construction emissions, compliance with the above anti-idling and emissions regulations would also result in energy savings from the use of more fuel-efficient engines. According to the CARB staff report that was prepared at the time the anti-idling Airborne Toxic Control Measure was being proposed for adoption in late 2004/early 2005, the regulation was estimated to reduce non-essential idling and associated emissions of diesel particulate matter and nitrogen oxide (NOX) emissions by 64 and 78 percent respectively in analysis year 2009. These reductions in emissions are directly attributable to overall reduced idling times and the resultant reduced fuel consumption. Mitigation Measure 4.3.6.2A includes a stricter provision that would limit idling to no more than three minutes in any one hour. Therefore, fuel savings have the potential to be even more than those estimated from the Airborne Toxic Control Measure.

CARB has also adopted emission standards for off-road diesel construction equipment of greater than 25 hp. The emissions standards are referred to as “tiers,” with Tier 4 being the most stringent (i.e., least polluting). The requirements are phased in, with full implementation for large and medium fleets by 2023 and for small fleets by 2028. The Project would accelerate the use of cleaner construction equipment by using mobile off-road construction equipment greater than 50 horsepower (wheeled or tracked) that meets, at a minimum, the Tier 4 off-road emissions standards as specified in Mitigation Measure 4.3.6.2A. Field testing by construction equipment manufacturers has shown that higher tier equipment results in lower fuel consumption. For example, Tier 4 interim engines have shown a 5 percent reduced fuel consumption compared to a Tier 3 engine. Similar reductions in fuel consumption have been shown for Tier 3 engines compared to a Tier 2 engine.

The Project would comply with and exceed (through its project design features [PDFs] and mitigation measures) the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 square feet will be designed to be LEED-certified. According to the California Energy Commissions (CEC), buildings compliant with the Title 24 (2019) standards should use 5 percent less energy for lighting, heating, cooling, ventilation, and water heating than the prior Title 24 (2013) standards for nonresidential uses. As specified in the Project Design Features, the Project would include

numerous energy and waste reduction features that would allow the project to comply with or exceed the Title 24 standards and achieve energy savings equal to or greater than what is required by state regulations.

With respect to operational transportation-related energy, the WLC project would support statewide efforts to improve transportation energy efficiency and reduce transportation fuel consumption with respect to private automobiles. In particular, the Project would provide the infrastructure for supporting a higher population of electric vehicles, in direct support of the state's targets of 1.5 million Zero Emission Vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2040. WLC will accommodate ZEV technologies by planning for appropriate on-site charging infrastructure. To that end, the Project will construct the WLC parking areas with cable raceways for installing future EV charging stations, which will enable WLC to more readily and cost effectively provide this service to future tenants if and when demand dictates. The Project would also include the installation of electric vehicle supply equipment pursuant to Title 24, part 6 of the CALGreen Code. Thus, the Project would comply with existing energy standards (Revised Final EIR Part 2, pg. 4.17-38 to pg. 4.17-39).

14. Cumulative Energy

a. Energy Standards, Policy, Regulation Consistency

Potential Significant Impact: Whether the Project in connection with past, present, and probable future projects would conflict with any applicable standards, policies, or regulations which may cause significant environmental effects.

Findings: Potential cumulative impacts of the Project related to energy regulations were analyzed in detail in Section 6.17 of the Revised Final EIR Part 2. Based on the entire record before us, this Planning Commission finds that potentially significant cumulative impacts related to consistency with energy standards, policy and regulations would be reduced to a less than significant level. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program.

Facts in Support of the Findings: The Project would comply with applicable CARB regulations restricting the idling of heavy-duty diesel motor vehicles and governing the accelerated retrofitting, repowering, or replacement of heavy-duty diesel on- and off-road equipment. As discussed in Section 4.7, Greenhouse Gas Emissions, CARB has adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. The measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than five minutes at any given time. While intended to reduce construction emissions, compliance with the above anti-idling and emissions regulations would also result in energy savings from the use of more fuel-efficient engines. According to the CARB staff report that was prepared at the time the anti-idling Airborne Toxic Control Measure was being proposed for adoption in late 2004/early 2005, the regulation was estimated to reduce non-essential idling and associated emissions of diesel particulate matter and nitrogen oxide (NOX) emissions by 64 and 78 percent respectively in analysis year 2009. These reductions in emissions are directly attributable to overall reduced idling times and the resultant reduced fuel consumption. Mitigation Measure 4.3.6.2A includes a stricter provision that would limit idling to no more than three minutes in any one hour.

Therefore, fuel savings have the potential to be even more than those estimated from the Airborne Toxic Control Measure.

CARB has also adopted emission standards for off-road diesel construction equipment of greater than 25 hp. The emissions standards are referred to as “tiers,” with Tier 4 being the most stringent (i.e., least polluting). The requirements are phased in, with full implementation for large and medium fleets by 2023 and for small fleets by 2028. The Project would accelerate the use of cleaner construction equipment by using mobile off-road construction equipment greater than 50 horsepower (wheeled or tracked) that meets, at a minimum, the Tier 4 off-road emissions standards as specified in Mitigation Measure 4.3.6.2A. Field testing by construction equipment manufacturers has shown that higher tier equipment results in lower fuel consumption. For example, Tier 4 interim engines have shown a 5 percent reduced fuel consumption compared to a Tier 3 engine. Similar reductions in fuel consumption have been shown for Tier 3 engines compared to a Tier 2 engine.

The Project would comply with and exceed (through its project design features and mitigation measures) the applicable provisions of Title 24 and the CALGreen Code in effect at the time of building permit issuance and buildings over 500,000 square feet will be designed to be LEED-certified. According to the California Energy Commission, buildings compliant with the Title 24 (2019) standards should use 5 percent less energy for lighting, heating, cooling, ventilation, and water heating than the prior Title 24 (2016) standards for nonresidential uses. As specified in the Project’s Design Features, the Project would include numerous energy and waste reduction features that would allow the project to comply with or exceed the Title 24 standards and achieve energy savings equal to or greater than what is required by state regulations.

With respect to operational transportation-related energy, the WLC project would support statewide efforts to improve transportation energy efficiency and reduce transportation fuel consumption with respect to private automobiles. In particular, the Project would provide the infrastructure for supporting a higher population of electric vehicles, in direct support of the state’s targets of 1.5 million Zero Emission Vehicles (ZEVs) by 2025 and 4.2 million ZEVs by 2040. WLC will accommodate ZEV technologies by planning for appropriate onsite charging infrastructure. To that end, the Project will construct the WLC parking areas with cable raceways for installing future EV charging stations, which will enable WLC to more readily and cost effectively provide this service to future tenants if and when demand dictates. The Project would also include the installation of electric vehicle supply equipment pursuant to Title 24, part 6 of the CALGreen Code. Thus, the project would comply with existing energy standards (Revised Final EIR Part 2, pg. 4.17-38 to pg. 4.17-39).

C. ENVIRONMENTAL IMPACTS NOT FULLY MITIGATED TO A LEVEL OF LESS-THAN-SIGNIFICANT

The Moreno Valley Planning Commission finds the following environmental impacts identified in the Revised Final EIR remain significant and unavoidable even after application of all feasible mitigation measures: aesthetics (individually and cumulative), air quality (individually and cumulative), land use and planning, noise, and transportation. In accordance with CEQA Guidelines Section 15092(b)(2), the Planning Commission of the City of Moreno Valley cannot approve the Project unless it first finds (1) under *Public Resources Code* Section 21081(a)(3), and CEQA Guidelines Section 15091(a)(3), that specific economic, legal, social technological, or other considerations, including provisions of employment opportunities to highly

trained workers, make infeasible the mitigation measures or Project alternatives identified in the Revised Final EIR; and (2) under CEQA Guidelines section 15092(b), that the remaining significant effects are acceptable due to overriding concerns described in the CEQA Guidelines Section 15093 and, therefore, a Statement of Overriding Considerations is included herein (refer to Section XX of these findings); or (3) that under Public Resources Code Section 21081(a)(2) and CEQA Guidelines Section 15091(a)(2) changes or alterations are within the responsibility and jurisdiction of other public agencies and not the City. Such changes can and should be adopted by other agencies.

1. Aesthetics (Individual and Cumulative Impacts)

a. Scenic Vistas

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could have adverse effects on one or more scenic vistas, notably views of the Badlands, Mount Russell Range, and Mystic Lake/San Jacinto Wildlife Area.

Finding: Potential impacts of the Project related to light and glare impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on scenic vistas and therefore impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, the nearest sensitive permanent visual receptors would be the existing single-family residences to the west and southwest along Redlands Boulevard. In addition, the views of the motoring public along SR-60, Gilman Springs Road, Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard would be significantly affected as well. At present, the Skechers building blocks views of the site for travelers on SR-60 who are immediately north of the Skechers building.

One of the development requirements of the Specific Plan is to have the heights of the buildings along the north, west and south perimeter of the site, including SR-60, be approximately the same height as the existing Skechers building (i.e., approximately 55 feet above a ground elevation of 1,740 feet above mean sea level (amsl)). This means, as the site elevation decreases to the south, taller buildings theoretically could be built as long as they do not exceed 1,795 feet elevation (i.e., height above sea level, not building height above ground). This would result in seeing only the buildings adjacent to the freeway for eastbound travelers on SR-60, but it would adversely affect views from other locations around the WLC Specific Plan site regardless of the height comparison to the Skechers building. The motoring public heading westbound on SR-60 would experience impacts to their views of Mount Russell.

Many of the views of the motoring public while on local roadways will fundamentally change instead of views of open agricultural land, these residents and motorists will view new logistics buildings and the associated parking areas, roadways, infrastructure, and landscaping. Therefore, the Project will have a significant visual impact. The degree to which these buildings may block views of major scenic resources (i.e., Mount Russell, the Badlands, and Mystic Lake) will depend on the location and heights of buildings.

This impact requires mitigation; however, this change in views, while substantial, is anticipated in the City's General Plan, which allows development within the Project area. The WLC Specific Plan would develop the site with logistics warehouse buildings (maximum height 60–80 feet), so this change in itself would represent a significant visual impact. In addition, the eventual change in views from existing (baseline) conditions is substantial and is considered a significant visual impact on scenic vistas. After implementation of the **Mitigation Measures 4.1.6.1A** through **4.1.6.1C**, adverse effects on scenic vistas would remain significant and unavoidable due to the fundamental change in public views for residents within and surrounding the Project site, for travelers on SR-60, Gilman Springs Road, Redlands Boulevard, World Logistics Center Parkway, and Alessandro Boulevard, and for users of the San Jacinto Wildlife Area. (Revised Final EIR Part 4 Volume 3, pgs. 4.1-61 to 4.1-73 and 4.1-82 to 4.1-83).

b. Scenic Resources and Scenic Highways

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could have a significant impact on the views of scenic resources for motorists traveling on SR-60 and Gilman Springs Road.

Finding: Potential impacts of the Project related to scenic resources and scenic highways impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project-related impacts to scenic vistas and scenic highways will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.1 of the Revised Final EIR Part 4 Volume 3, the City of Moreno Valley identifies SR-60 and Gilman Springs Road as local scenic roads. According to the City's General Plan EIR, major scenic resources within the Moreno Valley study area are visible from SR-60, and Gilman Springs Road, both of which are City-designated local scenic roadways. Development of the Project would significantly alter the existing view by introducing large industrial buildings adjacent to the freeway. Existing eastbound and westbound views on SR-60 and Gilman Springs Road would be fundamentally altered with the future development of the Project.

The perimeter portions of the site will have buildings with heights up to 60 feet, and some of the buildings south of Street C (southeastern portion of the site but not adjacent to the San Jacinto Wildlife Area), would

have heights of up to 80 feet. Since the Skechers building (roof height approximately 1,790 feet amsl) is already visible throughout the Project site and from off-site areas to the east, south, and southwest, it is likely that most new buildings will be visible from these areas or possibly even farther away, depending on building heights and locations. The use of light colors and reflective surfaces such as glass and polished metal near office entrances and building corners, such as required in the WLC Specific Plan design guidelines, will enhance the visibility of these buildings.

The proposed sound walls and ornamental landscaping would soften the visual impacts of future buildings, but the Project would likely result in at least a partial obstruction of a portion of the Mount Russell Range for motorists traveling on SR-60, so the proposed buildings may obstruct the view of a major scenic feature from a City-designated scenic route. The Project meets criteria in both the moderate and major visual intrusion categories. Therefore, it is anticipated that the WLC Specific Plan design guidelines may create a major visual intrusion (i.e., significant impact) for motorists traveling on SR-60 and Gilman Springs Road.

The WLC Specific Plan can preserve significant visual features, significant views, and vistas if the size and location of buildings developed under the WLC Specific Plan can be controlled so as to not substantially block views of Mount Russell, the Badlands, and Mystic Lake. The views from SR-60 and Gilman Springs Road will fundamentally change, but their views of major scenic resources (i.e., Mount Russell, the Badlands, and Mystic Lake) may be preserved through careful limitations on the height and location of future buildings. The WLC Specific Plan outlines how future development along SR-60 and Gilman Springs Road will be made visually attractive and can maintain some view corridors of the surrounding mountains and Mystic Lake through careful limitations on the height and location of future buildings. These are considered significant visual impacts on local scenic roads that will require mitigation.

Construction of future logistics warehousing according to the development standards and design guidelines of the WLC Specific Plan will help soften building façades, and the installation of ornamental landscaping will help screen the visual appearance of the buildings from SR-60, but the obstruction of local views will still be significant. Implementation of **Mitigation Measures 4.1.6.1A** through **4.1.6.1D**, **4.1.6.3A**, **4.1.6.4A**, and **4.1.6.4B** will help reduce these impacts, but not to less than significant levels. (Revised Final EIR Part 4, Volume 3, pgs. 4.1-73 to 4.1-76).

c. Existing Visual Character and Surroundings

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project could significantly degrade the existing visual character of the Project site from open space to an urbanized setting by introducing large logistics warehouse buildings.

Finding: Potential impacts of the Project related to visual impacts are discussed in detail in Section 4.1 of the Revised Final EIR Part 4- Volume 3. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with application of this mitigation measure, the Project will have significant Project-related impacts to the existing visual character of the site and will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the

alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Visual impacts associated with changes to the general character of the Project site (e.g., loss of open space), the components of the visual settings (e.g., landscaping and architectural elements), and the visual compatibility between proposed site uses and adjacent land uses would occur. The significance of visual impacts is inherently subjective as individuals respond differently to changes in the visual characteristics of an area. According to Section 1.4 of the Revised Final EIR Part 4 Volume 3, the Project site is currently undeveloped with existing agricultural fields throughout the site. Development of the proposed industrial uses on the Project site would include approximately 40.6 million square feet of warehouse distribution uses with associated parking areas, ornamental landscaping, and roadway and infrastructure on approximately 2,535 acres. Maximum building heights will range from 60 to 80 feet depending on location within the Project and will substantially change the views of both nearby residents and motorists on adjacent roadways.

The Project would also change views for travelers on the adjacent portion of SR-60 and Gilman Springs Road by introducing large industrial buildings in place of vacant agricultural land. The proposed buildings closest to the freeway would most likely have an average height of approximately 55 to 60 feet, although the maximum height may be increased by 10 feet, which would exceed the existing height of the adjacent freeway by approximately 30 feet.

Development of the Project would substantially and fundamentally change the existing character of the Project site from open space to an urbanized setting with many large logistics buildings. The change in the character of the site would constitute a significant alteration of the existing visual character of the WLC Project site, regardless of the architectural treatment and landscaping of the site. These impacts would be especially significant for residents of the existing residences on the Project site, depending on the timing, location, and size of development in the future.

The WLC Specific Plan includes a variety of architectural elements including façade accents such as corner treatments and roof trim. The Project also provides variation in wall planes that serve to avoid an institutional appearance and break up the bulk of the buildings. This variation would create shadow lines at various times of the day.

The proposed setbacks, landscaping, berms, and walls outlined in the Specific Plan appear sufficient to provide adequate visual screening between proposed warehouse buildings and the existing residential uses. However, mitigation is required to ensure the actual design and appearance of setback areas will effectively screen new development from existing residences and neighboring roadways.

However, even with implementation of **Mitigation Measures 4.1.6.1A through 4.1.6.1D, 4.1.6.3A, 4.1.6.4A, and 4.1.6.4B** the substantial change in visual character of the Project site and surrounding area from development of the Project will cause aesthetic impacts to remain significant and unavoidable. (Revised Final EIR Part 4 Volume 3, pgs. 4.1-76 to 4.1-80).

d. Cumulative Aesthetics – Scenic Vistas, Scenic Resources, and Existing Visual Character

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would in connection with past, present, and probable future projects result in cumulative impacts by adversely affecting one or more scenic vistas; scenic resources; and existing visual character.

Finding: Potential impacts of the Project related to cumulative aesthetics impacts are discussed in detail in Section 6.1 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant cumulative effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on scenic vistas, scenic resources, and on existing visual character. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The Project, in combination with other projects in the eastern portion of the City and along SR-60 and Gilman Springs Road, would have a cumulatively significant and unavoidable impact related to views, scenic resources, and existing character in this portion of the City.

The development of the Project would partially obstruct views of surrounding mountain vistas from various vantage points in and around the Project area. Scenic vistas adversely impacted by the project include views of Mount Russell and the foothills surrounding the Lake Perris State Recreation Area, the Badlands, the San Jacinto Wildlife Area and the valley floor. Views from Gilman Springs Road, and other local roadways could be altered by the development of the project in combination with some or all of the cumulative projects. Environmental documents for MV-3 and MV-4 both identified scenic vistas as being significant and unavoidable impacts and that both projects would have cumulative impacts. Both MV-3 or MV-4 identified that there were no feasible measures to reduce impacts on the scenic vistas. MV-3 and MV-4 are considered large warehouse projects with structures and uses that would be similar in character to the structures and uses of the project. Because there are cumulative projects that would result in significant and unavoidable impacts to scenic vistas, the cumulative development within the cumulative geographic areas for aesthetics would result in significant cumulative impacts associated with scenic vistas prior to mitigation.

The size, height, and location of buildings within the Project site are limited by the standards and guidelines contained in the WLC Specific Plan. Mitigation Measures 4.1.6.1A through 4.1.6.1D are recommended to reduce impacts related to the loss of public and private views. After implementation of the proposed mitigation measures, adverse effects on scenic vistas would remain significant and unavoidable due to the change in views for residents within and surrounding the project site, for travelers on SR-60, Gilman Springs Road, Theodore Street, and Redlands Boulevard. Therefore, the project's contribution to cumulative impacts to scenic vistas would be considered cumulatively significant and unavoidable. (Revised Final EIR Part 2, pgs. 6.1-5 to 6.1-9)

2. Air Quality

a. Air Quality Management Plan Consistency

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project has the potential to conflict with implementation of the SCAQMD 2012 Air Quality Management Plan (AQMP).

Finding: Potential impacts of the Project related to Air Quality Management Plan Consistency impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to inconsistencies with the SCAQMD 2012 Air Quality Management Plan and therefore, impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the Project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to the 1993 SCAQMD Handbook, there are two key indicators of consistency with the Air Quality Management Plan (AQMP):

1. Indicator: Whether the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
2. Indicator: A Project would conflict with the AQMP if it would exceed the assumptions in the AQMP in 2012 or increments based on the year of project buildout and phase. The Handbook indicates that key assumptions to use in this analysis are population number and location and a regional housing needs assessment. The parcel-based land use and growth assumptions and inputs used in the Regional Transportation Model run by the Southern California Association of Governments that generated the mobile inventory used by the SCAQMD for AQMP are not available and assumed not to include the project; therefore, the SCAQMD's significance thresholds are used to determine if the project exceeds the assumptions in the AQMP.

Considering the recommended criteria in the SCAQMD's 1993 Handbook, the analysis in the Revised Final EIR utilizes the following criteria to address this potential impact:

- Project's contribution to air quality violations (SCAQMD's first indicator, 1 as listed above);
- Assumptions in AQMP (SCAQMD's second indicator, 2, as listed above); and
- Compliance with applicable emission control measures in the AQMPs (2012 and 2016)

Project's Contribution to Air Quality Violations and Assumptions in AQMP. According to the SCAQMD, the Project is consistent with the AQMP if the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (SCAQMD, 1993, page 12-3). As shown in analyses in Impacts 4.3.6.2, 4.3.6.3, and 4.3.6.4 of the Revised Final EIR Part 2, the Project could violate an air quality standard and therefore, could contribute substantially to an existing or projected air quality violation.

If a project's emissions exceed the SCAQMD regional thresholds for NOX, VOC, PM10, or PM2.5, it follows that the emissions could cumulatively contribute to an exceedance of a pollutant for which the Basin is in nonattainment (ozone, PM10, and PM2.5) at a monitoring station in the Basin. The thresholds are criteria for determining environmental significance and are discussed in the SCAQMD's 1993 Handbook for Air Quality Analysis. An exceedance of a nonattainment pollutant at a monitoring station would not be consistent with the goals of the AQMP—to achieve attainment of pollutants. The Project would exceed the regional emission significance thresholds for VOC, NOX, CO, PM10, and/or PM2.5 prior to mitigation. This means that Project emissions could combine with other sources and could result in an ozone, PM10, or PM2.5 exceedance at a nearby monitoring station. The Basin in which the project is located is in nonattainment for these pollutants; therefore, according to this criterion, the Project would not be consistent with the AQMP. The regional emissions assume a zero baseline for existing emissions on the Project site and therefore assumes that the AQMP had no emissions for the Project site. The regional significance thresholds can be interpreted to mean that if Project emissions exceed the thresholds, then the Project would also not be consistent with the assumptions in the AQMP. Therefore, based on this criterion, the Project could contribute to air quality violations and would not be consistent with the AQMP (Revised Final EIR Part 2, pg. 4.3-37).

Compliance with Emission Control Measures. The second indicator of whether the Project could conflict with or obstruct implementation of the AQMP is by assessing the Project's compliance with the control measures in the AQMPs and the State Implementation Plan (SIP).

2012 AQMP: The Project would comply with all applicable rules and regulations enacted as part of the AQMP. In addition, the AQMP relies upon the SCAG regional transportation strategy, which is in its adopted 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and 2011 Federal Transportation Improvement Plan (FTIP). Included in the RTP/SCS are transportation control measures including active transportation (non-motorized transportation, e.g., biking and walking); transportation demand management; transportation system management; transit; passenger and highspeed rail; goods movement; aviation and airport ground access; highways; arterials; and operations and maintenance.

2016 AQMP: The SCAQMD approved on March 3, 2017 the Final 2016 AQMP. Currently, the 2016 AQMP is being reviewed by the U.S. EPA and CARB. Until the approval of the EPA and CARB, the current regional air quality plan is the Final 2012 AQMP adopted by the SCAQMD on December 7, 2012. Therefore, consistency analysis with the 2016 AQMP has not been included. Nonetheless, the Project would comply with all applicable rules and regulations enacted as part of the 2016 AQMP, including transportation control measures from the 2016 RTP/SCS.

State Implementation Plans. Geographical areas in the State that exceed the Federal air quality standards are called nonattainment areas. The Project area is in nonattainment for ozone, PM10, and PM2.5. SIPs show how each area will attain the Federal standards. To do this, the SIPs identify the amount of pollutant emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions. On September 27, 2007, the CARB adopted its State Strategy for the 2007 SIP. In 2009, the SIP was revised to account for emissions reductions from regulations adopted in 2007 and 2008 and clarifies CARB's legal commitment. Additional recent revisions to the SIP are as follows:

- In 2008, the EPA revised the lead national ambient air quality standard by reducing it to 0.15 µg/m³. On December 31, 2010, the Los Angeles County portion of the Basin was designated as nonattainment for the 2008 lead national standard as a result of exceedances measured near a large lead-acid battery recycling facility. The 2012 Lead SIP for Los Angeles County was prepared by the SCAQMD and addresses the recent revision to the lead national standard and outlines the strategy and pollution control activities that demonstrate attainment of the lead national standard before December 31, 2015. The 2012 Lead SIP was approved May 4, 2012.
- A SIP revision for the deferral nitrogen dioxide standard was prepared in 2012, to address the new 1-hour federal ambient air quality standard for nitrogen dioxide.
- The proposed California Infrastructure SIP revision was considered by the CARB on January 23, 2014. The proposed infrastructure SIP revision is administrative in nature and covers the National Ambient Air Quality Standards (federal standards) for ozone (1997 and 2008), fine particulate matter (PM_{2.5}; 1997, 2006, and 2012), lead (2008), nitrogen dioxide (2010), and sulfur dioxide (2010). The proposed revision describes the infrastructure (authorities, resources, and programs) California has in place to implement, maintain, and enforce these federal standards. It does not contain any proposals for emission control measures.

The SIP takes into account CARB rules and regulations. The Project will comply with applicable rules and regulations as identified in the AQMPs and SIPs and therefore, complies with this criterion.

Although the Project would be consistent with the policies, rules, and regulations in the AQMPs and SIP, the Project must meet all the criteria listed above to be consistent with the AQMPs. The Project could impede AQMP attainment because its construction and operation emissions exceed the SCAQMD regional significance thresholds, and therefore, the Project is considered to be inconsistent with the AQMP.

Applicable SCAQMD regulatory requirements are restated in the mitigation measures identified in Sections 4.3.6.2 and 4.3.6.3 of the Revised Final EIR Part 2. These measures shall be incorporated in all Project plans, specifications, and contract documents. **Mitigation Measures 4.3.6.2A, 4.3.6.2B, 4.3.6.2C, 4.3.6.2D, 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, and 4.3.6.4A** are required.

Overall, implementation of the World Logistics Center project would exceed applicable thresholds for all criteria pollutants, with the exception of SOX, as noted below. Despite the implementation of mitigation measures, emissions associated with the Project cannot be reduced below the applicable thresholds. Construction and operational emissions would be reduced to the extent feasible through implementation of mitigation measures listed above and described below. Construction emissions would be reduced through

implementation of mitigation measures that require the use of Tier 4 construction equipment, reduced idling time, use of non-diesel equipment where feasible, low-VOC paints and cleaning solvents, and dust suppression measures. Operational emissions would be reduced through implementation of mitigation measures that require reduced vehicle idling, use of non-diesel on-site equipment, meeting or exceeding 2010 engine emission standards for all diesel trucks entering the site, electric vehicle charging stations, and prohibition of refrigerated warehouses. In the absence of further feasible mitigation to reduce the Project's emission of criteria pollutants to below SCAQMD thresholds, potential air quality impacts resulting from exhaust from construction equipment will remain significant and unavoidable (Revised Final EIR Part 2, pgs. 4.3-35 to 4.3-38).

b. Construction Emissions

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would to exceed applicable daily thresholds that may affect sensitive receptors. For construction operations, the applicable daily thresholds are:

- 75 pounds per day of ROC/VOC;
- 100 pounds per day of NO_x;
- 550 pounds per day of CO;
- 150 pounds per day of PM₁₀;
- 150 pounds per day of SO_x; and
- 55 pounds per day of PM_{2.5}.

Finding: Potential impacts of the Project related to construction emission impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on construction emission impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Grading and other construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. The use of construction equipment on-site would result in localized exhaust emissions. Activity during peak grading days typically generates a greater amount of air pollutants than other Project construction activities.

While the actual details of the future construction schedule are not known, it is expected that Project construction would occur in two phases with the construction of Phase 1 occurring over five years and the

construction of Phase 2 occurring over ten years. Appendix A.1 of the Revised Final EIR Part 2 includes details of the emission factors and other assumptions.

Table 4.3-8 (Revised Final EIR Part 2 pg. 4.3-40) identifies projected emissions resulting from grading and construction activities for the World Logistics Center project and shows the estimated maximum daily construction emissions over the course of Project construction prior to the application of mitigation.

The construction emissions estimates summarized in Table 4.3-8 are based on the assumed construction scenario described in Appendix A.1, of this Revised Final EIR Part 2. Using emission factors from the CalEEMod model for off-road sources and EMFAC2017 emission factors for on-road sources, Table 4.3-8 indicates that construction emissions of criteria pollutants would exceed the SCAQMD daily emission thresholds for all criteria pollutants (VOC, NOX, CO, PM10, and PM2.5), with the exception of SOX. This is a significant impact requiring mitigation.

Fugitive dust emissions are generally associated with land clearing and exposure of soils to the air and wind and cut-and-fill grading operations. Dust generated during construction varies substantially by project, depending on the level of activity, the specific operations and equipment, local soils, and weather conditions at the time of construction. The World Logistics Center project will be required to comply with SCAQMD Rules 402 and 403 to control fugitive dust. There are a number of feasible control measures that can be reasonably implemented to significantly reduce PM10 emissions from construction.

As identified in Table 4.3-8, fugitive dust and exhaust emissions during the anticipated peak construction day for the World Logistics Center project would exceed SCAQMD daily construction thresholds. The percentage of dust and exhaust varies by year but for PM10 is an average of 85 percent dust and 15 percent exhaust. PM2.5 has an average of 54 percent dust and 46 percent exhaust.

Concrete pouring would likely occur during nighttime hours due to limitations high temperatures pose for concrete work during the day. On-site equipment used during concrete pouring would involve daytime preparation with actual concrete pouring occurring during the nighttime hours. On average, the total hours of operation for each piece of equipment during the concrete phase would be approximately 10 hours. Therefore, maximum daily emissions presented in Table 4.3-8 represent the average concrete pour day. However, under rare occurrences, extended concrete pour days may be required. Table 4.3-9 (Revised Final EIR Part 2, pg. 4.3-41) summarizes daily maximum emissions for each year of construction associated with 24-hour operation of on-site building concrete equipment. As shown in Table 4.3-9, maximum 24-hour concrete pour days would exceed SCAQMD thresholds for NOX. However, all maximum daily emissions are less than those for the worst-case construction day as summarized in Table 4.3-8. Therefore, rare 24-hour concrete pour days would be within the estimated worst-case construction day assumptions. No further analysis of 24-hour concrete pour days is required.

Similar to extended concrete pouring days, other phases of construction such as utility installation and building construction may require an occasional extended construction day based on the task at hand and schedule goals. Occasional extended construction hours would occur for specific tasks within specific planning areas as needed (determined on a day-to-day basis) and would not occur site-wide throughout the 15-year construction period. Therefore, it is anticipated that estimated yearly maximum construction day emissions, as summarized

in table 4.3-8, represent the realistic worst-case regional construction emissions for the 15-year construction duration.

The World Logistics Center project is required to comply with regional rules that assist in reducing short-term air pollutant emissions. SCAQMD Rule 402 requires implementation of dust-suppression techniques to prevent fugitive dust from creating a nuisance off-site. SCAQMD Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Applicable dust suppression techniques from Rule 403 are summarized below. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM10 component). Compliance with these rules would reduce impacts on nearby sensitive receptors. The applicable Rule 403 measures are as follows:

- All clearing, grading, earthmoving, or excavation activities shall cease when winds exceed 25 miles per hour per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the project are watered at least three times daily during dry weather. Watering, with complete coverage of disturbed areas, shall occur at least three times a day, preferably in the mid-morning, afternoon, and after work is done for the day.
- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 0.6 meter (2 feet) of freeboard (vertical space between the top of the load and top of the trailer) in accordance with the requirements of California Vehicular Code Section 23114.
- The contractor shall ensure that traffic speeds on unpaved roads and project site areas are 15 miles per hour or less to reduce fugitive dust haul road emissions.

SCAQMD Rule 1113 regulates the sale and application of architectural coatings. Rule 1113 is applicable to any person who applies or solicits the application of any architectural coating within the Basin. Rule 1113 sets limits on the amount of ROG or VOC emissions allowed for all types of architectural coatings. Compliance with Rule 1113 means that architectural coatings used during construction would have ROG or VOC emissions that comply with these limits.

Overall, as shown in Table 4.3-10 (Revised Final EIR Part 2, pg. 4.3-44), construction emissions are still significant after mitigation, with the exception of PM2.5 and SO2. The reduction in PM2.5 emissions is by a reduction in exhaust from the application of Tier 4 off-road equipment. PM10 emissions are still significant because emissions in 2022, 2023, 2024, and 2028 exceed the threshold; however, emissions of PM10 during all other years of construction are less than significant. Although mitigation reduces emissions of all pollutants (with the exception of CO due to how CalEEMod calculates Tier 4 emissions) during construction, potential air quality impacts resulting from exhaust from construction equipment and fugitive dust will remain significant and unavoidable.

c. Localized Construction and Operational Air Quality Impacts

Significant Unavoidable Impact. The Revised Final EIR evaluated and concluded that construction and operation of the Project would to exceed localized significance daily thresholds that may affect sensitive receptors.

Finding: Potential impacts of the Project related to localized construction and operational air quality impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects on localized construction and operational air quality impacts and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: The localized significance threshold (LST) analysis evaluated four conditions:

- Project Build Out (2020): this condition assumes that Phase 1 and Phase 2 of the Project are fully built out in 2020 as a worst-case scenario.
- 2022, the year when the Project emissions from both Project construction and operation are at their highest combined levels for several pollutants; and when construction activities would occur near the existing residences west of the Project boundary along Merwin Street;
- 2025, the earliest year Phase 1 is assumed to be fully operational. When the projected construction schedule would result in construction activities in the southern portion of the Project adjacent to Alessandro Boulevard and east of the existing residential areas along Merwin Street, and when all of Phase I operations would occur (approximately 57 percent of entire Project floor space); and
- 2035 when Phase 1 and Phase 2 of the Project are fully operational.

Project Full Build Out under 2020 conditions represents hypothetical worst-case conditions in that the Project physically could not be built-out in 2020 or, in fact, in any single year due to the size of the Project. These conditions have been included in this assessment to correspond to the analysis scenarios examined in the project TIA. These conditions also do not account for the fact that vehicle emissions are expected to decline over time as vehicle emission control technologies improve. Thus, consideration of these conditions will significantly overestimate the Project's potential air quality impacts. The 2022, 2025, and 2035 conditions represent the logical and realistic development of the Project over a period of 15 years as represented by the Project applicant. The LST analysis is presented for each condition below.

Pursuant to the SCAQMD's LST methodology, only emissions generated from emission sources located within and along the Project boundaries are included in the LST assessment. These emission sources include vehicle travel on the roadway network within and along the borders of the Project and emissions from support equipment including forklifts, yard/hostler trucks, and emergency standby electric generators.

The Project Full Build Out (2020) LST Assessment

The localized assessment results for the Project Phase 1 and Phase 2 Full Build Out (2020) condition are provided in Table 4.3-11 (Revised Final EIR Part 2, pg. 4.3-46) for receptors located within the Project boundaries and in Table 4.3-12 (Revised Final EIR Part 2, pg. 4.3-47) for receptors located outside the Project's boundaries along with a comparison to the SCAQMD's localized significance thresholds. The significance thresholds for CO and nitrogen dioxide are derived from the measured ambient air quality data from the SCAQMD Riverside air monitoring station and serve as the measure of existing air quality.

As noted from Table 4.3-11, the Project would exceed the SCAQMD's significance thresholds for the annual PM10 threshold for receptors located within the Project's boundaries. As shown in Table 4.3-12, the significance thresholds would not be exceeded at any sensitive receptor located outside of the Project boundaries (Revised Final EIR Part 2, Pg. 4.3-46).

It is important to note the Project Phase 1 and Phase 2 Full Build Out (2020) condition assumes that the Project's emissions are at the levels that would occur in 2020. The majority of the Project's operational emissions are from on-road mobile sources, more particularly, heavy-duty trucks that contribute a disproportionate amount of emissions compared to passenger vehicles. Emissions from on-road mobile sources are regulated at the State and Federal levels and, therefore, are outside of the control of local agencies such as the City and the SCAQMD. For example, the CARB is working closely with the USEPA, engine and vehicle manufacturers, and other interested parties to identify programs that will reduce emissions from heavy-duty diesel vehicles in California. Emission reductions arise from a combination of measures including the use of ultra-low sulfur diesel fuel, new emission standards for large diesel engines, restrictions on diesel engine idling, addition of post-combustion filter and catalyst equipment, and retrofits for business and government diesel truck fleets. The implementation of these emission reductions will also result in reductions of other pollutants such as NOX, VOC, and CO. As these emission reduction programs are implemented and there is a turnover in the use of older vehicles with newer and cleaner vehicles, the Project's operational emissions are expected to decline significantly in the future. Emission controls on mobile source vehicles already adopted by the CARB particularly dealing with NOX and PM10 controls on heavy-duty trucks will reduce truck emissions significantly over time. Thus, Project (2020) conditions represent highly conservative estimates, in terms of overestimating of the Project's operational impacts.

Project Development Schedule LST Assessment

The final localized threshold assessment condition examined potential local Project impacts considering the proposed construction and build-out schedule of the Project over a time period of 15 years from the commencement of construction in 2020 to the final build-out and occupation in 2035. This condition examined three specific time periods:

- The Project's on-site maximum daily and annual construction emissions were estimated using the CalEEMod land use emission model and the construction equipment inventory and activities provided by the applicant. The Project's on-site operational emissions, principally from the Project's mobile sources, were derived from detailed traffic volume data provided by the project's TIA that reflects a completely operational Phase 1. The TIA applied a comprehensive regional transportation model to develop daily and peak hour traffic volumes

for 2025 and buildout from the Project's mobile sources.

Peak hour and daily Project traffic volumes were developed for each year from 2020 to buildout for roadway segments within and along the boundaries of the Project using the following assumptions:

- Project operational traffic volumes were assumed to be zero in 2020, the year that Project construction would commence.
- Traffic volumes for the years 2021 to 2024 (the completion year for Phase 1 operations) were interpolated from 2025 volumes provided in the TIA by applying the annual Project occupancy schedule to the 2025 traffic volumes.
- Traffic volumes for the years 2026 to 2034 were interpolated from the provided traffic volumes at buildout by applying the annual Project occupancy schedule.

Localized Impact Analysis, 2025. The localized impacts for the short-term construction and operational activities were analyzed using an air dispersion model (EPA AERMOD Model) to simulate the transport and dispersion of Project-related emissions through the air. These impacts were then compared to the applicable SCAQMD localized concentration thresholds.

The estimated maximum localized air quality impacts from the construction and operation of the Project at Phase 1 buildout are summarized in Table 4.3-13 for locations within the Project's boundaries. These maximum impacts were found at the locations of the existing residences within the Project boundaries. Table 4.3-14 summarizes the highest air quality impacts for sensitive receptors located outside of the Project boundaries. These maximum impacts were found at the locations of the existing residences outside of the Project boundary located west of the Project boundary along Merwin Street. As noted from these two tables, Project impacts would exceed the significance thresholds for PM10 for locations within and outside the Project boundaries, thus represents a significant impact without mitigation (Revised Final EIR Part 2, pg. 4.3-48).

Localized Air Quality Impact Analysis, 2022. The year 2022 was selected for the LST Analysis for two principal reasons: 1) the year 2022 corresponds to the year with the highest combined total on-site construction and operational emissions for NOX and PM2.5, the second-highest on-site emissions for CO, and the fourth-highest on-site emissions of PM10; and 2) the location of the building construction in 2022 places the construction emissions nearest to the existing residences located west of the Project boundary along Merwin Street.

The Project's maximum combined impacts from construction and operations during 2022 are shown in Table 4.3-15 for the existing sensitive receptors located within the Project boundaries along with the SCAQMD-recommended significance thresholds. Table 4.3-16 shows the maximum combined impacts for sensitive receptors located outside of the Project boundaries. Maximum impacts outside of the Project boundary were found within the residential areas located to the west of the Project boundary. As shown in these tables, the Project would exceed the SCAQMD's significance thresholds for PM10 at locations within the Project boundary and outside of the Project boundary and NOX within the Project boundary (Revised Final EIR Part 2, pg. 4.3-49 to 4.3-51).

Localized Air Quality Impact Analysis, 2035. The year 2035 represents a long-term planning year when both phases of the Project would be fully in operation. Operational emissions during 2035 were estimated based on the Project’s trip generation and project-related travel along the local roadway network within and along the Project boundaries. Table 4.3-17 shows the maximum localized air quality impacts for 2035 relative to the background air quality levels at the existing sensitive receptors located within the Project boundaries. Table 4.3-18 identifies the highest localized impacts for sensitive receptors located outside of the Project boundaries. As shown in Table 4.3-17 and Table 4.3-18, the Project would exceed PM10 LSTs for receptors within and outside the Project boundary, and would, therefore, represent a significant impact without mitigation.

Overall the localized significance analysis demonstrates that without mitigation, the Project would exceed the localized significance thresholds for NOX and PM10 for one or more of the LST assessment years (2022, 2025, or 2035) analyzed. Therefore, according to this criterion, the air pollutant emissions would result in a significant impact and could exceed or contribute to an exceedance of the national 1- hour NO2 annual, as well as the 24-hour and annual PM10 ambient air quality standards.

Mitigation measures identified under Impact 4.3.6.2 (**Mitigation Measures 4.3.6.2A, 4.3.6.2B, 4.3.6.2D and 4.3.6.2E**) to reduce construction emissions of criteria pollutants are required. The Project will also be required to comply with SCAQMD Rules 402 and 403. Additionally, mitigation measures 4.3.6.3A, 4.3.6.3B, 4.3.6.3C, 4.3.6.3D, 4.3.6.3E, and 4.3.6.3F are required to reduce emissions of criteria pollutants during Project operations. After application of mitigation, the Project would continue to exceed the localized significance thresholds at one or more of the existing residences located within and outside the Project boundaries for PM10 (24-hour and/or annual) (Revised Final EIR Part 2, pgs. 4.3-45 to 4.3-55).

d. Long-Term Operational Emissions

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that implementation of the Project would have the potential to exceed applicable daily thresholds for operational activities.

Finding: Potential impacts of the Project related to long-term operational emissions are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects of long-term operational emissions and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Long-term air pollutant emission impacts that would result from the Project are those associated with stationary sources (generators, forklifts, etc.), area sources (landscaping and

maintenance activities), and mobile sources (e.g., emissions from the use of motor vehicles by Project generated traffic. As discussed in Section 4.3.3.2 of the Revised Final EIR Part 2, the TIA provides Vehicle Miles Traveled (VMT) attributable to the project based on the net effect the Project would have on regional travel as well as Project VMT without consideration of a net effect. The emissions from the net effect on VMT, in conjunction with the proposed stationary and area sources, are shown in the Revised Final EIR Part 2 for determination of significance even though VMT does not represent a CEQA impact for the Project.

Worst-Case Scenario. Projected emissions resulting from operational activities of the Project under the worst-case scenario are identified in Table 4.3-20 on page 4.3-56 of the Revised Final EIR Part 2. As identified in Table 4.3-20, operational emissions for the Project would exceed SCAQMD daily operational thresholds for all criteria pollutants with the exception of SOX for the “worst-case” 2020 scenario.

There may be minor emissions of VOC from the fueling station, depending on what type of fuel is used. However, details regarding the fueling station are currently unknown so the emission source is not estimated. This is a worst-case analysis because it assumes that the entire Project would be built-out in 2020. The motor vehicle and truck emission factors are from 2020, which assumes a “dirtier” fleet than would be the case in later years. In addition, no reductions are taken for mitigation measures.

Operational Regional Emissions. Table 4.3-21 shows the detailed operational emission sources generated both on-site and off-site for Phase 1 and buildout. The table shows particulate matter (PM10 and PM2.5) divided into dust (roadway and tire and brake wear) and exhaust sources. As shown in the table, emissions of VOC, NOX, CO, PM10, and PM2.5 are significant after completion of Phase 1 and after full buildout.

Table 4.3-22 shows the operational emissions year by year using emission factors interpolated from 2025 and 2035 emission factors. The VOC, NOX, CO, PM10, and PM2.5 emissions would be over the SCAQMD’s significance thresholds for most years. The emissions demonstrate that although the number of vehicles and trucks would increase year by year, the emissions do not increase dramatically because the per vehicle emission factors decrease over time as cleaner vehicles enter the fleet.

Combined Construction and Operation. There would be overlapping of construction and operational emissions with Project implementation. The maximum daily operational emissions were added to the maximum daily construction emissions and are shown in Table 4.3-23, which shows all pollutants for all years exceed the SCAQMD thresholds, with the exception of SOX emissions. As identified in Section 4.3 of Revised Final EIR Part 2, Project-related air quality impacts for all criteria pollutants, with the exception of SOX, would be significant and mitigation measures are required.

Health Effects. Section 4.3.6.6 Summary of Health Effects of Air Quality Emissions, starting on page 4.3-79 of the Revised Final EIR Part 2, discusses the health effects from ozone and PM2.5 resulting from the Project. Tables 4.3-32 through 4.3-35 show the annual percent of background health incidence for PM2.5 and ozone health effects associated with the unmitigated and mitigated Project, respectively. The “background health incidence” is the actual incidence of health effects (based on available data) as estimated in the local population

in the absence of additional emissions from the Project.²⁷ When taken in context, the small increase in incidences and the very small percent of the number of background incidences indicate that these health effects are minimal in a developed, urban environment. There are no relevant significance thresholds for health effects from criteria pollutants adopted by state, federal, or local agencies; thus, this information is provided for background understanding regarding the air quality emissions. Table 4.3-32 and Table 4.3-33 show the health effects, morbidity and mortality, of the unmitigated project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Table 4.3-34 and Table 4.3-35 show the health effects, morbidity and mortality, of the mitigated project emissions across the southern California model domain for the Annual Mean PM2.5 and Annual Mean Ozone, respectively. Potential PM2.5 Mitigated Project related health effects show an increase in asthma-related emergency room visits (0.0047%), asthma-related hospital admissions (0.0028%), all cardiovascular-related hospital admissions (not including myocardial infarctions (heart attacks)) (0.00059%), all respiratory-related hospital admissions (0.0015%), mortality (0.0044%), and nonfatal acute myocardial infarction (less 0.0020% for all age groups). Potential Project Mitigated Ozone-related health effects increased respiratory-related hospital admissions (0.00062%), mortality (0.00027%), and asthma-related emergency room visits for any age range (lower than 0.011% for all age groups). Because the health effects from ozone and PM2.5 are minimal, in light of background incidences, and health effects from other criteria pollutants would be even smaller, the health effects of those other criteria pollutants were not quantified. Because there are no established thresholds, this data was provided for informational purposes.

Mitigation Measures. The mitigation measures identified under Impact 4.3.6.3 (Mitigation Measures 4.3.6.3A through 4.3.6.3E) with the additional implementation of Mitigation Measure 4.3.6.4A would reduce operational emissions of criteria pollutants associated with the Project. It is important to note that, in addition to the operational activity mitigation measures identified previously, future development would need to incorporate physical attributes and operational programs that will act to generally reduce operational-source pollutant emissions including GHG emissions. These Project characteristics are identified in Section 4.7, Climate Change and Greenhouse Gas Emissions, and Section 4.17, Energy, of the Revised Final EIR Part 2 (pg. 4.3-61).

On October 21, 2016, the Project's developers entered into a settlement agreement with the SCAQMD which requires the payment to the SCAQMD of an Air Quality Improvement Fee of 64 cents per square foot for each building as the Project is constructed (Revised Final EIR Part 1, pg. 29 to 30). The settlement agreement states:

“[T]he payment of the Air Quality Improvement Fee will adequately mitigate heavy-duty truck-related air quality impacts that may result from the construction and operation of the World Logistics Center as described in the EIR and that no additional charges will be imposed on the

²⁷ Background health statistics were obtained from data included in the BenMAP model, and the sources are referenced in the BenMAP manual (USEPA, 2018). For example, EPA obtained mortality rates from the Centers for Disease Control (CDC) WONDER database, and hospital admissions rates from the Healthcare Cost and Utilization Project (HCUP).

World Logistics Center to mitigate emissions, including NOX, described in the EIR from heavy-duty trucks.”

Funds may be used by SCAQMD for any purpose to improve air quality in the South Coast Air Basin although the SCAQMD has indicated that the funds will be used “to develop mitigation efforts focused on reducing emissions in the areas affected by the warehouse project.”²⁸ One possible use might be that individual or fleet truck owners servicing the Project could be offered a financial incentive to purchase a near-zero or zero-emission truck model, similar to the Carl Moyer Program. This type of program has been an effective tool for more than 19 years in speeding the transition of heavy-duty trucks and other equipment to cleaner models. In the 2017 Reporting Cycle for the Carl Moyer Program (Funding Years 8-19), \$87,373,480 was funded for “On-Road” vehicles by the SCAQMD for a reduction of 6,265 tons of NOX and ROG emissions, and a reduction of 145.3 tons of PM emissions, with an average cost-effectiveness of \$11,612.²⁹ Using those costs and resulting reductions in emissions, the \$26,000,000 Air Quality Improvement Fee could result in a reduction of 1,864 tons of NOX and ROG emissions, and a PM reduction of 43 tons of PM emissions. Therefore, with the payment of the Air Quality Improvement Fee through the 2016 settlement, the Project’s net contribution to regional air quality would be further reduced. Because the use of the funds will be determined by the SCAQMD’s Governing Board and because it is not yet known how the SCAQMD will allocate the funds, no credit for emission reductions has been taken by the Project (Revised Final EIR Part 2, pg. 4.3-62).

Although implementation of **Mitigation Measures 4.3.6.3B** through **4.3.6.3F**, **4.3.6.4A**, and the payment of funds to SCAQMD may reduce impacts and vehicular trips associated with the Project, it is not possible to quantify the reduction in the amount of emissions that may occur. Considering the volume of emissions generated and current commuter habits, it is unlikely the implementation of vehicular management plans will result in a reduction of operational Project emissions to below existing SCAQMD thresholds. Application of Leadership in Energy and Environmental Design (LEED) standards and green building design principles could reduce emissions from building operations such as heating and cooling; however, such standards and principles would not reduce emissions of CO, ROG, NO_x, PM₁₀, and PM_{2.5} to below SCAQMD thresholds. No other feasible mitigation measures have been identified to reduce the operational emissions of CO, ROG, NO_x, PM₁₀, and PM_{2.5} to a less than significant level. Because the Project site is located in a nonattainment air basin for criteria pollutants, the addition of air pollutants resulting from operation of the Project would contribute to the continuation of nonattainment status in the Basin. In the absence of mitigation to reduce the Project’s emission of contribution of ozone, PM₁₀, and PM_{2.5} to below SCAQMD thresholds, long-term air quality impacts resulting from the operation of the Project would remain significant and unavoidable. (Revised Final EIR Part 2, pgs. 4.3-56 to 4.3-63).

²⁸ SCAQMD press release October 21, 2016, announcing the settlement.

²⁹ California Air Resources Board. Carl Moyer Program Status Reports. 2017 Reporting Cycle. Available online: <https://ww3.arb.ca.gov/msprog/moyer/status/status.htm>

e. Cumulative Air Quality Impacts - Construction

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to the cumulative exceedance of applicable daily thresholds that may affect sensitive receptors would be cumulatively considerable.

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, there will be a significant cumulative impact due to adverse effects from cumulative air quality impacts and the Project's contribution would be cumulatively considerable; therefore, cumulative impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, out of the 359 cumulative projects that were evaluated, 67 were found to be completed or currently undergoing construction as of November 2019. Therefore, 289 potential cumulative projects could undergo construction activities during the Project's 15-year construction period. Construction emissions gathered from the environmental documents and modeling show that out of the 289 cumulative projects, 95 cumulative projects were identified as exceeding VOC significance thresholds, 22 projects were identified as exceeding NO_x thresholds, and 2 projects would exceed CO, PM_{2.5} and PM₁₀ thresholds. However, even if none of the 289 potential cumulative projects undergo construction while the Project is under construction, a cumulatively considerable impact will occur because projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. The Project-specific construction emissions presented in Section 4.3.6.2 exceed the applicable SCAQMD significance thresholds for VOC, NO_x, CO, PM₁₀, and PM_{2.5}; therefore, a cumulatively considerable impact will occur, despite any potential construction activity associated with another project.

f. Cumulative Air Quality Impacts – Localized Construction and Operational Air Quality Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to the cumulative exceedance of localized thresholds that may affect sensitive receptors would be cumulatively considerable

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into,

the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, there will be a significant cumulative impact due to adverse effects to cumulative air quality impacts and the Project's contribution will be cumulatively considerable; therefore, cumulative impacts are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, out of the 359 cumulative projects that were identified, three cumulative projects (MV-5, MV-6, and MV-126) are located within 1,000 feet of the proposed Project boundary. The cumulative analysis focused on two cumulative scenarios: Construction start year (2020) and Full Build Out (2035).

The cumulative localized significance analysis demonstrates that without mitigation, the cumulative projects would exceed the localized significance thresholds for national 1-hour NO₂, annual PM₁₀, 24-hour PM₁₀, and 24-hour PM_{2.5} for one or more of the LST assessment years (2020 or 2035) analyzed. Therefore, according to this criterion, the air pollutant emissions would result in a significant impact and could exceed or contribute to an exceedance of the national 1-hour NO₂, annual PM₁₀, 24-hour PM₁₀, and 24-hour PM_{2.5} ambient air quality standards. Due to the findings of the Project's localized threshold analysis the air pollutant emissions from the Project would result in a significant cumulative impact and could exceed or contribute to an exceedance of the ambient air quality standards for NO₂, PM₁₀, and PM_{2.5}. Construction and operation of the cumulative projects along with the Project would result in cumulatively considerable significant and unavoidable localized impacts.

g. Cumulative Air Quality Impacts - Operations

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to the exceedance of cumulative operational thresholds would be cumulatively considerable.

Finding: Potential impacts of the Project related cumulative air quality impacts are discussed in detail in Section 6.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, this Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects to cumulative air quality impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic,

legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of the Revised Final EIR Part 2, operational emissions gathered from the environmental documents and modeling show that out of the 359 cumulative projects, 25 cumulative projects were identified as exceeding VOC significance thresholds, 59 projects were identified as exceeding NO_x thresholds, and 16 projects were identified as exceeding CO thresholds. None of the 359 projects would exceed the PM_{2.5} and PM₁₀ significance thresholds. However, because the Project-specific emissions exceed the SCAQMD significance thresholds, this Project is considered by the SCAQMD to be cumulatively considerable, despite the potential operation of any of the identified cumulative projects.

h. Cumulative Health Risk Impacts

Potentially Significant Impact. The Revised Final EIR evaluated and concluded that construction and operation of the Project would have a cumulatively considerable contribution cumulative significant cancer risk.

Finding: Potential impacts of the Project related to cumulative cancer risk and cancer burden impacts are discussed in detail in Section 4.3 of the Revised Final EIR Part 2. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment. (Finding 1). Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that, even with application of these mitigation measures, the cancer risk to sensitive receptors and the cancer burden to the general population will be cumulatively significant and unavoidable, and that the Project's contribution will be cumulatively considerable. The Project will have a significant impact due to adverse effects on long-term operational emissions impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As set forth in Section 6.3 of Revised Final EIR Part 2, the cumulative HRA uses the same air dispersion modeling and health risk calculation methodologies used in the Project-level HRA; however, the operational AERMOD model was updated to include emissions sources from the 359 cumulative projects and an expanded receptor grid that covers most of the South Coast Air Basin.

Two sets of 30-year cancer risk calculations were performed for the identified cumulative projects, one includes the cancer risks from exposure to construction plus operation (Cumulative Construction & Operation HRA), and the other includes 30-year exposure to the full operation of the 359 cumulative projects in addition to the Project (Cumulative Operation HRA).

Thirty-year exposure to cumulative construction and operations results in a cancer risk of 139.8 in one million at the maximum exposed receptor and 30-year cumulative operations would result in a cancer risk of 171.5 in one million at the maximum exposed receptor. These impacts at the maximum exposed receptor are above the cumulative cancer threshold of 10 in one million. Therefore, the construction and operation of cumulative projects in addition to the Project is expected to have a significant and unavoidable cumulative impact. (Revised Final EIR Part 2 pg. 6.3-28). As discussed in Section 4.3 of Revised Final EIR Part 2, the Project impacts would be reduced to less-than-significant levels after implementation of mitigation. However, because the Project would result in an increase in cancer risk of 9.1 under construction + operations and 7.1 under 30-year operations, the Project would be cumulatively considerable.

3. Land Use and Planning

a. Physically Divide an Established Community

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would physically divide an established community.

Finding: Potential impacts of the Project related to the existing rural residences on the Project site are discussed in detail in Section 4.10 of the Revised Final EIR Part 4, Volume 3. Changes or alterations have been required in, or incorporated into, the project which will mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with installation of solid block walls around the warehouse building or the existing residences, the Project will have a significant impact due to adverse effects to existing residences and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: According to Section 4.10 of the Revised Final EIR Part 4, Volume 3, the adjacent properties surrounding the WLC Project are residential, light industrial, open space and undeveloped. Essentially, the Project site is located along the eastern urban boundary of the City of Moreno Valley with development only adjacent to the western boundary and northwest corner of the site. At present, there are seven residences on the Project site. These properties vary in size from 0.5 to 10 acres and are located on the east side of Redlands Boulevard and World Logistics Center Parkway. These properties represent less than 1.5% of entire WLC Specific Plan area. The WLC Specific Plan designates these properties as “Light Logistics” and allows various logistics-related uses. It is believed these properties are currently occupied. It is possible that, as development of the Project site occurs according to the WLC Specific Plan, large warehouse buildings may eventually be located in close proximity to the existing residences. It would be ineffective and inefficient to try to incorporate these residences into the WLC Specific Plan land plan of large logistics warehouses to accommodate these residences. In addition, logistics operations would cause significant air pollutant, noise, and lighting, impacts on residents living in these units if they were adjacent to operating warehouses.

The WLC Specific Plan currently shows a 250-foot setback along the western boundary of the site to separate existing residences neighboring the Project site from the proposed warehouse buildings. However, it would be ineffective and inefficient to try to incorporate similar setbacks, for the existing residences on the Project site, into the WLC Specific Plan land plan. Under CEQA, the question is whether a project will affect the environment or persons in general, not whether a project will affect particular persons. For instance, CEQA addresses how view sheds are impacted by a proposed project but would not address the specific view that an individual resident sees. Therefore, the effect on the estimated 13 people (six homes x 2.2 persons average occupancy) who live in the six houses does not constitute an impact and is insignificant. The Commission has erred on the side of caution treating the impact as if it were significant.

Installation of solid block walls around the warehouse buildings or the existing residence would help reduce noise and lighting impacts, but they would not help reduce air pollutant impacts. Therefore, there is no effective mitigation available to protect or separate these existing residences from future warehousing buildings and operations. (Revised Final EIR Part 4 Volume 3, pgs. 4.10-36).

4. Noise

a. Off-Site Short-term Construction Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that construction activities would adversely affect residences located adjacent to off-site construction projects because they would still be exposed to noise levels greater than 60 dBA (Leq).

Finding: Potential impacts of the Project related to off-site short-term construction impacts of the Project are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would lessen the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the Commission and set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences adjacent to a construction area from significant noise levels, Project-related noise impacts during off-site construction on existing residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Off-site construction activities would occur within the allowed construction hours identified in the City's Noise Ordinance and would be consistent with the City's code. The nearest receptors are located at approximately 25 feet from off-site construction areas. Based on the operation of the two loudest pieces of equipment simultaneously at 25 feet, off-site construction could expose sensitive receptors to a noise level of 93 dBA Leq, which would exceed the City's allowable daytime exterior noise level of 60 dBA Leq. Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a NRCP, which is expected to attenuate construction noise levels by a minimum of 10 dB. However, even with implementation of this mitigation measure, noise levels experienced at residences adjacent to off-site construction activity would be above the City's threshold.

Therefore, impacts would remain significant and unavoidable. (Revised Final EIR Part 4 Volume 3, pgs. 4.12-17 to 4.12-26).

b. Substantial Temporary and/or Periodic Increase in Ambient Noise Levels – Construction

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project would elevate the existing ambient noise level above the applicable 10 dB substantial temporary increase threshold.

Finding: Potential impacts of the Project related to an increase in ambient noise levels are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to reduce construction noise so that ambient levels would not be elevated above the applicable 10 dB substantial temporary increase threshold, impacts will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The Project has the potential of exposing sensitive receptors within the vicinity of on- and off-site construction areas to noise levels that could temporarily elevate the existing ambient noise level above the applicable 10 dB substantial temporary increase threshold. As discussed in Section 4.12.3 of the Revised Final EIR Part 3, the City of Moreno Valley Noise Ordinance and General Plan do not contain an incremental increase threshold for construction. Therefore, for purposes of analysis, it was considered a significant impact in cases where sensitive receptors are exposed to construction noise levels that increase ambient noise levels by 10 dB.

Construction activities within the Project area (i.e., Plots 1 through 22) would elevate existing ambient noise levels by as much as 50 dB. The existing sensitive receptors that would be most affected by on-site construction activities are located within, to the west, and to the southwest of the Project area. The Project-related construction activities could also have the potential to expose wildlife located within the undeveloped land located south of the Project area to construction noise levels that would elevate the existing ambient to above the applied 10 dB substantial temporary increase threshold. Transient construction noise consisting of worker trips and construction equipment and materials delivery would not occur along the southern boundary of the site, adjacent to the wildlife area. Therefore, noise generated during on-site construction activities would not result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project with regard to the adjacent wildlife corridor. However, noise generated during on-site construction activities would result in a substantial temporary or periodic increase in ambient noise levels at residences within, to the west, and to the southwest of the project areas and would result in a significant impact (Revised Final EIR, Part 3, pg. 4.12-26 and Revised Final EIR, Part 1, pg. 744). As shown in Table 4.12-10 (Revised Final EIR pg. 4.12-29 to 4.12-35), off-site construction (e.g., roadway improvements, drainage improvements, etc.) in some areas, would elevate ambient noise levels by as much as 45 dB over

existing ambient noise levels. The existing sensitive receptors located adjacent to Redlands Boulevard, Cactus Avenue and near the intersections of World Logistics Center Parkway, South of SR 60/Highway 60 and Redlands Boulevard/Highway 60 would be most affected by off-site construction activities. Therefore, noise generated during off-site construction activities would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project and would result in a significant impact.

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a NRCP, which is expected to attenuate construction noise levels by 10 dB and prohibit construction activities within 800 feet of residences during nighttime hours. As shown in Table 4.12-8 and Table 4.12-10, even with implementation of Mitigation Measure 4.12.6.1A, sensitive receptors located near on-site and off-site construction areas would be exposed to construction noise levels that would elevate the existing ambient noise levels above the applied 10 dB substantial temporary increase threshold. Therefore, this would result in a significant and unavoidable impact with mitigation.

c. On-Site Short-term Construction Impacts - Daytime

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that on-site Project construction activities would adversely affect residences located within 500 feet of a construction area as the residences would be exposed to noise levels greater than 60 dBA (Leq).

Finding: Potential impacts of the Project related to on-site short-term construction impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences within 500 feet of a construction area from significant Project-related daytime noise impacts during construction and impacts on existing residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: Construction noise levels in and around the Project area would fluctuate depending on the type, number, and duration of use of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving or blasting), which can be particularly disruptive. Pile driving and blasting, however, is not proposed during Project construction. Table 4.12-7 shows typical noise levels produced by the types of construction equipment that would likely be used during Project construction.

The City of Moreno Valley Noise Ordinance prohibits construction from occurring outside of the hours of 8:00 p.m. to 7:00 a.m. that creates a noise disturbance. Construction occurring within the allowable hours of 7:00 a.m. and 8:00 p.m. would not result in the violation of the City's Noise Ordinance. Residences that are exposed

to noise levels exceeding those identified in Table 4.12-5 during daytime or nighttime project construction would result in violation of the City's Noise Ordinance (Revised Final EIR Part 3, pg. 4.12-16)

Construction operations would occur in two general areas; on-site and off-site. The on-site construction activities will be more intense. Some phases of the on-site construction are expected to occur for 24- hours a day, 7-days per week. For the purpose of this analysis, construction is anticipated to begin in 2020, periodically, for a total of 15-years.

On-site construction activities are expected to occur outside of the allowed construction hours specified in the City of Moreno Valley Noise Ordinance. The operation of each piece of off-road equipment within the on-site construction areas (i.e., Plots 1 through 22) would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical work day, the equipment would be operating at different locations within the various Plots of the Project site and would not likely be operating concurrently. However, for a more conservative approximation of construction noise levels to which the nearest sensitive receptor would be exposed, it is assumed that two of the loudest pieces of construction equipment would be operating at the same time and located within the Project Plots nearest to a sensitive receptor. The nearest sensitive receptors are the existing on-site residences, which would be located approximately 25 feet from construction activity of various Plots. As a worst-case scenario, it has been assumed that all existing on-site residences will remain onsite throughout construction (Revised Final EIR Part 3, pg. 4.12-17).

Based on the list of the construction equipment that would be used at each of the Plots, it was assumed that the two loudest pieces of off-road equipment (a paver and scraper) would have a combined noise level of 85 dBA Leq from a distance of 50 feet (FHWA, 2006a). Using this reference noise level and a 7.5 dB per doubling of distance attenuation rate, the noise exposure level at representative locations around the Project site were calculated and presented in Table 4.12-8. The location of the modeled receptor locations is presented in Figure 4.12-3. As shown in Figure 4.12-3 and Table 4.12-8 of the Revised Final EIR Part 3, noise generated during construction on the Plots, in some cases construction of various Plots occurring concurrently, would expose sensitive receptors to noise levels that would exceed the City's 60 dBA Leq daytime exterior noise standard. Specifically, impacts would occur at existing residences located within and to the west of the Project area. Affected receptors are all located within City of Moreno Valley boundaries.

Based on these projections, anticipated worst-case construction noise levels would regularly be exceeded at residences within and near the Project area. Based on an Leq noise level of 85 dBA Leq at 50 feet and an attenuation rate of 7.5 dB per doubling of distance, an observer would need to be at a distance of 500 feet from an active Project construction area to experience a noise level of 60 dBA Leq, or 800 feet for a noise level of 55 dBA Leq. Therefore, the on-site construction of the Project would result in the exposure of persons to or generation of noise levels in excess of standards established in the City of Moreno Valley Noise Ordinance and would result in a significant impact.

Implementation of **Mitigation Measure 4.12.6.1A** would reduce construction noise levels at nearby sensitive receptors through implementation of a NRCP, which is expected to attenuate construction noise levels by a minimum of 10 dB. Table 4.12-8 shows mitigated construction noise levels at sensitive receptors in the vicinity of on-site construction areas. Sensitive receptors located within and to the west of the Project would continue

to be exposed to construction noise levels that would exceed the City's daytime exterior noise standard of 60 dBA Leq even with implementation of mitigation. Additionally, with a 10-dB reduction, off-site construction activity would continue to expose the sensitive receptors at 25 feet to noise levels up to 83 dBA Leq. Therefore, this would result in a significant and unavoidable impact even with the implementation of mitigation.

d. Long-Term Traffic Noise Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's long-term traffic would result in a substantial permanent increase in ambient noise levels in the vicinity of the WLC Specific Plan area exceeding the maximum noise level allowed under the City's Municipal Code.

Finding: Potential impacts of the Project related to long-term traffic noise impacts on the Project site are discussed in detail in Section 4.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment. (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with application of these mitigation measures, the Project will have a significant impact due to adverse effects to long-term traffic noise impacts and therefore, are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The noise analysis for the World Logistics Center project is based on the traffic volume data contained in the revised Traffic Impact Analysis (TIA) prepared for the Project (contained in its entirety as Revised Final EIR Part 3 Appendix D). The TIA addressed the intersections of surface streets in Moreno Valley of a collector or higher classification street with another collector or higher classification street, at which the Project will add 50 or more peak hour trips. The study area also included the main travel routes between the Project and the nearby cities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. The study area extended west to the nearest ramps on SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes radiating from the Project site to the north, south, east, and west. The study area extended west to the nearest ramps on SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes radiating from the project site to the north, south, east, and west. The traffic analysis covered SR-60 from I-10 in the east to SR-71 in the west, SR-91/I-215 from I-210 in the east to I-15 in the west, I-215 from Redlands Avenue in the north to the Scott Road interchange in the south, and I-10 from SR-62 in the east to SR-60 in the west.

Three hundred and thirty-nine (339) roadway links and eighty-nine (89) freeway segments were analyzed in the noise analysis. The change in noise level was calculated for all 428 roadway and freeway links with and

without the World Logistics Center project for the (2018)³⁰, 2025, and 2040 buildout scenarios.³¹ Segments with noise increases less than 1.5 dB would not have a substantial noise increase and were not presented in the main body of the noise report (i.e., the tables). Similarly, any segments that do not have sensitive receptors (e.g., residential uses or schools) were also not presented in the main body of the noise report. Based on this filtering process, of the 428 segments analyzed, 21 segments have sensitive receptors and an increase of 1.5 dB for at least one buildout scenario and were therefore addressed in the analysis (Revised Final EIR Part 3, pgs. 4.12-36 to 4.12-37).

The projected future traffic volumes (WSP USA, June 2018) for roadway segments in the World Logistics Center project vicinity were used in the TIA. Modeled noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. As previously identified, long-term impacts from the Project's traffic noise that affect existing sensitive land uses are considered to be substantial and, therefore, constitute a significant noise impact if the Project would:

- Increase noise levels by 5dB or more where the no Project noise level is less than 60 CNEL;
- Increase noise levels by 3dB or more where the no Project noise level is 60 CNEL to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the no Project noise level is greater than 65 CNEL.

Operation of development that could occur within the World Logistics Center Project area would generate traffic along roadways in the project vicinity. Table 4.12-11 of the Revised Final EIR Part 3 (pg. 4.12-37) identifies existing with Project roadway traffic noise levels. Build out of the proposed WLC project under 2018 conditions would result in substantial increases in traffic noise levels in the Existing plus Project Build Out scenario case. The largest Project-related increase in traffic noise would be along Cactus Avenue Extension and Street F where increases of greater than 65 dBA are predicted. However, the increases associated with these roadway segments are attributable in part to Cactus Avenue Extension and Street F being new roads that will be constructed by the Project. A total of 13 road or freeway segments would result in a substantial noise increase attributable to the Project, resulting in a significant impact requiring mitigation.

Year 2025 (Phase I) With and Without World Logistics Center project scenarios projected traffic volumes on roadway segments in the Project vicinity were used to conduct the traffic noise modeling. The projected traffic volumes in the area were taken from the TIA prepared for the Project. Table 4.12-12 of the Revised Final EIR Part 3 (pg. 4.12-38) identifies year 2025 Without Project and With Project traffic noise levels.

³⁰ The Project's contribution to traffic noise in 2020 would represent a slightly smaller percentage given the increase in ambient traffic of roughly 2% per year. Using a 2018 buildout year therefore slightly overstates the increase in traffic noise attributable to the Project.

³¹ The traffic impact analysis (TIA) (Revised FEIR Part 3, Appendix F) analyzes full project buildout under existing conditions (year 2018) and full project buildout in 2040, which is the worst case for traffic analysis purposes as it accounts for greater regional growth in non-project traffic. For purposes of conservative air quality and greenhouse gas analyses in the Revised FEIR Part 2, it is assumed that full project operations would occur as early as 2035, resulting in the use of higher mobile emissions factors (dirtier engines). In addition, the public project buildout scenario under existing conditions assumed the year 2020 to align with the date of Part 2 of the Revised FEIR. The traffic utilized in the traffic noise analysis remain unchanged and references to the 2018 and 2040 build out years has been retained to maintain consistency with the TIA.

Increases in noise levels associated with Buildout Year (2040) traffic conditions on area roadways range up to 68.3 dBA. As identified in Table 4.12-13, the greatest increase in noise levels would be along Cactus Avenue Extension and Street F (east of World Logistics Center Parkway), where increases of 66.8 dBA and 68.3 dBA, respectively, are predicted for the Buildout Year 2040 With Project scenario over the Buildout Year 2040 Without Project scenario. However, the increases associated with these roadway segments are attributable in part to Cactus Avenue Extension and Street F being new roads that will be constructed by the Project. A total of eight road and freeway segments would result in a substantial noise increase attributable to the Project, resulting in a significant impact requiring mitigation (Revised Final EIR Part 3, pg. 4.12-39).

Areas within the World Logistics Center Site. Six occupied noise-sensitive uses within the World Logistics Center site include residences that may remain with the implementation of the Project. The land is currently zoned as WLC SP-LD with Industrial/Business Park general land uses, but it is anticipated that the residences may remain for some time. The existing residences, as long as they remain, must be considered sensitive land uses.

- *Street A/ World Logistics Center Parkway, South of SR 60 (Street B/Eucalyptus Avenue to Street F).* Three residences are located along Street A (World Logistics Center Parkway, South of SR 60) between the future Street B and Street F. These residences are anticipated to experience noise increases up to 18.5 dB due to the implementation of the Project. As a result, existing noise levels at these residences will be changed significantly. Therefore, this would be a significant impact requiring mitigation. The exact alignment of the roadway is to be determined, but the homes may be roughly 100 feet from the centerline on the roadway. Two residences front onto Street A (World Logistics Center Parkway), and the driveway access would make a soundwall ineffective. The other residence is on Street A (World Logistics Center Parkway) and it is difficult to determine where an outdoor living area is for this residence. However, since it is a single residence, a soundwall would have a limited effectiveness. Since mitigation is not feasible, impacts remain significant and unavoidable.
- *Street F/Dracaea Avenue (east of Street A/ World Logistics Center Parkway, South of SR 60).* A single residence is located east of World Logistics Center Parkway, South of SR 60 along what is currently Dracaea Avenue (future Street F). Existing conditions identify low levels of traffic noise on Dracaea Avenue. With build out of the Project in year 2040, this residence would experience noise increases up to 69.2 CNEL during the 2018 buildout year. Therefore, this would be a significant impact requiring mitigation. Installation of a soundwall would not be effective in reducing noise levels due to the opening for the driveway. Since mitigation is not feasible, impacts remain significant and unavoidable.
- *Street E/Dracaea Avenue (east of Redlands Boulevard).* Two residences are located along Dracaea Avenue east of Redlands Boulevard. These residences would be most affected by traffic along Redlands Boulevard between Eucalyptus Avenue and Cottonwood Avenue, where no significant noise increase has been identified. Additionally, although the alignment of future Street E is not yet known, it is not anticipated that the future Street E centerline would be located less than 100 feet from these residences. Therefore, impacts would be less than significant, and no mitigation is required.

Off-Site Areas Adjacent to the World Logistics Center Site. For areas adjacent to the World Logistics Center site, 13 segments would experience a noise increase that would be greater than significance criteria specified previously. These areas are described below.

- *Street D/Cactus Avenue Extension (Alessandro Boulevard to Cactus Avenue).* Cactus Avenue Extension, as shown in the Specific Plan, will come down the western side of the World Logistics Center project parallel to Merwin Street. It then merges with Cactus Avenue traveling to the west until Redlands Boulevard. A specific alignment has not been determined for this roadway. There are approximately 14 homes that side-on to Merwin Street that could be affected by traffic on Cactus Avenue Extension. There are no soundwalls along these homes. These homes would experience noise level increases of up to 66.8 dB during the 2040 buildout year. Therefore, this would be a significant impact requiring mitigation.
- *Redlands Boulevard (from Eucalyptus Avenue to State Route 60).* There are homes located at the northwestern corner of Redlands Boulevard and Eucalyptus Avenue. The 2018 buildout scenario results in a significant noise increase of 2.8 dB. Therefore, this would be a significant impact requiring mitigation.
- *Cactus Avenue (west of Redlands Boulevard).* Existing residences are located along Cactus Avenue with rear yards facing Cactus Avenue with soundwalls located along the rear yards of the residences. The 2018 and 2040 buildout scenarios result in significant noise increases of 2.1 dB and 3.9 dB, respectively. Therefore, this would be a significant impact requiring mitigation.
- *Ironwood Avenue (between Redlands Boulevard and Highland Boulevard).* There are two single-family homes that front onto Ironwood Avenue. There are also two churches along this roadway. A significant noise increase of 5.5 dB is projected for 2018 with full Project build-out. Therefore, this would be a significant impact requiring mitigation.
- *Cactus Avenue (Redlands Boulevard to Cactus Avenue Extension).* This area is occupied by a small group of single-family homes along Cactus Avenue between the future Street D/Cactus Avenue Extension and Redlands Boulevard. A significant noise increase is projected for all buildout scenarios. Currently, there is no soundwall along these homes. Therefore, this would be a significant impact requiring mitigation.
- *Locust Avenue (between Moreno Beach Drive and Smiley Boulevard).* There are three single-family homes along this roadway and the front onto the roadway. The 2018 buildout scenario results in a significant noise increase for this area. In 2018, the project will increase noise levels by 5.1 dB. Therefore, this would be a significant impact requiring mitigation.
- *Locust Avenue (between Moreno Beach Drive and Redlands Boulevard).* There are single-family homes along this roadway with front, rear, and side yards facing Locust Avenue. With Project buildout in 2018, the project will increase noise levels by 5.7 dB. Therefore, this would be a significant impact requiring mitigation.
- *Kitching Street (between Krameria Avenue and Lurin Avenue).* There are single-family homes along this roadway with rear yards facing Kitching Street. Existing 6-foot high soundwalls are located along the residences and rear yard areas. Under the 2018 buildout scenario, the noise level is projected to increase by 3.2 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 60 eastbound ramps (between SR-60 and Central Avenue).* Single-family homes are located south of SR-60 eastbound ramps. Under the Project buildout scenario in year

2018, a noise level increase of 7.6 dB is anticipated. Therefore, this would be a significant impact requiring mitigation.

- *State Route 60 (from Perris Boulevard to Nason Street)*. All residential areas along this stretch of freeway have soundwalls in place. The 2018 buildout scenario results in a significant noise increase of 1.5 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 60 (from Moreno Beach Drive to Redlands Boulevard)*. There are soundwalls in place for all residences in this area. The existing 2018 buildout scenario results in a significant noise increase of 2.4 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 215 (from Mill Street to 2nd Street)*. There are four residential uses located to the west of SR-215 south of 2nd Street with no soundwalls. The residential uses are set back from the freeway and are located at a lower grade than the freeway. The 2040 buildout scenario results in a significant noise increase of 1.9 dB. Therefore, this would be a significant impact requiring mitigation.
- *State Route 215 (from Baseline Road to Highland Avenue/SR-210)*. There are residential uses on the west and east sides of SR-215. There are soundwalls in place along this segment of the SR-215 alignment. The 2040 buildout scenario results in a significant noise increase of 1.7 dB. Therefore, this would be a significant impact requiring mitigation.

Specific Plan Design Features. The WLCSP indicates there will be a 250-foot setback from existing housing along Redlands Boulevard. No additional design features to attenuate noise impacts are planned as part of the WLCSP.

With the implementation of **Mitigation Measures 4.12.6.2A** through **4.12.6.2D**, two areas would experience noise increases that would be mitigated to a less than significant level. Those areas are as follows:

- Cactus Avenue from Redlands Boulevard to Cactus Avenue Extension; and
- Cactus Avenue Extension from Alessandro Boulevard to Cactus Avenue.

For the remaining noise impact locations adjacent to the World Logistics Center site for which significant noise impacts have been identified, mitigation measures are not feasible or will not fully reduce the impact to less than significant levels; therefore, aside from the two areas listed above, impacts would remain significant and unavoidable (Refer to Revised Final EIR Part 3, pgs. 4.12-44 to 4.12-45).

e. Cumulative Short-Term Construction Noise

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to cumulative short-term construction noise levels in the project vicinity is cumulatively considerable.

Finding: Potential impacts of the Project related to short-term construction noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached

Mitigation Monitoring and Reporting Program. However, as there is no effective mitigation available to protect existing residences within 500 feet of a construction area from significant noise levels, Project-related noise cumulative impacts during construction on existing rural residences will remain significant and unavoidable. Specific economic, legal, social, technological, or other considerations make alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: As discussed in Section 6.12 of the Revised Final EIR Part 3, construction crew commutes and the transport of construction equipment, and materials to the WLCSP area would incrementally increase noise levels on access roads leading to the site. Secondary sources of noise would include noise generated during excavation, grading, and building erection on the Project site. The net increase in Project site noise levels generated by these activities and other sources has been quantitatively estimated and compared to the applicable noise standards and thresholds of significance. Three cumulative projects are located at distances that could undergo construction activities during the Project's 16-year construction period: MV-5: P06-158/Gascon, MV-6: Highland Fairview Corporate Park, and MV-126: TTM 33222. Construction of the western portion of the Project would result in significant and unavoidable impacts. Should any of these three cumulative projects undergo construction while the western portion of the Project is under construction, cumulative construction noise impacts would occur, potentially exposing sensitive receptors to cumulative construction noise greater than that experienced from Project construction alone. Therefore, Project construction would result in cumulatively considerable and potentially significant cumulative noise impacts.

The three cumulative construction projects do not have CEQA documents in which construction noise has been analyzed. Therefore, assuming that construction of Related Projects would consist of similar construction activity and equipment as the project, receptors located nearest both the Project and each of the related projects could potentially be exposed to noise level increase of 10.1 dBA Leq and 44.4 dBA Leq (Revised Final EIR Part 3 pg. 6.12-25).

Implementation of Mitigation Measure 4.12.6.1A would reduce construction noise levels at nearby sensitive receptors through implementation of a Noise Reduction Compliance Plan (NRCP), which is expected to attenuate construction noise levels by 10 dB and prohibit construction activities within 800 feet of residences during nighttime hours. As shown in Section 4.12, Table 4.12-8 and Table 4.12-9, even with implementation of Mitigation Measure 4.12.6.1A, sensitive receptors located near on-site and off-site construction areas would be exposed to construction noise levels that would elevate the existing ambient noise levels above the applied 10 dB substantial temporary increase threshold. As shown in Table 6.12-3 (Revised Final EIR Part 3 pg. 6.12-26), with implementation of mitigation measures to Project construction noise levels, cumulative construction noise at sensitive receptors nearest Related Project MV-126 is expected to remain significant and unavoidable. Therefore, this would result in a significant and unavoidable cumulative impact with mitigation.

f. Cumulative Long-Term Traffic Noise Impacts

Significant Unavoidable Impact: The Revised Final EIR evaluated and concluded that the Project's contribution to cumulative long-term traffic noise levels in the project vicinity is cumulatively considerable.

Finding: Potential cumulative impacts of the Project related to cumulative long-term traffic noise impacts are discussed in detail in Section 6.12 of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which would mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure is adopted by the Planning Commission and set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with application of these mitigation measures, the Project will have significant cumulative impacts due to adverse effects to long-term traffic noise impacts and therefore are considered significant and unavoidable. Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Finding: The noise analysis for the World Logistics Center project is based on the traffic volume data contained in the revised Traffic Impact Analysis (TIA) prepared for the project (contained in its entirety as Revised Sections of the Final EIR Appendix D). Cumulative traffic volumes contained in the TIA were developed for the Future Year 2025 and Buildout 2040 analysis time horizons. Traffic volumes for each time horizon were developed utilizing a combination of various future traffic growth methods as follows. For Future Year 2025, traffic volumes were developed by interpolating year 2040 traffic volume projections from the Riverside County Transportation and Analysis Model (RivTAM) to year 2025 plus traffic from a list of past, present, and reasonably foreseeable projects (see Table 6.12B). For Buildout Year 2040, traffic volumes were developed by utilizing the year 2040 traffic volume projections from the RivTAM plus traffic from a list of past, present, and reasonably foreseeable projects.

Three hundred and thirty-nine (339) roadway links and eighty-nine (89) freeway segments were analyzed in the noise analysis. The change in noise level was calculated for all 428 roadway and freeway links with and without the World Logistics Center project for the existing case (2018), 2025, and 2040 buildout scenarios. Segments with noise increases less than 1.5 dB would not have a substantial noise increase and were not presented in the main body of the noise report (i.e., the tables). Similarly, any segments that do not have sensitive receptors (e.g., residential uses or schools) were also not presented in the main body of the noise report. Based on this filtering process, of the 428 segments analyzed, 21 segments have sensitive receptors and an increase of 1.5 dB for at least one buildout scenario and were therefore addressed in the analysis (Revised Final EIR Part 3, pgs. 6.12-26).

Cumulative noise impacts associated with roadway noise have been addressed based on the cumulative traffic volumes, analyzing the difference between future plus project traffic noise and existing without Project traffic noise to account for cumulative projects as well as ambient growth as a worst-case scenario. As identified in Table 6.12-4 (Revised Final EIR Part 3 pg. 6.12-27), implementation of the proposed WLC project would contribute to cumulative changes in traffic noise levels in Year 2025 (Phase I). The largest project-related increase in traffic noise would be along Street D/Cactus Avenue Extension (Alessandro Avenue to Cactus Avenue) and along Street F (east of World Logistics Center Parkway), where increases of 63.9 dBA and 58.1 dBA, respectively, are predicted for the 2025 With Project Phase 1 scenario over the 2018 Existing Conditions scenario. However, the increases associated with these roadway segments is attributable in part to Street

D/Cactus Avenue Extension and Street F being new roads that will be constructed by the Project through open space areas that are currently vacant and don't contribute to the overall ambient noise environment. A total of eleven road segments would result in a substantial noise increase attributable to the Project, resulting in a significant cumulative impact requiring mitigation.

Increases in noise levels associated with Buildout Year traffic conditions on area roadways range up to 68.3 dBA. As identified in the Table 6.12-5 (Revised Final EIR Part 3, pg. 6.12-28), the greatest increase in noise levels would be along Street D/Cactus Avenue Extension (Alessandro Boulevard to Cactus Avenue) and along Street F (east of World Logistics Center Parkway), where increases of 66.8 dBA and 68.3 dBA, respectively, are predicted for the Buildout Year With Project scenario over the Existing Conditions scenario. However, the increases associated with these roadway segments is attributable in part to Cactus Avenue Extension and Street F, being new roads that will be constructed by the Project through open space areas that are currently vacant and don't contribute to the overall ambient noise environment. A total of twenty-one road and freeway segments would result in a substantial noise increase attributable to the project, resulting in a significant impact requiring mitigation.

The project calls for improvements to several of the roadways around the project area in order to accommodate the projected increase in project traffic volumes. The presence of residential uses occurs within the Project and nearby area. These roadway segments are analyzed against the thresholds for determining significant impacts defined previously in Section 4.12.6.2 (Revised Final

EIR Part 3 pg. 4.12-36 to 4.12-45). As described previously in Section 4.12.4 (Revised Final EIR Part 3, pg. 4.12-15 to 4.12-16), the Project's incremental contribution to a cumulative noise increase would be considered cumulatively considerable and significant when ambient noise levels affect noise-sensitive land uses and when the Project increases noise levels by 1 dB or more over pre-Project conditions and the predicted future cumulative with Project noise levels cause the following cumulative increases:

- Increase noise levels by 5 dB or more where the existing noise level is less than 60 CNEL;
- Increase noise levels by 3 dB or more where the existing noise level is 60 to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the existing noise level is greater than 65 CNEL.

Cumulative noise impacts associated with roadway noise have been addressed based on the 2025 and 2040-time horizons analyses for the roadway segments identified for analysis in Section 4.12 of the Revised Final EIR Part 3. Table 6.12-4 (Revised Final EIR Part 3, pg. 6.12-27) and Table 6.12-5 (Revised Final EIR Part 3, pg. 6.12-28) show the Future Year 2025 and Buildout 2040, respectively, CNEL values with the Project and if a substantial increase would be produced based on the cumulatively significant significance criteria identified above. Traffic noise level increases from the existing baseline condition and the future (2025 and 2040) time horizons are attributable to the intermingled effects of both the cumulative (i.e., past, present, and reasonably foreseeable projects) development projects in the Project vicinity and region as well as the Project.

As discussed in Section 4.12.6.2 (Revised Final EIR Part 3, pg. 4.12-36 to 4.12-45), there are numerous instances in which there is no feasible means to reduce roadway noise impacts because of the existing developed nature of the affected roadway segment and/or the scattered nature of the sensitive receptors (i.e.,

residences), which prohibits the effectiveness of a soundwall. For those segments at which there is a cumulatively considerable impact and there is no feasible means to provide mitigation, the significant cumulative impact will remain significant and unavoidable (Revised Final EIR Part 3, pg. 6.12-29).

5. Transportation

a. Intersection and Roadway Level of Service (Outside the Jurisdiction of the City of Moreno Valley)

Potential Significant Impact: Whether the Project could cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Findings: Potential impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 4.15 and Appendix F of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with mitigation measures, the Project will have significant impacts due to inability to control the mitigation, funding and timing for improvements located outside the City of Moreno Valley, and therefore are considered significant and unavoidable. Those changes or alterations that are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency (Finding 2). Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: The Traffic Impact Analysis (TIA, Revised Final EIR Part 3, Appendix F) discusses Project-related impacts to the intersection and roadway level of service (LOS) under the following development scenarios:

- 5) Existing baseline conditions (2018) plus Phase 1 of the Project
- 6) Existing baseline conditions (2018) plus Buildout of the Project
- 7) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2025 plus Phase 1 of the Project
- 8) Existing baseline conditions plus other past, present, and reasonably foreseeable projects expected to be constructed by 2040 plus Buildout of the Project

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips, the standard generally used to determine if an impact is potentially significant. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands. The study area also extended west to the nearest ramps to SR-91 and as far south as the I-215 ramps at Redlands Avenue in Perris. The study area for freeways was selected to encompass the freeway routes extended from the Project site to the north, south, east, and west. The analysis

covered SR-60 from I-10 in the east to SR-71 in the west, SR-91/I-215 from I-210 in the east to I-15 in the west, I-215 from Redlands Avenue in the north to the Scott interchange in the south, and I-10 from SR-62 in the east to SR-60 in the west. In addition, any freeway ramp where the Project added 100 or more peak-hour trips was also studied.

Intersection LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for the study area intersections are summarized in Table 26 of the Revised Final EIR Part 3, Appendix F (pg. 123), showing that 19 intersections would operate at unacceptable LOS. Table 27 (pg. 129) shows there are 15 study intersections where Phase 1 of the Project would have a significant impact. Of those 15 study intersections, 12 are located outside of the jurisdiction of the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for the study area intersections are summarized in Table 35 of the Revised Final EIR Part 3, Appendix F (pg. 161), showing that 25 intersections would operate at unacceptable LOS. Table 36 (pg. 167) shows there are 17 study intersections where buildout of the Project would have a significant impact. Of those 17 study intersections, 12 are located outside of the jurisdiction of the City of Moreno Valley.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for the study area intersections are summarized in Table 49 of the Revised Final EIR Part 3, Appendix F (pg. 229), showing that 26 intersections would operate at unacceptable LOS. Table 50 (pg. 235) shows there are 13 study intersections where Phase 1 of the Project would have a significant impact. Of those 13 study intersections, 10 are located outside of the jurisdiction of the City of Moreno Valley.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 63 of the Revised Final EIR Part 3, Appendix F (pg. 300), showing that 72 intersections would operate at unacceptable LOS. Table 64 (pg. 306) shows there are 30 study intersections where buildout of the Project would have a significant impact. Of those 30 study intersections, 13 are located outside of the jurisdiction of the City of Moreno Valley.

Roadway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in Table 25 of the Revised Final EIR Part 3, Appendix F (pg. 104). Table 25 shows that 3 roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all 3 roadway segments. Of those 3 segments, 2 are located outside of the jurisdiction of the City of Moreno Valley.

Existing Baseline (Year 2018) Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 34 of the Revised Final EIR Part 3, Appendix F (pg. 142). Table 34 shows that three roadway segments would operate at unacceptable LOS and that the Project would worsen conditions, resulting in significant impacts at all three roadway segments. Of those 3 segments, 2 are located outside of the jurisdiction of the City of Moreno Valley.

2025 Plus Project Phase 1. The roadway segment levels of service for the study area are summarized in table 48 of the Revised Final EIR Part 3, Appendix F (pg. 210). Table 48 shows that all study segments would operate at acceptable LOS, and no Project impacts would occur.

2040 Plus Project Buildout. The roadway segment levels of service for the study area are summarized in Table 62 of the Revised Final EIR Part 3, Appendix F (pg. 280). Table 62 shows that one roadway segment, located outside of the jurisdiction of the City of Moreno Valley, would operate at unacceptable LOS and that the Project would worsen conditions, resulting in a significant impact.

Freeway Segment LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway segments are summarized in Table 28 of the Revised Final EIR Part 3, Appendix F (pg. 130), showing that 33 freeway segments would operate at unacceptable LOS. Table 29 (pg. 135) shows there are 24 freeway segments where Phase 1 of the Project would have a significant impact.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project Buildout levels of service for freeway segments are summarized in Table 37 of the Revised Final EIR Part 3, Appendix F (pg. 169), showing that 23 freeway segments would operate at unacceptable LOS. Table 38 (pg. 173) shows there are 24 freeway segments where buildout of the Project would have a significant impact.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway segments are summarized in Table 51 of the Revised Final EIR Part 3, Appendix F (pg. 237), showing that 40 freeway segments would operate at unacceptable LOS. Table 52 (pg. 241) shows there are 34 freeway segments where Phase 1 of the Project would have a significant impact.

2040 Plus Project Buildout. Year 2040 plus Project Buildout levels of service for freeway segments are summarized in Table 65 of the Revised Final EIR Part 3, Appendix F (pg. 310), showing that 58 freeway segments would operate at unacceptable LOS. Table 66 (pg. 314) shows there are 42 freeway segments where buildout of the Project would have a significant impact.

Freeway Weaving LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway weaving sections are summarized in Table 30 of the Revised Final EIR Part 3, Appendix F (pg. 137), showing that 5 freeway weaving sections would operate at unacceptable LOS. Table 31 (pg. 139) shows that Phase 1 of the Project would have a significant impact at all 5 freeway weaving sections.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project buildout levels of service for freeway weaving sections are summarized in Table 39 of the Revised Final EIR Part 3, Appendix F (pg. 175), showing that 5 freeway weaving sections would operate at unacceptable LOS. Table 40 (pg. 177) shows that buildout of the Project would have a significant impact at all 5 freeway weaving sections.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway weaving sections are summarized in Table 54 of the Revised Final EIR Part 3, Appendix F (pg. 245), showing that 9 freeway

weaving sections would operate at unacceptable LOS and that Phase 1 of the Project would have a significant impact at all 9 freeway weaving sections.

2040 Plus Project Buildout. Year 2040 plus Project buildout levels of service for freeway weaving sections are summarized in Table 68 of the Revised Final EIR Part 3, Appendix F (pg. 318), showing that 14 freeway weaving sections would operate at unacceptable LOS and that buildout of the Project would have a significant impact at all 14 freeway weaving sections.

Freeway Ramp LOS

Existing Baseline (Year 2018) Plus Project Phase 1. Existing baseline (Year 2018) plus Project Phase 1 levels of service for freeway ramps are summarized in Table 33 of the Revised Final EIR Part 3, Appendix F (pg. 140), showing that 1 freeway ramp would operate at unacceptable LOS and that Phase 1 of the Project would have a significant impact at that freeway ramp.

Existing Baseline (Year 2018) Plus Project Buildout. Existing baseline (Year 2018) plus Project buildout levels of service for freeway ramps are summarized in Table 42 of the Revised Final EIR Part 3, Appendix F (pg. 279), showing that 1 freeway ramp would operate at unacceptable LOS and that buildout of the Project would have a significant impact at that freeway ramp.

2025 Plus Project Phase 1. Year 2025 plus Project Phase 1 levels of service for freeway ramps are summarized in Table 47 of the Revised Final EIR Part 3, Appendix F (pg. 208), showing that 1 freeway ramp would operate at unacceptable LOS. Table 56 (pg. 247) shows that Phase 1 of the Project would have a significant impact at that freeway ramp.

2040 Plus Project Buildout. Year 2040 plus Project buildout levels of service for freeway ramps are summarized in Table 61 of the Revised Final EIR Part 3, Appendix F (pg. 278), showing that 3 freeway ramps would operate at unacceptable LOS. Table 70 (pg. 320) shows that buildout of the Project would have a significant impact at one of those freeway ramps.

Offsite Improvements to TUMF Facilities

As indicated in Section 4.15 of the Revised Final EIR Part 3, there are improvements and changes to the road system that are part of the TUMF Regional System of Highways and Arterials, some of which are under the jurisdiction of Moreno Valley and others of which are located in other jurisdictions. Mitigation Measure 4.15.7.4D requires the developer to pay TUMF fees applicable to a particular building prior to receiving a certificate of occupancy for the building. These payments shall constitute the developer's mitigation of Project impacts to this category of roads. Mitigation Measure 4.15.7.4G requires the City to work with the other member agencies of the Western Riverside Council of Governments, the agency overseeing the TUMF program, to program TUMF funds to implement the mitigation measures identified in the Revised Final EIR Part 3 (pg. 4.15-131) pertaining to TUMF facilities outside the jurisdiction of the City of Moreno Valley. To the extent that TUMF fees provided by the developer are used to implement the recommended improvements, the Project's impacts would be less-than-significant. However, because the City does not have direct control over TUMF funding, the City cannot ensure that the identified improvements would be made. Thus, at this

point the Project's impacts on these facilities must be considered significant and unavoidable (Revised Final EIR, Part 3, pp. 4.15-132).

Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

At this time, the City does not have cooperative agreements with nearby jurisdictions that would serve as a fair share contribution program for collecting and distributing developer funds to cover the cost of cross jurisdictions mitigation measures, other than the TUMF program. The City will work with the Cities of Beaumont, Perris, Redlands and Riverside, and with Riverside County to collect fair share funds from the developer and to implement the mitigations measures identified in the Revised Final EIR Part 3 (Tables 4.15-40, 4.15-41 and 4.15-42) that are in these jurisdictions if fair share contribution programs have been established with the jurisdictions. To the extent that the City is able to establish such a program (as described in Mitigation Measures 4.15.7.4E and 4.15.7.4F) and the other jurisdiction constructs the recommended improvement, the Project's impacts would be less-than-significant. However, because the City cannot guarantee that such a program will be established and does not have direct control over facilities outside of its jurisdiction, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's impacts on these facilities must be considered significant and unavoidable.

Similarly, the City has not entered into an agreement with Caltrans for the collection of developer fair share payments for improvements to the state highway system other than freeway interchange improvements funded through the TUMF program. Nor has Caltrans established a fair share contribution program to collect fair-share contributions to freeway improvements such as those identified in Revised Final EIR Part 3 Tables 4.15-40 and 4.15-41. Instead, Caltrans has traditionally relied on other means to fund freeway improvements; means involving multiple stages of review and input from other agencies, with priorities and constraints applied at each stage, that preclude a direct connection between developer-provided fair-share funds and specific highway improvements.

The key feature of this system pertaining to the recommended freeway mitigation measures is that this system is outside the control of the City of Moreno Valley. The City shall work with Caltrans to establish a fair share contribution program for collecting fair share funds from developers for use in funding needed freeway improvements. However, since at the present time no such program exists that would ensure that WLC funds contributed to Caltrans or any other state agency would be used to implement specific improvements that mitigate WLC impacts, and because there is no mechanism by which the City can construct or guarantee the construction of any improvements to the freeway system by itself, the Project's impacts on the state highway system must be considered significant and unavoidable (Revised Final EIR Part 3, pp. 4.15-131 to 4.15-135).

b. Cumulative Transportation Impacts

Potential Significant Impact: Whether the Project could cause a cumulatively considerable increase in traffic on the intersection, street and freeway system outside the jurisdiction of the City of Moreno Valley that is substantial in relation to the without Project (i.e., No-Project) scenario.

Findings: Potential cumulative impacts of the Project related to the increase in traffic volumes are discussed in detail in Section 6.15 and Appendix F of the Revised Final EIR Part 3. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment (Finding 1). Each mitigation measure adopted by the Planning Commission is set forth in the attached Mitigation Monitoring and Reporting Program. However, the Commission finds that even with mitigation measures, the Project will have significant impacts due to inability to control the mitigation, funding and timing for improvements located outside the City of Moreno Valley, and therefore are considered significant and unavoidable. Those changes or alterations that are within the responsibility and jurisdiction of other public agencies and have been, or can and should be, adopted by those other agencies (Finding 2). Specific economic, legal, social, technological, or other considerations make the alternatives identified in the Revised Final EIR and additional mitigation measures infeasible, and overriding economic, legal, social, technological, or other benefits of the project outweigh the significant and unavoidable effects on the environment, which are set forth in Section VI, Statement of Overriding Considerations (Finding 3).

Facts in Support of the Findings: Section 6.15 of the Revised Final EIR Part 3 and the Traffic Impact Analysis (TIA) in Appendix F discuss cumulative impacts of the Project to the intersection level of service (LOS). The cumulative impacts of the Project were determined by comparing the LOS of the study facilities under the 2040 No-Project and 2040 Plus Project Build-out Scenarios.

The study area for surface streets covered all intersections in Moreno Valley of collector or higher functional classification with another collector or higher classification street, at which the Project would add 50 or more peak hour trips. The study area also included the main routes between the Project and the neighboring communities of Riverside, Perris, Beaumont, San Jacinto, and Redlands.

Intersection LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area intersections are summarized in Table 6.15-3 in the Revised Final EIR Part 3 and in Table 76 on page 343 within the TIA, showing that 26 intersections would have unacceptable LOS and resulting in significant cumulative impacts. Of the 26 intersections, 10 are located outside of the City of Moreno Valley.

Roadway Segment LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area roadway segments are summarized in Table 6.15-2 in the Revised Final EIR Part 3 and in Table 75 on page 341 within the TIA, showing that one roadway segment would have unacceptable LOS and result in significant cumulative impacts. The roadway segment is located outside of the City of Moreno Valley.

Freeway LOS

Project Cumulative Impacts Under the 2040 Plus Project Buildout Scenario. The cumulative impacts under the Year 2040 plus Project Buildout levels of service for the study area freeway facilities (mainline and

weaving facilities) are summarized on pages 6.15-38 and 6.15-41 through 6.15-44 in the Revised Final EIR Part 3 as well as Table 77 and pages 346 through 354 of the TIA located in Appendix F of the Revised Final EIR Part 3. The project would result in significant cumulative impacts to 21 mainline facilities and 11 freeway weaving sections as shown in Table 77 of the TIA.

Mitigation Measures

Implementation of **Mitigation Measures 4.15.7.4.A** through **4.15.7.4.G** requires the applicant to construct or fund all required mitigation for the Project's cumulative impacts for intersections and roadways within the City of Moreno Valley, and includes the payment of a Transportation Uniform Mitigation Fee (TUMF) as set forth in Moreno Valley Municipal Code Chapter 3.44 and paying a fair share contribution to jurisdictions that have established such programs toward mitigating Project-related cumulative impacts in jurisdictions other than the City of Moreno Valley, as identified in Section 6.15 and Appendix F of the Revised Final EIR Part 3. With implementation of these mitigation measures, the Project's cumulative impacts on intersections located within the City of Moreno Valley could be reduced to less than significant. However, because the City cannot guarantee that such programs will be established and does not have direct control over the funding or construction of needed improvements outside of its jurisdiction, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's cumulative impacts on these facilities must be considered significant and unavoidable. A discussion of the two categories of improvements that would result in significant and unavoidable impacts is discussed below.

Offsite Improvements to TUMF Facilities

As indicated in Section 6.15 of the Revised Final EIR Part 3, there are improvements and changes to the road system that are part of the TUMF Regional System of Highways and Arterials, some of which are under the jurisdiction of Moreno Valley and others of which are located in other jurisdictions. Mitigation Measure 4.15.7.4D requires the developer to pay TUMF fees applicable to a particular building prior to receiving a certificate of occupancy for the building. These payments shall constitute the developer's mitigation of Project impacts to this category of roads. Mitigation Measure 4.15.7.4G requires the City to work with the other member agencies of the Western Riverside Council of Governments, the agency overseeing the TUMF program, to program TUMF funds to implement the mitigation measures identified in the Revised Final EIR Part 3 (pp. 6.15-39 to 6.15-40) pertaining to TUMF facilities outside the jurisdiction of the City of Moreno Valley. To the extent that TUMF fees provided by the developer are used to implement the recommended improvements, the Project's impacts would be less-than-significant. However, because the City does not have direct control over TUMF funding, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project's cumulative impacts on these facilities must be considered significant and unavoidable (Revised Final EIR, Part 3, p. 6.15-41).

Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

At this time, the City does not have cooperative agreements with nearby jurisdictions that would serve as a fair share contribution program for collecting and distributing developer funds to cover the cost of cross

jurisdictions mitigation measures, other than the TUMF program. The City will work with the Cities of Beaumont, Perris, Redlands and Riverside, and with Riverside County to collect fair share funds from the developer and to implement the signalization of the San Timoteo Road/Alessandro Road intersection and the San Timoteo Road and Live Oak Canyon intersection (respectively) if fair share contribution programs have been established with the jurisdictions. The City will work with the City of Riverside to collect a fair-share contribution from the developer to signalize the Martin Luther King Boulevard/I-215 northbound ramp intersection if fair share contribution program has been established with the City of Riverside. To the extent that the City is able to establish such programs (as described in Mitigation Measure 4.15.7.4F) and the other jurisdiction constructs the recommended improvement, the Project’s impact would be less than significant. However, because the City cannot guarantee that such programs will be established and does not have direct control over facilities outside of its jurisdiction, the City cannot ensure that the identified improvements would be made. Thus, at this point the Project’s impacts on these facilities must be considered significant and unavoidable.

Similarly, the City has not entered into an agreement with Caltrans for the collection of developer fair share payments for improvements to the state highway system other than freeway interchange improvements funded through the TUMF program. Nor has Caltrans established a fair share contribution program to collect fair-share contributions to freeway improvements such as those identified in Table 77 of the TIA in the Revised Final EIR Part 3. Instead, Caltrans has traditionally relied on other means to fund freeway improvements; means involving multiple stages of review and input from other agencies, with priorities and constraints applied at each stage, that preclude a direct connection between developer-provided fair-share funds and specific highway improvements.

The key feature of this system pertaining to the recommended freeway mitigation measures is that this system is outside the control of the City of Moreno Valley. The City shall work with Caltrans to establish a fair share contribution program for collecting fair share funds from developers for use in funding needed freeway improvements. However, since at the present time no such program exists that would ensure that WLC funds contributed to Caltrans or any other state agency would be used to implement specific improvements that mitigate WLC impacts, and because there is no mechanism by which the City can construct or guarantee the construction of any improvements to the freeway system by itself, the Project’s impacts on the state highway system must be considered significant and unavoidable (Revised Final EIR Part 3, pp. 4.15-41 to 4.15-43).

D. ADEQUACY OF THE RANGE OF PROJECT ALTERNATIVES

The Revised Final EIR Part 4 analyzed four alternatives to the Project as proposed, and also evaluated these alternatives for their ability to meet the Project’s objectives as described in Section II.B above. CEQA requires the evaluation of a “No Project Alternative” to assess the maximum net change in the environment as a result of implementation of the Project. The No Project Alternative, referred to as the No Project/No Build, assumes no ground-disturbing activities would take place, nor would any form of structure or facility be erected. No Project/Existing General Plan Alternative, a Reduced Density Alternative, and two Mixed Use Alternatives were also selected for analysis. CEQA requires the evaluation of alternatives that can reduce the significance of identified impacts and “feasibly attain most of the basic objectives of the Project.” Thus, in order to develop

a range of reasonable alternatives, the Project Objectives must be considered when this Commission is evaluating the alternatives.

1. No Project/No-Build Alternative

Description: Under the No-Build Alternative, no development would take place within the project limits. No ground-disturbing activities would take place, nor would any form of structure or facility be erected. This alternative provides a baseline comparison to the Project. (Revised Final EIR Part 4, Volume 3, pg. 6-14 to 6-15).

Impacts: The No Project/No-Build Alternative, as referenced in Section 6.0 of the Revised Final EIR Part 4, Volume 3, would not result in any new physical environmental effects.

Objectives: Under the No Project/No Build Alternative, the subject site would not be developed and none of the twelve of the Project Objectives would be achieved.

Finding: Under the No-Build Alternative, no ground-disturbing activities would take place, nor would any form of structure or facility be erected. This Alternative would not result in the same significant and unavoidable impacts associated with agricultural resources, air quality, and traffic that have been identified within the Revised Final EIR Part 4, Volume 3 for the Project. In the absence of development, no impacts would occur, and this alternative would be the environmentally superior alternative. However, prohibiting development of the site, as suggested by this alternative, would not fulfill any of the primary objectives of the Project. Retention of the project site in its current condition would not create a high cube logistics facility consisting of approximately 2,525 acres of warehouse uses and it would not expand employment opportunities within the City and surrounding area. This Alternative provides a baseline comparison to the Project. Because the No-Build Alternative does not meet any the Project objectives, the Commission hereby rejects the No-Build Alternative.

2. No Project/Existing General Plan Alternative

Note: This alternative is moot, as the Project is now consistent with the City's General Plan and zoning, which reflects the site as World Logistics Center Specific Plan, in accordance with the City's November 2015 approvals and as remains in effect following the various court actions noted above.

3. Alternative 1 - Reduced Density Alternative

Description: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, the Reduced Density Alternative has been considered with the intent of avoiding or substantially reducing significant impacts, and in particular the significant impacts that cannot be reduced to a less than significant level through implementation of mitigation measures created by the Project's traffic, air quality, and noise impacts. This Alternative includes development of the project site with approximately 28 million square feet of logistics warehousing, a reduction of 12.6 million square feet, including 74.3 acres for open space. The 1,084 acres owned by the CDFW would be designated as Open Space in the City's General Plan, similar to the Project. Under this alternative, the proposed logistics uses would represent a net decrease of approximately 31 percent as compared with the Project.

Because of the large area, approximately 2,535 acres, of the Project that is proposed for development, public facilities, or off-site improvements, a variety of reduced density alternatives could be considered that might substantially reduce or eliminate one or more of the significant and unavoidable impacts of the Project. For example, warehousing development on the site would have to be reduced to approximately one percent of the project site, or 400,000 square feet, of the WLC Project's proposed high-cube logistics warehouse building area in order to eliminate significant and unavoidable impacts associated with air quality in order to reduce air pollution emissions to less than applicable SCAQMD thresholds. The only way this could logically occur would be to develop a small portion of the site (i.e., less than one percent) and leave the rest of the site vacant. In addition, even this substantial reduction in the proposed high-cube logistics warehouse building area and/or developable area would not eliminate the Project's other significant and unavoidable impacts associated with aesthetics, air quality, noise, and transportation. Any of the viable alternatives that are examined in this EIR would entail some type of development on all or most of the project site, rather than development of an illogically small portion of the site (i.e., one percent). (Revised Final EIR Part 4, Volume 3, pg. 6-23 to 6-24).

Impacts: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, the Reduced Density Alternative would result in similar impacts for the following nine environmental issues: Aesthetics; Agriculture and Forestry Resources; Biological Resources; Cultural Resources; Geology and Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Mineral Resources; Recreation. Under the Reduced Density Alternative, development of the same high-cube logistics land uses, building heights and mass, but at a floor area level approximately 70 percent of the Project, would be constructed resulting in significant and unavoidable impacts associated with scenic vistas, local scenic roads, character of the site and surroundings, and on a cumulatively considerable basis in the same exact manner as the Project. Impacts related to short-term construction-related air quality would be the same as the Project, because the same amount of land would be disturbed and the same mix of equipment would be utilized. The Reduced Density Alternative would result in significant and unavoidable air quality impacts from CO, VOC, NO_x, and PM₁₀, emissions during project construction, in the same exact manner as the Project. Long-term operational-related air quality impacts would be incrementally reduced when compared to the Project, but the emissions cannot be mitigated to below SCAQMD thresholds and would remain significant and unavoidable in approximately the same manner as the Project. Similarly, impacts related to short-term construction-related noise cannot be mitigated to a less than significant level and would be significant and unavoidable in the exact same manner as the Project. Although traffic-related noise would be reduced when compared to the Project, impacts would have a similar effect on local roadway segments and would remain significant and unavoidable as there are no feasible mitigation measures that would be able to reduce impacts to a less than significant level, in approximately the same manner as the Project. Under this alternative, the volume of water required and the amount of wastewater and solid waste generated would be reduced in comparison to the Project and the decrease in the amount of logistics uses would result in a reduction of permanent jobs that would be created. Consequently, this Alternative would have incrementally reduced demand on public services, recreation, and water use. Similar to the Project, increased property tax revenues, the payment of fees, and adherence to City development and utility requirements would reduce these impacts to less than significant levels.

Because of the decrease in vehicle trips achieved under this alternative, impacts to the operation of local roadways and intersections would be proportionally reduced from those identified for the Project. However,

under this Alternative, the future increases in traffic volumes would have a similar effect on freeways and interchanges, resulting in significant impacts similar to those identified for the Project. Since the City does not have control over when freeway improvements would occur, traffic impacts to freeways and interchanges would remain significant and unavoidable for impacts associated with freeway segments in approximately the same manner as the Project, as the City does not have control of when such freeway improvements can be installed or constructed by Caltrans.

In summary, the Reduced Density Alternative would incrementally reduce almost all of the Project impacts by reducing the total square footage of development. However, all of the impacts identified as significant and unavoidable under the Project, including aesthetics, air quality, greenhouse gas emissions, noise, and traffic would still be significant and unavoidable under this alternative. (Revised Final EIR Part 4, Volume 3, pg. 6-24 to 6-29).

Objectives: Under this Alternative, some of the Project objectives are met, but not nearly to the same degree as the Project which includes creating substantial employment opportunities for the citizens; providing the land use designations and infrastructure plans necessary to meet current market demands and to support the City's Economic Development Action Plan; creates a major logistics center with good regional and freeway access; provides a major logistics center to accommodate to some degree the ever-expanding volumes at the Ports of Los Angeles and Long Beach; creates a project that will provide a balanced approach to the City's fiscal viability, economic expansion, and environmental integrity; provides the infrastructure improvements required to meet project needs in an efficient and cost-effective manner; encourages new development consistent with regional and municipal service capabilities; improves employment opportunities within the City to improve the City's jobs/housing balance and help reduce systemic unemployment within the City; provides thousands of construction job opportunities during the Project's buildout phase to improve the jobs/housing balance and help reduce systemic unemployment; and provide appropriate transitions or setbacks between on-site and off-site uses. (Revised Final EIR Part 4, Volume 3, Table 6.M: Comparison of Reduced Density Alternative to the Project Objectives, pg. 6-29).

Findings: Under the Reduced Density Alternative, development of the project site with approximately 28 million square feet of logistics warehousing, including 74.3 acres for open space would occur. This Alternative would have similar impacts that have been identified within the Revised Final EIR Part 4, Volume 3. However, the Reduced Density Alternative would result in a decrease in trip generation in comparison to the Project and would result in a decrease in the severity of the significant and unavoidable impacts to construction and operational air pollution emissions, and traffic. The Commission finds that the Reduced Density Alternative would fulfill three of the 12 Project Objectives by establishing design standards and development guidelines to ensure a consistent and attractive appearance throughout the entire project; establishing a master plan for the entire project area to ensure that the Project is efficient and business-friendly, accommodating the next-generation of logistics buildings; and providing appropriate transitions or setbacks between on-site and off-site uses. Moreno Valley residents would also have more opportunities for employment. Because the Reduced Density Alternative will not fulfill nine of the twelve objectives of the Project and the severity of significant and unavoidable impacts would be not be reduced, this Commission hereby rejects the Reduced Density Alternative.

4. Alternative 2 - Mixed Use A

Description: As identified in Section 6.0 of the Revised Final EIR Part 4, Volume 3, with the intent of avoiding or substantially reducing significant impacts created by the Project’s traffic, air quality, and noise impacts, the City considered Mixed Use A Alternative. This alternative includes development of the Project site with approximately 1,410 acres of logistics warehousing (22 million square feet), 1,000 acres of light industrial uses (2,120 million square feet), 50 acres of retail commercial uses (500,000 square feet), 100 acres of professional or medical office uses (1.0 million square feet), and 150 acres of open space. (Revised Final EIR Part 4, Volume 3, pg. 6-29 to 6-30).

Impacts: Section 6.0 of the Revised Final EIR Part 4, Volume 3, identifies nine environmental issues that would have similar impacts as the Project. These issues are: Aesthetics, Agricultural and Forestry Resources, Cultural Resources, Biological Resources, Geology and Soils, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, and Recreation. Under this alternative, impacts related to short-term construction-related air quality and noise impacts would remain significant and unavoidable, similar to the Project. Long-term air quality operational impacts under this alternative would be increased in magnitude, remain significant and unavoidable, and would result in similar conditions as identified for the Project. The Mixed Use A Alternative would decrease the amount of logistics warehousing and would add light industrial, commercial, and office uses that would generate more permanent and more varied jobs than the Project, but some uses may require skilled workers and it is not known if or to what degree these workers already reside in the City. In addition, the developer will be supporting a local employment center to help City residents find positions within the WLC before the positions are advertised on a regional basis. The office uses proposed under this alternative may incrementally increase the total number of people that would be added to the City’s population and could have greater demands on public services and recreation. However, the increased property tax revenues, payment of fees, and dedication of parkland would reduce these impacts to a less than significant level. This alternative would increase the amount of wastewater generated, increase the amount of potable water required, and increase the amount of solid waste produced on-site. Similar to the Project, adherence to utility requirements would reduce these impacts to less than significant levels. Because of the increase in vehicle trips resulting from this alternative, impacts to noise and air quality would be proportionally increased from the Project and remain significant and unavoidable.

Long-term traffic impacts would remain significant and unavoidable for impacts associated with freeway segments as the City does not have control of when such freeway improvements would occur. Similarly, traffic-related noise would be increased in magnitude and cannot be mitigated to a less than significant level in a manner similar to the Project.

In summary, the Mixed Use A Alternative would increase employment opportunities but would substantially increase traffic, noise, and air quality impacts. All the impacts identified as significant under the Project, including air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-29 through 6-34).

Objectives: Under this alternative, nearly all of the Project objectives are met, with the exception of the following: creates a major logistics center with good regional and freeway access; provides a major logistics

center to accommodate to some degree the ever-expanding volumes at the Ports of Los Angeles and Long Beach; creates a project that will provide a balanced approach to the City's fiscal viability, economic expansion, and environmental integrity; and provides the infrastructure improvements required to meet Project needs in an efficient and cost-effective manner; encourages new development consistent with regional and municipal service capabilities. (Revised Final EIR Part 4, Volume 3, Table 6.O: Comparison of the Mixed Use A Alternative to the Project Objectives, pg. 6-34).

Finding: Under the Mixed Use A Alternative, the project site would be developed with approximately 1,410 acres of logistics warehousing (22 million square feet), 1,000 acres of light industrial uses (2,120 million square feet), 50 acres of retail commercial uses (500,000 square feet), 100 acres of professional or medical office uses (1.0 million square feet), and 150 acres of open space. The Mixed Use A Alternative would increase employment opportunities but would substantially increase traffic, noise, and air quality impacts. All the impacts identified as significant under the Project, including air quality health risks, would still be significant under this alternative.

Most of the objectives of the Project would be met; however, the Mixed Use A Alternative would not meet the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system. This Commission finds that the Mixed Use A Alternative would have similar impacts to all environmental issues. Because the Mixed Use A Alternative will not substantially reduce the environmental impact of the Project and it would not meet the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system, this Commission hereby rejects the Mixed Use A Alternative.

5. Alternative 3 - Mixed Use B

Description: As identified in Section 6.0 of the FEIR, Volume 3, the Mixed Use B Alternative would develop the project site similar to the land use plan of the Moreno Highlands Specific Plan (MHSP) but with 10 million square feet of logistics warehousing on the 603 acres proposed for business, retail, institutional, and other uses under the MHSP. (Revised Final EIR Part 4 Volume 3, pg. 6-34 to 6-35).

Impacts: Section 6.0 of the Revised Final EIR Part 4, Volume 3, Under Alternative 3, impacts related to short-term construction-related air quality would be similar to the Project as the same amount of land would be disturbed, and the same mix of equipment would be utilized. Long-term operational-related air pollutant emissions would be higher than the Project and would remain significant and unavoidable, with the exception of PM_{2.5} and SO_x. Like the Project, long-term air quality relative to criteria pollutants would still be significant, with the exception of SO_x. Assuming the same level of mitigation as the proposed Project, there would be no cancer risks associated with this alternative since the use of new technology diesel engines do not contribute to cancer risk as described in Revised Final EIR Volume 3 Section 4.3. The development of the Mixed Use B Alternative would have increased demands on public services and recreation facilities to serve future residential uses. However, increased property tax revenues, payment of development impact fees, and adherence to development requirements would reduce these impacts to a less than significant level. Water supply availability is expected to be available as water demand is expected to be the same. Water demand was determined to be available for the Project. There would be an increase in vehicle trips under this alternative,

resulting in greater noise and air quality impacts compared to that identified for the Project; therefore, long-term traffic impacts would remain significant and unavoidable. Development of the Mixed-Use B Alternative would provide new employment opportunities and homes for residents of Moreno Valley, but new employment opportunities would be significantly reduced compared to the Project.

In summary, the Mixed-Use B Alternative would incrementally increase traffic and not improve the City's jobs/housing balance over the long-term. However, this is the only alternative that would reduce a significant impact of the Project (aesthetics – views) by substantially reducing the amount of warehousing on the site and replacing it with residential uses. Views of the area would still transition from vacant agricultural land to suburban development, but it would have a residential appearance compared to the Project. All the other impacts identified as significant under the Project, including likely air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-34 through 6-38).

Objectives: Under this alternative, some of the Project objectives are met, with the exception of the following: provides the land use designation and infrastructure plans necessary to meet current market demands and to support the City's Economic Development Action Plan; creates a major logistics with good regional and freeway access; establishes a master plan for the entire project area to ensure that the project is efficient and business-friendly, accommodating the next-generation of logistics buildings; provides a major logistics center to accommodate to some degree the ever-expanding trade volumes at the Ports of Los Angeles and Long Beach; creates a project that will provide a balanced approach to the City's fiscal viability, economic expansion, and environmental integrity; provides the infrastructure improvements required to meet project needs in an efficient and cost-effective manner; encourages new development consistent with regional and municipal service capabilities; and provides thousands of construction job opportunities during the Project's buildout. (Revised Final EIR Part 4, Volume 3, Table 6.Q: Comparison of the Mixed-Use B Alternative to the Project Objectives, pg. 6-38).

Finding: Under the Mixed Use B Alternative, development of the Project site similar to the land use plan of the Moreno Highlands Specific Plan (MHSP) but with 10 million square feet of logistics warehousing on the 603 acres proposed for business, retail, institutional, and other uses under the MHSP. The Mixed-Use B Alternative would incrementally increase traffic and not improve the City's jobs/housing balance over the long-term. However, this is the only alternative that would reduce a significant impact of the Project (aesthetics – views) by substantially reducing the amount of warehousing on the site and replacing it with residential uses. Views of the area would still transition from vacant agricultural land to suburban development, but it would have a residential appearance compared to the Project. All the other impacts identified as significant under the Project, including likely air quality health risks, would still be significant under this alternative. (Revised Final EIR Part 4, Volume 3, pgs. 6-37).

Some of the objectives of the Project would be met; however, the Project objectives of locating distribution services near transportation corridors and clustering such uses near the state highway system would not be met. This Commission finds that the Mixed-Use B Alternative would have similar impacts to all environmental issues except for aesthetic because this Alternative would eliminate the significant and unavoidable impacts to aesthetics. Because the Mixed Use B Alternative will not substantially reduce the environmental impact of the Project and it would not meet the Project objectives of locating major distribution services near transportation

corridors and clustering such uses near the state highway system, provide land use designations and infrastructure plans necessary to meet current market demands and to support the City's Economic Development Action Plan, and create a project that will provide a balanced approach to the City's fiscal viability, economic expansion, and environmental integrity this Commission hereby rejects the Mixed Use B Alternative.

6. Alternatives Considered and Rejected

A variety of additional alternatives were considered as part of the Revised Final EIR Part 4, Volume 3's Alternatives Analysis. (Revised Final EIR Part 4, Volume 3, pgs. 6-3 through 6-5) Two possible alternatives were considered and rejected because they could not accomplish the basic objectives of the Project or they were considered infeasible. Per the *CEQA Guidelines* (Section 15126.6(c)), factors that may be considered when addressing the feasibility of alternatives include failure to meet most of the stated Project objectives, infeasibility, or inability to avoid significant environmental effects. The purpose of the Project is to provide for and expand employment and revenue opportunities within the City of Moreno Valley. The Project would expand employment options in a location that is convenient to existing transportation corridors, convenient to existing and future City residents and would augment the City's economic base. The following provides and discussion of the three development scenarios that were considered and rejected as potential alternatives to implementation of the Project based on Section 15126.6 of the *CEQA Guidelines* because they did not feasibly attain most of the basic objectives of the Project while reducing or avoiding any of the significant effects of the Project:

- **All Residential Alternative:** A number of residential uses, including very low density (2-acre or 5-acre lots) were considered prior to deciding on all warehousing uses, but it was concluded that any residential alternatives, or alternatives that emphasized residential uses, would further exacerbate the City's jobs/housing imbalance and did not meet any of the Project goals. In addition, the City's Economic Strategy Plan excludes additional residential development in this area. For these reasons, all Residential Use Alternatives were rejected for further analysis. However, an evaluation of the largely residential Moreno Highlands Specific Plan (MHSP) was provided under the No Project/Existing General Plan alternative. (Revised Final EIR Part 4, Volume 3, pg. 6-4).
- **Mixed Use Alternative:** The EIR examines two Mixed Use Alternatives with varying amounts of residential and non-residential uses. The No Project-Existing General Plan Alternative is based on the approved mixed-use Moreno Highlands Specific Plan (MHSP). In addition, Alternative 3 (Mixed Use B) evaluates the impacts of substituting logistics warehouse uses for the non-residential uses currently included in the MHSP. After extensive evaluation, it was concluded that any reasonable combination of residential and non-residential uses (i.e., light industrial, business park, office, commercial) would result in impacts similar to those of the MHSP, Alternative 2 (mixed non-residential uses but no residential uses), or Alternative 3 (Moreno Highlands Specific Plan with logistics warehousing as the main non-residential use). For this reason, no other Mixed Use Alternatives were considered further in this analysis. (Revised Final EIR Part 4, Volume 3, pg. 6-4).

- Alternative Sites. Section 6.0 of the Revised Final EIR Part 4, Volume 3 examines different sites in the surrounding region to determine if an alternative location would reduce or eliminate one or more significant impacts of the Project. This analysis must be based on feasible sites that could realistically support the Project (i.e., a contiguous 2,610-acre site for 40.6 million square feet of high-cube and light logistics warehouse uses as envisioned by the WLC Specific Plan). The surrounding jurisdictions, including Cities of Riverside, Perris, San Jacinto, Menifee, Calimesa, Banning, and Beaumont and the County of Riverside, along with Moreno Valley were contacted to identify potential alternative sites for the Project. Revised Final EIR Part 4, Volume 3, Figure 6.1 pg. 44 shows the locations of the various jurisdictions that were contacted and/or analyzed in this evaluation and Revised Final EIR Part 4, Volume 3, Table 6.R pg. 45 presents the results of that analysis. Table 6.R indicates that there are no feasible alternative sites in the surrounding or nearby jurisdictions that could support the Project (i.e., that have enough vacant land zoned or available for logistics warehousing with good freeway and/or rail access). For these reasons, Alternative Sites were not considered further in this analysis. (Revised Final EIR Part 4, Volume 3, pgs. 6-38 through 6-41).

7. Environmentally Superior Alternative

As identified in the Revised Final EIR Part 4, Volume 3, the No Project/Existing General Plan Alternative has mixed impacts relative to the Project; it reduces aesthetic impacts to less than significant levels but worsens the jobs/housing ratio by introducing more housing than employment-generating uses. The Mixed Use A Alternative substantially increases traffic and related impacts compared to the Project impacts, but it does not create any additional significant impacts. The Mixed Use B Alternative would incrementally increase traffic and would not improve the jobs/housing balance. It would incrementally reduce health risks to existing residents along Redlands Boulevard (i.e., approximately 30 percent less warehousing), but could create health risks for new residents depending on the ultimate location of warehouses and new residences. In addition, this alternative would also worsen the jobs/housing ratio of the City by allowing the construction of many more homes than job-creating land uses. Regarding air quality impacts, development of any land uses would likely exceed SCAQMD thresholds mainly due to the size of the Project site. (Revised Final EIR Part 4, Volume 3, pg. 6-45 to 6-47).

The *CEQA Guidelines* (Section 15126.6 (e)[2]) requires that an environmentally superior alternative be identified in the EIR. Based on the analysis in Revised Final EIR Part 4 Section 6 and the summary contained in Revised Final EIR Part 4 Table 6.S, Alternative 1 – Reduced Density – is the only alternative that reduces traffic, air quality, and related impacts by reducing the total square footage of warehousing by approximately 30 percent. Alternative 3—Mixed Use B—is the only alternative that would reduce a significant impact of the proposed project (i.e., aesthetics – views). However, it could create health risks for future residents of the Project and would worsen the jobs/housing balance of the City over the long term. For these reasons, the Revised Final EIR Part 4 concluded that Alternative 1 – Reduced Density — was environmentally superior to the proposed project.

Revised Final EIR Part 4 Table 6.T compared Alternative 1 to the project objectives and determined Alternative 1 does not meet 9 of the 12 major goals of the proposed project mainly because reducing the total

square footage by 30 percent also reduces the amount of new employment and property tax revenues. Therefore, Alternative 1 - Reduced Density, was rejected in favor of the proposed project.

E. GROWTH-INDUCING IMPACTS

CEQA requires a discussion of ways in which the Project could be growth-inducing. Specifically, CEQA Guidelines Section 1512602(d) states that an EIR must describe the ways in which the Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

The Project area is largely vacant undeveloped land, although there are six existing single-family homes in various locations on the WLC Project site along with associated ranch/farm buildings. The site has been farmed since the early 1900s and has supported dry (non-irrigated) farming, livestock grazing, and limited citrus groves. Much of the site continues to be used for dry farming.

The City's population has grown steadily over the past decades. Population projections developed by SCAG estimate the City's population will reach approximately 213,700 persons by the year 2020 and approximately 255,200 persons by the year 2035. The extent to which the new jobs created by a Project are filled by existing residents is a factor that tends to reduce the growth-inducing effect of a Project. Construction of the WLC Project will create short-term construction jobs. These short-term positions are anticipated to be filled by workers who, for the most part, reside in the Project area; therefore, construction of the WLC Project will not generate a permanent increase in population within the Project area. Development envisioned under the Specific Plan consists of approximately 40.6 million square feet of logistics warehouse and general warehouse facilities.

Development of the high-cube logistics warehouse and general warehouse facilities will create jobs in the local economy. It is estimated that the WLC Project would result in approximately 25,000 new on-site job opportunities in addition to 7,583 indirect jobs of which 3,792 are projected to be within the City as a result of Project implementation (Revised Final EIR Part 1, Response 1-G-170-4).

The new employment opportunities resulting from development of the proposed high-cube logistics warehouse and general warehouse uses will raise the City's current jobs-to-housing ratio by providing additional jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, due to the City's projected jobs/housing ratio, it is reasonable to assume that a large percentage of these jobs would be filled by persons already living within the City or Project area. The Project does not include a residential component. The WLC Project is located within an area that is currently largely vacant and previously planned for a mix of residential, commercial, business park, and open space land uses in accordance with the General Plan Community Development Element. The WLC Project is consistent with the City's General Plan and zoning, which allows a mix of land use designations including Logistics Development and Light Logistics. Therefore, no significant increase in population of the City would result from the development or operation of the WLC Project.

The *Fiscal and Economic Impact Study World Logistics Center Moreno Valley, California* (Revised Final EIR Part 4 Appendix O "Study," DTA 2014) estimates that approximately 7,386 indirect/induced jobs will be

created in the County, of which 3,693 jobs are projected to be within the City as a result of Project implementation (updated as approximately 25,000 new on-site job opportunities in addition to 7,583 indirect jobs of which 3,792 are projected to be within the City as a result of Project implementation, as noted in Revised Final EIR Part 1, Response 1-G-170-4). While the specific location of the potential additional indirect/induced jobs created within the County cannot be specifically determined, it is reasonable to assume that a large percentage of these jobs will support service jobs and are likely to be located in the WLC Project vicinity, and therefore the City. As detailed in the Study, total recurring revenues available to the City are estimated at approximately \$11,257,466 per year. The greatest percentage of revenue is attributed to the Property Tax In-Lieu of Vehicle License Fee (40.2%), followed by Secured Property Tax (29.1%), and Business Receipts Tax and Licenses (10.8%). Total recurring costs to the City are estimated at approximately \$5,557,674 per year. The greatest percentage of cost is attributed to the Police Services (35.8%), followed by Infrastructure and Parks Maintenance Costs (34.1%), and Fire Services (13.3%).

Project recurring annual fiscal surplus that would be available to the City is estimated at approximately 7 million dollars which is twice the Project annual City General Fund costs.

The Project would add 40.6 million square feet of logistics facilities and associated infrastructure in the eastern portion of the City. Since the City currently has a jobs-to-housing ratio substantially lower than the region (i.e., SCAG region), it is likely that much of the employment that would be generated by this Project can be accommodated by the existing workforce in the City and surrounding area. In that way, the Project is growth-inducing in terms of employment. Due to relatively high vacancy rates in the City, it is also likely that the housing needs of new employees that do not already live in the City (i.e., own or rent) could largely be accommodated by the City’s existing housing stock. Therefore, the WLC Project would only produce modest (i.e., not significant) growth inducement within Moreno Valley.

As previously noted, the specific location of the additional indirect jobs created within the County cannot be specifically determined; however, it is likely that a large percentage of these jobs will be support service jobs and are likely to be located in the Project vicinity. The Study assumes that one-half of these indirect jobs will be located within the City. The Study indicates that the creation of new jobs to the City will lead to more consumer spending by employees in existing retail establishments within the City, as well as new retail development that will be attracted to the City as a result of this spending. Job creation also results in increased tax revenues to the City through increased property taxes and sales taxes associated with development of the WLC Project. However, it is important to note that because of the difference in timing of the development of the various phases of the WLC Project, the number of employees summarized above will not be realized at the same time.

Development of the WLC Project is projected to create approximately 16,521 construction-related jobs within the City. Similar to recurring employment (i.e., permanent), it is likely that a large percentage of these jobs will be located in the general vicinity of the WLC Project and therefore within the City.

The WLC Project does not include a residential component; therefore, the jobs generated by the WLC Project would not need to support new households as a result of direct employment or indirect employment. Based on the potential increase in jobs (additional 25,000 direct jobs) within the City and no substantial increase in

population as a result of the project, the City's jobs-to-housing ratio would improve from the (2011) ratio of 0.47 to 0.91, thus achieving a greater jobs-to-housing balance within the City. As development of the WLC Project is expected to occur over the course of many years, the jobs-to-housing ratio will not be significantly changed immediately. The City's current jobs-to-housing ratio is exceptionally low when compared to SCAG standards; therefore, the need for employment is immediate. A balance between jobs and housing within the City would have a positive impact by decreasing costs associated with commuting, traffic congestion, air pollution, and improves the standard of living. It also provides savings and a better quality of life to consumers in operation and maintenance of automobiles, lessening commute times and saving to local public agencies in terms of the need to construct and maintain new road improvements.

Streets, water and sewer utilities, and municipal services would be extended to serve the WLC Project. The WLC Project will benefit other development projects in the Project area, and therefore, could potentially induce additional business and job growth by removing an impediment to growth, such as a lack of basic infrastructure or services. However, the WLC Project is located proximate to other existing warehouse, commercial, and residential uses. Therefore, the Project will necessitate extension of major infrastructure; however, the Project will not result in substantial population growth that has not already been planned for in the City's General Plan. As discussed in the Statement of Overriding Considerations in Section VI, the Project is consistent with the General Plan and would further the overall goals of the General Plan, and because the improvements necessary for development of the site would not facilitate growth that has not been anticipated in the project area, no significant growth-inducing effect would occur, and no mitigation is required. (Section 5.0 of the Revised Final EIR Part 4, Volume 3, pgs. 5-4 through 5-6)

F. SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126(c) of the CEQA Guidelines mandates that an EIR must address any significant irreversible environmental changes which would be involved in the proposed action should it be implemented. An impact would fall into this category if it resulted in any of the following:

- A. The project would involve a large commitment of non-renewable resources;
- B. The primary and secondary impacts of the project would generally commit future generations of people to similar uses;
- C. The project involves uses in which irreversible damage could result from any potential environmental incidents associated with the project; and/or
- D. The project will consume large amounts of energy that are produced from non-renewable fossil fuels, although the WLC Specific Plan indicates the proposed uses will efficiently consume energy and water resources.

Determining whether the WLC Project may result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed in such a way that there would be little possibility of restoring them. Because no significant mineral resources were identified within the Project site, no significant impacts related to this issue would result from development of the Project. Natural resources in the form of construction materials would be utilized in the construction of the WLC Project and energy resources in the form of electricity and natural gas would be used during the long-term operation of the Project; however,

their use is not expected to result in a negative impact related to the availability of these resources. Existing scenic vistas were identified as being visible from outside the Project limits. Implementation of the WLC Project would result in the obstruction of views of the Badlands, Mt. Russell and Mystic Lake/San Jacinto Wildlife Preserve from the nearest sensitive visual receptors and those traveling along roadways in the Project vicinity. This is a significant and irreversible environmental change that would occur as a result of Project implementation. Cumulatively, future development along SR-60 would also result in the obstruction of the existing views of surrounding mountains and visual features.

In addition, this logistics warehouse project, in concert with the other built or approved industrial warehouse projects to the north and west, will fundamentally change the character and land use pattern of this portion of the City. Many of the Project-specific impacts are addressed, as outlined above, but the land use change represented by this and other industrial projects represents a substantial irreversible change in community character for this area. (Revised Final EIR Part 4, Volume 3 pgs. 5-4).

VI. STATEMENT OF OVERRIDING CONSIDERATIONS

Pursuant to Section 15093 of the CEQA Guidelines, this Commission must balance the benefits of the proposed Project against unavoidable environmental risks in determining whether to approve the proposed Parcel Map, and CEQA Guidelines Section 15093(b) provides that when a public agency approves a project that will result in significant impacts that are identified in the Final EIR but are not avoided or substantially lessened, the agency must state in writing the specific reasons to support its decision based on the Final EIR and/or other information in the whole administrative record. If the specific economic, legal, social, technological or other benefits of a proposed project outweigh its unavoidable adverse environmental impacts, the adverse effects may be considered “acceptable.”

As set forth in sections V.A and V.B above, many of the World Logistics Center’s impacts on the environment will either be insignificant or, through the imposition of mitigation measures as conditions of approval of the Project, can be reduced to less than significant.

Some impacts of the World Logistics Center will remain significant and unavoidable even after the imposition of all feasible mitigation measures which include impacts to aesthetics, air quality, land use, noise, transportation and circulation. There are no feasible alternatives to the Project which would mitigate or avoid those environmental impacts as indicated in Section V.D above.

In consideration of the above and as set forth below, this Commission has determined that the benefits which will accrue from the development of the Project outweigh the significant and unavoidable impacts which the Project will produce.

Finding: Notwithstanding the significant unavoidable impacts to aesthetics (individually and cumulative), air quality (individually and cumulative), land use and planning, noise, and transportation discussed in subsection V.C above, the development of otherwise underused land, the creation of jobs by the Project, both during construction and after the Project is in operation, the multiplier effect which will create secondary jobs to support the Project and those who work in it, the substantial economic benefits which will be generated, directly and indirectly, by the Project, the reduction in commute times and the reduction of trips on the County’s highways during peak morning and evening hours in the peak travel direction, the reduction of water consumption over previously planned uses, the achievement of the City’s goal of attracting new business opportunities, the improvement of the City’s jobs/housing balance and the generation of revenues which will go into the City’s general fund constitute benefits which outweigh the unavoidable adverse environmental impacts to aesthetics, air quality, land use, noise and transportation and circulation. Each of the benefits, individually, constitutes a sufficient basis for approving the Project notwithstanding the significant and unavoidable impact on aesthetics, air quality, land use, noise and transportation and circulation which will result.

Factual Basis for the Finding:

Approval of the Project Will Create Jobs and Increase Economic Activity. At full build-out, the Project is estimated to generate over 25,000 ongoing direct jobs in the City. An economic study of the Project

concluded that the proposed WLC project could generate approximately 25,000 new on-site jobs within the City (Revised Final EIR Part 1, Response 1-G-170-4). In addition to the projected on-site job creation, the study estimates the proposed WLC Project could generate new off-site jobs (i.e., indirect/induced employment) in all industries of the economy. The study also estimated that an additional 7,583 indirect/induced jobs could be created in the County, of which 3,792 jobs were projected to be within the City as a result of project implementation. In constant 2012 dollars, these jobs will result in estimated annual wages of approximately \$830,000,000 for direct jobs and approximately \$300,000,000 in wages resulting from indirect and induced jobs. Of the estimated \$300,000,000 indirect and induced jobs approximately \$150,000,000 in wages will occur within the City. (Revised Final EIR Part 4 Appendix O, Table 4B.). This translates into an overall annual estimated economic output of approximately \$2,370,000,000, approximately \$1,940,000,000 of which will occur within the City (Revised Final EIR Part 4 Appendix O, Table 4C.). The Project also is estimated to generate in aggregate, almost 13,000 direct construction jobs over the 15-year build-out period, equivalent to approximately 850 full-time equivalent jobs every year for the duration of the 15-year construction period. These jobs will result in estimated wages, in constant 2012 dollars, of approximately \$625,000,000. (Revised Final EIR Part 4 Appendix O, Table 4D.) Added to this will be approximately 7,400 estimated indirect and induced jobs, with approximately 3,700 of them within the City, with wages, in constant 2012 dollars, of approximately \$300,000,000 half of which, approximately \$150,000,000 will be for jobs within the City. (Revised Final EIR Part 4 Appendix O, Table 4D.) Construction is estimated to result in approximately \$2,600,000,000 in total economic output, which includes in wages and sales income of which approximately \$2,140,000,000 will occur within the City. (Revised Final EIR Part 4 Appendix O, Table 4D.)

Furthermore, with the recent dramatic economic impact of the COVID-19 restrictions and associated substantial job loss, unemployment claims and direct impact to local businesses, the Project provides extraordinary economic value in construction jobs, City revenues, infrastructure improvements and permanent jobs at a time when such economic considerations are critical to a City's immediate and long-term success.

Approval of the Project Will Increase the City's Tax Revenues and Generate a Substantial Annual tax Surplus. At full build-out, the Project is estimated to generate approximately \$11,300,000 in annual revenues (in constant 2012 dollars) for the City (Revised Final EIR Part 4 Appendix O, Table 3A) with approximately \$5,500,000 in costs (Revised Final EIR Part 4 Appendix O, Table 3B) resulting in an estimated annual surplus of almost \$5,700,000 (Revised Final EIR Part 4 Appendix O, Table 3C). In addition, the City will receive an estimated additional \$1,800,000 in Moreno Valley Fire property taxes over the cost of the fire protection services which will be provided to the Project, money that can be spent on fire services in other parts of the City (Revised Final EIR Part 4 Appendix O, page 18).

Approval of the Project Will Provide Money for Schools. The Project is estimated to provide approximately \$47,502,000 in school impact mitigation fees (calculated based on a total 40,600,000 sq. ft. times the 2019 Moreno Valley School District and San Jacinto Unified School District's respective development fees) that can be used to improve educational opportunities for students within both the Moreno Valley Unified School District and the San Jacinto Unified School District. (Revised Final EIR Part 4, Table 4.14.D.) The Project is estimated to also generate approximately \$22,000,000 in additional State education revenue annually as a result of the 1% ad valorem property taxes assessed against the developed Project property. Further, the Project

is estimated to contribute \$6,993,000 to be used by the City to provide and enhance educational and workforce development training in the supply chain and logistics industries. Finally, the Project will also benefit education as a result of income taxes paid to the State on jobs created by the Project, which will be used to fund elementary and high schools, both locally and throughout the State. (Education Code § 14002.).

Approval of the Project Will Improve the City’s Jobs/Housing Balance. As shown in Section 4.13.1.3 of the Revised Final EIR Part 4, the City’s current jobs/housing balance of 0.47 is one of the lowest in Southern California and is almost 60% below the Southern California Association of Government’s 1.14 average, resulting in long commutes for many of the City’s residents. At full build-out, the jobs within the City associated with the Project, direct, indirect and induced, are projected to increase the jobs/housing balance to 0.91 (Revised Final EIR Part 4 Appendix O, Table 4F).

Approval of the Project Will Further the State of California’s Goals of Improving the Urban Jobs/Housing Balance. California Government Code 65890.1 declares the following:

- State land use patterns should be encouraged that balance the location of employment-generating uses with residential uses so that employment-related commuting is minimized.
- Balance in employment and residential land use patterns reduces traffic congestion and may contribute to improvement of air quality in urban areas.
- Balancing of employment-generating land uses and residential land uses improves economic and housing opportunities and reduces loss of economic productivity caused by transportation delay.
- The attainment of a more balanced land use pattern requires the cooperation of government agencies with the private sector to assure that public and private decisions affecting land use take into consideration the need to seek balance in the location of employment-generating land uses and residential land uses.
- Local agencies and state agencies should cooperate to facilitate the balancing of employment-generating land uses and residential land uses and provisions of transportation to serve these uses.
- Local governments have the primary responsibility to plan for local land use patterns, within the parameters established by state law to achieve statewide needs.
- It is the intent of the Legislature to move toward the goal that every California worker have available the opportunity to reside close to his or her jobsite.

By creating an estimated 25,000 direct jobs and more indirect and induced jobs in Moreno Valley, the Project improves the City’s jobs/housing balance and helps the City meet this State-mandated goal.

Approval of the Project Will Further the General Plan’s Goal to Create an Orderly and Balanced Land Use Pattern that Accommodates a Range of Residential, Cultural, Recreational, Business and Employment Opportunities (Goal 9.1, I). The Project adds a major jobs-rich, high- demand land use which is projected to provide a substantial number of both construction and permanent job opportunities to significantly improve the City’s low jobs-housing balance and establish a long-term stable tax base to fund City services. The Project includes a Specific Plan which incorporates extensive project design standards and

project review processes to ensure that all project development occurs in an orderly and balanced manner.

Approval of the Project Will Further the General Plan’s Goal of Creating Clean, Attractive Conditions, Free of Blight and Deteriorated Conditions (Goal 9.1, II). The Project will convert more than 2,600 acres of unused, unproductive marginal farmland into a comprehensively designed logistics campus incorporating Project-wide guidelines for site planning, architecture, and landscaping. The WLC project will advance many of the City’s General Plan goals, objectives and policies. The Project includes a Specific Plan which requires compliance with these guidelines for all development within the WLC, all of which will be subject to a discretionary plan review process including provisions for public review.

Approval of the Project Will Further the General Plan’s Goal of Creating a Community that Enjoys a Healthy Economic Climate that Benefits Both Residents and Businesses (Goal 9.1, IV). The Project will create substantial long-term economic growth and stability for the City as a whole through the creation of tens of thousands of short-term and long-term employment opportunities, increased property values, substantial on-going revenue sources from property taxes and retail sales, low cost of municipal services for logistics uses and payment of substantial development fees. Based on the projections from three separate economic analyses contained in the EIR, the Project will provide substantial annual tax surpluses that will generate funds for use by the City to address city-wide needs.

Approval of the Project Will Further the General Plan’s Goal of Creating Recreational Amenities, Recreational Services and Open Space, Including but not Limited to Parks, Multi-Use Trails, Community Centers and Open Space (Goal 9.1, V). The Project includes the offer of dedication of 74.3 acres of significant open space in the Mt. Russell area. This area is immediately adjacent to the State of California’s 8,800-acre Lake Perris State Recreation Area and the 9,000-acre San Jacinto Wildlife Area. The 74.3 acres will be offered for dedication to the state and to the City for open space use. In addition, the WLC Specific Plan includes the provision for more than five miles of new mixed-use trails to be developed through the Project extending the existing trail system to provide public access opportunities to the Lake Perris Recreation Area and the San Jacinto Wildlife Area.

Approval of the Project Will Further the General Plan’s Goal to Create a Pattern of Land Uses Which Organizes Future Growth, Minimizes Conflicts Between Land Uses and Which Promotes the Rational Utilization of Presently Underdeveloped and Undeveloped Parcels (Goal 2.1). The Project will develop a major undeveloped section of the City into a self-contained, master-planned logistics park featuring major setback areas between the Project and adjacent land uses. Development of the Project will occur in an organized rational manner subject to the review and approval by the City of all development proposals.

Approval of the Project Will Further the General Plan’s Goal to Create an Organized, Well-Designed, High Quality, and Functional Balance of Urban and Rural Land Uses that Will Meet the Needs of a Diverse Population and Promote the Optimum Degree of Health, Safety, Well-being and Beauty for All Areas of the Community While Maintaining a Sound Economic Base (Goal 2.2). The Project will convert more than 2,600 acres of unused, unproductive marginal farmland into a comprehensively designed logistics campus incorporating Project-wide guidelines for site planning, architecture, and landscaping. The WLC project will advance many of the City’s General Plan goals, objectives and policies. This Project replaces the

previously approved 20-year old Moreno Highlands Specific Plan west of Gilman Springs Road which proved to be unmarketable. The Project is projected to create thousands of job opportunities in the City of Moreno Valley within a master-planned logistics campus that will feature unified building design concepts, on-site and off-site landscaping, architecture, street design and a project-wide drainage and water quality system that emphasizes the creation of a sustainable business environment, a safe working environment for thousands of employees, in an attractive comfortable setting while creating a source of major economic benefits and stability to the City and its residents.

Approval of the Project Will Further the General Plan’s Goal of Achieving an Overall Design Statement that Will Establish a Visually Unique Image Throughout the City (Goal 2.3). The Project will be subject to extensive design guidelines which guide all elements of the development of the Project including grading, streets, buildings, lighting, landscaping, architecture, screening, parking, and signage all focused on creating a unified, aesthetically pleasing, functional design across the entire project area. The Project’s proximity to SR60 and Gilman Springs Road will provide a comprehensively planned, architecturally-significant entry statement for the City. Every element of the Project will be subject to City review and approval to ensure that all applicable standards and these City goals are met.

Approval of the Project Will Further the General Plan’s Goal of Providing Systems for Water Supply and Distribution; Wastewater Collection, Treatment and Disposal; and Energy Distribution Which are Capable of Meeting the Present and Future Needs of All Residential, Commercial and Industrial Customers Within the City of Moreno Valley (Goal 2.5). The Project will provide necessary infrastructure systems to accommodate the future water, wastewater and utility needs of all users within the WLC. Such infrastructure systems will be constructed to keep pace with demand and will be monitored by the City and the Eastern Municipal Water District in connection with the review of each individual building application. Infrastructure improvements will be required to be operational at such time as buildings are occupied.

Approval of the Project Will Further the General Plan’s Goal of Balancing the Provision of Urban and Rural Lands Within Moreno Valley by Providing Adequate Land for Present and Future Urban and Economic Development Needs, While Retaining the Significant Natural Features and the Rural Character and Lifestyle of the Northeastern Portion of the Community (Objective 2.1). The Project will establish a major center of jobs-rich land uses to provide thousands of job opportunities for residents of the City and the region and will generate substantial long-term tax revenues to the City, the County and the State to assist in the funding of public services throughout the region. The development of the Project will be accomplished without impact on the rural character and lifestyle of the northeastern portion of the community. The SR60 corridor will provide a significant visual and functional separation between the WLC project and the northeastern portion of the community.

Approval of the Project Will Further the General Plan’s Goal of Providing a Mix of Industrial Uses Which Will Provide a Sound and Diversified Economic Base and Ample Employment Opportunities for the Citizens of Moreno Valley with the Establishment of Industrial Activities that Have Good Access to the Regional Transportation System, Accommodate the Personal Needs of Workers and Business Visitors; and which Meets the Service Needs of Local Businesses (Objective 2.5). The Project will provide

a large-scale, master-planned logistics center specifically designed for the unique goods movement needs of the national and international business community relating to access, circulation, security and technology, all in an attractive, secure and sustainable environment. The Project will create thousands of job opportunities for the citizens of Moreno Valley and the region and will provide a substantial long-term source of tax revenues to help provide a stable and diversified economic base for the City. The circulation plan for the Project is oriented toward the SR60 freeway and to Gilman Springs Road so that traffic, particularly truck traffic, can move to and from the freeway system without interacting with drivers from residential areas in the vicinity. Heavy trucks are prohibited on streets adjacent to residential areas in the vicinity of the Project.

Approval of the Project Will Further the General Plan’s Goal of Designating Business Park/Industrial Areas to Provide for Manufacturing, Research and Development, Warehousing and Distribution as Well as Office and Support Commercial Activities (Policy 2.5.1). The Project will create a 2,600-acre master-planned logistics park which can provide up to 40,600,000 square feet of logistics uses (warehouse and distribution) and ancillary office uses in addition to associated infrastructure. Development of the Project will create thousands of job opportunities responding to the strong demand of the logistics industry and adding to the depth and variety of employment opportunities in the City. Development of the Project will provide a substantial long-term revenue benefits to the City allowing for the funding of City services across a broader and more stable economic base.

Approval of the Project Will Further the General Plan’s Goal of Locating Industrial Uses to Avoid Adverse Impacts on Surrounding Land Uses (Policy 2.5.2). The Project site is located at the most easterly end of the City and is buffered by SR60 on the north, Gilman Springs Road and the Badlands on the east, and the permanent open space of the San Jacinto Wildlife Area on the south. The Project includes several design features specifically to address the interface with the residential areas to the west of the Project. An extensive landscaped setback runs the full length of the Project along Redlands Boulevard, Bay Avenue and Merwin Street. This setback includes an earthen berm and a landscape design oriented to the adjacent residential neighborhoods. Special building height restrictions are applicable to the Project along its western edge to reduce the visibility of WLC buildings from the properties to the west. Other design features include: substantial development setbacks along all edges of the Project, extensive landscape treatments within these setbacks, a circulation system designed to direct trucks toward the freeways and away from residential areas, revisions to city-enforced Truck Routes to prohibit large trucks in residential areas, lighting restrictions, noise restrictions, building height limitations and architectural and landscape guidelines. These design features will be implemented by the City in connection with its review and approval of all development proposals within the WLC area.

Approval of the Project Will Further the General Plan’s Goal of Screening Manufacturing and Industrial Uses When Necessary to Reduce Glare, Noise, Dust, Vibrations and Unsightly Views (Policy 2.5.3). The Project provides extensive design guidelines in the Specific Plan to provide appropriate screening of WLC uses. The Specific Plan contains provisions for extensive landscape areas in setbacks around the WLC project, including an earthen berm along the western project edge. In addition, guidelines addressing building height limitations, on-site and off-site landscape requirements, equipment screening, light-shielding and noise restrictions are contained in the Specific Plan. Implementation of these design features will ensure that adjacent

properties are not adversely affected by the development of the WLC project. The City will implement these guidelines in connection with its Plot Plan review of all development proposals in the WLC as required in the Specific Plan.

Approval of the Project Will Further the General Plan’s Goal of Designing Industrial Developments to Discourage Access Through Residential Areas (Policy 2.5.4). The Project provides for a circulation system that directs traffic toward the freeways and away from local residential areas. The circulation plan provides no vehicular access to Redlands Blvd. between the existing intersections with Eucalyptus Ave. on the north and Cactus Ave. on the south. The City’s Truck Routes will be amended such that heavy truck traffic will be prohibited on Redlands Blvd. south of Eucalyptus Ave. and on Cactus Ave. west of the WLC project.

Approval of the Project Will Further the General Plan’s Goal of Encouraging Open Space Preservation through Policies that Recognize Valuable Natural Resources and Areas Required for Protection of Public Safety that Exist in the City (Objective 2.7). The Project includes 74.3 acres of land on the slopes of Mt. Russell will be offered for dedication to the State of California or to the City of Moreno Valley as permanent open space

Approval of the Project Will Further the General Plan’s Goal of Supporting and Encouraging the Annexation of Unincorporated Areas within the General Plan Study Area for which: a) Long-term Benefits Will be Derived by the City, b) Adequate Infrastructure and Services Have Been or Can Be Economically Provided in Accordance with Current City Standards, and c) the Proposed Annexation Will Generate Sufficient Revenues to Adequately Pay for the Provision of City Services Within a Reasonable Period of Time (Policy 2.9.1). The Project includes the annexation of an 85-acre parcel at the intersection of Gilman Springs Road and Alessandro Blvd., the development of which is incorporated into the WLC Specific Plan. The site’s location west of Gilman Springs Road makes its inclusion in the Specific Plan both practical and logical from a Project design perspective as well as for the delivery of public services.

Approval of the Project Will Further the General Plan’s Goal of Ensuring that All Development within the City of Moreno Valley Is of High Quality, Yields a Pleasant Living and Working Environment for Existing and Future Residents and Attracts Business as the Result of:

Consistent Exemplary Design (Objective 2.10). The Project establishes extensive design guidelines in the Specific Plan and establishes project review procedures by the City to ensure that all development is of high quality, compatible design, and incorporates features to enhance its environmental sustainability. The City will conduct a discretionary review of all development proposals to ensure that the overall WLC and each building within it will result in a pleasant environment for employees and visitors. Through the provisions of the Specific Plan, the Project will have a consistent design theme (Policy 2.10.1), will contain regulations regarding screening of outdoor storage and trash facilities (Policy 2.10.2), will require architecturally attractive building elevations (Policy 2.10.3), will require landscaping as an integral part of the Project design (Policy 2.10.4), requires a landscaped area as setback along the freeway right-of-way (Policy 2.10.5), will require a comprehensive sign program for the entire Project area (Policy 2.10.6), provides regulations for the control of on-site lighting (Policy 2.10.7 and 8), provides design standards for fences and walls (Policy 2.10.9), provides design standards for street frontages (Policy 2.10.10), provides design features (setbacks, berms, landscaping,

height restrictions, etc.) to screen the Project from residential properties (Policy 2.10.11), provides screening requirements for on-site parking areas (Policy 2.10.12) and requires compliance with the Municipal Code for landscaping in parking areas (Policy 2.10.13).

Approval of the Project Will Further the General Plan’s Goal of Maintaining a Water System Capable of Meeting Daily and Peak Demands of Moreno Valley Residents and Businesses Including the Provision of Adequate Fire Flows (Objective 2.11). The Project will be designed to minimize water consumption to the greatest degree possible. In addition to incorporating water-saving design features in all buildings, the Project will feature a landscape design that will minimize the use of mechanical irrigation to the greatest degree possible. The Project is required to confirm the availability of infrastructure to provide adequate water service (including fire flows) to serve development prior to the occupancy of each building in the WLC. Improvement plans will be reviewed and approved by the City and by Eastern Municipal Water District for all development within the WLC.

Approval of the Project Will Further the General Plan’s Goal of Maintaining a Wastewater Collection, Treatment and Disposal System Capable of Meeting the Daily and Peak Demands of Moreno Valley Residents and Businesses (Objective 2.12). The Project’s commitment to reducing water consumption throughout the Project will significantly reduce the amount of wastewater that will be generated. The Project is required to confirm the availability of infrastructure to provide adequate wastewater services to serve development prior to the occupancy of each building in the WLC. Improvement plans will be reviewed and approved by the City and by Eastern Municipal Water District for all development within the Project.

Approval of the Project Will Further the General Plan’s Goal of Coordinating Development Activity With the Provision of Public Infrastructure and Services (Objective 2.13). The Project is subject to state-mandated subdivision procedures as well as discretionary project review procedures both carried out by the City prior to the development of any property within the Project area. These procedures establish the nature and extent of infrastructure improvements needed to serve any proposed development. All development plans will be reviewed and approved by the service provider and such development will be limited to that which can be adequately served (Policy 2.13.1). Backbone facilities will be constructed with the initial phases of the development served (Policy 2.13.2). Such improvements are required to be operational prior to the occupancy of any new buildings (Policy 2.13.3). The Project will include advanced technology infrastructure, including high-speed internet access and solar energy. (Policy 2.13.4).

Approval of the Project Will Further the General Plan’s Goal of Developing a System of Trails Which Contribute to Environmental Quality and Energy Conservation by Providing Alternatives to Motorized Vehicular Travel and Opportunities for Recreational Equestrian Riding, Bicycle Riding and Hiking and that Connects With Major Regional Trail Systems (Objective 4.3). The Project includes the extension of the City’s multi-use trail system with five miles of trails to be constructed within the WLC. These trails will provide linkages between the residential area west of the Project to the Lake Perris Recreation Area and the San Jacinto Wildlife Area to the south of the Project and to the Badlands area east of the Project. The trails will extend along Eucalyptus Ave. providing a nearby linkage to the future trails on the north side of SR60 (Policy 4.3.1). In addition, a public Trail Head will be constructed along Alessandro Boulevard (Policy 4.3.5).

All such multi-use trails will be constructed along with adjacent development (Policy 4.3.3).

Approval of the Project Will Further the General Plan’s Goal of a Safe, Efficient, Environmentally and Fiscally Sound Integrated Vehicular Circulation System which Provides Access to Development and Supports Mobility Requirements of the System’s Users (Goal 5.1). The Project incorporates a circulation system that fully meets the needs of the WLC project through the provision of enhanced freeway interchanges, new and expanded arterial highways, and collector streets within the WLC (Objective 5.1). The design of this system of roadways will be evaluated with each proposed building to ensure that adequate access and circulation is provided for planned vehicles (autos and trucks) as well as emergency vehicles, trash trucks, pedestrians and bicycles (Policy 5.1.1). Class II bikeways will be constructed on all streets in the WLC to reduce conflicts between vehicular, pedestrian and bicycle traffic (Policy 5.1.2). Off-street parking is required to meet Municipal Code requirements (Policy 5.1.3) and additional truck pull-out parking bays along collector streets will be installed to offer additional truck parking without obstructing traffic flow. The circulation system is designed to preclude project truck traffic from traveling through residential areas by interrupting through traffic on Alessandro Blvd. and by not designating Redlands Blvd. south of Eucalyptus Ave. and Cactus Avenue west of the WLC project as Truck Routes.

Approval of the Project Will Further the General Plan’s Goal of Maintaining Level Of Service (LOS) “D” in the Vicinity of SR60 and High Employment Centers (Objective 5.3). The Project has been designed to meet the LOS “D” standard throughout the Project and each building project will be required to prepare and process a focused traffic impact analysis to confirm that this standard is met. Road improvements to maintain this standard will be constructed prior to occupancy of each building (Policy 5.3.1). Other traffic improvements will be funded through the collection of TUMF fees in connection with the construction of each building (Policy 5.3.5). Mitigation Measures imposed on the development of the Project will ensure that surrounding streets will not be exposed to additional traffic or traffic delays.

Approval of the Project Will Further the General Plan’s Goal of Maximizing the Efficiency of the Local Circulation System (Objective 5.5). The Project’s circulation system includes a system of roadways to provide safe and efficient access to all development parcels within the WLC. Each individual project will be reviewed and approved by the City to ensure that roadway spacing is appropriate (Policy 5.5.1), turn lanes are provided where necessary (Policy 5.5.2) and points of access are coordinated to ensure adequate capacity, efficiency and safety (Policy 5.5.3 and 5.5.4).

Approval of the Project Will Further the General Plan’s Goal of Encouraging Development of an Efficient Public Transportation System for the Entire Community (Objective 5.8). The Project has been designed to accommodate public transit vehicles on all Project streets, including future bus turnouts and bus shelters at such time as bus routes are established to serve the WLC (Policy 5.8.4).

Approval of the Project Will Further the General Plan’s Goal of Encouraging Development of Safe, Efficient and Aesthetic Pedestrian Facilities (Objective 5.9). The Project includes a system of pedestrian walkways that will link all Project sites to one another as well as to transit facilities, trails, bikeways, and off-Project locations (Policies 5.9.1 and .2). Such pedestrian walks will be designed into adjacent Project plans to enhance the aesthetics of the pedestrian experience while encouraging non-vehicular transportation. (Policies

5.9.3 and .4).

Approval of the Project Will Further the General Plan’s Goal of Encouraging Bicycling as an Alternative to Single Occupant Vehicle Travel for the Purpose of Reducing Fuel Consumption.

Traffic Congestion and Air Pollution (Objective 5.10). The Project provides a comprehensive network of bikeways along all Project streets to link all Project sites as well as links to off-Project bicycle facilities and circulation facilities (Policy 5.10.1). Plot Plans for each building will ensure that facilities are incorporated (storage lockers, showers, etc.) to encourage the use of bicycles.

Approval of the Project Will Make Major Progress Toward Fulfilling Goals of the Moreno Valley Economic Development Action Plan. The Moreno Valley Economic Development Action Plan approved by the City Council, first as a two-year plan in April 2011, and again as a three- year plan in April 2013, specifically identified logistics development in eastern Moreno Valley as a primary economic opportunity for the City. The logistics industry has been a leader in job creation in the Inland Empire and is expected to remain a strong business sector for the region (Inland Empire Quarterly Economic Report, January, 2014). Accordingly, the Project will create jobs well-suited for the local population in a community with an unemployment rate of 9.7% (April, 2014), which is well above the State average of 7.3% (April, 2014). (City Manager’s Report, pages 13-14 (June, 2014).

Approval of the Project Will Provide Quality Jobs. As set forth in Revised Final EIR Part 1 Response to Comment 1-F8-17, development of the Project is projected to create over 25,000 jobs with an estimated average annual income of \$40,926 (David Taussig & Associates, Fiscal and Economic Impact Study, 2014). This average income, taken from the U.S. Census Bureau for Riverside County and the Inland Empire, is slightly higher than the \$40,124 average income of current Moreno Valley residents according to the U.S. Bureau of Labor Statistics.

Approval of the Project Will Create Jobs in the Industry Where Demand Exists. For twenty years, the Moreno Highlands Specific Plan allowed for the development of a mix of residential, commercial, and small business park uses. However, due to a lack of demand, the uses allowed by the Specific Plan were never realized. Throughout Moreno Valley, there remains undeveloped residentially and commercially zoned property that sits underutilized due to a lack of demand resulting in a lack of job creation. Recognition of the lack of job creation was one of the driving elements of the City’s Economic Development Action Plan (April, 2011 and April, 2013), which sought to increase investment in the City and create job opportunities within the City. The Economic Development Action Plan identified healthcare and the logistics industries as the two major areas of economic opportunity for the City, where job creation is directly linked to market demand. The City has lost job creation opportunities due to the mismatch between zoning and market demand for those land uses. By selectively aligning some of the City’s land uses with market demands, the City will create job opportunities within the City that would not be achievable based on current zoning and market demand.

Approval of the Project Will Increase Employment, Furthering the City’s Goal of Improving Quality of Life and Creating a Healthy Economic Climate by Reducing Poverty and Its Impacts. The Project will create jobs improving the economic vitality of the City and help reduce its 10.7% unemployment rate as of

August 2014, according to the City Manager’s October, 2014, Update. Increased employment in the City is one of many actions that will raise the quality of life and help improve the economic environment for the 1 in 6 residents, including 1 in 4 children, that live below the poverty line. By approving the Project, thereby creating an estimated 25,000 jobs, the City will help reduce poverty and its resulting impacts, which will result in an improved quality of life and economic climate (Ultimate General Plan Goals II and IV).

Approval of the Project Will Improve Public Health. One method of improving public health in Moreno Valley is to improve economic opportunities in the City because poverty is strongly correlated with many negative outcomes, particularly health. Public health research groups like the Robert Wood Johnson Foundation find that socioeconomic difficulties, not environmental issues, are the principal causes of public health risks (<http://www.dailynews.com/opinion/20131025/californias-poor-kept-in-poverty-by-job-killing-elite-john-husing>). And according to “IS POVERTY A DEATH SENTENCE? The Human Cost of Socioeconomic Disparities” by Senator Bernie Sanders (<http://www.sanders.senate.gov/>), almost as many people die from poverty as from lung cancer. Therefore, one of the best ways to improve public health in Moreno Valley is to increase the number of employment opportunities in the City. By approving the Project, thereby creating an estimated 25,000 direct jobs, the City will help reduce poverty and its resulting public health impacts.

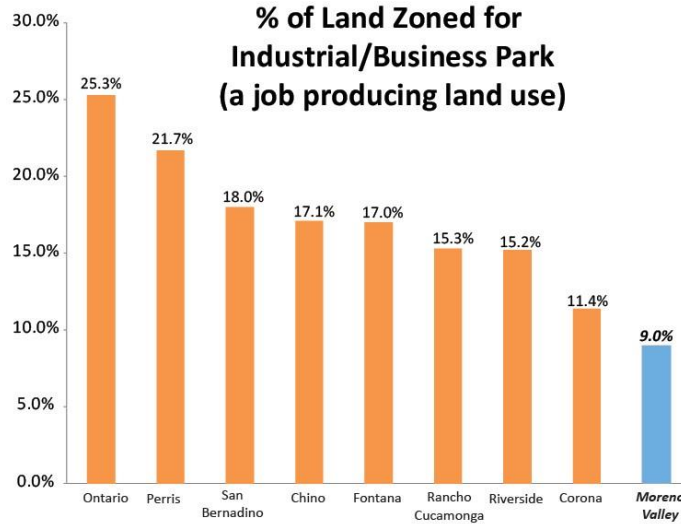
Approval of the Project Will Allow for the Economic Use of Currently Underused Land. As set forth in Appendices C-1 and C-4 of the Revised Final EIR Part 4 , the Project site is currently suitable only for dry farming as the high cost and uncertain availability of irrigation water make irrigated farming economically infeasible. Further, as stated in section 3.3.1 of the Revised Final EIR Part 4 , there were numerous uses permitted by the previous zoning on the site (the Moreno Highlands Specific Plan), but, because there had been no market for the planned and permitted uses, the Project site has remained undeveloped for over 20 years. As set forth in the Project Objectives in Section 3.6 of the Revised Final EIR Part 4 and in the Fiscal and Economic Impact Study dated May 21, 2014 (Revised Final EIR Part 4 Appendix O), the approval of the Project will allow the conversion of vacant, marginally productive agricultural land into a jobs- and revenue-producing facility.

Approval of the Project Will Ensure the Availability of Industrially-Zoned Land in Moreno Valley to Meet Demand. With the exception of the Project site, the City of Moreno Valley has less than 150 acres, remaining for industrial development that does not already have an application for development pending. Over 14 million square feet of industrial development has been constructed in Moreno Valley with only one building currently vacant (City of Moreno Valley Economic Development Summary, July 10, 2014). As noted, inclusive of the 14 million square feet of industrial buildings already developed in the city, the City will still suffer from a substantial deficit of jobs compared to housing and the remaining 150 acres of industrial land in the City is insufficient to create the jobs needed to reduce poverty in the City and to meet the City’s employment goals set forth in the Economic Development Action Plan. Land for logistics development is in high demand and is one of the fastest-growing sectors in the Inland Empire (Inland Empire Quarterly Economic Report, January, 2014). Without additional industrially zoned land, the City will not be able to meet the regional demand for logistics facilities which the city has identified as a prime area of economic opportunity in the City. Approval of the Project will provide more than 2,400 acres of land for logistics use, responding to

the demand for those uses.

Approval of the Project Will Allow Moreno Valley to be More Competitive for Industrial Projects.

Moreno Valley substantially lags other cities in the Inland Empire in the percentage of land zoned for industrial/business park uses (see chart below):



City of Moreno Valley’s Economic Development Action Plan, Survey of Inland Region - Industrial/Business Park Zoning (April, 2011)

With hardly any other available land remaining in the City for industrial development, the City cannot effectively compete and gain its fair share of industry in the region. With an insufficient amount of industrially zoned land, Moreno Valley is unable to attract the jobs necessary to provide economic opportunities for its residents.

Approval of the Project Will Make Major Progress Toward Fulfilling the Regional Need for Logistics Development.

The Southern California Association of Governments, of which the City is a member, came to the following conclusions in its June, 2010, report, Industrial Space in Southern California: Future Supply and Demand for Warehousing and Intermodal Facilities, at pages ES- 1-2:

“According to assumed growth rates, the region will run out of suitably zoned vacant land in about the year 2028. At that time, forecasts show that the demand for warehousing space will be approximately 1,023 million square feet.

“During the year 2035, there will be a projected shortfall of space of about 228 million square feet, unless other land not currently zoned for warehousing becomes available.”

The Project will be developed over the time period that the region needs additional appropriately zoned land for warehousing and intermodal facilities. As a result, the Project will help meet the forecasted demand for such facilities and will allow the City to be well placed to reap the benefits from serving the demand for

logistics services.

Approval of the Project Will Implement Aggressive Air Quality Strategies. The Project will implement the most stringent air quality requirements. All trucks serving the facility will be required to meet U.S. Environmental Protection Agency's (USEPA) and California Air Resources Board's (CARB) most stringent engine emissions standards that apply to new heavy-duty vehicles (Mitigation Measure 4.3.6.2A). By prohibiting trucks that do not meet 2010 emissions standards, the Project will exceed the operational requirements of USEPA and CARB and other agencies. In addition, the Project will: 1) construct an alternative fueling station to encourage the use of alternatively-fueled vehicles (Mitigation Measure 4.3.6.3C); 2) prohibit the use of diesel in onsite facility equipment (Mitigation Measure 4.3.6.3B); and 3) restrict idling (Mitigation Measure 4.3.6.3B), and 4) prohibit the use of diesel backup generators (Mitigation Measure 4.3.6.3B).

Approval of the Project Will Ensure that the Health of Residents, School Children and Workers, both Within and Outside of the Project Area, Will Not Be Adversely Affected by the Construction and Operation of the Project. The development of a logistics facility necessarily involves the use of large numbers of diesel trucks. Numerous studies have found that the exhaust from the older diesel trucks can cause cancer and other adverse health effects. As set forth in Revised Final EIR Part 4 Section 4.3, the recent study conducted by the Health Effects Institute demonstrates that diesel trucks which comply with stringent USEPA and CARB standards do not cause cancer or adverse health effects. Project conditions of approval prohibit diesel trucks which do not comply with the 2010 standards from accessing the Project. The Revised Final EIR Part 2 utilized current OEHHA guidelines and the new EMFAC2017 emission factors, demonstrating that the Project would not result in significant health risk impacts (Revised Final EIR Part 2, Page 4.3-78). As a result, the City will enjoy the numerous benefits which will flow from the construction and operation of the Project without subjecting anyone to the risk of cancer and other adverse health effects which result from the use of older diesel trucks.

Approval of the Project Will Reduce Commuting Time and Decrease Traffic on the County's Highways during Peak Hours. As shown in Section 4.15.3.2 of the Revised Final EIR Part 4, the jobs created by the Project will result in shorter commutes for the City's residents, shorter commutes for those who do not reside in the City but who have been forced to seek jobs closer to Los Angeles and will allow workers from outside of the City to travel to and from the Project on the County's freeways in the off peak directions which will reduce commute times. (Revised Final EIR Part 4 Appendix L, section 4.D.)

Approval of the Project Will Result in Substantially Fewer Vehicle Trips Compared to the Previous Zoning (prior to adoption of the WLC Specific Plan). The traffic study for the Moreno Highlands Specific Plan (current zoning) forecasted a total of 178,608 average vehicle trips per day (ADT) resulting from the development of the Moreno Highlands plan. Deducting the land in the Moreno Highlands plan purchased by the California Department of Fish and Wildlife, San Diego Gas and Electric Company and Southern California Gas Company, none of which will be developed further, reduces the Average Daily Trips to 119,668. (Revised Final EIR Part 4, Volume 3, Table 6.G.) The development of the Moreno Highlands plan (zoning in place prior to November 2015 adoption of the WLC Specific Plan) would result in more than a 70% increase in Average Daily Trips as compared to the development of the World Logistics Center project (69,542 ADT). (Revised

Final EIR Part 4, Volume 3, Table 6.G.) It is important to note that the approved Moreno Highlands traffic studies did not provide separate counts for car and truck traffic and did not provide a forecast in terms of passenger care equivalents (PCEs) therefore the Average Daily Trips for the Moreno Highlands plan may understate total traffic as compared to the World Logistics Center Average Daily Trips. However, even if the Moreno Highlands plan were to generate no truck trips at all (only passenger car trips), it would still generate substantially more PCE trips than the proposed Project. Further, the operation of the WLC will result in a substantial net decrease in vehicle miles currently traveled because of the substantial decrease in the commuting distances of the workers who will have jobs at the WLC (Attachment B).

Approval of the Project Will Result in the Consumption of Substantially Less Water Compared to Previous Zoning. When compared to the previously in place Moreno Highland Specific Plan, there will be a 64% decrease in projected water demand, 1,761,260 gallons per day, compared to 4,888,456 gallons per day after accounting for the land within the Specific Plan area which will never be developed. (Revised Final EIR Part 4, Table 6.I.) As a result, the Project's water usage consumption will be substantially below that anticipated in the City's General Plan and the 2010 Eastern Municipal Water District's Urban Water Management Plan. (Revised Final EIR Part 4, Volume 3, pg. 4.16-20.). As the Project is currently consistent with the General Plan and zoning, Project implementation will be consistent with General Plan and Urban Water Management Plan projections.

Approval of the Project Will Create a Master-Planned, Sustainable Development. The development of the Project will be governed by the World Logistics Center Specific Plan which will result in a master-planned industrial development that will create a jobs center in eastern Moreno Valley that is separated from residential communities. By governing the development of the Project through the use of the Specific Plan, the City has ensured that all development at the Project site will meet the highest environmental standards while limiting impacts on the community. The Project achieves these standards through requirements such as LEED certification for buildings, minimal irrigation landscaping, solar power which ensures sustainable design and the smallest environmental footprint. In addition, the use of a master-planned development ensures that the Project will meet the highest aesthetic standards, creating a world-class facility, subject to rigorous design standards.

VII. CERTIFICATION OF THE FINAL ENVIRONMENTAL IMPACT REPORT

A. FINDINGS

1. CEQA Compliance

The Moreno Valley Planning Commission certifies that the Revised Final EIR was prepared in compliance with CEQA and the CEQA Guidelines and that the Planning Commission has complied with CEQA's procedural and substantive requirements.

The Moreno Valley Planning Commission further certifies declares that it has reviewed and considered the EIR in evaluating the Project and that the Revised Final EIR reflects the independent judgment and analysis of the Planning Commission. The Planning Commission further finds that no new significant information as defined by CEQA Guidelines Section 15088.5, has been received by the Planning Commission after the circulation of the RSFEIR and Recirculated Sections that would require further recirculation. All of the information added to the Revised Final EIR merely clarifies, amplifies or makes insignificant modifications to an already adequate DEIR, RSFEIR and Recirculated Sections pursuant to CEQA Guidelines Section 15088.5(b).

Accordingly, the Planning Commission certifies the Revised Final EIR for the WLC Project.

As the decision-making body for approval of the Parcel Map, the Planning Commission has reviewed and considered the information contained in the Findings and supporting documentation. The Planning Commission determines that the Findings contain a complete and accurate reporting of the environmental impacts and mitigation measures associated with the Project, as well as complete and accurate reporting of the unavoidable impacts and benefits of the Project as detailed in the Statement of Overriding Considerations.

B. Significant Unavoidable Impacts/Statement of Overriding Considerations

The Project will have significant adverse impacts even following adoption of all feasible mitigation measures which are required by the Commission. The following significant environmental impacts have been identified in the Revised Final EIR and will require mitigation but cannot be mitigated to a level of insignificance as set forth in Section V(C) of these Findings:

- Aesthetics - Scenic Vistas
- Aesthetics - Scenic Resources and Scenic Highways
- Aesthetics - Substantial degradation of the existing visual character or quality of the site and its surroundings
- Aesthetics - Cumulative Aesthetic Impacts
- Air Quality - Construction Air Pollutant Emissions
- Air Quality - Operational Air Pollutant Emissions
- Air Quality - Consistency with Air Quality Management Plan (AQMP)
- Air Quality - Cumulative Air Pollutant Emissions

- Air Quality - Sensitive Receptors
- Land Use and Planning - Physically divide an established neighborhood (impacts on existing residences)
- Noise - Short-Term Construction Noise
- Noise - Long-Term Traffic Noise
- Noise – Long Term Noise
- Noise - Cumulative Noise Levels
- Transportation - Off-Site Impacts to TUMF Facilities
- Transportation Off-Site Improvements to Roads Outside the Jurisdiction of the City and Not Part of the TUMF Program

The Planning Commission has eliminated or substantially reduced environmental impacts where feasible as described in the Findings, and the Planning Commission determines that the remaining unavoidable significant adverse impacts are acceptable due to the reasons set forth in the preceding Statement of Overriding Considerations.

C. Conclusions

All potentially significant environmental impacts from implementation of the Project have been identified in the Revised Final EIR and, with the implementation of the mitigation measures defined herein and set forth in the MMRP, will be mitigated to a less-than-significant level, except for the impacts identified in Section VII.A.2 above. All reasonable and feasible mitigation measures have been adopted in the MMRP, the City finds that economic, social, and environmental considerations of the proposed Project outweigh the unavoidable significant adverse impacts described in Section VII.A.2 above. Further, the City finds that each of the separate benefits of the proposed Project is hereby determined to be, independent of the other proposed Project benefits, a basis for overriding all unavoidable environmental impacts identified in the Revised Final EIR and in these Findings. The reasons for accepting these remaining significant impacts are described below. In making these findings, the City has balanced the benefits of the proposed Project against its unavoidable environmental impacts and finds that the benefits outweigh and override the significant unavoidable impacts for the reasons stated below.

VIII. ADOPTION OF MITIGATION MONITORING AND REPORTING PROGRAM

Pursuant to *Public Resources Code* Section 21081.6, the Planning Commission hereby adopts, as conditions of approval of the Project, the Mitigation Monitoring and Reporting Plan (MMRP) provided as Resolution Exhibit B. In the event of any inconsistencies between the mitigation measures as set forth herein and the attached MMRP, the MMRP shall control, except to the extent that a mitigation measure contained herein is inadvertently omitted from the MMRP, in which case such mitigation measure shall be deemed as if it were included in the MMRP.

Attachment A
VMT Thresholds Memo

Attachment: Planning Commission 2020-20 RFEIR Resolution May 14, 2020 (4074 : World Logistics Center)

RESOLUTION NUMBER 2020-21

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, APPROVE TENTATIVE PARCEL MAP NO. 36457 FOR FINANCE AND CONVEYANCE PURPOSES ONLY SUBJECT TO CERTIFICATION OF THE WORLD LOGISTICS CENTER FINAL ENVIRONMENTAL IMPACT REPORT AND APPROVAL OF THE 2020 WORLD LOGISTICS CENTER DEVELOPMENT AGREEMENT

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and;

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively “HF” or “Applicant”) have a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit “A-1” and as illustrated in the depiction set forth in Exhibit “A-2” (the “Subject Property”) of the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support uses on the land subject to the World Logistics Center Specific Plan; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the “WLC Land Benefit Initiative,” to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only (“Parcel Map”), attached hereto as Exhibit A, subject to subsequent processing and recordation of a future map for development purposes; and

WHEREAS, an Environmental Impact Report was prepared for the “Project,” as collectively described and depicted in the World Logistics Center Land Use and Zoning

Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, Section 9.14.065 ("Finance and Conveyance Maps") of the Moreno Valley Municipal Code set forth the criteria governing the filing and processing of tentative maps for finance and/or conveyance purposes; and

WHEREAS, pursuant to 9.14.065 C ("Submittal Requirements"), the Director of Community Development waived the following requirements as requested in advance by Applicant:

1. Identification of existing structures, both above and below ground, which are too small to show on the Parcel Map, such as but not limited to, power poles and fire hydrants;
2. Identification of widths, approximate grades of proposed streets and approximate street centerline radii of curves;
3. Identification of specific areas of existing subsurface sewage disposal systems and disposal areas;
4. Identification of proposed facilities for control of storm waters;
5. Identification of common areas and open spaces since there are none to show currently;
6. Identification of adjoining residential property and lot lines due to the size of the Parcel Map;
7. Identification of existing use and zoning of property immediately surrounding the Parcel Map;
8. Identification of existing zoning and proposed land use of property within the Parcel Map;
9. Inclusion of a detailed Site Grading Plan.
10. Identification of dimensions and location of sidewalks and common areas;
11. Inclusion of a soils and geology report; and
12. Inclusion of a regional housing needs statement; and

WHEREAS, the Planning Commission noticed and conducted a Public Hearing to consider the Revised Final Environmental Impact Report, the proposed 2020 World Logistics Center Development Agreement and Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. Recitals and Exhibits

That the foregoing Recitals and attached Exhibits are true and correct and are hereby incorporated by this reference.

Section 2. Evidence

That the Planning Commission has considered all of the evidence submitted into the administrative record for the proposed Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, including, but not limited to, the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein;
- (b) Title 9 (“Planning and Zoning”) of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Draft EIR and all studies, reports, public comments and responses thereto;
- (d) Final EIR and all studies, reports, public comments and responses thereto;
- (e) Draft Development Agreement by and between the City and Developer, its application and all documents, records and references contained therein;
- (f) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” that was unanimously approved by the City Council in November 24, 2015;
- (g) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (h) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (i) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (j) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (k) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (l) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015;
- (m) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto, including without limitation, the application and reports and written statements regarding the proposed

method of control of storm water, including data as to amount of runoff, and the approximate grade and dimensions of the proposed facilities, unless waived;

(n) Written waiver requests submitted by Applicant and approval of said waivers by the Community Development Director;

(o) Planning Commission Staff Report and Staff Presentation and all documents, records and references related thereto;

(p) Testimony and/or comments from Developer and its representatives during the Planning Commission Public Hearing;

(q) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the Planning Commission Public Hearing;

(r) Riverside County Superior Court's Ruling on Peremptory Writ of Mandate, filed February 8, 2018;

(s) Riverside County Superior Court's Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018; and

(t) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5t 689.

Section 3. Findings

That based on the content of the foregoing Recitals and the Evidence contained in the Administrative Record as set forth above, the Planning Commission hereby finds that:

(a) The Tentative Parcel Map is for finance and conveyance purposes only;

(b) The Tentative Parcel Map does not create a legal building site and that a future map for development purposes must be processed and recorded in order for any development on the site to occur;

(c) No development approvals are included in this Tentative Parcel Map;

(d) The Tentative Parcel Map includes parcel map identification number, assessor's parcel number, title of map, and legal description of property;

(e) The Tentative Parcel Map includes the name and address of the owner and subdivider and name and address of person preparing map;

(f) The Tentative Parcel Map includes the approximate total acreage of property and lot size net and gross for a typical lot and for each irregular lot, overall dimensions, north arrow, scale and date;

(g) The Tentative Parcel Map identifies the land division boundary line and vicinity map showing its relationship to the surrounding community;

(h) The Tentative Parcel Map references the assessor's map book and page numbers of adjoining land divisions;

(i) The Tentative Parcel Map identifies the names, locations, right-of-way, width and improvements of existing adjacent streets, alleys, railroads and existing structures, both above and below ground, unless waived by the Community Development Director at the request of Applicant;

(j) The Tentative Parcel Map identifies the names, location, widths of rights-of-way or proposed streets, alleys and easements, and the approximate grades of proposed streets and approximate street centerline radii of curves, unless waived by the Community Development Director at the request of Applicant;

- (k) The Tentative Parcel Map identifies the streets, alleys and right-of-way providing legal access to the property, unless waived by the Community Development Director at the request of Applicant;
- (l) The Tentative Parcel Map identifies all the proposed private streets, unless waived by the Community Development Director at the request of Applicant;
- (m) The Tentative Parcel Map includes the names of utility purveyors, location and width of existing and proposed known public utility easements;
- (n) The Tentative Parcel Map identifies the location and width of the areas for required subsurface sewage disposal systems, unless waived by the Community Development Director at the request of Applicant;
- (o) The Tentative Parcel Map identifies all known existing wells on the property or within two hundred (200) feet of the subdivision boundary;
- (p) The Tentative Parcel Map identifies all water courses, channels, existing culverts and drain pipes, including existing and proposed facilities for control of storm waters, unless waived by the Community Development Director at the request of Applicant;
- (q) The Tentative Parcel Map identifies the land areas subject to overflow, inundation or flood hazard;
- (r) The Tentative Parcel Map identifies the land or right-of-way to be dedicated for public use and right-of-way for railroads and other uses unless waived by the Community Development Director at the request of Applicant;
- (s) The Tentative Parcel Map identifies all common areas and open spaces, unless waived by the Community Development Director at the request of Applicant;
- (t) The Tentative Parcel Map identifies the proposed lot lines and approximate dimensions, unless waived by the Community Development Director at the request of Applicant;
- (u) The Tentative Parcel Map identifies all adjoining property and lot lines, unless waived by the Community Development Director at the request of Applicant;
- (v) The Tentative Parcel Map includes the maximum contour interval required by the City Engineer and the contour lines extend three hundred (300) feet beyond the exterior boundaries of the property since the adjacent property is unimproved and vacant;
- (w) The Tentative Parcel Map identifies the existing use and zoning of property immediately surrounding tentative map;
- (x) The Tentative Parcel Map identifies the existing zoning and proposed land use of the property, unless waived by the Community Development Director at the request of Applicant;
- (y) The Tentative Parcel Map includes a statement as to whether the tentative map includes the entire contiguous ownership of the land divider or only a portion thereof;
- (z) The parcel (or parcels) of land covered by the Tentative Parcel Map meet the minimum size requirements to ensure that future development can meet all applicable site development standards imposed by Title 9 of the Municipal Code;
- (aa) The parcel (or parcels) of land have access from a public road, or access is both feasible and required by a condition of approval for the proposed map;
- (bb) The parcel lines do not conflict with any public easements;

(cc) There are not physical constraints or other issues which may affect the feasibility of future development on the site (e.g., vehicular access, utility service extensions);

(dd) The map provides sufficient information on future uses and feasibility of future uses to ensure consistency with the general plan and zoning designations for the site;

(ee) The site is suitable for the future permitted or proposed uses;

(ff) The map provides sufficient information on the subdivision design and future improvements to evaluate its potential impact on the environment in compliance with the California Environmental Quality Act;

(gg) There is sufficient information on the subdivision design and future improvements to enable the city to determine whether the map complies with applicable water quality standards, particularly with respect to future discharge of waste into the sewer system.

(hh) The Tentative Parcel Map contains or is accompanied by all the necessary site grading information such as, but not limited to, the proposed cuts and fills in the subdivision related to slope stability, erosion control and landscaping of the proposed grading, subsurface sewage disposal unless waived by the Community Development Director at the request of Applicant;

(ii) The Tentative Parcel Map includes the elevations of all individual building pads in the subdivision; the elevations at the perimeter of the subdivision; and the relationship of the subdivision to adjoining land and development unless waived by the Community Development Director at the request of Applicant.

(jj) The parcel (or parcels) of land covered by the map meet the minimum size requirements to ensure that future development can meet all applicable site development standards imposed by Title 9 of the municipal code.

(kk) The parcel (or parcels) of land have access from a public road, or access is both feasible and required by a condition of approval for the proposed map.

(ll) The parcel lines do not conflict with any public easements.

(mm) There are not physical constraints or other issues which may affect the feasibility of future development on the site (e.g., vehicular access, utility service extensions). If necessary in order to adequately evaluate the map, additional technical studies (e.g., access study) should be required prior to finding the application complete;

(nn) The map provides sufficient information on future uses and feasibility of future uses to ensure consistency with the general plan and zoning designations for the site;

(oo) The site is suitable for the future permitted or proposed uses.

(pp) The map provides sufficient information on the subdivision design and future improvements to evaluate its potential impact on the environment in compliance with the California Environmental Quality Act;

(qq) That the proposed map is consistent with applicable general and specific plans and the zoning ordinance;

(rr) That the design or improvement of the proposed subdivision is consistent with applicable general and specific plans;

(ss) That the site is physically suitable for the type of development;

(tt) That the site is physically suitable for the proposed density of development.

(uu) That the design of the subdivision or the proposed improvements are not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat;

(vv) That the design of the subdivision or type of improvements is not likely to cause serious public health problems;

(ww) That the design of the subdivision or the type of improvements will not conflict with easements, acquired by the public at large, for access through or use of, property within the proposed subdivision; and

(xx) That despite the waivers requested by Applicant and approved by the Community Development Director, the proposed map continues to comply with the spirit and intent of the Subdivision Map Act and Section 9.14.065 ("Finance and Conveyance Maps") of the Moreno Valley Municipal Code.

Section 4. Recommendation

That based on the foregoing Recitals, Administrative Record and Findings, the Planning Commission hereby approves Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, as attached hereto as Exhibit A, subject to the following mandatory conditions of approval set forth in this Resolution, and the subsequent certification of the 2020 World Logistics Center Final Environmental Impact Report and the World Logistics Center Development Agreement.

Section 5. Mandatory Conditions of Approval

That in addition to the standard subdivision conditions of approval applied to all maps for development purposes attached as Exhibit B, the following shall apply to Tentative Parcel Map No. 36457:

(a) Any submittal requirements which were waived by the Community Development Director in connection with Tentative Parcel Map No. 36457 shall be submitted concurrently with the first discretionary application for development of the property covered by the map (i.e., with an application for a future map, a conditional use permit, or master plan), or shall be submitted as prescribed by conditions of approval already in place with underlying entitlement approvals that govern continued or subsequent development of the property as described on the face of the Parcel Map; and

(b) Tentative Parcel Map No. 36457 is approved for finance and land conveyance purposes only and no applications for building or grading permits shall be accepted for the parcel or parcels created by the Parcel Map unless consistent with any development entitlements approved by the City, or as prescribed by conditions of approval already in place with underlying entitlement approval that govern continued or subsequent development of the property as described on the face of the Parcel Map.

Section 6. Repeal of Conflicting Provisions

That all the provisions as heretofore adopted by the Planning Commission that are

in conflict with the provisions of this Resolution are hereby repealed.

Section 7. **Severability**

That the Planning Commission declares that, should any provision, section, paragraph, sentence or word of this Resolution be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words of this Resolution as hereby adopted shall remain in full force and effect.

Section 8. **Effective Date**

That this Resolution shall take effect 10-days after the date of adoption.

Section 9. **Certification**

That the Secretary to the Planning Commission shall certify to the passage of this Resolution.

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PASSED AND ADOPTED THIS 14th day of May, 2020.

CITY OF MORENO VALLEY
PLANNING COMMISSION

Patricia Korzec, Chairperson

ATTEST:

Patty Nevins,
Secretary to the Planning Commission

APPROVED AS TO FORM:

Steven B. Quintanilla
Interim City Attorney

CONDITIONS OF APPROVAL

Tentative Parcel Map (PEN20-0017)

Page 1

CITY OF MORENO VALLEY
 CONDITIONS OF APPROVAL
 Tentative Parcel Map (PEN20-0017)

EFFECTIVE DATE:

EXPIRATION DATE:

COMMUNITY DEVELOPMENT DEPARTMENTPlanning Division

1. The developer, or the developer's successor-in-interest, shall be responsible for maintaining any undeveloped portion of the site in a manner that provides for the control of weeds, erosion and dust. (MC 9.02.030)

Special Conditions

2. This approval shall comply with all applicable requirements of the City of Moreno Valley Municipal Code.
3. This tentative map shall expire three years after the approval date of this tentative map unless extended as provided by the City of Moreno Valley Municipal Code; otherwise it shall become null and void and of no effect whatsoever in the event the applicant or any successor in interest fails to properly file a final map before the date of expiration. (MC 9.02.230, 9.14.050, 080)
4. Tentative Parcel Map No. 36457 would grant the approval to subdivide 1,539.2-gross acres into 26 lots for finance and land conveyance purposes only and does not provide any rights for development. No applications for building or grading permits shall be accepted for the parcel or parcels created by this map until a future application for development under the Specific Plan has been approved by the City, or as prescribed by conditions of approval already in place with underlying entitlement approval that govern continued or subsequent development of the property as described on the face of the map per MC 9.14.065(3d).
5. Prior to final map recordation, or building permit issuance, subdivision phasing (including any proposed common open space or improvement phasing, if applicable), shall be subject to a separate Phasing Plan submittal for Planning Division approval. Any proposed phasing shall provide for adequate vehicular access to all lots in each phase as determined by the City Transportation Engineer or designee and shall substantially conform to all intent and purpose of the subdivision approval. (MC 9.14.080)

CONDITIONS OF APPROVAL

Tentative Parcel Map (PEN20-0017)

Page 2

6. The site shall be developed in accordance with the approved tentative map on file in the Community Development Department -Planning Division, the Municipal Code regulations, General Plan, World Logistics Center Specific Plan, and the conditions contained herein. (MC 9.14.020)
7. Any submittal requirements which were waived in connection with the financing map in accordance with 9.14.065(3a.) shall be submitted concurrently with the first discretionary application for development of the property covered by the map (i.e. with an application for a future map or plot plan).
8. Tentative Tract Map No. 36457 may be acted upon in the manner provided in Government Code Section 66452, except that if the final map is approved, such approval with respect to Parcel 26 shall be conditioned upon annexation of the property to the City of Moreno Valley.

PUBLIC WORKS DEPARTMENT**Prior to Map Approval**

9. After recordation, a digital (pdf) copy of the recorded map shall be submitted to the Land Development Division.
10. Resolution of all drainage issues shall be as approved by the City Engineer.
11. If the project involves the subdivision of land, maps may be developed in phases with the approval of the City Engineer. Financial security shall be provided for all public improvements associated with each phase of the map. The boundaries of any multiple map increment shall be subject to the approval of the City Engineer. If the project does not involve the subdivision of land and it is necessary to dedicate right-of-way/easements, the developer shall make the appropriate offer of dedication by separate instrument. In either case, the City Engineer may require the dedication and construction of necessary utility, street or other improvements beyond the project boundary, if the improvements are needed for circulation, parking, access, or for the welfare or safety of the public. This approval must be obtained prior to the Developer submitting a Phasing Plan to the California Bureau of Real Estate. [MC 9.14.080(B)(C), GC 66412 & 66462.5]
12. Maps (prepared by a registered civil engineer and/or licensed surveyor) shall be submitted for review and approved by the City Engineer per the current submittal requirements.
13. This map is approved for finance and land conveyance purposes only. No applications for building or grading permits shall be accepted for the parcel or parcels created by this map until a (future map/conditional use permit/master plan)

CONDITIONS OF APPROVAL

Tentative Parcel Map (PEN20-0017)

Page 3

for development has been approved by the city, or as prescribed by conditions of approval already in place with underlying entitlement approval that govern continued or subsequent development of the property as described on the face of the map per subsection (C)(4). (Ord. 894 § 5, 2015

14. All street dedications shall be free of all encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.
15. The Tentative Parcel Map 36457 shall meet the prior approved COA Final for PA12-0015, and those applicable requirements per City Ordinance No. 894 and City Code 9.14.065
16. The following statement must be clearly printed on the face of the proposed financing map: "FOR FINANCE AND CONVEYANCE PURPOSES ONLY."
17. The face of the map must include the following additional statement: "THIS MAP DOES NOT CREATE A LEGAL BUILDING SITE. FURTHER APPLICATIONS ARE NECESSARY TO DEVELOP THIS PROPERTY."
18. The face of the map must include the following additional statement in addition to the statement required: "THIS MAP DOES NOT REMOVE ANY DEVELOPMENT REQUIREMENTS SET FORTH WITH APPROVAL OF PEN20-0017 WHICH MUST BE SATISFIED WITH CONTINUED DEVELOPMENT OF THE PROPERTY."

Special Districts Division

19. The Special Districts Division will condition the parcels associated with the Tentative Parcel Map 36457 for all special financing districts applicable to the project when an application for development is submitted to the City for review.

RESOLUTION NUMBER 2020-22

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, RECOMMENDING THAT THE CITY COUNCIL ADOPT THE REQUISITE ORDINANCE APPROVING THE PROPOSED 2020 WORLD LOGISTICS CENTER DEVELOPMENT AGREEMENT

WHEREAS, the City of Moreno Valley is a general law city and a municipal corporation of the State of California; and

WHEREAS, HF Properties, a California general partnership, Sunnymead Properties, a Delaware general partnership, Theodore Properties Partners, a Delaware general partnership, 13451 Theodore, LLC, a California limited liability company, and HL Property Partners, a Delaware general partnership (collectively “HF”) have a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City of Moreno Valley, as described in the legal description set forth in Exhibit “A-1” and as illustrated in the depiction set forth in Exhibit “A-2” (the “Subject Property”) of the attached proposed 2020 World Logistics Center Development Agreement, attached hereto as Exhibit A; and

WHEREAS, on November 24, 2015, the City Council unanimously approved the World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” attached hereto as Exhibit B, which amended the General Plan of the City of Moreno Valley, amended the City of Moreno Valley Zoning Map, repealed the Moreno Highlands Specific Plan, and adopted the World Logistics Center Specific Plan, and imposed certain Project Conditions of Development; and

WHEREAS, the World Logistics Center Specific Plan allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support uses on the land subject to the World Logistics Center Specific Plan; and

WHEREAS, on November 24, 2015, the Moreno Valley Community Services District Board of Directors also unanimously approved the “WLC Land Benefit Initiative,” attached hereto as Exhibit C, to request that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road; and

WHEREAS, HF submitted Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only, attached hereto as Exhibit D, subject to subsequent processing and recordation of a future map for development purposes; and

WHEREAS, an Environmental Impact Report was prepared for the “Project,” as collectively described and depicted in the World Logistics Center Land Use and Zoning

Entitlements Initiative, WLC Land Benefit Initiative, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement; and

WHEREAS, to strengthen the public planning process, encourage private participation in comprehensive planning and reduce the economic risk of development, the California State Legislature adopted Sections 65864 et seq. of the California Government Code, "Development Agreement Statute" which authorizes cities to enter into property development agreements with any person(s) or entity(ies) having a legal or equitable interest in real property for the development of such real property in order to establish certain development rights in the real property; and

WHEREAS, Section 9.02.110 ("Development Agreements") of the Moreno Valley Municipal Code acknowledges that the Development Agreement Statute permits local agencies and property owners to enter into development agreements as to matters such as the density, intensity, timing and conditions of development of real properties and that development agreements provide an enhanced degree of certainty in the development process for both the property owner/developer and the public agency; and

WHEREAS, the proposed 2020 World Logistics Center Development Agreement will eliminate uncertainty in planning for and secure orderly development of the Subject Property, assure progressive installation of necessary improvements, and ensure attainment of the maximum effective utilization of resources within City at the least economic cost to its citizens; and

WHEREAS, based on the foregoing recitals, City has determined that proposed 2020 World Logistics Center Development Agreement is appropriate under the Development Agreement Statute and Section 9.02.110 ("Development Agreements") of the Moreno Valley Municipal Code; and

WHEREAS, after the Planning Commission conducts a noticed public hearing pursuant to the provisions of Section 9.02.200 ("Public hearing and notification procedures") of the Moreno Valley Municipal Code, it shall make any recommendation for approval in writing to the City Council based on the following findings: (a) The proposed development agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the general plan and any applicable specific plan; (b) The proposed development agreement is compatible with the uses authorized in, and the regulations prescribed for, the land use district in which the real property is located; (c) The proposed development agreement is in conformity with public convenience, general welfare and good land use practice; (d) The proposed development agreement will not be detrimental to the public health, safety and general welfare; and (e) The proposed development agreement will not adversely affect the orderly development or the preservation of property values for the subject property or any other property; and

WHEREAS, the proposed 2020 World Logistics Center Development Agreement will be voluntarily entered into in consideration of the benefits to and the rights created in

favor of each of the parties hereto and in reliance upon the various representations and warranties contained therein; and

WHEREAS, the Planning Commission noticed and conducted a Public Hearing to consider the Revised Final Environmental Impact Report, Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes Only and the proposed 2020 World Logistics Center Development Agreement.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. Recitals and Exhibits

That the foregoing Recitals and attached Exhibits are true and correct and are hereby incorporated by this reference.

Section 2. Evidence

That the Planning Commission has considered all of the evidence submitted into the administrative record for the proposed 2020 World Logistics Project Development Agreement, including, but not limited to, the following:

- (a) Moreno Valley General Plan and all other relevant provisions contained therein
- (b) Title 9 (“Planning and Zoning”) of the Moreno Valley Municipal Code and all other relevant provisions referenced therein;
- (c) Draft EIR and all studies, reports, public comments and responses thereto;
- (d) Final EIR and all studies, reports, public comments and responses thereto;
- (e) Draft Development Agreement by and between the City and Developer, its application and all documents, records and references contained therein;
- (f) World Logistics Center Land Use and Zoning Entitlements Initiative, also known as the “Moreno Valley Jobs initiative,” that was unanimously approved by the City Council in November 24, 2015;
- (g) Amendments to the Moreno Valley General Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved by the City Council through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (h) Amendments to the City of Moreno Valley Zoning Map as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were approved through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (i) Moreno Highlands Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was repealed through the City Council’s adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;

- (j) World Logistics Center Specific Plan as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which was adopted through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (k) Project Conditions of Development as described in the World Logistics Center Land Use and Zoning Entitlements Initiative which were imposed through the City Council's adoption of the Logistics Center Land Use and Zoning Entitlements Initiative on November 24, 2015;
- (l) WLC Land Benefit Initiative, requesting that the Riverside County Local Agency Formation Commission initiate the process for the Moreno Valley Community Services District to annex an 85-acre parcel along Gilman Springs Road, unanimously approved by the Moreno Valley Community Services District Board of Directors on November 24, 2015;
- (m) Tentative Parcel Map No. 36457 for Finance and Conveyance Purposes only, subject to subsequent processing and recordation of a future map for development purposes and all documents, records and references related thereto;
- (n) Planning Commission Staff Report and Staff Presentation and all documents, records and references related thereto;
- (o) Testimony and/or comments from Developer and its representatives during the Planning Commission Public Hearing;
- (p) Testimony and/or comments from all persons that was provided in written format or correspondence, at, or prior to, the Planning Commission Public Hearing;
- (q) Riverside County Superior Court's Ruling on Peremptory Writ of Mandate, filed February 8, 2018;
- (r) Riverside County Superior Court's Judgment Granting Petitions for a Peremptory Writ of Mandate, filed June 7, 2018; and
- (s) Court of Appeal Opinion, Center for Community Action & Environmental Justice v. City of Moreno Valley (2018) 26 CA5t 689.

Section 3. Findings

That based on the content of the foregoing Recitals and the Evidence contained in the Administrative Record as set forth above, the Planning Commission hereby finds that:

- (a) The proposed 2020 World Logistics Project Development Agreement includes the duration of the agreement;
- (b) The proposed 2020 World Logistics Project Development Agreement references the permitted uses of the Subject Property;
- (c) The proposed 2020 World Logistics Project Development Agreement references the range of permitted density and intensity of use of the Subject Property;
- (d) The proposed 2020 World Logistics Project Development Agreement references the maximum height and size of proposed buildings;

- (e) The proposed 2020 World Logistics Project Development Agreement includes provisions for reservation or dedication of land for public purposes, or the payment of fees in lieu thereof;
- (f) The proposed 2020 World Logistics Project Development Agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the general plan and any applicable specific plan;
- (g) The proposed 2020 World Logistics Project Development Agreement is compatible with the uses authorized in, and the regulations prescribed for, the land use district in which the real property is located;
- (h) The proposed 2020 World Logistics Project Development Agreement is in conformity with public convenience, general welfare and good land use practice;
- (i) The proposed 2020 World Logistics Project Development Agreement will not be detrimental to the public health, safety and general welfare; and
- (j) The proposed 2020 World Logistics Project Development Agreement will not adversely affect the orderly development or the preservation of property values for the subject property or any other property.

Section 4. Recommendation

That based on the foregoing Recitals, Administrative Record and Findings, the Planning Commission hereby recommends that the City Council adopt the requisite ordinance approving the 2020 World Logistics Center Development Agreement as attached hereto.

Section 5. Repeal of Conflicting Provisions

That all the provisions as heretofore adopted by the Planning Commission that are in conflict with the provisions of this Resolution are hereby repealed.

Section 6. Severability

That the Planning Commission declares that, should any provision, section, paragraph, sentence or word of this Resolution be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, paragraphs, sentences or words of this Resolution as hereby adopted shall remain in full force and effect.

Section 7. Effective Date

That this Resolution shall take effect immensely upon the date of adoption.

Section 8. Certification

That the Secretary of the Planning Commission shall certify to the passage of this Resolution and shall cause the same to be transmitted to the City Council for its consideration.

PASSED AND ADOPTED THIS 14th day of May, 2020.

CITY OF MORENO VALLEY
PLANNING COMMISSION

Patricia Korzec, Chairperson

ATTEST:

Patty Nevins,
Secretary to the Planning Commission

APPROVED AS TO FORM:

Steven B. Quintanilla
Interim City Attorney

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

Recording Requested by And
When Recorded Return to:

City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552
Attn: City Clerk

[Exempt From Recording Fee Per Gov. Code § 27383]

DEVELOPMENT AGREEMENT
(World Logistics Center)

This DEVELOPMENT AGREEMENT (“Agreement”) is entered into as of this ____ day of _____, 2020, by and between the CITY OF MORENO VALLEY, a California general law municipal corporation (“City”), and HF PROPERTIES, a California general partnership, SUNNYMEAD PROPERTIES, a Delaware general partnership, THEODORE PROPERTIES PARTNERS, a Delaware general partnership, 13451 THEODORE, LLC, a California limited liability company, and HL PROPERTY PARTNERS, a Delaware general partnership (collectively “HF”). The City and HF hereafter are referred to collectively as the “Parties” and individually as a “Party.”

RECITALS

A. Consistent with the City’s economic development and general plan, the City and HF have agreed to enter into this Agreement because the World Logistics Center will be a master planned business park specifically designed to support large global companies and their business and logistics operations which will be a significant revenue generating, job creating and training/education project as further detailed in Exhibit A-3.

B. The City is authorized to enter into development agreements with persons having legal or equitable interests in real property for the development of such property pursuant to California State general laws: Article 2.5 of Chapter 4 of Division I of Title 7 of the California Government Code commencing with section 65864 (the “Development Agreement Law”), and Article XI, Section 7, of the California Constitution, together with City ordinances.

C. The City has enacted an ordinance, codified and set forth in the Moreno Valley Municipal Code as Title 9, Section 9.02.110 (the “Development Agreement Ordinance”) that establishes the procedures and requirements for its consideration of such development agreements upon application by, or on behalf of, persons having legal or equitable interests in real property pursuant to the Development Agreement Law.

D. HF represents and hereby warrants that it has a legal and equitable interests in approximately two thousand, two hundred sixty three (2263) acres of real property located in the region commonly referenced as the Rancho Belago area of the City, as described in the legal

description set forth in Exhibit “A-1” and as illustrated in the depiction set forth in Exhibit “A-2” (the “Subject Property”). The City has been provided proof of the records HF relies upon for the representation and warranty by HF. City is relying upon this evidence and considers it to be an element of HF’s consideration for this Agreement.

E. In clarification of the foregoing the Subject Property includes approximately 85 acres, as described on Exhibit “A-1” and depicted in Exhibit “A-2” that is currently located in an unincorporated area of Riverside County but is proposed by HF to be annexed to the City within five years, subject to the process and approval of the Riverside County Local Agency Formation Commission (“LAFCO”) (the “Annexation”).

F. The World Logistics Center Specific Plan (“WLCSP”) allows the development of approximately forty million, six hundred thousand (40,600,000) square feet of industrial, logistics, warehouse and support use on the land subject to the WLCSP. The WLCSP, a General Plan Amendment and a Zone Change of the Subject Property and the Annexation, were unanimously approved by the City Council of the City on November 24, 2015, in response to initiative petitions submitted to it. The Development, as hereinafter defined, includes both HF improvements to the Subject Property and City entitlements, including but not limited to, Tentative Parcel Map 36457 and annexation of an 85-acre parcel along Gilman Springs Road. The Development, including the Project, as defined herein, will also include subdivision maps and other approvals needed to construct the facilities proposed for the Subject Property. The permitted uses of the Subject Property, including a plan of development, the density and intensity of use, the maximum height and size of proposed buildings are set forth in the WLCSP, as it may be amended from time to time, and are hereby incorporated by reference. The City’s certification of the Environmental Impact Report and approval of the Tentative Parcel map are conditions precedent to this Agreement.

G. The development of the Subject Property will generate a variety of public benefits to the City, its residents, property owners, taxpayers and surrounding communities. The Project is believed to substantially advance the goals of the City’s adopted Economic Development Action Plan, expand and improve the City’s property and sales tax base, invest significant private capital into the local economy, generate extensive construction employment and new permanent employment opportunities for Moreno Valley and the region, and will improve the severe jobs to housing imbalance that currently exists in the City. Among the public benefits, the development of this Project pursuant to the WLCSP will implement goals, objectives and policies of the City’s General Plan, and the WLCSP, which will provide logistics development, public utility and open space uses for the Subject Property and for the City. In exchange for the duties and obligations imposed by this Agreement, HF will receive the vested right to develop the Subject Property for the Term in accordance with the terms of this Agreement.

H. The City has previously adopted the Economic Development Action Plan (“EDAP”). The WLCSP responds to a portion of the EDAP. The eastern portion of Moreno Valley lacks the infrastructure necessary to support and implement the City’s EDAP. To allow for the development of the World Logistics Center and the WLCSP, HF is willing to provide and assist the City in the development of infrastructure in support of the City’s economic plan which may be in excess of HF’s fair share and therefore may provide broader benefits. The City and HF desire to ensure that all beneficiaries of the Infrastructure Improvements will pay their fair

share per the Municipal Code. Therefore this Agreement includes reference to the City’s usual method for reimbursement to an owner for the amount of the costs of such Infrastructure Improvements which exceeds the fair share of those costs and accrues to the benefit of other owners.

I. On _____, 2020, the Planning Commission of the City, at a duly noticed public hearing certified, in Resolution 2020-___, the Revised Final Environmental Impact Report (SCH # 2012021045) (the “EIR”) and approved the related Mitigation Monitoring and Reporting Program and, in Resolution 2020- ___, Tentative Parcel Map 36457, PEN20-0017.

J. On _____, 2020, the Planning Commission of the City, at a duly noticed public hearing held pursuant to the Development Agreement Law and the Development Agreement Ordinance, recommended, in Resolution 2020-___ that the City Council find and determine that this Agreement is consistent with the goals, objectives, policies, general land uses and programs specified in the City General Plan, as amended by the Project Approvals; is compatible with the uses authorized in and the land use regulations prescribed by the City in its Zoning Code; and will promote and encourage the development of the Subject Property by providing a greater degree of certainty with respect thereto, while also providing specified public benefits to the City.

K. On _____, 2020, after a duly noticed public hearing held pursuant to the Development Agreement Law and the Development Agreement Ordinance, the City Council of the City approved the introduction of Ordinance No. ____ (the “Enacting Ordinance”) that would approve and adopt this Agreement and authorize its execution on behalf of the City. On _____, 2020, the City Council of the City adopted the Enacting Ordinance.

L. The Parties intend that HF will proceed with the Development upon the Subject Property pursuant to this Agreement within the Term.

AGREEMENT

NOW, THEREFORE, in consideration of the above recitals which are incorporated herein and intended to assist with the interpretation of this Agreement, and of the mutual covenants hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and HF agree as follows:

ARTICLE 1 DEFINITIONS.

The following terms when used in this Agreement shall, unless defined elsewhere in this Agreement, have the meanings set forth below:

1.1 “Agreement” shall mean this Development Agreement by and between the City and HF and any subsequent amendments.

1.2 “City” shall mean the City of Moreno Valley, a municipal corporation, organized and existing under the general laws of the State of California.

1.3 “City Council” shall mean the governing body of the City.

1.4 “Development” shall mean the improvement of the Subject Property for the purposes of completing the structures, improvements and facilities composing the Project, including but not limited to: grading; the construction of infrastructure related to the Project whether located within or outside the Subject Property; the construction of buildings and structures; construction of post-development storm drain related improvements and the installation of landscaping and public facilities and improvements. “Development” also includes the maintenance, repair, reconstruction, modification, or redevelopment of any building, structure, improvement, landscaping, or facility after the construction and completion thereof on the Subject Property. The Development shall at all times conform to the Agreement.

1.5 “Development Impact Fee,” “Development Impact Fees” or “DIF” means for purposes of this Agreement only those fees imposed pursuant to Moreno Valley Municipal Code Sections 3.42.070 (police facilities), 3.42.080 (City hall facilities), 3.42.090 (corporate yard facilities) and 3.42.100 (maintenance equipment). The term “Development Impact Fees” (or “DIF”) does not include those fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals), 3.42.050 (interchange improvements) and 3.42.060 (fire facilities).

1.6 “Development Plan” shall mean the plan for Development of the Subject Property pursuant to the Existing Regulations and including the Infrastructure Improvements.

1.7 “Development Requirement(s)” shall mean any fees or requirement(s) of the City imposed in connection with or pursuant to the Project Approvals such as the construction or improvement of public facilities or the payment of fees or assessments in order to lessen, offset, mitigate or compensate for the impacts of the Development.

1.8 “Effective Date” shall mean the date that is ninety (90) days after the date the City Council adopts the Enacting Ordinance unless litigation is commenced in which case the Effective Date shall mean the date on which the litigation is finally terminated, whether by dismissal which leaves all of the Project Approvals in place or by the entry of a final judgment, free from further appellate review, which upholds the Project Approvals. Notwithstanding the forgoing, Article 7 shall be immediately effective thirty one (31) days after the date the City Council adopts the enacting ordinance.

1.9 “Enacting Ordinance” shall mean the City Council adopted ordinance described in Recital K of this Agreement.

1.10 “Existing Regulations” shall mean the Project Approvals, Development Requirements, and all ordinances, resolutions, codes, rules, regulations and official policies of City, adopted and effective on the date of the adoption of the Enacting Ordinance governing Development and use of the Subject Property, including but not limited to the permitted use of land, the density or intensity of use, the maximum height and size of proposed building, and the architectural design, improvement and construction standards and specifications applicable to the Development of the Subject Property, all as set forth in the General Plan, WLCSP and Zone Change adopted by the City Council of the City on November 24, 2015. The City shall compile two sets of the Existing Regulations. Once that compilation has been completed by the City, one

set will be stored with the Agreement by the City Clerk for future use and certainty of requirements and the other set will be given to HF.

1.11 “HF” shall mean HF PROPERTIES, SUNNYMEAD PROPERTIES, THEODORE PROPERTIES PARTNERS, 13451 THEODORE, LLC and HL PROPERTY PARTNERS, and/or its successors or assigns to all or any portion of the Subject Property.

1.12 “Infrastructure Improvements” shall mean all public infrastructure improvements on and off the Subject Property.

1.13 “Judgment(s)” shall mean one or more final or interim judgment(s) of a court of competent jurisdiction affecting the rights of the Parties hereunder.

1.14 “Moreno Valley Municipal Code” shall mean the City’s Municipal Code in effect on the date of the adoption of the Enacting Ordinance.

1.15 “Mortgagee” shall mean a mortgagee of a mortgage, a beneficiary under a deed of trust or any other security device, a lender, or each of their respective successors and assigns.

1.16 “Parcel” shall mean any lot created by a recorded subdivision or parcel map.

1.17 “Project” shall mean the Development and operation of the Subject Property pursuant to and consistent with the Development Plan and the provisions of this Agreement.

1.18 “Project Approvals” shall mean, collectively, the General Plan Amendment, the WLCSP, the Zone Change, the Annexation, all approved through the initiative process on November 24, 2015, and Tentative Parcel Map 36457.

1.19 “Subject Property” shall mean that certain real property consisting of the property more particularly described in Exhibit “A-1” attached hereto and depicted on Exhibit “A-2” attached hereto, any real property subject to the WLCSP acquired by HF after the date on which the Enacting Ordinance is adopted and all real property intended to be included by the Annexation. Until the Annexation is finally accomplished by HF at its sole cost and expense, nothing in this Agreement shall apply to the property to be annexed.

1.20 “Subsequent Development Approvals” shall mean any and all ministerial and/or discretionary permits, licenses, consents, rights and privileges, and other ministerial and/or discretionary actions approved or issued by City in connection with Development of the Subject Property after the date of the adoption of the Enacting Ordinance, including all associated environmental documentation and mitigation measures pursuant to the California Environmental Quality Act.

1.21 “Subsequent Regulations” shall mean any ordinances, resolutions, codes, rules, regulations and official policies of the City adopted and effective after the date of the adoption of the Enacting Ordinance.

1.22 “Term” shall mean the period of time during which this Agreement shall be in effect, enforceable and bind the Parties, as set forth below in Section 3.5 of this Agreement.

assumes all the duties and obligations of HF under this Agreement with respect to the portion of the Subject Property being transferred. City shall have the sole power to allocate, prorate, or otherwise apportion any term, provision, fee, contribution, or similar duty or obligation of HF, so that City, HF, and assignee have a specific agreement as to the duties and obligations, of all Parties after the Transfer.

(c) Any Assignment of this Agreement will require the prior written consent of the City, which will not be unreasonably withheld or delayed. The City's approval will be based upon the City's reasonable determination, in accordance with the standard set forth in Section 3.4.1(d) as to whether or not such Assignee has the requisite ability to complete the portion of the Subject Property being transferred. Within thirty (30) days following receipt by the City of written notice regarding Assignment (such notice must include development experience information regarding the Assignee sufficient to allow the City to make the above determination) the City will notify HF regarding its approval or disapproval of such Assignment. Failure of the City to respond in writing within thirty (30) days of receipt of the notice of the Assignment shall constitute approval of the assignment.

Any Assignment not made in compliance with the foregoing conditions shall result in HF continuing to be responsible for all obligations under this Agreement. Notwithstanding the failure of any Assignee to receive City approval and/or execute the Agreement required by subparagraph (c) above, the burdens of this Agreement shall be binding upon such Assignee, but the benefits of this Agreement including but not limited to DIF, shall not inure to such Assignee until and unless such Assignment is approved by the City and executed.

3.4.1 Release of HF. Notwithstanding any Assignment, HF shall continue to be obligated under this Agreement unless HF is given a release in writing by City, which release shall be provided by City upon the full satisfaction by HF of the following conditions:

(a) HF no longer has a legal or equitable interest in the portion of the Subject Property being transferred other than a lien on the portion of the Subject Property being transferred to secure the payment of the purchase price to HF. HF shall provide the City written notice to the City of the party to which the lien is to be transferred, upon transfer of the lien, pursuant to this Article 3.

(b) HF is not then in default under this Agreement in City's sole reasonable determination, subject to procedure set forth in Section 5.2 of this Agreement.

(c) HF has provided City with the notice and executed agreement and other information required under subparagraphs (b) and (c) of Subsection 3.4 above.

(d) The City has reviewed and approved the Assignee and the Assignment, such approval to include a determination by the City that the Assignee has the requisite ability to complete the portion of the Subject Property being transferred.

(e) The Assignee provides City with security equivalent to any security previously provided by HF to secure performance of its obligations hereunder with respect to the portion of the Subject Property being transferred. The City shall cooperate with HF to effectuate

the substitution of security provided by HF to that to be provided by the Assignee with respect to the portion of the Subject Property being transferred.

(i) HF has paid City all monies then due and owing to City under this Agreement.

3.4.2 Subsequent Assignment. Any subsequent Assignment after an initial Assignment shall be made only in accordance with and subject to the terms and conditions of this Article. All subsequent Assignors must deliver written acknowledgement of this Agreement, and the Assignees duties under the Agreement or the City may, in its sole discretion, terminate this Agreement as to that owner’s parcel(s).

3.4.3 Termination of Agreement With Respect to Individual Parcels upon Sale and Completion of Construction. Notwithstanding any other provisions of this Agreement, this Agreement shall terminate with respect to any Parcel and such Parcel shall be released and no longer be subject to this Agreement without the execution or recordation of any further document upon satisfaction of the following conditions:

(a) The Parcel has been finally subdivided and sold or leased for a period longer than one year to a member of the public or other ultimate user; and,

(b) A Certificate of Occupancy has been issued for each new structure on the Parcel shown on the plot plan required by Section 11.3.2 of the WLCSP, and the fees set forth under this Agreement have been paid.

(c) The Parcel has no duty to contribute monies or render performance under this Agreement.

3.5 Term. Unless earlier terminated as provided in this Agreement, this Agreement shall continue in full force and effect until the earlier of (i) the date of completion of the last portion of the Development, or (ii) the date that is fifteen (15) years from and after the Effective Date of this Agreement unless new Certificates of Occupancy have been granted by the City for new buildings on the Subject Property consistent with the Development Plan for not less than twelve-million (12,000,000) square feet (gross floor area as defined by Moreno Valley Municipal Code 9.15.030) in which event the Term shall be extended for an additional ten (10) years, subject to extension pursuant to Section 11.9 below (the “Term”). Alternatively, if HF is, for any reason, unable to obtain new Certificates of Occupancy for not less than eight (8) million square feet, and up to twelve million (12,000,000) square feet within the original fifteen (15) year Term, it shall be entitled to have this Agreement extended for an additional ten (10) years, subject to extension pursuant to Section 11.9 below, upon the payment to the City of one million dollars (\$1,000,000) prior to the expiration of the original fifteen (15) year term.

3.6 City Cooperation.

(a) In anticipation of the effort necessary to facilitate the timely processing and permitting of project improvements, HF may request the City to designate a mutually agreeable individual (the “City’s WLC Coordinator”) who shall have the authority to facilitate and coordinate development services within the City and with HF for all actions to be taken by

the City which are needed for the development of the Project, including, but not limited to, discretionary approvals, entitlements, site plans, grading, building and occupancy permit applications and inspections through the City's review and approval processes, all at the full cost of HF, which HF shall pay in advance and replenish upon City's request, from time to time. If any payments are not received by City when requested, the WLC coordinator shall cease acting until the funds are received and normal City protocols shall govern. All applications submitted to the City shall be evaluated for completeness within twelve (12) working days of receipt by the City. If not complete, the City shall immediately ensure that HF is notified of what additional information is required.

(b) Upon receipt of an application deemed complete pursuant to subsection 3.6(a) above for a site, grading, building, occupancy, or similar permit, the City shall process, review and approve or disapprove the application within ten (10) working days for the first submittal and within ten (10) working days of any subsequent submittals.

(c) It shall be the City's WLC Coordinator's responsibility to ensure that all of the time limits set forth above are met.

(d) The Project shall, pursuant to ordinary procedures, participate in the City's "Time and Materials Fee Program" which is designed to ensure that the City is reimbursed by HF for its actual costs of providing discretionary approvals, entitlements, planning, grading, and building permits and inspections and fire prevention services. For convenience this shall include the payments due under sub sections 3.6(a) and 3.6(e).

(e) The City shall, pursuant to City's standard contracting procedures, maintain on-call contracts with at least three qualified entities or persons, mutually acceptable to both the City and HF, who can be called upon to immediately provide the services set forth above when the City's WLC Coordinator determines that the City, utilizing typical City staff resources, is unlikely to be able to meet the time limits set forth above. HF shall be solely responsible for the cost of using the qualified private entities or persons. HF shall deposit with City a sum City then determines necessary for such consultants, immediately upon written request from City. HF shall replenish such funds, from time to time, upon written request from City. If any funds are not received per City's request, the consultants shall, without liability, cease work until such money is received.

(f) The City's WLC Coordinator shall cooperate with HF in obtaining any permits or approvals needed from any other agency at full cost to HF.

(g) The City, at HF's request, shall meet with HF to consider in good faith, economic incentives sought by HF similar to those approved for logistics projects in other areas of the City after the Effective Date.

3.7 Time of the Essence. The Parties expressly acknowledge and agree that time is of the essence in the performance of the provisions of this Agreement.

3.8 Mutual Waiver of Estoppel Defenses by Parties. Notwithstanding any legal authorities to the contrary concerning the doctrines of waiver and estoppel as applied to public entities and the actions or inactions of public agencies or public agency officers and officials, the

Parties acknowledge and agree that each Party and its successors and assigns to all or any interest in the Subject Property are relying upon the contents of this Agreement and the Parties' execution of this Agreement and the recordation hereof, and that in consideration of such material reliance, each Party shall now be estopped from denying the underlying validity of this Agreement and each Party knowingly and expressly waives any such claim or defense.

ARTICLE 4 DEVELOPMENT OF THE PROPERTY.

4.1 Vested Right to Develop. During the Term, HF or its Assignee, shall have a vested right to develop the Subject Property in accordance with the Existing Regulations, and as subject to the provisions of this Agreement.

4.2 Effect of Agreement on Land Use Regulations. Except as otherwise provided under the terms of this Agreement, the rules, regulations and official policies governing permitted uses of the Subject Property, the density and intensity of use of the Subject Property, the maximum height and size of proposed buildings, and the design, improvement, and construction standards and specifications applicable to Development of the Subject Property, shall be only the Existing Regulations and those contained in the Development Plan.

4.3 Subsequent Development Approvals. When required by the Moreno Valley Municipal Code, the City shall accept for processing, review and take action upon all properly filed applications for Subsequent Development Approvals. The City further agrees that, unless otherwise requested by HF, the City shall not amend or rescind any Subsequent Development Approvals after such approvals have been granted by the City except as otherwise provided for in Title 9 of the City Municipal Code, or as directed by court order, or as related to approvals not granted by the City. Any Subsequent Development Approval, when granted, shall be deemed to be part of the Existing Regulations from the date of approval except as mandated by court order, or as specified in approvals not granted by the City.

4.4 Timing of Development. HF represents that it intends to commence and complete the physical improvements specified in the Development Plan for the Project. HF cannot specify the specific timing of development. HF will use its best efforts to commence construction at the earliest possible date consistent with market conditions. Because the California Supreme Court held in *Pardee Construction Co. v. City of Camarillo* (1984) 37 Ca1.3d 455, that the failure of the parties therein to provide for the timing of development resulted in a latter adopted initiative restricting the timing of development to prevail over such parties' agreement, it is the Parties' intent to cure that deficiency by expressly acknowledging and providing that HF shall have the right to develop the Subject Property at its own timing. In addition, to the extent HF decides to proceed with the Development of the Subject Property, City shall cooperate with HF with respect to the improvement of the Development of the Subject Property. If HF determines, in its sole and absolute discretion, to develop portions or phases of the Project, the City shall allow the phasing of public improvements unless the City determines that generally applied City of Moreno Valley Municipal engineering or planning requirements demand that additional or complete public improvements be made. The public improvements to be provided would be only those needed to serve the portion or phase being developed consistent with the environmental analysis which shall demonstrate to the City that the public improvements to be provided would be only those needed to serve the portion or phase being developed.

4.5 Terms of Maps and Other Project Approvals. Pursuant to California Government Code Sections 66452.6(1) and 65863.9, the term of any subdivision or parcel map that may be processed on all or any portion of the Subject Property and the term of each of the Development approvals, including Tentative Parcel Map 36457, and any Subsequent Development Approvals, shall be extended until the expiration of the Term.

4.6 Changes and Amendments. The Parties acknowledge that although Development of the Project may require Subsequent Development Approvals, such Development shall be in compliance with this Agreement including the Development Plan. The above notwithstanding, HF may determine that changes are appropriate and desirable in the existing Project Approvals or Development Plan. In the event HF finds that such a change is appropriate or desirable, HF may apply in writing for an amendment to the existing Project Approvals or the Development Plan to effectuate such change. The City shall review and process any request for an amendment in the same manner that it would review and process a similar request for an amendment from any other owner of commercial or industrial land in similar circumstances. Any amendment to the Project Approvals or the Development Plan, when granted, shall be deemed to be part of the Existing Regulations from the date of the grant. Such amendments shall not be unreasonably withheld.

4.7 Reservation of Authority.

4.7.1 Limitations, Reservations and Exceptions. Notwithstanding any other provision of this Agreement, the following Subsequent Regulations shall apply:

(a) Procedural regulations consistent with this Agreement relating to hearing bodies, petitions, applications, notices, findings, records, hearing, reports, recommendations, appeals and any other matter of procedure subject to the City's obligations under Section 3.6, and as may be the subject to future general law enactments by the State of California.

(b) Changes adopted by the California Building Standards Commission as part of the then current versions of Title 24 – the California Building Standards Code – and also adopted by the City as Subsequent Regulations.

(c) Subsequent Regulations, not otherwise specified under this Section 4.7.1, that are not in conflict with the Existing Regulations and the Development Plan.

(d) Subsequent Regulations, not otherwise specified under this Section 4.7.1, that are in conflict with the Existing Regulations or the Development Plan provided HF has given written consent to the application of such regulations to Development of the Subject Property at HF's sole and absolute discretion.

(e) Increased DIF, as defined in Section 1.5 of this Agreement, which shall be paid in the amount of the DIF in effect at the time that they are to be paid.

(f) Judgment(s) and/or federal, state and county laws and regulations which the City is required to enforce as against the Subject Property or the Development of the Subject Property.

4.7.2 Further Future Discretion of City. This Agreement shall not prevent the City, in acting on Subsequent Development Approvals, from applying Subsequent Regulations allowed under Section 4.7.1. Further, it is also understood and acknowledged by the Parties that the Project Approvals contemplate that the City may be required, in certain circumstances, to undertake further environmental review of Subsequent Development Approvals. If the circumstances set forth in CEQA Guideline Section 15162 occur in the context of the City considering Subsequent Development Approvals, or if otherwise required by the EIR, the City is required to, and shall, without being subject to claim, assertion of breach or other challenge by HF or Assignee exercise the maximum discretion authorized by law, consistent with the terms of CEQA and this Agreement.

4.7.3 Modification or Suspension by Federal or State, County, or Multi-Jurisdictional Law. In the event that any Judgment(s) or federal, state, county, or multi-jurisdictional laws or regulations, enacted after the Effective Date of this Agreement, prevent or preclude compliance with one or more of the provisions of this Agreement, such provisions of this Agreement shall be modified or suspended as may be necessary to comply with such Judgment(s) or federal, state, county, or multi jurisdictional laws or regulations, and this Agreement shall remain in full force and effect to the extent it is not inconsistent with such laws or regulations and to the extent such laws or regulations do not render such remaining provision impractical to enforce.

4.8 Payment of, and Reimbursement for, the Cost of Improvements Paid for by HF Which Are in Excess of HF’s Fair Share. HF shall satisfy the requirements imposed by Mitigation Measure 4.15.7.4.A, as set forth in the EIR, to ensure that all of the Development’s impacts on the City’s circulation system, including, but not limited to, improvements to arterial streets, traffic signals and interchanges, are mitigated. Because HF will be responsible for paying for or constructing all circulation-related improvements, it shall not pay the fees imposed by Moreno Valley Municipal Code Sections 3.42.030 (arterial streets), 3.42.040 (traffic signals) and 3.42.050 (interchange improvements). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.9 Provision of a “turnkey” Fire Station. HF shall, at its own cost, provide a fully constructed, fully equipped fire station and fire station site, including fire trucks, as specified by the City’s Fire Chief. The fire station’s furniture and fixtures shall be reasonably comparable to those of the most recently completed fire station within the City. The fire station, equipment and trucks shall be provided as and when directed by the Fire Chief. Because HF will be responsible for the provision of the fire station, fire station site, equipment, and trucks, it shall not pay the fee imposed by Moreno Valley Municipal Code Section 3.42. 060 (fire facilities). City will provide to HF the reimbursement agreement(s) in the form and type as specified in Chapter 9.14 of Title 9 of the Moreno Valley Municipal Code.

4.10 City’s Provision of Public Infrastructure and Services. Except as otherwise prescribed in this Agreement and/or as required of the development through existing or future mitigation measures, development standards, and conditions of approval, the City shall provide the public infrastructure and services which are not HF’s responsibility as determined by the City with timing at the sole and absolute discretion of the City.

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

4.11 Local Hiring Program. HF will establish a WLC Local Hiring Program, at HF's cost to identify, align, and facilitate educational interests and programs with workforce development programs that facilitate the hiring of Moreno Valley residents for job opportunities at the World Logistics Center, and associated jobs not directly at WLC, but in industries that support WLC. HF will require its contractors, suppliers and tenants to be active participants in Moreno Valley Employment Resource Center ("ERC") programs including, but not limited to, the job opportunity announcement program. World Logistics Center employers will be requested to submit all job announcements to the ERC at least one week prior to providing such announcements to other agencies or to the general public. Potential employers will be requested to provide information regarding job opportunities to the ERC including details regarding job titles, minimum qualifications, application processes, and employer contact information. HF shall request that subsequent users to make good faith efforts to hire Moreno Valley City residents. HF shall, upon City's request from time to time, provide to the City proof of its efforts under this section and the success of HF's efforts. HF shall also participate with the Hire MoVal Incentive Program, which was adopted by the City Council on April 28, 2015, and as it may be amended from time to time.

4.12 Education/Innovation/Training/Library Funding.

The City and HF are especially interested in ensuring that the residents of Moreno Valley are provided education resources and obtain every opportunity to secure the jobs which will be created by the operation of the World Logistics Center. Toward that end, HF is willing to contribute six million, nine hundred and ninety three thousand dollars (\$6,993,000), to be used by the City to provide and enhance educational and workforce development training in the supply chain and logistics industries, as follows:

(a) HF shall contribute no less than five million, two hundred sixty eight thousand dollars (\$5,268,000), one million dollars (\$1,000,000) to be contributed at the issuance of the first building permit for a logistics building on the Subject Property and \$0.11/square foot to be paid at the time of the issuance of the building permit for each succeeding building, excluding the fire station;

(b) In addition to the foregoing, beginning on the Effective Date and on each anniversary of that date thereafter, HF shall contribute to the City one hundred thousand dollars (\$100,000) per year for the next six (6) years; and

(c) In addition to the foregoing, beginning in the 7th year on the anniversary date of the Effective Date and continuing throughout the Term, HF shall contribute to the City one hundred twenty five thousand dollars (\$125,000) per year, on the specified anniversary date of the Effective Date, so long as this Agreement is in effect.

4.13 State Route 60 Landscape, Signage, Bridge Design Program. City shall set up a joint City/HF committee to develop freeway related landscaping, bridge architectural concepts, engineering and freeway signage regulations for SR-60 between Redlands Boulevard and Gilman Springs Road. The guidelines, concepts and regulations shall be developed in an expeditious manner. The City shall contribute up to Fifty Thousand Dollars (\$50,000) and HF

shall match the City's contributions on a ten to one basis, up to Five-Hundred Thousand dollars (\$500,000).

4.14 Air Filtration Systems for Seven Properties on World Logistics Parkway and Dracaea Avenue. Notwithstanding the findings of the EIR, Owner agrees to fund the installation of air filtration systems meeting ASHRSE Standard 52.2 MERV-13 standards at the locations listed below, not to exceed \$25,000 per property. Property owners shall be under no obligation to accept such offer. Prior to the issuance of the first grading permit within the WLCSP, Owner shall provide documentation to the City confirming that an offer has been extended to each of the owners of said properties, and \$175,000 shall be deposited in a City account designated for this purpose and an agreement regarding the use and distribution of funds shall be executed between City and Owner. The affected property owners shall have two years from the receipt of the offer to accept the offer. Upon acceptance of each offer, Owner shall work with each owner to ensure the filtration system is properly installed within one year of acceptance. Owner shall invoice City for reimbursement of payments up to \$25,000 per property. This provision applies only to the following seven houses:

12400 World Logistics Center Parkway, Moreno Valley, CA 92555 current APN: 422-020-010

13100 World Logistics Center Parkway, Moreno Valley, CA 92555 current APN: 422-070-029

13200 World Logistics Parkway, Moreno Valley, CA 92555 current APN: 422-070-032

13241 World Logistics Parkway, Moreno Valley, CA 92555 current APN: 478-220-014

29080 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 478-220-030

29140 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 478-220-009

30240 Dracaea Avenue, Moreno Valley, CA 92555 current APN: 422-070-037

ARTICLE 5 REVIEW FOR COMPLIANCE.

5.1 Periodic Review. The City shall review this Agreement annually, on or before the anniversary of the Effective Date, in order to ascertain the good faith compliance by HF with the terms of the Agreement. As part of that review, HF or its successor and assigns shall submit an annual monitoring review statement describing its actions in compliance with this Agreement, in a form acceptable to the Community Development Director or his/her authorized designee, within thirty (30) calendar days after written notice therefrom requesting such a statement. The statement shall be accompanied by an annual review and administration fee sufficient to defray the estimated costs of review and administration of the Agreement during the succeeding year. The amount of the annual review and administration fee shall be set by resolution of the City Council. No failure on part of the City to conduct or complete the review as provided herein shall have any impact on the validity of this Agreement. HF shall, for the first year, deposit \$1,000.00 on the Effective Date for the first year of review.

5.2 Procedure. Each Party shall have a reasonable opportunity to assert matters which it believes have not been undertaken in accordance with the Agreement, to explain the basis for such assertion, and to receive from the other Party a justification of its position on such matters.

5.2.1 If on the basis of the Parties' review of any terms of the Agreement, either Party concludes that the other Party has not complied in good faith with the terms of the Agreement, then such Party may issue a written "Notice of Non-Compliance" specifying the grounds therefor and all facts demonstrating such non-compliance.

5.2.2 The Party receiving a Notice of Non-Compliance shall have thirty (30) calendar days to cure or remedy the non-compliance identified in the Notice of Non-Compliance, or if such cure or remedy is not reasonably capable of being cured or remedied within such thirty (30) days period, to commence to cure or remedy the non-compliance and to diligently and in good faith prosecute such cure or remedy to completion.

5.2.3 If the Party receiving the Notice of Non-Compliance does not believe it is out of compliance and contests the Notice, it shall do so by responding in writing to said Notice within thirty (30) calendar days after receipt of the Notice.

5.2.4 If a Notice of Non-Compliance is contested, the Parties shall, for a period of not less than fifteen (15) calendar days following receipt of the response, seek to arrive at a mutually acceptable resolution of the matter(s) occasioning the Notice. In the event that a cure or remedy is not timely effected or, if the Notice is contested and the Parties are not able to arrive at a mutually acceptable resolution of the matter(s) by the end of the fifteen (15) calendar day period, the party alleging the non-compliance may thereupon pursue the remedies provided in Article 6 of this Agreement.

5.2.5 Neither Party hereto shall be deemed in breach if the reason for non-compliance is due to a "force majeure" as defined in, and subject to the provisions of, Section 11.9 below or any other non performance authorized by this Agreement.

5.3 Certificate of Agreement Compliance. If, at the conclusion of an annual review, HF is found to be in compliance with this Agreement, City shall, upon request by HF, issue a Certificate of Agreement Compliance ("Certificate") to HF stating that after the most recent Periodic Review and based upon the information known or made known to the City that (1) this Agreement remains in effect and that (2) HF is in compliance. The Certificate, shall be in recordable form, shall contain information necessary to communicate constructive record notice of the finding of compliance, and shall state that the Certificate expires upon the earlier of (i) one (1) year from the date thereof, or (ii) the date of recordation of a Notice of Termination of Development Agreement. HF may record the Certificate with the County Recorder. Additionally, HF may at any time request from the City a Certificate stating, in addition to the foregoing, which obligations under this Agreement have been fully satisfied with respect to the Subject Property, or any lot or parcel within the Subject Property.

ARTICLE 6 DEFAULT AND REMEDIES.

6.1 Specific Performance; Waiver of Damages. The Parties acknowledge and agree that specific performance is the preferred remedy available for the enforcement of this Agreement. Accordingly, both Parties hereby waive the right to obtain monetary damages from the other Party by reason of default of this Agreement. Subject to the procedure set forth in Section 5.2 above, any material default by HF or the City of the Agreement that is not timely cured by HF or the City shall be deemed a material default by HF or the City of this Agreement.

6.2 Termination of the Agreement.

6.2.1 Termination of Agreement for Default of HF. The City in its reasonable discretion may terminate this Agreement for any failure of HF to perform any material duty or obligation of HF hereunder or to comply in good faith with the terms of this Agreement (hereinafter referred to as “default” or “breach”); provided, however, the City may terminate this Agreement pursuant to this Section only after following the procedure set forth in Section 5.2 and HF and/or Assignee fail to remedy any issue. Further, if a mortgage of HF comes into possession of the Subject Property by default of HF, City may without liability, and in its sole and absolute discretion, terminate this Agreement. A bankruptcy filing by HF or general Partner of HF, or HF’s successors and assigns, shall also be grounds by City for termination of this Agreement.

6.2.2 Termination of Agreement for Default of City. HF in its reasonable discretion may terminate this Agreement for any default by the City; provided, however, HF may terminate this Agreement pursuant to this Section only after following the procedure set forth in Section 5.2 and thereafter providing written notice by HF to the City of the default setting forth the nature of the default and the actions, if any, required by the City to cure such default and, where the default can be cured, the failure of the City to cure such default within thirty (30) days after the effective date of such notice or, in the event that such default cannot be cured within such thirty (30) day period, the failure of the City to commence to cure such default within such thirty (30) day period and to diligently proceed to complete such actions and to cure such default.

6.2.3 Rights and Duties Following Termination. Upon the termination of this Agreement, no Party shall have any further right or obligation hereunder and City shall treat HF and the Subject Property pursuant to all ordinances, policies, and laws as uniformly applied in the City.

6.3 Institution of Legal Action. Subject to notice of default and opportunity to cure under Section 5.2, in addition to any other rights or remedies, any Party to this Agreement may institute an equitable action to cure, correct, or remedy any default, to enforce any covenants or agreements herein, to enjoin any threatened or attempted violation hereof, or to obtain any other equitable remedies consistent with this Agreement. Any action at law or in equity arising under this Agreement or brought by any Party hereto for the purpose of enforcing, construing or determining the validity of any provision of this Agreement shall be filed and tried in the Superior Court of the County of Riverside, State of California, or such other appropriate court in said County, and the Parties hereto waive all provisions of law providing for the filing, removal or change of venue to any other court. Service of process on the City shall be made in

accordance with California law. Service of process on HF shall be made in any manner permitted by California law and shall be effective whether served inside or outside California. If an action or proceeding is brought by any Party to this Agreement because of default, or to enforce a provision hereof, the prevailing Party shall be entitled to reimbursement of all costs and expenses, including attorneys' fees, incurred in prosecuting such legal action or proceeding. This provision is separate and severable, and shall survive the merger of this Agreement into any judgment on this Agreement. In all instances, the Parties agree that §6.1 also survives and controls the actions of the Parties, and further, that the Parties shall stipulate to the limitation on remedies imposed by §6.1.

ARTICLE 7 THIRD PARTY LITIGATION.

7.1 Notice, Defense and Indemnification of Third Party Litigation. The City shall promptly notify HF of any claim, action, or proceeding filed and served against the City to challenge, set aside, alter, void, annul, limit or restrict the approval and continued implementation and enforcement of this Agreement or any Existing Regulation, including but not limited to Project Approvals and CEQA challenges, as they may be filed from time to time by one or more third parties. HF agrees to fully defend, indemnify and hold the City harmless for all costs of defense and/or judgment(s) obtained in any such action or proceeding by reimbursing City, on a monthly basis, for any and all costs. The City shall notify HF within ten (10) calendar days after the City has selected the defense counsel(s). The City and HF agree to cooperate in the defense of such action(s), which includes HF being provided the opportunity to present City its views and recommendations regarding defense counsel or defense strategy. City shall use its best efforts to reasonably manage case costs and seek reasonable attorney rates.

7.2 Effect of Third Party Litigation on Implementation of Agreement. If any third party litigation referred to in Section 7.1 is filed, the City shall continue to comply with the terms of this Agreement unless prohibited from doing so by court order.

7.3 If third party litigation is filed and if HF decides, in its sole and absolute discretion, not to defend the litigation then upon providing written notice of that decision to the City not to defend the litigation this Agreement shall terminate and no Party shall thereafter have any rights or obligations under it. Nothing in this Agreement shall prevent the City, if it decides in its sole and absolute discretion, from defending the litigation at its own sole cost.

ARTICLE 8 MORTGAGEE AND LENDER PROTECTION.

8.1 The Parties hereto agree that this Agreement shall not prevent or limit HF, in any manner, at HF's sole discretion, from encumbering the Subject Property or any portion thereof or any improvement thereon by any mortgage, deed of trust or other security device securing financing with respect to the Subject Property. The City acknowledges that the lenders providing such financing may require certain Agreement interpretations and modifications and agrees upon request, from time to time, to meet with HF and representatives of such lenders to negotiate in good faith any such request for interpretation or modification but City reserves the right to make the final decisions, pursuant to law of such requests. The City is not bound nor is there any predetermination as to matters requiring public hearing or any adjudicative proceeding. Subject to compliance with applicable laws, the City will not unreasonably withhold its consent

to any such requested interpretation or modification provided the City determines such interpretation or modification is consistent with the intent and purposes of this Agreement and not harmful to City in any manner, in City's sole and absolute discretion. HF shall reimburse City for all costs incurred by City in connection with compliance with this Section 8.1 HF represents and warrants that there are presently no financings of any type or nature that encumber the Subject Property and further represents there are no covenants, financings or other burdens that impair City's rights under this Agreement, and further, no third party holds rights to the Subject Property superior to this Agreement as regards to City's rights.

8.2 Any Mortgagee of the Subject Property shall be entitled to the following rights and privileges:

(a) Neither entering into this Agreement nor a breach of this Agreement shall defeat, render invalid, diminish or impair the lien of any mortgage on the Subject Property made in good faith and for value, unless otherwise required by law.

(b) The Mortgagee of any mortgage or deed of trust encumbering the Subject Property, or any part thereof, which Mortgagee has submitted a request in writing to the City in the manner specified herein for giving notices, shall be entitled to receive written notification from the City of any default by HF in the performance of HF's obligations under this Agreement.

(c) If the City timely receives a request from a Mortgagee requesting a copy of any notice of default given to HF under the terms of this Agreement, the City shall make a good faith effort to provide a copy of that notice to the Mortgagee within ten (10) days of sending the notice of default to HF. The Mortgagee shall have the right, but not the obligation, to cure the default during the period that is the longer of (i) the remaining cure period allowed such Party under this Agreement, or (ii) thirty (30) days.

(d) Any Mortgagee who comes into possession of the Subject Property, or any part thereof, pursuant to foreclosure of the mortgage or deed of trust, or deed in lieu of such foreclosure, shall take the Subject Property, or part thereof, subject to the terms of this Agreement. Notwithstanding any other provision of this Agreement to the contrary, no Mortgagee shall have an obligation or duty under this Agreement to perform any of HF's obligations or other affirmative covenants of HF hereunder, or to guarantee such performance; except that (i) to the extent that any covenant to be performed by HF is a condition precedent to the performance of a covenant by the City, the performance thereof shall continue to be a condition precedent to the City's performance hereunder, and (ii) in the event any Mortgagee seeks to develop or use any portion of the Subject Property acquired by such Mortgagee by foreclosure, deed of trust, or deed in lieu of foreclosure, such Mortgagee shall strictly comply with all of the terms, conditions and requirements of this Agreement and the Development Plan applicable to the Subject Property or such part thereof so acquired by the Mortgagee. The successor Mortgagee is hereby on notice that the event of taking possession of the Subject Property allows, but does not require City to terminate this Agreement without cost or liability to City.

8.3 The City shall, at HF's cost paid to City immediately upon City's request, provide publically available information requested by potential lenders in a timely fashion. City shall not

be required, but may, provide any information exempt from disclosure under the California Public Records Act. (G.C. 6250 et. seq.)

ARTICLE 9 INSURANCE.

9.1 Liability Insurance. HF shall maintain an insurance policy protecting against death or injury to person or property for claims arising out of activities on the Subject Property in the amount of at least five million dollars (\$5,000,000) with the City, its officers, officials, employees, agents and representatives named as additional insured. This requirement is in addition to any liability insurance requirement which the City routinely imposes as a condition to the issuance of a building, grading or encroachment permit. In addition, all such insurance:

- (a) shall be primary insurance and not contributory with any other insurance the City or its officers, officials, employees, agents, and representatives may have;
- (b) shall contain no special limitations on the scope of protection affordable to the City and its officers, officials, employees, agents, and representatives;
- (c) shall be claims made and not dates of occurrence insurance;
- (d) shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer’s liability;
- (e) shall provide that the policy shall not be canceled by the insurer or Owner unless there is a minimum of thirty (30) days prior written notice to the City;
- (f) shall be endorsed to include a waiver of subrogation rights against the City or its officers, officials, employees, agents, and representatives; and
- (g) shall not require Owner to meet a deductible of more than One Hundred Thousand Dollars (\$100,000) unless approved in writing by the City’s Community Development Director in his/her sole and absolute discretion.

9.2 Workers Compensation Insurance. HF shall ensure that any consultant or contractor hired by HF for work on or related to the Subject Property shall carry workers compensation insurance as required by the State of California. This requirement is in addition to any workers compensation insurance requirement which the City routinely imposes as a condition to the issuance of a building, grading or encroachment permit.

ARTICLE 10 INDEMNITY FOR INJURY TO PERSON OR PROPERTY.

HF agrees to and shall indemnify, defend, and hold harmless the City and the City’s officers, officials, members, employees, agents, and representatives, from and against any, and all claims, liabilities, awards, settlements, agreements, damages, and losses, including without limitation reasonable attorneys’ fees and litigation expenses, including court and expert witness fees (collectively, “Claims”), with respect to any action brought due to the death or personal injury of any person, or physical damage to any person’s real or personal property, caused by the construction of improvements by, or construction-related activities of, HF or HF’s employees,

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agents, representatives, servants, invitees, consultants, contractors, or subcontractors (collectively, “HF’s Representatives”) on the Subject Property, or for any construction defects in any improvements constructed by HF or HF’s Representatives on the Subject Property or for any other work related to this Agreement. The foregoing indemnification provision shall survive the termination of this Agreement.

Notwithstanding the above, HF agrees to and shall indemnify, defend, and hold harmless the City and the City’s officers, officials, members, employees, agents and representatives, from and against any and all claims, liabilities, damages, and losses, including without limitation reasonable attorneys’ fees and litigation expenses, including court and expert witness with respect to any action brought to challenge the Project’s entitlement approvals and/or the EIR.

ARTICLE 11 MISCELLANEOUS PROVISIONS.

11.1 Recordation of Agreement. The City Clerk shall have this Agreement recorded with the County Recorder within the period required by Government Code section 65868.5. Any amendments to this Agreement approved by the Parties, and any cancellation hereof, shall be similarly recorded. A failure to record this Agreement in a timely fashion shall not affect its validity in any manner.

11.2 Entire Agreement. This Agreement sets forth and contains the entire understanding and agreement of the Parties with respect to the subject matter set forth herein, and there are no oral or written representations, understandings or ancillary covenants, undertakings or agreements which are not contained or expressly referred to herein. No testimony or evidence of any such representations, understandings or covenants shall be admissible in any proceeding of any kind or nature to interpret or determine the terms or conditions of this Agreement except as to future and further agreements and the exercise of the Existing Regulations.

11.3 Severability. If any term, provision, covenant or condition of this Agreement shall be determined invalid, void or unenforceable, the invalid provision shall be deemed to be severable from the remaining provisions contained within the Agreement. The Parties hereby state and acknowledge they would have adopted each provision contained within this Agreement notwithstanding the presence of an invalid provision.

11.4 Interpretation and Governing Law. This Agreement and any dispute arising hereunder shall be governed and interpreted in accordance with the laws of the State of California. This Agreement shall be construed as a whole according to its fair language and common meaning to achieve the objectives and purposes of the Parties, and the rule of construction to the effect that ambiguities are to be resolved against both the drafting parties or in favor of the City or HF shall not be employed in interpreting this Agreement, all Parties having been represented by counsel in the negotiation and preparation, adoption, application and execution hereof.

11.5 Section Headings. All section headings and subheadings are inserted for convenience only and shall not affect any construction or interpretation of this Agreement.

11.6 Singular and Plural. As used herein, the singular of any word includes the plural.

11.7 Waiver. Failure of a Party to insist upon the strict performance of any of the provisions of this Agreement by the other Party, or the failure by a Party to exercise its rights upon the default of the other Party, shall not constitute a waiver of such Party's right to insist and demand strict compliance by the other Party with the terms of this Agreement thereafter.

11.8 No Third Party Beneficiaries. This Agreement is made and entered into for the sole protection and benefit for the Parties and their successors and assigns. No other person shall have any right of action based upon any provision of this Agreement.

11.9 Force Majeure. Neither Party shall be deemed to be in default where failure or delay in performance of any of its obligations under this Agreement is caused by earthquakes, acts of God, pandemics, fires, wars, riots or similar hostilities, strikes and other labor difficulties beyond the Party's control (including the Party's employment force), economic or environmental/physical conditions (such as lack of utilities) beyond HF's control which make Development uneconomic or infeasible, other causes beyond the Party's reasonable control or court actions (such as restraining orders or injunctions). If any such events shall occur, the Term of this Agreement and the time for performance shall be extended for the duration of each such event, provided that the Term shall not be extended under any circumstances for more than three (3) years regardless of the number or length of individual extensions and further, in no instance, shall be for a duration longer than the circumstance serving to cause the delay. Notwithstanding the foregoing, if construction ceases after commencement, but prior to the issuance of new Certificates of Occupancy, HF, at its sole cost, shall secure, preserve and prevent any nuisance conditions from occurring on the Subject Property.

11.10 Mutual Covenants. The covenants contained herein are mutual covenants and also constitute conditions to the concurrent or subsequent performance by the Party benefited thereby of the covenants to be performed hereunder by such benefited Party.

11.11 Counterparts. This Agreement may be executed by the Parties in counterparts, which counterparts shall be construed together and have the same effect as if all of the Parties had executed the same instrument.

11.12 Covenant Not To Sue Each Other Regarding the Construction of the Agreement. The Parties to this Agreement, and each of them, agree that this Agreement and each term hereof are legal, valid, binding, and enforceable. The Parties to this Agreement, and each of them, hereby covenant and agree that each of them will not commence, maintain, or prosecute any claim, demand, cause of action, suit, or other proceeding against any other Party to this Agreement, in law or in equity, or based on an allegation, or assert in any such action, that this Agreement or any term hereof is void, invalid, or unenforceable.

11.13 Project as a Private Undertaking. It is specifically understood and agreed by and between the Parties that the Development of the Subject Project is a private development, that neither Party is acting as the agent of the other in any respect hereunder, and that each Party is an independent contracting entity with respect to the terms, covenants and conditions contained in this Agreement. No partnership, joint venture or other association of any kind is formed by this Agreement. The only relationship between the City and HF is that of a government entity

regulating the Development of private property, on the one hand, and the holder of legal or equitable title to such property, on the other hand.

11.14 Further Actions and Instruments. Each of the Parties shall cooperate in good faith with and provide reasonable assistance to the other to the extent contemplated hereunder in the performance of all obligations under this Agreement and the satisfaction of the conditions of this Agreement. Upon the request of either Party at any time, the other Party shall promptly execute, with acknowledgment or affidavit if reasonably required, and file or record such required instruments and writings and take any actions as may be reasonably necessary under the terms of this Agreement to carry out the intent and to fulfill the provisions of this Agreement or to evidence or consummate the transactions contemplated by this Agreement.

11.15 Amendments in Writing/Cooperation. This Agreement may be amended only by written consent of both Parties specifically approving the amendment and in accordance with the Government Code section 65868. The Parties shall cooperate in good faith with respect to any amendment proposed in order to clarify the intent and application of this Agreement, and shall treat any such proposal on its own merits, and not as a basis for the introduction of unrelated matters. Subject to the provisions of Moreno Valley Municipal Code Section 9.02.110E, minor, non-material modifications which are clerical or strictly technical corrections which do not affect the substantive terms and conditions of the Agreement may be approved by the Community Development Director in consultation with the City Attorney as an operating Memorandum. City, upon its request, may be compensated for its costs reasonably incurred in reviewing and processing any request under this section, including costs arising from third parties engaged by the City in furtherance of any request.

11.16 Operating Memoranda. The Parties acknowledge and agree that the provisions of this Agreement require a close degree of cooperation between the City and HF, and Development of the Subject Property hereunder may demonstrate that refinements or clarifications are appropriate with respect to the details of performance of the City and HF. If and when, from time to time, during the Term of this Agreement, the City and HF agree that such refinements or clarifications are necessary or appropriate, they will effectuate such refinements or clarifications through operating memoranda approved by the City and HF, which, after execution, will be attached to this Agreement as addenda and become a part hereof, and may be further refined or clarified from time to time as necessary with future approval by the City and HF. The Community Development Director, in consultation with the City Attorney, will be authorized to make the determination whether a requested refinement or clarification and corresponding operating memoranda may require a public hearing and approval by the City Council. Notwithstanding the foregoing, the City staff or contract staff may decline to execute any operating Memoranda and may instead submit the matter to the City Council for its consideration and action.

11.17 Corporate Authority. The person(s) executing this Agreement on behalf of each of the Parties hereto represent and warrant that (i) such Party are duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said Party, (iii) without representing and warranting whether or not the Agreement is lawful by so executing this Agreement, such Party is formally bound to the provisions of this Agreement, and (iv) the

entering into this Agreement does not violate any provision of any other agreement to which such Party is bound.

11.18 Notices. All notices under this Agreement shall be effective upon any of the following: personal delivery, via e-mail, via facsimile so long as the sender receives confirmation of successful transmission from the sending machine, or three (3) business days after deposit in the United States mail, registered, certified, postage fully prepaid and addressed to the respective Parties as set forth below or as to such other address as the Parties may from time to time designate in writing:

To City: City of Moreno Valley
14177 Frederick Street
Moreno Valley, California 92552
Attn: City Manager
Telephone: (951) 413-3000
Facsimile: (951) 413-3200
E-mail address: cmoffice@moval.org

Copies to: City Attorney
14177 Frederick Street
Moreno Valley, California 92552
Telephone: (951) 413-3036
Facsimile: (951) 413-3034
E-mail address: cityclerk@moval.org

To HF: Iddo Benzeevi
President and Chief Executive Officer
Highland Fairview Operating Co.
14225 Corporate Way
Moreno Valley, CA 92553
Telephone: (951) 867-5327
Facsimile: (951) 867-5328
E-mail Address: ibenzeevi@highlandfairview.com

Copy to: Kenneth B. Bley, Esq.
Cox, Castle & Nicholson LLP
2029 Century Park East, Suite 2100
Los Angeles, CA 90067
Telephone: (310) 284-2231
Facsimile: (310) 284-2100
E-mail address: kbley@coxcastle.com

11.19 Nonliability of City Officials. No officer, official, member, employee, contractor, attorney, agent, or representatives of the City shall be liable for any amounts due hereunder, and no judgment or execution thereon entered in any action hereon shall be personally enforced against any such officer, official, member, employee, agent, or representative.

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

11.20 No Brokers. The City and HF represent and warrant to the other that neither has employed any broker and/or finder to represent its interest in this transaction. Each Party agrees to indemnify and hold the other free and harmless from and against any and all liability, loss, cost, or expense (including court costs and reasonable attorney’s fees) in any manner connected with a claim asserted by any individual or entity for any commission or finder’s fee in connection with this Agreement arising out of agreements by the indemnifying Party to pay any commission or finder’s fee.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the day and year first set forth above.

City:

CITY OF MORENO VALLEY

By

Mayor, City of Moreno Valley

ATTEST:

By

City Clerk

APPROVED AS TO FORM:

By

City Attorney

HF:

HF PROPERTIES,
a California general partnership

By: _____

Name: Iddo Benzeevi

Its: President

SUNNYMEAD PROPERTIES,
a Delaware general partnership

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By: _____

Name: Iddo Benzeevi

Its: President

THEODORE PROPERTIES PARTNERS,
a Delaware general partnership

By: _____

Name: Iddo Benzeevi

Its: President

13451 THEODORE, LLC,
a California limited liability company

By: _____

Name: Iddo Benzeevi

Its: President

HL PROPERTY PARTNERS,
a Delaware general partnership

By: _____

Name: Iddo Benzeevi

Its: President

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

State of California)
County of _____)

On _____, before me,

(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

(Seal)

State of California)
County of _____)

On _____, before me,

(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

(Seal)

State of California)
County of _____)

On _____, before me,

(insert name and title of the officer)

Notary Public, personally appeared _____
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument
the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

(Seal)

EXHIBIT "A-1"
LEGAL DESCRIPTION

THOSE CERTAIN PARCELS OF LAND IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

(APN: 478-220-01)

LOTS 1, 2 AND 7 IN BLOCK 59 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-3, 4)

LOTS 5 AND 6 IN BLOCK 55 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-7)

LOT 4 IN BLOCK 60 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 423-250-2, 7, 10, 11, 18)

PARCELS 1, 2 AND 10 OF PARCEL MAP 17905, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGES 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 422-070-18, 20, 22)

THAT PORTION OF THE NORTH HALF OF THE NORTH HALF OF FRACTION 7, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF, WHICH LIES NORTH OF THE SOUTH LINE OF LOTS 1, 2, 3 AND 4 IN BLOCK 57 AND WHICH LIES NORTH OF THE SOUTH LINE OF LOT 1 AND ITS EASTERLY EXTENSION AND LOT 2 IN BLOCK 58 AS LOTS AND BLOCKS ARE SHOWN ON MAP 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY RECORDED IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO RECORDS.

EXCEPT THAT PORTION LYING WEST OF THE EAST LINE OF PARCELS 2 AND 3 OF PARCEL MAP NO. 8113, ON FILE IN BOOK 28, PAGE 38 OF PARCEL MAPS, RIVERSIDE COUNTY RECORDS.

ALSO EXCEPT THAT PORTION WHICH LIES NORTHEAST OF THE WESTERLY LINE OF STATE HIGHWAY ROUTE 194, 100.00 FEET IN WIDTH AS DESCRIBED IN THE DEEDS RECORDED OCTOBER 27, 1936 AS FILE NOS. 1498 AND 1499 IN BOOK 300, PAGES 344 AND 345 OF OFFICIAL RECORDS, RIVERSIDE COUNTY RECORDS.

ALSO EXCEPT ONE-HALF OF ALL GAS, OIL AND MINERAL RIGHTS 500.00 FEET BELOW THE SURFACE AS RESERVED IN THE DEEDS RECORDED SEPTEMBER 01, 1960 AS FILE NOS. 77097, 77098, 77099 AND 77100 ALL OF OFFICIAL RECORDS.

TOGETHER WITH:

(APN: 478-220-17, 18, 19, 20, 21, 22, 23, 24)
 LOTS 1 THROUGH 8, INCLUSIVE, IN BLOCK 81 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-15, 16, 25, 26, ,28)
 LOTS 1, 2, 3, 4, 5, 6, AND 8 IN BLOCK 82 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

EXCEPTING FROM LOT 7, ONE HALF OF ALL OIL, GAS, MINERAL AND SUBSURFACE RIGHTS 500 FEET OR MORE BELOW THE SURFACE, BUT WITHOUT ANY RIGHTS WHATSOEVER TO THE USE OF THE SURFACE OR THE SUBSURFACE AREA OF SAID LAND TO A DEPTH OF 500 FEET FROM SAID SURFACE FOR ANY PURPOSE INCIDENTAL TO THE OWNERSHIP OF SAID SUBSTANCES, AS RESERVED TO MARY B. TRAUTWEIN, A WIDOW, ET AL. BY DEED RECORDED MARCH 6, 1964 AS INSTRUMENT NO. 28654 OF OFFICIAL RECORDS

TOGETHER WITH:

(APN: 478-230-7)
 LOTS 1 THROUGH 8 IN BLOCK 87 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11 PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-230-1, 2, 3, 4, 5, 6)
 LOTS 1 THROUGH 4, 7 AND 8 IN BLOCK 88 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11,

PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-230-19-0, 20)

LOTS 2 AND 7 IN BLOCK 109 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

EXCEPT FROM SAID LOT 7 BLOCK 109 THAT PORTION CONVEYED TO THE COUNTY OF RIVERSIDE IN DEED RECORDED JULY 24, 1973 AS FILE NO. 97183 OF OFFICIAL RECORDS.

TOGETHER WITH:

(APN: 478-230-11, 14)

LOTS 1 AND 8 IN BLOCK 109 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-230-9, 10)

LOTS 3 AND 4 IN BLOCK 110 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA AS PER MAP RECORDED IN BOOK 11 PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-210-54-9)

LOTS 1 THROUGH 4, BLOCK 1 OF THE TOWN OF MORENO, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 19, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THE NORTHERLY 10 FEET OF THAT PORTION OF BAY AVENUE, VACATED BY RESOLUTION RECORDED JANUARY 10, 1974 AS FILE NO. 4002 OF OFFICIAL RECORDS, LYING BETWEEN THE SOUTHERLY PROLONGATION OF THE EAST LINE OF RUSSELL STREET AND THE SOUTHERLY PROLONGATION OF EAST LINE OF LOT 4 IN BOOK 1 AS SHOWN ON AS MAP OF TOWN OF MORENO.

TOGETHER WITH:

(APN: 478-210-55-0)

LOTS 1 THROUGH 4, BLOCK 2 OF TOWN OF MORENO, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN

BOOK 11, PAGE(S) 19, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THE NORTHERLY 10 FEET OF THAT PORTION OF BAY AVENUE, VACATED BY RESOLUTION RECORDED JANUARY 10, 1974 AS FILE NO. 4002 OF OFFICIAL RECORDS, LYING BETWEEN THE SOUTHERLY PROLONGATION OF THE EAST LINE OF REDLANDS BOULEVARD AND THE SOUTHERLY PROLONGATION OF THE WEST LINE OF RUSSEL STREET AS SHOWN ON SAID MAP OF TOWN OF MORENO.

TOGETHER WITH:

(APN: 478-220-4, 5, 6, 10, 11)

LOTS 1, 2, 3, 7 AND 8 IN BLOCK 60 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-8, 9, 10)

LOTS 6, 7 AND 8 IN BLOCK 56 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-2, 3, 12, 13)

LOTS 3, 4, 5 AND 6 IN BLOCK 59 AS SHOWN BY MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 488-350-5)

LOT 7 IN BLOCK 55 OF MAP NO. 1, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TOGETHER WITH THAT PORTION OF EUCALYPTUS AVENUE, WITHIN SAID BLOCK LYING SOUTHERLY AND ADJACENT TO SAID LOT 7.

TOGETHER WITH:

(APN: 488-350-6)

LOT 8 IN BLOCK 55 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TOGETHER WITH THOSE PORTIONS

OF EUCALYPTUS AVENUE AND SINCLAIR STREET, WITH SAID BLOCK LYING SOUTHERLY, EASTERLY AND ADJACENT TO SAID LOT 8.

TOGETHER WITH:

(APN: 488-350-7)

LOT 5 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 423-250-8, 9, 12 AND 423-260-10)

PARCELS 3 THROUGH 5, AND 11 OF PARCEL MAP 17905, IN THE CITY OF, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGE(S) 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: 423-260-3, 4, 5, 7, 8, 9 AND 423-310-1, 2)

PARCELS 6 THROUGH 9 AND 14 THROUGH 17 OF PARCEL MAP 17905, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 114, PAGE(S) 70 THROUGH 83, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN: PORTION 488-350-15)

ALL THOSE PORTIONS OF LOTS 1, 2, 3 AND 4 OF BLOCK 55, MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP ON FILE IN BOOK 11 PAGE 10 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

EXCEPTING THEREFROM THAT PORTIONS OF LOTS 3 AND 4 OF BLOCK 34 CONVEYED TO THE STATE OF CALIFORNIA IN DEED RECORDED MAY 25, 1962 AS INSTRUMENT NO. 48967 IN BOOK 3147 PAGE 181 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

ALSO EXCEPTING THEREFROM ONE HALF OF ALL OIL, GAS, MINERAL AND SUBSURFACE RIGHTS 500 FEET OR MORE BELOW THE SURFACE, BUT WITHOUT ANY RIGHTS WHATSOEVER TO THE USE OF THE SURFACE OR THE SUBSURFACE AREA OF SAID LAND TO A DEPTH OF 500 FEET FROM SAID SURFACE FOR ANY PURPOSE INCIDENTAL TO THE OWNERSHIP OF SAID SUBSTANCES, AS RESERVED IN DEED RECORDED JULY 12, 1961 AS INSTRUMENT NO. 59232 IN BOOK 2942 PAGE 318 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA. SAID EXCEPTION AFFECTS LOTS 1, 2 AND 4 OF SAID BLOCK 55.

TOGETHER WITH:

(APN 478-240-011-3, 017-9, 026-7, 027-8, 030-0)
 LOT(S) 3, 4, 5, 6 AND 7 IN BLOCK 136, MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE, SINCLAIRE STREET AND CACTUS AVENUE, WITHIN SAID BLOCK, LYING WESTERLY OF THE EAST LINE OF SAID LOTS PROLONGED NORTHERLY AND SOUTHERLY, THAT WOULD PASS WITH A CONVEYANCE OF SAID LOTS.

TOGETHER WITH:

(APN 478-240-028-9)
 LOT 1 IN BLOCK 136 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING NORTHERLY OF THE SOUTH LINE OF SAID LOT PROLONGED EASTERLY AND EASTERLY OF THE EAST WEST LINE OF SAID LOT PROLONGED NORTHERLY.

TOGETHER WITH:

(APN 478-240-019-1)
 LOT 8 IN BLOCK 136 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF CACTUS AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING EASTERLY OF THE WEST LINE OF SAID LOT PROLONGED SOUTHERLY AND SOUTHERLY OF THE NORTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

(APN 478-240-025-6)
 LOT 8 IN BLOCK 113 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET, WITHIN SAID BLOCK, LYING EASTERLY OF THE WEST LINE OF SAID LOT PROLONGED SOUTHERLY AND SOUTHERLY OF THE NORTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

(APN 478-240-29-0)

LOT 2 IN BLOCK 136 OF MAP NO.1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, CALIFORNIA, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE, THEODORE STREET, CACTUS AVENUE, AND SINCLAIR STREET WHICH WOULD PASS BY OPERATION OF LAW.

TOGETHER WITH:

(APN 478-240-24-5)

LOT 7 IN BLOCK 113 OF MAP NO. 1, BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH THOSE PORTIONS OF BRODIAEA AVENUE AND THEODORE STREET WHICH WOULD PASS BY OPERATION OF LAW.

TOGETHER WITH:

(APN 478-240-005-8, 008-1)

LOTS 3 AND 6, BLOCK 113, MAP NO. 1 BEAR VALLEY & ALESSANDRO DEVELOPMENT COMPANY., IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, CALIFORNIA.

TOGETHER WITH:

(APN 422-070-033-1)

PARCEL 4 OF PARCEL MAP 8113, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 28, PAGE 38 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN 422-130-002-8, 003-9)

THE EASTERLY 80 ACRES OF THAT PORTION OF FRACTION SECTION 8, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY UNITED STATES GOVERNMENT SURVEY, LOCATED SOUTHWESTERLY OF THE SOUTHWESTERLY LINE OF THE PORTION OF SAID SECTION GRANTED TO THE STATE OF CALIFORNIA FOR HIGHWAY PURPOSES BY DEED RECORDED MARCH 17, 1937 IN BOOK 318, PAGE 57 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

EXCEPT FROM GOVERNMENT LOTS 3, 4, 5, 6 AND 9, THE SOUTH 30 FEET THEREOF, AS GRANTED TO RIVERSIDE COUNTY FOR ROAD PURPOSES BY DEED RECORDED JUNE 23, 1916 IN BOOK 433, PAGE 192 OF DEEDS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, AND AS SHOWN ON LICENSED SURVEYOR'S MAP ON FILE IN BOOK 5, PAGE 44 OF RECORDS OF SURVEY, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

THE WESTERLY LINE OF SAID 80 ACRES BEING PARALLEL WITH THE WESTERLY LINE OF SAID SECTION 8.

TOGETHER WITH:

(APN 422-130-001, 422-110-001)

THAT PORTION OF FRACTION SECTION 8, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, LYING SOUTHWESTERLY OF THE SOUTHWESTERLY LINE OF THE PORTION OF SAID LAND DESCRIBED IN DEED TO THE STATE OF CALIFORNIA RECORDED MARCH 17, 1937 IN BOOK 318, PAGE 57 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

EXCEPT THE EASTERLY 80 ACRES THEREOF, THE WESTERLY LINE OF SAID 80 ACRES BEING PARALLEL WITH THE WESTERLY LINE OF SAID SECTION.

ALSO EXCEPT THE SOUTH 30.00 FEET AS DESCRIBED IN DEED TO THE COUNTY OF RIVERSIDE RECORDED JUNE 23, 1916 IN BOOK 433, PAGE 192 OF DEEDS.

ALSO EXCEPTING THEREFROM ANY PORTION THAT LIES WITHIN PARCEL 3 OF PARCEL MAP 16950 AS PER MAP ON FILE IN BOOK 99 OF PARCEL MAPS, AT PAGES 34 THROUGH 42, RIVERSIDE COUNTY RECORDS.

ALSO EXCEPT ONE HALF OF ALL GAS, OIL, AND MINERAL RIGHTS 500.00 FEET FROM BELOW THE SURFACE AS RESERVED BY MARIE B. ERRAMUSPE, A WIDOW, BY DEED RECORDED SEPTEMBER 01, 1960 AS INSTRUMENT NO. 77098, OFFICIAL RECORDS.

TOGETHER WITH:

(APN 422-070-6, 10, 17, 19, 21, AND 422-080-01, 02, 03, 04)

LOTS 1 THROUGH 4 BOTH INCLUSIVE, IN BLOCK 111; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 83; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 84; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 85; LOTS 1 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 86; LOTS 5 THROUGH 8 BOTH INCLUSIVE, IN BLOCK 57; LOTS 5, 6, 7 AND 8 IN BLOCK 58 AND LOTS 1 THROUGH 4 BOTH INCLUSIVE, IN BLOCK 112, OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO COUNTY RECORDER, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH THOSE PORTIONS OF THEODORE STREET, ULYSSES STREET, VIRGINIA STREET, DRACAEA AVENUE, COTTONWOOD AVENUE, BAY AVENUE AND ALESSANDRO BOULEVARD ADJOINING SAID LOTS WITHIN SAID BLOCKS.

TOGETHER WITH THAT PORTION OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, WHICH LIES EAST OF THE EAST LINE OF SAID BLOCKS 57, 84, 85 AND 112.

EXCEPT THAT PORTION OF BLOCK 58 LYING WITHIN PARCEL. MAP 8113 AS PER MAP RECORDED IN BOOK 28, PAGE 38 OF PARCEL MAPS, RECORDS OF RIVERSIDE COUNTY.

ALSO EXCEPT THAT PORTION LYING NORTHEAST OF THE SOUTHWEST LINE OF THE LAND DESCRIBED IN DEEDS TO THE COUNTY OF RIVERSIDE RECORDED OCTOBER 27, 1936 IN BOOK 300, PAGES 344 AND 345 OF OFFICIAL RECORDS, RECORDED JULY 09, 1936 IN BOOK 287, PAGE 315 AND AUGUST 07, 1936 IN BOOK 292, PAGE 85, AND MARCH 17, 1937 IN BOOK 318, PAGE 57, ALL OF OFFICIAL RECORDS.

ALSO EXCEPT PORTION LYING SOUTHERLY OF THE NORTH LINE OF THE LAND DESCRIBED IN DEED TO THE COUNTY OF RIVERSIDE RECORDED DECEMBER 13, 1915 IN BOOK 432, PAGE 254 OF DEEDS.

ALSO EXCEPT THAT PORTION DESCRIBED IN DEED RECORDED NOVEMBER 27, 1934 IN BOOK 205, PAGE 29 OF OFFICIAL RECORDS AND OCTOBER 23, 1934 IN BOOK 199, PAGE 97 OF OFFICIAL RECORDS.

ALSO EXCEPT ONE-HALF OF ALL GAS, OIL AND MINERALS 500.00 FEET FROM BELOW THE SURFACE AS RESERVED IN DEED RECORDED SEPTEMBER 01, 1960 AS INSTRUMENT NOS. 77097, 77098, 77099, 77100 AND 77101, ALL OF OFFICIAL RECORDS.

TOGETHER WITH:

(APN 478-220-029-8)

PARCEL(S) 1 OF PARCEL MAP NO. 9880, AS PER PLAT RECORDED IN BOOK 47 OF PARCEL MAPS, PAGE(S) 25, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH:

(APN 488-350-019)

LOT 1 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO., AS SHOWN BY MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH THOSE PORTIONS OF FIR AVENUE AND THEODORE STREET WITHIN SAID BLOCK LYING EAST OF THE WEST LINE OF SAID LOT PROLONGED NORTHERLY AND NORTH OF THE SOUTH LINE OF SAID LOT PROLONGED EASTERLY.

TOGETHER WITH:

(APN 488-350-021)

LOT 2 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH:

(APN 488-350-023)

LOT 3 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH:

(APN 488-350-025)

LOT 4 IN BLOCK 56 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, LYING SOUTHERLY OF PARCEL MAP 35629, FILED IN MAP BOOK 231 PAGES 77 THROUGH 82 OF PARCEL MAPS.

TOGETHER WITH THOSE PORTIONS OF SINCLAIR STREET WITHIN SAID BLOCK LYING WESTERLY AND NORTHERLY AND ADJACENT TO SAID LOT 4.

TOGETHER WITH:

(APN 478-240-006,007)

LOTS 1 AND 2 IN BLOCK 113 OF MAP NO. 1 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-014)

LOT 8 IN BLOCK 59 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE 10 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

TOGETHER WITH:

(APN: 478-220-27)

LOT 7 IN BLOCK 82 OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, AS SHOWN BY MAP NO. 1, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 11, PAGE(S) 10, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY.

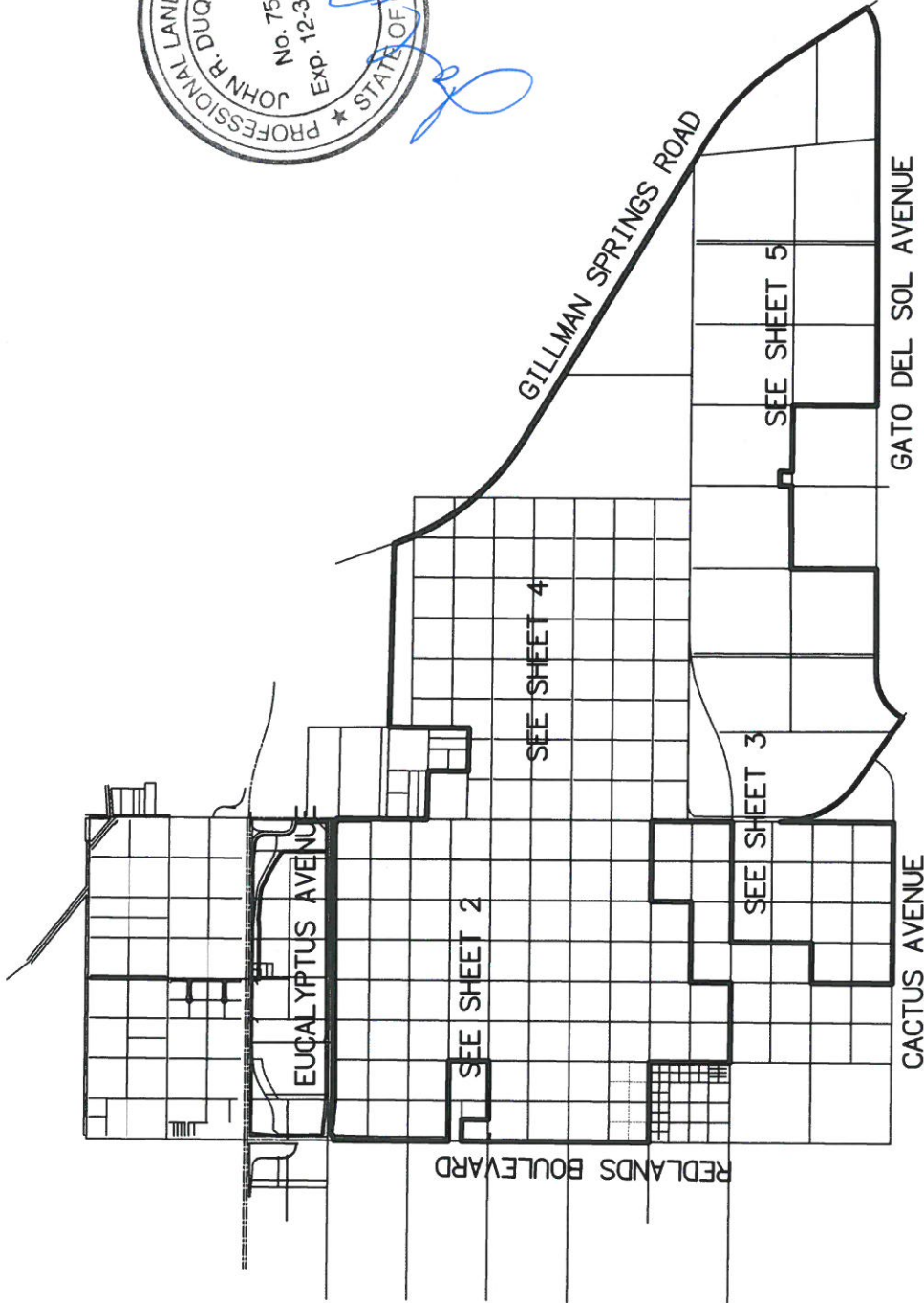
THIS DESCRIPTION WAS PREPARED BY ME OR UNDER MY DIRECTION.

John R. Duquette
JOHN R. DUQUETTE, PLS 7566

DATE: 5/27/15



Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)



PLANNING ■ DESIGN ■ CONSTRUCTION

RBF
CONSULTING

40810 COUNTY CENTER DRIVE, SUITE 100
TEMECULA, CALIFORNIA 92591-6022
951.676.8042 • FAX 951.676.7240 • www.RBF.com

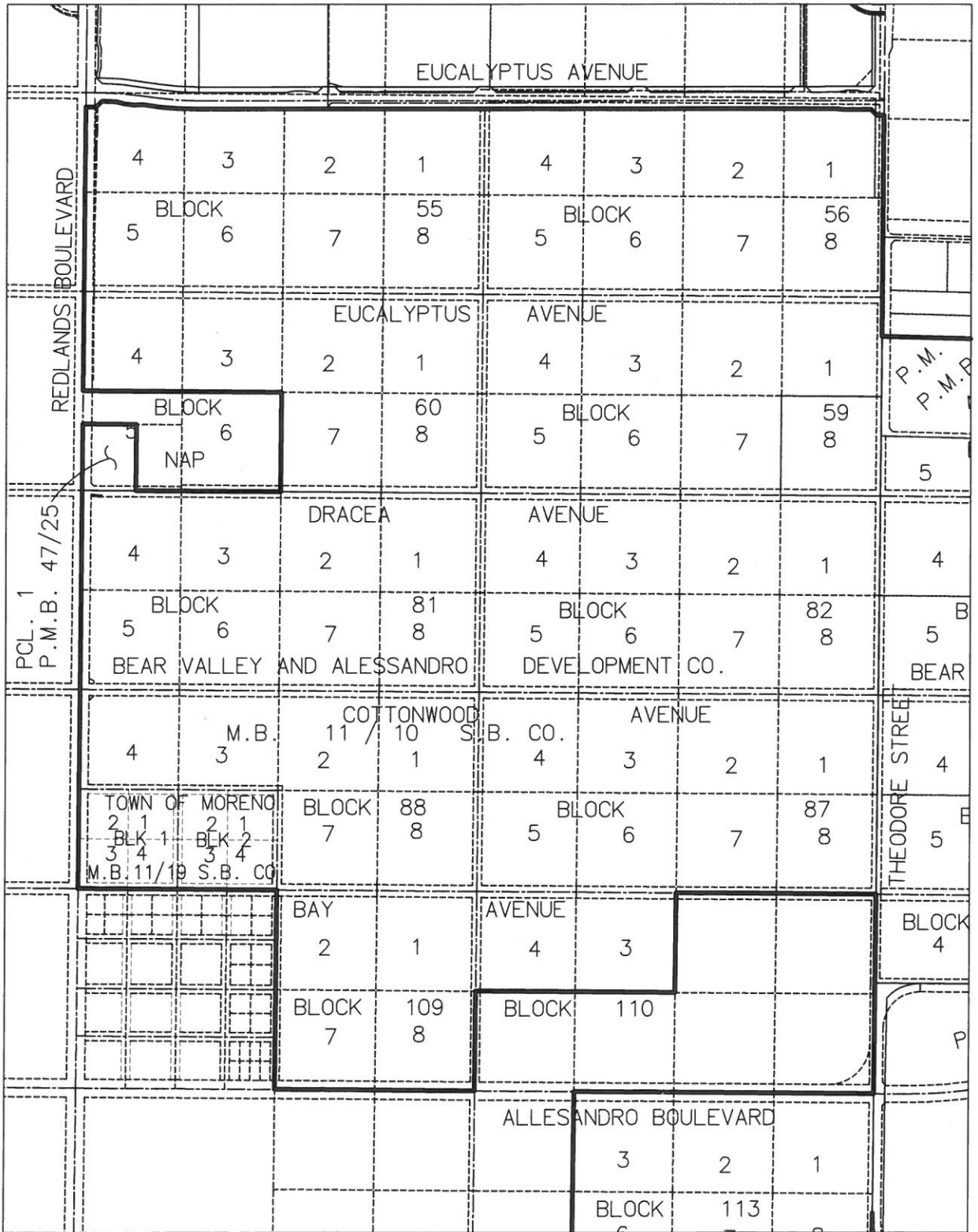
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SHEET 1 OF 5 SHEETS

DATE MAY 27, 2015	SCALE 1"=3000'	JOB NO. 10-105750
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EXHIBIT "A-2"

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)



SEE SHEET 4



Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

EXHIBIT "A-2"

SEE SHEET 3

SHEET 2 OF 5 SHEETS

DATE	SCALE	JOB NO.
MAY 27, 2015	1"=1000'	10-105750

DATE	SCALE	JOB NO.
MAY 27, 2015	1"=1000'	10-105750

RBF CONSULTING

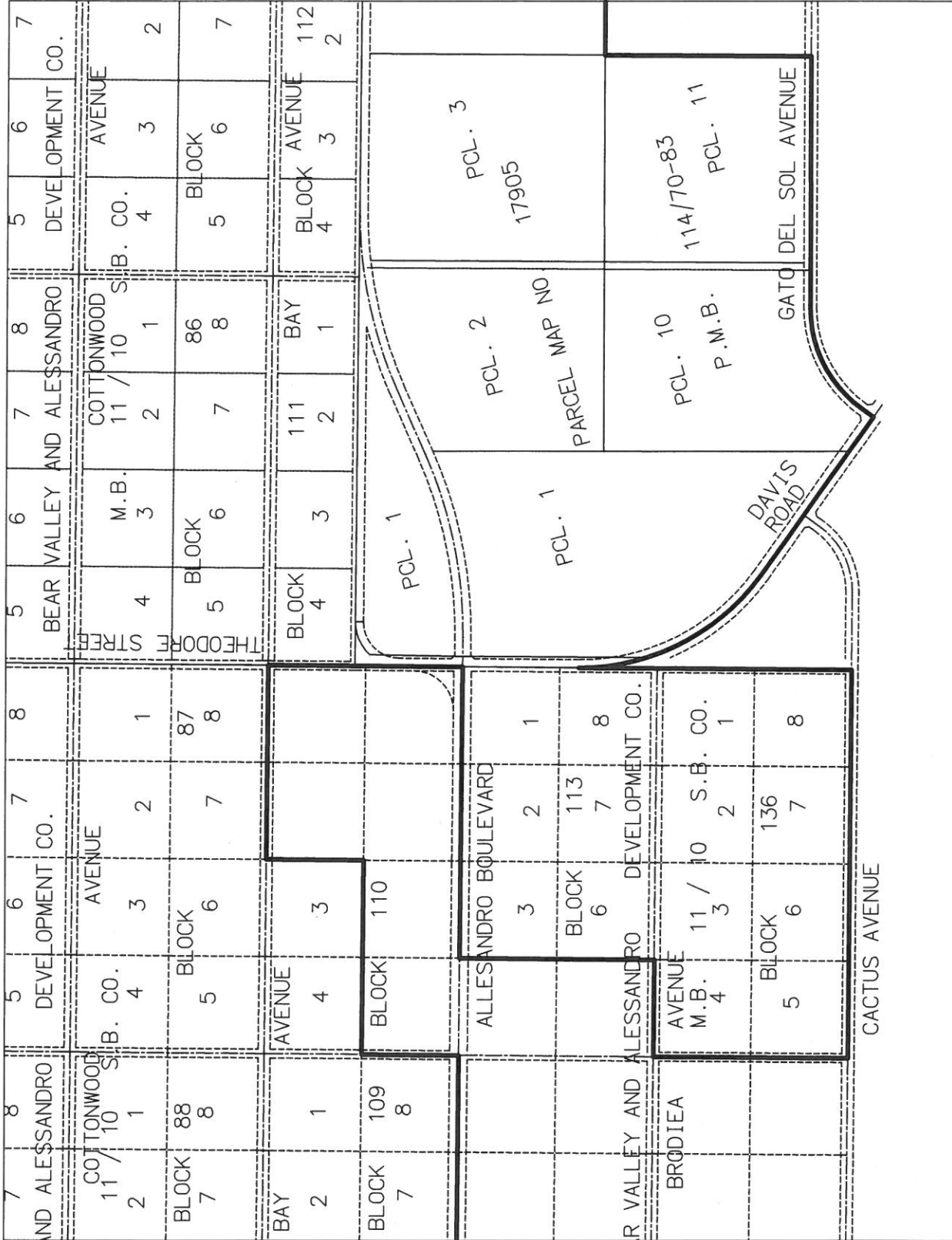
PLANNING ■ DESIGN ■ CONSTRUCTION

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SEE SHEET 2

SEE SHEET 4

SEE SHEET 5



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SHEET 3 OF 5 SHEETS

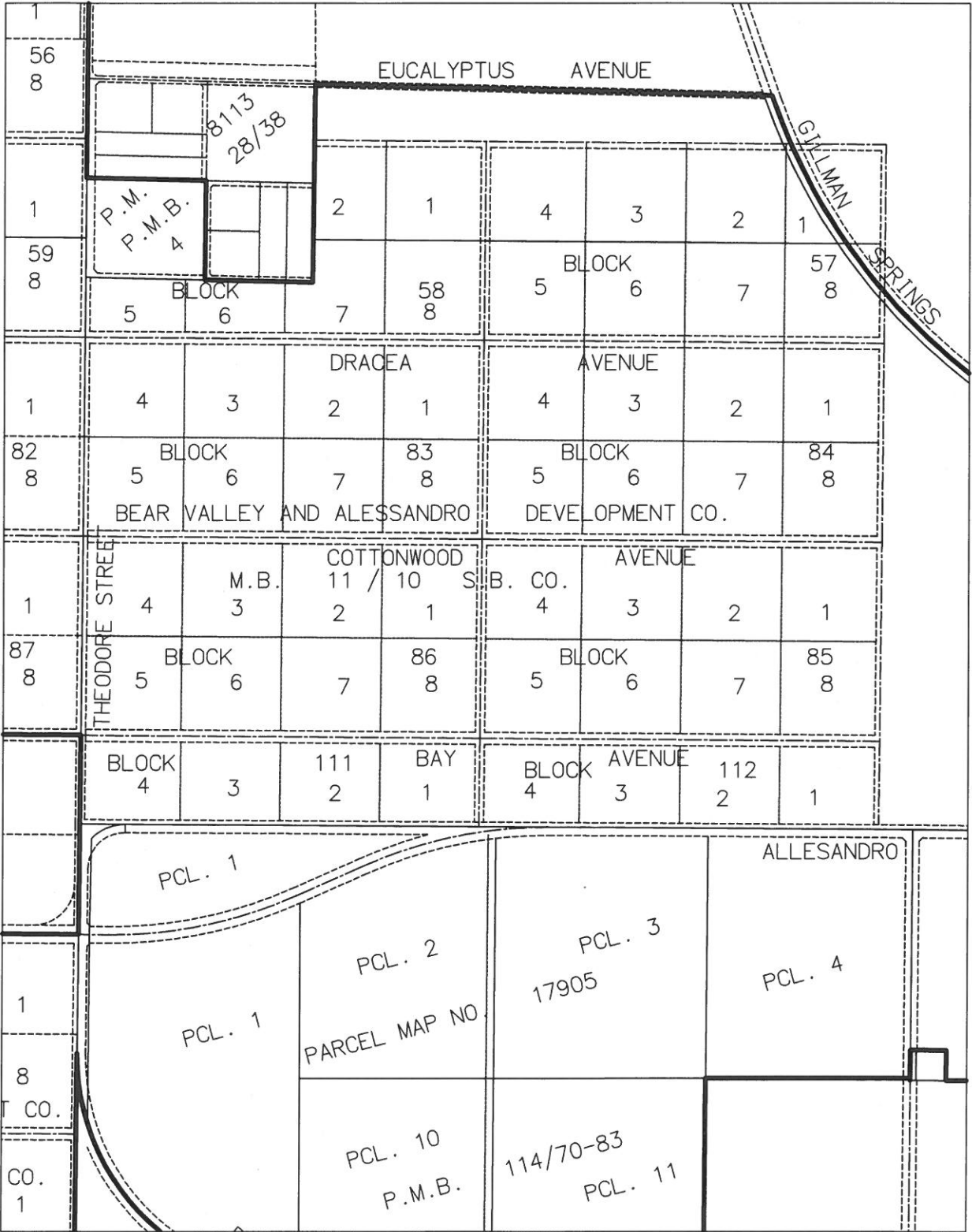
DATE	SCALE	JOB NO.
MAY 27, 2015	1" = 1000'	10-105750

EXHIBIT "A-2"

H:\P01A\10105750\CADD\MAPPING\EXHIBITS\5750EXR039 WORLD LOGISTICS.DWG -DUQUETTE 5/27/15 10:31 am

Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

SEE SHEET 2



SEE SHEET 3

SEE SHEET 5

EXHIBIT "A-2"

SHEET 4 OF 5 SHEETS

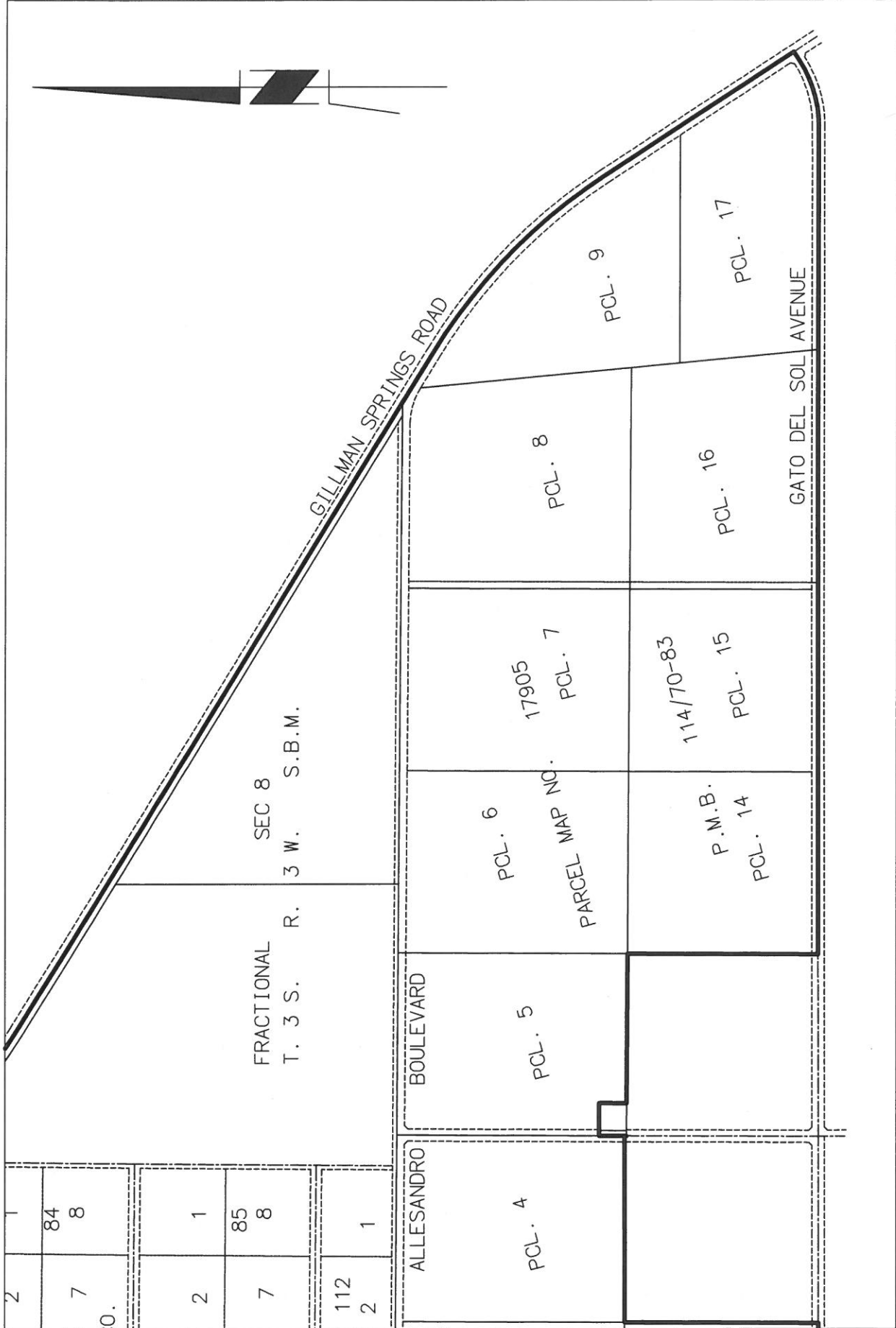
DATE MAY 27, 2015	SCALE 1"=1000'	JOB NO. 10-105750
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Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)



SEE SHEET 3

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SHEET 5 OF 5 SHEETS
 JOB NO. 10-105750
 SCALE 1"=1000'
 DATE MAY 27, 2015

EXHIBIT "A-2"

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Attachment: Planning Commission 2020-22 Resolution for Development Agreement May 14, 2020 (4074 : World Logistics Center)

EXHIBIT NO. A-3

Public Benefits; all are viewed as material consideration for this Agreement, by the City and its Council (not listed in priority).

1. Representation and Warranty in support of HF's legal or equitable interest in the land composing the area subject to this Agreement. (Recital E and 3.2)
2. DIF fees, public improvements, or both will be paid to the City to further public improvements. (1.5, 4.8, 4.9)
3. City has oversight over transfer of land or buildings within the area covered by the Agreement. (3.4)
4. HF pays for special staff and consultants. (3.6)
5. Education/Library/Job training/funding to City/Job opportunities. (4.11, 4.12)
6. Fire station: "turn key" fire station will be built on HF provided land and will be fully funded and equipped by HF. (4.8)
7. Land owners are bound, contractually, to provide City benefits beyond those available via a nexus condition.
8. City advances its General Plan's goals, policies and objectives as anticipated when it was adopted.
9. City controls when HF has qualified to release itself, in whole or part, from the Development Agreement. (3.4, 3.5)
10. City preserves its right to impose the enhanced development standards on the Project outlined in the specific plan. (4.2)
11. City has set performance criteria for the Terms of the Agreement. (3.5, 4.4)
12. City preserves the right to update standards and, as required and lawful, require further CEQA reviews. (4.7.1)
13. City Code Standards are imposed for any reimbursements to HF for oversizing any infrastructure. (4.8)
14. City required and is able to hold HF accountable for a local hiring program for City residents. (4.11)
15. City obtains Education, Library, Training, and Innovation funding for residents in the amount up to \$6,993,000, during the Term of the Development Agreement, with One Million Dollars (\$1,000,000) of that being provided in a single lump sum payment upon issuance of the first building permit.

16. HF will contribute \$500,000 toward the City's development of SR 60 landscape, signage, bridge design enhancement. (4.13)
17. City will annually review and enforce its benefits, and ensure performance of its duties. (Article 5)
18. Defaults and issues in dispute have a specified resolution process. (Article 6)
19. City is covered by HF funded liability insurance (9.1) and from tort claims. (Article 10)
20. City is protected as to ensuring HF performance, despite external causation. (11.9)



Report to City Council

TO: Mayor and City Council

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: PUBLIC HEARING TO ADOPT THE FISCAL YEAR 2019/2020 CARES ACT AMENDMENT AND CITIZEN PARTICIPATION PLAN AMENDMENT AND AWARD CONSULTING CONTRACT TO WILLDAN FINANCIAL FOR CARES ACT GRANT ADMINISTRATION

RECOMMENDED ACTION

Recommendations: That the City Council:

1. Conduct a Public Hearing to allow public comment on the proposed CARES Act Amendment to the 2019-2020 Annual Action Plan and proposed amendment to the Citizen Participation Plan reflecting CARES Act waivers.
2. Review and adopt the proposed CARES Act Amendment to the 2019-2020 Annual Action Plan
3. Review and adopt the FY 2019-2020 Citizen's Participation Plan (as Amended for the CARES Act).
4. Authorize a budget amendment as set forth in the fiscal impact section and authorize the Chief Financial Officer to allocate grant funds between HUD-approved grant activities.
5. Award consulting agreement to Willdan Financial for CARES ACT Grant Administration Services.

SUMMARY

The City of Moreno Valley received an allocation of \$1,197,491 in Federal Community Development Block Grants Coronavirus (CDBG-CV) funding, and \$630,838 in Emergency Solutions Grants Program Coronavirus (ESG-CV) funding by the U.S.

Department of Housing and Urban Development (HUD) under the Coronavirus Aid, Relief, and Economic Security Act (CARES Act).

The primary objective of CDBG-CV funds is to prevent, prepare for, and respond to the coronavirus pandemic (COVID19) affecting the low to moderate-income residents. ESG-CV funds are to be used to prevent, prepare for, and respond to the coronavirus pandemic (COVID19) among individuals and families who are homeless or receiving homeless assistance and to support additional homeless assistance and homelessness prevention activities to mitigate the impacts of COVID-19. The activities recommended for funding under CDBG-CV and ESG-CV are summarized in Attachment 1.

Furthermore, HUD has granted certain waivers with regard to public noticing and the public comment period normally required in a recipient agency’s Citizen Participation Plan for Substantial Amendments in order to accelerate the implementation of selected eligible activities for the CDBG-CV and ESG-CV funds and to quickly respond to the growing spread and effects of COVID-19. The City has notified HUD of its election of two of the waivers reducing the public noticing and public comment period for the CARES Act Amendment from the official 30 days to a minimum of 5 days in advance of the public hearing.

This report recommends that the City Council conduct a Public Hearing to update the 2019-2020 Annual Action Plan to include the activities recommended for funding under the CDBG-CV and ESG-CV funding by the CARES Act.

In addition, this report recommends the approval to award a Consulting Agreement to Willdan Financial Services to provide grant administration services to promptly and effectively utilize this grant funding.

DISCUSSION

As a recipient of federal grant funding, the City of Moreno Valley completes a five-year Consolidated Plan and an Annual Action Plan Update that details the use of the grant funds issued to the City by HUD. Under the City’s Citizen Participation Plan, it is required that in cases where there are substantial changes to an approved Plan that City notify its citizens of the proposed amendment(s) and provide them the opportunity to comment by holding a Public Hearing, then submitting the Council-approved ‘Substantial Amendment(s)’ to HUD for final approval. Tonight’s Public Hearing provides the opportunity for public comment and outlines the proposed Substantial Amendment to the 2019/2020 Action Plan to include the CARES Act funding as recommended in Attachment 1.

The following is the CARES Act Amendment and amended Citizen Participation Plan Schedule:

Date	Event
------	-------

Thursday, April 30, 2020	Notice of Funding Availability (NOFA) available. APPLICATIONS AVAILABLE ON CITY WEBSITE.
Friday, May 29, 2020	Applications due from applicants.
Thursday, June 11, 2020	Commencement CARES Act Amendment and Amended Citizen's Participation Plan public comment/review period.
Tuesday, June 16, 2020	Close of CARES Act Amendment and Amended Citizen's Participation Plan public comment/review period.
Tuesday, June 16, 2020	Public Hearing: Approve CARES Act Amendment and Amended Citizen's Participation Plan.
Thursday, June 18, 2020	Submission of 2019/2020 CARES Act Amendment to HUD

The purpose of the CDBG-CV and ESG-CV funds is to supplement the existing operational budgets of nonprofit organizations and government agencies responding to the critical needs of the community by providing services to prevent, prepare for, and respond to increased demand for services for these populations. It is expected that these funds will be utilized quickly, within one (1) to six (6) months after award.

The City received an allocation of CDBG-CV funds to be used for activities/programs that prevent, prepare for and/or respond to COVID-19 among the residents and businesses in the City. Activities must meet one of the HUD National Objectives (i.e. benefit to low and moderate-income persons; a documented health or safety condition or particular urgency) and be eligible under 24 CFR Part 570.

CDBG-CV Funding and Limitations

Fiscal Year 2019/2020 Allocation	Amount
Planning and Administration Cap (20% of annual grant)	\$ 239,498.20
Available for Other Activities	957,992.80
TOTAL Approved Allocation *	\$1,197,491.00

** Approved allocations provided by HUD on April 2, 2020.*

The City received an allocation for ESG-CV funds to be used to help protect the homeless and reduce the spread of COVID -19 by safely getting individuals into shelter and providing immediate housing options. ESG-CV funds will also support additional homeless assistance and homelessness prevention activities to mitigate the impacts of COVID-19.

ESG-CV Funding and Limitations

Fiscal Year 2019/2020 Allocation	Amount
Planning and Administration Cap (10% of annual grant)	\$ 63,083.80
Available for Other Activities	567,754.20
TOTAL Approved Allocation *	\$630,838.00

** Approved allocations provided by HUD on April 2, 2020.*

The City staff collaborated with Willdan Financial Services (“Willdan”) and used an expedited evaluation process for the 2019/2020 CDBG-CV and ESG-CV applications appropriate for the current urgency and public health crisis resulting from the COVID19 pandemic. All applications were considered for the following:

- Impact of the coronavirus pandemic upon the applicant and the response to the critical needs of the community by providing services to prevent, prepare for, and respond to increased demand for services.
- Impact of the coronavirus pandemic upon the applicant’s initial operating budget and subsequent adjustments.
- The number of persons served, and the level of service provided, since the January 21, 2020, COVID19 "impact date" providing similar services being applied for.
- The proposed uses of the funds.
- The ability of the applicant to readily utilize and expend the funds.

In line with the City’s policies, objectives, and the Citizen’s Participation Plan as amended for the CARES Act, the final project selections and recommended CARES Act funding outlined in Attachment 1 were determined based on the CARES Act eligibility of the activity and the applicant’s ability to perform under the required City and HUD criteria.

This Staff Report requests that City Council approve the proposed CARES Act Amendment and the fund the recommended activities as outlined in Attachment 1.

In addition, staff is requesting approval to enter into a consulting agreement with Willdan Financial Services for the administration of the CARES Act Grants. Willdan Financial Services has been providing Grant Support Services for the City’s HUD funded grants since 2017. Additionally, Willdan has been providing grant administration support as it relates to the anticipated CARES Act Grants including the funding recommendation process. Willdan has assisted with the Substantial Amendment Process, preparation of required reports, notifications, technical assistance and review of applications for federal compliance.

Willdan proposes to assist with the Program Administration of the CDBG-CV and ESG-CV grants including drafting sub-recipient agreements, preparation of environmental review reports, IDIS set up, ongoing review of sub-recipient invoices and technical

support, HUD technical assistance and reporting to City staff on grant administration milestones. Willdan will also perform final close out of activities in IDIS and fulfill HUD requirements for oversight including monitoring visits to determine compliance with federal regulations.

The proposed agreement will be for an amount not to exceed \$75,000.00. The fee reflects the tasks and hours necessary to complete the CDBG-CV and ESG-CV administration through December 31, 2021. The City will be invoiced monthly based on the number of service hours provided. The cost of this agreement will be paid for using grant administration funding available.

ALTERNATIVES

Alternative 1. Conduct the Public Hearing, adopt CARES Act Amendment, affecting CDBG & ESG, to the FY 2019-2020 Annual Action Plan and the Citizen's Participation Plan amendment; authorize the Chief Financial Officer to allocate grant funds between HUD-approved grant activities; and award consulting agreement to Willdan Financial for CARES ACT Grant Administration Services. *Staff recommends this action because it complies with HUD's substantial amendment requirements, would allow the City to meet the commitment goals established for the CDBG-CV and ESG-CV Programs.*

Alternative 2: Decline to adopt the CARES Act Amendment, affecting CDBG & ESG to the 2019-2020 Annual Action Plan and the Citizen's Participation Plan amendment; do not authorize the Chief Financial Officer to allocate grant funds between HUD-approved grant activities; and do not approve a Consulting Services Agreement with Willdan Financial for CARES Act Grant Administration Services. *Staff DOES NOT recommend this action because it does not comply with HUD's substantial amendment requirements, would not allow for the City to meet its upcoming commitment goals established for the CDBG-CV and ESG-CV Programs.*

FISCAL IMPACT

The allocation of the CDBG-CV and ESG-CV funds have been made available through HUD under the CARES Act. The allocation of the CARES Act funds will not impact any projects, as previously approved by the City Council. **This amendment would have no impact on the General Fund.**

The following allocation of grant funds is proposed:

Description	Fund	GL Account No.	Type (Rev/Exp)	FY 19/20 Budget	Proposed Adjustments	FY 19/20 Amended Budget
Grant Revenue	CDBG-CV	Fund 2512	Rev	\$ 0	\$1,197,491	\$1,197,491
Grant Revenue	ESG-CV	Fund 2514	Rev	\$ 0	\$630,838	\$630,838
Administration/ Programs	CDBG-CV	Fund 2512	Exp.	\$ 0	\$1,197,491	\$1,197,491
Administration/ Programs	ESG-CV	Fund 2514	Exp.	\$ 0	\$630,838	\$630,838

NOTIFICATION

Notice of this meeting was published in the Press-Enterprise newspaper on June 11, 2020. As part of HUD's issued waivers of standard regulations for CARES Act funds, the official 30-day public review period was reduced to a minimum of 5 days. The 5-day public review period occurred from June 11, 2020 to June 16, 2020. Respondents were given the opportunity to provide comments via email, telephone, and in person. Staff would like to note that at the time of submission of this report there were no comments received from the public either in support or opposing these projects.

PREPARATION OF STAFF REPORT

Prepared By:
Dena Heald
Deputy Finance Director

Department Head Approval:
Marshall Eyerman
Assistant City Manager/
Chief Financial Officer

CITY COUNCIL GOALS

Public Safety. Provide a safe and secure environment for people and property in the community, control the number and severity of fire and hazardous material incidents, and provide protection for citizens who live, work and visit the City of Moreno Valley.

Public Facilities and Capital Projects. Ensure that needed public facilities, roadway improvements, and other infrastructure improvements are constructed and maintained.

Positive Environment. Create a positive environment for the development of Moreno Valley's future.

CITY COUNCIL STRATEGIC PRIORITIES

1. Economic Development
2. Public Safety
3. Library
4. Infrastructure
5. Beautification, Community Engagement, and Quality of Life
6. Youth Programs

ATTACHMENTS

1. CARES Act Application Review and Funding Recommendations
2. Press Enterprise Notice - CARES Act Amendment
3. FY 2019-20 Citizen Participation Plan - CARES Amended
4. Willdan Financial Grant Administration for CARES Act - Proposal

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/11/20 3:55 PM
City Attorney Approval	<u>✓ Approved</u>	6/11/20 11:59 AM
City Manager Approval	<u>✓ Approved</u>	6/11/20 6:18 PM



City of Moreno Valley

**COMMUNITY DEVELOPMENT BLOCK GRANT CORONAVIRUS FUNI
(CDBG-CV)**

EMERGENCY SOLUTIONS GRANT CORONAVIRUS FUNDS (ESG-C

FISCAL YEAR 2019/20

**CARES ACT APPLICATION REVIEW
AND
FUNDING RECOMMENDATION**

**Public Hearing
June 16, 2020**

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Attachment: CARES Act Application Review and Funding Recommendations [Revision 2] (4064 : PUBLIC HEARING TO ADOPT THE CARES

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I. OVERVIEW

The Coronavirus Aid, Relief, and Economic Security Act (CARES Act), Public Law 116-136, was signed by President Trump on March 27, 2020 and made available \$5 billion in U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant Coronavirus (CDBG-CV) funds and \$1 billion in Emergency Solutions Grants Program Coronavirus funds (ESG-CV) to prevent, prepare for, and respond to the coronavirus (COVID-19). Of this amount, HUD is immediately allocating \$2 billion of CDBG-CV funds and \$1 billion in ESG-CV funds based on the fiscal year 2020 entitlement formula. The remaining \$3 billion shall be allocated based on needs using best available data. HUD is developing a new formula for a second allocation that must be distributed with 90-days of the CARES Act.

The City received an allocation of ESG-CV funds in the amount of \$630,838 to be used to prevent, prepare for, and respond to the coronavirus pandemic among individuals and families who are homeless or receiving homeless assistance. The funds will also support additional homeless assistance and homelessness prevention activities to mitigate the impacts of COVID-19. The City also received an allocation of CDBG-CV funds in the amount of \$1,197,491 to be used to prevent, prepare for, and respond to the coronavirus among the residents and businesses in the City. This allocation was authorized in response to the growing effects of this historic public health crisis.

Two important changes were also made by the CARES Act including the elimination of the 15% limit on Public Service activities for CBDG-CV funds and elimination of the 100% match for ESG-CV funds.

Descriptions of each formula block program (ESG-CV and CDBG-CV) can be found in Sections II and III of this report.

The following subsections provide an overview of the Five-Year Consolidated Plan, the FY 2019/20 Citizen Participation Plan Amended for CARES ACT, The CARES Act Amendment to the FY 2019/20 Annual Action Plan and the FY 2019/20 CARES Act Application Process and Review.

The Five-Year Consolidated Plan

Every five years, the City of Moreno Valley prepares a Five-Year Consolidated Plan, which describes community needs, resources, priorities, and proposed activities to be undertaken under certain HUD programs, including, HOME, ESG and CDBG.

The proposed Consolidated Plan for Program Years 2018/19 through 2022/23, outline the following goals and strategies:

- Substandard Housing Strategy
- Homelessness Strategy
- Public Services Program Strategy

- Public Facilities and Improvements Strategy
- Housing Discrimination Strategy

- Economic Development Strategy
- Planning and Administration Development Strategy

FY 2019/20 Citizen Participation Plan Amended for the CARES Act

The City has developed a Citizen Participation Plan as a part of the Five-Year Consolidated Plan that sets forth the policies and procedures to encourage citizen's participation in the HOME, ESG and CDBG Program planning and implementation processes. This Citizen Participation Plan provides the method and process by which the City will encourage citizen participation in the development of its Consolidated Plan, Annual Action plans and substantial amendments to such plans.

In response to Coronavirus, HUD has granted certain waivers with regard to advance public noticing and the public comment period normally required in a recipient agency's Citizen Participation Plan for CARES Act related substantial amendments in order to accelerate the implementation of selected eligible activities for the CDBG-CV and ESG-CV funds and to quickly respond to the growing spread and effects of COVID-19. The City has notified HUD of its election of two CARES Act waivers reducing public noticing of the public hearing and public comment period for any CARES Act amendments to the FY 2019/20 Annual Action Plan from the official 30 days to no less than 5 days in advance of the public hearing as allowed by the HUD waivers.

A copy of the FY 2019/20 City's Citizen Participation Plan as amended for the CARES Act is available for inspection at the Financial & Management Services Department during normal business hours or on the City website under Grants Monitoring and Administration.

The CARES Act Amendment to the FY 2019/20 Annual Action Plan

The City is proposing a CARES Act related substantial amendment to the FY 2019/20 Annual Action Plan (CARES Act Amendment). The CARES Act Amendment will outline the selected ESG-CV and CDBG-CV expected funding and programs selected to accomplish the CARES Act related goals for FY 2019-20 as shown in Sections II and III, respectively, of this Funding Recommendation report shown below.

On June 16, 2020, the City of Moreno Valley will hold a public hearing to adopt the CARES Act Amendment and the Citizen Participation Plan as amended for the CARES Act. A copy of the proposed CARES Act Amendment and amended Citizen Participation Plan are available for inspection at the Financial & Management Services Department during normal business hours or on the City website under Grants Monitoring and Administration.

Fiscal Year 2019/20 CARES Act Amendment Objectives and Policies

The ESG-CV and CDBG-CV funds are intended to be used for costs necessary to prevent, prepare for, and respond to the coronavirus pandemic, it is expected that these funds will be utilized quickly, within one (1) to six (6) months after award. The City's Objectives for the ESG-CV and CDBG-CV programs are summarized below.

ELIGIBLE ESG-CV ACTIVITIES

To be eligible for ESG-CV funds, the proposed activity must comply with U.S. Department of Housing and Urban Development (HUD) regulations and be an eligible component under Part 24 CFR 576 Subpart B (Street Outreach, Emergency Shelter, Rapid Re-Housing, and Homeless Prevention).

HUD Approved Flexibilities for ESG-CV Funding.

- There is no “cap” on emergency shelter and outreach activities;
- There is no “matching” funds requirement;
- Income limits for “at risk for homelessness” has been increased to 50% - very low income.
- Funds can be used to provide temporary shelters through leasing of existing property, temporary structures, or other means to prevent, prepare for, and respond to coronavirus impacts; and
- No ESG-CV funds may be used to require persons experiencing homelessness to receive treatment or perform other prerequisite activities as a condition of receiving shelter, housing, or other services; and
- HUD has provided additional waivers to other ESG regulations.

Specific to the COVID-19 outbreak, applications must be for activities/programs that prevent, prepare for and/or respond to COVID-19. The following are considered by HUD to be among eligible expenses of ESG-CV funds:

- Engage homeless individuals and families living on the street;
- Improve the number and quality of emergency shelters for homeless individuals and families;
- Shelter operations;
- Provide essential services to shelter residents;
- Rapidly re-house homeless individuals and families utilizing housing first approach; and
- Prevent families and individuals from becoming homeless.
- Grant funds may be used toward the costs of participating in the existing Homeless Management Information System (HMIS) of the County of Riverside’s Continuum of Care. Staff time for HMIS data entry shall be eligible and allocable as a direct cost budgeted under the associated eligible category (i.e.: Rapid Rehousing, Homelessness Prevention, Street Outreach, and Emergency Shelter). These costs are to be budgeted and accounted for as such to avoid duplication in costs.

ELIGIBLE CDBG-CV ACTIVITIES

To be eligible for CDBG-CV funds the proposed activity must comply with U.S. Department of Housing and Urban Development (HUD) regulations by meeting one of the following National Objectives:

1. Benefit to Low and moderate-income Persons
2. Documented Health or Safety Condition or Particular Urgency

In addition, the activity must be considered eligible under Part24 CFR 570.

Specific to the COVID-19 outbreak, applications must be for activities/programs that prevent, prepare for and/or respond to COVID-19. The following are considered by HUD to be among eligible expenses of CDBG-CV funds:

Buildings and Improvements, Including Public Facilities

- Construction of a facility for testing, diagnosis or treatment.
- Rehabilitation of a community facility to establish an infectious disease treatment clinic.
- Acquisition/rehabilitation/construction of a group living facility designed to centralize patients undergoing treatment.
- Rehabilitation of a commercial building or closed school building to establish an infectious disease treatment clinic.
- Acquire and quickly rehabilitate (if necessary) a motel or hotel to expand capacity of hospitals to accommodate isolation of patients during recovery.
- Make interim improvements to private properties to enable an individual patient to remain quarantined on a temporary basis.

Assistance to Businesses, including Special Economic Development Assistance

- Provide grants or loans to support new businesses or expand existing businesses to create jobs and manufacture medical supplies necessary to respond to infectious diseases.
- Provide short-term working capital assistance to small businesses to enable job retention held by low-/moderate-income persons.
- Provide technical assistance, grants, loans, and other financial assistance to establish, stabilize and expand microenterprises that provide medical, food delivery, cleaning, and other services to support home health and quarantine.

Provision of New or Quantifiably Increased Public Services

- Carry out job training to expand the pool of health care workers and technicians that are available to treat disease.
- Provide testing, diagnosis or other services at a fixed or mobile location.
- Increase the capacity of targeted health services for infectious disease response within existing health facilities.
- Provide equipment, supplies and materials necessary to carry out a public service.
- Deliver meals on wheels to quarantined individuals or individuals that need to maintain social distancing due to medical vulnerabilities.

FY2019/20 CARES Act Application Process and Review

On April 30, 2020 the City published Notice of Funding Availability (NOFA) for Fiscal Year 2019/20 Application for Funding for ESG-CV and CDBG-CV. According to the application guidelines, interested parties were informed to submit their completed applications by May 29, 2020, 5:00 pm. Programs and projects seeking funding from the City of Moreno Valley must be used for costs necessary to prevent, prepare for, and respond to the coronavirus pandemic, in addition to meeting all other conditions as summarized in the application booklet. A copy of the application booklet which provides additional information on the City's objectives and policies can be found on the City's website.

The City received eighteen (18) applications, one of which was withdrawn, requesting a total \$2,139,043.80,. This report does not include information from any applications that were deemed ineligible or were withdrawn.

As part of the application process in preparation of the CARES Act Amendment, the City has contracted Willdan Financial Services ("Willdan") to collaborate with City Staff and Officials, as the Technical Review Committee for the ESG-CV and CDBG-CV application proposals.

The City's used an expedited evaluation for the 2019/2020 ESG-CV and CDBG-CV applications appropriate for the current urgency and public health crisis resulting from the COVID19 pandemic. All applications were considered for the following:

- Impact of the coronavirus pandemic upon the applicant and the response to the critical needs of the community by providing services to prevent, prepare for, and respond to increased demand for services.
- Impact of the coronavirus pandemic upon the applicant's initial operating budget and subsequent adjustments.
- The number of persons served, and the level of service provided, since the January 21, 2020, COVID19 "impact date" providing similar services being applied for.
- The proposed uses of the funds.
- The ability of the applicant to readily utilize and expend the funds.

In line with the City's policies and objectives and the Citizen's Participation Plan as amended for the CARES Act, the final project selections and recommended CARES Act funding will be made by the City Council via Public Hearing on June 16, 2020. The CARES Act Amendment to the FY 2019/20 is scheduled to be submitted to HUD on June 18, 2020.

The following subsequent sections of this report contain the current proposed project selections for Fiscal Year 2019/2020.

II. Emergency Solutions Grants Program Coronavirus (ESG-CV) - \$630,838.00

Grant Purpose

The City received an allocation of ESG-CV funds to be used to prevent, prepare for, and respond to the coronavirus pandemic (COVID-19) among individuals and families who are homeless or receiving homeless assistance. The funds will also support additional homeless assistance and homelessness prevention activities to mitigate the impacts of COVID-19.

The primary intent of the ESG-CV funds is to supplement the existing operational budgets of nonprofit organizations and government agencies responding to the critical needs of the community by providing services to prevent, prepare for, and respond to increased demand for services as a result of the Coronavirus pandemic. The funds will also help protect the homeless and reduce the spread of COVID-19 by safely getting individuals into shelter and providing immediate housing options.

Funding

Estimated Fiscal Year 2019/2020 Allocation	ESG-CV
Planning and Administration Cap (10% of annual grant)	\$63,083.80
Available for Other Activities	567,754.20
TOTAL Approved Allocation *	\$630,838.00

* Approved allocations provided by HUD on April 2, 2020.

Applications

By the May 29, 2020 application deadline, the City received five (5) ESG-CV applications with funding requests totaling \$449,291.00, \$118,463.20 less than the estimated Available for Other Activities.

Recommendations

The applications were evaluated and ESG-CV Funding Recommendations were determined based on the CARES Act eligibility of the activity and the applicant's ability to perform under the required City and HUD criteria.

City of Moreno Valley
Fiscal Year 2019/20
 Application Review
 Emergency Solutions Grant Coronavirus (ESG-CV)

App. No.	Applicant	Program	CARES Priority	Funding Requested FY 19-20	Funding Recommended FY 19-20
1	Remnant of Life Worship Center, Inc.	Van purchase for food distribution/meals on wheels	Public Service - Food Program	\$47,495	\$47,495
2	The Hole in Wall, Inc.	Community Homeless Solution	Homeless/Homeless Prevention Activities	\$31,243	\$0
3	The Salvation Army	Rapid Rehousing/Homeless Prevention/Street Outreach	Homeless/Homeless Prevention Activities	\$216,000	\$216,000
4	United States Veterans Initiative	Rapid Rehousing/Homeless Prevention/Street Outreach	Homeless/Homeless Prevention Activities	\$129,553	\$129,553
5	Build Up Lives Foundation	BULF Safe Ways	Homeless/Homeless Prevention Activities	WITHDRAWN	\$0
6	Lutheran Social Services of Southern California	Homeless Prevention	Homeless/Homeless Prevention Activities	\$25,000	\$25,000
n/a	City of Moreno Valley	Program Administration - 10%		\$63,083	\$63,083
Totals				\$512,374	\$481,131

Attachment: CARES Act Application Review and Funding Recommendations [Revision 2] (4064 : PUBLIC

III. Community Development Block Grants Program Coronavirus (CDBG-CV) - \$1,197,491.00

Grant Purpose

The City received an allocation of CDBG-CV funds to be used to prevent, prepare for, and respond to the coronavirus among the residents and businesses in the City. This allocation was authorized in response to the growing effects of this historic public health crisis.

Funding

Estimated Fiscal Year 2019/2020 Allocation	CDBG-CV
Planning and Administration Cap (20% of annual grant)	\$239,498.20
Available for Other Activities	957,992.80
TOTAL Approved Allocation *	\$1,197,491.00

* Approved allocations provided by HUD on April 2, 2020.

CDBG-CV Activities Allocation and Elimination of Public Service 15% Cap.

CARES Act eliminated the 15% limit on Public Service activities for CBDG-CV funds.

The City's CARES priority ranking is prioritizing the unique needs of our community's low- and moderate-income persons and those most vulnerable such as elderly and homeless.

Priority 1: Providing new and quantifiable increased Public Services, including providing equipment, supplies and materials necessary. Basic Needs related social services programs such as but not limited to emergency food, shelter (homelessness), health services.

Priority 2: Employment services/programs and Job (Skills) Training

Priority 3: Assistance businesses, including special economic development assistance to local small business providing employment to low- and moderate-income residents

Priority 4: CDBG-CV Administration of the funded programs including but not limited to: Activity oversight; Processing of amendments; IDIS management; Implementation of the Citizen Participation plan for needs assessment and project selection; Preparation of the additional CARES act amendments; Preparation of the year-end CAPER report; Program specific reporting; On-site monitoring of subrecipients.

Applications

By the May 29, 2020 application deadline, there were a total of twelve (12) CDBG-CV applications with funding requests totaling \$1,569,752.80, exceeding the estimated Available for Other Activities by \$611,760.00.

Recommendations

Th applications were evaluated and CDBG-CV Funding Recommendations were determined based on the CARES Act eligibility of the activity and the applicant's ability to perform under the required City and HUD criteria.

DRAFT

City of Moreno Valley
Fiscal Year 2019/20
 Application Review
 Community Development Block Grants Program Coronavirus (CDBG-CV)
Public Service

App. No.	Applicant	Program	CARES Priority	Funding Requested FY 19-20	Funding Recommended FY 19-20
(1) Public Service - Basic Needs					
7	Remnant of Life Worship Center, Inc.	Food distribution to homeless/seniors	Basic Needs (Health Services)	\$107,055	\$0
9	Assistance League of Riverside	Operation School Bell	Basic Needs (Health Services)	\$10,000	\$0
13	City of Moreno Valley	Moval Meals	Basic Needs (Health Services)	\$584,069	\$375,288
14	The Hole In Wall, Inc.	Community Homeless Solution	Basic Needs (Health Services)	\$50,000	\$0
15	Community Now	Mental Wellness Video Series	Basic Needs (Health Services)	\$5,900	\$0
16	Family Service Association	Senior Nutrition Program	Basic Needs (Health Services)	\$32,000	\$32,000
17	Build Up Lives Foundation	Save Lives (COVID-19 testing sites)	Basic Needs (Health Services)	\$179,332	\$0
18	Salvation Amry	Food Pantry	Basic Needs (Health Services)	\$20,000	\$0
(2) Public Service - Employment Services/Programs and Job (Skills) Training					
8	City of Moreno Valley	Expand Public Wifi Network	Employment Services/Programs and Job (Skills) Training	\$30,000	\$30,000
11	City of Moreno Valley - Economic Development Dept.	STRIVE MoVal	Employment Services/Programs and Job (Skills) Training	\$120,705	\$120,705
12	Rising Stars Business Academy	Job Training Program	Employment Services/Programs and Job (Skills) Training	\$30,692	\$0
(3) Assistance to Businesses, including Special Economic Development Assistance					
10	City of Moreno Valley	Small Business Grants	Assistance to Businesses, including Special Economic Development Assistance	\$400,000	\$400,000
(4) Project Administration					
n/a	City of Moreno Valley	Project Administration - 20%		\$239,498	\$239,498
Total				\$1,809,251	\$1,197,491

IV. Fiscal Year 2019/20 CARES Act Applicants Program Descriptions

Applicant's Program Descriptions for each application, as submitted by the applicants, can be found in the subsequent pages.

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City of Moreno Valley
 Fiscal Year 2019/20
 Emergency Solutions Grant (ESG-CV)
 Applicant Program Description

Application Number: 1
 Funding: ESG-CV

Applicant: Remnant of Life Worship Center, Inc.
Program: Food distribution/meals on wheels

FY 19/20 Recommended Funding: \$47,495

Requested Funding Amount: **\$47,495**
 MV # Person/Unit Served: 21,420
 Funding per MV Person/Unit Served: \$2.22/person

ESG Component	Budget
Street Outreach	\$47,495
Total	\$47,495

Program Description:

The program would purchase and distribute non-prepared food as "Grocery Bags" through their "Grab and Go" program, but also delivery services, bringing food/cleaning supplies/hygiene bags to the needy and seniors in need or dealing with health/medical issues.

Application Number: 2
 Funding: ESG-CV

Applicant: The Hole in Wall, Inc.
Program: Community Homeless Solution

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$31,243**
 MV # Person/Unit Served: 52
 Funding per MV Person/Unit Served: \$600.83/person

ESG Component	Budget
Street Outreach	\$10,560
Rapid Rehousing	\$7,003
Homelessness Prevention	\$5,280
Emergency Shelter	\$3,360
HMIS	\$5,040
Total	\$31,243

Program Description:

The goal of the program is to reduce the rate of homelessness in the City of Moreno Valley, by providing basic needs, case management and supportive services in order to facilitate the achievement of self-sufficiency.

City of Moreno Valley
 Fiscal Year 2019/20
 Emergency Solutions Grant (ESG-CV)
 Applicant Program Description

Application Number: 3
 Funding: ESG-CV

Applicant: The Salvation Army
Program: Rapid Rehousing/Homeless Prevention

FY 19/20 Recommended Funding: \$216,000

Requested Funding Amount: **\$216,000**
 MV # Person/Unit Served: 35 households
 Funding per MV Person/Unit Served: \$6,171.43/household

ESG Component	Budget
Street Outreach	
Rapid Rehousing	\$120,000
Homelessness Prevention	\$96,000
Emergency Shelter	
Total	\$216,000

Program Description:

This program is an expansion of existing homelessness prevention activities provided by the Salvation Army. The goal of the program is to assist households maintain stable housing and prevent increased homelessness. An additional caseworker would be hired.

Application Number: 4
 Funding: ESG-CV

Applicant: United States Veterans Initiative (U.S. Vets)
Program: U.S. Vets – ESG-CV

FY 19/20 Recommended Funding: \$129,553

Requested Funding Amount: **\$129,553**
 MV # Person/Unit Served: 36 households
 Funding per MV Person/Unit Served: \$3,598.69/household

ESG Component	Budget
Street Outreach	\$49,836
HMIS	\$11,000
Homelessness Prevention	\$47,300
Emergency Shelter	\$21,417
Total	\$129,553

Program Description:

The project would help veterans transition from homelessness, and at-risk of homelessness, to self-sufficiency and stability while focusing on preventing and responding to the impact of COVID-19. Through Homeless Prevention, the goal is to immediately provide stabilization services, short-term rental assistance to veterans, provide essential services and equipment, such as PPE, masks, gloves, hand sanitizer, soap and places to get clean, to homeless individuals and their families. Through the Emergency Beds program the goal is to provide 18 additional beds and essential services for homeless veterans.

City of Moreno Valley
 Fiscal Year 2019/20
 Community Development Block Grant Coronavirus (CDBG-CV)
 Applicant Program Description

Application Number: 5
 Funding: ESG-CV

Applicant: Build Up Lives Foundation
Program: BULF Safe Ways

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$120,000 - withdrawn**
 MV # Person/Unit Served: 37,000
 Funding per MV Person/Unit Served: \$3.24/person

ESG Component	Budget
Street Outreach	\$30,000
HMIS	\$5,000
Homelessness Prevention	\$35,000
Emergency Shelter	\$50,000
Total	\$120,000

Program Description:

Build Up Lives Foundation proposes to open a 8pm-8am shelter for women who are experiencing domestic violence or homelessness. Domestic violence cases have been on the rise due to COVID-19. The project needs to hire employees and to purchase equipment to open the shelter.

Application Number: 6
 Funding: ESG-CV

Applicant: Lutheran Social Services of Southern California (“LSSSC”)
Program: Homeless Prevention

FY 19/20 Recommended Funding: \$25,000

Requested Funding Amount: **\$25,000**
 MV # Person/Unit Served: 15 households
 Funding per MV Person/Unit Served: \$1,667/household

ESG Component	Budget
Street Outreach	
Homelessness Prevention	\$25,000
Emergency Shelter	
Total	\$25,000

Program Description:

LSSSC will use CV-ESG funds to provide fifteen (15) households at imminent of losing their home due to economic challenges related to COVID-19, with short-term financial assistance to cover their rent/lease/mortgage. LSSSC will offer some level of case management and supportive services with a tailored action plan to ensure that these households maintain self-sufficiency after services are completed. Some supportive services will be landlord-client mediation to prevent evictions, linkage to resources, life skills training, and financial education.

City of Moreno Valley
Fiscal Year 2019/20
Community Development Block Grant Coronavirus (CDBG-CV)
Applicant Program Description

Application Number: 7
Funding: CDBG-CV

Applicant: Remnant of Life Worship Center, Inc.
Program: Food distribution to homeless/seniors

Funding Type: Public Service
CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$107,055**
MV # Person/Unit Served: 30,000
Funding per MV Person/Unit Served: \$3.57/person

Program Description:
The program would purchase and distribute non-prepared food as "Grocery Bags" through their "Grab and Go" program, but also delivery services, bringing food/cleaning supplies/hygiene bags to the needy and seniors in need or dealing with health/medical issues.

Application Number: 8
Funding: CDBG-CV

Applicant: City of Moreno Valley
Program: Expand Public Wifi Network

Funding Type: Public Service
CARES Priority: Employment Services/Programs and Job (Skills) Training

FY 19/20 Recommended Funding: \$30,000

Requested Funding Amount: **\$30,000**
MV # Person/Unit Served: 7,890
Funding per MV Person/Unit Served: \$3.80/person

Program Description:
The goal of the project is to offer free, public Wi-Fi to residents so they can participate in basic societal services. Particularly, in response to COVID-19 unemployment and closed schools, the City seeks to respond to the situation by enabling residents to search and apply for jobs, and to participate in school online teaching programs. This grant will enable the Wi-Fi service at the Community and Recreation Center's Community Garden area, at the Cottonwood Golf Center banquet and meeting rooms, and the Senior Center.

Application Number: 9

City of Moreno Valley
Fiscal Year 2019/20
Community Development Block Grant Coronavirus (CDBG-CV)
Applicant Program Description

Funding: CDBG-CV

Applicant: Assistance League of Riverside
Program: Operation School Bell

Funding Type: Public Service
CARE Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$10,000**
MV # Person/Unit Served: 330
Funding per MV Person/Unit Served: \$3.30/person

Program Description:

The purpose of Operation School Bell (OSB) is to provide economically disadvantaged and homeless children with appropriate clothing and personal hygiene items necessary to attend school with pride and dignity.

Application Number: 10
Funding: CDBG-CV

Applicant: City of Moreno Valley
Program: Small Business Grants

Funding Type: Public Service
CARES Priority: Assistance to Businesses, including Special Economic Development

FY 19/20 Recommended Funding: \$400,000

Requested Funding Amount: **\$400,000**
MV # Person/Unit Served: 45
Funding per MV Person/Unit Served: \$8,888.89/business

Program Description:

The Program provides a one-time grant of \$7,500 to eligible Moreno Valley businesses which were negatively impacted by the economic shutdown resulting from the COVID-19 pandemic either through loss of sales, lost or reduced workforce or temporary closure.

Application Number: 11

City of Moreno Valley
 Fiscal Year 2019/20
 Community Development Block Grant Coronavirus (CDBG-CV)
 Applicant Program Description

Funding: CDBG-CV

Applicant: City of Moreno Valley - Economic Development Dept.
Program: STRIVE MoVal

Funding Type: Public Service
 CARES Priority: Employment Services/Programs and Job (Skills) Training

FY 19/20 Recommended Funding: \$120,705

Requested Funding Amount: **\$120,705**
 MV # Person/Unit Served: 1,593
 Funding per MV Person/Unit Served: \$75.77/person

Program Description:

Assisting residents qualified as low- to moderate-income (LMI), the program utilizes the Moreno Valley ERC as a physical location to provide access to computers and internet not otherwise available with new desktop tools (e.g. training and job search shortcuts, resume writing templates).

Application Number: 12
 Funding: CDBG-CV

Applicant: Rising Stars Business Academy
Program: Job Training Program

Funding Type: Public Service
 CARES Priority: Employment Services/Programs and Job (Skills) Training

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$30,692**
 MV # Person/Unit Served: 60
 Funding per MV Person/Unit Served: \$511.53/person

Program Description:

The project will develop new partnerships with local businesses that will commit to hiring their students who will be readily equipped to work. The new partnerships will include jobs in IT pathways, customer service jobs, administrative work and logistics, in response to COVID19. The youth will complete a 12-week course, then will be placed into a 40-hour internship to apply their skills to hands on work. The team will work to identify job placements that respond to service needs caused by COVID19.

Application Number: 13

City of Moreno Valley
Fiscal Year 2019/20
Community Development Block Grant Coronavirus (CDBG-CV)
Applicant Program Description

Funding: CDBG-CV

Applicant: City of Moreno Valley
Program: MoVal Meals

Funding Type: Public Service
CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$375,288

Requested Funding Amount: **\$584,069**
MV # Person/Unit Served: 2,165
Funding per MV Person/Unit Served: \$173.34/person

Program Description:

The goal of the program is to have 500 care packages available to the most critical segment of Moreno Valley's population each week. These care packages will help in supplementing the resident's daily food and grocery supplies. The program is scheduled to terminate on June 30, 2020. The need and project success will have fed over 2,165 eligible participants and kept part-time staff employed during the COVID-19 pandemic.

Application Number: 14
Funding: CDBG-CV

Applicant: The Hole in Wall, Inc.
Program: Community Homeless Solution

Funding Type: Public Service
CARES Priority: Basic Needs (Health Service)
Public Service Priority: n/a

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$50,000**
MV # Person/Unit Served: 51
Funding per MV Person/Unit Served: \$980.39/person

Program Description:

The goal of the program is to reduce the rate of homelessness in the City of Moreno Valley, bu providing basic needs, case management and supportive services in order to facilitate the achievement of self-sufficiency.

Application Number: 15

City of Moreno Valley
 Fiscal Year 2019/20
 Community Development Block Grant Coronavirus (CDBG-CV)
 Applicant Program Description

Funding: CDBG-CV

Applicant: Community Now
Program: Mental Wellness during COVID-19 Video Series

Funding Type: Public Services
 CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$5,900**
 MV # Person/Unit Served: 350
 Funding per MV Person/Unit Served: \$16.86/person

Program Description:

This series of (20) online videos will serve the residents of Moreno Valley and the Inland Empire with a virtual way of using social media outlets to receive education and information on topics related to staying mentally well, not only during this COVID-19 pandemic which resulted in Stay-at-Home orders but also into the future. The broadcasts with mental health providers and other professionals will share verified up-to-date information on the laws in the area, start the discussion about mental health and teach the strategies and coping skills we all need to maintain wellness during such stressful and fearful times.

Application Number: 16
 Funding: CDBG-CV

Applicant: Family Service Association
Program: Senior Nutrition Program

Funding Type: Public Service
 CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$32,000

Requested Funding Amount: **\$32,000**
 MV # Person/Unit Served: 425
 Funding per MV Person/Unit Served: \$75.29/person

Program Description:

Family Service Association (FSA) is providing a curbside pickup of prepared meals for seniors at the City of Moreno Valley Senior Center. This new model of operation was implemented in response to COVID-19 and the County's Stay at Home Order.

Application Number: 17

City of Moreno Valley
Fiscal Year 2019/20
Community Development Block Grant Coronavirus (CDBG-CV)
Applicant Program Description

Funding: CDBG-CV

Applicant: Build Up Lives Foundation
Program: Save Lives (COVID-19 testing sites)

Funding Type: Public Services
CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$179,332**
MV # Person/Unit Served: 80,000
Funding per MV Person/Unit Served: \$2.24/person

Program Description:
The program would establish a COVID-19 testing facility in Moreno Valley.

Application Number: 18
Funding: CDBG-CV

Applicant: The Salvation Army
Program: Food Pantry

Funding Type: Public Services
CARES Priority: Basic Needs (Health Services)

FY 19/20 Recommended Funding: \$0

Requested Funding Amount: **\$20,000**
MV # Person/Unit Served: 34,000
Funding per MV Person/Unit Served: \$0.59/person

Program Description:
Through our social service program we offer a food pantry to help individuals and their families in need. The pantry is open 12:00pm – 3:00pm Monday, Tuesday, Wednesday and Friday. Clients can access the pantry once every 30 days. Since the start of the pandemic we have increased our hours and allowed clients to receive food twice a month. The requested funding will make it possible to continue the increased hours of operation. We have seen an increase in need and 70% of clients coming are first time clients seeking help as a direct result of the pandemic.



**NOTICE OF PUBLIC COMMENT PERIOD AND
PUBLIC HEARING FOR
CARES ACT AMENDMENTS TO
FISCAL YEAR 2019-2020 ANNUAL ACTION PLAN
AND
FISCAL YEAR 2019-2020 CITIZENS PARTICIPATION PLAN**

The Coronavirus Aid, Relief, and Economic Security Act (CARES Act), Public Law 116-136, was signed by President Trump on March 27, 2020 and made available \$5 billion in U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant Coronavirus (CDBG-CV) funds and \$1 billion in Emergency Solutions Grants Program Coronavirus funds (ESG-CV) to prevent, prepare for, and respond to the coronavirus (COVID-19). Of this amount, HUD is immediately allocating \$2 billion of CDBG-CV funds and \$1 billion in ESG-CV funds based on the fiscal year 2020 entitlement formula.

The City of Moreno Valley received an allocation of \$1,197,491 in Federal Community Development Block Grants Coronavirus (CDBG-CV) funding and \$630,838 in Emergency Solutions Grants Program Coronavirus (ESG-CV) funding by the U.S. Department of Housing and Urban Development (HUD) under the Coronavirus Aid, Relief, and Economic Security Act (CARES Act).

The primary objective of CDBG-CV funds is to prevent, prepare for, and respond to the coronavirus pandemic (COVID19) affecting the low to moderate-income residents. ESG-CV funds are to be used to prevent, prepare for, and respond to the coronavirus pandemic (COVID19) among individuals and families who are homeless or receiving homeless assistance and to support additional homeless assistance and homelessness prevention activities to mitigate the impacts of COVID-19.

On April 30, 2020 the City published Notice of Funding Availability (NOFA) for Fiscal Year 2019-2020 Application for Funding for CDBG-CV and ESG-CV. According to the application guidelines, interested parties were informed to submit their completed applications by May 29, 2020, 5:00 pm. 18 applications were received and considered by the City.

The City is proposing CARES Act amendments to the 2019-2020 Annual Action Plan and 2019-2020 Citizen Participation Plan. The amendments are available for public review and comment for 5 days from June 11, 2020 through June 16, 2020. To view the amendment in its entirety, please visit the City's website at www.moval.org and click on Departments/Financial & Management Services and under the Grants & Programs option click on the Grants Monitoring and Administration link and choose the Grant Reports tab.

About the proposed FY 2019-2020 CARES Act Amendments:

As a recipient of federal grant funding the City of Moreno Valley completes a five-year Consolidated Plan and an Annual Action Plan that details the use of the grant funds. Substantial changes to the current 2018-2023 Consolidated Plan and FY 2019-2020 Annual Action Plan require cities to notify citizens of the proposed amendments, while also providing them the opportunity to comment on the changes.

The following changes summarizes the proposed 'CARES Act Amendment':

- **FY 2019-2020 Annual Action Plan (AAP)**: Proposes CARES Act Amendment to the AAP providing recommended funding for CDBG-CV and ESG-CV eligible activities. The draft of the CARES Act Amendment is available on the City website.
- **FY 2019-2020 Citizen Participation Plan (CPP)**: Proposes an amendment to the CPP reflecting HUD CARES Act waivers reducing public noticing and comment periods to a minimum of 5-days for the CARES Act amendment. The draft Citizen Participation Plan (as Amended by the CARES Act) is available on the City website.

The proposed amendments will be available for public review from June 11, 2020 through June 16, 2020. The City Council will hold a Public Hearing to receive comments and adopt the proposed amendments on **Tuesday, June 16, 2020 at 6:00 p.m.** at the following location:

VIA TELECONFERENCE ONLY

Go to: <http://morenovalleyca.ig2.com/default.aspx> for instructions

Citizens of the City of Moreno Valley and the general public are encouraged to attend via teleconference. Any questions or concerns regarding teleconferencing may be emailed to zoom@moval.org. All persons interested in this matter may appear and be heard at the hearing. Persons of low- and moderate-incomes, disabled, homeless, elderly and members of minority group are particularly encouraged to attend. If unable to attend, comments may be provided by contacting the Financial Operations Division at (951) 413-3450 or e-mailing grantsadmin@moval.org.

Upon request, this invitation public notice will be made available in appropriate alternative formats to persons with disabilities, in compliance with the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in these activities should direct such requests to Guy Pegan, ADA Coordinator, at (951) 413-3120 at least 72 hours before the activity. The 72-hour notification will enable the City to make reasonable arrangements to ensure accessibility and participation in this meeting or event.

Date Published: June 11, 2020



FISCAL YEAR 2019/20
CITIZEN PARTICIPATION PLAN
(as Amended for CARES ACT)

City of Moreno Valley
Financial & Management Services Dept.
Financial Operations Division
14177 Frederick St. PO Box 88005
Moreno Valley, CA 92552-0805

FISCAL YEAR 2019/20 CITIZEN PARTICIPATION
AS AMENDED FOR CARES ACT

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
HOME INVESTMENT PARTNERSHIPS (HOME) PROGRAM
EMERGENCY SOLUTIONS GRANTS (ESG) PROGRAM

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Attachment: FY 2019-20 Citizen Participation Plan - CARES Amended (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT AMENDMENT

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

**CITY OF MORENO VALLEY
 CONSOLIDATED PLAN 2018-2023**

CITIZEN PARTICIPATION PLAN

INTRODUCTION

The City of Moreno Valley is required by law to have a detailed Citizen Participation Plan which contains the City's policies and procedures for public involvement in the Consolidated Plan process and the use of CDBG and HOME funds. The Moreno Valley Citizen Participation Plan was developed pursuant to the U.S. Department of Housing and Urban Development (HUD), Consolidated Submission for Community Planning and Development Programs, as required under 24CFR Part 91 and Part 8. The Citizen Participation Plan provides the method and process by which the City of Moreno Valley will encourage citizen participation in the development of its Consolidated Plan. Through this plan, citizens will be afforded the opportunity to provide input regarding housing and community development needs, issues and problems affecting low and moderate-income persons, the development of strategies, project selections and funding distributions.

CARES Act provisions responding to COVID-19 pandemic

The *Coronavirus Aid, Relief, and Economic Security Act* (CARES Act), Public Law 116-136, was signed by President Trump on March 27, 2020 and made available \$5 billion in U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant Coronavirus (CDBG-CV) funds and \$1 billion in Emergency Solutions Grants Program Coronavirus funds (ESG-CV) to prevent, prepare for, and respond to the coronavirus (COVID-19). Of this amount, HUD is immediately allocating \$2 billion of CDBG-CV funds and \$1 billion in ESG-CV funds based on the fiscal year 2020 entitlement formula.

In addition, HUD has granted certain waivers with regard to public noticing and the public comment period normally required in a recipient agency's Citizen Participation Plan for Substantial Amendments in order to accelerate the implementation of selected eligible activities for the CDBG-CV and ESG-CV funds and to quickly respond to the growing spread and effects of COVID-19. The City has notified HUD of its election of two of the waivers as further explained below under **D. Amendments to the Annual Action Plan**.

Encouraging Public Participation

The law requires that the City's Citizen Participation Plan both provide for and encourage public participation, emphasizing involvement by low and moderate-income people, especially those living in low and moderate-income neighborhoods (see page

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

15, CDBG Target Area Map). Also, HUD expects the City to take whatever actions are appropriate to encourage the participation of minorities, people who do not speak English, and people with disabilities.

The City also maintains a distribution list of persons, agencies, and organizations that have expressed interest in the City's CDBG, HOME, and ESG programs. Notifications of events, such as the Community Needs Assessment meetings, are mailed directly to those on the distribution list to encourage public participation.

The Role of Low Income People

The law declares that the primary purpose of the programs covered by this Citizen Participation Plan is to improve communities by providing: decent housing, a suitable living environment, and growing economic opportunities – all for principally low and moderate-income people.

The City of Moreno Valley will provide the Riverside County Public Housing Authority with a copy of all Public Notices that are published during the Consolidated Plan process. The City encourages input from residents of public housing developments and via the Public Housing Authority; residents are notified of Community Needs Meetings as well as Public Hearings.

Because the amount of federal CDBG, HOME, and ESG money the City receives each year is mostly based upon the severity of both poverty and substandard housing conditions in the City, it is necessary that public participation genuinely involve low-income residents who experience these conditions. Genuine involvement by low-income people must take place at all stages of the process, including:

- Identifying needs
- Setting priorities among these needs, deciding how much money should be allocated to each high-priority need and suggesting the types of programs to meet high-priority needs
- Overseeing the way in which programs are carried out

The Various Stages of the Consolidated Plan Process

The policies and procedures in this Citizen Participation Plan relate to several stages of action mentioned in law or regulation. In general, these stages or events include:

1. Identification of community and housing needs (via a Public Hearing(s))
2. Preparation of a draft use of funds for the upcoming year, called the Proposed Annual Action Plan (Public Hearing required)
3. Formal approval by the City Council of the Final Annual Action Plan (via a Public Hearing)

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

4. In the case where it is necessary to change the use of money already budgeted in an Action Plan or change priorities, a Substantial Amendment will be proposed (completed via Public Hearing)
5. After the program year is complete, a Consolidated Annual Performance and Evaluation Report (CAPER) is drafted for public review and comment and then submitted to HUD.

The Program Year

The program year for Moreno Valley coincides with the City’s fiscal year running from July 1st through June 30th.

PUBLIC NOTICES

Items Covered by the Public Notice Requirement

Advance public notice is provided once a federally required document is available for public review and comment, such as the Annual Action Plan or Consolidated Plan. In addition, advance public notice of all Public Hearings and public meetings is provided at least two weeks in advance.

Public Notice Schedule

Advance notice of all available documents, Public Hearings and public meetings is provided at least two weeks in advance. The notices will give residents a clear understanding of the event being announced. The following is a general timeline of when public notices are published:

<i>October</i>	Notice of Community Needs Meetings/Public Hearings
<i>October</i>	Notice of Public Hearing to Identify Community Needs
<i>December</i>	Notice of Funding Availability and Application Process
<i>March</i>	Notice of Public Hearing to Discuss Proposed Action Plan
<i>March</i>	Notice of Action Plan Availability for Public Review
<i>March</i>	Notice of Public Hearing to Adopt Final Action Plan
<i>As Needed</i>	Notice of Availability of Amendment to Consolidated/Action Plan
<i>As Needed</i>	Notice of Public Hearing to Amend Consolidated/Action Plan

Forms of Public Notice

Public notices are published in the Press-Enterprise Newspaper as display advertisements in the non-legal section of the local edition. A copy of the public notice will be sent to any person or organization requesting to be on the mailing list.

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

PUBLIC ACCESS TO INFORMATION

As required by law, the City will provide the public with reasonable and timely access to information and records relating to the data or content of the Consolidated Plan, as well as the proposed, actual and past use of funds covered by the Citizen Participation Plan. Regarding the past use of funds, the law requires reasonable public access to records about any uses of these funds during the previous five years.

Also, the City will provide the public with reasonable and timely access to local meetings relating to the proposed or actual use of funds.

Standard Documents

Standard documents include:

- The proposed and final Annual Action Plans
- The proposed and final Five-Year Consolidated Plan (CONPLAN)
- Proposed and final Substantial Amendments to either an Annual Action Plan or the Five-Year Consolidated Plan
- Consolidated Annual Performance and Evaluation (CAPER) Report
- Citizen Participation Plan

Availability of Standard Documents

All documents are available for immediate public review at City Hall in the Financial & Management Services Department. Copies of standard documents that are not currently posted for public review will be provided to the public within five working days of the request at no cost. Copies of draft documents such as the Action Plan and CAPER are available at several locations for public review. These locations are: The Library, the Community Senior Center, City Hall, and the Conference and Recreation Center, along with the City's public website. Documents remain at each of the designated locations for the entire required review time that is specified in the applicable public notice. All final documents are available for public review at City Hall during normal business hours.

PUBLIC HEARINGS

Public Hearings are required by law in order to obtain the public's views and to provide the public with the City's responses to public questions and proposals. The law requires a minimum of two public meetings at two different stages of the process. The City will conduct two Public Hearings and additional Public Meetings at the following stages of the process: Identifying Needs, Proposed Annual Action Plan (Project Selection), and the Final Annual Action Plan adoption. Public Hearings are also conducted for amendments to the Annual Action Plan as needed.

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

Access to Public Hearings

Public Hearings will be held only after there has been adequate notice as described in the “Public Notice” part of this Citizen Participation Plan, including a display advertisement in the non-legal section of the newspaper at least two weeks prior to the Public Hearing. Public Hearings are conducted during the regularly scheduled City Council meetings.

Public Hearings and Populations with Unique Needs

All Public Hearings will be held at locations accessible to people with disabilities and provisions will be made for people with disabilities when requests are made within at least five working days prior to a hearing. Translators will be provided for people who do not speak English when requests are made at least five working days prior to a hearing.

Conduct of Public Hearings

To ensure that Public Hearings are meaningful to residents, each Public Hearing will be conducted in the presence of the City Council. Each resident choosing to speak will be allowed a maximum of three minutes to make a verbal presentation.

The following is a general timeline of when public hearings are conducted during the process:

November	Public Hearing to Identify Community Needs
April	Public Meeting to Discuss Proposed Annual Action Plan
May	Public Hearing to Adopt Final Annual Action Plan
As needed	Public Hearing to Amend Consolidated/Action Plan

STAGES IN THE PROCESS

A. IDENTIFYING NEEDS

Because the housing and community development needs of low and moderate-income people are so great and so diverse, priorities must be set to decide which needs should get more attention and more resources than other needs. This is the basic reason the Consolidated Plan exists.

A Public Hearing is required to obtain resident’s opinions about needs and what priority those needs have. In order to encourage public involvement, a Public Hearing is conducted to allow residents to express comments regarding the needs of the City’s low and moderate-income populations. The Public Hearing about community needs will be completed at least 15 days before a draft Annual Action Plan is published for comment,

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

so that the needs identified can be considered by the City and addressed in the draft Annual Action Plan.

B. THE PROPOSED ANNUAL ACTION PLAN (AND/OR FIVE-YEAR CONPLAN)

The law providing the funds covered by the Citizen Participation Plan calls for improved accountability of jurisdictions to the public. In that spirit, and in compliance with the terms of the law, the City will use the following procedures:

At the beginning of this stage, the City will provide the public with an estimate of the amount of CDBG, HOME, and ESG funds it expects to receive in the upcoming year, along with a description of the range of types of activities that can be funded with these resources. Also, the public will be given an estimate of the amount of these funds that will be used in ways that will benefit low and moderate-income people.

Displacement and Relocation

The City does not have any plans to displace or relocate any residents from their homes using CDBG, HOME, or ESG funds. If a project necessitated displacement or relocation, it would be done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), which requires preparation of an “anti-displacement plan.” The anti-displacement plan would describe how the City would compensate people who are displaced as a result of the use of the funds, specifying the type and amount of compensation.

Technical Assistance

City Staff will work with organizations and individual’s representative of low-and moderate-income people who are interested in submitting a proposal to obtain funding for an activity. All potential applicants for funding are encouraged to contact City staff for technical assistance before completing a proposal form.

Availability of a Proposed Annual Action Plan

Within 3 weeks after the Public Hearing about the Proposed Annual Action Plan, the City will make the Proposed Annual Action Plan available to the public. In addition, copies will be available at the locations specified above in the section, “Public Access to Information.” A public notice will be published at least two weeks prior to the document’s availability. The term “notice” described earlier in the section on “Public Notice” will be used.

Also, the date the Proposed Annual Action Plan is available to the public will be at least 30 days prior to the date a Final Annual Action Plan is approved by the City Council so that low and moderate-income people will have a reasonable opportunity to examine it and to submit comments.

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

Public Hearing and Further Action

A Public Hearing about the Proposed Annual Action Plan will be conducted by the City Council within 30 days before it is available to the public. In addition, this Public Hearing will be held so that there are at least another 30 days before the Final Annual Action Plan is approved by the City Council so that the elected officials can consider the public's comments from the Public Hearing.

In preparing a Final Annual Action Plan, careful consideration will be given to all comments and views expressed by the public, whether given as verbal testimony at the Public Hearing or submitted in writing during the review and comment period. The Final Annual Action Plan will have a section that presents all comments and explains why any comments were not accepted.

C. THE FINAL ANNUAL ACTION PLAN (AND/OR FIVE-YEAR CONPLAN)

Copies of the Final Annual Action Plan will be made available to the public at City Hall for review. Copies can be obtained free of charge and within five business days of the request.

D. AMENDMENTS TO THE ANNUAL ACTION PLAN (AND/OR FIVE-YEAR CONPLAN)

The Final Annual Action Plan will be amended any time there is: a change in one of the Priorities presented on the HUD-required Priority Table, a change in the use of money to an activity not mentioned in the Final Annual Action Plan, or, a change in the purpose, location, or scope of beneficiaries of an activity. The public will be notified whenever there is an amendment.

Substantial Amendments

The following will be considered "substantial" amendments:

1. A change in the use of CDBG, HOME, or ESG money from one activity to another.
2. The elimination of an activity originally described in the Annual Action Plan.
3. The addition of an activity not originally described in the Annual Action Plan.
4. A change in the purpose of an activity, such as a change in the type of activity or its ultimate objective – for example, a change in a construction project from housing to commercial.
5. A meaningful change in the location of an activity.
6. A change in the type or characteristics of people benefiting from the activity. Among the "characteristics" are:
 - a. The HUD-recognized income levels of: 0-30 percent of Area Median Income (AMI); between 31 and 50 percent AMI; and between 51 to 80 percent AMI

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

- b. Race or ethnicity
 - c. Renter or homeowner
 - d. Single households, small households (two to four persons), large households (five or more persons)
7. A 20% decrease in the number of low and moderate-income people benefiting from an activity.
 8. A change in the scope of an activity, such that there is a 20% increase or decrease in the amount of money allocated to the activity.

Public Notice and Public Hearing for Substantial Amendments

There must be reasonable notice of a proposed Substantial Amendment so that residents will have an opportunity to review it and comment on it. Notice will be made according to the procedures described earlier in this Citizen Participation Plan, with the addition of the following procedures specifically for Substantial Amendments:

1. There will be advanced notice of the availability of a proposed Substantial Amendment 30 days before there is a Public Hearing.
2. A detailed written description of the proposed Substantial Amendment will be made available to the public. Also, copies will be available at the locations indicated earlier in this Citizen Participation Plan under "Public Access to Information."
3. There will be a Public Hearing regarding the proposed Substantial Amendment conducted by the City Council. This Public Hearing will not take place until the public has had 30 days to review the proposed Substantial Amendment.
4. The Public Hearing will be held no sooner than two weeks prior to submission to HUD.
5. In preparing the Final Substantial Amendment, careful consideration will be given to all comments and views expressed by the public, whether given as verbal testimony at the Public Hearing or submitted in writing during the review and comment period. The Final Substantial Amendment will have a section that presents all comments and explains why any comments were not accepted.
- 6.

Public Notice and Public Hearing for Substantial Amendment-CARES Act

The City has notified the LA HUD office of its election of eligible CARES Act waivers to Citizen Participation public noticing and comment period to accelerate the implementation of selected eligible activities for the CDBG-CV and ESG-CV funds and to quickly respond to the growing spread and effects of COVID-19.

Notice of Public Hearing and public comment period for any FY 2019/20 Substantial Amendment for the CARES Act funds (CARES Act Amendment) will be at least five days in advance as allowed by HUD waivers. The notices will give residents a clear

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

understanding of the event being announced. The following are the dates of public notices for :

<i>April 30, 2020</i>	Notice of Funding Availability-CARES Act Funds
<i>June 11, 2020</i>	Notice of Public Hearing to Adopt CARES Act Amendment

There must be reasonable notice of a proposed CARES Act Amendment so that residents will have an opportunity to review it and comment on it. Notice will be made according to the procedures described earlier in this Citizen Participation Plan for SA-CARES Act, with the addition of the following procedures specifically for CARES Act Amendment:

1. There will be advanced notice of the availability of a proposed Substantial Amendment at least 5 days before there is a Public Hearing.
2. A detailed written description of the proposed CARES Act Amendment will be made available to the public. Also, copies will be available at the locations indicated earlier in this Citizen Participation Plan under "Public Access to Information."
3. There will be a Public Hearing regarding the proposed CARES Act Amendment conducted by the City Council. This Public Hearing will not take place until the public has had at least 5 days to review the proposed CARES Act Amendment.
4. The Public Hearing will be held no sooner than two days prior to submission to HUD.
5. If social distancing orders relating to the COVID-19 outbreak are still being enforced, the City will provide video/audio access to the public through video conferencing medium such as Zoom.
6. In preparing the Final Substantial Amendment, careful consideration will be given to all comments and views expressed by the public, whether given as verbal testimony at the Public Hearing or submitted in writing during the review and comment period. The final CARES Act Amendment will have a section that presents all comments and explains why any comments were not accepted.

The Public Hearing for the CARES Act Amendment will be held on the following date:

<i>June 16, 2020</i>	Public Hearing to Adopt CARES Act Amendment and amended Citizen's Participation Plan
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E. CONSOLIDATED ANNUAL PERFORMANCE AND EVALUATION REPORT (CAPER)

Every program year the City must submit to the Department of Housing and Urban Development (HUD) a Consolidated Annual Performance and Evaluation Report (CAPER) within 90 days of the close of the program year. In general, the CAPER must

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

describe how funds were used during the program year and the extent to which these funds were used for activities that benefited low and moderate-income people.

Public Notice for the Consolidated Annual Performance and Evaluation Report (CAPER)

There must be reasonable notice that the Consolidated Annual Performance and Evaluation Report (CAPER) is available so that residents will have an opportunity to review it and comment on it. Notice will be made according to the procedures described earlier in this Citizen Participation Plan, with the addition of the following procedures specifically for the CAPER:

1. The City will publish a notice of CAPER availability two weeks in advance of the public review period.
2. A complete copy of the CAPER will be made available to the public at the locations indicated earlier in the Citizen Participation Plan under "Public Access to Information."
3. The public will have a minimum of 15 days to review and provide comments on the CAPER.
4. In preparing the CAPER for submission to HUD, careful consideration will be given to all comments views expressed by the public. The CAPER sent to HUD will have a section that presents all comments and explains why any comments were not accepted.

Contents of the CAPER

The CAPER provides details on the actions taken by the City and the accomplishments completed during the previous program year. Accomplishments include the number of low and moderate-income persons served and the ethnicity of those individuals. Also provided are expenditures taken during the year and funds spent undertaking each activity.

COMPLAINT PROCEDURES

Comments, suggestions or complaints may be addressed to the Financial & Management Services Department as follows:

City of Moreno Valley
Financial & Management Services Department
Attn: Financial Operations Division
14177 Frederick Street
P.O. Box 88005
Moreno Valley, CA 92552-0805
(951) 413-3450

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

All written complaints from the public will receive a meaningful written response within 15 working days after receipt.

CHANGES TO THE CITIZEN PARTICIPATION PLAN

The Citizen Participation Plan can be changed only after the public has been notified of the intent to modify it, and only after the public has had a reasonable chance to review and comment on proposed substantial changes to it.

FY 2019/20 Annual Action Plan & Citizen Participation Schedule

Date	Event
Tuesday, October 22, 2019	Public Meeting 1: Public Meeting to Review Action Plan Calendar Schedule
Tuesday, November 5, 2019	Public Hearing 1: Public Hearing to Adopt Objectives/Policies & Collect Community Needs Comments
Thursday, December 19, 2019	Notice of Funding Availability (NOFA) Available. APPLICATIONS AVAILABLE FOR DISTRIBUTION.
Thursday, January 9, 2020	In-Person Application Workshop
Friday, January 31, 2020	Applications Due from Applicants
Monday, March 9, 2020	Finance Subcommittee 1:1 Meetings to Review Staff Project Recommendations
Tuesday, March 24, 2020	Public Meeting 2: Open Technical Review Committee Meeting - Applicants are invited to attend and provided with an opportunity to explain programs in person.
Friday, April 3, 2020	Commencement of 30 - Day Action Plan Public Comment/Review Period
Tuesday, April 21, 2020	Public Hearing 2 for Action Plan: Public Hearing to Review Project Recommendations as issued by the Finance Subcommittee
Sunday, May 3, 2020	Close of 30 – Day Action Plan Public Comment/Review Period
Tuesday, May 5, 2020	Public Hearing 3 for Action Plan: Approve Annual Action Plan
Friday, May 15, 2020	Submittal of 2019/20 Action Plan to HUD

Community Development Block Grant (CDBG), Home Investment Partnerships Program (HOME), Emergency Solutions Grants Program (ESG)
FY 2019/20 Citizen Participation Plan-As Amended for CARES Act

FY 2019/20 CARES Act Amendment & Amended Citizen Participation Schedule

Date	Event
Thursday, April 30, 2020	Notice of Funding Availability (NOFA) available. APPLICATIONS AVAILABLE ON CITY WEBSITE.
Friday, May 29, 2020	Applications due from applicants
Thursday, June 11, 2020	Commencement CARES Act Amendment and Amended Citizen's Participation Plan public comment/review period
Tuesday, June 16, 2020	Close of CARES Act Amendment and Amended Citizen's Participation Plan public comment/review period
Tuesday, June 16, 2020	Public Hearing: Approve CARES Act Amendment and Amended Citizen's Participation Plan
Thursday, June 18, 2020	Submittal of 2019/20 CARES Act Amendment to HUD



May 14, 2020

Ms. Dena Heald
 Deputy Finance Director
 City of Moreno Valley
 14177 Fredrick Street
 Moreno Valley, California 92553

Re: Proposal to Provide Administration of CARES Act Funds including Community Development Block Grants – COVID-19 (CDBG-CV) and Emergency Solutions Grants Program– COVID-19 (ESG-CV)

Dear Ms. Heald:

Per your request, Willdan Financial Services (“Willdan”) is pleased to submit the following proposal to the City of Moreno Valley (“City”) to provide Grant Administration Services to promptly and effectively utilize the recent Community Development Block Grants (CDBG-CV) funds of \$1,197,491, and Emergency Solutions Grants Program (ESG-CV) funds of \$630,838. These funds have been preliminarily awarded to the City by the U.S. Department of Housing and Urban Development (HUD) under the *Coronavirus Aid Relief, and Economic Security Act* (CARES Act), to assist in mitigating the impact to the community due to the Coronavirus outbreak. The objective of CDBG-CV and ESG-CV funds is to prepare for and respond to the coronavirus pandemic (COVID-19), and its affect primarily to the low- and moderate-income residents.

HUD has urged agencies receiving federal assistance through the CARES Act to move quickly to initiate qualified programs, and has granted certain waivers to standard regulations to expedite the process. Willdan’s commitment to the City of Moreno Valley is to provide the highest degree of dedication and expertise in order to achieve this goal.

We look forward to the opportunity to extend our relationship with the City to include the requested grant administration services. Should you have any questions, or need additional information, please contact me at (951) 587-3527, or via email at bquaid@willdan.com.

Thank you again for this opportunity to submit our proposal for these critical services.

Sincerely,

WILLDAN FINANCIAL SERVICES

A handwritten signature in blue ink that reads 'Robert D. Quaid'.

Robert D. Quaid
 Principal Consultant

A handwritten signature in blue ink that reads 'Gladys Medina'.

Gladys Medina
 Vice President – Group Manager

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Attachment: Willdan Financial Grant Administration for CARES Act - Proposal (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT

Proposed Consultant Team

Our management and supervision of the project team is very simple: staff every position with experienced, capable personnel in sufficient numbers to deliver a superior product to the City, on time and on budget. With that philosophy in mind, we have selected experienced professionals to provide the services requested. We are confident that our team possesses the depth of experience that will successfully fulfill the desired work performance.

Mr. **Robert “Bob” Quaid**, Principal Consultant, will serve as the Project Manager for this assignment and will be the primary contact person for City staff.

Ms. **Helen Jones** and Ms. **Richelle Tague** will provide **grant subrecipient monitoring and administrative support** and will work closely with Mr. Quaid during the engagement.

Resumes

Resumes for Willdan project team are provided on the following pages. Each resume identifies the team member’s title, responsibility, and prior experience that will be drawn upon in order to effectively and efficiently complete the services desired by the City.

Attachment: Willdan Financial Grant Administration for CARES Act - Proposal (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT

Robert (Bob) Quaid, CPA Project Manager

Education

*Bachelor of Science,
University of Southern
California*

In the position of Principal Consultant at Willdan, Mr. Quaid provides project management, procedural support and quality review for Willdan's District Administration and Financial Services Consulting groups. Mr. Quaid also services as the lead consultant for grant administration, cost of service and cost audits and as interim finance/administrative staff to client agencies.

Areas of Expertise

*Grant Administration
and Monitoring*

With 20 years of experience in the public finance industry, Mr. Quaid has participated in numerous cost service studies and construction cost audits. Mr. Quaid began his career as an auditor in 1976 with the international CPA firm formerly known as Haskins & Sells. He spent 11 years as an accounting and financial manager in the real estate development industry before joining Willdan in 2001.

Cost of Service Studies

BID Administration

Related Project Experience

*Statutory Financial
Reporting*

City of Moreno Valley, CA – Grant Consultant/Manager: As the lead grant consultant to the City, Mr. Quaid reports to the City financial operations manager and supervises a Willdan staff of three individuals supporting the City's annual grant administration, monitoring and reporting activities. These activities include, but are not limited to: reviewing, scoring and preparing Council recommendation reports on the subrecipient applications for the City's annual CDBG, HOME and ESG entitlement awards; conducting pre- and post-award training sessions with subrecipients; reviewing sub-recipient invoices for payment; and entering various information into the HUD Integrated Disbursement of Information System (IDIS). Mr. Quaid also oversees the preparation of the Annual Action Plan and the Consolidated Annual Performance Evaluation Report (CAPER), plans and conducts the annual onsite subrecipient monitoring, and interfaces with regional HUD representatives on technical issues for the City.

*Fiscal Analysis for User
Fees and Rates*

Fund Audits

*Quality Review of
Community Facilities,
Lighting & Landscaping,
and Assessment Districts*

Affiliations

*California Society of
Municipal Finance
Officers*

North City West School Facilities Financing Authority, CA – Administrator: As the administrator for the three member joint powers authority, Mr. Quaid worked closely with the Executive Director and was primarily responsible for supervising the monthly administration, accounting and investment functions including processing of revenues and expenses in accordance with GAAP; coordinating debt service payments with the bond trustee; preparing quarterly Board agendas and financial reports; working with the independent CPA during the annual audit/compliance review; interfacing with the San Diego County Office of Education; filing mandatory/regulatory reports with the City of San Diego and the Securities and Exchange Commission; and communicating with Board members, as needed.

Certifications/Licenses

*Certified Public
Accountant*

20 Years' Experience

Central Basin Municipal Water District, CA – Interim Financial Manager: As the District's Interim Financial Manager, Mr. Quaid's duties included working with the General Manager, department heads and District staff to develop the annual budget; provide an assessment of the finance department's current staffing plan; work with staff in preparation of monthly budget versus actual reports for project managers for budget monitoring; work with staff in preparation of financial information to be included in the monthly Board reports; assist department staff with scheduled check runs and check requests; effectively manage cash flows; ensure compliance with IRS and SEC requirements on tax-exempt bond issues; review the District's Long-Range Financial Plan with the General Manager; assist with the identification of necessary rates to meet District revenue requirements; provide financial market updates; attend regular monthly Board meetings, agenda meetings and department head meetings; and held regular office hours at the District office. Mr. Quaid also represented the District in a Bureau of Reclamation grant audit for the District's recycled water pipeline providing necessary support for indirect costs allocated to the grant.

Attachment: Willdan Financial Grant Administration for CARES Act - Proposal (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT

Richelle Lane

Senior Analyst

Education

*Bachelor of Science in
Business Administration
(Emphasis in
Accounting); California
Baptist University*

Areas of Expertise

Grant-Related Services

*Non-Profit Organization
Accounting*

Database Management

9 Years' Experience

Ms. Richelle Tague provides grant administration support for Willdan's grant engagements. She provides review and evaluation of subrecipient CDBG, HOME and ESG grant applications, invoice review, procedures development, preparation of cash drawdowns and budget progress reports for funded projects.

As a Willdan Senior Analyst, Ms. Tague assists in the research and analysis required to resolve local government financial issues related to district and grant administration, including database management, research of applicable laws and regulations, and report preparation.

Further, Ms. Tague is also involved in auditing services, for which she has worked with a number of cities and developers related to the reimbursement of public facilities. She is also part of the on-call grant services team and is responsible for providing fiscal, reimbursement review, reporting, and budget support to agencies on an as-needed basis.

Ms. Tague came to Willdan with six years of combined finance and accounting experience. Prior to joining Willdan, she worked for the American Red Cross and was responsible for the day-to-day grant fiscal administration for federally funded programs, such as CDBG and various National Emergency Grants (NEG).

Previous services performed by Ms. Tague related to federal grants included:

- Preparation of draw down requests;
- Accounts payable and payroll;
- Monitoring of grant expenditures and project milestones;
- Development of policies and procedures to implement new grants and projects; and
- Analysis and preparation of statistical information used for performance reporting (i.e., number of participants served, income levels, demographics etc.).

Related Project Experience

City of Moreno Valley, CA – Grant Analyst: Ms. Tague serves as one of Willdan's grant analysts providing technical support in evaluation for funding of the City's CDBG, ESG and HOME applications for Fiscal Years 2018 through 2020.

Helen Jones Analyst

Education

*Bachelor of Arts,
Lakehead University,
Thunder Bay, Canada
Cum Laude*

Ms. Helen Jones is a Senior Analyst in Willdan’s District Administration Services group. She assists in the research and analysis necessary to resolve local government financial issues related to auditing and administration.

Certified Fraud Examiner

Areas of Expertise

*Grant Monitoring
Acquisition Audit Services*

Ms. Jones joined Willdan with over a dozen years of financial and auditing experience. She enhances the Willdan team by bringing her expertise in understanding organization objectives and structure, policies, processes, internal controls, and external regulations; identifying risk areas; and preparing programs. In her career, she has served as an auditor, controller and chief financial officer, with real estate development and financial control firms.

Professional Affiliations

*Association of Chartered
Certified Accountants*

As a senior analyst and auditor with an international fraud investigation and dispute resolution firm in the firms’ Cayman office, she specialized in complex offshore asset recovery; fraud investigation and insolvency projects; prepared affidavits in support of Grand Court submissions; traced funds and classes structures of SPhinX Funds with over \$500M in assets; and cross border insolvency complications. She also maintained direct involvement in efforts to recover Fairfield funds’ assets, one of the major victims in the Bernie Madoff Ponzi scheme.

12 Years’ Experience

In the capacity of financial controller of a real estate development and general construction firm, Ms. Jones oversaw all financial matters, including preparing financial statements; payroll, regulatory communications and filings; ensuring adequate cash flow; and reporting to investors. While with the firm, she was the acting chief financial officer for a real estate development/new construction project in Old Town Temecula and oversaw the construction of a \$12M mixed use building with a combined square footage of 37,000 and accommodating restaurants, retail spaces, executive office suites and apartments. Her tasks included, point of contact for all project funding for the lending bank and fund control company; prepared all fund draw requests; ensured compliance with all provisions of the City of Temecula conditions for redevelopment grant of \$4M; vendor relations and payment of sub-contractors; investor reporting; and preparing financial statements and regulatory filings.

Related Project Experience

City of Moreno Valley, CA – Grant Analyst: Ms. Jones serves as one of Willdan’s grant analysts providing technical and compliance reviews of subrecipient invoices under agreement with the City. Ms. Jones also teams with Mr. Quaid in conducting the onsite monitoring of the City’s CDBG, HOME and ESG subrecipients providing technical support in review of contracts, Davis-Bacon prevailing wage compliance, Section 3 compliance and other HUD regulations affecting the program activity. Ms. Jones also assists in the preparation of the monitoring reports to the City.

County of San Diego, CA – Construction Cost Audit Project Analyst: Currently serving as project analyst for the construction cost audit of \$55.4 million in public facilities including streets, bridges, parks, sewer, water and wastewater treatment associated with Community Facilities District No. 2008-1.

Ms. Jones reviews all required documents required for submittal by the home developer, pursuant to the Acquisition and Funding Agreement. She also performs the review of certified payroll for the contractors and subcontractors for prevailing wage compliance, coordinates communications by the Project Manager to the County and the developer and assists in the preparation of the audit reports for the facilities.

Attachment: Willdan Financial Grant Administration for CARES Act - Proposal (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT

Scope of Work

Willdan understands that the City seeks grant program administration support for its 2020 CDBG-CV and ESG-CV funds (collectively the "CARES Act Funds") awarded by HUD to mitigate the effect of the Coronavirus outbreak. Prompt program planning, implementation and administration is essential to the successful performance of the City's CARES Act Funds activities and reporting of accomplishments to HUD.

HUD has issued waivers of standard regulations for CARES Act Funds in order to expedite the implementation of the eligible programs, including reducing the public comment period in the City's Citizen Participation Plan from 30 days to a minimum of 5 days. Willdan assumes that the City will notify HUD of its election of the applicable public comment waivers in May. Willdan will provide technical assistance to the City toward the modifications to the City's Citizen Participation Plan prior to the commencement of the tasks below.

Willdan also understands that the City will be applying the CARES Act Funds to activities in both program years 2019 and 2020. Since the 2019/20 Annual Action Plan has been approved by HUD and the 2020/21 Annual Action Plan was approved by the City Council and submitted to HUD for review in May 2020, Willdan understands that the CARES ACT Funds activities selected will be submitted to HUD through substantial amendments for both the 2019/20 and 2020/21 program years. Our scope and proposed timeline are based on that understanding.

Willdan proposes the following tasks to fully administer the CARES Act Funds.

Funding Recommendation Process

- Assist in drafting public notices to initiate the CDBG-CV/ESG-CV program selection in accordance with City Citizen Participation Plan as amended, such as the Notice of Funding Availability (NOFA) and notice of public hearing.
- Provide technical assistance with regard to eligible activities for the CARES Act Funds.
- Revise application and project selection templates, as needed.
- Review applications and associated documents submitted by applicants.
- Notify applicants regarding incomplete or missing documentation.
- Prepare draft and final application review and funding recommendation report to City Council.
- Prepare draft and final substantial amendments to 2019/20 (SA 2019/20) and 2020/21 (SA 2020/21) Annual Action Plans.
- Attend one (1) public hearing each for SA 2019/20 and SA 2020/21.
- Assist in the preparation of staff reports and presentation materials.
- Submit SA 2019/20 and SA 2020/21 to HUD through IDIS.

Program Administration

- If requested, conduct workshop for selected CDBG-CV/ESG-CV subrecipients to advise on City and HUD requirements relating to CARES Act Funds.
- Assist in the drafting and finalization of CDBG-CV/ESG-CV subrecipient agreements with City. Interface with subrecipients regarding questions or request for technical assistance. Assumption is that the City will award to three (3) CDBG-CV subrecipients for the and two (2) ESG-CV subrecipients.
- Coordinate the preparation of environmental reports for each subrecipient activity.
- Set up programs with executed agreements in IDIS, including CDBG-CV and ESG-CV administration.
- Perform ongoing review of subrecipient invoices requesting reimbursement of program costs, including but not limited to, comparing requested amount with program budget, determining all cost are supported with appropriate documentation linking them to program activity, verifying receipt of all required certifications and performance reports, interfacing with subrecipients on any issues relating to the invoice.
- Provide ongoing technical support to subrecipients and interface with local HUD representative for technical assistance, as needed.
- Provide ongoing reporting to City staff of grant administration milestones.

Program Close Out

- Perform final close out of CDBG-CV/ESG-CV subrecipient programs in IDIS.
- Fulfill HUD requirements for subrecipient oversight by scheduling and notifying subrecipients of onsite monitoring visits to determine compliance with federal regulation and terms and conditions of the agreement.

City Responsibilities

To assist Willdan, the City will provide the following information and/or services:

- Primary contact at City for all grant related deliverables and correspondence.
- Background information related to the historical and current grant operations such as areas of concern, and future plans.
- Access to all relevant CDBG-CV and ESG-CV related files on the City network.
- Access to City’s account in IDIS.

Please note Willdan will rely on the validity and accuracy of the City of Moreno Valley data and documentation to complete this engagement. Willdan will rely on the data as being accurate without performing an independent verification of accuracy, and that we will not be responsible for any errors that result from inaccurate data provided by the City or a third party.

Project Timeline

Based on our scope of services, Willdan proposes the following timeline for the CARES Act Funds administration.

City of Moreno Valley CARES Act Funds Proposed Timeline							
Task	May	Jun	Jul	Aug	Sep	Oct - Jun	Jul - Dec
A. FUNDING RECOMMENDATION PROCESS							
1 Public Notices-NOFA, Public Hearing, etc.	x	x	x				
2 Application review/Program recommendation/AAP substantial amendment(s)		x	x				
3 Public Hearing to approve funding recommendation		x					
4 Submit Substantial Amendment in IDIS			x				
B. PROGRAM ADMINISTRATION							
1 Subrecipient Workshop/Technical Training			x				
2 Environmental Impact Reports			x	x			
3 Subrecipient Agreements				x		x	
4 Setup programs in IDIS					x	x	
5 Review subrecipient Invoices for payment					x	x	x
6 On-going technical assistance	x	x	x	x	x	x	x
C. PROGRAM CLOSE OUT							
1 Close out projects in IDIS						x	x
2 Perform on-site monitoring						x	x

Attachment: Willdan Financial Grant Administration for CARES Act - Proposal (4064 : PUBLIC HEARING TO ADOPT THE CARES ACT

Proposed Fees

Proposed Project Fees

Based upon our proposed scope of work, we propose a **not-to-exceed annual contract price of \$75,000**. The fee reflects the tasks and hours necessary to complete the CDBG-CV administration through December 31, 2021. We will invoice the City monthly based on the number of service hours provided to the project.

City of Moreno Valley CARES Act Funds Administration							
Willdan Staffing Budget by Task (1)	Billing Rate	Hrs Weekly Tasks	Hrs Monthly Tasks	Hrs Single Tasks	Total Hrs	Total \$	%
Bob Quaid, Project Manager	\$ 115						
Planning & Interface the City/HUD		1			50	\$ 5,750	
Staff Supervision & Review		2			100	\$ 11,500	
Draft Staff Reports				4	4	\$ 460	
Technical Assistance to Subrecipients			1		12	\$ 1,380	
Applicant Evaluations & Recommendations				5	5	\$ 575	
Review Subrecipient Agreements				8	8	\$ 863	
Subrecipient Monitoring				40	40	\$ 4,600	
Subtotal					219	\$ 25,128	26%
Richelle Tague, Senior Analyst	\$ 95						
Applicant Evaluations & Recommendations				5	5	\$ 475	
Subrecipient Invoice 2nd Reviews			8		90	\$ 8,550	
Subtotal					95	\$ 9,025	12%
Helen Jones, Analyst	\$ 80						
Planning & Interface the City/HUD		2			100	\$ 8,000	
Draft Notices (NOFA, Public Notices, etc.)				8	8	\$ 640	
Draft Plan Amendment(s)				20	20	\$ 1,600	
Draft Subrecipient Agreements				40	40	\$ 3,200	
Subrecipient Detail Invoice Reviews & Performance Tracking			20		240	\$ 19,200	
IDIS reporting			2		24	\$ 1,920	
Subrecipient Monitoring				80	80	\$ 6,400	
Subtotal					512	\$ 40,960	62%
(1) All tasks assumes 5 total CARES Act programs					Willdan Labor Total	826 \$ 75,113	100%
					Adjustment	\$ (113)	
					Willdan Not-To-Exceed Total	\$ 75,000	

Hourly Rates

The table below outlines Willdan's current hourly rates that will apply for any additional services above and beyond the proposed Scope of Work.

Hourly Rate Schedule		
Position	Team Member	Hourly Rate
Principal Consultant	Robert Quaid	\$ 115
Senior Analyst	Richelle Lane	95
Analyst	Helen Jones	80
Analyst Assistant		75



Report to City Council

TO: Mayor and City Council
 Mayor and City Council Acting in its Capacity as
 President and Members of the Board of Directors of the
 Moreno Valley Community Services District (CSD)

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: PUBLIC HEARING ESTABLISHING APPROPRIATIONS
 ("GANN") LIMIT FOR FISCAL YEAR 2020/21

RECOMMENDED ACTION

Recommendations: That the City Council and CSD:

1. Conduct a Public Hearing to receive public comments on the City of Moreno Valley General Fund appropriations limit for Fiscal Year 2020/21.
2. Adopt Resolution No. 2020-XX, a resolution of the City Council of the City of Moreno Valley, California, establishing the appropriations limit for Fiscal Year 2020/21.
3. Conduct a Public Hearing to receive public comments on the Moreno Valley Community Services District's appropriations limit for Fiscal Year 2020/21.
4. Adopt Resolution No. CSD 2020-XX, a resolution of the Moreno Valley Community Services District establishing the appropriations limit for Fiscal Year 2020/21.

SUMMARY

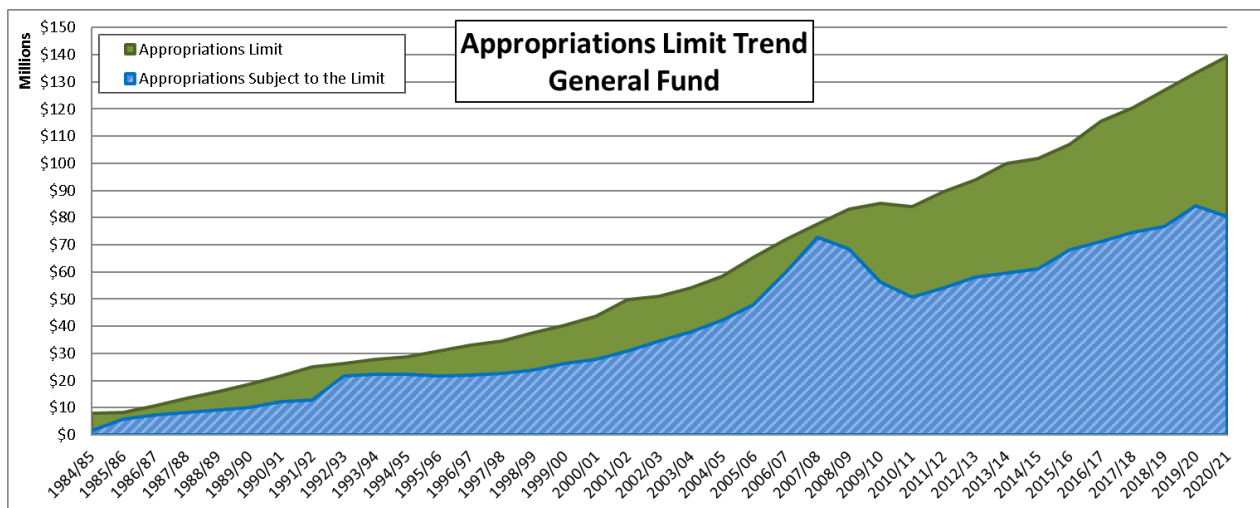
This report recommends that the City Council and the Community Services District Board of Directors conduct public hearings and adopt the resolutions to establish the Gann Appropriations Limits for both the General Fund and the Community Services District (District) for FY 2020/21. The Gann Appropriations Limit, the result of the passage of Proposition 4 in 1979, places limits on the amount of tax proceeds that can be appropriated each year. For FY 2020/21 the limit for the General Fund is

\$139,321,723 and the limit for the District is \$22,450,741. With revenues subject to the limit totaling \$80,536,602 for the General Fund and \$11,473,096 for the District there is still significant capacity to accommodate future revenue growth.

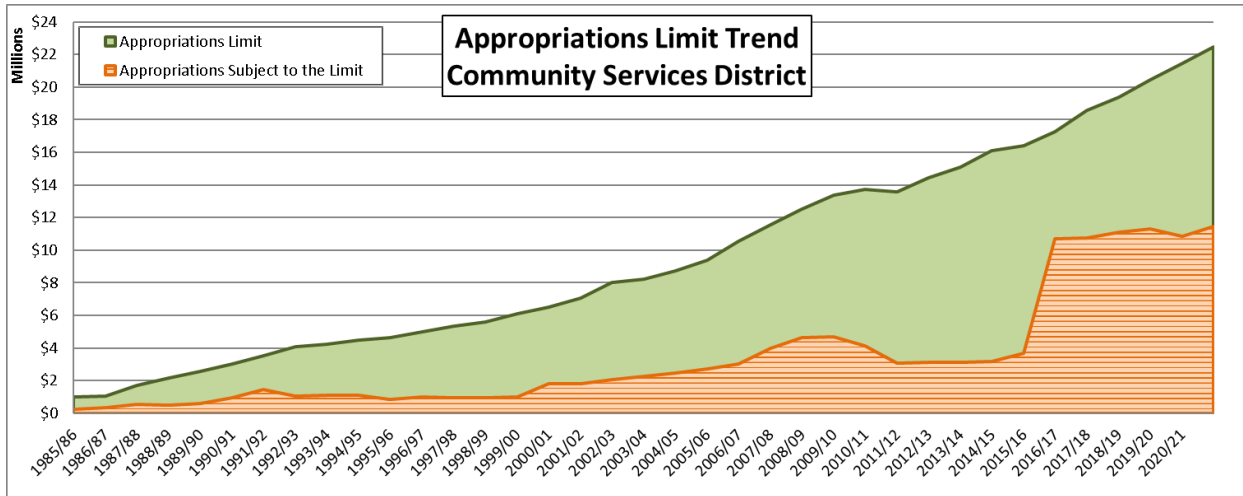
DISCUSSION

Section 7910 of the State Government Code requires a governing body to annually adopt by resolution, an Appropriation (Gann) Limit for the upcoming fiscal year. For FY 2020/21 the appropriation limit for the General Fund is \$139,321,723 and the limit for the District is \$22,450,741. With revenues subject to the limit totaling \$80,536,602 for the General Fund and \$11,473,096 for the District there is still significant capacity to accommodate future revenue growth. The Gann calculation is reviewed by the City’s external audit firm as part of the annual audit process.

In 2008, the available capacity between the appropriations limit and the appropriations subject to the limit for the City reached the lowest point at 6.34%. Over the next three years, appropriation levels were reduced as a result of the recession and declining revenues. Since then, as the local economy has improved, the remaining capacity has gradually increased to approximately 42% of the appropriations limit. Based on projections from the Long Range Business Plan we expect capacity levels to remain relatively high and we do not foresee any issues going forward that would result in the City reaching the appropriations limit.



The Community Services District continues to maintain sufficient capacity related to the appropriations limit. In 2015, based on a ruling by the City Attorney, revenues that had previously been accounted for as non-proceeds of tax were reclassified as tax related revenues. This restatement resulted in reducing their appropriation capacity from 78% to 38%. Their available capacity is currently approximately 51%. Based on the projections from the Long Range Business Plan we anticipate that the capacity rate will remain in this relative range and we do not foresee any issues with the appropriations limit going forward.



Adoption of the proposed resolutions will formalize the Gann Appropriations Limits for FY 2020/21.

ALTERNATIVES

1. Conduct a Public Hearing to receive public comments on the City of Moreno Valley General Fund appropriations limit for Fiscal Year 2020/21.
2. Adopt Resolution No. 2020-XX, a resolution of the City Council of the City of Moreno Valley, California, establishing the appropriations limit for Fiscal Year 2020/21.
3. Conduct a Public Hearing to receive public comments on the Moreno Valley Community Services District’s appropriations limit for Fiscal Year 2020/21.
4. Adopt Resolution No. CSD 2020-XX, a resolution of the Moreno Valley Community Services District establishing the appropriations limit for Fiscal Year 2020/21.
5. Do not conduct a Public Hearing to receive comments on the appropriation limits and do not adopt the proposed resolutions establishing the appropriations limits and provide staff with further direction.

Staff recommends Alternatives 1 through 4 since these actions will adopt the Gann Appropriations Limit in accordance with State law.

FISCAL IMPACT

There is no fiscal impact. Both the General Fund and the District are safely within their legal appropriations limits for Fiscal Year 2020/21.

NOTIFICATION

Notification regarding the adoption of the Gann Limit was published in the newspaper on June 1, 2020. The documents were made available for public review on May 28, 2020.

PREPARATION OF STAFF REPORT

Prepared By:
Brooke McKinney
Treasury Operations Division Manager

Department Head Approval
Marshall Eyerman
Assistant City Manager/Chief Financial Officer/City Treasurer

CITY COUNCIL GOALS

Revenue Diversification and Preservation. Develop a variety of City revenue sources and policies to create a stable revenue base and fiscal policies to support essential City services, regardless of economic climate.

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. FY 2020-21 Gann Limit Resolution Gen Fund
- 2. FY 2020-21 Gann Limit Resolution_CSD

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/03/20 11:30 AM
City Attorney Approval	<u>✓ Approved</u>	6/08/20 3:46 PM
City Manager Approval	<u>✓ Approved</u>	6/08/20 3:52 PM

RESOLUTION NO. 2020-__

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, ESTABLISHING THE APPROPRIATIONS LIMIT FOR FISCAL YEAR 2020/21

WHEREAS, Article XIII B of the California Constitution and Section 7910 of the California Government Code require that each year the City of Moreno Valley shall by resolution, establish an appropriations limit for the City for the following fiscal year; and

WHEREAS, the City Council adopted the Budget for Fiscal Year 2020/21 a copy of which is on file in the Office of the City Clerk and is available for public inspection; and

WHEREAS, the said budget contains the estimates of the services, activities and projects comprising the budget, and contains expenditure requirements and the resources available to the City; and

WHEREAS, the City's Financial & Management Services Department has heretofore prepared and submitted data and documentation required for and to be used in the determination of certain matters and for the establishment of an appropriations limit for the City for Fiscal Year 2020/21 and such data and documentation has been available to the public for at least fifteen days prior to adoption of this Resolution; and

WHEREAS, the City Council has elected to use the annual change in the Per Capita Personal Income as the cost of living factor, and

WHEREAS, the City Council has considered pertinent data and documentation and made such determinations as may be required by law, and has adopted this Resolution at a regularly scheduled meeting of the City Council.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

1. That the appropriations limit for the City of Moreno Valley for Fiscal Year 2020/21 is hereby established at \$139,321,723, and the total annual appropriations subject to such limitation for Fiscal Year 2020/21 is estimated to be \$80,536,602.
2. The City Council hereby adopts the findings and methods of calculations set forth in Exhibit A, the Proceeds of Tax Calculation, Exhibit B, the Appropriations (Gann) Limit Calculation, and Exhibit C, the Summary of Annual Appropriation (Gann) Limits. To the extent permitted by applicable law, the City of Moreno Valley reserves the right to change or revise any gross factors associated with the calculation of the limit established pursuant to Article XIII B of the California Constitution if such changes or revisions would result in a more advantageous appropriation limit in the present or future.

1
Resolution No. 2020-XX
Date Adopted: June 16, 2020

- 3. Pursuant to Section 53901 of the California Government Code, by no later than August 30, 2020, the City Clerk shall file a copy of this Resolution with the Auditor of the County of Riverside.
- 4. Within fifteen days after the adoption of this Resolution, the City Clerk shall certify to the adoption thereof and, as so certified, cause a copy to be posted in at least three public places within the City.

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its adoption.

APPROVED AND ADOPTED this 16^h day of June, 2020.

Mayor of the City of Moreno Valley

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

2
Resolution No. 2020-XX
Date Adopted: June 16, 2020

Attachment: FY 2020-21 Gann Limit Resolution Gen Fund (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

RESOLUTION JURAT

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) ss.
CITY OF MORENO VALLEY)

I, Pat Jacquez-Nares, City Clerk of the City of Moreno Valley, California, do hereby certify that Resolution No. 2020-XX was duly and regularly adopted by the City Council of the City of Moreno Valley at a regular meeting thereof held on the 16th day of June, 2020 by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

(Council Members, Mayor Pro Tem and Mayor)

CITY CLERK

(SEAL)

Resolution No. 2020-XX³
Date Adopted: June 16, 2020

Attachment: FY 2020-21 Gann Limit Resolution Gen Fund (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

EXHIBIT A

CITY OF MORENO VALLEY
 APPROPRIATIONS (GANN) LIMIT
 PROCEEDS OF TAX CALCULATION
 GENERAL FUND FY 2020/21

REVENUE SOURCE	BUDGETED PROCEEDS OF TAX	BUDGETED NON-PROCEEDS OF TAX	TOTAL REVENUE
Taxes			
Property (1)	\$ 37,927,300		\$ 37,927,300
Sales	\$ 17,023,010		17,023,010
Motor Vehicle In-Lieu	\$ -		-
Business Gross Receipts	\$ 3,233,787		3,233,787
Utility Users	\$ 15,717,540		15,717,540
Other Taxes	2,824,045		2,824,045
Fees			
Franchise		7,731,350	7,731,350
Development Fees		10,060,122	10,060,122
Other Fees, Permits & Licenses		2,020,449	2,020,449
Fines & Forfeitures		343,843	343,843
Administrative Charges		3,302,771	3,302,771
Intergovernmental		313,000	313,000
Miscellaneous		282,600	282,600
Total	\$ 76,725,682	\$ 24,054,135	\$ 100,779,817
% of Total	76.13	23.87	100.00
Allocation of Interest	3,810,920	1,194,886	5,005,806
Adjusted Total	\$ 80,536,602	\$ 25,249,021	\$ 105,785,623

Revenues are based on FY 2020/21 Amended Budget

Notes:

(1) Includes Property Tax In-Lieu of Vehicle License Fees In-Lieu

Attachment: FY 2020-21 Gann Limit Resolution Gen Fund (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

EXHIBIT B

**CITY OF MORENO VALLEY
 APPROPRIATIONS (GANN) LIMITS
 LIMIT CALCULATION
 GENERAL FUND FY 2020/21**

APPROPRIATIONS SUBJECT TO THE LIMIT

FY 2020/21 Total Revenue *	\$ 105,785,623
Less: Non-Proceeds of Tax	25,249,021
A) Total Appropriations Subject to the Limit	<u>\$ 80,536,602</u>

APPROPRIATIONS LIMIT

B) FY 2019/20 Appropriations Limit	\$133,245,718												
C) Change Factor **	<table> <thead> <tr> <th></th> <th style="text-align: center;"><u>% Increase</u></th> <th style="text-align: center;"><u>Factor</u></th> </tr> </thead> <tbody> <tr> <td>Cost of Living (Per Capital Personal Income)-COL</td> <td style="text-align: center;">3.73</td> <td style="text-align: center;">1.0373</td> </tr> <tr> <td>Population Adjustment - PA</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">1.0080</td> </tr> <tr> <td>Change Factor (COL x PA)</td> <td></td> <td style="text-align: center;"><u>1.0456</u></td> </tr> </tbody> </table>		<u>% Increase</u>	<u>Factor</u>	Cost of Living (Per Capital Personal Income)-COL	3.73	1.0373	Population Adjustment - PA	0.80	1.0080	Change Factor (COL x PA)		<u>1.0456</u>
	<u>% Increase</u>	<u>Factor</u>											
Cost of Living (Per Capital Personal Income)-COL	3.73	1.0373											
Population Adjustment - PA	0.80	1.0080											
Change Factor (COL x PA)		<u>1.0456</u>											
D) Increase in Appropriations Limit	6,076,005												
E) FY 2020/21 Appropriations Limit (B x C)	<u>\$ 139,321,723</u>												

REMAINING APPROPRIATIONS CAPACITY

(E - A)	<u>\$ 58,785,121</u>
Remaining Capacity as a Percent of the FY 2020/21 Appropriations Limit	<u>42.19%</u>

* Revenues based upon FY 2020/21 Amended Budget

** State Department of Finance
 Percent of Change in California Per Capita Income
 Percent of Change in City of Moreno Valley Population

Attachment: FY 2020-21 Gann Limit Resolution Gen Fund (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

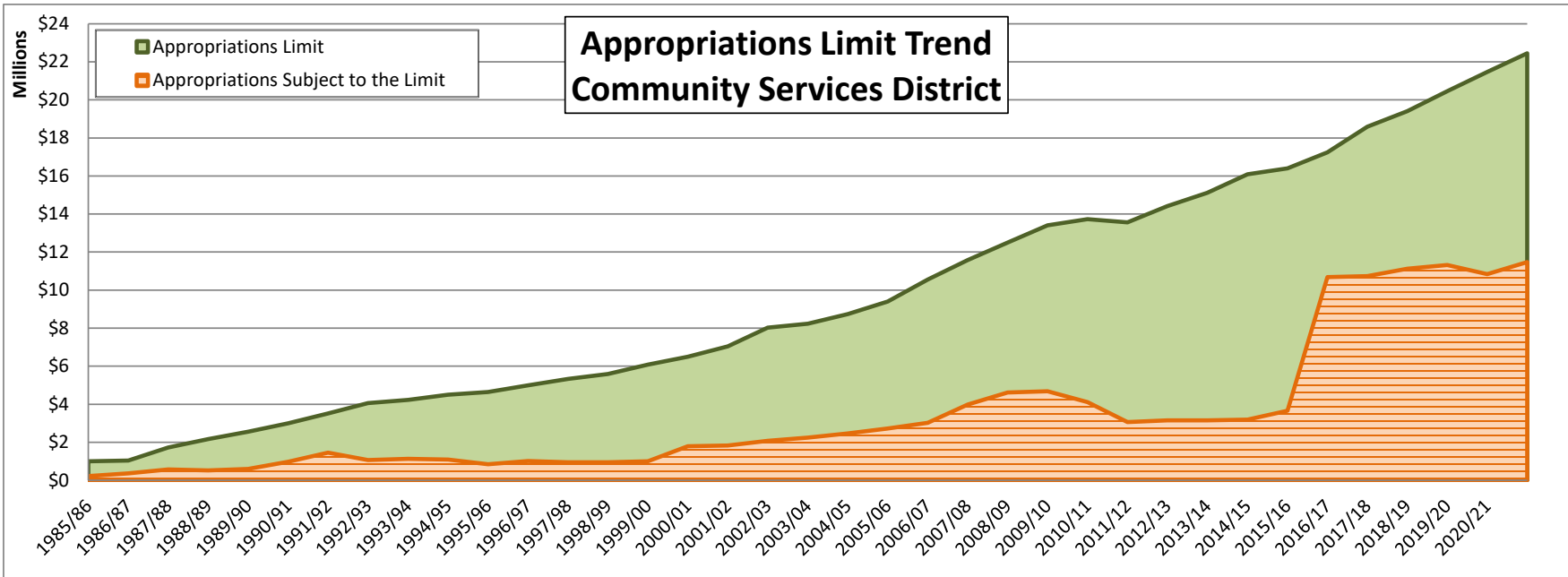
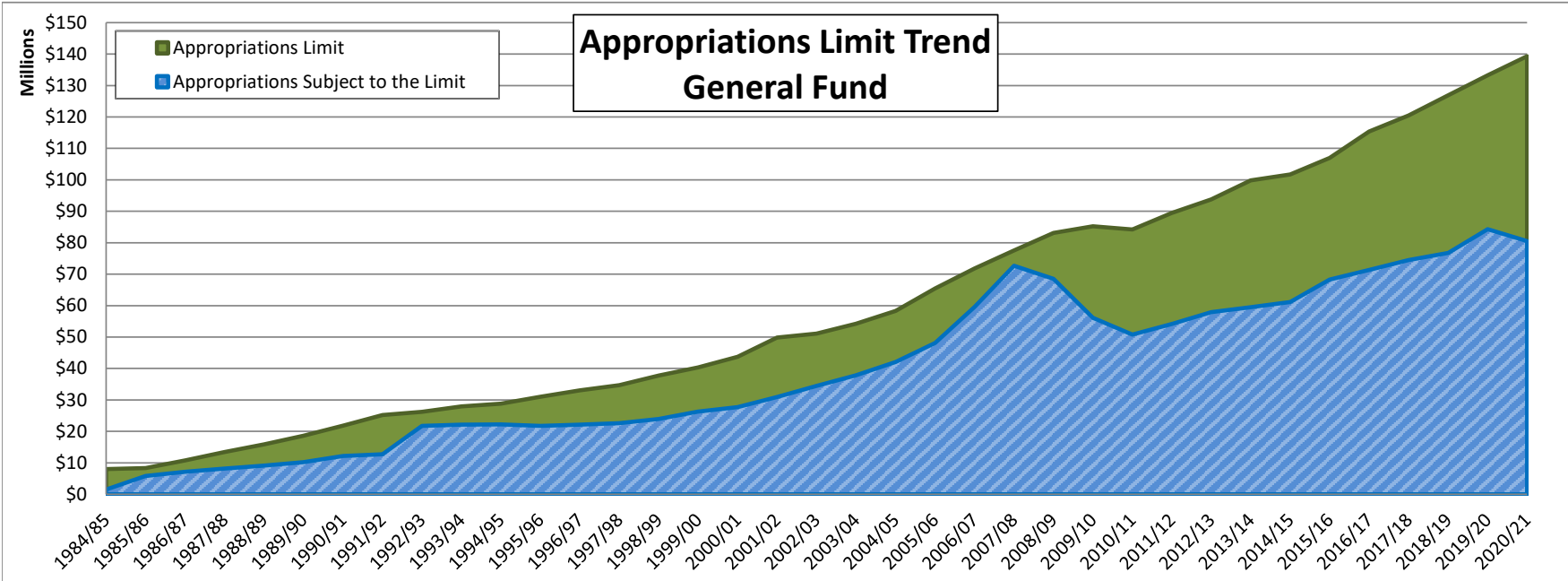
EXHIBIT C

**CITY OF MORENO VALLEY
SUMMARY OF ANNUAL APPROPRIATION (GANN) LIMITS
GENERAL FUND AND COMMUNITY SERVICES DISTRICT**

FISCAL YEAR	COST OF LIVING CHANGE	POPULATION CHANGE	GENERAL FUND			COMMUNITY SERVICES DISTRICT		
			APPROPRIATIONS LIMIT	SUBJECT TO THE LIMIT	REMAINING CAPACITY	APPROPRIATIONS LIMIT	SUBJECT TO THE LIMIT	REMAINING CAPACITY
1984/85	-	-	\$8,000,000	\$1,489,525	\$6,510,475	\$1,000,000	\$225,224	\$774,776
1985/86	3.74%	-	8,299,200	5,801,524	2,497,676	1,037,400	366,257	671,143
1986/87	2.30%	13.34%	10,739,623	7,182,998	3,556,625	1,730,616	571,404	1,159,212
1987/88	3.40%	21.27%	13,419,869	8,186,487	5,233,382	2,162,519	514,685	1,647,834
1988/89	3.93%	13.98%	15,897,098	9,117,625	6,779,473	2,561,707	595,770	1,965,937
1989/90	4.98%	11.53%	18,612,989	10,193,243	8,419,746	2,999,354	973,431	2,025,923
1990/91	4.21%	12.34%	21,790,136	12,168,319	9,621,817	3,511,329	1,447,368	2,063,961
1991/92	4.14%	9.53%	25,184,125	12,702,824	12,481,301	4,058,248	1,068,016	2,990,232
1992/93	-0.64%	4.74%	26,209,119	21,751,950	4,457,169	4,223,419	1,127,115	3,096,304
1993/94	2.72%	3.69%	27,915,333	22,167,783	5,747,550	4,498,364	1,090,166	3,408,198
1994/95	0.71%	2.56%	28,833,747	22,191,470	6,642,277	4,646,360	839,650	3,806,710
1995/96	4.72%	2.66%	30,999,161	21,770,020	9,229,141	4,995,302	1,018,520	3,976,782
1996/97	4.67%	1.91%	33,066,805	22,117,750	10,949,055	5,328,489	952,480	4,376,009
1997/98	4.67%	0.19%	34,677,158	22,635,500	12,041,658	5,587,986	952,480	4,635,506
1998/99	4.15%	4.44%	37,718,345	23,919,000	13,799,345	6,078,052	1,000,500	5,077,552
1999/00	4.53%	2.29%	40,328,454	26,298,904	14,029,550	6,498,653	1,796,366	4,702,287
2000/01	4.91%	3.36%	43,728,143	27,701,784	16,026,359	7,046,489	1,831,589	5,214,900
2001/02	7.82%	5.68%	49,823,846	30,910,955	18,912,891	8,028,770	2,074,425	5,954,345
2002/03	-1.27%	3.88%	51,099,336	34,456,312	16,643,024	8,234,307	2,244,708	5,989,599
2003/04	2.31%	3.72%	54,226,615	37,805,936	16,420,679	8,738,247	2,465,590	6,272,657
2004/05	3.28%	4.17%	58,342,415	42,094,636	16,247,779	9,401,480	2,727,571	6,673,909
2005/06	5.26%	6.59%	65,460,190	48,100,800	17,359,390	10,548,461	3,016,336	7,532,125
2006/07	3.96%	5.59%	71,855,651	59,592,475	12,263,176	11,579,046	3,987,532	7,591,514
2007/08	4.42%	3.38%	77,568,175	72,653,027	4,915,148	12,499,580	4,615,504	7,884,076
2008/09	4.29%	2.79%	83,153,084	68,506,576	14,646,508	13,399,550	4,685,689	8,713,861
2009/10	0.62%	1.83%	85,198,650	56,124,960	29,073,690	13,729,179	4,108,012	9,621,167
2010/11	-2.54%	1.40%	84,193,306	50,777,288	33,416,018	13,567,175	3,059,579	10,507,596
2011/12	2.51%	3.66%	89,463,807	54,120,708	35,343,099	14,416,480	3,146,478	11,270,002
2012/13	3.77%	1.05%	93,811,748	57,930,634	35,881,114	15,117,121	3,146,049	11,971,072
2013/14	5.12%	1.23%	99,825,081	59,511,085	40,313,996	16,086,128	3,193,939	12,892,189
2014/15	0.80%	1.12%	101,751,705	61,132,366	40,619,339	16,396,590	3,661,696	12,734,894
2015/16	3.82%	1.28%	107,002,093	68,270,362	38,731,731	17,242,654	10,686,758	6,555,896
2016/17	5.37%	2.35%	115,401,757	71,329,731	44,072,026	18,596,202	10,733,417	7,862,785
2017/18	3.69%	0.67%	120,456,354	74,479,064	45,977,290	19,410,716	11,119,754	8,290,962
2018/19	3.67%	1.64%	126,924,860	76,753,778	50,171,082	20,453,071	11,321,286	9,131,785
2019/20	3.86%	1.09%	133,245,718	84,305,457	48,940,261	21,471,634	10,837,005	10,634,629
2020/21	3.73%	0.80%	139,321,723	80,536,602	58,785,121	22,450,741	11,473,096	10,977,645

Note (1) During 2014 the City Attorney made a ruling that certain revenues which had previously been shown as Non-Proceeds of Tax should be shown as Proceeds of Tax instead. That ruling is reflected in data beginning with FY 2015/16.

Attachment: FY 2020-21 Gann Limit Resolution Gen Fund (4038 : PUBLIC HEARING ESTABLISHING



RESOLUTION NO. CSD 2020-__

A RESOLUTION OF THE MORENO VALLEY COMMUNITY SERVICES DISTRICT ESTABLISHING THE APPROPRIATIONS LIMIT FOR FISCAL YEAR 2020/21

WHEREAS, Article XIII B of the California Constitution and Section 7910 of the California Government Code require that each year the Moreno Valley Community Services District (District) shall by resolution, establish an appropriations limit for the District for the following fiscal year; and

WHEREAS, the City Council, acting in its capacity as the Board of Directors of the District, has adopted the Budget for Fiscal Year 2020/21 a copy of which is on file in the Office of the City Clerk and is available for public inspection; and

WHEREAS, the said budget contains the estimates of the services, activities and projects comprising the budget, and contains expenditure requirements and the resources available to the District; and

WHEREAS, the District's Financial & Management Services Department has heretofore prepared and submitted data and documentation required for and to be used in the determination of certain matters and for the establishment of an appropriations limit for the District for Fiscal Year 2020/21 and such data and documentation has been available to the public for at least fifteen days prior to adoption of this Resolution, and

WHEREAS, the City Council, acting in its capacity as the Board of Directors of the District, has elected to use the annual change in the Per Capita Personal Income as the cost of living factor. and

WHEREAS, the City Council, acting in its capacity as the Board of Directors of the District, has considered pertinent data and documentation and made such determinations as may be required by law, and has adopted this Resolution at a regularly scheduled meeting of the Board of Directors of the District.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE MORENO VALLEY COMMUNITY SERVICES DISTRICT DOES HEREBY RESOLVE AS FOLLOWS:

1. That the appropriations limit for the Moreno Valley Community Services District for Fiscal Year 2020/21 is hereby established at \$22,450,741 and the total annual appropriations subject to such limitation for Fiscal Year 2020/21 is estimated to be \$11,473,096.
2. The District's Board of Directors hereby adopts the findings and methods of calculations set forth in Exhibit A, the Proceeds of Tax Calculation, Exhibit B, the Appropriation (Gann) Limit Calculation, and Exhibit C, the Summary of Annual

1
Resolution No. CSD 2020-XX
Date Adopted: June 16, 2020

Appropriation (Gann) Limits. To the extent permitted by applicable law, the District reserves the right to change or revise any gross factors associated with the calculation of the limit established pursuant to Article XIIB of the California Constitution if such changes or revisions would result in a more advantageous appropriations limit in the present or future.

- 3. Pursuant to Section 53901 of the California Government Code, by no later than August 30, 2019, the City Clerk, acting in the capacity of Secretary of the Moreno Valley Community Services District, shall file a copy of this Resolution with the Auditor of the County of Riverside.
- 4. Within fifteen days after the adoption of this Resolution, the City Clerk, acting in the capacity of Secretary of the Moreno Valley Community Services District, shall certify to the adoption thereof and, as so certified, cause a copy to be posted in at least three public places within the City.

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its adoption.

APPROVED AND ADOPTED this 16th day of June, 2020.

Mayor of the City of Moreno Valley,
 Acting in the capacity of President of the
 Moreno Valley Community Services District

ATTEST:

City Clerk, acting in the capacity
 of Secretary of the Moreno Valley
 Community Services District

APPROVED AS TO FORM:

City Attorney, acting in the capacity
 of General Counsel of the Moreno
 Valley Community Services District

2
 Resolution No. CSD 2020-XX
 Date Adopted: June 16, 2020

Attachment: FY 2020-21 Gann Limit Resolution_CSD (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

RESOLUTION JURAT

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) ss.
CITY OF MORENO VALLEY)

I, Pat Jacquez-Nares, Secretary of the Moreno Valley Community Services District, Moreno Valley, California do hereby certify that Resolution No. CSD 2020-XX was duly and regularly adopted by the Board of Directors of the Moreno Valley Community Services District at a regular meeting held on the 16th day of June, 2020 by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

(Board members, Vice-President and President)

SECRETARY

(SEAL)

Resolution No. CSD 2020-XX³
Date Adopted: June 16, 2020

Attachment: FY 2020-21 Gann Limit Resolution_CSD (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

EXHIBIT A

**CITY OF MORENO VALLEY
APPROPRIATIONS (GANN) LIMIT
PROCEEDS OF TAX CALCULATION
COMMUNITY SERVICES DISTRICT FY 2020/21**

REVENUE SOURCE	BUDGETED PROCEEDS OF TAX	BUDGETED NON-PROCEEDS OF TAX	TOTAL REVENUE
<u>Taxes</u>			
Zone A - Parks & Recreation	\$ 7,870,480		\$ 7,870,480
Zone A - Parks & Recreation Rest. Assets	-		-
CFD No 1 - Parks	-		-
LMD 2014-01 - Residential Lights	125,800		125,800
Zone C - Arterial Lights	653,700		653,700
Zone D - Standard Landscaping	-		-
Zone E - Extensive Landscaping	-		-
LMD 2014-02	-		-
CFD 2014-01	-		-
Zone L - Library Services	2,249,908		2,249,908
Zone M - Median Fund	-		-
Zone S - Sunnymead Blvd.	-		-
<u>Fees</u>			
Zone A - Parks & Recreation		1,145,028	1,145,028
Zone A - Parks & Recreation Rest. Assets		-	-
CFD No 1 - Parks		-	-
LMD 2014-01 - Residential Lights		960,500	960,500
Zone C - Arterial Lights		7,500	7,500
Zone D - Standard Landscaping		1,186,000	1,186,000
Zone E - Extensive Landscaping		121,180	121,180
LMD 2014-02		2,028,866	2,028,866
CFD 2014-01		-	-
Zone L - Library Services		30,000	30,000
Zone M - Median Fund		123,200	123,200
Zone S - Sunnymead Blvd.		64,300	64,300
<u>Miscellaneous</u>			
Zone A - Parks & Recreation		22,000	22,000
Zone A - Parks & Recreation		913,460	913,460
Zone A - Parks & Recreation		1,000	1,000
Zone A - Parks & Recreation		5,000	5,000
Zone B - Residential Lights		-	-
Zone E - Extensive Landscaping		-	-
LMD 2014-02		-	-
Zone D - Standard Landscaping		-	-
Zone L - Library Services		10	10
Zone L - Library Services		30,000	30,000
<u>Transfers In</u>			
Zone A - Parks & Recreation		-	-
Zone A - Parks & Recreation Rest. Assets		-	-
CFD No 1 - Parks		-	-
LMD 2014-01 - Residential Lights		430,500	430,500
Zone C - Arterial Lights		216,500	216,500
Zone D - Standard Landscaping		-	-
Zone E - Extensive Landscaping		-	-
LMD 2014-02		210,000	210,000
CFD 2014-01		-	-
Zone L - Library Services		475,000	475,000
Zone M - Median Fund		180,490	180,490
Zone S - Sunnymead Blvd.		-	-
Total	\$ 10,899,888	\$ 8,150,534	\$ 19,050,422
% of Total	57.22	42.78	100.00
Allocation of Interest *	77,757	58,143	135,900
Adjusted Total	\$ 10,977,645	\$ 8,208,677	\$ 19,186,322

Attachment: FY 2020-21 Gann Limit Resolution_CSD (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

EXHIBIT B

CITY OF MORENO VALLEY
APPROPRIATIONS (GANN) LIMITS
LIMIT CALCULATION
COMMUNITY SERVICES DISTRICT FY 2020/21

APPROPRIATIONS SUBJECT TO THE LIMIT

FY 2020/21 Total Revenue *	\$	19,186,322
Less: Non-Proceeds of Tax		8,208,677
A) Total Appropriations Subject to the Limit	\$	<u>10,977,645</u>

APPROPRIATIONS LIMIT

B) FY 2019/20 Appropriations Limit		21,471,634
C) Change Factor **	% Increase	Factor
Cost of Living (Per Capital Personal Income)-COL	3.73	1.0373
Population Adjustment - PA	0.80	1.0080
Change Factor (COL x PA)		<u>1.0456</u>
D) Increase in Appropriations Limit		979,107
E) FY 2020/21 Appropriations Limit (B x C)	\$	<u>22,450,741</u>

REMAINING APPROPRIATIONS CAPACITY

(E - A)	\$	<u>11,473,096</u>
Remaining Capacity as a Percent of the FY 2020/21 Appropriations Limit		<u>51.10%</u>

* Revenues based upon FY 2020/21 Amended Budget

** State Department of Finance
Percent of Change in California Per Capita Income
Percent of Change in Population

Attachment: FY 2020-21 Gann Limit Resolution_CSD (4038 : PUBLIC HEARING ESTABLISHING APPROPRIATIONS ("GANN") LIMIT FOR

COMMUNITY SERVICES DISTRICT

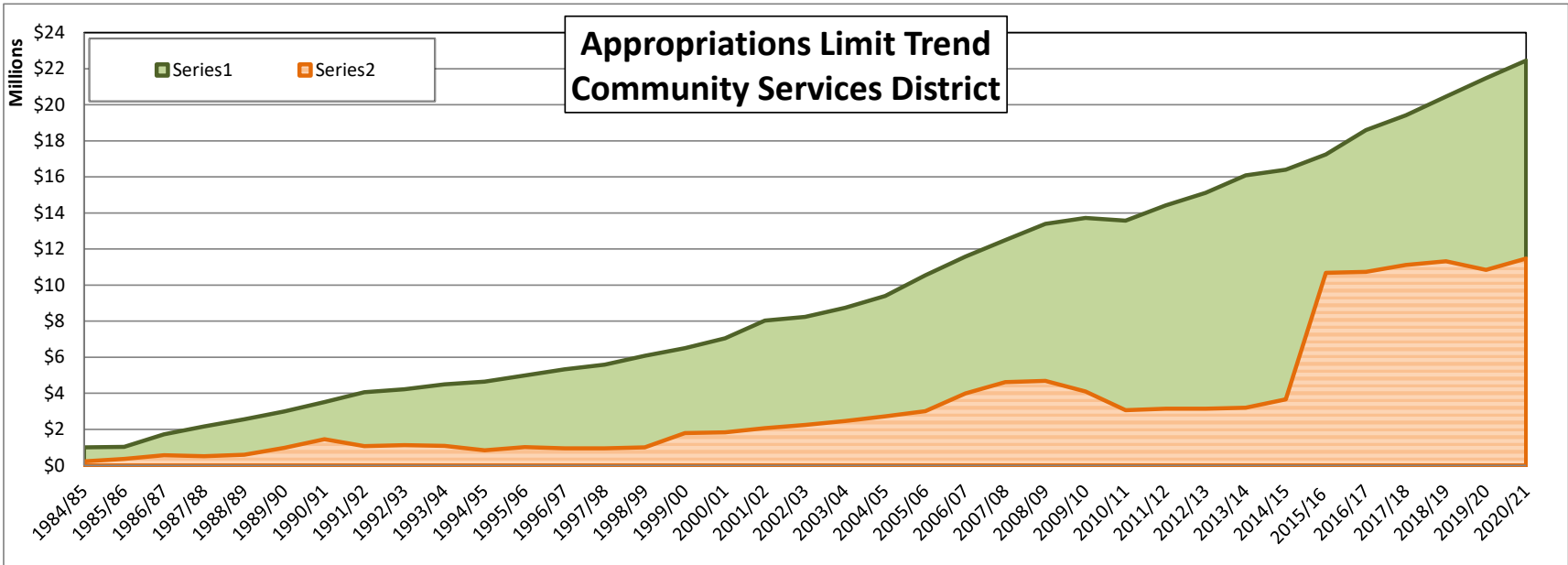
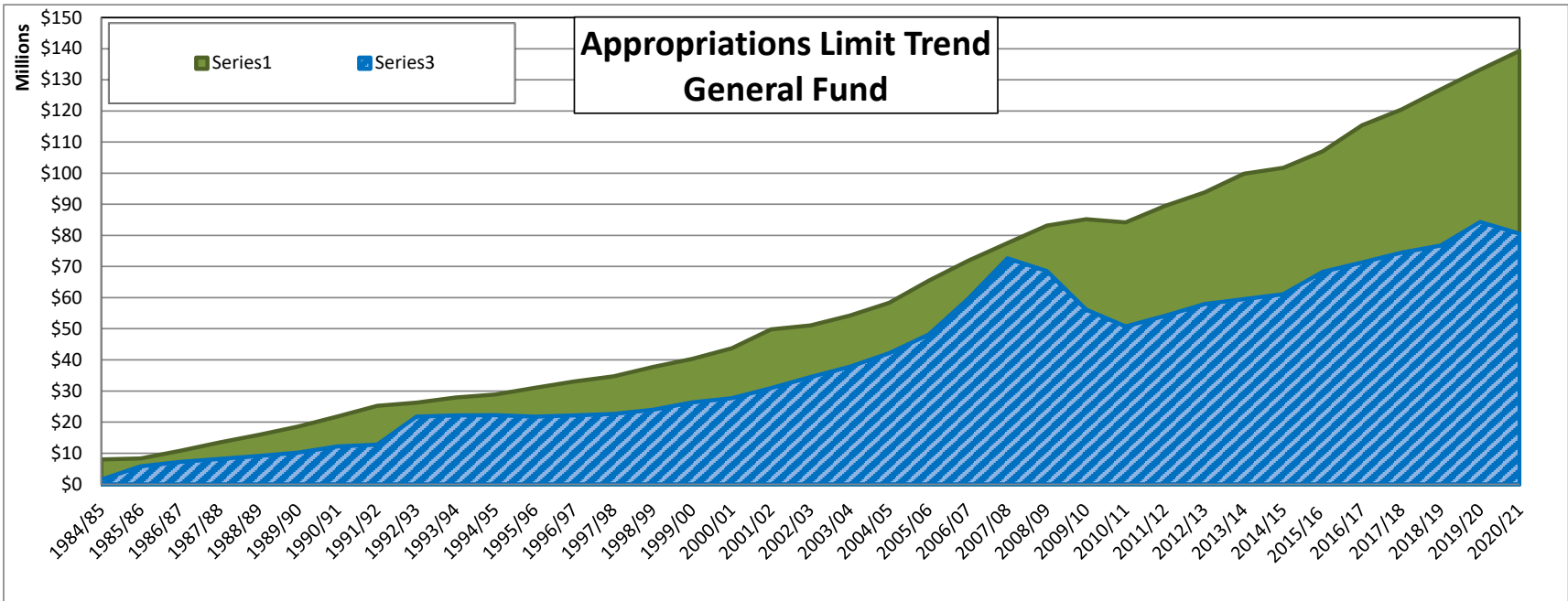
EXHIBIT C

CITY OF MORENO VALLEY
SUMMARY OF ANNUAL APPROPRIATION (GANN) LIMITS
GENERAL FUND AND COMMUNITY SERVICES DISTRICT

FISCAL YEAR	COST OF LIVING CHANGE	POPULATION CHANGE	GENERAL FUND			COMMUNITY SERVICES DISTRICT		
			APPROPRIATIONS LIMIT	SUBJECT TO THE LIMIT	REMAINING CAPACITY	APPROPRIATIONS LIMIT	SUBJECT TO THE LIMIT	REMAINING CAPACITY
1984/85	-	-	\$8,000,000	\$1,489,525	\$6,510,475	\$1,000,000	\$225,224	\$774,776
1985/86	3.74%	-	8,299,200	5,801,524	2,497,676	1,037,400	366,257	671,143
1986/87	2.30%	13.34%	10,739,623	7,182,998	3,556,625	1,730,616	571,404	1,159,212
1987/88	3.40%	21.27%	13,419,869	8,186,487	5,233,382	2,162,519	514,685	1,647,834
1988/89	3.93%	13.98%	15,897,098	9,117,625	6,779,473	2,561,707	595,770	1,965,937
1989/90	4.98%	11.53%	18,612,989	10,193,243	8,419,746	2,999,354	973,431	2,025,923
1990/91	4.21%	12.34%	21,790,136	12,168,319	9,621,817	3,511,329	1,447,368	2,063,961
1991/92	4.14%	9.53%	25,184,125	12,702,824	12,481,301	4,058,248	1,068,016	2,990,232
1992/93	-0.64%	4.74%	26,209,119	21,751,950	4,457,169	4,223,419	1,127,115	3,096,304
1993/94	2.72%	3.69%	27,915,333	22,167,783	5,747,550	4,498,364	1,090,166	3,408,198
1994/95	0.71%	2.56%	28,833,747	22,191,470	6,642,277	4,646,360	839,650	3,806,710
1995/96	4.72%	2.66%	30,999,161	21,770,020	9,229,141	4,995,302	1,018,520	3,976,782
1996/97	4.67%	1.91%	33,066,805	22,117,750	10,949,055	5,328,489	952,480	4,376,009
1997/98	4.67%	0.19%	34,677,158	22,635,500	12,041,658	5,587,986	952,480	4,635,506
1998/99	4.15%	4.44%	37,718,345	23,919,000	13,799,345	6,078,052	1,000,500	5,077,552
1999/00	4.53%	2.29%	40,328,454	26,298,904	14,029,550	6,498,653	1,796,366	4,702,287
2000/01	4.91%	3.36%	43,728,143	27,701,784	16,026,359	7,046,489	1,831,589	5,214,900
2001/02	7.82%	5.68%	49,823,846	30,910,955	18,912,891	8,028,770	2,074,425	5,954,345
2002/03	-1.27%	3.88%	51,099,336	34,456,312	16,643,024	8,234,307	2,244,708	5,989,599
2003/04	2.31%	3.72%	54,226,615	37,805,936	16,420,679	8,738,247	2,465,590	6,272,657
2004/05	3.28%	4.17%	58,342,415	42,094,636	16,247,779	9,401,480	2,727,571	6,673,909
2005/06	5.26%	6.59%	65,460,190	48,100,800	17,359,390	10,548,461	3,016,336	7,532,125
2006/07	3.96%	5.59%	71,855,651	59,592,475	12,263,176	11,579,046	3,987,532	7,591,514
2007/08	4.42%	3.38%	77,568,175	72,653,027	4,915,148	12,499,580	4,615,504	7,884,076
2008/09	4.29%	2.79%	83,153,084	68,506,576	14,646,508	13,399,550	4,685,689	8,713,861
2009/10	0.62%	1.83%	85,198,650	56,124,960	29,073,690	13,729,179	4,108,012	9,621,167
2010/11	-2.54%	1.40%	84,193,306	50,777,288	33,416,018	13,567,175	3,059,579	10,507,596
2011/12	2.51%	3.66%	89,463,807	54,120,708	35,343,099	14,416,480	3,146,478	11,270,002
2012/13	3.77%	1.05%	93,811,748	57,930,634	35,881,114	15,117,121	3,146,049	11,971,072
2013/14	5.12%	1.23%	99,825,081	59,511,085	40,313,996	16,086,128	3,193,939	12,892,189
2014/15	0.80%	1.12%	101,751,705	61,132,366	40,619,339	16,396,590	3,661,696	12,734,894
2015/16	3.82%	1.29%	107,002,093	68,270,362	38,731,731	17,242,654	10,686,758 (1)	6,555,896
2016/17	5.37%	2.35%	115,401,757	71,329,731	44,072,026	18,596,202	10,733,417	7,862,785
2017/18	3.69%	0.67%	120,456,354	74,479,064	45,977,290	19,410,716	11,119,754	8,290,962
2018/19	3.67%	1.64%	126,924,860	76,753,778	50,171,082	20,453,071	11,321,286	9,131,785
2019/20	3.86%	1.09%	133,245,718	84,305,457	48,940,261	21,471,634	10,837,005	10,634,629
2020/21	3.73%	0.80%	139,321,723	80,536,602	58,785,121	22,450,741	11,473,096	10,977,645

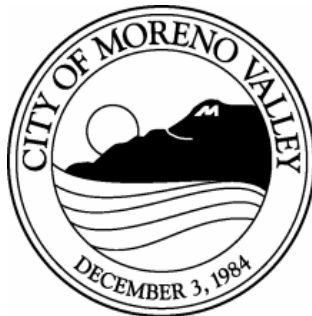
Note (1) During 2014 the City Attorney made a ruling that certain revenues which had previously been shown as Non-Proceeds of Tax should be shown as Proceeds of Tax instead. That ruling is reflected in data beginning with FY 2015/16.

Attachment: FY 2020-21 Gann Limit Resolution_CSD (4038 : PUBLIC HEARING ESTABLISHING



**MINUTES
CITY COUNCIL REGULAR MEETING OF THE CITY OF MORENO VALLEY
June 2, 2020**

TELECONFERENCED MEETING



**TELECONFERENCED MEETING
CITY COUNCIL REGULAR MEETING - 6:00 PM
JUNE 2, 2020
[Pursuant to Governor Executive Order N-29-20]**

There Will Not Be a Physical Location for Attending the Meeting

The Public May Observe the Meeting and Offer Public Comment As Follows:

STEP 1

Install the Free Zoom App or Visit the Free Zoom Website at [<https://zoom.us/>](https://zoom.us/)

STEP 2

Get Meeting ID Number and Password by emailing zoom@moval.org
[<mailto:zoom@moval.org>](mailto:zoom@moval.org) or calling (951) 413-3001

STEP 3

Select Audio Source

*Computer Speakers/Microphone
or
Telephone*

STEP 3

Public Comments May be Made Via Zoom

During the Meeting, the Mayor Will Explain the Process for Submitting Public Comments

ALTERNATIVE

If you do not wish to make public comments, you can view the meeting on Channel MVTV-3, the City's website at www.moval.org or YouTube

Minutes Acceptance: Minutes of Jun 2, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

**MINUTES
JOINT MEETING OF THE
CITY COUNCIL OF THE CITY OF MORENO VALLEY
MORENO VALLEY COMMUNITY SERVICES DISTRICT
CITY AS SUCCESSOR AGENCY FOR THE
COMMUNITY REDEVELOPMENT AGENCY OF THE
CITY OF MORENO VALLEY
MORENO VALLEY HOUSING AUTHORITY
MORENO VALLEY PUBLIC FINANCING AUTHORITY
BOARD OF LIBRARY TRUSTEES**

**REGULAR MEETING – 6:00 PM
June 2, 2020**

CALL TO ORDER

SPECIAL PRESENTATIONS - NONE

Minutes Acceptance: Minutes of Jun 2, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

**MINUTES
JOINT MEETING OF THE
CITY COUNCIL OF THE CITY OF MORENO VALLEY
MORENO VALLEY COMMUNITY SERVICES DISTRICT
CITY AS SUCCESSOR AGENCY FOR THE
COMMUNITY REDEVELOPMENT AGENCY OF THE
CITY OF MORENO VALLEY
MORENO VALLEY HOUSING AUTHORITY
MORENO VALLEY PUBLIC FINANCING AUTHORITY
BOARD OF LIBRARY TRUSTEES**

**REGULAR MEETING – 6:00 PM
June 2, 2020**

CALL TO ORDER

The Joint Meeting of the City Council, Community Services District, City as Successor Agency for the Community Redevelopment Agency of the City of Moreno Valley, Moreno Valley Housing Authority, Moreno Valley Public Financing Authority and the Board of Library Trustees was called to order at 6:04 p.m. by Mayor Gutierrez in the Council Chamber located at 14177 Frederick Street.

Mayor Gutierrez announced that the City Council receives a separate stipend for CSD meetings.

Mayor Gutierrez commented on the lives lost to Covid-19, increasing unemployment and the civil unrest occurring throughout the Nation. He mentioned his participation in a community protest for police reform.

ROLL CALL

Council:	Dr. Yxstian A. Gutierrez	Mayor
	Victoria Baca	Mayor Pro Tem
	David Marquez	Council Member
	Ulises Cabrera	Council Member
	Dr. Carla J. Thornton	Council Member

INTRODUCTIONS

Staff:	Pat Jacquez-Nares	City Clerk
	Steve Quintanilla	Interim City Attorney
	Mike Lee	City Manager
	Marshall Eyerman	Assistant City Manager/Chief Financial Officer
	Michael Wolfe	Interim Assistant City Manager/Director of

Minutes Acceptance: Minutes of Jun 2, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

Manuel Mancha

Public Works/City Engineer
Community Development Director

PUBLIC COMMENTS ON AGENDA ITEMS AND NON-AGENDA ITEMS

Brandon Mosley

1. Announced that a prayer march is scheduled for Friday, June 5th.
2. Proposed nine police department policy changes.

Angel Lopez

1. Thanked the residents who exercised their constitutional right to protest, peacefully.
2. Critical that the 10% reduction to the City Council salary and travel and training budgets is insufficient.

Marquise Lucy

1. Disapproved of the police response to the protest on Saturday, May 30th.
2. Asked the City Council to adopt measures to ease community tension.

Mayor Gutierrez thanked Ms. Lucy for voicing her concerns and assured her that the City Council was working on implementing changes.

Marshall Hawthorne

1. Condemned the police response to the protest on Saturday, May 30th.
2. Suggested that the police force be augmented with more local and minority recruits.

Mike Meazy

1. Concurred with the appeal for more local police officers.
2. Requested more artistic outlets for the youth.

Linda Thomas

1. Called for the resignation of Council Member Marquez.

Elmer Thomas

1. Requested that Council Member Marquez resign.
2. Encouraged residents to text FLOYD to 55156 and sign the corresponding petition to charge the officers involved in his apprehension.

JOINT CONSENT CALENDARS (SECTIONS A-E)

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Victoria Baca, Mayor Pro Tem
SECONDER:	Dr. Carla J. Thornton, Council Member
AYES:	Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

A. CONSENT CALENDAR-CITY COUNCIL

- A.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

- A.2. City Council - Regular Meeting - May 19, 2020 6:00 PM

Council Member Marquez remarked that although the minutes from the last City Council meeting can not be changed he would like the record to reflect that his intent was to only recuse himself from Item No. B.4 and not the entire Consent Calendar.

Mayor Pro Tem Baca stated Council Member Marquez is unable to change his vote after its been cast.

Recommendation: Approve as submitted.

- A.3. COUNCIL DISCRETIONARY EXPENDITURE REPORTS FOR FISCAL YEAR 2019/2020 FROM JULY 1, 2019 THROUGH APRIL 30, 2020 (Report of: City Clerk)

Recommendation:

1. Receive and file the Fiscal Year 2019/2020 Council Discretionary Expenditure Report for July 1, 2019 through April 30, 2020.

- A.4. GENERAL MUNICIPAL ELECTION – NOVEMBER 3, 2020 RESOLUTIONS CALLING AND GIVING NOTICE AND REQUESTING CONSOLIDATION WITH STATEWIDE GENERAL ELECTION (RESO. NOS. 2020-38 - 40) (Report of: City Clerk)

Recommendations: That the City Council:

1. Adopt Resolution No. 2020-38 - A Resolution calling an election titled, "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, CALLING AND GIVING NOTICE OF A GENERAL MUNICIPAL ELECTION ON TUESDAY, NOVEMBER 3, 2020, FOR CERTAIN OFFICERS, AS REQUIRED BY THE PROVISIONS OF THE LAWS OF THE STATE OF CALIFORNIA RELATING TO GENERAL LAW CITIES
2. Adopt Resolution No. 2020-39 - A Resolution requesting election consolidation titled, "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, REQUESTING THE BOARD OF SUPERVISORS OF THE COUNTY OF RIVERSIDE

TO CONSOLIDATE A GENERAL MUNICIPAL ELECTION TO BE HELD ON TUESDAY, NOVEMBER 3, 2020, WITH THE STATEWIDE GENERAL ELECTION TO BE HELD ON THAT DATE, PURSUANT TO §10403 OF THE CALIFORNIA ELECTIONS CODE”.

3. Adopt Resolution No. 2020-40 - A Resolution establishing regulations and cost for Candidate Statements titled: “A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, PROVIDING FOR REGULATIONS PERTAINING TO MATERIALS FOR CANDIDATES AND COSTS PERTAINING TO CANDIDATE STATEMENTS SUBMITTED TO THE VOTERS AT A GENERAL MUNICIPAL ELECTION TO BE HELD ON TUESDAY, NOVEMBER 3, 2020”
- A.5. COVID-19 PANDEMIC RESOLUTIONS EXTENDING THE LOCAL STATE OF EMERGENCY AND CERTAIN EMERGENCY MEASURES, APPROVING TEMPORARY OUTDOOR DINING PERMIT PROCEDURES AND DECLARING A FISCAL EMERGENCY (RESO. NOS. 2020-41 - 43) (Report of: Financial & Management Services)

Recommendation: That the City Council:

1. That the City Council adopt a Resolution Extending the Local State of Emergency and Certain Emergency Measures, a Resolution Approving Temporary Outdoor Dining Permit Procedures, and a Resolution Declaring a Fiscal Emergency related to the Local, State and National State/Declarations of Emergency related to the COVID-19 Pandemic.
- A.6. SECOND READING AND ADOPTION OF AN ORDINANCE TO AMEND MUNICIPAL CODE, TITLE 3 (REVENUE AND FINANCE), CHAPTER 12 (PURCHASING), SECTION 070 (GENERAL PROTEST PROCEDURES) FOR CONTRACTS AND PURCHASE ORDERS (Report of: Public Works)

Recommendation:

1. Second Reading and Adoption of the attached Ordinance No. _____, to update City of Moreno Valley Municipal Code, Title 3 (Revenue and Finance), Chapter 12 (Purchasing), Section 070 (General Protest Procedures) for contracts and purchase orders.

- A.7. AUTHORIZATION TO AWARD BID FOR THE FURNISHING OF TRAFFIC SIGNAL CONTROLLERS AND CABINETS TO ECONOLITE CONTROL PRODUCTS, INC. (Report of: Public Works)

Recommendations:

1. Award the bid to Econolite Control Products, Inc., the lowest responsive and responsible bidder, for the purchase of traffic signal controllers and cabinets; and
2. Authorize the issuance of a Purchase Order to Econolite Control Products, Inc. in the amount of \$479,136.86 for the purchase of traffic signal controllers and cabinets, funded by a combination of previously approved and budgeted federal grants, development impact fees, Technology Services Operating budget (General Fund), and AQMD funds.

- A.8. AUTHORIZATION TO AWARD A CONSTRUCTION CONTRACT TO HARDY & HARPER, INC. AND A PROFESSIONAL CONSULTANT SERVICE AGREEMENT TO LOR GEOTECHNICAL GROUP, INC. FOR THE CITYWIDE PAVEMENT REHABILITATION PROGRAM (FISCAL YEAR 2019/20) - PROJECT NO. 801 0085 (AGMT. NOS. 2020-162 AND 163) (Report of: Public Works)

Recommendations:

1. Award a construction contract to Hardy & Harper, Inc., 32 Rancho Circle, Lake Forest, CA 92603, for the Citywide Pavement Rehabilitation Program (Fiscal Year 2019/20) project and authorize the City Manager to execute a contract with Hardy & Harper, Inc. in the amount of \$4,080,364.90;
2. Award an Agreement for Professional Consultant Services to LOR Geotechnical Group, Inc., 6121 Quail Valley Court, Riverside, CA 92507 to provide materials testing and geotechnical services for the Citywide Pavement Rehabilitation Program (Fiscal Year 2019/20) project and authorize the City Manager to execute the agreement with LOR Geotechnical Group, Inc., in the amount of \$120,000.00;
3. Authorize the issuance of a Purchase Order to Hardy & Harper, Inc., in the amount of \$4,263,981.32 (\$4,080,364.90 bid amount plus a 4.5% contingency) and a Purchase Order to LOR Geotechnical Group, Inc. in the amount of \$120,000.00 for completing the construction of the project, funded by a combination of Senate Bill 1 (SB1) Funds (2000A), Capital Projects Reimbursement Funds (3008), and Gas Tax Funds (2000); and

4. Authorize the Public Works Director/City Engineer to execute any subsequent change orders to Hardy & Harper, Inc. contract, but not exceeding the total contingency of \$182,616.42, subject to the approval of the City Attorney.

A.9. PARTICIPATION IN A TURF REBATE PROGRAM FOR ZONE 03 OF LANDSCAPE MAINTENANCE DISTRICT NO. 2014-02 AND APPROVAL OF A RELATED CONTRACT AMENDMENT (AGMT. NO. 2017-33-05) (Report of: Public Works)

Recommendations:

1. Authorize Participation in Metropolitan Water District's (MWD) and Eastern Municipal Water District's (EMWD) turf replacement rebate programs for rebates of up to \$255,725.00 for the benefit of Zone 03 of Landscape Maintenance District (LMD) No. 2014-02.
2. Approve the Fifth Amendment to the Independent Contractor Agreement for Landscape Districts – South with Merchants Landscape Services, Inc. ("Amendment"), in substantially the form attached hereto, to increase the not-to-exceed amount to \$3,998,583.47, which is funded by previously approved and budgeted special assessments within Zone 03 of the LMD.
3. Approve budget adjustments as set forth in the Fiscal Impact section of this report.
4. Authorize the City Manager to execute the Amendment subject to the approval of the City Attorney and provided sufficient funding appropriations and program approvals have been granted by the City Council.

A.10. AUTHORIZATION TO AWARD A CONSTRUCTION CONTRACT TO SIDRA GROUP INC. FOR PEDESTRIAN HYBRID BEACON ON CACTUS AT WOODLAND PARK – PROJECT NO. 808 0017 (AGMT. NO. 2020-164) (Report of: Public Works)

Recommendations:

1. Award a construction contract to Sidra Group Inc., 6510 Box Springs Boulevard, Suite G, Riverside, CA 92507, for the Pedestrian Hybrid Beacon on Cactus at Woodland Park project and authorize the City Manager to execute a contract with Sidra Group Inc. in substantial conformance with the attached contract in the amount of \$356,713.00;
2. Authorize the issuance of a Purchase Order for Sidra Group Inc. in the amount of \$392,384.00 (\$356,713.00 bid amount plus a 10%

contingency) when the contract has been signed by all parties;

3. Authorize the Public Works Director/City Engineer to execute any subsequent change orders to the contract, but not exceeding the total contingency of \$35,671.00, subject to the approval of the City Attorney; and
4. Authorize a budget adjustment as set forth in the Fiscal Impact section of this report to provide sufficient budget to complete the project funded by a combination of Measure A and State SB821 Bicycle and Pedestrian Facilities Program funds.

A.11. APPROVE SECOND AMENDMENT TO AGREEMENT WITH CSG CONSULTANTS, INC. FOR BUILDING AND SAFETY PLAN CHECK SERVICES, INSPECTIONS, AND PERMIT TECHNICIAN CONSULTANT SERVICES (AGMT. NO. 2017-41-02) (Report of: Community Development)

Recommendations:

1. Approve the Second Amendment to Agreement for Building and Safety Plan Check Services, Inspections, and Permit Technician Consultant Services with CSG Consultants, Inc. and authorize the City Manager, or his designee to execute the amendment, subject to the approval of the City Attorney.
2. Authorize a one-year extension of the Agreement with CSG Consultants, Inc. and authorize an increase of \$295,000.00 to the not-to-exceed amount of the Agreement to \$795,000.00 to cover added contract costs for FY19/20 and projected costs in FY20/21, using funds received as outlined in the development fee schedule for plan check services.

A.12. Authorization to Submit Grant Proposal for Local Government Planning Support Grants Program referred to as the Local Early Action Planning Grant (LEAP) (RESO. NO. 2020-44) (Report of: Community Development)

Recommendation:

1. Adopt Resolution No. 2020-44, authorizing City Staff to apply for and submit an application package for Local Early Action Planning Grants Program (LEAP) funds in the amount of \$500,000, and authorizing the City Manager to execute an agreement to accept grant funds. **(RESO. NO. 2020-44)**

- A.13. HOUSING DENSITY BONUS AGREEMENT BY AND BETWEEN THE CITY OF MORENO VALLEY AND COURTYARDS AT COTTONWOOD, LP (AGMT. NO. 2020-165) (Report of: Community Development)

Recommendations: That the City Council:

1. Approve the Housing Density Bonus Agreement by and between the City of Moreno Valley and Courtyards at Cottonwoods, LP.
2. Authorize the City Attorney to make amendments to the Agreement as needed to finalize the Agreement.
3. Authorize the City Manager to execute the Housing Density Bonus Agreement, subject to the approval of the City Attorney.

B. CONSENT CALENDAR-COMMUNITY SERVICES DISTRICT

- B.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

- B.2. MINUTES - REGULAR MEETING OF MAY 19, 2020 6:00 PM (See A.2)

Recommendation: Approve as submitted.

C. CONSENT CALENDAR - HOUSING AUTHORITY

- C.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

- C.2. MINUTES - REGULAR MEETING OF MAY 19, 2020 6:00 PM (See A.2)

Recommendation: Approve as submitted.

D. CONSENT CALENDAR - BOARD OF LIBRARY TRUSTEES

- D.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

D.2. MINUTES - REGULAR MEETING OF MAY 19, 2020 6:00 PM (See A.2)

Recommendation: Approve as submitted.

E. CONSENT CALENDAR - PUBLIC FINANCING AUTHORITY

E.1. ORDINANCES - READING BY TITLE ONLY - THE MOTION TO ADOPT AN ORDINANCE LISTED ON THE CONSENT CALENDAR INCLUDES WAIVER OF FULL READING OF THE ORDINANCE.

Recommendation: Waive reading of all Ordinances.

E.2. MINUTES - REGULAR MEETING OF MAY 19, 2020 6:00 PM (See A.2)

Recommendation: Approve as submitted.

F. PUBLIC HEARINGS

Questions or comments from the public on a Public Hearing matter are limited to five minutes per individual and must pertain to the subject under consideration.

Those wishing to speak should follow the teleconference procedures.

F.1. PUBLIC HEARING FOR DELINQUENT NUISANCE ABATEMENT (RESO. NO. 2020-45) (Report of: Fire Department)

Fire Marshal Villalobos provided the report.

Mayor Gutierrez opened the Public Hearing at 6:36 p.m.

There being no comments in support or opposition, Mayor Gutierrez closed the Public Hearing at 6:36 p.m.

Recommendations:

1. Conduct a public hearing and accept public testimony on delinquent nuisance abatement account.
2. Adopt Resolution No. 2020-45 A Resolution of the City Council of the City of Moreno Valley, California, Confirming Statements of Costs against Real Property located in the City of Moreno Valley, for Abatements of Public Nuisances and Direction that Said Statement of Costs Constitute a Lien upon Said Properties.
3. Approve placing the submitted Property Assessment List of delinquent nuisance abatement accounts on the Fiscal Year (FY) 2020/2021 Riverside County property tax roll for collection.

4. Direct the City Clerk to file with the Riverside County Tax Assessor's office a certified copy of Resolution No. 2020-45 and the Property Assessment List as required by Section 6.04.120 of the City of Moreno Valley Municipal Code.

RESULT: APPROVED [UNANIMOUS]
MOVER: David Marquez, Council Member
SECONDER: Victoria Baca, Mayor Pro Tem
AYES: Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

Mayor Pro Tem Baca and Council Member Cabrera requested to make their comments at this time.

Mayor Pro Tem Baca expressed her anger over the death of George Floyd. She asked for support for the establishment of a Citizens Public Safety Committee and that the meeting be adjourned in memory of George Floyd.

Council Member Thornton supported her recommendation.

Mayor Gutierrez indicated that he approved of the committee.

Council Member Cabrera communicated his approval of the committee. He thanked the participants and organizers of the Community Park protest. He conveyed his eagerness to meet with community members to identify solutions for improving community-police relations. He agreed with the residents who advocated for a more local police force. He expressed his support for the formation of the City's own police department.

F.2. PUBLIC HEARING FOR UNPAID SOLID WASTE ACCOUNTS TO DEFER PAYMENTS UNTIL DECEMBER 2020 THROUGH THE PROPERTY TAX BILLS (Report of: Financial & Management Services)

Assistant City Manager/Chief Financial Officer Eyerman provided the report.

Mayor Gutierrez opened the Public Hearing at 6:46 p.m.

There being no comments in support or opposition, Mayor Gutierrez closed the Public Hearing at 6:46 p.m.

Recommendations: That the City Council:

1. Conduct the Public Hearing and accept public testimony regarding Calendar Year (CY) 2019 unpaid solid waste accounts to be applied to the Fiscal Year (FY) 2020/21 County of Riverside property tax roll for collection;

2. Approve the Solid Waste Delinquency Report from Waste Management, Inc. (Waste Management) listing the CY 2019 delinquent solid waste accounts for placement on the FY 2020/21 County of Riverside property tax roll for collection; and
3. Direct the City Clerk to file the Solid Waste Delinquency Report with the County of Riverside Auditor-Controller.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Victoria Baca, Mayor Pro Tem
SECONDER:	Dr. Yxstian A. Gutierrez, Mayor
AYES:	Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

Brandon Carn

1. In the interest of fiscal responsibility, expressed his desire for an increase in the City Council budget cuts.
2. Questioned certain members of the City Council who claim solidarity with protestors while also blocking residents from commenting on their social media accounts.

Roy Bleckert

1. Requested notification if issues arise with the maintenance of his properties.
2. Encouraged leaders to study the non-aggressive policing approach adopted by Michigan Sheriff Chris Swanson

F.3. PUBLIC HEARING FOR ONE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MAIL BALLOT PROCEEDING (Report of: Public Works)

Interim Assistant City Manager/Public Works Director/City Engineer Wolfe provided the report.

Mayor Gutierrez opened the Public Hearing at 6:55 p.m.

There being no comments in support or opposition, Mayor Gutierrez closed the Public Hearing at 6:55 p.m.

Recommend that the City Council:

1. Conduct the Public Hearing and accept public testimony for the mail ballot proceeding for the National Pollutant Discharge Elimination System (NPDES) Common Interest, Commercial, Industrial, and Quasi-Public Use Regulatory Rate to be applied to the property tax bill of the parcels identified herein;
2. Direct the City Clerk to open and count the returned NPDES ballot;

RESULT: APPROVED [UNANIMOUS]
MOVER: Victoria Baca, Mayor Pro Tem
SECONDER: Dr. Carla J. Thornton, Council Member
AYES: Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

3. Verify and accept the results of the mail ballot proceeding as maintained by the City Clerk on the Official Tally Sheet and if approved, set the rate and impose the NPDES Common Interest, Commercial, Industrial, and Quasi-Public Use Regulatory Rate, as applicable, on the Assessor's Parcel Numbers as mentioned;
4. Receive and file the Official Tally Sheet with the City Clerk's office.

RESULT: APPROVED [UNANIMOUS]
MOVER: Victoria Baca, Mayor Pro Tem
SECONDER: David Marquez, Council Member
AYES: Dr Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

G. GENERAL BUSINESS

G.1. FISCAL YEAR 2019/20 THIRD QUARTER BUDGET REVIEW AND APPROVAL OF THE FISCAL YEAR 2019/20 THIRD QUARTER BUDGET AMENDMENTS (RESO. NOS. 2020-46 and CSD 2020-19) (Report of: Financial & Management Services)

Assistant City Manager/Chief Financial Officer Eyerman provided the report.

Recommendations: That the City Council:

1. Receive and file the Fiscal Year 2019/20 Third Quarter Financial Summary. (Attachment 1).
2. Adopt Resolution No. 2020-46. A resolution of the City Council of the City of Moreno Valley, California, adopting the revised budgets for Fiscal Years 2019/20 – 2020/21.
3. Approve the Operating Reserve Stabilization Repayment Plan. (Attachment 5).
4. Approve the City Position Summary. (Attachment 6).
5. Approve the Civic Center Amphitheater Fee Schedule. (Attachment 7).

RESULT: APPROVED [UNANIMOUS]
MOVER: Victoria Baca, Mayor Pro Tem
SECONDER: David Marquez, Council Member
AYES: Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

Recommendation: That the CSD:

1. Adopt Resolution No. CSD 2020-19. A resolution of the Moreno Valley Community Services District of the City of Moreno Valley, California, adopting the revised operating and capital budget for Fiscal Years (FY) 2019/20 – 2020/21.

RESULT: APPROVED [UNANIMOUS]
MOVER: Victoria Baca, Mayor Pro Tem
SECONDER: David Marquez, Council Member
AYES: Dr. Yxstian A. Gutierrez, Victoria Baca, David Marquez, Ulises Cabrera, Dr. Carla J. Thornton

H. ITEMS REMOVED FROM CONSENT CALENDARS FOR DISCUSSION OR SEPARATE ACTION - NONE

I. REPORTS

I.1. CITY COUNCIL REPORTS

(Informational Oral Presentation - not for Council action)

March Joint Powers Commission (JPC) - Mayor Pro Tem Baca

Mayor Pro Tem Baca reported the following:

Tonight, I'm providing an update from the March Joint Powers Commission meeting held on May 27th.

At that meeting, the Commission amended the annual budgets for the JPA, the Airport Authority and the Utility Authority.

We also updated the Transportation Uniform Mitigation Fees that the JPA collects for the Western Region Council of Governments to reflect changes in the cost of construction.

Riverside County Habitat Conservation Agency (RCHCA) - None

Riverside County Transportation Commission (RCTC) - None

Riverside Transit Agency (RTA) - None

Minutes Acceptance: Minutes of Jun 2, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

Western Riverside Council of Governments (WRCOG) - Mayor Pro Tem Baca

Mayor Pro Tem Baca reported the following:

Item covered at the WRCOG Executive Committee meeting on June 1, 2020 is as follows:

- The Executive Committee adopted the Fiscal Year 2020/2021 Agency Budget. The current budget represents a total decrease of approximately 30% compared to the prior fiscal year.

Western Riverside County Regional Conservation Authority (RCA) - None

School District/City Joint Task Force - None

I.2. CITY MANAGER'S REPORT

(Informational Oral Presentation - not for Council action)

City Manager Lee addressed the Public Speaker comments.

I.3. CITY ATTORNEY'S REPORT - NONE

(Informational Oral Presentation - not for Council action)

CLOSING COMMENTS AND/OR REPORTS OF THE CITY COUNCIL, COMMUNITY SERVICES DISTRICT, CITY AS SUCCESSOR AGENCY FOR THE COMMUNITY REDEVELOPMENT AGENCY, HOUSING AUTHORITY, PUBLIC FINANCING AUTHORITY, AND THE BOARD OF LIBRARY TRUSTEES.

Council Member Thornton

1. Reflected on the Black experience in 2020.
2. Called on residents to be proactive in trying to disrupt racism.
3. Encouraged residents to become police officers.
4. Asked parents to hold their curfew breaking teens accountable.
5. Spoke out against community destruction.
6. Expressed hopefulness that change is coming to Moreno Valley.

Council Member Marquez

1. Expressed empathy and asked residents to pray for unity.
2. Encouraged people to work with the police.
3. Discussed the irresponsibility of allowing an officer with eighteen complaints to continue serving.
4. Asserted that he never mentioned his position or interfered with the investigation at the scene of an accident involving his granddaughters.
5. Invited residents to call him.

Mayor Gutierrez

1. Commended staff for their hard work. Namely, City Manager Lee, Chief Salisbury, all City employees, City Clerk Jacquez-Nares, and Parks and Community Services Director Solano.
2. Praised the mothers participating in the Time for Tots graduation.
3. Encouraged graduates to stay strong.
4. Noted that he donated over \$1,000 of discretionary funds to the Adopt a Senior program.
5. Thanked organizers for ensuring a peaceful protest.

ADJOURNMENT

There being no further business to come before the City Council, Mayor Gutierrez adjourned the meeting in memory of George Floyd at 7:20 p.m.

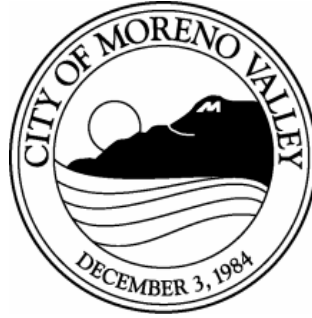
Submitted by:

Pat Jacquez-Nares, CMC & CERA
 City Clerk
 Secretary, Moreno Valley Community Services District
 Secretary, City as Successor Agency for the Community
 Redevelopment Agency of the City of Moreno Valley
 Secretary, Moreno Valley Housing Authority
 Secretary, Board of Library Trustees
 Secretary, Public Financing Authority

Approved by:

Dr. Yxstian A. Gutierrez
 Mayor
 City of Moreno Valley
 President, Moreno Valley Community Services District
 Chairperson, City as Successor Agency for the Community
 Redevelopment Agency of the City of Moreno Valley
 Chairperson, Moreno Valley Housing Authority
 Chairperson, Board of Library Trustees
 Chairperson, Public Financing Authority

TELECONFERENCED MEETING



**TELECONFERENCED MEETING
CITY COUNCIL STUDY SESSION - 6:00 PM
JUNE 9, 2020
[Pursuant to Governor Executive Order N-29-20]**

There Will Not Be a Physical Location for Attending the Meeting

The Public May Observe the Meeting and Offer Public Comment As Follows:

STEP 1

Install the Free Zoom App or Visit the Free Zoom Website at [<https://zoom.us/>](https://zoom.us/)

STEP 2

Get Meeting ID Number and Password by emailing zoom@moval.org
[<mailto:zoom@moval.org>](mailto:zoom@moval.org) or calling (951) 413-3001

STEP 3

Select Audio Source

*Computer Speakers/Microphone
or
Telephone*

STEP 3

Public Comments May be Made Via Zoom

During the Meeting, the Mayor Will Explain the Process for Submitting Public Comments

ALTERNATIVE

If you do not wish to make public comments, you can view the meeting on Channel MVTV-3, the City's website at www.moval.org or YouTube

Minutes Acceptance: Minutes of Jun 9, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

**MINUTES
CITY COUNCIL OF THE CITY OF MORENO VALLEY
MORENO VALLEY COMMUNITY SERVICES DISTRICT
CITY AS SUCCESSOR AGENCY FOR THE
COMMUNITY REDEVELOPMENT AGENCY OF THE
CITY OF MORENO VALLEY
MORENO VALLEY PUBLIC FINANCING AUTHORITY
MORENO VALLEY HOUSING AUTHORITY**

**STUDY SESSION – 6:00 PM
June 9, 2020**

CALL TO ORDER

The Joint Meeting of the City Council, Community Services District, City as Successor Agency for the Community Redevelopment Agency of the City of Moreno Valley, Moreno Valley Housing Authority, Moreno Valley Public Financing Authority and the Board of Library Trustees was called to order at 6:05 p.m. by Mayor Gutierrez in the Council Chamber located at 14177 Frederick Street.

Mayor Gutierrez announced that the City Council receives a separate stipend for CSD meetings.

ROLL CALL

Council:	Dr. Yxstian A. Gutierrez	Mayor
	Victoria Baca	Mayor Pro Tem
	David Marquez	Council Member
	Ulises Cabrera	Council Member
	Dr. Carla J. Thornton	Council Member

INTRODUCTIONS

Staff:	Pat Jacquez-Nares	City Clerk
	Marshall Eyerman	Chief Financial Officer/Assistant City Manager
	Mike Lee	City Manager
	Michael Wolfe	Interim Assistant City Manager, Public Works Director/City Engineer
	Manuel Mancha	Community Development Director
	Patti Solano	Parks & Community Services Director

Minutes Acceptance: Minutes of Jun 9, 2020 6:00 PM (CONSENT CALENDAR-CITY COUNCIL)

PUBLIC COMMENTS ON MATTERS ON THE AGENDA ONLY

Alex Panelli

1. Inquired as to an expansion of the sphere of influence.

Robert Then

1. Expressed his concern that the EIR update does not mitigate the air pollution to a level of insignificance.

Tom Jerele

1. Indicated his overall approval of the General Plan Update, except for the additional residential units planned for central Sunnymead.

George Hague

1. Requested that the meeting be rescheduled as he believes the information wasn't made available to the public.
2. Communicated his support for the plans for Downtown Center and the Moreno Valley Mall Community Center.
3. Against development of the hills.
4. Asked for the elimination of the commercial portion of the office/commercial concept.

A. BUSINESS

- A.1. Review of Preferred Land Use Concept for the General Plan Update (Report of: Community Development)

Andrew Hill of Dyett and Bhatia provided the report.

Mayor Gutierrez discussed the process overview. He expressed his support of the downtown concept. He asked if higher education could be considered for the area located at the north end of the freeway. He indicated that he thought it was prudent that flexibility was built in to all of the designations.

Andrew Hill remarked that the concept could be reworked to broaden the range of uses.

Mayor Pro Tem Baca thanked staff, the GPAC, and Andrew Hill for their work on the general plan update. She questioned if Box Springs Mutual Water Company was taken into consideration.

Andrew Hill stated that the next phase would include the identification of strategies to overcome the infrastructure challenges.

Council Member Thornton expressed concern that the freeway retail zoning will compete with the downtown area. She suggested medical offices would be more appropriate for the population residing in that area. Conveyed her opposition to the industrial zoning adjacent to the residential areas along Pettitt St.

Council Member Cabrera demonstrated his desire that annexations would be considered as part of the General Plan. He asked if studies have been completed to estimate the City's population and demographics in 2029. He stressed the need to capitalize on the demand for housing. He inquired if Kaiser, RUHS, Moreno Valley Unified and similar institutions have been contacted. He explained that Lake Perris is an important consideration as Olympic events are scheduled there in 2028. He stressed the need to ensure that development results in high quality jobs. He pointed out that the California Air Resources Board is relocating to Riverside providing the City an opportunity to take advantage of the resultant business. Lastly, he thanked everyone working on the General Plan Update.

Andrew Hill explained that the forecast is for 75,000 new residents over the next 20 years. He noted that the demographic composition is difficult to foretell. He confirmed that stakeholder interviews included both school districts and that the GPAC contains representation from Moreno Valley College.

Mayor Gutierrez asked if the growth of the older population could be factored into the demographic projection.

Council Member Marquez commended staff and the consultant for their work. He inquired if the plan includes updating the infrastructure. He discussed the fact that residents desire large acre residences north of the freeway and oppose retail development. He explained that the far west side of the City, near the interchange of several freeways, would be the ideal spot for businesses. Expressed hope that the plan is considered carefully to avoid any potential litigation.

Andrew Hill confirmed that studies were completed to determine the condition of the infrastructure.

A.2. CITY COUNCIL REQUESTS AND COMMUNICATIONS - NONE

(ITEMS MAY BE DEFERRED BY COUNCIL IF TIME DOES NOT PERMIT FULL REVIEW.)

ADJOURNMENT

There being no further business to come before the City Council, Mayor Gutierrez adjourned the meeting at 7:09 p.m

Submitted by:

Pat Jacquez-Nares, CMC & CERA
 City Clerk
 Secretary, Moreno Valley Community Services District
 Secretary, City as Successor Agency for the Community
 Redevelopment Agency of the City of Moreno Valley
 Secretary, Moreno Valley Housing Authority
 Secretary, Board of Library Trustees
 Secretary, Public Finance Authority

Approved by:

Dr. Yxstian A. Gutierrez
 Mayor
 City of Moreno Valley
 President, Moreno Valley Community Services District
 Chairperson, City as Successor Agency for the Community
 Redevelopment Agency of the City of Moreno Valley
 Chairperson, Moreno Valley Housing Authority
 Chairperson, Board of Library Trustees
 Chairperson, Public Financing Authority



Report to City Council

TO: Mayor and City Council

FROM: Pat Jacquez-Nares, City Clerk

AGENDA DATE: June 16, 2020

TITLE: 2020 CITY COUNCIL COMMISSION, BOARD, AND SUBCOMMITTEE APPOINTMENTS

RECOMMENDED ACTION

Recommendation: That the City Council:

1. Ratify the appointments to the various committees and subcommittees as noted on the 2020 Council Committee Participation List – terms end on December 31, 2020.

SUMMARY

The previous Council Committee Participation appointments were for six months and have come to their end. Mayor Gutierrez has compiled the new 2020 Council Committee Participation appointments with the terms to end on December 31, 2020 (Attachment 1).

PREPARATION OF STAFF REPORT

Prepared By:
Pat Jacquez-Nares
City Clerk

Department Head Approval:
Pat Jacquez-Nares
City Clerk

CITY COUNCIL GOALS

None

CITY COUNCIL STRATEGIC PRIORITIES

1. Economic Development
2. Public Safety

- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. 2020 Council Committee Participation

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/10/20 2:19 PM
City Attorney Approval	<u>✓ Approved</u>	6/10/20 10:59 AM
City Manager Approval	<u>✓ Approved</u>	6/10/20 3:03 PM

REVISED 6/3/2020
MAYOR'S RECOMMENDATIONS
2020 COUNCIL COMMITTEE PARTICIPATION

CITY COUNCIL ADVISORY COMMISSIONS/BOARDS:	Primary	Alternate	Term
Arts Commission	Cabrera		12/31/2020
Emerging Leaders Council	Cabrera		12/31/2020
Environmental and Historical Preservation Board	Thornton		12/31/2020
Library Commission	Baca		12/31/2020
Parks, Community Services and Trails Committee	Cabrera		12/31/2020
Senior Citizens' Board	Baca		12/31/2020
Traffic Safety Commission	Thornton		12/31/2020
Utilities Commission	Thornton		12/31/2020

CITY COUNCIL SUBCOMMITTEES:

Economic Development Subcommittee <i>Appoint 2 Primary</i>	Gutierrez/Cabrera		12/31/2020
Finance Subcommittee <i>Appoint 2 Primary</i>	Gutierrez/Cabrera		12/31/2020
Public Safety Subcommittee <i>Appoint 2 Primary</i>	Thornton/Baca	Gutierrez	12/31/2020
Parks and Community Services Council Committee <i>Appoint 2 Primary 2 Alternates</i>	Gutierrez/Baca		12/31/2020



Report to City Council

TO:

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: PAYMENT REGISTER - APRIL 2020

RECOMMENDED ACTION

Recommendation:

1. Receive and file the Payment Register.

SUMMARY

The Payment Register is an important report providing transparency of financial transactions and payments for City activity for review by the City Council, the residents and businesses in Moreno Valley. The report is posted to the City's website as soon as it is available. The report is included in the City Council agenda as an additional means of distributing the report.

The payment register lists in alphabetical order all checks and wires in the amount of \$25,000 or greater, followed by a listing in alphabetical order of all checks and wires less than \$25,000. The payment register also includes the fiscal year-to-date (FYTD) amount paid to each vendor

PREPARATION OF STAFF REPORT

Prepared By:
Dena Heald
Deputy Finance Director

Department Head Approval:
Marshall Eyerman
Chief Financial Officer/City Treasurer
Assistant City Manager

CITY COUNCIL GOALS

None

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. April 2020 Payment Register

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/01/20 2:50 PM
City Attorney Approval	<u>✓ Approved</u>	6/01/20 11:57 AM
City Manager Approval	<u>✓ Approved</u>	6/08/20 3:52 PM



**City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020**

CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
ACCELA, INC.	27733	04/27/2020	INV-ACC51320	ACCELA CIVIC PLATFORM SUBSCRIPTION 3/31/20-3/30/21	\$284,193.88
		04/27/2020	CM-ACC88197	CREDIT-DOWNTIME (JAN, FEB, MAR 2019)	
Remit to: CHICAGO, IL					FYTD: \$304,692.17
ADOPT A HIGHWAY LITTER REMOVAL SERVICE OF AMERICA	27636	04/13/2020	166302	STATE ROUTE 60/PIGEON PASS RD INTERCHANGE-LITTER REMOVAL/VEGETATION CONTROL 8/1-10/31/19	\$38,280.00
		04/13/2020	170820	STATE ROUTE 60/PERRIS BLVD/HEACOCK ST-LITTER REMOVAL/ VEGETATION CONTROL 8/1-10/31/19	
		04/13/2020	170821	STATE ROUTE 60/PERRIS BLVD/HEACOCK ST-LITTER REMOVAL/ VEGETATION CONTROL 11/1/19-1/31/20	
Remit to: ENCINITAS, CA					FYTD: \$64,220.00
ALL AMERICAN ASPHALT, INC.	239059	04/06/2020	188320	CITYWIDE PAVEMENT REHAB PROGRAM FY18/19	\$435,761.36
	239257	04/27/2020	188923	CITYWIDE PAVEMENT REHAB PROGRAM FY18/19	\$214,986.65
		04/27/2020	188830	CITYWIDE PAVEMENT REHAB PROGRAM FY18/19	
Remit to: CORONA, CA					FYTD: \$3,866,286.19
BELFOR USA GROUP, INC.	27739	04/27/2020	1384115	RODENT MITIGATION-CITY YARD	\$45,933.58
Remit to: RIVERSIDE, CA					FYTD: \$45,933.58
CALPINE CORPORATION DBA CALPINE ENERGY SERVICES	27641	04/13/2020	59122	RESOURCE ADEQUACY-MARCH 2020/MV UTILITY	\$105,400.00
Remit to: HOUSTON, TX					FYTD: \$316,200.00
COUNTY OF RIVERSIDE SHERIFF	27791	04/28/2020	SH0000037121	CONTRACT LAW ENFORCEMENT BILLING #8 (01/02-01/29/20)	\$3,369,313.82
Remit to: RIVERSIDE, CA					FYTD: \$33,125,585.73

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020

CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
DYETT & BHATIA URBAN AND REGIONAL PLANNERS	27561	04/06/2020	19-572-03	GENERAL PLAN UPDATE AND EIR CONSULTING 1/1-1/31/20	\$97,706.11
	27699	04/20/2020	19-572-04REV1	GENERAL PLAN UPDATE AND EIR CONSULTING 2/1-2/29/20	\$93,666.22
Remit to: OAKLAND, CA					<u>FYTD:</u> \$307,032.43
EASTERN MUNICIPAL WATER DISTRICT	239267	04/27/2020	MAR-20 4/27/20	WATER CHARGES	\$36,111.75
		04/27/2020	APR-20 4/27/20	WATER CHARGES	
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$1,699,141.68

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020

CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
ENCO UTILITY SERVICES MORENO VALLEY LLC	27568	04/06/2020	0402-MF-02375	SOLAR SYSTEM INSPECTION	\$318,301.79
		04/06/2020	0402-MF-02373	SOLAR SYSTEM INSPECTION	
		04/06/2020	MVU-2020-43922	DISTRIBUTION CHARGES 2/21-3/24/20	
	27701	04/20/2020	40-401B-05	WA# 40-401-B-DAY ST LINE EXTENSION	\$48,802.18
		04/20/2020	40-410A-09	WA# 40-410A-BELLA VISTA APARTMENT HOMES	
		04/20/2020	40-444B-01	WA# 40-444B-AT&T CELL TOWER-IRIS PLAZA	
		04/20/2020	40-444A-03	WA# 40-444A-AT&T CELL TOWER-IRIS PLAZA	
		04/20/2020	C20-07	HEACOCK ST. SOUTH OF PARKLAND AVE-VEHICLE HIT STREETLIGHT	
		04/20/2020	40-501-2003	WA# 40-501 ACQUIRED SCE STREETLIGHTS MAINTENANCE	
		04/20/2020	40-448A-01	WA# 40-448-DAVIS ST.-6 SLS	
		04/20/2020	40-446A-03	WA# 40-446A-ALERE PROPERTY GROUP	
		04/20/2020	40-416B-08	WA# 40-416B-PROLOGIS INDIAN BUSINESS PARK	
		04/20/2020	40-409B-07	WA# 40-409B-MVU STREETLIGHT RE-NUMBERING	
		04/20/2020	40-434B-02	WA# 40-434B-CENTERPOINTE COMMERCE CENTER	
		04/20/2020	40-411-07	WA# 40-411-FIELD VERIFICATION OF STREET LIGHT	
		04/20/2020	40-412B-03	WA# 40-412B-OLD 215 FRONTAGE ROAD	
		04/20/2020	40-445-05	WA# 40-445-DISTRIBUTION SYSTEM PLANNING UPDATE	
		04/20/2020	40-443A-06	WA# 40-443A-KIA DEALERSHIP	
		04/20/2020	40-429B-04	WA# 40-429B-MORENO VALLEY SELF STORAGE	
		04/20/2020	40-431B-03	WA# 40-413B-PHELAN DEVELOPMENT	
		04/20/2020	40-442A-07	WA# 40-442A-BEAZER HOMES-PHASE 4-79 HOMES	
		04/20/2020	40-438A-08	WA# 40-438A-CENTURY COMMUNITIES	
		04/20/2020	40-436B-04	WA# 40-436B-BOULDER RIDGE SLS PHASE 2 AND 3	
		04/20/2020	40-405A-12	WA# 40-405A-MORENO BEACH DR. BRIDGE CROSSING	

Remit to: ANAHEIM, CA

FYTD: \$4,646,419.67

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020

CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
ESI ACQUISITION, INC.	27569	04/06/2020	INVESi2390	RAVE ANNUAL SOFTWARE 5/1/20-4/30/21	\$26,780.00
Remit to: ATLANTA, GA					<u>FYTD:</u> \$41,970.00
EXELON GENERATION COMPANY, LLC	27571	04/06/2020	MVEU-00090A	ELECTRICITY POWER PURCHASE 3/1-3/31/20	\$344,609.28
Remit to: BALTIMORE, MD					<u>FYTD:</u> \$5,619,431.12
FERREIRA CONSTRUCTION CO. INC.	27573	04/06/2020	5277007	DYNAMIC TRAVELER ALERT MESSAGE BOARDS PROJECT-VRS LOCATIONS	\$355,022.64
Remit to: RANCHO CUCAMONGA, CA					<u>FYTD:</u> \$1,506,729.16
HOT LINE CONSTRUCTION, INC	27583	04/06/2020	87278	DAY STREET LINE EXTENSION PROJECT-PAY APPLICATION #2	\$598,955.95
Remit to: IRVING, TX					<u>FYTD:</u> \$1,975,339.31
JTB SUPPLY CO., INC.	27753	04/27/2020	107218	BATTERY BACK UP SERVICE	\$33,143.90
Remit to: ORANGE, CA					<u>FYTD:</u> \$103,938.68
LIBRARY SYSTEMS & SERVICES, LLC	27600	04/06/2020	INV2899	LIBRARY CONTRACT SVCS & MATERIALS-MAIN & MALL-APR 2020	\$157,897.90
Remit to: ROCKVILLE, MD					<u>FYTD:</u> \$1,578,979.00

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



City of Moreno Valley
Payment Register
 For Period 4/1/2020 through 4/30/2020

CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
MARIPOSA LANDSCAPES, INC.	27663	04/13/2020	88369	LANDSCAPE MAINT.-SOUTH AQUEDUCT B-MAR20	\$26,554.16
		04/13/2020	88366	LANDSCAPE MAINT.-NORTH AQUEDUCT-MAR20	
		04/13/2020	88374	LANDSCAPE MAINT.-CONFERENCE & REC. CENTER-MAR20	
		04/13/2020	88373	LANDSCAPE MAINT.-CITY YARD-MAR20	
		04/13/2020	88372	LANDSCAPE MAINT.-MARCH ANNEX BUILDING-MAR20	
		04/13/2020	88371	LANDSCAPE MAINT.-ANIMAL SHELTER-MAR20	
		04/13/2020	88370	LANDSCAPE MAINT.-AQUEDUCT/SCE & OLD LAKE DRIVE-MAR20	
		04/13/2020	88384	LANDSCAPE MAINT.-CITY YARD SANTIAGO OFFICE-MAR20	
		04/13/2020	88380	LANDSCAPE MAINT.-FIRE STATIONS 2, 6, 48, 58, 65, 91, & 99-MAR20	
		04/13/2020	88375	LANDSCAPE MAINT.-MORENO BEACH ELECTRIC SUBSTATION-MAR20	
		04/13/2020	88377	LANDSCAPE MAINT.-PUBLIC SAFETY BUILDING-MAR20	
		04/13/2020	88379	LANDSCAPE MAINT.-UTILITY FIELD OFFICE-MAR20	
		04/13/2020	88381	LANDSCAPE MAINT.-CITY HALL-MAR20	
		04/13/2020	88383	LANDSCAPE MAINT.-VETERANS MEMORIAL-MAR20	
		04/13/2020	88497	LANDSCAPE MAINT.-NPDES WQB-MAR20	
		04/13/2020	88382	LANDSCAPE MAINT.-ANNEX 1-MAR20	
		04/13/2020	88376	LANDSCAPE MAINT.-LIBRARY-MAR20	
		04/13/2020	88368	LANDSCAPE MAINT.-SOUTH AQUEDUCT A-MAR20	
		04/13/2020	88361	LANDSCAPE MAINT.-TOWNGATE COMMUNITY CENTER-MAR20	
		04/13/2020	88362	LANDSCAPE MAINT.-TOWNGATE AQUEDUCT BIKEWAY-MAR20	
		04/13/2020	88363	LANDSCAPE MAINT.-AQUEDUCT BIKEWAY/BAY AVE. TO GRAHAM-MAR20	
		04/13/2020	88367	LANDSCAPE MAINT.-PAN AM SECTION AQUEDUCT-MAR20	
		04/13/2020	88364	LANDSCAPE MAINT.-AQUEDUCT BIKEWAY-DELPHINIUM/PERHAM TO JFK-MAR20	
		04/13/2020	88378	LANDSCAPE MAINT.-SENIOR CENTER-MAR20	

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



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CHECKS IN THE AMOUNT OF \$25,000 OR GREATER

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
MARIPOSA LANDSCAPES, INC.		04/13/2020	88365	LANDSCAPE MAINT.-AQUEDUCT BIKEWAY/VANDENBERG TO FAY-MAR20	
		04/13/2020	88385	LANDSCAPE MAINT.-KITCHING ELECTRIC SUBSTATION-MAR20	
Remit to: IRWINDALE, CA					FYTD: \$428,682.10
MERCHANTS BUILDING MAINTENANCE, LLC.	27664	04/13/2020	574634	JANITORIAL SERVICES-MAR. 2020	\$35,166.18
Remit to: MONTEREY PARK, CA					FYTD: \$344,297.22
MERCHANTS LANDSCAPE SERVICES INC	27760	04/27/2020	55791	LANDSCAPE MAINT.-ZONES E-8, LMD 03, 03A, 04, 05, 06, & 07-MAR20	\$30,340.90
		04/27/2020	55871	IRRIGATION REPAIRS-ZONE 04-MAR. 2020	
Remit to: MONTEREY PARK, CA					FYTD: \$504,118.89
MICHAEL BAKER INTERNATIONAL, INC	27609	04/06/2020	1074765	STATE ROUTE 60/WLC PARKWAY INTERCHANGE-DESIGN SVCS	\$102,286.31
		04/06/2020	1078479	STATE ROUTE 60/WLC PARKWAY INTERCHANGE-DESIGN SVCS	
Remit to: LOS ANGELES, CA					FYTD: \$596,209.60
MORENO VALLEY UTILITY	239132	04/13/2020	APR-20 4/13/20	ELECTRICITY CHARGES	\$67,115.86
Remit to: HEMET, CA					FYTD: \$874,818.68
RE ASTORIA 2 LLC	27719	04/20/2020	00043	RENEWABLE ENERGY-MV UTILITY-MAR. 2020	\$25,222.69
Remit to: SAN FRANCISCO, CA					FYTD: \$370,079.80

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<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>		
SOUTHERN CALIFORNIA EDISON	239139	04/13/2020	MAR-20 4/13/20	ELECTRICITY CHARGES	\$89,406.39		
		04/13/2020	729-6522/MAR-20	ELECTRICITY CHARGES FOR ACQUIRED STREETLIGHTS			
		04/13/2020	717-8456/MAR-20	ELECTRICITY CHARGES FOR ADDED STREETLIGHTS			
		04/13/2020	717-8027/MAR-20	ELECTRICITY CHARGES FOR ADDED STREETLIGHTS			
		04/13/2020	721-3449/MAR-20	IFA CHARGES-SUBSTATION			
		04/13/2020	707-6081/MAR-20	ELECTRICITY CHARGES			
		04/13/2020	587-9520/MAR-20	ELECTRICITY-FERC CHARGES/MVU			
		04/13/2020	026-1608/MAR-20	IFA & DISTRIBUTION UPGRADE CHARGES-KITCHING SUBSTATION			
		04/13/2020	717-7516/MAR-20	ELECTRICITY CHARGES FOR ACQUIRED STREETLIGHTS			
		239281	04/27/2020	7501135140		WDAT CHARGES-MVU/24417 NANDINA AVE. SUBSTATION-MAR 2020	\$42,968.82
			04/27/2020	7501135147		WDAT CHARGES-MVU/SUBSTATION 115KV INTERCONNECTION-MAR 2020	
			04/27/2020	7501135142		WDAT CHARGES-MVU/IRIS AVE.-MAR 2020	
			04/27/2020	7501135141		WDAT CHARGES-MVU/17160 KITCHING ST. SUBSTATION-MAR 2020	
	04/27/2020		7501135143	WDAT CHARGES-MVU/GRAHAM ST.-MAR 2020			
	04/27/2020	7501135144	WDAT CHARGES-MVU/GLOBE ST.-MAR 2020				
	04/27/2020	7501135145	WDAT CHARGES-MVU/NANDINA AVE.-MAR 2020				
	04/27/2020	7501135146	WDAT CHARGES-MVU/FREDERICK ST.-MAR 2020				
Remit to: ROSEMEAD, CA					FYTD: \$2,088,277.99		
SYNERGY COMPANIES	239146	04/13/2020	MVU SB DI 03-20	ENERGY AUDITS & INSTALLATION OF ENERGY EFFICIENCY MEASURES	\$26,486.60		
Remit to: HAYWARD, CA					FYTD: \$456,252.95		

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TENASKA ENERGY, INC	27678	04/13/2020	MOREN0002829002	RENEWABLE ENERGY-GEOTHERMAL-MV UTILITY	\$203,290.75
Remit to: ARLINGTON, TX					FYTD: \$5,530,604.35
THE ADVANTAGE GROUP/ FLEX ADVANTAGE	27622	04/06/2020	202004	APRIL 2020 RETIREE MEDICAL BENEFIT BILLING	\$38,971.04
Remit to: TEMECULA, CA					FYTD: \$477,839.96
THINK TOGETHER, INC	27623	04/06/2020	111-19/20-9	ASES PROGRAM MANAGEMENT SERVICES-INSTALLMENT #9	\$596,579.24
Remit to: SANTA ANA, CA					FYTD: \$5,488,844.56
TURF STAR, INC.	239148	04/13/2020	3300252-00	WORKMAN HD WITH 200 GAL. SPRAYER EQUIPMENT PURCHASE	\$52,129.57
Remit to: SAN FRANCISCO, CA					FYTD: \$52,129.57
WELLS FARGO CORPORATE TRUST	27786	04/27/2020	W200401	DEBT SERVICE-2013 REFUNDING OF 2005 LEASE REVENUE BOND	\$115,368.65
	27787	04/27/2020	W200402	DEBT SERVICE-2014 REFUNDING OF 2005 LEASE REVENUE BOND	\$563,941.46
	27788	04/27/2020	W200403	DEBT SERVICE-2015 TAXABLE LEASE REVENUE BOND	\$222,641.56
	27789	04/27/2020	W200404	DEBT SERVICE-2016 REFUNDING OF 2007 LEASE REVENUE BOND	\$1,272,159.85
	27790	04/27/2020	W200405	DEBT SERVICE-2019 TAXABLE LEASE REVENUE BOND	\$316,489.97
Remit to: LOS ANGELES, CA					FYTD: \$8,816,281.81
WILLDAN ENGINEERING	27689	04/13/2020	002-22093	PLAN CHECK & INSPECTION SERVICES FOR BLDG. & SAFETY DEPT.-DEC19	\$50,784.00
Remit to: ANAHEIM, CA					FYTD: \$414,910.81

TOTAL AMOUNTS OF \$25,000 OR GREATER	\$10,482,771.01
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4IMPRINT	27691	04/20/2020	8144743	PROMOTIONAL ITEMS-ECONOMIC DEVELOPMENT	\$8,799.75
	27732	04/27/2020	8242513	PROMOTIONAL ITEMS-MV UTILITY	\$5,328.11
Remit to: OSHKOSH, WI					<u>FYTD:</u> \$21,182.85
AARVIG AND ASSOCIATES, APC	239058	04/06/2020	35062	LEGAL SERVICES-CLAIM MV1910 (V. GADBERRY)	\$650.60
	239110	04/13/2020	35041	LEGAL SERVICES-CLAIM MV1910 (V. GADBERRY)	\$1,989.83
Remit to: REDLANDS, CA					<u>FYTD:</u> \$24,751.64
ABUBEKER, HANAN	239229	04/20/2020	2001737.047	RENTAL REFUND BALANCE	\$67.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$67.00
ACOSTA, MONA	239291	04/27/2020	2001772.047	RENTAL REFUND BALANCE	\$77.30
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$77.30
ADLERHORST INTERNATIONAL LLC	27635	04/13/2020	104594	MONTHLY K-9 TRAINING (RICO/ARKAN/HERBIE) MARCH 2020	\$525.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$10,679.49
ADMINSURE	27734	04/27/2020	13222	WORKERS' COMP CLAIM ADMIN-MAY 2020	\$2,241.00
Remit to: ONTARIO, CA					<u>FYTD:</u> \$24,651.00
ADVANCE REFRIGERATION & ICE SYSTEMS, INC	27692	04/20/2020	47594	ICE MACHINE REPAIR-FIRE STATION 65	\$505.43
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$15,497.49

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<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
ADVANCED ELECTRIC INC.	27540	04/06/2020	12549	ELECTRICAL REPAIRS-CITY HALL	\$9,848.92
		04/06/2020	12637	ELECTRICAL REPAIRS-COMMUNITY REC. CENTER	
		04/06/2020	12640	ELECTRICAL REPAIRS-FIRE STATION 6	
		04/06/2020	12638	ELECTRICAL REPAIRS-CITY HALL	
Remit to: MORENO VALLEY, CA					FYTD: \$10,248.92
ADVANTAGE GRAPHICS AND PROMOTIONS	27637	04/13/2020	14076	CARBONLESS INSPECTION CHECKLIST-PD	\$186.54
Remit to: DANA POINT, CA					FYTD: \$3,870.35
AEI-CASC ENGINEERING	27541	04/06/2020	0041585	PLAN CHECK SVCS-PWQMP	\$3,809.75
		04/06/2020	0041919	PLAN CHECK SVCS-PWQMP	
Remit to: COLTON, CA					FYTD: \$29,835.50
AGUILAR'S DAY CARE	239074	04/06/2020	BL#00232- YR2020	REFUND/OVER PAYMENT FOR BL#00232	\$64.08
Remit to: MORENO VALLEY, CA					FYTD: \$64.08
ALCARAZ, MELISSA	239292	04/27/2020	2001764.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
		04/27/2020	2001727.047	REFUND - TIME 4 TOTS CRC AM	
Remit to: MORENO VALLEY, CA					FYTD: \$169.00
ALDI, INC.	239151	04/13/2020	MVU 7014047-01	PBI SOLAR REBATE INCENTIVE	\$13,603.08
Remit to: MORENO VALLEY, CA					FYTD: \$145,796.52
ALEX ORELLANA	27542	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
ALL AMERICAN ASPHALT, INC.	27634	04/09/2020	W200406	RETENTION PAYABLE DEPOSIT-ESCOW DEPOSIT NO. 2609	\$22,934.81
Remit to: CORONA, CA					FYTD: \$3,866,286.19

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ALLIANT INSURANCE SERVICES, INC.	27638	04/13/2020	3RD QTR-CY2019	SPECIAL EVENT INSURANCE (JULY-SEPT 2019 PREMIUMS)	\$11,596.00
		04/13/2020	4TH QTR-CY2019	SPECIAL EVENT INSURANCE (OCT-DEC 2019 PREMIUMS)	
Remit to: SAN DIEGO, CA					<u>FYTD:</u> \$95,510.88
ALLIED PAVING COMPANY	239152	04/13/2020	BL#00309- YR2020	REFUND/OVER PAYMENT FOR BL#00309	\$71.00
Remit to: GARDEN GROVE, CA					<u>FYTD:</u> \$71.00
ALLIED STORAGE CONTAINERS	239111	04/13/2020	R20043106	20' STORAGE BIN RENTAL 4/1-4/30/20	\$70.04
Remit to: COLTON, CA					<u>FYTD:</u> \$700.40
ALTERNATIVE ENERGY SYSTEMS CONSULTING, INC	27735	04/27/2020	21810-09	MVU ENGINEERING SVCS & SUPPORT-ENERGY EFFICIENT AUDIT	\$35.00
Remit to: CARLSBAD, CA					<u>FYTD:</u> \$41,910.82
AMERICAN FORENSIC NURSES	27639	04/13/2020	73263	PHLEBOTOMY SVCS	\$1,320.00
		04/13/2020	73248	PHLEBOTOMY SVCS	
	27736	04/27/2020	73290	PHLEBOTOMY SVCS	\$965.00
		04/27/2020	73306	PHLEBOTOMY SVCS	
Remit to: LA QUINTA, CA					<u>FYTD:</u> \$22,455.00
AMERICAN HOMES 4 RENT PROPERTIES FIVE LLC	239075	04/06/2020	BL#35897- YR2020	REFUND/OVER PAYMENT FOR BL#35897	\$81.00
Remit to: CALABASAS, CA					<u>FYTD:</u> \$81.00
AMERICAN RESIDENTIAL LEASING COMPANY LLC	239076	04/06/2020	BL#31715- YR2020	REFUND/OVER PAYMENT FOR BL#31715	\$103.58
Remit to: CALABASAS, CA					<u>FYTD:</u> \$103.58

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AMERIGAS PROPANE, LP	239230	04/20/2020	BL#00402- YR2020	REFUND/OVER PAYMENT FOR BL#00402	\$93.63
Remit to: VALLEY FORGE, PA					<u>FYTD:</u> \$93.63
ANGEL BOBBITT	27543	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: PERRIS, CA					<u>FYTD:</u> \$1,750.00
ANGELA B. WILLIAMS	27544	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
ANIMAL EMERGENCY CLINIC, INC.	27737	04/27/2020	MARCH 2020	AFTER HOURS EMERGENCY VET SVCS-MV ANIMAL SHELTER	\$310.00
Remit to: GRAND TERRACE, CA					<u>FYTD:</u> \$5,197.00
ANTHONY ALFARO	27545	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
ARELLANO, JESSICA	239153	04/13/2020	R20-146723	ANIMAL SERVICES REFUND-SPAY/NEUTER DEPOSITS FOR 2 DOGS	\$150.00
Remit to: MOORPARK, CA					<u>FYTD:</u> \$150.00
ARIAS, MARIBEL	239294	04/27/2020	2001751.047	RENTAL REFUND BALANCE	\$120.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$120.00
AROSTEGUI, KRISTI	239295	04/27/2020	R20-147163	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$95.00
ASTORGA, DANNY	239072	04/06/2020	REIMB. 3/26/20	REIMBURSE CLEANING SUPPLIES PURCHASED (COVID-19)	\$136.91
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$136.91

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AUTOMATIC STOREFRONT SERVICE/E-Z AUTOMATED SYSTEMS	239258	04/27/2020	0030935	REPLACED STOREFRONT DOOR CLOSER-ANNEX 1	\$1,006.18
Remit to: CHINO, CA					<u>FYTD:</u> \$35,917.36
AVALOS, RUBI	239296	04/27/2020	2001723.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$84.50
AVANT GARDE	27693	04/20/2020	6055	HOME HABITAT FOR HUMANITY-MARCH 2020	\$1,365.00
	27738	04/27/2020	6054	HOME PROGRAM MANAGEMENT-MARCH 2020	\$1,911.25
Remit to: POMONA, CA					<u>FYTD:</u> \$14,918.75
AVIMA, ANGELICA	239297	04/27/2020	2001774.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$206.20
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$206.20
BELL, MARY	239077	04/06/2020	R20-147033	ANIMAL SERVICES REFUND-RETURN ADOPTION FEES	\$163.00
Remit to: WOODLAND HILLS, CA					<u>FYTD:</u> \$163.00
BIO-TOX LABORATORIES	239112	04/13/2020	39522	FORENSIC TOXICOLOGY TESTING SVCS FOR PD	\$184.00
	239259	04/27/2020	37239	FORENSIC TOXICOLOGY TESTING SVCS FOR PD	\$6,156.00
		04/27/2020	37174	FORENSIC TOXICOLOGY TESTING SVCS FOR PD	
		04/27/2020	37175	FORENSIC TOXICOLOGY TESTING SVCS FOR PD	
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$55,836.00
BIRD, JAMIE	27546	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
BLEDSOE, NONA	239154	04/13/2020	2001739.047	REFUND - FLAG FOOTBALL JUNIOR CLASS	\$67.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$67.00

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BLUECOSMO	27740	04/27/2020	BU01211238	SATELLITE PHONE SERVICE PLAN-FIRE	\$548.00
Remit to: SEATTLE, WA					<u>FYTD:</u> \$4,406.00
BMW MOTORCYCLES OF RIVERSIDE	27694	04/20/2020	6024196	MAINT & REPAIRS-TRAFFIC MOTORCYCLE	\$1,417.65
		04/20/2020	6024078	MAINT & REPAIRS-TRAFFIC MOTORCYCLE	
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$262,217.60
BOB MURRAY & ASSOCIATES	239113	04/13/2020	8529	EXECUTIVE SEARCH-COMMUNITY DEVELOPMENT DIRECTOR	\$272.03
Remit to: ROSEVILLE, CA					<u>FYTD:</u> \$65,227.65
BOLANOS MAINTENANCE	239231	04/20/2020	BL#35237- YR2020	REFUND/OVER PAYMENT FOR BL#35237	\$3.05
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$3.05
BONNIE L. GALLOWAY	27547	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
BOSCO LEGAL SERVICE, INC.	27548	04/06/2020	STMT127471	LEGAL COURIER SVCS 2/4-2/28/20	\$999.55
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$12,007.60

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BOX SPRINGS MUTUAL WATER COMPANY	239060	04/06/2020	1088-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	\$392.62
		04/06/2020	195-5 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	45-4 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	331-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	1087-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	204-9 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	80-4 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	721-1 3/25/20	WATER USAGE-TOWNGATE MARCH 2020	
		04/06/2020	1086-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	1085-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	1084-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	189-13 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	
		04/06/2020	36-1 3/25/20	WATER ASSESSMENT ON VACANT LOTS OWNED BY THE HOUSING AUTHORITY	

Remit to: MORENO VALLEY, CA FYTD: \$4,222.34

BRAUN BLAISING SMITH WYNNE, P.C.	239260	04/27/2020	18832	LEGAL SERVICES-MV UTILITY-MARCH 2020	\$921.40
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Remit to: SACRAMENTO, CA FYTD: \$9,541.98

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BRIDGEPAY NETWORK SOLUTIONS	27640	04/13/2020	5401	CREDIT CARD GATEWAY SVCS-MAR 2020	\$15.90
Remit to: ALTAMONTE SPRINGS, FL					<u>FYTD:</u> \$329.10
BRIGHTVIEW LANDSCAPE SERVICES, INC.	27549	04/06/2020	6682663	LANDSCAPE MAINT-ZONES D, M, S, 09, LM-01H & LM-02A	\$18,146.89
	27741	04/27/2020	6750150	LANDSCAPE MAINT-ZONES D, M, S, 09, LM-01H, LM-02A & LM-01G	\$18,534.30
Remit to: PASADENA, CA					<u>FYTD:</u> \$379,030.50
BRISK TRANSPORTATION & COLD STORAGE, INC.	239108	04/06/2020	5817	COVID-19 PERSONAL PROTECTIVE EQUIPMENT-COVERALLS	\$15,516.00
Remit to: ONTARIO, CA					<u>FYTD:</u> \$15,516.00
BUCKINGHAM PROPERTY MANAGEMENT	239078	04/06/2020	BL#19114- YR2020	REFUND/OVER PAYMENT FOR BL#19114	\$132.20
	239079	04/06/2020	BL#20101- YR2020	REFUND/OVER PAYMENT FOR BL#20101	\$407.40
Remit to: FRESNO, CA					<u>FYTD:</u> \$539.60
BUNYAK, STEVE	239080	04/06/2020	BL#27854-YR2020	REFUND/OVER-PAYMENT FOR BL#27854	\$108.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$108.00
BURNETT, SHERRY	239081	04/06/2020	2001543.047	SENIOR CTR. RENTAL REFUND	\$300.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$300.00
BYRD, HARVEY	239155	04/13/2020	R20-146886	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$95.00

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C A S C ENGINEERING AND CONSULTING INC	239156	04/13/2020	BL#00239- YR2020	REFUND/OVER PAYMENT FOR BL#00239	\$75.00
Remit to: GRAND TERRACE, CA					<u>FYTD:</u> \$75.00
CALIFORNIA BUILDING STANDARDS COMMISSION	239261	04/27/2020	1ST QTR 2020	SB 1473 FEES COLLECTED FOR 1/1-03/31/20	\$1,545.30
Remit to: SACRAMENTO, CA					<u>FYTD:</u> \$11,261.70
CALIFORNIA MUNICIPAL UTILITIES ASSOC.	239262	04/27/2020	19-0521	CMUA 2020 STATEWIDE SURVEY	\$1,500.00
Remit to: SACRAMENTO, CA					<u>FYTD:</u> \$25,583.92
CALIFORNIA STATE ASSOCIATION OF COUNTIES	239114	04/13/2020	36921	RECRUITMENT POSTING-CODE & NEIGHBORHOOD SVCS DIVISION MANAGER	\$150.00
Remit to: SACRAMENTO, CA					<u>FYTD:</u> \$150.00
CAMERON-DANIEL, P.C.	27742	04/27/2020	1129	LEGAL SERVICES-MV UTILITY	\$4,251.50
Remit to: ROSEVILLE, CA					<u>FYTD:</u> \$46,158.00
CANYON SPRINGS HIGH SCHOOL WRESTLING BOOSTER CLUB	239298	04/27/2020	2001750.047	SENIOR CTR. RENTAL REFUND	\$1,117.64
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,117.64
CARASOFT TECHNOLOGY CORPORATION	239115	04/13/2020	IN751772	LEXISNEXIS ANNUAL MAINT 4/1/20-3/31/21	\$2,682.21
Remit to: RESTON, VA					<u>FYTD:</u> \$2,682.21
CARLA GABRIELA GONZALEZ	27550	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00

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CARRANZA, LEIDY	239299	04/27/2020	2001729.047	REFUND - TIME 4 TOTS CRC PM	\$84.50
Remit to: MORENO VALLEY, CA					FYTD: \$84.50
CASTILLO, BLANCA	239082	04/06/2020	R20-146702	ANIMAL SERVICES REFUND-SPAY/NEUTER DEPOSIT	\$75.00
Remit to: RIVERSIDE, CA					FYTD: \$75.00
CEMEX	239116	04/13/2020	9441611814	MIXED CONCRETE MATERIALS	\$516.29
	239206	04/20/2020	9441623637	MIXED CONCRETE MATERIALS	\$516.29
Remit to: PASADENA, CA					FYTD: \$15,528.98
CHANDLER ASSET MANAGEMENT, INC	27642	04/13/2020	2003MORENOVA	INVESTMENT MANAGEMENT SVCS-MAR 2020	\$7,296.47
Remit to: SAN DIEGO, CA					FYTD: \$68,288.87
CHAPPELL, TREANNA	239157	04/13/2020	2001712.047	REFUND - FLAG FOOTBALL JUNIOR	\$67.00
Remit to: MORENO VALLEY, CA					FYTD: \$67.00
CHARLES ABBOTT ASSOCIATES, INC	27643	04/13/2020	60765	PLAN CHECK SVCS-BOULDER RIDGE-PEN18-0109	\$3,178.00
		04/13/2020	60766	PLAN CHECK SVCS-TOWNGATE STARBUCKS-FEB 2020	
		04/13/2020	60764	PLAN CHECK SVCS-HF CORPORATE PARK PHASE 2	
		04/13/2020	60763	PLAN CHECK SVCS-ENCROACHMENT PERMITS	
Remit to: MISSION VIEJO, CA					FYTD: \$251,547.00
CHAVIRA, ANGEL	239300	04/27/2020	2001761.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					FYTD: \$84.50
CHEYENNE BURTON	27551	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00

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CHIANG, IVAN	239301	04/27/2020	REFUND	REFUND-MORENO ROSE SENIOR COMMUNITY PROJECT	\$16,425.20
Remit to: FOUNTAIN VALLEY, CA					FYTD: \$16,425.20
CHRISTINA RUIZ	27552	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
CHUNG, SUN	239083	04/06/2020	2001549.047	REFUND BALANCE - BALLET FOR KIDS	\$20.50
Remit to: MORENO VALLEY, CA					FYTD: \$20.50
CINTAS FIRST AID & SAFETY	239263	04/27/2020	5016862838	FIRST AID KIT SUPPLIES-CORPORATE YARD MECHANIC SHOP	\$243.88
		04/27/2020	5016862827	FIRST AID KIT SUPPLIES-CORPORATE YARD OFFICES	
		04/27/2020	5016862828	FIRST AID KIT SUPPLIES-CONFERENCE AND RECREATION CENTER	
		04/27/2020	5016862837	FIRST AID KIT SUPPLIES-CORPORATE YARD WAREHOUSE	
		04/27/2020	5016862836	FIRST AID KIT SUPPLIES-CITY HALL	
		04/27/2020	5016862839	FIRST AID KIT SUPPLIES-CORPORATE YARD SIGNS SIGNAL	
Remit to: CINCINNATI, OH					FYTD: \$2,113.79
CISNEROS, BREANNA	239158	04/13/2020	2001713.047	PICNIC SHELTER RENTAL REFUND-CELEBRATION PARK	\$81.44
Remit to: MORENO VALLEY, CA					FYTD: \$81.44
CIVIC SOLUTIONS, INC	27553	04/06/2020	022920	PLANNING ENTITLEMENT AND PLAN CHECK SVCS-FEBRUARY 2020	\$6,984.16
	27695	04/20/2020	89719	PLANNING ENTITLEMENT AND PLAN CHECK SVCS-MARCH 2020	\$1,365.00
	27743	04/27/2020	89641	PLANNING ENTITLEMENT AND PLAN CHECK SVCS-2/24-2/29/2020	\$2,625.00
Remit to: MISSION VIEJO, CA					FYTD: \$113,080.80
CLARISSA M RUIZ	27554	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00

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CLEARY, DEBORAH	239233	04/20/2020	R20-147346	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: PERRIS, CA					<u>FYTD:</u> \$95.00
COLLINS, RONDA	239234	04/20/2020	2001741.047	RENTAL REFUND BALANCE	\$20.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$20.50
COLONIAL SUPPLEMENTAL INSURANCE	239061	04/06/2020	7133069-0401381	EMPLOYEE SUPPLEMENTAL INSURANCE	\$7,939.42
	239264	04/27/2020	7133069-0501384	EMPLOYEE SUPPLEMENTAL INSURANCE	\$7,939.42
Remit to: COLUMBIA, SC					<u>FYTD:</u> \$79,716.94
COMPULINK MANAGEMENT CENTER, INC. - DBA LASERFICHE	27696	04/20/2020	4080	LASERFICHE IMPLEMENTATION	\$88.18
Remit to: LONG BEACH, CA					<u>FYTD:</u> \$235,170.46
CORODATA MEDIA STORAGE INC.	27644	04/13/2020	DS1292554	OFF-SITE MEDIA STORAGE-MARCH 2020	\$535.32
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$4,682.34
CORONADO FAMILY CHILD CARE	239084	04/06/2020	BL#31889- YR2020	REFUND/OVER PAYMENT FOR BL#31889	\$65.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$65.00
CORRAL, VANESA	239302	04/27/2020	2001770.047	MISCELLANEOUS SERVICES	\$30.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$30.00
COSCO FIRE PROTECTION, INC.	239107	04/06/2020	JC163448	PATIO INSTALLATION-ANIMAL SHELTER	\$23,694.00
Remit to: BREA, CA					<u>FYTD:</u> \$23,694.00

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COSTAR REALTY INFORMATION, INC	239117	04/13/2020	111009799-1	COMMERCIAL REAL ESTATE DATABASE SVC-APRIL 2020	\$1,500.62
Remit to: BALTIMORE, MD					FYTD: \$15,006.20
COUNSELING TEAM, THE	239062	04/06/2020	76008	EMPLOYEE ASSISTANCE PROGRAM-MARCH 2020	\$1,250.00
Remit to: SAN BERNARDINO, CA					FYTD: \$20,660.00
COUNTY OF RIVERSIDE	239118	04/13/2020	20-32399	RECORDATION-DOCUMENT #2020-0043310	\$29.00
	239119	04/13/2020	2890	REGISTERED VOTERS CONFIRMATION-CFD NO.1/ANNEX NO. 2020-52	\$105.00
		04/13/2020	2881	REGISTERED VOTERS CONFIRMATION-CFD NO. 2014-01/AMEND NO. 45	
		04/13/2020	2889	REGISTERED VOTERS CONFIRMATION-CFD NO. 2014-01/AMEND NO. 46	
	239228	04/20/2020	4082020	NOTICE OF EXEMPTION-PROJECT NO. 805 0054	\$50.00
Remit to: RIVERSIDE, CA					FYTD: \$312,520.28
COUNTY OF RIVERSIDE 1	239120	04/13/2020	PU000004948	JANITORIAL SUPPLIES-POLICE STATION-FEBRUARY 2020	\$1,233.03
	239265	04/27/2020	PU000004949	JANITORIAL SUPPLIES-POLICE STATION-MARCH 2020	\$1,528.56
Remit to: RIVERSIDE, CA					FYTD: \$9,072.59
COVINGTON & BURLING LLP	27697	04/20/2020	60889226	LEGAL SERVICES	\$12,089.00
Remit to: WASHINGTON, DC					FYTD: \$54,661.50
COWAN, DELORES R	27645	04/13/2020	JAN-MAR 2020	INSTRUCTOR SERVICES-ALL STARS CHEER CLASSES	\$600.00
Remit to: MORENO VALLEY, CA					FYTD: \$2,860.80
CREATIVE LAWNS AND CARE	239159	04/13/2020	BL#20893- YR2020	REFUND/OVER PAYMENT FOR BL#20893	\$71.00
Remit to: MORENO VALLEY, CA					FYTD: \$71.00

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CREER, BAKARI G.	239121	04/13/2020	SPRING 2020	2020 SPRING MAPPED STUDENTS/VENDORS	\$225.00
Remit to: MORENO VALLEY, CA					FYTD: \$225.00
CRIME SCENE STERI-CLEAN, LLC	27646	04/13/2020	40647	BIO HAZARD REMOVAL SERVICE	\$950.00
		04/13/2020	40608	BIO HAZARD REMOVAL SERVICE	
	27698	04/20/2020	40663	BIO HAZARD REMOVAL SERVICE	\$200.00
Remit to: RANCHO CUCAMONGA, CA					FYTD: \$10,550.00
CRUZ, VERONICA	239122	04/13/2020	SUMMER/FALL 2019	TUITION/EMPLOYEE EDUCATION REIMBURSEMENT	\$418.37
Remit to: MORENO VALLEY, CA					FYTD: \$564.53
D&D SERVICES DBA D&D DISPOSAL, INC.	239123	04/13/2020	114740	DECEASED ANIMAL REMOVAL-MARCH 2020	\$745.00
Remit to: VALENCIA, CA					FYTD: \$7,450.00
D.R HORTON	239160	04/13/2020	612-0077	REFUND-DEPOSIT BALANCE-BRIDGE ENGINEERING ANALYSIS OLIVER ST	\$200.00
	239161	04/13/2020	122630	REFUND-DEPOSIT BALANCE-INSPECTION SVCS OLIVER ST	\$6,955.00
Remit to: CORONA, CA					FYTD: \$7,155.00
DALAYSIA JANELLE COLEMAN	27555	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
DANIET LENONE LYLES	27556	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
DATA TICKET, INC.	27557	04/06/2020	111360	ADMIN CITATION PROCESSING-BLDG & SAFETY-FEB 2020	\$284.30
Remit to: IRVINE, CA					FYTD: \$221,153.98

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DAVID OLLIS LANDSCAPE DEVELOPMENT INC	239085	04/06/2020	BL#07644- YR2020	REFUND/OVER PAYMENT FOR BL#07644	\$81.50
Remit to: REDLANDS, CA					FYTD: \$81.50
DDL TRAFFIC INC.	27647	04/13/2020	6826	OPTICOM TRAFFIC SIGNAL EQUIPMENT	\$4,976.75
Remit to: CHINO HILLS, CA					FYTD: \$8,047.63
DE GUZMAN, ROSALLE	239086	04/06/2020	2001548.047	COTTONWOOD GOLF CTR. RENTAL REFUND	\$206.20
Remit to: MORENO VALLEY, CA					FYTD: \$206.20
DELTA DENTAL OF CALIFORNIA	27558	04/06/2020	BE003863220	EMPLOYEE DENTAL INSURANCE-PPO	\$15,510.87
	27744	04/27/2020	BE003885481	EMPLOYEE DENTAL INSURANCE-PPO	\$16,132.77
Remit to: SAN FRANCISCO, CA					FYTD: \$155,939.33
DELTACARE USA	27559	04/06/2020	BE003864076	EMPLOYEE DENTAL INSURANCE-HMO	\$4,832.18
	27745	04/27/2020	BE003886281	EMPLOYEE DENTAL INSURANCE-HMO	\$4,774.52
Remit to: DALLAS, TX					FYTD: \$62,970.76
DEPARTMENT OF CONSERVATION	239207	04/20/2020	1ST QTR 2020	SMI FEES REPORT-1ST QTR ENDING 3/31/20	\$2,834.58
Remit to: SACRAMENTO, CA					FYTD: \$31,406.29
DEPARTMENT OF ENVIRONMENTAL HEALTH	239266	04/27/2020	IN0380359	ENVIRONMENTAL HEALTH PERMIT-CELEBRATION PARK	\$406.00
Remit to: RIVERSIDE, CA					FYTD: \$24,176.50
DEVIN PARRISH	27560	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00

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DISH DBS CORPORATION	239124	04/13/2020	86557282/APR20	SATELLITE TV-FIRE STATION 99-3/31-4/30/20	\$106.05
Remit to: PALATINE, IL					<u>FYTD:</u> \$1,086.60
DIVINE FAMILY TRUST RENTAL PROPERTY	239087	04/06/2020	BL#25344- YR2020	REFUND/OVER PAYMENT FOR BL#25344	\$65.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$65.00
DIVISION OF THE STATE ARCHITECT	239125	04/13/2020	1ST QTR 2020-796	STATE PORTION-DISABILITY ACCESS & EDUCATION FEE REPORT 796	\$2,275.20
Remit to: SACRAMENTO, CA					<u>FYTD:</u> \$3,403.70
DOMEN, MERCED	239162	04/13/2020	R20-147136	ANIMAL SERVICES REFUND-CHANGE OF LICENSE TYPE	\$19.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$19.00
DORADO, NATHAN	239303	04/27/2020	R20-146956	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$95.00
DOTSON, JACQUELINE	239235	04/20/2020	R20-147269	ANIMAL SERVICES REFUND-DUPLICATE LICENSE PAYMENT	\$15.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$15.00

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E.R. BLOCK PLUMBING & HEATING, INC.	27562	04/06/2020	131343	BACKFLOW DEVICE REPAIR-UTILITY FIELD OFFICE	\$463.13
		04/06/2020	131426	BACKFLOW DEVICE TEST-FIRE STATION 99	
	27648	04/13/2020	131376	BACKFLOW DEVICE TEST-ZONES D, M, 02, 06, 01, 03 & NPDES	\$700.00
		04/13/2020	131430	BACKFLOW DEVICE TEST-ZONE NPDES	
		04/13/2020	131429	BACKFLOW DEVICE TEST-PUBLIC SAFETY BLDG.	
	27700	04/20/2020	131428	BACKFLOW DEVICE TEST-FIRE STATION 48	\$50.00
	27746	04/27/2020	131561	BACKFLOW DEVICE TEST-FIRE STATION 6	\$75.00
		04/27/2020	131560	BACKFLOW DEVICE TEST-FIRE STATION 91	
Remit to: RIVERSIDE, CA					FYTD: \$25,674.67
EASTERN MUNICIPAL WATER DISTRICT	239063	04/06/2020	FEB-20 4/06/20	WATER CHARGES	\$763.05
		04/06/2020	MAR-20 4/06/20	WATER CHARGES	
	239208	04/20/2020	MAR-20 4/20/20	WATER CHARGES	\$6,284.94
		04/20/2020	APR-20 4/20/20	WATER CHARGES	
Remit to: LOS ANGELES, CA					FYTD: \$1,699,141.68
ELENO ZEPEDA JR	27563	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
ELIAS MARIN	27564	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
ELIGIO, HECTOR	27565	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
ELIZABETH BUENROSTRO	27566	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: ANAHEIM, CA					FYTD: \$1,750.00

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EMERGENT BATTERY TECHNOLOGIES, INC.	27567	04/06/2020	36262	REPLACEMENT BATTERIES (28) FOR BATTERY BACKUP SYSTEMS	\$3,950.10
Remit to: ANAHEIM, CA					<u>FYTD:</u> \$15,257.65
ENCO UTILITY SERVICES MORENO VALLEY LLC	27649	04/13/2020	MFP-2020-43928	METER FEES-REGULAR	\$523.00
	27747	04/13/2020	0402-MF-02377	SOLAR SYSTEM INSPECTION	
		04/27/2020	C19-16-0120	VEHICLE HIT STREETLIGHT-THEODORE ST	\$9,335.49
		04/27/2020	0402-MF-02378	SOLAR SYSTEM INSPECTION	
Remit to: ANAHEIM, CA					<u>FYTD:</u> \$4,646,419.67
ENVIRONMENTAL & REGULATORY SPECIALIST, INC	27702	04/20/2020	2785	CONDUCTED BURROWING OWL SURVEY-POORMAN'S RESERVOIR MARCH 2020	\$1,600.00
Remit to: NEWPORT BEACH, CA					<u>FYTD:</u> \$3,200.00
ESCALANTE, RYAN	239304	04/27/2020	R20-147477	ANIMAL SERVICES REFUND-RABIES DEPOSIT	\$20.00
Remit to: COLTON, CA					<u>FYTD:</u> \$20.00
ESTEVON ELIGIO	27570	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
EWING IRRIGATION PRODUCTS	239126	04/13/2020	11309427	PARTS & SUPPLIES-IRRIGATION	\$11,481.12
		04/13/2020	9327392	CONTROLLER REPLACEMENTS-IRRIGATION	
Remit to: PHOENIX, AZ					<u>FYTD:</u> \$31,381.44

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FAIR HOUSING COUNCIL OF RIVERSIDE COUNTY, INC.	27572	04/06/2020	JAN-20 (FH)	FAIR HOUSING DISCRIMINATION SVCS-CDBG	\$5,082.46
		04/06/2020	JAN-20 (LT)	LANDLORD/TENANT MEDIATION SVCS-CDBG	
	27703	04/20/2020	FEB-20 (LT)	LANDLORD/TENANT MEDIATION SVCS-CDBG	\$4,063.49
		04/20/2020	FEB-20 (FH)	FAIR HOUSING DISCRIMINATION SVCS-CDBG	
Remit to: RIVERSIDE, CA					FYTD: \$50,634.49
FALCON ENGINEERING SERVICES, INC.	27748	04/27/2020	2019-04	PAVEMENT REHAB VARIOUS STREETS CDBG FY 19/20-INSPECTION SVCS	\$3,146.00
Remit to: CORONA, CA					FYTD: \$119,977.00
FAMILY SERVICE ASSOCIATION	27749	04/27/2020	01-2020-008	SENIOR NUTRITION PROGRAM FY 19/20-OCT-DEC 2019	\$6,717.53
Remit to: MORENO VALLEY, CA					FYTD: \$16,174.07
FAMILY SERVICES ASSOCIATION	239163	04/13/2020	2001744.047	CONFERENCE & REC. CTR. RENTAL REFUND	\$500.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,000.00
FERRELL GAS INC	239164	04/13/2020	BL#02451- YR2020	REFUND/OVER PAYMENT FOR BL#02451	\$62.89
Remit to: LIBERTY, MO					FYTD: \$62.89
FIEDLER, KRISTINE	27574	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
FIELDMAN, ROLAPP & ASSOC.	239209	04/20/2020	25163	BOND TEAM RFP PREPARATION AND REVIEW 2/6-3/19/20	\$3,255.00
Remit to: IRVINE, CA					FYTD: \$3,255.00
FIRST AMERICAN DATA TREE, LLC	239127	04/13/2020	20027760320	ONLINE SOFTWARE SUBSCRIPTION-MAR 2020	\$99.00
Remit to: PASADENA, CA					FYTD: \$990.00

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FOWLER, ERICA	239305	04/27/2020	R20-147527	ANIMAL SERVICES REFUND-DUPLICATE LICENSE PAYMENT	\$15.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$15.00
FR/CAL MORENO VALLEY, LLC	239236	04/20/2020	96068	REFUND-TRUST FUND BALANCE-PEN17-0065/NANDINA A INDUSTRIAL BLDG	\$221.50
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$62,683.66
FRANCE PUBLICATIONS, INC.	27650	04/13/2020	2020-34558	INTERFACE HEALTHCARE REAL ESTATE WEST-SPONSORSHIP-FEB 2020	\$3,000.00
		04/13/2020	2020-34559	INTERFACE ENTERTAINMENT EXPERIENCE EVOLUTION-SPONSORSHIP-FEB 2020	
Remit to: ATLANTA, GA					<u>FYTD:</u> \$42,795.00
FRANKLIN, L. C.	27575	04/06/2020	MAR-2020	MILEAGE REIMBURSEMENT	\$131.68
Remit to: PERRIS, CA					<u>FYTD:</u> \$1,609.18
FREE ENERGY SAVINGS COMPANY LLC	239165	04/13/2020	BL#21462- YR2020	REFUND/OVER PAYMENT FOR BL#21462	\$85.03
Remit to: MONTCLAIR, CA					<u>FYTD:</u> \$85.03
FRONTIER COMMUNICATIONS/FORMERLY VERIZON	27704	04/20/2020	7002Z183-S-20096	BACKBONE COMMUNICATIONS SERVICE 4/5/20-5/4/20	\$3,573.21
Remit to: ROCHESTER, NY					<u>FYTD:</u> \$34,097.09
FRONTIER COMMUNICATIONS/FORMERLY VERIZON CALIF.	239268	04/27/2020	081095-5/APR20	FOREIGN EXCHANGE BUSINESS LISTING-MV UTILITY	\$15.20
Remit to: CINCINNATI, OH					<u>FYTD:</u> \$5,004.96

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FUEL PROS, INC	27705	04/20/2020	0000048558	FUEL TANK VAPOR RECOVERY TESTING-FIRE STATION 91	\$6,101.28
		04/20/2020	0000048559	FUEL TANK VAPOR RECOVERY TESTING & REPAIRS-CITY YARD	
		04/20/2020	0000048391	FUEL TANK VAPOR RECOVERY TESTING-FIRE STATION 2	
		04/20/2020	0000048392	FUEL TANK VAPOR RECOVERY TESTING & REPAIRS-FIRE STATION 48	
Remit to: CHINO, CA					<u>FYTD:</u> \$17,638.08
FUSCOE ENGINEERING INC	239166	04/13/2020	BL#26142- YR2020	REFUND/OVER PAYMENT FOR BL#26142	\$81.92
Remit to: IRVINE, CA					<u>FYTD:</u> \$81.92
GARCIA, MARA	239306	04/27/2020	CK NO. 229340	REISSUE UNCLAIMED CHECK/REFUND-SPAY/NEUTER DEPOSIT	\$75.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$75.00
GARCIA, RUBY ANDIE NAVARRO	27576	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
GEOCON WEST, INC	239269	04/27/2020	72003440	ALESSANDRO BLVD/GRANT ST TRAFFIC SIGNAL/STREET IMPROVEMENTS	\$805.00
Remit to: SAN DIEGO, CA					<u>FYTD:</u> \$9,973.00
GEYSSELL PENATE-ESTRADA	27577	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
GIBBS, GIDEN, LOCHER,TURNER, SENET & WITTBRODT LLP	27578	04/06/2020	248745-002	UPDATE PUBLIC WORKS BID DOCUMENTS	\$5,037.50
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$5,616.50
GILLIAM, SUSAN	239167	04/13/2020	R20-147212	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: BEAUMONT, CA					<u>FYTD:</u> \$95.00

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GIPSON, JONAYE	239237	04/20/2020	2001736.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$1,030.70
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,030.70
GIVENS, SHERRY	239307	04/27/2020	2001769.047	RENTAL REFUND BALANCE	\$192.80
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$192.80
GLOBAL PAYMENTS, INC. DBA ACTIVE NETWORK, LLC	27651	04/13/2020	AN655462	ACTIVE NET PROCESSING FEES 3/16-3/22/20	\$20,679.75
		04/13/2020	AN654871	ACTIVE NET CUSTOMER REFUNDS 3/16-3/22/20	
		04/13/2020	AN658345	ACTIVE NET CUSTOMER REFUNDS 3/23-3/29/20	
		04/13/2020	AN658929	ACTIVE NET PROCESSING FEES 3/22-3/29/20	
Remit to: ATLANTA, GA					<u>FYTD:</u> \$20,679.75
GOETTI AIR CONDITIONING	239168	04/13/2020	BL#33124- YR2020	REFUND/OVER PAYMENT FOR BL#33124	\$82.17
Remit to: CORONA, CA					<u>FYTD:</u> \$82.17
GRAVES & KING, LLP	27579	04/06/2020	2002-0010227-05	LEGAL SERVICES-CLAIM MV1908 (S. LATTIMORE)	\$16,259.81
		04/06/2020	2001-0010166-04	LEGAL SERVICES-CLAIM MV 0010166 (INRI TOWING)	
		04/06/2020	2001-0010227-04	LEGAL SERVICES-CLAIM MV1908 (S. LATTIMORE)	
		04/06/2020	2002-0010166-05	LEGAL SERVICES-CLAIM MV 0010166 (INRI TOWING)	
	27652	04/13/2020	2002-0010107-04	LEGAL SERVICES-CLAIM MV0010104 (P. MIDDLEBROOKS)	\$339.08
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$140,578.35
GREENTECH LANDSCAPE, INC.	27580	04/06/2020	47474	LANDSCAPE MAINT-ZONES 01, 01A, 8 & E7	\$9,205.65
	27653	04/13/2020	47475	LANDSCAPE MAINT-PARKS	\$11,593.00
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$255,386.36
GRIFFIS, TYLER	239308	04/27/2020	R20-147361	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: REDLANDS, CA					<u>FYTD:</u> \$95.00

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GUEVARA, MONICA	239169	04/13/2020	2001706.047	REFUND - ROBERTO'S PARENT AND CHILD AMAZING MARTIAL ARTS CLASS	\$48.00
Remit to: PERRIS, CA					<u>FYTD:</u> \$48.00
GW SERVICES, LLC	239171	04/13/2020	CK NO. 231041	REISSUE UNCLAIMED CHECK DATED 4/3/17-BL#02891 OVERPAYMENT	\$68.11
Remit to: VISTA, CA					<u>FYTD:</u> \$68.11
HAAKER EQUIPMENT	27654	04/13/2020	M05838	HYDROTEX PRESSURE WASHER	\$5,198.94
Remit to: LA VERNE, CA					<u>FYTD:</u> \$393,860.73
HABITAT FOR HUMANITY RIVERSIDE	27581	04/06/2020	MHR1920-1	MOBILE HOME REPAIR PROGRAM-JANUARY 2020	\$1,638.74
		04/06/2020	MHR1920-2	MOBILE HOME REPAIR PROGRAM-FEBRUARY 2020	
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$320,605.45
HALL, LAKISHA	239309	04/27/2020	R20-146908	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: FONTANA, CA					<u>FYTD:</u> \$95.00
HAMPTON INN & SUITES	239088	04/06/2020	BL#28941- YR2020	REFUND/OVER PAYMENT FOR BL#28941	\$2,610.81
Remit to: SPARTANBURG, SC					<u>FYTD:</u> \$2,610.81
HARPER, TARSHA	239172	04/13/2020	2001630.047	REFFUND - FLAG FOOTBALL PEE WEE CLASS	\$67.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$67.00
HARRIS FAMILY DAYCARE	239173	04/13/2020	BL#18479- YR2020	REFUND/OVER PAYMENT FOR BL#18479	\$121.21
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$121.21

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HASCO HEATING AIR CONDITIONING SERVICE COMPANY	27750	04/27/2020	93883	HVAC REPAIR-CITY HALL	\$19,809.20
		04/27/2020	93880	HVAC REPAIR-PUBLIC SAFETY BLDG.	
		04/27/2020	93879	HVAC REPAIR-PUBLIC SAFETY BLDG.	
		04/27/2020	93884	HVAC REPAIR-CITY HALL	
		04/27/2020	93630	HVAC REPAIR-CONFERENCE & REC. CENTER	
		04/27/2020	93629	HVAC REPAIR-CONFERENCE & REC. CENTER	
		04/27/2020	93882	HVAC REPAIR-EMERGENCY OPERATION CENTER	
		04/27/2020	93881	HVAC REPAIR-EMERGENCY OPERATION CENTER	
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$64,462.07
HELWIG, KRYSTAL	239310	04/27/2020	2001717.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$84.50
HERRERA, GINA	239238	04/20/2020	2001749.047	PICNIC SHELTER RENTAL REFUND-SHADOW MOUNTAIN PARK	\$124.70
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$124.70
HILLTOP GEOTECHNICAL, INC.	27582	04/06/2020	17220	CITYWIDE PAVEMENT REHAB PROGRAM FY18-19, CONSULTANT SERVICES	\$9,018.00
		04/06/2020	17221	CITYWIDE PAVEMENT REHAB PROGRAM FY18-19, CONSULTANT SERVICES	
Remit to: SAN BERNARDINO, CA					<u>FYTD:</u> \$63,575.50
HINDERLITER DE LLAMAS & ASSOCIATES	239128	04/13/2020	0033186-IN	SALES TAX AUDIT SVCS-QUARTER 3 2019	\$13,535.64
Remit to: BREA, CA					<u>FYTD:</u> \$37,486.18

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HLP, INC.	27706	04/20/2020	17841	WEB LICENSE MONTHLY SVC FEE	\$101.50
Remit to: LITTLETON, CO					<u>FYTD:</u> \$32,482.35
HODGE, SONDRRA	239089	04/06/2020	R20-146884	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: ANAHEIM, CA					<u>FYTD:</u> \$95.00
HR GREEN PACIFIC INC.	27655	04/13/2020	133447	PLAN CHECK SVCS-ENCROACHMENT PERMITS	\$11,391.00
		04/13/2020	132310	PLAN CHECK SVCS-DEC 2019	
		04/13/2020	133452	PLAN CHECK SVCS-WQMP-THRU 2/28/20	
Remit to: DES MOINES, IA					<u>FYTD:</u> \$188,322.00
HUGHES NETWORK SYSTEMS, LLC	239129	04/13/2020	B1-357791960	INTERNET SVCS 3/30-4/30/20	\$92.34
Remit to: CHICAGO, IL					<u>FYTD:</u> \$923.40
HUNT, CATRINA	239174	04/13/2020	R20-147216	ANIMAL SERVICES REFUND-RABIES DEPOSIT	\$20.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$20.00
HUYER-DRUSCHEL, BRYANNA	239239	04/20/2020	R20-146737	ANIMAL SERVICES REFUND-SPAY/NEUTER DEPOSIT	\$75.00
Remit to: COLTON, CA					<u>FYTD:</u> \$75.00
INLAND EMPIRE PROPERTY SERVICE, INC	27584	04/06/2020	19133	WEED ABATEMENT SVCS-APN 308-030-019	\$161.00
	27707	04/20/2020	20108	NUISANCE ABATEMENT SVCS-25426 FRAN LOU	\$6,654.43
		04/20/2020	20111	NUISANCE ABATEMENT SVCS-25426 FRAN LOU	
		04/20/2020	20110	NUISANCE ABATEMENT SVCS-26124 WINDEMERE WAY	
		04/20/2020	20109	NUISANCE ABATEMENT SVCS-292-022-011, 032 & 061	
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$221,081.32

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INLAND OVERHEAD DOOR COMPANY	27585	04/06/2020	45106	GATE REPAIR-FIRE STATION 91	\$289.00
	27656	04/13/2020	45144	GATE REPAIR-CITY YARD	\$69.50
	27708	04/20/2020	44319	GATE REPAIR-FIRE STATION 48	\$7,146.00
		04/20/2020	45199	ROLL UP DOOR REPAIR-FIRE STATION 6	
		04/20/2020	44661-1	GATE REPAIR-PUBLIC SAFETY BUILDING	
		04/20/2020	45195	GATE REPAIR-PUBLIC SAFETY BUILDING	
		04/20/2020	44955	GATE REPAIR-UTILITY FIELD OFFICE	
		04/20/2020	44956	GATE REPAIR-CITY YARD	
		04/20/2020	45158	GATE REPAIR-CITY YARD	
	27751	04/27/2020	45218	ROLL UP DOOR REPAIR-CITY YARD	\$139.00
Remit to: COLTON, CA					FYTD: \$44,273.63
INSIDE PLANTS, INC.	27586	04/06/2020	79203	INSIDE PLANT MAINT SVC-APRIL 2020	\$137.00
Remit to: CORONA, CA					FYTD: \$1,370.00
INTERPRETERS UNLIMITED	27709	04/20/2020	M20M3-13197	LANGUAGE INTERPRETATION SERVICES	\$88.00
Remit to: SAN DIEGO, CA					FYTD: \$1,212.00
IRIS PARTNERS, LLC	27752	04/27/2020	MAY 2020	LEASE PAYMENT-LIBRARY-MAY 2020	\$8,944.44
Remit to: UPLAND, CA					FYTD: \$30,461.46
ISMAEL OROZCO	27587	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
J & S JEWELRY	239240	04/20/2020	BL#12214- YR2020	REFUND/OVER PAYMENT FOR BL#12214	\$79.98
Remit to: LOS ANGELES, CA					FYTD: \$79.98

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J B C ROOFING	239241	04/20/2020	BL#33651- YR2020	REFUND/OVER PAYMENT FOR BL#33651	\$150.75
Remit to: REDLANDS, CA					FYTD: \$150.75
J C PENNEY OPTICAL #1045	239090	04/06/2020	BL#03457- YR2020	REFUND/OVER PAYMENT FOR BL#03457	\$88.26
Remit to: GLENDORA, NJ					FYTD: \$88.26
JACQUELINE CENTENO	27588	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,500.00
JENNIFER PEREZ	27589	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
JOHANNA DEL ROSARIO RAMOS ANGULO	27590	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
JONES III, JAMES	239091	04/06/2020	126921	REFUND-HOME OCCUPATION PERMIT	\$95.00
Remit to: MORENO VALLEY, CA					FYTD: \$95.00
JOSEPH O'NEIL MCDANIEL	27591	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
JOSIAH NELSON	27592	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
JTB SUPPLY CO., INC.	27593	04/06/2020	107113	TRAFFIC SIGNAL MAINT REPAIR	\$1,745.55
	27657	04/13/2020	107159	TRAFFIC SIGNAL MAINT SUPPLIES	\$11,620.28
Remit to: ORANGE, CA					FYTD: \$103,938.68

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JUDITH ALEJANDRA PEREZ	27594	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
KARLA NOEMI GOMEZ	27595	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
KATIE VAZQUEZ	27596	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
KEANE, RAMON	239311	04/27/2020	R20-146819	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: IRVINE, CA					<u>FYTD:</u> \$95.00
KIM'S BEAUTY SUPPLIES	239175	04/13/2020	BL#33088- YR2020	REFUND/OVER PAYMENT FOR BL#33088	\$60.00
Remit to: LA PALMA, CA					<u>FYTD:</u> \$60.00
KLEITZS TAX SERVICE	239242	04/20/2020	BL#03726- YR2020	REFUND/OVER PAYMENT FOR BL#03726	\$73.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$73.00
KODIAK CONCEPTS INC	239176	04/13/2020	BL#35526- YR2020	REFUND/OVER PAYMENT FOR BL#35526	\$109.25
Remit to: LAKE FOREST, CA					<u>FYTD:</u> \$109.25
KONICA MINOLTA BUSINESS SOLUTIONS, USA	27658	04/13/2020	35254625	COPIER LEASE-CITY CLERK	\$1,399.02
	27710	04/20/2020	9006657858	COPIER USAGE-MARCH 2020	\$76.42
	27754	04/27/2020	35288181	COPIER LEASE-CITY WIDE	\$9,665.10
Remit to: PASADENA, CA					<u>FYTD:</u> \$101,072.92
KOU, KEVIN	239312	04/27/2020	R20-146750	ANIMAL SERVICES REFUND-SPAY/NEUTER DEPOSIT	\$75.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$75.00

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KTU+A	27597	04/06/2020	31826	CONSULTING SVCS-DRACAEA NEIGHBORHOOD GREENWAY	\$18,067.24
	27755	04/27/2020	31940	CONSULTING SVCS-DRACAEA NEIGHBORHOOD GREENWAY	\$11,931.25
Remit to: SAN DIEGO, CA					FYTD: \$32,778.49
KYLE CHRISTOPHER MOSLEY	27598	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
L A SOLAR GROUP INC	239092	04/06/2020	BL#30509- YR2020	REFUND/OVER PAYMENT FOR BL#30509	\$78.37
Remit to: VAN NUYS, CA					FYTD: \$78.37
LA DALE JENNINGS CONSTRUCTION	239177	04/13/2020	BL#31747- YR2020	REFUND/OVER PAYMENT FOR BL#31747	\$62.25
Remit to: BURBANK, CA					FYTD: \$62.25
LARA, DIANA	239243	04/20/2020	2001747.047	RENTAL REFUND BALANCE	\$67.00
Remit to: MORENO VALLEY, CA					FYTD: \$67.00
LARRY JACINTO CONSTRUCTION INC	239093	04/06/2020	BL#03413- YR2020	REFUND/OVER PAYMENT FOR BL#03413	\$99.99
	239244	04/20/2020	BL#03413- YR2020	REFUND/OVER PAYMENT FOR BL#03413	\$150.14
Remit to: MENTONE, CA					FYTD: \$250.13
LATITUDE GEOGRAPHICS	239270	04/27/2020	INV0012900	GEOCORTEX TECHNICAL SUPPORT HOURS 11/3-11/30/19	\$350.00
Remit to: VICTORIA, BC					FYTD: \$15,720.00
LEE-WALLACE, COURTNEY	239245	04/20/2020	2001734.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$848.80
Remit to: MORENO VALLEY, CA					FYTD: \$848.80

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LEIGHTON CONSULTING INC	239178	04/13/2020	BL#16734- YR2020	REFUND/OVER PAYMENT FOR BL#16734	\$74.03
Remit to: TEMECULA, CA					<u>FYTD:</u> \$74.03
LEIVAS, INC. DBA. LEIVAS LIGHTING	27711	04/20/2020	1010392	LANDSCAPE LIGHTING MAINT-MAR 2020-ZONES M, E-7, 01, 02 & 03	\$4,074.80
		04/20/2020	1010393	LANDSCAPE LIGHTING MAINT-FEB 2020-ZONES M, E-7, 01, 02 & 03	
		04/20/2020	1010391	LANDSCAPE LIGHTING MAINT-JAN 2020-ZONES M, E-7, 01, 02 & 03	
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$55,452.57
LEQUIRE, TARA	239179	04/13/2020	2001699.047	REFUND - ART EXPRESSION LEVEL 1 CLASS	\$36.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$36.00
LEVEL 3 COMMUNICATIONS/FORMERLY TW TELCOM	27659	04/13/2020	90436838	LOCAL/LONG DISTANCE CALLS 3/17-4/16/20	\$5,430.04
		04/13/2020	90436838a	INTERNET & DATA SVCS 3/17-4/16/20	
	27756	04/27/2020	91456648(a)	INTERNET & DATA SVCS 4/17-5/16/20	\$6,550.68
		04/27/2020	91456648	LOCAL/LONG DISTANCE CALLS 4/17-5/16/20	
Remit to: BROOMFIELD, CO					<u>FYTD:</u> \$60,945.30
LEXISNEXIS PRACTICE MANAGEMENT	27599	04/06/2020	3092520767	LEGAL RESEARCH TOOLS-FEB 2020	\$1,104.00
	27660	04/13/2020	3092574167	LEGAL RESEARCH TOOLS-MAR 2020	\$1,104.00
Remit to: CHICAGO, IL					<u>FYTD:</u> \$11,958.00

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LILLY, ANA	27661	04/13/2020	00070	GRAPHIC/WEB DESIGN 3/08-3/21/20	\$1,117.79
	27712	04/20/2020	00071	GRAPHIC/WEB DESIGN 3/22-4/04/20	\$1,399.40
Remit to: RIVERSIDE, CA					FYTD: \$21,082.12
LILY MUYAMBO	27601	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
LIMBO, EIFEL	239313	04/27/2020	2001717.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
	239314	04/27/2020	2001760.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					FYTD: \$169.00
LOPEZ, LAYLONIE NUNE	239130	04/13/2020	SPRING 2020	2020 SPRING MAPPED STUDENTS/VENDORS	\$50.00
Remit to: MORENO VALLEY, CA					FYTD: \$50.00
LOPEZ, SAMANTHA YAMILETH	27602	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
LYONS SECURITY SERVICE, INC.	27603	04/06/2020	27717	SECURITY GUARD SVCS-CONF & REC CTR-JAN 2020	\$6,746.87
	27662	04/13/2020	27921	SECURITY GUARD SVCS-COTTONWOOD GOLF CTR SPECIAL EVENTS-MAR 2020	\$7,104.50
		04/13/2020	27922	SECURITY GUARD SVCS-TOWNGATE COMM CTR-MAR 2020	
		04/13/2020	27923	SECURITY GUARD SVCS-LIBRARY-MAR 2020	
		04/13/2020	27919	SECURITY GUARD SVCS-CITY HALL-MAR 2020	
	27713	04/20/2020	27837	SECURITY GUARD SVCS-CONF & REC CTR-FEB 2020	\$14,603.08
		04/20/2020	27920	SECURITY GUARD SVCS-CONF & REC CTR-MAR 2020	
	27757	04/27/2020	27860	SECURITY GUARD SVCS-MV UTILITY-MAR 2020	\$80.68
Remit to: ANAHEIM, CA					FYTD: \$156,230.03

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MAINSTREET PROPERTY GROUP, LLC.	239094	04/06/2020	85933	REFUND DEPOSIT BALANCE-MAINSTREET TRANSITIONAL CARE FACILITY	\$2,170.00
Remit to: CARMEL, IN					<u>FYTD:</u> \$2,170.00
MALIBU TRANSPORTATION LLC	239180	04/13/2020	BL#31354- YR2020	REFUND/OVER PAYMENT FOR BL#31354	\$68.56
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$68.56
MANSANAREZ, MELINDA	239315	04/27/2020	2001716.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
	239316	04/27/2020	2001759.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$169.00
MARIA R. JONES	27604	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
MARIPOSA LANDSCAPES, INC.	27605	04/06/2020	88195	LANDSCAPE EXTRA WORK-FEB20-ZONE 02/REMOVE BROKEN BRANCH-PASEO3	\$917.38
		04/06/2020	88194	LANDSCAPE EXTRA WORK-FEB20-ZONE 02/REMOVE BROKEN BRANCHES-AREA 4	
		04/06/2020	88193	LANDSCAPE EXTRA WORK-FEB20-ZONE 02/REMOVE BROKEN BRANCHES-PASEO3	
		04/06/2020	88192	LANDSCAPE EXTRA WORK-FEB20-ZONE 02/REMOVE BROKEN BRANCH-PASEO1	
		04/06/2020	87921	LANDSCAPE EXTRA WORK-JAN20-NPDES WQB/ANT CONTROL	
	27714	04/20/2020	88559	LANDSCAPE EXTRA WORK-MAR20-NPDES WQB/IRRIGATION REPAIRS	\$76.64
	27758	04/27/2020	88360	LANDSCAPE MAINT.-SD LMD ZONE 02-MAR. 2020	\$9,685.39
Remit to: IRWINDALE, CA					<u>FYTD:</u> \$428,682.10

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MARTINEZ, MARIA	239181	04/13/2020	2001697.047	REFUND - ART EXPRESSION LEVEL 1 CLASS	\$36.00
	239182	04/13/2020	2001698.047	REFUND - ART EXPRESSION LEVEL 1 CLASS	\$36.00
	239183	04/13/2020	2001702.047	REFUND - FOLKLORIC DANCE YOUTH BEGINNER CLASS	\$39.00
Remit to: MORENO VALLEY, CA					FYTD: \$861.00
MCA STONERIDGE LLC	239184	04/13/2020	MVU 7012650-02	COMMERCIAL LIGHTING REBATE INCENTIVE	\$3,296.40
Remit to: RIVERSIDE, CA					FYTD: \$29,068.51
MCCAIN TRAFFIC SUPPLY	239210	04/20/2020	INV0248705	TRAFFIC SIGNAL EQUIPMENT	\$860.92
Remit to: VISTA, CA					FYTD: \$466,484.85
MCHUGH, PATRICK	239095	04/06/2020	R20-146145	ANIMAL SERVICES REFUND-OVERPAYMENT ON WEB LICENSING	\$13.00
	239185	04/13/2020	R20-147061	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: MORENO VALLEY, CA					FYTD: \$108.00
MELISSA PEREZ	27606	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
MENGISTU, YESHIALEM	27607	04/06/2020	MAR-2020	MILEAGE REIMBURSEMENT	\$125.93
Remit to: MORENO VALLEY, CA					FYTD: \$1,237.96

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MERCHANTS BUILDING MAINTENANCE, LLC.	27715	04/20/2020	574664	SPECIAL CLEANINGS FOR FEB 2020 EVENT RENTALS-TOWNGATE COMM. CTR.	\$4,395.00
		04/20/2020	574705	SPECIAL CLEANINGS FOR MAR 2020 EVENT RENTAL-COTTONWOOD GOLF CTR.	
		04/20/2020	574662	SPECIAL CLEANINGS FOR FEB 2020 EVENT RENTALS-CONF. & REC. CENTER	
		04/20/2020	574706	SPECIAL CLEANINGS FOR MAR 2020 EVENT RENTAL-TOWNGATE COMM. CTR.	
		04/20/2020	574763	SPECIAL CLEANINGS FOR MAR 2020 EVENT RENTALS-CONF. & REC. CENTER	
	27759	04/27/2020	577792	SPECIAL CLEANINGS FOR FEB 2020 EVENT RENTAL-COTTONWOOD GOLF CTR	\$270.00
		04/27/2020	577790	SPECIAL CLEANINGS FOR JAN 2020 EVENT RENTALS-COTTONWOOD GOLF CTR	
Remit to: MONTEREY PARK, CA					FYTD: \$344,297.22
MERCHANTS LANDSCAPE SERVICES INC	27608	04/06/2020	55717	IRRIGATION REPAIRS-ZONE 03-FEB. 2020	\$12,465.29
		04/06/2020	55722	LANDSCAPE EXTRA WORK-FEB20-ZN 03/WELD METAL PLATE TO ACCESS DOOR	
		04/06/2020	55720	LANDSCAPE EXTRA WORK-FEB20-ZONE E-8/INSTALL PLANT MATERIAL	
		04/06/2020	55719	LANDSCAPE EXTRA WORK-FEB20-ZN 03/BLOCK OFF MONUMENT ACCESS DOOR	
	27716	04/20/2020	55718	IRRIGATION REPAIRS-ZONE 04-FEB. 2020	\$1,302.27
Remit to: MONTEREY PARK, CA					FYTD: \$504,118.89
MESA FENCE CO. INC	239186	04/13/2020	BL#22509- YR2020	REFUND/OVER PAYMENT FOR BL#22509	\$89.34
Remit to: PERRIS, CA					FYTD: \$89.34

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MICHAEL LE RENTAL PROPERTY	239187	04/13/2020	BL#24918- YR2020	REFUND/OVER PAYMENT FOR BL#24918	\$71.60
Remit to: MIRA LOMA, CA					<u>FYTD:</u> \$71.60
MICHELLE MADELINE BUSTAMANTE	27610	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
MILLER , ROBERT	239096	04/06/2020	R20-146303	ANIMAL SERVICES REFUND-DUPLICATE LICENSE PAYMENT	\$15.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$15.00
MISSION PACIFIC LAND COMPANY	239097	04/06/2020	DEPOSIT REFUND	REFUND-DEPOSIT BALANCE-PEN16-0092, 00193 & 0096	\$2,890.04
Remit to: NEWPORT BEACH, CA					<u>FYTD:</u> \$2,890.04
MONICA CABALLERO	27611	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
MOORE, HEZAKIAH	239131	04/13/2020	SPRING 2020	2020 SPRING MAPPED STUDENTS/VENDORS	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$250.00
MORALES, GLENDY	239317	04/27/2020	2001752.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$200.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$200.00
MORENO VALLEY EXPRESS CAR WASH	27761	04/27/2020	2	CAR WASH SERVICES FOR PD PATROL VEHICLES	\$1,085.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$2,633.00

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MORENO VALLEY MALL HOLDING, LLC	27762	04/27/2020	MAY 2020 RENT	MAY 2020 RENT PAYMENT FOR SP. 2078-M.V. LIBRARY BRANCH	\$6,874.54
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$68,745.40
MORENO VALLEY TOW & RADIATOR	239211	04/20/2020	9844	EVIDENCE TOWING FOR PD	\$225.00
	239271	04/27/2020	20-09865	EVIDENCE TOWING FOR PD	\$225.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$5,853.00
MR. MONEY MECHANIC LLC	239246	04/20/2020	BL#34669- YR2020	REFUND/OVER PAYMENT FOR BL#34669	\$81.52
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$81.52
MRE STAR, LLC	239212	04/20/2020	8967	EMERGENCY RATIONS - COMPLETE MEALS WITH HEATERS	\$4,464.00
Remit to: ELLENTON, FL					<u>FYTD:</u> \$4,464.00
NBS GOVERNMENT FINANCE GROUP	27665	04/13/2020	32000012	CONSULTING SERVICES-BOUNDARY MAP PREPARATION	\$400.00
Remit to: TEMECULA, CA					<u>FYTD:</u> \$22,655.00
NETRONIX INTEGRATION	27612	04/06/2020	S34546.01	CARD READER REPAIR-PUBLIC SAFETY BLDG.	\$8,797.04
		04/06/2020	S34694.01	CARD READER REPAIR-CONFERENCE & REC. CENTER	
		04/06/2020	S34124.01	CARD READER NODE REPLACEMENT-PUBLIC SAFETY BLDG.	
		04/06/2020	5426B20X.01	CARD READER AND SALTO INSTALLATION-PUBLIC SAFETY BLDG.	
Remit to: SAN JOSE, CA					<u>FYTD:</u> \$42,561.40
NEW ENGLAND LEAD BURNING COMPANY INC	239188	04/13/2020	BL#24741- YR2020	REFUND/OVER PAYMENT FOR BL#24741	\$65.67
Remit to: BURLINGTON, MA					<u>FYTD:</u> \$65.67

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NICOLE DENISE MUCKELROY	27613	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
NIEVES, JONATHAN	239133	04/13/2020	SPRING 2020	2020 SPRING MAPPED STUDENTS/VENDORS	\$225.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$225.00
NPG INC, DBA GOLDSTAR ASPHALT PRODUCTS	27763	04/27/2020	14846	ROAD AND HIGHWAY BUILDING MATERIALS-MAINT & OP'S	\$131.24
Remit to: PERRIS, CA					<u>FYTD:</u> \$131.24
OVERLAND PACIFIC & CUTLER, LLC	27764	04/27/2020	2003125	RIGHT OF WAY CONSULTING SERVICES	\$1,527.50
Remit to: LONG BEACH, CA					<u>FYTD:</u> \$17,389.90
PACIFIC COMMUNITIES BUILDER INC	239189	04/13/2020	BL#10015- YR2020	REFUND/OVER PAYMENT FOR BL#10015	\$83.29
Remit to: NEWPORT BEACH, CA					<u>FYTD:</u> \$83.29
PACIFIC TELEMAGEMENT SERVICES	27765	04/27/2020	2041995	PAY PHONE SERVICES-MAY 2020	\$137.81
Remit to: SAN RAMON, CA					<u>FYTD:</u> \$1,703.81
PAINTING BY ZEB BODE	27666	04/13/2020	04032020	PAINT/STENCIL FIRE LANE CURBING AT SUNNYMEAD & LASSELLE PARKS	\$3,280.00
Remit to: NORCO, CA					<u>FYTD:</u> \$10,817.00
PALAU, MEGAN	27667	04/13/2020	FALL/WINTER 2019	TUITION/EMPLOYEE EDUCATION REIMBURSEMENT	\$439.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$538.00

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PALLMAR AND COMPANY	239098	04/06/2020	BL#24447- YR2020	REFUND/OVER PAYMENT FOR BL#24447	\$65.75
Remit to: ORANGE, CA					<u>FYTD:</u> \$65.75
PATRICK SAADE	27614	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
PEDLEY SQUARE VETERINARY CLINIC	27668	04/13/2020	FEB-2020	VETERINARY SERVICES-MV ANIMAL SHELTER	\$8,688.50
	27717	04/20/2020	MAR-2020	VETERINARY SERVICES-MV ANIMAL SHELTER	\$10,574.41
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$131,292.34
PENA, ROSALINDA	239318	04/27/2020	2001754.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$115.00
Remit to: PERRIS, CA					<u>FYTD:</u> \$115.00
PEPE'S TOWING	239213	04/20/2020	89290	EVIDENCE TOWING FOR PD	\$675.00
		04/20/2020	90951	EVIDENCE TOWING FOR PD	
		04/20/2020	78797	EVIDENCE TOWING FOR PD	
	239272	04/27/2020	91708	EVIDENCE TOWING FOR PD	\$765.00
		04/27/2020	91702	EVIDENCE TOWING FOR PD	
		04/27/2020	91707	EVIDENCE TOWING FOR PD	
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$5,576.00
PERCEPTIVE ENTERPRISES, INC.	27669	04/13/2020	3608	PROFESSIONAL DBE CONSULTING SERVICES	\$4,740.00
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$22,170.00
PETTY CASH - FINANCE	239073	04/06/2020	MAR 2020	PETTY CASH FUND REPLENISHMENT	\$1,087.94
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$8,023.75

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PHELAN DEVELOPMENT, INC.	239247	04/20/2020	93876	REFUND-TRUST ACCOUNT BALANCE-PEN17-0036/97, 110SF WAREHOUSE	\$1,424.00
Remit to: NEWPORT BEACH, CA					<u>FYTD:</u> \$1,424.00
PHO HA NGUYEN	239190	04/13/2020	BL#34667- YR2020	REFUND/OVER PAYMENT FOR BL#34667	\$69.17
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$69.17
PICART, ANGELA	239191	04/13/2020	2001738.047	RENTAL REFUND BALANCE	\$77.30
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$77.30
PLANET R2	27670	04/13/2020	1048-I	KN95 MASKS FOR FIRST RESPONDERS/COVID-19	\$12,130.21
	239109	04/06/2020	1050-0	MOVAL MEALS-TOTE BAGS	\$6,373.69
		04/06/2020	1055	MOVAL MEALS-DISPOSABLE GLOVES	
Remit to: IRVINE, CA					<u>FYTD:</u> \$18,503.90
PLATTEN, YESENIA	239319	04/27/2020	2001722.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
	239320	04/27/2020	2001721.047	REFUND - TIME 4 TOTS CRC AM	\$71.82
	239321	04/27/2020	2001762.047	REFUND - TIME 4 TOTS CRC AM	\$71.82
	239322	04/27/2020	2001763.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$312.64
POLITICAL DATA INC.	239273	04/27/2020	605527	MAIL FILE-JOIN THE CONVERSATION COMMUNITY SURVEY	\$2,321.72
Remit to: NORWALK, CA					<u>FYTD:</u> \$2,321.72
PRESS ENTERPRISE/CALIFORNIA NEWSPAPERS PARTNERSHIP	239064	04/06/2020	0011372193	PUBLIC HEARING NOTICE ADVERTISING-PEN18-0228 &0217	\$851.00
		04/06/2020	0011375800	PUBLIC HEARING NOTICE ADVERTISING-PEN20-035_20200325	
		04/06/2020	0011372195	PUBLIC HEARING NOTICE ADVERTISING-PEN19-0157	
Remit to: COLORADO SPRINGS, CO					<u>FYTD:</u> \$6,473.90

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PRIESTER, COURTNEY	239323	04/27/2020	2001767.047	RENTAL REFUND BALANCE	\$214.00
	239324	04/27/2020	2001766.047	REFUND - TIME 4 TOTS CRC AM	\$82.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$296.00
PROFESSIONAL COMMUNICATIONS NETWORK PCN	239134	04/13/2020	156900272	LIVE ANSWERING SERVICE FOR ROTATIONAL TOW PROGRAM	\$533.81
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$5,898.91
PROMONTORY POINTE HOME OWNERS ASSOCIATION	239192	04/13/2020	2001309.047	REISSUE REFUND-INCORRECT NAME ON CHECK #238932	\$125.00
Remit to: CORONA, CA					<u>FYTD:</u> \$125.00

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PRUDENTIAL OVERALL SUPPLY	27671	04/13/2020	22969576	UNIFORM RENTAL & LAUNDERING SVC.-TRAFFIC SIGNAL MAINT. STAFF	\$638.72
		04/13/2020	22973034	UNIFORM RENTAL & LAUNDERING SVC.-VEHICLE/EQUIPMENT MAINT. STAFF	
		04/13/2020	22969580	UNIFORM RENTAL & LAUNDERING SVC.-GRAFFITI REMOVAL STAFF	
		04/13/2020	22969581	UNIFORM RENTAL & LAUNDERING SVC.-PARKS MAINT. STAFF	
		04/13/2020	22969579	UNIFORM RENTAL & LAUNDERING SVC.-CONCRETE MAINT. STAFF	
		04/13/2020	22969578	UNIFORM RENTAL & LAUNDERING SVC.-STREET SWEEPING STAFF	
		04/13/2020	22969577	UNIFORM RENTAL & LAUNDERING SVC.-CFD #1 STAFF	
		04/13/2020	22969582	UNIFORM RENTAL & LAUNDERING SVC.-TREE MAINT. STAFF	
		04/13/2020	22969575	UNIFORM RENTAL & LAUNDERING SVC.-SIGNS & STRIPING STAFF	
		04/13/2020	22969574	UNIFORM RENTAL & LAUNDERING SVC.-STREET MAINT. STAFF	
		04/13/2020	22969573	UNIFORM RENTAL & LAUNDERING SVC.-VEHICLE/EQUIPMENT MAINT. STAFF	
		04/13/2020	22966069	UNIFORM RENTAL & LAUNDERING SVC.-TREE MAINT. STAFF	
		04/13/2020	22966067	UNIFORM RENTAL & LAUNDERING SVC.-GRAFFITI REMOVAL STAFF	
		04/13/2020	22966066	UNIFORM RENTAL & LAUNDERING SVC.-CONCRETE MAINT. STAFF	
		04/13/2020	22973036	UNIFORM RENTAL & LAUNDERING SVC.-SIGNS & STRIPING STAFF	
		04/13/2020	22966061	UNIFORM RENTAL & LAUNDERING SVC.-STREET MAINT. STAFF	
		04/13/2020	22966060	UNIFORM RENTAL & LAUNDERING SVC.-VEHICLE/EQUIPMENT MAINT. STAFF	
		04/13/2020	22973043	UNIFORM RENTAL & LAUNDERING SVC.-TREE MAINT. STAFF	
		04/13/2020	22973035	UNIFORM RENTAL & LAUNDERING SVC.-STREET MAINT. STAFF	
		04/13/2020	22973039	UNIFORM RENTAL & LAUNDERING SVC.-STREET SWEEPING STAFF	
		04/13/2020	22973037	UNIFORM RENTAL & LAUNDERING SVC.-TRAFFIC SIGNAL MAINT. STAFF	

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PRUDENTIAL OVERALL SUPPLY		04/13/2020	22966065	UNIFORM RENTAL & LAUNDERING SVC.-STREET SWEEPING STAFF	
		04/13/2020	22973040	UNIFORM RENTAL & LAUNDERING SVC.-CONCRETE MAINT. STAFF	
		04/13/2020	22973041	UNIFORM RENTAL & LAUNDERING SVC.-GRAFFITI REMOVAL STAFF	

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PRUDENTIAL OVERALL SUPPLY	27718	04/20/2020	22973032	UNIFORM RENTAL & LAUNDERING SVC.-CITY YARD SECURITY GUARD STAFF	\$378.32
		04/20/2020	22973038	UNIFORM RENTAL & LAUNDERING SVC.-CFD #1 STAFF	
		04/20/2020	22976367	UNIFORM RENTAL & LAUNDERING SVC.-VEHICLE/EQUIPMENT MAINT. STAFF	
		04/20/2020	22976373	UNIFORM RENTAL & LAUNDERING SVC.-CONCRETE MAINT. STAFF	
		04/20/2020	22976372	UNIFORM RENTAL & LAUNDERING SVC.-STREET SWEEPING STAFF	
		04/20/2020	22976376	UNIFORM RENTAL & LAUNDERING SVC.-TREE MAINT. STAFF	
		04/20/2020	22966056	UNIFORM RENTAL & LAUNDERING SVC.-LIBRARY SECURITY GUARD STAFF	
		04/20/2020	22966058	UNIFORM RENTAL & LAUNDERING SVC.-CITY YARD SECURITY GUARD STAFF	
		04/20/2020	22966059	UNIFORM RENTAL & LAUNDERING SVC.-PURCHASING STAFF STOREKEEPER	
		04/20/2020	22976374	UNIFORM RENTAL & LAUNDERING SVC.-GRAFFITI REMOVAL STAFF	
		04/20/2020	22976368	UNIFORM RENTAL & LAUNDERING SVC.-STREET MAINT. STAFF	
		04/20/2020	22969570	UNIFORM RENTAL & LAUNDERING SVC.-FACILITIES MAINT. STAFF	
		04/20/2020	22973042	UNIFORM RENTAL & LAUNDERING SVC.-PARKS MAINT. STAFF	
		04/20/2020	22973030	UNIFORM RENTAL & LAUNDERING SVC.-LIBRARY SECURITY GUARD STAFF	
		04/20/2020	22973033	UNIFORM RENTAL & LAUNDERING SVC.-PURCHASING STAFF STOREKEEPER	
		04/20/2020	22966057	UNIFORM RENTAL & LAUNDERING SVC.-FACILITIES MAINT. STAFF	
		04/20/2020	22969569	UNIFORM RENTAL & LAUNDERING SVC.-LIBRARY SECURITY GUARD STAFF	
		04/20/2020	22969572	UNIFORM RENTAL & LAUNDERING SVC.-PURCHASING STAFF STOREKEEPER	

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PRUDENTIAL OVERALL SUPPLY		04/20/2020	22969571	UNIFORM RENTAL & LAUNDERING SVC.-CITY YARD SECURITY GUARD STAFF	
		04/20/2020	22973031	UNIFORM RENTAL & LAUNDERING SVC.-FACILITIES MAINT. STAFF	
	27766	04/27/2020	22976366	UNIFORM RENTAL & LAUNDERING SVC.-PURCHASING STAFF STOREKEEPER	\$250.87
		04/27/2020	22979722	UNIFORM RENTAL & LAUNDERING SVC.-STREET MAINT. STAFF	
		04/27/2020	22979727	UNIFORM RENTAL & LAUNDERING SVC.-CONCRETE MAINT. STAFF	
		04/27/2020	22976365	UNIFORM RENTAL & LAUNDERING SVC.-CITY YARD SECURITY GUARD STAFF	
		04/27/2020	22979726	UNIFORM RENTAL & LAUNDERING SVC.-STREET SWEEPING STAFF	
		04/27/2020	22979728	UNIFORM RENTAL & LAUNDERING SVC.-GRAFFITI REMOVAL STAFF	
		04/27/2020	22979730	UNIFORM RENTAL & LAUNDERING SVC.-TREE MAINT. STAFF	
		04/27/2020	22979721	UNIFORM RENTAL & LAUNDERING SVC.-VEHICLE/EQUIPMENT MAINT. STAFF	
		04/27/2020	22976364	UNIFORM RENTAL & LAUNDERING SVC.-FACILITIES MAINT. STAFF	
		04/27/2020	22976369	UNIFORM RENTAL & LAUNDERING SVC.-SIGNS & STRIPING STAFF	
		04/27/2020	22976363	UNIFORM RENTAL & LAUNDERING SVC.-LIBRARY SECURITY GUARD STAFF	
		04/27/2020	22976370	UNIFORM RENTAL & LAUNDERING SVC.-TRAFFIC SIGNAL MAINT. STAFF	
Remit to: RIVERSIDE, CA					FYTD: \$16,565.36
PSOMAS	27672	04/13/2020	158983	JUAN BAUTISTA MULTI-USE TRAIL ATP-2 CONSULTANT SVCS	\$1,451.80
Remit to: LOS ANGELES, CA					FYTD: \$182,287.03
RAMIN BRAL	239193	04/13/2020	BL#22211- YR2020	REFUND/OVER PAYMENT FOR BL#22211	\$197.20
Remit to: SANTA MONICA, CA					FYTD: \$197.20

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RAMOS, ANGEL	239248	04/20/2020	2001743.047	REFUND - TIME 4 TOTS CRC AM	\$306.00
	239325	04/27/2020	2001718.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$390.50
REA, CESAR	239099	04/06/2020	R20-146854	ANIMAL SERVICES REFUND-LATE FEE FOR LICENSE	\$21.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$21.00
READY REFRESH BY NESTLE	27767	04/27/2020	00D0035449180	BOTTLED WATER COOLER RENTAL-ARMADA ELEMENTARY/CHILD CARE	\$4.28
		04/27/2020	00D0035449420	BOTTLED WATER COOLER RENTAL-RAINBOW RIDGE ELEMENTARY/CHILD CARE	
Remit to: LOUISVILLE, KY					<u>FYTD:</u> \$642.31
RECON ENVIRONMENTAL, INC.	239214	04/20/2020	61003	CONSULTANT SERVICES REGARDING CEQA RULES/PROCEDURES UPDATE	\$2,406.61
Remit to: SAN DIEGO, CA					<u>FYTD:</u> \$18,873.69
REFRIGERATION CONTROL COMPANY	239194	04/13/2020	BL#24485- YR2020	REFUND/OVER PAYMENT FOR BL#24485	\$63.32
Remit to: CORONA, CA					<u>FYTD:</u> \$63.32
REGIONAL GOVERNMENT SERVICES AUTHORITY	27768	04/27/2020	10729	PROFESSIONAL CONSULTANT SERVICES-HUMAN RESOURCES/FEB. 2020	\$1,500.00
Remit to: CARMEL VALLEY, CA					<u>FYTD:</u> \$1,500.00
REVENUE EXPERTS INC	239249	04/20/2020	BL#12518- YR2020	REFUND/OVER PAYMENT FOR BL#12518	\$65.00
Remit to: IRVINE, CA					<u>FYTD:</u> \$65.00

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RIGEL PRODUCTS & SERVICE	27769	04/27/2020	3877	PIONJAR MOTORIZED JACK HAMMER SUPPLIES	\$1,147.54
Remit to: CRESTLINE, CA					FYTD: \$1,147.54
RIGHT AWAY ROOTER PLUMBING	239250	04/20/2020	BL#35205- YR2020	REFUND/OVER PAYMENT FOR BL#35205	\$67.63
Remit to: MORENO VALLEY, CA					FYTD: \$67.63
RIGHTWAY SITE SERVICES, INC.	239135	04/13/2020	260938	PORTABLE RESTROOMS RENTAL-MAINT. & OPS. DIVISION	\$888.02
		04/13/2020	260708	WASH STATIONS FOR M.V. POLICE STATION	
	239215	04/20/2020	261130	PORTABLE RESTROOMS/WASH STATIONS FOR CRC-FARMERS MARKET/COVID-19	\$1,596.85
		04/20/2020	261522	PORTABLE RESTROOMS RENTAL-MARCH MIDDLE SCHOOL	
		04/20/2020	262350	PORTABLE RESTROOM AND WASH STATIONS RENTALS AT POLICE STATION	
	239274	04/27/2020	262627	PORTABLE RESTROOMS RENTAL-MAINT. & OPS. DIVISION	\$722.58
		04/27/2020	262537	PORTABLE RESTROOM RENTAL-COTTONWOOD GOLF COURSE	
		04/27/2020	262538	PORTABLE RESTROOMS RENTAL-EQUESTRIAN CENTER	
Remit to: LAKE ELSINORE, CA					FYTD: \$19,352.90
RIVERSIDE AREA RAPE CRISIS CENTER	239065	04/06/2020	OCTOBER2019-04	CDBG SUBGRANTEE PAYMENT-CHILD ABUSE PREVENTION PROGRAM	\$1,196.21
	239136	04/13/2020	NOVEMBER2019-05	CDBG SUBGRANTEE PAYMENT-CHILD ABUSE PREVENTION PROGRAM	\$1,269.35
	239275	04/27/2020	DECEMBER2019-06	CDBG SUBGRANTEE PAYMENT-CHILD ABUSE PREVENTION PROGRAM	\$1,030.32
Remit to: RIVERSIDE, CA					FYTD: \$10,417.95
RIVERSIDE COUNTY EDUCATION ACADEMY	239251	04/20/2020	2001742.047	TOWNGATE COMM. CTR. RENTAL REFUND	\$200.00
Remit to: MORENO VALLEY, CA					FYTD: \$200.00

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RIVERSIDE COUNTY FLOOD CONTROL & WATER, CONSERVATION DIST.	239276	04/27/2020	FC18033 RCFC-WCD	DIRECT PAY-RCFC&WCD 801 0077 PERMIT FEES	\$1,825.89
		04/27/2020	FC18034 RCFC-WCD	DIRECT PAY-RCFC&WCD 801 0077 PERMIT FEES	
		04/27/2020	FC18044 RCFC-WCD	DIRECT PAY-RCFC&WCD 801 0077 PERMIT FEES	
Remit to: RIVERSIDE, CA					FYTD: \$2,073.95
RIVERSIDE COUNTY HABITAT CONSERVATION	239137	04/13/2020	1ST QTR 2020	STEPHEN'S KANGAROO RAT MITIGATION FEES FOR QTR ENDING 3/31/2020	\$15,810.00
Remit to: RIVERSIDE, CA					FYTD: \$53,768.50
RIVERSIDE COUNTY OFFICE OF EDUCATION	239277	04/27/2020	2020 / 2470	TRANSLATION SERVICES-CITY COUNCIL MEETING 3/3/20	\$141.90
Remit to: RIVERSIDE, CA					FYTD: \$12,243.30
RIVERSIDE UNIVERSITY HEALTH SYSTEMS - MEDICAL CTR	27673	04/13/2020	1150	SART EXAMS BILLING FOR PD - MAR. 2020	\$6,000.00
Remit to: MORENO VALLEY, CA					FYTD: \$30,000.00
ROBLES, PRESCILLA	239326	04/27/2020	2001733.047	COTTONWOOD GOLF CTR. RENTAL REFUND	\$1,790.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,790.00
RODRIGUEZ, MICHELLE	239327	04/27/2020	2001757.047	REFUND - TIME 4 TOTS CRC AM	\$42.25
Remit to: MORENO VALLEY, CA					FYTD: \$42.25
RSG, INC	27674	04/13/2020	I005770	SB 341 COMPLIANCE REPORTING SERVICES 18-19	\$5,000.00
	27720	04/20/2020	I006061	AFFORDABLE HOUSING COMPLIANCE MONITORING SERVICES-MAR. 2020	\$1,030.00
Remit to: IRVINE, CA					FYTD: \$19,778.25

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RUBEN'S TIRES	239100	04/06/2020	BL#14969- YR2020	REFUND/OVER PAYMENT FOR BL#14969	\$138.30
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$138.30
RUBIN FAMILY DAY CARE	239195	04/13/2020	BL#05809- YR2020	REFUND/OVER PAYMENT FOR BL#05809	\$65.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$65.00
S P THEODOSIS	239196	04/13/2020	BL#25302- YR2020	REFUND/OVER PAYMENT FOR BL#25302	\$61.65
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$61.65
SAFEWAY SIGN CO.	27721	04/20/2020	16557	TRAFFIC SIGNS/HARDWARE	\$4,138.58
		04/20/2020	16601	TRAFFIC SIGNS/HARDWARE	
Remit to: ADELANTO, CA					<u>FYTD:</u> \$50,478.76
SAINZ, ENID	239328	04/27/2020	2001753.047	RENTAL REFUND BALANCE	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$84.50

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SAN BERNARDINO & RIVERSIDE CO FIRE EQUIP	27675	04/13/2020	108126	5 YEAR CERTIFICATION & REPORTS-EOC	\$3,462.32
		04/13/2020	108134	ANNUAL SPRINKLER/HYDRANT TESTING-CONFERENCE & REC. CENTER	
		04/13/2020	108121	ANNUAL FIRE SPRINKLER CERTIFICATION-FIRE STATION 2	
		04/13/2020	108132	ANNUAL SPRINKLER CERTIFICATION-SENIOR CENTER	
		04/13/2020	108129	ANNUAL SPRINKLER CERTIFICATION-FIRE STATION 58	
		04/13/2020	108127	ANNUAL SPRINKLER CERTIFICATION-PUBLIC SAFETY BUILDING	
		04/13/2020	108133	SEMI ANNUAL ANSUL SYSTEM INSPECTION-CONFERENCE & REC. CENTER	
		04/13/2020	108124	ANNUAL FIRE SPRINKLER CERTIFICATION-CITY HALL	
		04/13/2020	108131	SEMI ANNUAL ANSUL SYSTEM INSPECTION-SENIOR CENTER	
		04/13/2020	108122	ANNUAL SPRINKLER CERTIFICATION-FIRE STATION 91	
	27770	04/27/2020	108128	ANNUAL SPRINKLER CERTIFICATION & REPORTS-CITY YARD	\$1,300.00
		04/27/2020	108125	ANNUAL SPRINKLER CERTIFICATION-FIRE STATION 48	
		04/27/2020	108123	5 YEAR CERTIFICATION & REPORTS-FIRE STATION 65	
Remit to: SAN BERNARDINO, CA					FYTD: \$9,612.44
SANCHEZ, AMADOR	239197	04/13/2020	2001693.047	REFUND - BEGINNER BALLET FOR KIDS CLASS	\$41.00
	239198	04/13/2020	2001694.047	REFUND - BEGINNER BALLET FOR KIDS CLASS	\$41.00
Remit to: MORENO VALLEY, CA					FYTD: \$82.00
SCMAF - INLAND VALLEY	239278	04/27/2020	8247	INSURANCE FOR CONTRACT INSTRUCTORS-MAR 2020 CLASSES	\$328.70
Remit to: EL MONTE, CA					FYTD: \$4,031.80
SCOR INDUSTRIES	239199	04/13/2020	BL#28921- YR2020	REFUND/OVER PAYMENT FOR BL#28921	\$124.81
Remit to: BLOOMINGTON, CA					FYTD: \$124.81

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SEARLE CREATIVE GROUP, LLC	27615	04/06/2020	20089	WEBSITE HOSTING & MAINTENANCE-FEB. 2020	\$647.50
	27771	04/27/2020	20156	WEBSITE HOSTING & MAINTENANCE-MAR. 2020	\$1,146.25
Remit to: VENTURA, CA					FYTD: \$4,019.00
SECTRAN SECURITY, INC	239279	04/27/2020	20040926	ARMORED CAR DEPOSIT TRANSPORTATION SERVICES-APR. 2020	\$553.24
Remit to: LOS ANGELES, CA					FYTD: \$5,505.01
SECURITY LOCK & KEY	27772	04/27/2020	30176	BOX OF KEY BLANKS FOR PD	\$269.38
Remit to: RIVERSIDE, CA					FYTD: \$2,322.34
SHAN SMOKE SHOP	239101	04/06/2020	BL#31025- YR2020	REFUND/OVER PAYMENT FOR BL#31025	\$69.36
Remit to: MORENO VALLEY, CA					FYTD: \$69.36
SHAYNESKGUA COLEN	27616	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
SHUKERRAH PALMER	27617	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
SIGNS BY TOMORROW	27618	04/06/2020	24835	UPDATE & INSTALLATION OF PUBLIC HEARING SIGN	\$607.50
		04/06/2020	24834	UPDATE & INSTALLATION OF PUBLIC HEARING SIGN	
Remit to: MURRIETA, CA					FYTD: \$6,378.75
SMART ENERGY WATER	27773	04/27/2020	3006	MOBILE APPLICATION - ANNUAL RENEWAL 3/2020-3/2021	\$11,800.00
Remit to: IRVINE, CA					FYTD: \$39,800.00
SMITH AND SEVERSON BUILDERS LLC	239200	04/13/2020	BL#36369- YR2020	REFUND/OVER PAYMENT FOR BL#36369	\$2,173.79
Remit to: LAKE FOREST, CA					FYTD: \$2,173.79

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SMITH, DEMARCUS	239138	04/13/2020	SPRING 2020	2020 SPRING MAPPED STUDENTS/VENDORS	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$250.00
SOLANO, PATRICIA	239201	04/13/2020	R19-143716	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: MENIFEE, CA					FYTD: \$95.00
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	239066	04/06/2020	3609564	ANNUAL RENEWAL FEES-FIRE STATION 58	\$978.44
		04/06/2020	3600036	ANNUAL RENEWAL FEES-FIRE STATION 6	
		04/06/2020	3611758	EMISSIONS FEES-FIRE STATION 58	
Remit to: DIAMOND BAR, CA					FYTD: \$4,693.04
SOUTHERN CALIFORNIA EDISON	239067	04/06/2020	MAR-20 4/6/20	ELECTRICITY CHARGES	\$6,165.41
	239068	04/06/2020	7501132786	RELIABILITY SERVICE-DLAP_SCE_TS10-DEC19	\$486.91
	239216	04/20/2020	MAR-20 4/20/20	ELECTRICITY CHARGES	\$14,443.26
	239280	04/27/2020	APR-20 4/27/20	ELECTRICITY CHARGES	\$12,078.29
		04/27/2020	MAR-20 4/27/20	ELECTRICITY CHARGES	
Remit to: ROSEMEAD, CA					FYTD: \$2,088,277.99
SOUTHERN CALIFORNIA EDISON 3	239282	04/27/2020	388429 - SCE	NEW METER AND SERVICE-24752 CACTUS AVE	\$3,886.79
Remit to: ROSEMEAD, CA					FYTD: \$11,987.32
SOUTHERN CALIFORNIA GAS CO.	239140	04/13/2020	MAR-2020	GAS CHARGES	\$11,199.49
Remit to: MONTEREY PARK, CA					FYTD: \$69,076.23
SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY	27774	04/27/2020	0420	WORKING GROUP PARTICIPATION AGREEMENT 3/1/20-2/28/21 - MV UTILITY	\$10,000.00
Remit to: GLENDORA, CA					FYTD: \$11,054.00

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<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
SOUTHERN PET SUPPLIES	27722	04/20/2020	9853	PET SUPPLIES-ASSORTED COLLARS & NYLON LEADS	\$382.90
Remit to: SAN DIEGO, CA					<u>FYTD:</u> \$2,553.45
SPARKLETTS	27723	04/20/2020	10050036 040220	BOTTLED WATER COOLER RENTAL FOR EOC/ERF	\$9.46
Remit to: DALLAS, TX					<u>FYTD:</u> \$316.86
SPRINT	239217	04/20/2020	LCI-281992	GPS/CELLULAR PINGS FOR PD	\$60.00
Remit to: KANSAS CITY, MO					<u>FYTD:</u> \$560.00
SSD ALARM/FORMERLY PACIFIC ALARM SERVICE, INC	239141	04/13/2020	R 155242	ALARM SYSTEM RENT/SVC./MONITORING-KITCHING SUBSTATION-APR 2020	\$516.50
		04/13/2020	R 155243	ALARM SYSTEM RENT/SVC./MONITORING-MOVAL SUBSTATION- APR 2020	
Remit to: BEAUMONT, CA					<u>FYTD:</u> \$6,198.00
STANDARD INSURANCE CO	239069	04/06/2020	200401	EMPLOYEE SUPPLEMENTAL INSURANCE	\$1,263.16
	239283	04/27/2020	200501	EMPLOYEE SUPPLEMENTAL INSURANCE	\$1,263.16
Remit to: PORTLAND, OR					<u>FYTD:</u> \$12,496.00

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STANLEY CONVERGENT SECURITY SOLUTIONS, INC	27619	04/06/2020	17222163	ALARM SYSTEM MONITORING-SENIOR CENTER/MAR-MAY 2020	\$13,081.10
		04/06/2020	17206032	ALARM SYSTEM MONITORING-FIRE STATION 99/MAR 2020	
		04/06/2020	17197935	ALARM SYSTEM MONITORING-EOC/MAR 2020	
		04/06/2020	17213845	SECURITY ALARM MONITORING SERVICES FOR FIRE STATIONS/MAR 2020	
		04/06/2020	16864016	INSTALLATION OF SECURITY SYSTEM UPGRADES-SUNNYMEAD PARK SNACK BAR	
		04/06/2020	17198390	ALARM SYSTEM MONITORING-MARCH ANNEX BLDG 823/MAR-MAY 2020	
		04/06/2020	17213597	ALARM SYSTEM MONITORING-EMPLOYMENT RESOURCE CENTER/MAR 2020	
		04/06/2020	17221002	ALARM SYSTEM MONITORING-CITY YARD SANTIAGO OFFICE BURGLAR ALARM/MAR-MAY 2020	
		04/06/2020	17218527	ALARM SYSTEM MONITORING-FIRE STATION 58/MAR-MAY 2020	
	04/06/2020	17214702	ALARM SYSTEM MONITORING-CITY YARD & TRANSP. TRAILER/MAR-MAY 2020		
Remit to: PALATINE, IL					FYTD: \$56,993.55
STARLITE RECLAMATION ENVIRONMENTAL SERVICES, INC.	239070	04/06/2020	117605	HAZARDOUS WASTE MATERIAL AT CITY YARD	\$5,914.94
		04/06/2020	117604	HAZARDOUS WASTE REMOVAL-CITY YARD	
Remit to: FONTANA, CA					FYTD: \$31,068.36
STATE BOARD OF EQUALIZATION	239218	04/20/2020	1ST QTR 2020	ELECTRICAL ENERGY SURCHARGE RETURN ACCOUNT #31-000177/JAN-MAR 2020	\$12,925.77
Remit to: SACRAMENTO, CA					FYTD: \$56,679.74

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STATE BOARD OF EQUALIZATION 1	27792	04/30/2020	1ST QTR 2020	SALES & USE TAX REPORT FOR THE QUARTER ENDING 3/31/20	\$4,171.00
Remit to: SACRAMENTO, CA					FYTD: \$74,735.00
STATE CONTROLLER'S OFFICE	239142	04/13/2020	FAUD-00002213	ANNUAL STREET REPORT-FY 2018/19	\$3,300.00
Remit to: SACRAMENTO, CA					FYTD: \$6,099.74
STATE OF CALIFORNIA DEPT. OF JUSTICE	239143	04/13/2020	441909	BLOOD ALCOHOL ANALYSIS SERVICES FOR PD-FEB. 2020	\$630.00
	239219	04/20/2020	447461	BLOOD ALCOHOL ANALYSIS SERVICES FOR PD-MAR. 2020	\$280.00
	239220	04/20/2020	431578 (HR)	FINGERPRINTING SERVICES-HR/EMPLOYMENT/VOLUNTEERS RELATED-JAN20	\$1,028.00
		04/20/2020	431578 (BL)	FINGERPRINTING SERVICES-BUSINESS LICENSE RELATED-JAN20	
		04/20/2020	431578 (PCS)	FINGERPRINTING SERVICES-P&CS COACHES/CONTRACT INSTRUCTORS-JAN20	
	239221	04/20/2020	437656 (BL)	FINGERPRINTING SERVICES-BUSINESS LICENSE RELATED-FEB20	\$951.00
		04/20/2020	437656 (HR)	FINGERPRINTING SERVICES-HR/EMPLOYMENT/VOLUNTEERS RELATED-FEB20	
		04/20/2020	437656 (PCS)	FINGERPRINTING SERVICES-P&CS COACHES/CONTRACT INSTRUCTOR-FEB20	
	239222	04/20/2020	443494	LIVE SCAN FINGERPRINTING APPS FOR PD-MAR. 2020	\$1,598.00
Remit to: SACRAMENTO, CA					FYTD: \$40,493.00
STENO SOLUTIONS TRANSCRIPTION SVCS., INC.	27676	04/13/2020	43344	TRANSCRIPTION SERVICES FOR PD-MAR. 2020	\$601.20
Remit to: CORONA, CA					FYTD: \$13,206.15

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STEPHEN H BADGETT CONSULTING LLC	27677	04/13/2020	MVU-014	CONSULTING SERVICES-REVIEW SCOPE OF WORK ON RFI'S/MAR 2020	\$4,812.50
Remit to: MURRIETA, CA					<u>FYTD:</u> \$25,375.00
STILES ANIMAL REMOVAL, INC.	239144	04/13/2020	110004	DECEASED LARGE ANIMAL REMOVAL SERVICES-MAR. 2020	\$320.00
Remit to: GUAISTI, CA					<u>FYTD:</u> \$4,920.00
STRADLING, YOCCA, CARLSON & RAUTH	27724	04/20/2020	363339-0003	LEGAL SERVICES-COTTONWOOD MATTER-MAR. 2020	\$2,175.90
		04/20/2020	363336-0031	LEGAL SERVICES-GENERAL-MAR. 2020	
Remit to: NEWPORT BEACH, CA					<u>FYTD:</u> \$47,177.40
SUN DOWN WINDOW TINTING	239102	04/06/2020	BL#25604- YR2020	REFUND/OVER PAYMENT FOR BL#25604	\$71.00
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$71.00
SUNNYMEAD ACE HARDWARE	239071	04/06/2020	86078	MISC SUPPLIES FOR FIRE STATION 58	\$201.22
		04/06/2020	86192	MISC SUPPLIES FOR FIRE STATION 65	
		04/06/2020	75308	MISC SUPPLIES FOR FIRE STATION	
		04/06/2020	86212	MISC SUPPLIES FOR FIRE STATION 2	
		04/06/2020	85980	MISC SUPPLIES FOR FIRE STATION	
		04/06/2020	85562	MISC SUPPLIES FOR FIRE STATION 58	
	239145	04/13/2020	86613	MISC. SUPPLIES FOR PD	\$123.60
	239223	04/20/2020	86458	MISC SUPPLIES FOR FIRE STATION 2	\$21.51
	239284	04/27/2020	86759	MISC SUPPLIES FOR FIRE STATION	\$76.10
		04/27/2020	86720	MISC SUPPLIES FOR FIRE STATION	
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$3,780.54
SUNWEST ELECTRIC INC	239103	04/06/2020	BL#13034- YR2020	REFUND/OVER PAYMENT FOR BL#13034	\$64.05
Remit to: ANAHEIM, CA					<u>FYTD:</u> \$64.05

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TAHREEM KHAN	27620	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
TAITYANA L. BENSON	27621	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
TAV, STEVEN	239202	04/13/2020	2001705.047	REFUND - SHITO-RYU KARATE CLASS	\$20.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$20.00
TEANO, RAQUEL	239329	04/27/2020	2001755.047	RENTAL REFUND BALANCE	\$84.50
Remit to: BEAUMONT, CA					<u>FYTD:</u> \$84.50
THAI GARDEN	239252	04/20/2020	BL#31204- YR2020	REFUND/OVER PAYMENT FOR BL#31204	\$65.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$65.00
THE ADVANTAGE GROUP/ FLEX ADVANTAGE	27679	04/13/2020	119034	FLEX AND COBRA ADMIN FEES-MARCH 2020	\$1,236.25
Remit to: TEMECULA, CA					<u>FYTD:</u> \$477,839.96
THE LEW EDWARDS GROUP	27680	04/13/2020	215	FISCAL SUSTAINABILITY & BALLOT MEASURE CONSULTING SVCS- MAR 20	\$5,750.00
Remit to: OAKLAND, CA					<u>FYTD:</u> \$53,500.00

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THE SOCO GROUP INC.	27681	04/13/2020	0771757-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	\$12,237.19
		04/13/2020	0770375-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
		04/13/2020	0772637-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
		04/13/2020	0773633-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
		04/13/2020	0774603-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
		04/13/2020	0775513-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
		04/13/2020	0772677-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	
	27725	04/20/2020	0776297-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	\$1,364.18
27775	04/27/2020	0777079-IN	FUEL FOR CITY VEHICLES & EQUIPMENT	\$3,110.28	
	04/27/2020	0778216-IN	FUEL FOR CITY VEHICLES & EQUIPMENT		
Remit to: ORANGE, CA					FYTD: \$284,611.26
THOMPSON COBURN LLP	27726	04/20/2020	3407829	LEGAL SERVICES-MVU/RELIABILITY STANDARD COMPLIANCE-JAN. 2020	\$107.06
Remit to: WASHINGTON, DC					FYTD: \$332.67
THOMSON REUTERS-WEST PUBLISHING CORP.	27682	04/13/2020	842104605	AUTO TRACK SERVICES FOR PD INVESTIGATIONS-MAR. 2020	\$1,140.93
Remit to: CAROL STREAM, IL					FYTD: \$12,569.27
TILFORD, ASHLEY	27624	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
TIME MANAGEMENT, INC.	239224	04/20/2020	5862	TIMING & REGISTRATION SERVICES FOR RACE ON THE BASE EVENT 3/7/20	\$1,785.00
Remit to: CARLSBAD, CA					FYTD: \$1,785.00
TIME WARNER CABLE	239225	04/20/2020	091922301040120	FIBER INTERNET ACCESS SERVICES - APR. 2020	\$844.00
Remit to: PITTSBURGH, PA					FYTD: \$8,440.00

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TKE ENGINEERING INC	239285	04/27/2020	2020-126	ALESSANDRO BLVD/GRANT ST TRAFFIC SIGNAL/ST IMPROVEMENTS	\$455.00
Remit to: RIVERSIDE, CA					FYTD: \$52,782.50
T-MOBILE USA	239147	04/13/2020	9395121323	CELLULAR TECHNOLOGY EXTRACTION/LOCATOR SERVICES FOR PD	\$816.00
		04/13/2020	9393148991	CELLULAR TECHNOLOGY EXTRACTION/LOCATOR SERVICES FOR PD	
		04/13/2020	9394737842	CELLULAR TECHNOLOGY EXTRACTION/LOCATOR SERVICES FOR PD	
Remit to: SEATTLE, WA					FYTD: \$12,087.00
TONY'S STARTERS ALTERNATORS SUPPLIES	239253	04/20/2020	BL#26803- YR2020	REFUND/OVER PAYMENT FOR BL#26803	\$90.39
Remit to: MORENO VALLEY, CA					FYTD: \$90.39
TOWELS TUTORING	239203	04/13/2020	BL#33864- YR2020	REFUND/OVER PAYMENT FOR BL#33864	\$141.25
Remit to: RIVERSIDE, CA					FYTD: \$141.25
TOWNSEND PUBLIC AFFAIRS, INC.	27727	04/20/2020	14925	CONSULTING SERVICES-GRANT WRITING & FUNDING ADVOCACY-JUL. 2019	\$20,000.00
		04/20/2020	15218	CONSULTING SERVICES-GRANT WRITING & FUNDING ADVOCACY-OCT. 2019	
		04/20/2020	15127	CONSULTING SERVICES-GRANT WRITING & FUNDING ADVOCACY-SEP. 2019	
		04/20/2020	15034	CONSULTING SERVICES-GRANT WRITING & FUNDING ADVOCACY-AUG. 2019	
	27776	04/27/2020	15796	CONSULTING SERVICES-LOBBYIST/ADVOCATE & GRANT WRITING-APR. 2020	\$4,000.00
Remit to: NEWPORT BEACH, CA					FYTD: \$49,000.00

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TR DESIGN GROUP, INC.	27777	04/27/2020	4363	ARCHITECTURAL DESIGN SERVICES FOR IRIS LIBRARY BRANCH PROJECT	\$1,787.50
Remit to: RIVERSIDE, CA					<u>FYTD:</u> \$46,673.40
TUMON BAY RESORT & SPA	27778	04/27/2020	MAY 2020 RENT	MAY 2020 RENT (INCL. CAM, ETC.) FOR EMPLOYMENT RESOURCE CTR.	\$8,014.73
Remit to: TAMUNING, GU					<u>FYTD:</u> \$88,162.03
TYRA COLEMAN	27625	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$1,750.00
U.S. POSTAL SERVICE	239290	04/27/2020	GC61115B	POSTAGE-CSD PUBLIC HEARING NOTICE TO PROPERTY OWNERS	\$8,928.41
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$35,963.41
ULTRASERV AUTOMATED SERVICES, LLC	27728	04/20/2020	204171	COFFEE SERVICE SUPPLIES-CITY HALL/PUBLIC WORKS LOCATION	\$574.81
		04/20/2020	204499	COFFEE SERVICE SUPPLIES-CITY HALL/BREAK ROOM LOCATION	
		04/20/2020	204500	COFFEE SERVICE SUPPLIES-CITY HALL/CITY CLERK LOCATION	
		04/20/2020	202745	COFFEE SERVICE SUPPLIES-CITY HALL/BREAK ROOM LOCATION	
	27779	04/27/2020	207723	COFFEE SERVICE SUPPLIES-CONFERENCE & REC. CENTER	\$461.49
		04/27/2020	207724	COFFEE SERVICE SUPPLIES-ANNEX 1	
		04/27/2020	207841	COFFEE SERVICE SUPPLIES-ANIMAL SHELTER	
		04/27/2020	207725	COFFEE SERVICE SUPPLIES-CITY HALL/PUBLIC WORKS LOCATION	
Remit to: COSTA MESA, CA					<u>FYTD:</u> \$13,140.51

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UNDERGROUND SERVICE ALERT	27729	04/20/2020	320200459 (d)	DIGALERT TICKETS SUBSCRIPTION SERVICE-MAR20	\$193.15
		04/20/2020	320200459 (b)	DIGALERT TICKETS SUBSCRIPTION SERVICE-MAR20	
		04/20/2020	320200459 (c)	DIGALERT TICKETS SUBSCRIPTION SERVICE-MAR20	
		04/20/2020	320200459 (a)	DIGALERT TICKETS SUBSCRIPTION SERVICE-MAR20	
	239226	04/20/2020	dsb20191618 (c)	CA STATE FEE FOR REGULATORY COSTS TO DIG SAFE BOARD	\$126.28
		04/20/2020	dsb20191618 (b)	CA STATE FEE FOR REGULATORY COSTS TO DIG SAFE BOARD	
		04/20/2020	dsb20191618 (a)	CA STATE FEE FOR REGULATORY COSTS TO DIG SAFE BOARD	
		04/20/2020	dsb20191618 (d)	CA STATE FEE FOR REGULATORY COSTS TO DIG SAFE BOARD	
Remit to: CORONA, CA					<u>FYTD:</u> \$5,207.07
UNION BANK OF CALIFORNIA 1	239286	04/27/2020	1203563	INVESTMENT CUSTODIAL SERVICES-MAR. 2020	\$291.67
Remit to: LOS ANGELES, CA					<u>FYTD:</u> \$4,027.35
UNITED ROTARY BRUSH CORP	27683	04/13/2020	313846	STREET SWEEPER BRUSHES & ACCESSORIES	\$1,468.29
		04/13/2020	313944	STREET SWEEPER BRUSHES & ACCESSORIES	
Remit to: KANSAS CITY, MO					<u>FYTD:</u> \$32,833.43
UTAH PACIFIC CONSTRUCTION	239104	04/06/2020	BL#14561- YR2020	REFUND/OVER PAYMENT FOR BL#14561	\$65.00
Remit to: MURRIETA, CA					<u>FYTD:</u> \$65.00

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VACATE TERMITE & PEST ELIMINATION COMPANY	27780	04/27/2020	97048	RODENT CONTROL SERVICES-MAR20-FAIRWAY PARK	\$1,637.00
		04/27/2020	97047	RODENT CONTROL SERVICES-MAR20-SUNNYMEAD PARK	
		04/27/2020	97046	RODENT CONTROL SERVICES-MAR20-SHADOW MTN. PARK	
		04/27/2020	97045	RODENT CONTROL SERVICES-MAR20-MORRISON PARK	
		04/27/2020	97044	RODENT CONTROL SERVICES-MAR20-JFK PARK	
		04/27/2020	97042	RODENT CONTROL SERVICES-MAR20-CONFERENCE & REC. CENTER	
		04/27/2020	98223	PEST CONTROL SERVICE-APR20-MARCH FIELD PARK COMMUNITY CTR.	
		04/27/2020	98224	PEST CONTROL SERVICE-APR20-TRANSPORTATION TRAILER	
		04/27/2020	97043	RODENT CONTROL SERVICES-MAR20-EQUESTRIAN CENTER	
		04/27/2020	97053	RODENT CONTROL SERVICES-MAR20-SKATE PARK	
		04/27/2020	97049	RODENT CONTROL SERVICES-MAR20-CELEBRATION PARK	
		04/27/2020	98218	PEST CONTROL SERVICE-APR20-CITY YARD	
		04/27/2020	98203	PEST CONTROL SERVICE-APR20-CITY YARD SANTIAGO OFFICE	
		04/27/2020	97050	RODENT CONTROL SERVICES-MAR20-EL POTRERO PARK	
		04/27/2020	97537	PEST CONTROL SERVICE-MAR20-CELEBRATION PARK RESTROOMS	
		04/27/2020	97536	PEST CONTROL SERVICE-MAR20-SKATE PARK RESTROOM/SNACK BAR	
		04/27/2020	97535	PEST CONTROL SERVICE-MAR20-SUNNYMEAD PARK RESTROOM/SNACK BAR	
		04/27/2020	97533	PEST CONTROL SERVICE-MAR20-MORRISON PARK RESTROOM/SNACK BAR	
		04/27/2020	97055	RODENT CONTROL SERVICES-MAR20-VISTA LOMAS PARK	
		04/27/2020	97054	RODENT CONTROL SERVICES-MAR20-EDISON EASEMENT	
		04/27/2020	98222	PEST CONTROL SERVICE-APR20-MARCH ANNEX	
		04/27/2020	97041	RODENT CONTROL SERVICES-MAR20-COTTONWOOD GOLF COURSE	

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VALLEY WIDE TOWING, LLC	27684	04/13/2020	20-08688	EVIDENCE TOWING FOR PD	\$1,012.50
		04/13/2020	8696	EVIDENCE TOWING FOR PD	
		04/13/2020	8673	EVIDENCE TOWING FOR PD	
		04/13/2020	8661	EVIDENCE TOWING FOR PD	
Remit to: MORENO VALLEY, CA					FYTD: \$5,136.25
VANESSA CARRASCO	27626	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00
VELAZQUEZ, REBECCA	239254	04/20/2020	2001746.047	COTTONWOOD GOLF CTR. RENTAL REFUND	\$206.20
Remit to: MORENO VALLEY, CA					FYTD: \$206.20
VERIZON WIRELESS	239287	04/27/2020	9852273113	DATA CHARGES FOR CELLULAR SERVICE FOR PD DEVICES	\$360.75
Remit to: DALLAS, TX					FYTD: \$4,235.75
VICTOR MEDICAL CO	27781	04/27/2020	5031869	ANIMAL MEDICAL SUPPLIES/VACCINES	\$2,590.04
		04/27/2020	5043494	ANIMAL MEDICAL SUPPLIES/VACCINES	
Remit to: LAKE FOREST, CA					FYTD: \$22,661.73
VIGILANT SOLUTIONS, LLC	239149	04/13/2020	31607 RI	ANNUAL CAMERA LICENSE KEY RENEWAL 3/2020 - 2/2021	\$12,480.00
Remit to: LIVERMORE, CA					FYTD: \$12,480.00
VISION SERVICE PLAN	27627	04/06/2020	809009517	EMPLOYEE VISION INSURANCE	\$3,988.30
	27782	04/27/2020	809212469	EMPLOYEE VISION INSURANCE	\$4,063.54
Remit to: SAN FRANCISCO, CA					FYTD: \$43,137.39

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



**City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020**

CHECKS UNDER \$25,000

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
VOICES FOR CHILDREN, INC.	27685	04/13/2020	7 / JAN-20	CDBG SUBGRANTEE PAYMENT-COURT APPOINTED SPECIAL ADVOCATE PROGRAM	\$4,151.38
	27730	04/20/2020	8 / FEB-20	CDBG SUBGRANTEE PAYMENT-COURT APPOINTED SPECIAL ADVOCATE PROGRAM	\$2,972.66
Remit to: RIVERSIDE, CA					FYTD: \$24,427.67
VOYAGER FLEET SYSTEM, INC.	27686	04/13/2020	869211615013	CNG FUEL PURCHASES	\$6,476.81
	27783	04/27/2020	869336602013	FUEL CARD CHARGES-PD TRAFFIC MOTORS	\$1,295.37
Remit to: HOUSTON, TX					FYTD: \$91,017.43
VULCAN MATERIALS CO, INC.	27687	04/13/2020	72536153	ASPHALTIC MATERIALS	\$2,785.00
		04/13/2020	72529469	ASPHALTIC MATERIALS	
		04/13/2020	72546266	ASPHALTIC MATERIALS	
		04/13/2020	72543487	ASPHALTIC MATERIALS	
		04/13/2020	72544785	ASPHALTIC MATERIALS	
		04/13/2020	72538057	ASPHALTIC MATERIALS	
		04/13/2020	72531060	ASPHALTIC MATERIALS	
		04/13/2020	72541204	ASPHALTIC MATERIALS	
		04/13/2020	72536154	ASPHALTIC MATERIALS	
		04/13/2020	72541203	ASPHALTIC MATERIALS	
Remit to: LOS ANGELES, CA					FYTD: \$53,928.81
WARAICH, BALJEET	239330	04/27/2020	2001765.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					FYTD: \$84.50
WEI, ZHAOMIN	9001	04/07/2020	MARCH 24, 2020	KN95 MASKS	\$24,000.00
Remit to: CHINO HILLS, CA					FYTD: \$24,000.00

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



**City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020**

CHECKS UNDER \$25,000

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
WEST COAST ARBORISTS, INC.	27628	04/06/2020	156046	TREE TRIMMING SERVICES - ZONE E-8	\$3,163.75
		04/06/2020	158553	TREE REMOVAL SERVICES - ZONE 01A-RP	
	27688	04/13/2020	158222	TREE REMOVAL SERVICES - ZONE 08	\$16,952.93
		04/13/2020	158220	TREE TRIMMING/REMOVAL SERVICES - ZONE 03	
	27784	04/27/2020	158221-A-A	TREE TRIMMING/REMOVAL SERVICES - ZONE D	\$14,153.83
		04/27/2020	158713	TREE TRIMMING SERVICES - ZONE 02	
Remit to: ANAHEIM, CA					FYTD: \$245,967.55
WEST COAST SHOPPING CART SERVICE, INC.	239150	04/13/2020	20-045	SHOPPING CART RETRIEVAL SERVICES-FEB. 2020	\$3,370.25
	239227	04/20/2020	20-050	SHOPPING CART RETRIEVAL SERVICES-MAR. 2020	\$3,519.00
Remit to: WEST COVINA, CA					FYTD: \$36,834.75
WESTERN MUNICIPAL WATER DISTRICT	239288	04/27/2020	24753-018620/MR0	WATER CHARGES-M.A.R.B. BALLFIELDS	\$2,292.90
		04/27/2020	23821-018257/MR0	WATER CHARGES-MARCH FIELD PARK COMMUNITY CTR. LANDSCAPE	
		04/27/2020	23821-018258/MR0	WATER CHARGES-MARCH FIELD PARK COMMUNITY CTR.-BLDG. 938	
		04/27/2020	23866-018292/MR0	WATER CHARGES-SKATE PARK	
Remit to: ARTESIA, CA					FYTD: \$39,524.52

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**City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020**

CHECKS UNDER \$25,000

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
WESTERN RENEWABLE ENERGY GENERATION	239289	04/27/2020	WR17296	WREGIS CERTIFICATE ISSUANCE/CREATED	\$128.18
		04/27/2020	WR15530	WREGIS CERTIFICATE ISSUANCE/CREATED	
		04/27/2020	WR15959	WREGIS CERTIFICATE ISSUANCE/CREATED	
		04/27/2020	WR15088	WREGIS CERTIFICATE ISSUANCE/CREATED	
		04/27/2020	WR17733	WREGIS CERTIFICATE ISSUANCE/CREATED	
		04/27/2020	WR18175	ANNUAL FEE - LOAD SERVING AND CERTIFICATE ISSUANCE	
		04/27/2020	WR16397	WREGIS CERTIFICATE ISSUANCE/CREATED	
		04/27/2020	WR16877	WREGIS CERTIFICATE ISSUANCE/CREATED	
Remit to: SALT LAKE CITY, UT					<u>FYTD:</u> \$344.94
WHISNER, MARY	239255	04/20/2020	R20-147176,177	ANIMAL SERVICES REFUND-PAID TWICE ONLINE FOR 2 LICENSES	\$72.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$72.00
WILLDAN FINANCIAL SERVICES	27629	04/06/2020	010-43918	ANNUAL CONTINUING DISCLOSURE SERVICES-VARIOUS SPECIAL TAX BONDS	\$13,155.00
		04/06/2020	010-43917	ANNUAL CONTINUING DISCLOSURE SERVICES-VARIOUS COP, LRBS & TABS	
	27731	04/20/2020	010-44422	GRANT ADMINISTRATION SERVICES-MAR. 2020	\$24,493.15
Remit to: TEMECULA, CA					<u>FYTD:</u> \$278,481.15
WILLIAMS, PAULA	239332	04/27/2020	2001730.047	REFUND - TIME 4 TOTS CRC AM	\$84.50
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$84.50
WILLIAMS, CARL	239331	04/27/2020	2001771.047	RENTAL REFUND BALANCE	\$42.00
Remit to: MORENO VALLEY, CA					<u>FYTD:</u> \$42.00

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**City of Moreno Valley
Payment Register
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CHECKS UNDER \$25,000

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
WINCHESTER ASSOCIATES, INC.	239105	04/06/2020	DEPOSIT REFUND	REFUND DEPOSIT BALANCE-PEN16-0140 & 0141	\$958.02
	239106	04/06/2020	DEPOSIT REFUND	REFUND TRUST ACCOUNT BALANCE-PEN16-0135, 0136 & 0137	\$3,257.34
Remit to: MORENO VALLEY, CA					FYTD: \$51,915.36
WURM'S JANITORIAL SERVICES, INC.	27785	04/27/2020	27532	PD LOBBY FURNITURE CLEANING	\$475.00
Remit to: CORONA, CA					FYTD: \$1,997.90
XEROX CAPITAL SERVICES, LLC	27690	04/13/2020	099951865	COLOR COPIER EQUIPMENT LEASE-MAR 2020-GRAPHICS DEPT.	\$2,973.58
		04/13/2020	099951866	COLOR COPIER LEASE/BILLABLE PRINTS-MAR 2020-PARKS DEPT.	
		04/13/2020	099951867	COLOR COPIER EQUIPMENT LEASE-MAR 2020-PARKS DEPT.	
		04/13/2020	099951864	COLOR COPIER LEASE/BILLABLE PRINTS-MAR 2020-GRAPHICS DEPT.	
Remit to: PASADENA, CA					FYTD: \$25,368.75
YARNALL, LAURA	239256	04/20/2020	R20-147365	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: MORENO VALLEY, CA					FYTD: \$95.00
YEAU, JOHN	239333	04/27/2020	R20-146818	ANIMAL SERVICES REFUND-SPAY/NEUTER AND RABIES DEPOSITS	\$95.00
Remit to: LAGUNA NIGUEL, CA					FYTD: \$95.00
YOLANDA MENDOZA RENTAL PROPERTY	239204	04/13/2020	BL#26371- YR2020	REFUND/OVER PAYMENT FOR BL#26371	\$67.38
Remit to: CERRITOS, CA					FYTD: \$67.38
YOLANDA NEAL - YAKUBU	27630	04/06/2020	APRIL 2020	MOVAL LEARNS-APRIL 2020	\$250.00
Remit to: MORENO VALLEY, CA					FYTD: \$1,750.00

Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



City of Moreno Valley
Payment Register
For Period 4/1/2020 through 4/30/2020

CHECKS UNDER \$25,000

<u>Vendor Name</u>	<u>Check/EFT Number</u>	<u>Payment Date</u>	<u>Inv Number</u>	<u>Invoice Description</u>	<u>Payment Amount</u>
ZHU, LIANNA	239205	04/13/2020	2001703.047	REFUND - VOVINAM MARTIAL ARTS CLASS	\$49.00
Remit to: MORENO VALLEY, CA					FYTD: \$49.00

TOTAL CHECKS UNDER \$25,000	\$1,211,120.19
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GRAND TOTAL	\$11,693,891.20
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Attachment: April 2020 Payment Register (3882 : PAYMENT REGISTER - APRIL 2020)



Report to City Council

TO: Mayor and City Council

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: AUTHORIZATION TO AWARD PROFESSIONAL CONSULTANT SERVICES TO WILLDAN ENGINEERING FOR PROJECT MANAGEMENT SERVICES OF THE COURTYARDS AT COTTONWOOD PROJECT AND NSP CLOSE OUT

RECOMMENDED ACTION

Recommendations:

1. Award a professional consultant services agreement to Willdan Engineering to provide project management services for The Courtyards at Cottonwood Project, funded by HOME Investment Partnerships Program (HOME) and Neighborhood Stabilization Program (NSP), and closeout management of the NSP programs.
2. Authorize the City Manager to execute the Agreement, subject to approval as to form by the City Attorney, and subsequent amendments to the Agreement, including the authority to approve purchase orders in accordance with the terms of the Agreement, provided sufficient funding appropriations have been approved by the City Council.

SUMMARY

The City submitted a request to the U.S. Department of Housing and Urban Development (HUD) for the release of federal HOME Investment Partnerships Program (HOME) funds under Title II of the Cranston-Gonzalez National Affordable Housing Act (NAHA), in accordance with section 288 (42 U.S.C. 12838), as amended, and the release of National Stabilization Program funds under Title III of the Housing and Economic Recovery Act of 2008 and related laws, to undertake The Courtyards at Cottonwood Family Apartments Project. HUD provided the City with an Authority to Use

Grant Funds effective January 31, 2020. The federal funding source for this project is as follows: HOME-\$1,000,000; and NSP 1-\$3,500,000. The proposed project intends to provide affordable housing for residents through the development of 81 affordable units.

This report recommends approval of an agreement with Willdan Engineering (the "Consultant") to provide project management services for the management of The Courtyards at Cottonwood Project, as well as the NSP grant closeout process. This process includes but is not limited to all necessary reporting; reconciliation of activity and financial data; completion and submission of the required closeout application provided by the City's HUD-assigned Community Development and Planning (CPD) representative; and the transition of remaining NSP program income. The agreement will remain in effect for 18 months following the formal completion of the project.

This agreement will provide the necessary resources and technical expertise needed to ensure compliance with NSP and HOME Regulations. Willdan will provide these services to minimize demands upon the time and effort of City staff. Willdan will provide oversight of the City's NSP and HOME funding for this project by providing to City staff, as appropriate, specific recommendations for action along with full evaluations of all appropriate alternatives.

The staff report was reviewed by the Finance Sub Committee at their May 26, 2020 meeting and recommended to move to City Council for review.

DISCUSSION

"The Courtyards at Cottonwood" project will be gated community and consist of eighty-one (81) affordable units within 2 two-story 30-unit family buildings and a one-story 20-unit senior building. The proposed project will also include a Community Building with management, leasing, services and maintenance offices, a maintenance garage, computer lab, laundry room and a full kitchen. Site amenities are also proposed to include a community pool, a tot lot, basketball court and a senior vita course. A manager's unit will be located on the second floor of the community building.

The proposed development will be an affordable housing project that will be rented to extremely low-income households (up to 30% of median income), and low-income households (up to 60% median income). All income-restricted units will be at rents that do not exceed affordable rents as defined in the California Health and Safety Code. A portion of the units will be reserved for senior citizen households. The development will be located at the northeast corner of Cottonwood Avenue and Indian Street.

The substantial amendment to approve this project's federal funding was approved by City Council on March 17, 2020.

The City Council approved the development agreement with Courtyards at Cottonwood, L.P. a California limited partnership on April 21, 2020.

In order to comply with federally imposed regulations for the funding proposed for this

project, the City is seeking approval of an agreement with Willdan Engineering (the "Consultant") to provide project management services for The Courtyards at Cottonwood project, as well as the NSP grant closeout process.

The Consultant is proposing to provide the City the appropriate range of services needed for the administration of NSP and HOME funds utilized for this project. In addition, the proposal includes technical advisor support related to labor compliance on an as needed basis. The Consultant will ensure proper oversight of the City's NSP and HOME funds administration by providing to City staff, as appropriate, specific recommendations for action along with full evaluations of all appropriate alternatives.

The Consultant's technical approach to assisting with the administration of the City's NSP 1 and HOME funds involves assigning a well-qualified team, under the direction of a senior member staff, to provide the services being requested by the City. A designated Analyst will take the lead in providing NSP and HOME administration services, as well as, report directly to the City's Chief Financial Officer in delivering the desired services.

Additionally, upon completion of all NSP related activities, the Consultant will assist in the reconciliation process for all financial and performance data; ensure all closeout criteria has been met (i.e., 25% set-aside, national objectives, etc.) and ensure all other grant requirements and responsibilities have been carried out. In addition, the Consultant will complete and submit the Closeout Package provided by CPD, prepare the final Quarterly Performance Report (QPR) in the DRGR system, coordinate execution of the Closeout Agreement between the City and HUD and assist the City with monitoring all post closeout responsibilities (i.e., affordability provisions, annual QPR reporting's, etc.). This project will be the last of the NSP activities undertaken by the City. The City will continue to provide accounting support and internal audits through the Financial Operations Division.

In December 2015, the City processed a Request for Proposals (RFP) for Consulting Services for On-Call Services to assist with the Administration of Housing and Urban Development (HUD) Programs, Services and Activities Related to Community Development Block Grants (CDBG), HOME Investment Partnership Program (HOME), Emergency Solutions Grant (ESG), and Neighborhood Stabilization Program Grant (NSP).

Through a competitive process, three companies were interviewed and Willdan Financial Services was determined to have responded with the most comprehensive program implementation and administration plan. The City since entered into a five-year Grant Administration Services Agreement, in August of 2017, with Willdan. Now in its third year of their agreement, Willdan has demonstrated full capacity in undertaking a majority of the City's grant administration activities and reporting. Including ongoing support from Willdan Engineering's team, who in addition to providing technical assistance related to HUD regulations for program/project development and capacity; is tasked with the closing out of NSP activities and ensuring compliance adherence of NSP regulations. To ensure continuity of citywide grant regulation adherence, the City

is recommending additional support for project management in conjunction with a sole source with separate terms independent of the current Grant Administration Services Agreement with Willdan.

Staff requests the City Council to authorize the City Manager to execute an agreement with Willdan Engineering to provide project management services for The Courtyards at Cottonwood project, which will remain effective for 18 months following formal completion of the project as well as the NSP grant closeout process. In addition, staff requests approval of any future amendments subject to: a) satisfactory performance by the Consultant for services performed; b) approval from the City Attorney; and c) approval of continued funding by the City Council.

ALTERNATIVES

1. Approve and authorize the recommended actions as presented in this staff report. *Staff recommends this alternative.*
2. Do not recommend approval of proposed recommended actions as set forth in this staff report. *Staff does not recommend this alternative.*

FISCAL IMPACT

The cost of the proposed agreement for consultant services is for an amount not to exceed \$150,000. This agreement will be funded using available administrative funds received from HUD and is anticipated to be completed by 2024, depending on actual construction development. **There will be no impact to the General Fund.**

NOTIFICATION

Posting of the agenda.

PREPARATION OF STAFF REPORT

Prepared By:
Dena Heald
Deputy Finance Director

Department Head Approval:
Marshall Eyeran
Chief Financial Officer/City Treasurer

CITY COUNCIL GOALS

None

CITY COUNCIL STRATEGIC PRIORITIES

1. Economic Development
2. Public Safety
3. Library
4. Infrastructure

- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. Project Management of Courtyards @ Cottonwood and NSP1 Closeout - Proposal by Willdan Engineering

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	5/27/20 8:54 AM
City Attorney Approval	<u>✓ Approved</u>	5/27/20 9:16 AM
City Manager Approval	<u>✓ Approved</u>	5/27/20 9:23 AM



January 24, 2020

Ms. Dena Heald
 Finance & Operations Manager
 City of Moreno Valley
 14177 Frederick Street
 Moreno Valley, CA 92553

Subject: NSP1/HOME Administration Services for the Courtyards @ Cottonwood Project and NSP1 Closeout

Dear Ms. Heald:

Pursuant to your recent inquiry, I wish to confirm that Willdan Engineering (Willdan) can and would be most pleased to provide a part-time analyst who is experienced in administration of HUD-funded programs, such as the Neighborhood Stabilization Program (NSP) and the HOME Investment Partnerships Program (HOME). Ms. Jennifer Maria would serve as a part-time extension of staff at Moreno Valley City Hall for approximately 8 hours per week (1 days). She would work directly under your supervision and would be primarily responsible for the NSP1 and HOME administration components of the Courtyards @ Cottonwood project, as well as facilitate the NSP1 grant closeout process. Additionally, Ms. Maria would also be available to attend public meetings and hearings on an as-needed basis.

Ms. Maria's services would be billed at \$110.00/hr., which is a fully burdened or "all-inclusive" billing rate. Ms. Maria will work on the premises at City Hall every other week, as well as be available to perform remote work related to this project. She is immediately available to start work. Subsequent to Ms. Maria's startup with the City, a more formalized Agreement for Professional Services can be executed between the City and Willdan Engineering.

We sincerely appreciate the opportunity to offer our NSP and HOME administration services to the City of Moreno Valley and look forward to assisting you with your immediate needs. If you have any questions, or need additional information, please contact me at (562) 364-7600 or at slopez@willdan.com.

Respectfully submitted,

WILLDAN ENGINEERING

A handwritten signature in blue ink that reads "Salvador Lopez Jr."

Salvador Lopez Jr.
 Director of Planning



Project Approach

It is Willdan's understanding that the City of Moreno Valley is seeking NSP and HOME administration services for the implementation of the Courtyards at Cottonwood project, as well as the NSP1 grant closeout process. It is also Willdan's understanding that the Courtyards at Cottonwood project is intended to provide affordable housing to its residents through the development of eighty-one (81) affordable units. Upon formal completion of the Courtyards @ Cottonwood project, Willdan staff shall initiate and complete the formal closeout process for the entire NSP1 funding source. This process includes but is not limited to: all necessary reporting; reconciliation of activity and financial data; completion and submission of the required closeout application provided by HCD; and the transition of remaining NSP1 program income into the CDBG program.

Willdan is proposing to provide the City the appropriate range of services needed for the administration of NSP1/HOME funds, in order to allow City staff to direct their attention and efforts to the many other tasks required of them. Willdan will provide these services to minimize demands upon the time and effort of City staff. Willdan will ensure proper oversight of the City's NSP1 and HOME funds administration by providing to City staff, as appropriate, specific recommendations for action along with full evaluations of all appropriate alternatives. Our staff will also provide written reports and updates to City staff to keep them informed on a regular basis and document program accomplishments.

Willdan's technical approach to assisting with the administration of the City's NSP1 and HOME funds involves assigning a well-qualified team, under the direction of a senior member of our staff, to provide the services being requested by the City. Our designated CDBG Analyst, Jennifer Maria, will take the lead in providing NSP and HOME administration services, as well as, report directly to the department manager in delivering the desired services.

Scope of Work

NSP1 Administration Services (Courtyards @ Cottonwood Project)

- Provide technical direction and assistance for the administration and implementation of the NSP1-funded component of the project.
- Oversee the management and implementation of the project, including the preparation and review of federal funding requirements as part of the construction bid packages, requests for proposals, monitoring reports, public notices, etc. Such activities shall be coordinated with City staff for quality control purposes.
- Set up and maintain project activities and narratives in the Disaster Recovery Grants Reporting System (DRGR). Prepare drawdown requests for reimbursement of expended funds on a monthly basis, or as directed.
- Prepare all HUD required reports, notices, and documents necessary to process any City approved amendments to the Consolidated Plan and/or Annual Action Plan.
- Prepare necessary environmental review forms and documents for the project, where required.



- Develop a monitoring plan and monitor all the project activities to ensure appropriate records maintenance, reporting, and compliance with all applicable NSP1 requirements.
- Assist with the development and review of all project-related agreements (i.e., Affordable Housing Agreement) to ensure regulatory compliance with HUD guidelines.
- Review and audit, if necessary, invoices for reimbursements and coordinate with vendors and/or developer to resolve discrepancies for NSP-1-funded project activities.
- Provide Compliance Reports, as needed, for project-related use of NSP1 grant funds.
- Create and maintain complete file(s) for NSP1-funded activities, as they directly relate to the project's implementation.
- During HUD monitoring, assist the City in gathering and providing requested information to support compliance with HUD requirements.

HOME Administration Services (Courtyards @ Cottonwood Project)

- Provide technical Provide technical direction and assistance for the administration and implementation of the HOME- funded component of the project.
- Oversee the management and implementation of the project, including the preparation and review of federal funding requirements as part of the construction bid packages, requests for proposals, monitoring reports, public notices, etc. Such activities shall be coordinated with City staff for quality control purposes.
- Set up and maintain project activities and narratives in the Integrated Disbursement and Information System (IDIS). Prepare drawdown requests for reimbursement of expended funds on a monthly basis, or as directed.
- Prepare all HUD required reports, notices, and documents necessary to process any City approved amendments to the Consolidated Plan and/or Annual Action Plan.
- Prepare necessary environmental review forms and documents for the project, where required.
- Develop a monitoring plan and monitor all the project activities to ensure appropriate records maintenance, reporting, and compliance with all applicable HOME requirements.
- Assist with the development and review of all project-related agreements (i.e., Affordable Housing Agreement) to ensure regulatory compliance with HUD guidelines.
- Review and audit, if necessary, invoices for reimbursements and coordinate with vendors and/or developer to resolve discrepancies for HOME-funded project activities.
- Provide Compliance Reports, as needed, for project-related use of HOME grant funds.
- Create and maintain complete file(s) for HOME-funded activities, as they directly relate to the project's implementation.
- During HUD monitoring, assist the City in gathering and providing requested information to support compliance with HUD requirements.



NSP1 Administration Services (Grant Closeout)

Upon completion of all NSP1-related activities:

- Perform reconciliation process for all financial and performance data.
- Ensure all closeout criteria has been met (i.e., 25% set-aside, national objectives, etc.) and ensure all other grant requirements and responsibilities have been carried out.
- Complete and submit Closeout Package provided by CPD.
- Preparation of the final Quarterly Performance Report (QPR) in the DRGR system.
- Coordinate execution of the Closeout Agreement between the City and HUD.
- Assist the City with monitoring all post closeout responsibilities (i.e., affordability provisions, annual QPR reporting's, etc.).



Cost Summary

Willdan proposes the not-to-exceed fee of **\$150,000** to provide NSP/HOME Administration Services for the Courtyards @ Cottonwood Project and the NSP1 grant closeout process for the City of Moreno. This fee shall remain firm for 12-18 months following formal completion of the Courtyards at Cottonwood Family Apartments project.

Proposed Service Fees

Service Type	Cost Estimate
*HOME Administration Services for Courtyards @ Cottonwood Project	\$33,000
*NSP Administration Services for Courtyards @ Cottonwood Project	\$100,000
General Administration Services for NSP1 (Including NSP1 Closeout)	\$17,000
Total	\$150,000

*Labor Compliance fees not included. Available upon request, as needed.

Staff Hourly Rates

Staff Member	Project Role	Hourly Rate*
Salvador Lopez, Jr.	Principal-in-Charge	\$216
Jennifer Maria	CDBG Analyst (Project Manager)	\$110
*Jane Freij	Labor Compliance Manager	\$150

*Available upon request and at the discretion of the City.

Reimbursable Expenses

Willdan will be reimbursed for out-of-pocket expenses for an amount not-to-exceed \$2,500 of the proposed overall fee. Examples of reimbursable expenses include but are not limited to: postage; travel expenses; mileage (current prevailing rate); and copying (currently 6¢ per copy).

Any additional expense for reports or from outside services will be billed to the City. Charges for meeting and consulting with counsel, the City, or other parties regarding services not listed in the scope of work will be at our then-current hourly rates.



Resumes

Salvador Lopez Jr.

Principal in Charge

Profile Summary	
Education:	<ul style="list-style-type: none"> ▪ BS, Urban & Regional Planning, California State Polytechnic University, Pomona ▪ AA Chaffey College
Experience:	19 Years

Mr. Salvador Lopez has over 19 years of planning experience that spans all aspects of planning, including current, advance, and environmental planning, as well as active transportation planning and housing and community development. He is highly experienced at managing multi-disciplinary teams in the development of policy and long-range planning documents for public agencies.

Relevant Project Experience

Contract Planning Services, County of Sacramento, California. Program Manager responsible for overall contract services program management and oversight for staffing resources provided to the City. Staff planners assist with current, advance, and special project planning; environmental review; and on-call environmental planning services.

On-Call Planning Services, City of Willows, California. Program Manager responsible for overall on-call project assignment management and oversight for staffing resources provided to the City. Staff planners assist with current, advance, and special project planning; development project review; entitlement processing, including general plan and zoning amendments; CEQA document preparation and review; and other long-range planning activities. Representative projects include:

- Willows Gateway Application Processing and CEQA for a commercial/retail, hotel, and service station developments adjacent to agricultural lands.

Fortin Street Development Application Processing and IS/MND, City of Baldwin Park, California. Project Manager responsible for overall project management and oversight to process an application and preparing an initial study/mitigated negative declaration for a tentative tract map to subdivide four residential properties on 1.75 acres into 15 residential lots as a planned unit development.

Building and Safety Services, City of El Monte, California. Contract Planner. Contract planning services emphasizing discretionary case processing and long-range advanced planning programs. Professional land use and planning services; processing complex land use development projects; general administration of City-initiated planning work and studies; conceptual plans; reviewing and processing land use entitlement applications; preparing General Plan text or map amendments; preparing or amending Specific Plans; preparing Zoning Code text or map amendments; preparing initial studies under the California Environmental Quality Act and related environmental documents; preparing staff reports, resolutions and ordinances.

Special Project Planning Services, City of Artesia, California. Program Manager responsible for overall on-call project assignment management and oversight for staffing resources provided to the City. Serves as Case Planner responsible for reviewing and processing land use entitlement applications; preparing general plan text or map amendments; preparing or amending specific plans; preparing zoning code text or map amendments; and preparing related environmental studies. Performance of these responsibilities requires expertise and knowledge in general plan compliance and implementation, CEQA/NEPA conformance, project management, and general planning procedures.



Planning Services, City of Hawaiian Gardens, California. Project Manager responsible for overall project management and oversight for staffing resources provided to the City. Staff planners assist with processing development applications and other day-to-day planning activities, including – but not limited to – land use entitlements, special projects, CEQA administration, casino project management, and successor agency management.

Contract Planning Services, City of Long Beach, California. Project Manager responsible for overall project management and oversight for staffing resources provided to the City. Staff planners assist with current planning, advance planning, special projects planning, development project review, entitlement processing, CEQA document preparation and review, historic assessments, community outreach, and other long-range planning activities.

On-Call Planning Services, City of El Monte, California. Contract Planner responsible for contract planning services emphasizing discretionary case processing and long-range advanced planning programs. Programs involved land use planning; complex land use development projects; general administration of City-initiated planning work and studies; conceptual plans; land use entitlement applications; general plan, specific plan, and zoning code updates and map amendments; and initial studies under the California Environmental Quality Act and related environmental documents. Responsible for preparing all associated staff reports, resolutions, and ordinances.

Contract Planning Services, City of Cudahy, California. Project Manager responsible for overall project management and oversight for staffing resources provided to the City. Staff provides full-time contract planning services for the City's Planning Division as well as for Interim Community Development Director.

Evan Brooks Associates. Senior Planning Associate. Serve in the areas of land use planning, non-motorized and active transportation planning, health and sustainability planning, project management and grant writing. Responsible for providing on-call planning services and coordination of planning activities for client cities. Provide planning project review services including design review, land use entitlements, including but not limited to general plan amendments, specific plans, zoning code amendments, etc. Project management services for current and advance planning programs, policy development, environmental studies, traffic studies, local/state/federally funded grants, specific plans, planned developments, residential developments and document preparation including staff reports and technical studies. Community outreach services for project or program specific projects, including print and on-line communications, visioning workshops, inter-governmental agency collaborations, and public opinion surveys. Represent planning staff at public meetings and present planning and zoning projects to various planning commissions, city councils, government agencies and community groups. Lead, coordinate and manage all planning/municipal services staff and provide staffing evaluation services.

City of Baldwin Park, California. Associate Planner/Acting Principal Planner/Assistant Planner/Planning Technician responsible for current, long-term and advanced planning activities, analyze and compile technical data, research and prepare staff reports for Planning Commission and City Council. Process Plan/Design Reviews; plan checks and any applicable entitlement. Interpret planning procedures and zoning requirements, prepare environmental documents, conduct a variety of general plan and zoning code amendment and planning studies, make policy recommendations, develop requests for proposals, manage contract compliance for grants and professional services and act as staff liaison between the City Council and consultants. Supervise and direct sensitive, significant and controversial planning projects and grant programs. Administer Design Review and the Planning Commission Meetings. Collaborate with policy makers, civic leaders and advocates. Train and instruct staff, assist in managing and coordinating the activities of the Planning Division



Jennifer Maria

CDBG Analyst (Project Manager)

Profile Summary	
Education:	<ul style="list-style-type: none"> ▪ BS, Business Administration, Mount Saint Mary's University, Los Angeles, California (2015-Present) ▪ Undeclared, University of California, Los Angeles ▪ Certificate of Completion, Grant Writing & Administration, California State University, Dominguez Hills, Carson, California
Experience:	15 Years

Ms. Jennifer Maria is a Willdan Engineering CDBG Administrator with 15 years of experience. Ms. Maria is experienced with the implementation and administration of Community Development Block Grant Programs (CDBG), including Housing Rehabilitation (Grant/Loan Program), Code Enforcement, Economic Development, Public Facilities and Public Service Programs.

Relevant Project Experience

Grant Administration Services, City of Moreno Valley, California. Special Projects Support. Assist in the provision of on-call grant administration services to the City for the CDBG, HOME, NSP and ESG programs. Provide technical assistance to grants management team for CDBG and HOME-funded activities. Develops and maintains project activities/narratives in the Disaster Recovery Grants Reporting System (DRGR); Ensures accurate and timely submission of performance and financial data in the DRGR Quarterly Performance (QPR) system; Monitors financial data in the DRGR system to ensure HUD expenditure requirements are maintained, in coordination with City management; Prepares drawdown requests for reimbursement of expended funds on an as-needed basis; Coordinates Environmental review processes for assigned HUD-funded activities to ensure compliance with NEPA guidelines; Monitors NSP1- and NSP3-funded activities to ensure national objectives are met and HUD regulations are satisfied (i.e. LH25 requirement, etc.); Provides applicants with technical assistance related to HUD regulations for program/project development and capacity; Assists with the CHDO certification application review process the HOME CHDO set-aside fund applicants; Maintains accurate and complete project files for all assigned HUD-funded activities; Prepares regulatory reports, documents, and notices related to substantial amendments to the City's Annual Action Plan and/or 5-Year Consolidated Plan for assigned HUD-funded activities; Participates in meetings with potential partners and/or grant subrecipients; Performs data clean-up and reconciliation activities in the DRGR systems for the NSP1 and NSP3 grant programs; attends public meetings, as needed; Assists grants management team with identifying solutions related to complex HUD regulation inquiries.

City of Cudahy, California. CDBG Coordinator/Human Resources Manager. Maintained the duties associated with the implementation and administration of Community Development Block Grant Programs (CDBG), including Housing Rehabilitation (Grant/Loan Program), Code Enforcement and Public Service Programs under the general direction of the Community Development Director. Monitored rules and administered, regulations, procedures, forms, applications, records, request for proposals, and reports in accordance with applicable federal, state and local laws, rules and regulations, as they applied to each individual CDBG Program. Developed, implemented and maintained program information, evaluation and reporting systems; prepared and submitted grantee performance reports, including project descriptions and program budgets. Maintained, prepared, and entered client data onto the CDBG Public Service and Housing Rehabilitation Modules for quarterly and annual reporting purposes. Conducted special studies and surveys, as need by the City, or as requested by the Los Angeles Community Development Commission (LACDC) for preparation of 5-year Consolidated Plan, Annual Action Plan, and CAPER. Assisted in the preparation of budgets, requests for proposals, and public hearing notices for the Community Development Department. Implemented and monitored contracts between the City and the appropriate agencies involved with CDBG administration; served as primary contact for the City with



LACDC. Prepared public hearing notices and staff reports for the City Council and attended/presented at City Council Meetings and/or City Planning Commission meetings. Reviewed/prepared CDBG funding requests reimbursements (with and/or without supporting documentation), as needed by the Finance Department. Assisted the Finance Director with preparation for Financial Monitoring performed by LACD financial staff. Identified funding sources and prepared detailed proposals for various grant sources (i.e. data collection, research, narratives, budgets, scopes of work). Managed/tracked the return of Program Income for the Housing Rehabilitation Program. Processed reconveyance requests for past Housing Rehabilitation Program participants.

City of Cudahy, California. Administrative Assistant – CDBG Administration. Managed the implementation and administration of Community Development Block Grant Programs (CDBG), including Housing Rehabilitation (Grant/Loan Program), Code Enforcement and Public Service Programs under the general direction of the Community Development Director. Monitored rules and administered, for the City Planning Commission and the City Council. Made all necessary presentations to the City Council and community during Public Hearings for annual CDBG budgets. Reviewed CDBG Funding Requests under the supervision of the Community Development Director and the Finance Director. Assisted the regulations, procedures, forms, records, request for proposals, and reports in accordance with applicable federal, state and local laws, rules and regulations, as they applied to each individual CDBG Program. Developed, implemented and maintained program information, evaluation and reporting systems; prepare and submit grantee performance reports, including project descriptions and program budgets. Conducted special studies and surveys. Assisted in the preparation of budgets, requests for proposals and public hearing notices for the Community Development Department. Implemented and monitored contracts between the City and the appropriate agencies involved with CDBG; principal contact with the Los Angeles County Community Development Commission. Prepared staff reports for the City Council and required to attend City Council Meetings and/or City Commission meetings as necessary. Reviewed CDBG Funding requests under the supervision of the Community Development Director and the Finance Director. Assisted the Finance Director with preparation for Financial Monitoring performed by CDBG. Identified funding sources and prepared grant proposals for various grants (i.e. data collection, research, narratives, budgets, scopes of work). Provided administrative support to Community Development Divisions (i.e., Planning, Building and Safety, Code Enforcement), as needed.

City of Cudahy, California. Account Clerk - Business License. Provided technical assistance to all potential businesses and contractors during the application process and compiled necessary documentation required for that specific type of business. Managed the CDBG-funded Business Assistance Program through the provision of advanced technical assistance for new, micro-enterprise business owners seeking guidance/educational resources. Created and maintained files for all new and existing businesses/contractors. Generated and expedited Business License Renewal Notices on an annual basis. Collected and processed payment information for all Business License Renewals on an annual basis. Coordinated oversight of tenant improvements with Building and Safety Division. Assisted the Planning Division the processing of Zoning Clearances. Monitored businesses for compliance with the assistance of the Code Enforcement Department.

City of Cudahy, California. Clerk Typist. Provided the Code Enforcement Department with clerical assistance by generating outgoing violation notices and tracking follow-up inspection progress. Organized, generated, and submitted paperwork for the payment of invoices received by the City of Cudahy. Collected and processed payments for Pre-Sale Inspections and Building and Safety Permits.



Jane Freij

Labor Compliance Manager

Profile Summary	
Education:	<ul style="list-style-type: none"> ▪ BA, Linguistics, University of Kansas ▪ Litigation/Corporations Certificate, Attorney Assistant Training Program, University of California, Los Angeles
Experience:	20 Years

Profile Summary	
Education:	<ul style="list-style-type: none"> ▪ BA, Linguistics, University of Kansas
Registrations/ Certifications:	<ul style="list-style-type: none"> ▪ Litigation/Corporations Certificate, Attorney Assistant Training Program, University of California – Los Angeles
Experience:	<ul style="list-style-type: none"> ▪ 20 Years

Ms. Jane Freij possesses a proven record of profitability achieved through comprehensive and effective management of time and budget. Key areas of expertise include project needs analyses, scheduling and budgeting, contract administration/negotiation, legal documentation, policy and procedure development, and writing and editing. As a Supervising Labor Compliance Manager, Ms. Freij provides oversight of labor compliance monitoring services for various federally-funded projects under FHWA, FTA, HUD, and EPA. She is familiar with the FHWA federal funding administration process from field review and request for authorization to final invoicing and has specialized training in the reporting requirements and fraud detection and prevention procedures for projects funded by the American Recovery and Reinvestment Act of 2009.

Relevant Project Experience

Gridley and Reservoir Hill Parks and Playground CDBG Improvements, City of Cerritos, California. Labor Compliance Manager responsible for providing supervisory federal and state labor compliance services for parks and other citywide playground improvement projects utilizing CDBG funding.

ADA Ramp and Sidewalk CDBG Improvements and Grant Administration and Implementations Services, City of Rolling Hills Estates, California. Labor Compliance Manager responsible for providing supervisory federal and state labor compliance services to upgrade citywide ramps and sidewalks to ADA compliance. Assistance is being provided for administration and implementation of the City's annual CDBG program funding.

Community Development Block Grant Labor Compliance, Various Cities, California. Labor Compliance Manager responsible for providing supervisory federal and state labor compliance services for CDBG-funded projects administered by the U.S. Department of Housing and Urban Development and the Los Angeles County Community Development Commission for

- City of Bell Gardens
- City of Burbank
- City of Calimesa
- City of Commerce
- City of Hawaiian Gardens
- City of La Mirada
- City of Lawndale
- City of Maywood
- City of Paramount
- City of Pico Rivera
- City of Rosemead
- City of San Marino
- City of South El Monte
- City of South Gate



La Brea Avenue Intersection Realignment – Phase III and La Brea Avenue Pavement Reconstruction – Phase II, City of Inglewood, California. Labor Compliance Task Leader responsible for providing labor compliance to reconfigure five street intersections at La Brea Avenue, Market Street, Spruce Avenue, and La Palma Avenue and to fully reconstruct the AC pavement roadway on La Brea Avenue and Hawthorne Boulevard between 104th Street and Market Street.



Report to City Council

TO: Mayor and City Council

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: LIST OF PERSONNEL CHANGES

RECOMMENDED ACTION

Recommendation:

1. Ratify the list of personnel changes as described.

DISCUSSION

The attached list of personnel changes scheduled since the last City Council meeting is presented for City Council ratification.

Staffing of City positions ensures assignment of highly qualified and trained personnel to achieve Momentum MoVal priorities, objectives and initiatives.

FISCAL IMPACT

All position changes are consistent with appropriations previously approved by the City Council.

PREPARATION OF STAFF REPORT

Prepared By:
Vanessa Leccese
Executive Assistant

Department Head Approval:
Marshall Eyerman
Assistant City Manager
Chief Financial Officer/City Treasurer

CITY COUNCIL GOALS

None

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. Personnel Changes

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/07/20 9:19 PM
City Attorney Approval	<u>✓ Approved</u>	6/08/20 9:45 AM
City Manager Approval	<u>✓ Approved</u>	6/08/20 3:53 PM

**City of Moreno Valley
Personnel Changes
June 16, 2020**

New Hires

None

Promotions

None

Transfers

None

Separations

Gary Chamber, Code Compliance Officer, Community Development Department/Code Neighborhood Services Division

Arthur Wilson, Maintenance Worker II, Public Works Department/Maintenance & Operations Division

Carol Hancock, Senior Customer Service Assistant, Parks & Community Services Department

Anne Shacklett, Senior Office Assistant, Parks & Community Services Department

Barry Verducco, Landscape Services Inspector, Public Workers Department, Special Districts Division

George Chang, Maintenance Worker II, Public Works Department/Maintenance & Operations Division

Eric Lewis, Transportation Division Manager/City Traffic Engineer Public Works Department/Transportation Engineering Division

Debra Pratt, Senior Administrative Assistant, Financial Management Services Department

Gina Gonzales, Executive Assistant II, City Manager's Department

Sylvester Collins, Maintenance Worker II, Public Works Department/Maintenance & Operations Division

Eric Menzies, Park Ranger, Parks & Community Services Department, Park Maintenance Division

Attachment: Personnel Changes (4052 : LIST OF PERSONNEL CHANGES)



Report to City Council

TO: Mayor and City Council

FROM: Marshall Eyerman, Assistant City Manager

AGENDA DATE: June 16, 2020

TITLE: APPROVE BID AWARD TO ONE SOURCE DISTRIBUTORS FOR THE PURCHASE OF EMERGENCY STOCK FOR MORENO VALLEY UTILITY (MVU)

RECOMMENDED ACTION

Recommendations:

1. Approve bid award to OneSource Distributors for the purchase of Emergency Stock for Moreno Valley Utility.
2. Authorize the purchase of emergency stock as needed in an amount not to exceed a total of \$1,325,000 for Fiscal Year 2020-2021 through Fiscal Year 2024/2025.
3. Authorize the Assistant City Manager/Chief Financial Officer to execute any subsequent related minor change orders up to his signature authority.

SUMMARY

This report recommends the award of the contract to OneSource Distributors for the purchase of Emergency Stock for the replacement of streetlights, PME 9 switches, PME 10 switches, PME 11 switches, 75 kVA transformers, and fuses for Moreno Valley Utility. The purchase of Emergency Stock will allow Moreno Valley Utility to replace MVU infrastructure as needed, ensuring the reliability of the system. The equipment will be purchased from operating funds up to the purchase order amount authorized for each fiscal year.

DISCUSSION

Electric utilities across the state, both investor-owned and publicly-owned, keep

inventory of items needed to make timely repairs or replacement of equipment that are part of the infrastructure system. The timely repairs or replacement of equipment helps to maintain reliability of the electrical distribution system.

A Request for Quote (RFQ) was advertised and placed on Planet Bids, the City's online bidding portal, from March 27, 2020 through April 17, 2020. All RFQ Questions and Answers were posted on Planet Bids. The RFQ requested pricing on the specified items in a single unit price.

Two responses were received – one from OneSource Distributors, and the other from Anixter.

OneSource Distributors was deemed to be the lowest, responsive bidder, with pricing 5% lower on average. Contract pricing will be held for two years and years three through five may have up to a 6% escalator.

The equipment will be delivered to the City of Moreno Valley Corporate yard.

ALTERNATIVES

1. Approve and authorize the recommended actions as presented in this staff report. *Staff recommends this alternative because it will allow the utility to offer timely and needed repairs or replacement to the infrastructure system that serves MVU customers.*
2. Do not approve and authorize the recommended actions as presented in this staff report. *Staff does not recommend this alternative because it will delay the repair or replacement of infrastructure that is needed to serve MVU customers.*

FISCAL IMPACT

The equipment purchases will be paid for with MVU operating funds. There will be no impact to the General Fund.

Funds are available in account number 6010-30-80-45510-710134 for Fiscal Year 2020/2021. Funds will be made available for future fiscal years.

NOTIFICATION

Publication Agenda.

PREPARATION OF STAFF REPORT

Prepared By:
Lesia Bowers
Sr. Accountant

Department Head Approval:
Marshall Eyerman
Assistant City Manager/Chief Financial Officer

Concurred By:
Jeannette Olko
Electric Utility Division Manager

CITY COUNCIL GOALS

Public Facilities and Capital Projects. Ensure that needed public facilities, roadway improvements, and other infrastructure improvements are constructed and maintained.

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

Objective 4.1: Develop a Moreno Valley Utility Strategic Plan to prepare for the 2020 expiration of the ENCO Utility Systems agreement.

ATTACHMENTS

- 1. MVU emergency stock evaluation

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	5/27/20 8:52 AM
City Attorney Approval	<u>✓ Approved</u>	5/27/20 10:48 AM
City Manager Approval	<u>✓ Approved</u>	5/27/20 11:17 AM

MVU Emergency Stock
RFQ #2020-005
Evaluation
4/21/2020

Bidders	PME 9 Switch	PME 10 Switch	PME 11 Switch	75 kVA Transformer
One Source	\$ 18,597.65	\$ 20,671.84	\$ 19,017.88	\$ 2,566.61
Anixter*	\$ 20,065.00	\$ 22,305.00	\$ 20,528.75	\$ -

*Escalation of 6% for second year

Attachment: MVU emergency stock evaluation (4047 : APPROVE PURCHASE OF INVENTORY FOR MVU)

Current limiting fuse (40 amp)	Current limiting fuse (80 amp)	Arterial Street light pole and mast arm	Residential Street light pole and mast arm
\$ 86.74	\$ 177.79	\$ 3,000.84	\$ 2,235.81
\$ 104.00	\$ 189.31	\$ 3,170.58	\$ 2,322.00

Attachment: MVU emergency stock evaluation (4047 : APPROVE PURCHASE OF INVENTORY FOR MVU)



Report to City Council

TO: Mayor and City Council

FROM: Michael L. Wolfe, P.E., Public Works Director/City Engineer

AGENDA DATE: June 16, 2020

TITLE: AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA CORPORATION FOR THE JUAN BAUTISTA DE ANZA MULTI-USE TRAIL ATP-4 PROJECT NO. 801 0086

RECOMMENDED ACTION

Recommendations:

1. Award an Agreement for Professional Consultant Services to KOA Corporation, 3190 Shelby Street, Bldg C, Ontario, CA 91764 to complete preliminary engineering, design, and right-of-way services for the Juan Bautista de Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue;
2. Authorize the issuance of a Purchase Order to KOA Corporation, in the amount of \$482,824 when the contract has been signed by all parties. The Project is fully funded by ATP Grant Cycle 4 (Fund 2301);
3. Authorize the City Manager to execute the contract with KOA Corporation, subject to the approval by the City Attorney; and
4. Authorize the Public Works Director to execute any subsequent related amendments to the Agreement for Professional Consultant Services with KOA Corporation, not to exceed the Purchase Order amount, subject to the approval by the City Attorney.

SUMMARY

This report recommends approval of an agreement for Professional Consultant Services with KOA Corporation to complete preliminary engineering, design, right-of-way (ROW) acquisition, and construction support for the Juan Bautista de Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue project. The project is funded with ATP grant cycle 4

funding. There is no impact to the General Fund.

DISCUSSION

The Active Transportation Program (ATP) was created by California Senate Bill 99 (Chapter 359, Statutes of 2013) and Assembly Bill 101(Chapter 354, Statutes of 2013) to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidated existing federal and state transportation programs into a single program that is annually funded by various state and federal funds. Eligible projects for ATP grant funding include pedestrian facilities, traffic control devices, bicycle facilities, and recreational trails.

On June 19, 2018, City Council approved submission of an application for this project under the ATP Cycle 4 Call for Projects. The project was subsequently approved, and on April 16, 2019, the City Council accepted the ATP Cycle 4 grant in total amount of \$8.4 Million for the project. At the October 9, 2019 California Transportation Commission (CTC) meeting, the CTC allocated funding in the amount of \$1,010,000 for the Plans, Specifications and Estimate (PS&E) and ROW phases and authorized the City to proceed with the project.

This Juan Bautista de Anza Multi-Use Trail project from Moreno Valley Mall to Iris Avenue entails the design, right of way acquisition, and construction of approximately four miles, in varying segments lengths, from Moreno Valley Mall to Iris Avenue. When these segments are completed, they will connect to other segments of the overall trail project funded through previous ATP cycles or constructed by developments. These other segments include Iris Avenue to El Portero Park and the southern portion of the trail from El Portero Park to Lake Perris State Park.

Requests for Proposals (RFP) for Professional Consultant Services were distributed and advertised in accordance with the California State Department of Transportation (Caltrans) and City's processes in compliance with ATP grant program. The City received three (3) proposals in response to the RFP. Following a competitive selection process, KOA Corporation was selected as the most qualified consultant to perform the work consisting of full service preliminary engineering, design, right-of-way, and construction support. The selection process was pursuant to the City's Municipal Code requirements for professional services procurement.

Staff recommends the award of the design contract to KOA Corporation for the preliminary engineering, design, and right-of-way phases and construction support for the Juan Bautista de Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue project.

Approval of the recommended actions would support Objective 4.6.1 of the Momentum MoVal Strategic Plan: "Complete the Juan Bautista De Anza Regional Trail."

ALTERNATIVES

1. Approve and authorize the recommended actions as presented in this staff report. *This alternative will provide for the Juan Bautista De Anza Multi-Use Trail project to move forward in accordance with the grant requirements.*
2. Do not approve and authorize the recommended actions as presented in this staff report. *This alternative will delay the Juan Bautista De Anza Multi-Use Trail project and jeopardize funding within the approved schedule.*

FISCAL IMPACT

The Juan Bautista De Anza Multi-Use project is included in the Fiscal Year 2019/20 and 2020/21 Capital Improvement Plan (CIP) as a funded project. The project is fully funded by ATP Grant Cycle 4 (Fund 2301). The ATP funding will provide reimbursement of up to \$1,010,000 with a 100% reimbursement rate (no local match required) for PS&E and ROW. There is no impact to the General Fund.

AVAILABLE PROJECT BUDGET FY 2019/20-2020/21:

Capital Projects Grants (Account No. 2301-70-77-80001) (Project No. 801 0086)	\$1,010,000
Total	\$1,010,000

ESTIMATED COSTS FOR PS&E AND ROW

PS&E and ROW Consultant.....	\$482,824
Right-of-Way Acquisition	\$400,000
Project Administration*	<u>\$127,176</u>
Total Estimated Costs	\$1,010,000

**Includes City project administration, application fees, related miscellaneous costs, and approvals.*

ANTICIPATED PROJECT SCHEDULE:

Complete Design.....	Spring 2021
Complete Right-of-Way Acquisition	Summer 2021
Construction	Spring 2022

NOTIFICATION

Public notification and community outreach will continue throughout the completion of this project.

PREPARATION OF STAFF REPORT

Prepared By:
Henry Ngo, P.E.
Capital Projects Division Manager

Department Head Approval:
Michael L. Wolfe, P.E.
Public Works Director/City Engineer

CITY COUNCIL GOALS

Public Safety. Provide a safe and secure environment for people and property in the community, control the number and severity of fire and hazardous material incidents, and provide protection for citizens who live, work and visit the City of Moreno Valley.

Community Image, Neighborhood Pride and Cleanliness. Promote a sense of community pride and foster an excellent image about our City by developing and executing programs which will result in quality development, enhanced neighborhood preservation efforts, including home rehabilitation and neighborhood restoration.

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

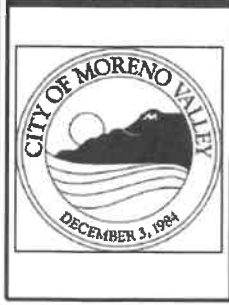
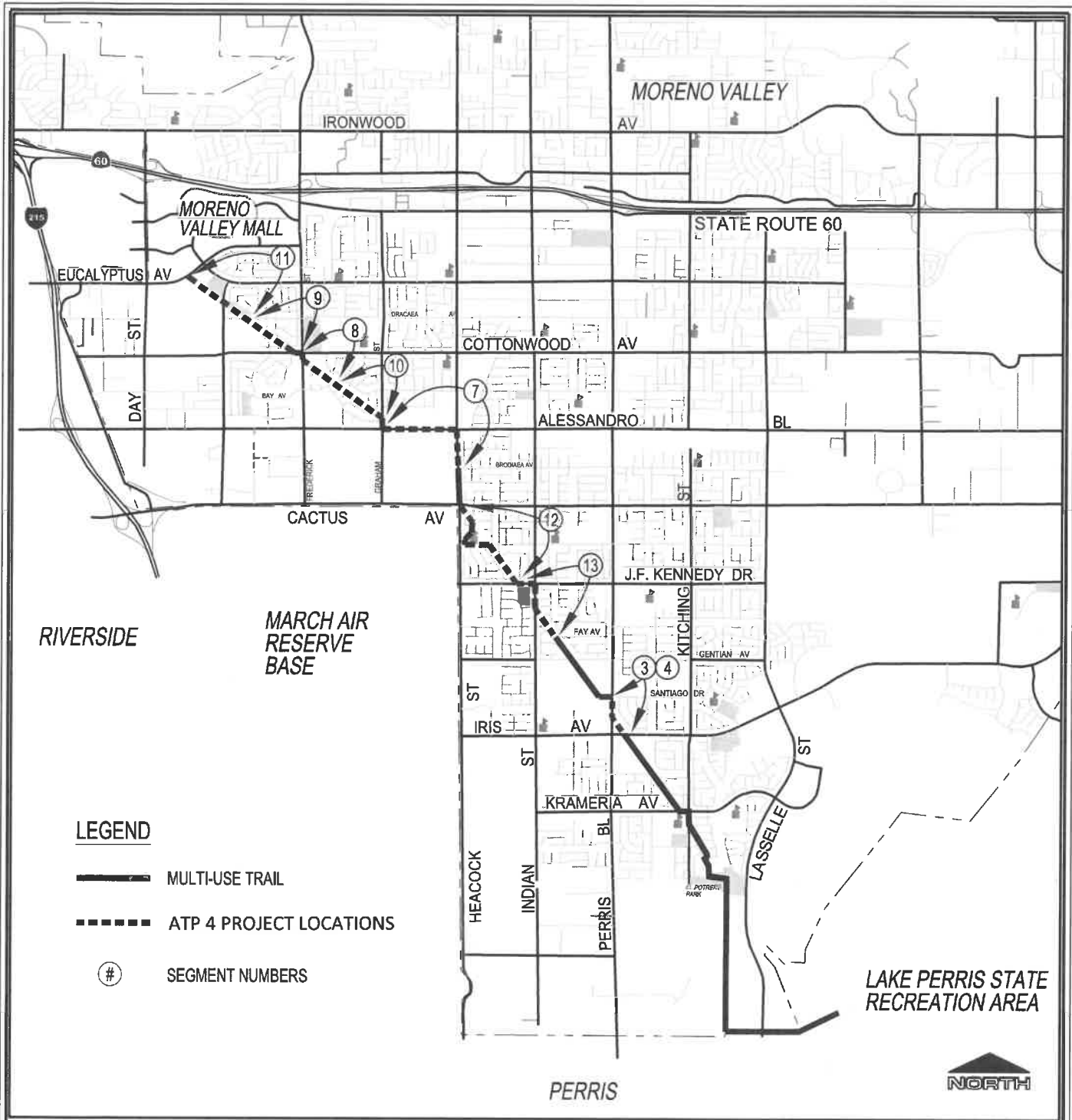
Objective 4.6: Advance the development of a well-connected and balanced citywide transportation network that serves all modes.

ATTACHMENTS

- 1. Location Map
- 2. Agreement

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/08/20 4:07 PM
City Attorney Approval	<u>✓ Approved</u>	6/11/20 12:00 PM
City Manager Approval	<u>✓ Approved</u>	6/11/20 12:02 PM



Juan Bautista de Anza Multi-Use Trail

Public Works Department
Capital Projects Division

Scale: None

**FROM MORENO VALLEY MALL AREA TO
LAKE PERRIS STATE RECREATION AREA**

Attachment: Location Map (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

**AGREEMENT FOR PROFESSIONAL
CONSULTANT SERVICES WITH KOA CORPORATION FOR
THE JUAN BAUTISTA DE ANZA MULTI-USE TRAIL FROM MORENO
VALLEY MALL TO IRIS AVENUE
PROJECT NO. 801 0086
ATPSB16-5411(076)**

This Agreement is by and between the City of Moreno Valley, California, a municipal corporation, hereinafter described as "City," and KOA Corporation, a California corporation, hereinafter described as "Consultant." This Agreement is made and entered into effective on the date the City signs this Agreement.

RECITALS

WHEREAS, the City has determined it is in the public interest to proceed with the professional work hereinafter described as "Project"; and

WHEREAS, the City has determined the Project involves the performance of professional and technical services of a temporary nature as more specifically described in Exhibit A (City's Request for Proposal) and Exhibit B (Consultant's Proposal) hereto; and

WHEREAS, the City does not have available employees to perform the services for the Project; and

WHEREAS, the City has requested the Consultant to perform such services for the Project; and

WHEREAS, the Consultant is professionally qualified in California to perform the professional and technical services required for the Project, and hereby represents that it desires to and is professionally and legally capable of performing the services called for by this Agreement;

THEREFORE, the City and the Consultant, for the consideration hereinafter described, mutually agree as follows:

AGREEMENT FOR PROFESSIONAL
CONSULTANT SERVICES FOR
JUAN BAUTISTA DE ANZA MULTI-USE TRAIL
CITY PROJECT NO. 801 0086
FEDERAL PROJECT NO. ATPSB1L-5441(076)

DESCRIPTION OF PROJECT

1. The Project is described as Juan Bautista de Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue, City Project No. 801 0086 and Federal Project No. ATPSB16-5411(076).

SCOPE OF SERVICES

2. The Consultant's scope of service is described on Exhibit B attached hereto and incorporated herein by this reference. In the event of a conflict, the City's request for scope and fee shall take precedence over the Consultant's Proposal.

3. The City's responsibility is described on Exhibit C attached hereto and incorporated herein by this reference.

PAYMENT TERMS

4. The City agrees to pay the Consultant and the Consultant agrees to receive a "Not-to-Exceed" fee of \$482,824.00 in accordance with the payment terms provided on Exhibit D attached hereto and incorporated herein by this reference.

TIME FOR PERFORMANCE

5. The Consultant shall commence services upon receipt of written direction to proceed from the City.

6. This Agreement shall be effective from effective date and shall continue in full force and effect date through December 31, 2022, subject to any earlier termination in accordance with this Agreement. The services of Consultant shall be completed in a sequence assuring expeditious completion, but in any event, all such services shall be completed prior to expiration of this Agreement.

7. (a) The Consultant agrees that the personnel, including the principal Project

**AGREEMENT FOR PROFESSIONAL
CONSULTANT SERVICES FOR
JUAN BAUTISTA DE ANZA MULTI-USE TRAIL
CITY PROJECT NO. 801 0086
FEDERAL PROJECT NO. ATPSB1L-5441(076)**

manager, and all subconsultants assigned to the Project by the Consultant, shall be subject to the prior approval of the City.

(b) No change in subconsultants or key personnel shall be made by the Consultant without written prior approval of the City.

SPECIAL PROVISIONS

8. It is understood and agreed that the Consultant is, and at all times shall be, an independent contractor and nothing contained herein shall be construed as making the Consultant or any individual whose compensation for services is paid by the Consultant, an agent or employee of the City, or authorizing the Consultant to create or assume any obligation or liability for or on behalf of the City.

9. The Consultant may also retain or subcontract for the services of other necessary consultants with the prior written approval of the City. Payment for such services shall be the responsibility of the Consultant. Any and all subconsultants employed by the Consultant shall be subject to the terms and conditions of this Agreement, except that the City shall have no obligation to pay any subconsultant for services rendered on the Project.

10. The Consultant and the City agree to use reasonable care and diligence to perform their respective services under this Agreement.

11. The Consultant shall comply with applicable federal, state, and local laws in the performance of work under this Agreement.

12. To the extent required by controlling federal, state and local law, Consultant shall not employ discriminatory practices in the provision of services, employment of personnel, or in any other respect on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation,

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ethnicity, status as a disabled veteran or veteran of the Vietnam era. Subject to the foregoing and during the performance of this Agreement, Consultant agrees as follows:

(a) Consultant will comply with all applicable laws and regulations providing that no person shall, on the grounds of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, ethnicity, status as a disabled veteran or veteran of the Vietnam era be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity made possible by or resulting from this Agreement.

(b) Consultant will not discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, ethnicity, status as a disabled veteran or veteran of the Vietnam era. Consultant shall ensure that applicants are employed, and the employees are treated during employment, without regard to their race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, ethnicity, status as a disabled veteran or veteran of the Vietnam era. Such requirement shall apply to Consultant's employment practices including, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provision of this nondiscrimination clause.

(c) Consultant will, in all solicitations or advertisements for employees placed

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by or on behalf of Consultant in pursuit hereof, state that all qualified applicants will receive consideration for employment without regard to race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, ethnicity, status as a disabled veteran or veteran of the Vietnam era.

(d) If Consultant should subcontract all or any portion of the services to be performed under this Agreement, Consultant shall cause each subcontractor to also comply with the requirements of this Section 13.

13. To the furthest extent allowed by law (including California Civil Code section 2782.8 if applicable), Consultant shall indemnify, hold harmless and defend the City, the Moreno Valley Community Services District (“CSD”), the Moreno Valley Housing Authority (“Housing Authority”) and each of their officers, officials, employees, agents and volunteers from any and all loss, liability, fines, penalties, forfeitures, costs and damages (whether in contract, tort or strict liability, including but not limited to personal injury, death at any time and property damage), and from any and all claims, demands and actions in law or equity (including reasonable attorney's fees and litigation expenses) that arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of Consultant, its principals, officers, employees, agents or volunteers in the performance of this Agreement.

If Consultant should subcontract all or any portion of the services to be performed under this Agreement, Consultant shall require each subcontractor to indemnify, hold harmless and defend City, CSD, Housing Authority and each of their officers, officials, employees, agents and volunteers in accordance with the terms of the preceding paragraph.

This section shall survive termination or expiration of this Agreement.

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14. Insurance.

(a) Throughout the life of this Agreement, Consultant shall pay for and maintain in full force and effect all insurance as required in Exhibit E or as may be authorized in writing by the City Manager or his/her designee at any time and in his/her sole discretion.

(b) If at any time during the life of the Agreement or any extension, Consultant or any of its subcontractors fail to maintain any required insurance in full force and effect, all services and work under this Agreement shall be discontinued immediately, and all payments due or that become due to Consultant shall be withheld until notice is received by City that the required insurance has been restored to full force and effect and that the premiums therefore have been paid for a period satisfactory to City. Any failure to maintain the required insurance shall be sufficient cause for City to terminate this Agreement. No action taken by City pursuant to this section shall in any way relieve Consultant of its responsibilities under this Agreement. The phrase "fail to maintain any required insurance" shall include, without limitation, notification received by City that an insurer has commenced proceedings, or has had proceedings commenced against it, indicating that the insurer is insolvent.

(c) The fact that insurance is obtained by Consultant shall not be deemed to release or diminish the liability of Consultant, including, without limitation, liability under the indemnity provisions of this Agreement. The duty to indemnify City shall apply to all claims and liability regardless of whether any insurance policies are applicable. The policy limits do not act as a limitation upon the amount of indemnification to be provided by Consultant. Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Consultant, its principals, officers, agents, employees, persons under the supervision of Consultant, vendors, suppliers, invitees, consultants, sub-consultants,

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subcontractors, or anyone employed directly or indirectly by any of them.

(d) Upon request of City, Consultant shall immediately furnish City with a complete copy of any insurance policy required under this Agreement, including all endorsements, with said copy certified by the underwriter to be a true and correct copy of the original policy. This requirement shall survive expiration or termination of this Agreement.

(e) If Consultant should subcontract all or any portion of the services to be performed under this Agreement, Consultant shall require each subcontractor to provide insurance protection in favor of City and each of its officers, officials, employees, agents and volunteers in accordance with the terms of this section, except that any required certificates and applicable endorsements shall be on file with Consultant and City prior to the commencement of any services by the subcontractor.

15. The waiver by either party of a breach by the other of any provision of this Agreement shall not constitute a continuing waiver or a waiver of any subsequent breach of either the same or a different provision of this Agreement. No provisions of this Agreement may be waived unless in writing and signed by all parties to this Agreement. Waiver of any one provision herein shall not be deemed to be a waiver of any other provision herein.

16. Consultant and subconsultants shall pay prevailing wage rates when required by the Labor Laws of the State of California.

17. (a) The Consultant shall deliver to the Public Works Director/City Engineer of the City or his designated representative, fully completed and detailed project-related documents which shall become the property of the City. The Consultant may retain, for its files, copies of any and all material, including drawings, documents, and specifications, produced by the Consultant in performance of this Agreement.

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(b) The Consultant shall be entitled to copies of all furnished materials for his files and his subconsultants, if any.

(c) The City agrees to hold the Consultant free and harmless from any claim arising from any unauthorized use of computations, maps, and other documents prepared or provided by the Consultant under this Agreement, if used by the City on other work without the permission of the Consultant. Consultant acknowledges that Consultant work product produced under this agreement may be public record under State law.

18. (a) This Agreement shall terminate without any liability of City to Consultant upon the earlier of: (i) Consultant's filing for protection under the federal bankruptcy laws, or any bankruptcy petition or petition for receiver commenced by a third party against Consultant; (ii) 10 calendar days prior written notice with or without cause by City to Consultant; (iii) City's non-appropriation of funds sufficient to meet its obligations hereunder during any City fiscal year of this Agreement, or insufficient funding for the Project; or (iv) expiration of this Agreement. The written notice shall specify the date of termination. Upon receipt of such notice, the Consultant may continue services on the project through the date of termination, provided that no service(s) shall be commenced or continued after receipt of the notice, which is not intended to protect the interest of the City. The City shall pay the Consultant within thirty (30) days after the date of termination for all non-objected to services performed by the Consultant in accordance herewith through the date of termination. Consultant shall not be paid for any work or services performed or costs incurred which reasonably could have been avoided.

(b) In the event of termination due to failure of Consultant to satisfactorily perform in accordance with the terms of this Agreement, City may withhold an amount that would

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otherwise be payable as an offset to, but not in excess of, City's damages caused by such failure. In no event shall any payment by City pursuant to this Agreement constitute a waiver by City of any breach of this Agreement which may then exist on the part of Consultant, nor shall such payment impair or prejudice any remedy available to City with respect to the breach.

(c) Upon any breach of this Agreement by Consultant, City may (i) exercise any right, remedy (in contract, law or equity), or privilege which may be available to it under applicable laws of the State of California or any other applicable law; (ii) proceed by appropriate court action to enforce the terms of the Agreement; and/or (iii) recover all direct, indirect, consequential, economic and incidental damages for the breach of the Agreement. If it is determined that City improperly terminated this Agreement for default, such termination shall be deemed a termination for convenience.

(d) Consultant shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of Consultant and without its fault or negligence such as, acts of God or the public enemy, acts of City in its contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. Consultant shall notify City in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, and shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to Administrator of the cessation of such occurrence.

19. This Agreement is binding upon the City and the Consultant and their successors and assigns. Except as otherwise provided herein, neither the City nor the Consultant shall assign, sublet, or transfer its interest in this Agreement or any part thereof without the prior written consent of the other.

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20. A City representative shall be designated by the City and a Consultant representative shall be designated by the Consultant. The City representative and the Consultant representative shall be the primary contact person for each party regarding performance of this Agreement. The City representative shall cooperate with the Consultant, and the Consultant's representative shall cooperate with the City in all matters regarding this Agreement and in such a manner as will result in the performance of the services in a timely and expeditious fashion.

21. This Agreement represents the entire and integrated Agreement between the City and the Consultant, and supersedes all prior negotiations, representations or Agreements, either written or oral. This Agreement may be modified or amended only by a subsequent written Agreement signed by both parties.

22. Where the payment terms provide for compensation on a time and materials basis, the Consultant shall maintain adequate records to permit inspection and audit of the Consultant's time and materials charges under this Agreement. The Consultant shall make such records available to the City at the Consultant's office during normal business hours upon reasonable notice. Nothing herein shall convert such records into public records. Except as may be otherwise required by law, such records will be available only to the City. Such records shall be maintained by the Consultant for three (3) years following completion of the services under this Agreement.

23. The City and the Consultant agree, that to the extent permitted by law, until final approval by the City, all data shall be treated as confidential and will not be released to third parties without the prior written consent of both parties.

24. (a) Consultant shall comply, and require its subcontractors to comply, with all

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applicable (i) professional canons and requirements governing avoidance of impermissible client conflicts; and (ii) federal, state and local conflict of interest laws and regulations including, without limitation, California Government Code Section 1090 et. seq., the California Political Reform Act (California Government Code Section 87100 et. seq.) and the regulations of the Fair Political Practices Commission concerning disclosure and disqualification (2 California Code of Regulations Section 18700 et. seq.). At any time, upon written request of City, Consultant shall provide a written opinion of its legal counsel and that of any subcontractor that, after a due diligent inquiry, Consultant and the respective subcontractor(s) are in full compliance with all laws and regulations. Consultant shall take, and require its subcontractors to take, reasonable steps to avoid any appearance of a conflict of interest. Upon discovery of any facts giving rise to the appearance of a conflict of interest, Consultant shall immediately notify City of these facts in writing.

(b) In performing the work or services to be provided hereunder, Consultant shall not employ or retain the services of any person while such person either is employed by City or is a member of any City council, commission, board, committee, or similar City body. This requirement may be waived in writing by the City Manager, if no actual or potential conflict is involved.

(c) Consultant represents and warrants that it has not paid or agreed to pay any compensation, contingent or otherwise, direct or indirect, to solicit or procure this Agreement or any rights/benefits hereunder.

(d) Neither Consultant, nor any of Consultant's subcontractors performing any services on this Project, shall bid for, assist anyone in the preparation of a bid for, or perform any services pursuant to, any other contract in connection with this Project unless fully

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disclosed to and approved by the City Manager, in advance and in writing. Consultant and any of its subcontractors shall have no interest, direct or indirect, in any other contract with a third party in connection with this Project unless such interest is in accordance with all applicable law and fully disclosed to and approved by the City Manager, in advance and in writing. Notwithstanding any approval given by the City Manager under this provision, Consultant shall remain responsible for complying with Section 25(a), above.

(e) If Consultant should subcontract all or any portion of the work to be performed or services to be provided under this Agreement, Consultant shall include the provisions of this Section 25 in each subcontract and require its subcontractors to comply therewith.

(f) This Section 25 shall survive expiration or termination of this Agreement.

25. All Plans, drawings, Specifications, reports, logs, and other documents prepared by the Consultant in its performance under this Agreement shall, upon completion of the project, be delivered to and be the property of the City, provided that the Consultant shall be entitled, at its own expense, to make copies thereof for its own use.

26. The laws of the State of California shall govern the rights, obligations, duties, and liabilities of the parties to this Agreement, and shall also govern the interpretation of this Agreement. Venue shall be vested in the Superior Court of the State of California, County of Riverside.

SIGNATURE PAGE FOLLOWS

IN WITNESS HEREOF, the parties have each caused their authorized representative to execute this Agreement.

City of Moreno Valley

KOA Corporation

BY: _____
Mike Lee, City Manager

BY: _____

Name: _____

TITLE: _____
(President or Vice President)

Date

Date

<u>INTERNAL USE ONLY</u>
APPROVED AS TO LEGAL FORM:

City Attorney

Date
RECOMMENDED FOR APPROVAL:

Public Works Director/City Engineer

Date

BY: _____

Name: _____

TITLE: _____
(Corporate Secretary)

Date

- Enclosures:
- Exhibit A – City Scope of Services
 - Exhibit B – Consultant Proposal
 - Exhibit C – City Services to be Provided
 - Exhibit D – Terms of Payment
 - Exhibit E – Insurance Requirements

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

EXHIBIT "A"

**REQUEST FOR PROPOSAL
FOR PROFESSIONAL CONSULTANT SERVICES
FOR JUAN BAUTISTA DE ANZA MULTI-USE TRAIL
FROM MORENO VALLEY MALL TO IRIS AVENUE
PROJECT NUMBER: 801 0086**

I. INVITATION

You are hereby invited to submit a Proposal for Professional Consultant Services, for the **Juan Bautista De Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue.**

Interested parties may register and download copies of the RFP by visiting the City's web site, www.moval.org, selecting "City Bids and RFP's" under the "City Hall" Resources link at the home page and selecting the "Online Bidding System" link. To download proposal packages and submit proposals, vendors will be required to pay an online usage download fee of \$10.00. All documents associated with this RFP will be downloadable after the fee has been paid. Once the prospective Bidder downloads any documents relative to a solicitation, that Bidder's name will appear on the Prospective Bidders List.

Proposals will be accepted until 5:00 p.m. on May 28, 2020.

Proposals shall be submitted electronically (in PDF format) via the City's vendor portal website, located at <http://www.planetbids.com/portal/portal.cfm?CompanyID=24660>. The proposer shall provide a separate electronic file for their technical proposal and cost proposal.

The proposer is solely responsible for "on time" submission of their electronic proposal. The City will only consider proposals that have been transmitted successfully and have been issued an ebid confirmation number with a time stamp from the Bid Management System indicating that bid was submitted successfully. Transmission of proposals by any other means will not be accepted. Proposer shall be solely responsible for informing itself with respect to the proper utilization of the proposal management system, for ensuring the capability of their computer system to upload the required documents, and for the stability of their internet service. Failure of the proposer to successfully submit an electronic proposal shall be at the proposer's sole risk and no relief will be given for late and/or improperly submitted proposals. Proposers experiencing any technical difficulties with the proposal submission process may contact PlanetBids at (818) 992-1771. Questions of an operational nature may be directed to the City's Capital Projects Division at (951) 413-3130. Neither the City nor PlanetBids makes any guarantee as to the timely availability of assistance, or assurance that any given problem will be resolved by the proposal submission deadline.

All questions regarding this RFP must be submitted through the vendor portal noted above and must be submitted no later than May 21, 2020 at 5:00 p.m.

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II. GENERAL PROJECT DESCRIPTION

The scope of work is to provide the Professional Consultant Design Service to complete the PS&E and ROW phases for Juan Bautista De Anza Multi Use Trail from Moreno Valley Mall- Eucalyptus Avenue to Iris Avenue project. The project includes construction of approximately 4 miles of multi-use trail for bicyclists and pedestrian including Class I Bike path and pedestrian path, street crossing, sidewalk improvement and connection to existing trails. The project preliminary design and environmental document has been approved by Caltrans in November 2018. Project has CE Determination in compliance with CEQA and NEPA. The Juan Bautista Trail alignment is mainly along the existing Aqueduct pipeline of Department of Water Resource.

The design scope of work also includes right of way service for easement needs, right of way acquisition where the trail alignment crossing privately owned properties, design, utility relocation planning, permitting, confirmation of environmental clearance, and MHSCP consistency for the project. The Juan Bautista De Anza Trail, Historic Corridor, formerly known as the Aqueduct Trail System, extends from the Moreno Valley Mall area (Eucalyptus Avenue near Arbor Park Lane and Fire Station 6) to the Lake Perris State Recreational Area. In 2014, the entire length of the trail corridor received CMAQ Funding through RCTC for the Project Approval and Environmental Document (PA&ED) phase. The PA&ED was completed and approved by Caltrans in November 2018.

The proposed scope of work includes the following phases: Process for all required permits for the project including but not limit to 401, 404, 1602 and MHSCP consistency (Phase 1). Plans, specifications, and estimates (PS&E) (Phase 2); right-of-way, utilities, and related work (Phase 3); and construction support (Phase 4). The consultant services shall be done in phases to match the funding allocations. The project will be performed in collaboration with the Parks & Community Services Department. The City desires creativity, experience, and efficiency in achieving a completed project.

III. PROJECT FUNDING AND SCHEDULE

The project is funded by the State Active Transportation Program – Cycle 4 administered by California Department of Transportation (Caltrans) District 8 Local Assistance. The project currently has fund allocation for PS&E and ROW phases. The budget for soft cost in PS&E and ROW is \$360,000. Per Caltrans Local Assistance Procedure, PS&E and ROW phases have to be completed before City can request fund allocation for project construction.

The Consultant shall be required to meet or exceed the following timeline for this project:

Interview Shortlisted Firms:	June 2020
Notice to Proceed:	July 2020
PS&E and ROW 50%	February 2020
PS&E and ROW 100%	June 2021
Submit Request for Allocation for Construction to Caltrans	June 2021
Construction	May 2022

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

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IV. SCOPE OF SERVICES

The City is requesting firms to provide Professional Consultant Services for the Juan Bautista De Anza Multi-Use Trail project from Moreno Valley Mall to Iris Avenue.

DETAILED PROJECT DESCRIPTION:

This project consists of design of a primarily off-street multi-use trail and ADA compliant pedestrian path from Moreno Valley Mall-Eucalyptus Avenue to Iris Avenue generally along the alignment of DWR's aqueduct pipe line in the City of Moreno Valley. Its length is approximately 4 miles. The proposed concrete trail is to be 10-feet wide and the pedestrian path of decomposed granite is to be 4-feet wide. The project includes high visibility crosswalks, pedestrian/bicycle crossing signal with push-buttons and traffic signal modification at the major street crossing.

The design is to meet current standards, or generally-accepted industry standards, for a multi-use trail. "Multi-use" is defined as non-motorized transportation. There is City's existing trail infrastructure, partially-completed Class I bike and/or pedestrian path with gaps between Moreno Valley Mall area (Eucalyptus Avenue near Arbor Park Lane and Fire Station 6) and Iris Avenue. It generally follows the right of way for the DWR's East Branch of the California Aqueduct that terminates at Lake Perris.

The Consultant shall complete trail design, confirm validity of environmental clearance, perform design, obtain required permit, MSHCP consistency, acquire right of way, and perform utility relocation planning. Consultant will perform right-of-way research to identify existing easements and ownerships including the DWR rights, perform design to meet Americans with Disabilities Act (ADA) compliance, and complete deliverables in accordance with Caltrans Local Assistance Procedures Manual, including assisting City in preparation the request for authorization (RFA) for construction. Approximately ten (10) parcels will require permissions, easements, or acquisitions. For potential restrictions for building on top of the California Aqueduct pipe, refer to the DWR website <http://www.water.ca.gov/>.

CONSULTANT SERVICES

The Consultant shall provide services in progressive phases, as described above. Be advised that the following is a general description of the scope of services. The Consultant shall anticipate any additional coordination or scope to meet the project goals and objectives in their proposal.

Phase 1: The Phase 1 Services shall include, but not be limited to:

1. Confirm right-of-way needs and prepare documents and a detailed right-of-way plan. The plans shall contain enough information to determine square footage of additional right-of-way is required and what type (easement, fee, etc.).
2. Confirm utility conflicts and coordinate with utility owners to obtain adjustment

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and/or relocation.

3. Confirm existing drainage patterns and facilities and identify needed drainage facilities, catch basins, culverts, etc. with supporting hydrology and hydraulic calculations.
4. Coordinate with affected City Departments and outside agencies, including: Moreno Valley Unified School District (MVUSD); Caltrans; County of Riverside; DWR; and Safe Routes to School coordinator.
5. Confirm requirements for various permits necessary for the project, 401, 404, 1602, RCA MSHCP consistency, encroachment permits including DWR.
6. Incorporate designs to maximize ADA accessibility on proposed alignment. Proposed trail access points must meet current ADA standards.

Phases 2, PS&E, and Phase 3, Right-of-Way and Utilities: The Phase Services listed here are to be included, at a minimum, in either the Phase 2 or 3 scope, are to be **segregated by Phase**, and are as follows:

1. Perform survey and prepare base map, including field edits.
2. Finalize trail pavement evaluation.
3. Incorporate Santa Ana Region Low Impact Development (LID) guidance and standards for transportation project requirements with concurrence of City staff.
4. Prepare supporting hydrology and hydraulic calculations for proposed drainage structures.
5. Prepare construction plans and specifications for trail improvements, street improvements, drainage facilities, traffic signal, striping and signing, and traffic control plans, with submission for review at 50%, 100%, final, and Mylar stages.
6. The final Plans, Specifications, and Estimate (PS&E) shall be stamped and signed by the Design Consultant Civil Engineer, licensed to practice in the State of California, who supervised the PS&E preparation.
7. Final landscaping, irrigation, and planting plans, if prepared, shall be stamped and signed by the Design Consultant's Landscape Architect, licensed to practice in the State of California, who supervised the plan preparation.
8. Assist City in preparation of final utility notices and coordinate with utility companies for relocation of interfering utilities. Identify all utilities that have prior rights.
9. Prepare all right-of-way related documents and ROW Certifications for Caltrans.
10. Provide title reports and/or litigation guarantees for each of the take parcels.
11. Provide full-service appraisal services and provide settlement negotiations and escrow services.

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12. The Consultant shall provide an adjustment of final design plans and corresponding documents to reduce the scope of work to match available budget in accordance with City-specified priorities.

Phase 4: Advertising, Bidding and Construction Support

The Phase 4 shall include, but not be limited to, the following tasks:

1. Assist City staff in evaluating and checking all bids per project requirements.
2. Answer questions regarding the Technical Provisions, the design drawings or conflicts in the design during bidding process and pre-construction meeting.
3. Assist City for any change of Design during construction.
4. Incorporate all red-line comments prepared by the Contractor and project inspector and prepare final ink on Mylar "as-built" record plans. The as-built/record drawings shall be signed by the Engineer of Record and provided to the City for approval prior to the release of the final progress payment.

DETAILED DESCRIPTIONS OF WORK ITEMS ARE AS FOLLOWS:

A. ENVIRONMENTAL

1. The Consultant shall confirm the environmental clearance prepared by others is consistent with their proposed design. Environmental procedures shall be in compliance with CEQA and NEPA requirements.
2. The Consultant shall follow the recommendations of the environmental clearance and include applicable provisions in the project's specifications, plans, and estimates, for example, whether there needs to be a pre-construction survey for the presence of Burrowing Owl.

B. SURVEYING

The Consultant shall perform all surveys and survey-related services necessary for engineering design of specific proposed improvements, including, but not limited to:

1. Conduct supplemental street surveys, trail surveys, utility surveys, boundary surveys, and property line surveys to obtain sufficient information for engineering of the proposed improvements and right-of-way acquisition process. Survey base file(s) from previously-completed PA/ED work (by others) will be provided to consultant.
2. Prepare topographic base maps containing all surface features and needed elevations. Topography shall include, but not be limited to, all features within the one hundred twenty foot (120') trail corridor and shall

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extend the length of the street, a minimum of two hundred feet (200') beyond the proposed terminus, and at all street crossings, and include existing sewer manhole inverts, top of cone and rim elevations.

3. Establish a uniform stationing on the trail alignment, and provide cross-sections at fifty feet (50') intervals within the limits described. The cross sections shall be incorporated in the plans for construction bidding purposes at the appropriate stage. A nail and tin shall be placed every one hundred feet (100') on station and fifty feet (50') painted in between with the station number painted next to it. All public and private street intersections shall have a nail and tin along with having the station number painted next to it. If centerline is on private property, then the station markings shall be offset.
4. Establish a minimum of two (2) temporary benchmarks on the project.
5. Submit survey topography on CD-RW diskette and a separate hard copy plot provided for the proposed improvements, using AutoCAD Land Development or compatible software approved by the City. Survey points with coordinates, elevations, and description key shall be AutoCAD Land Development Standard Survey Descriptions only; no other survey description will be allowed. The data shall be submitted in ASCII format on CD-RW diskette with a hard copy printout provided.

C. AUTOCAD DRAWINGS

The topography map shall be set up with the following guidelines:

1. Drawing scale shall be: 1" = 20' or 1" = 40' horizontal and 1" = 2" or 1" = 4' for vertical profiles.
2. Lettering style shall be Arial and sizes shall correspond to standard scales. The latest City Title Block shall be used.
3. The following is a table of items that shall be placed on designated layers as shown:

Description	Layer	Color
Points	POINTS	Light Grey (253)
Point numbers	PNTS	Light Grey (253)
Point elevations	ELEV	Red
Point descriptions	DESC	Dark Grey (250)
Intermediate Contours	INTER	Dark Grey (250)
Index contours	INDEX	Red
Topography	TOPO	Yellow
Text	TEXT	Red
Centerline	CL	Red
Right-of-Way	ROW	Blue
Curb and gutter	CG	Green
Sidewalk	SW	Yellow

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D. GEOTECHNICAL

The Consultant shall perform geotechnical services necessary for design of specific proposed improvements, including but not limited to reviewing and utilizing available subsurface exploration and analysis report (prepared for PA/ED phase by others) for engineering recommendations. Propose any additional project-specific soil tests or analyses. If additional analyses are needed, they shall follow the following protocol:

1. Review project Plans and Specifications through the design process, with consideration of geotechnical issues such as materials testing and suitability.
2. Provide geotechnical evaluation and recommendations on, including, but not limited to, grading, earthwork, settlement, surface and subsurface drainage, foundation/column/slab design, slope stability, pavement design, trench backfill, retaining wall design, environmental concerns, removal of unsuitable materials, etc.
3. An investigation of the existing street pavement conditions shall be performed, where street improvements are proposed, accompanied by pavement coring and soil borings and sampling. Pavement corings and soil samples in sufficient quantities shall be taken and tested to determine R values and structural pavement sections to be considered for the project. The Consultant shall record the pavement and base thicknesses of each coring and record in-situ soil type, weight, moisture content, relative compaction, etc., at a minimum 2 feet (2') depth, or as recommended by the Geotechnical Engineer supervising the investigation. Boring logs shall be prepared and presented in a report along with all test results and recommendations for replacement structural section, overlay thickness, and/or rehabilitative repair strategy. Consideration for the effect of any overlay recommendations upon the existing profile, cross section and or drainage shall be addressed.
4. Prepare field and final geotechnical memoranda and logs of exploratory borings and results of laboratory testing.
5. Prepare scale plans showing locations and identifications of the borings and other required geotechnical information.
6. A Traffic Index (TI) shall be used in accordance with the City Standards when making recommendations for City streets. Appropriate TI shall be used for the crossing streets with higher classification and/or for streets with truck route designation.
7. All in-place/laboratory tests, sampling, and reports shall be performed and prepared in accordance with Caltrans and other applicable agency procedures, policies, regulations, requirements, and formats.

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8. Potholes in paved street areas shall be repaired per City Standard Plan No. 602, A through E; however, potholes within the proposed pavement construction area may be considered for an alternate repair treatment, at the discretion of the City Program Manager.
9. It will be the responsibility of the Consultant to notify Underground Service Alert prior to the start of any subsurface exploration work. The Consultant shall submit a traffic control plan for street work only to the City for review and obtain a permit to operate and conduct explorations within the public right-of-way.
10. The Consultant shall obtain all necessary permits to enter and construct on private properties from property owners, as required by the City, for all research such as surveying, geotechnical, and other design-related work.

E. RESEARCH OF RECORD INFORMATION

The Consultant shall perform all research of utility company, and other agency records as necessary to secure all the information, clearances, and/or plan review services required to identify, locate, and accurately layout all underground improvements and easements, centerline, right-of-way, property lines, curb and gutter, intersecting streets, cross gutters, and other ancillary items that may affect the project.

The City will provide copies of available pertinent City Records, such as survey ties, benchmarks, and street plans that the City knowingly has in its possession.

F. UTILITY COORDINATION

The Consultant shall contact all utility agencies providing service within the City and obtain utility maps and records for the project area. Field reviews to locate all surface utilities that are impacted by the project shall be performed. A summary of the research findings, anticipated conflicts, relocations or adjustments shall be included in a memorandum. Continuing coordination shall be performed up to the Notice to Relocate prior to construction.

The Consultant shall provide utility notices (using City provided template) to all utility companies with facilities within the limits of the project, such as, but not limited to: DWR, Eastern Municipal Water District (EMWD), Southern California Gas Company, (GAS), Southern California Edison (SCE), Moreno Valley Utility (MVU), Time Warner, and Verizon. Said notices will inform the utility of their need to relocate their facilities prior to construction or to adjust their facilities to grade after completion of the street paving.

The Consultant shall directly submit to **each utility company their required number of preliminary and final plan sets that provide the location, elevation of the utility, and the elevation of the improvement with the conflict area clouded to show the utility companies the areas that conflict.** The Consultant shall coordinate with the utilities for relocation of their facilities if required. The Consultant shall provide the utility companies with three (3) relocation notices. The City shall supply the Consultant with the required format for the utility notice in a

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Microsoft Word® format. The Consultant shall be responsible to complete the document. The Consultant shall also be required to coordinate with the utility companies the scheduled relocation of the utilities prior to the start of construction.

The utility notices are as follows: 1st Utility Notice for City Improvements, Preliminary Project Notice; 2nd Utility Notice for City Improvements, Prepare to Relocate; 3rd Utility Notice for City Improvements, Notice to Relocate; and 4th Utility Notice for City Improvements, Notice to Relocate Immediately. The City will supply the Consultant with the required forms for the utility notices in a Microsoft Word® format.

The Consultant shall compose all utility letters and forms. The City will print the utility notices on City letterhead and the Consultant shall pick-up and mail the letters, Certified, with Return Receipt requested back to the City. A copy of the Certified Mail article numbers shall be provided to the City within a few days of mailing. The Consultant shall document on the return receipt card the project number, project name, and name of the Consultant. The Consultant shall call the utility companies, as necessary, until a written response form is received from each potential conflicting utility.

The Consultant shall prepare and maintain a detailed utility coordination log that shall be updated on regular basis and be presented and discussed at Project Development Team (PDT) meetings.

The Consultant shall measure and document the height of the existing overhead utility lines for traffic signal, safety lighting, and street light clearance.

The Consultant shall obtain a Release Letter for Source of Power from MVU, as needed.

The Consultant shall coordinate with SCE or MVU for the source and location of the power for any traffic signals and locations for the meter cabinet and traffic sign controller. The Consultant shall obtain the address for the meter cabinet, when the location is known, from the City Building Division.

The Consultant shall coordinate with the utility companies for the relocation of any of their facilities that conflict with the proposed improvements and continue coordination until the utility conflict is resolved.

G. UTILITY POTHOLING

The Consultant shall pothole, or engage a construction service to pothole, all underground utilities to determine the location, depth for clearance, connection points, or conflicts for any underground improvements such as sewer lines, storm drains, gas lines, waterlines and other utilities. The Consultant shall pothole at least an adequate number of water and sewer laterals at appropriate locations to establish an average lateral depth. The Consultant shall submit to each utility company a preliminary set of plans that provide the location and elevation of the utility with the conflict areas clouded to show the utility companies the areas of conflict with the proposed improvements. The potholing information and plan shall

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be submitted to the City after completion of that task. If an area of possible conflict was not potholed, the Consultant shall pothole the area to verify no conflicts, at no cost to the City.

Potholes in paved street areas shall be repaired per City Standard Plan No. MVS-132 A through F; however, potholes within the proposed pavement construction area may be considered for an alternate repair treatment, at the discretion of the City Program Manager.

It shall be the responsibility of the Consultant to notify Underground Service Alert prior to the start of any subsurface exploration work. The Consultant shall submit for City Review a traffic control plan and obtain a permit to operate and conduct any potholing within the public right-of-way.

The Consultant shall obtain all necessary permits to enter and construct on private properties from property owners, as required by the City, for all research such as surveying, geotechnical, and other design-related work.

H. RIGHT-OF-WAY

The Right of Way information is provided with this RFP (Attachment) including the list of APNs and contact information. Consultant shall confirm right-of-way needs and prepare documents and a detailed right-of-way plan. The plans shall contain enough information to determine square footage of additional right-of-way is required and what type (easement, fee, etc.). Right-of-way need may include acquisition as fee simple interest, permanent easements, temporary easements, and right of entries, which are collectively termed as right-of-way. The consultant shall submit the plan to the City for review. Consultant shall clearly identify locations where additional rights are needed on the plan.

These services shall include the following major elements:

1. Identify all needed right-of-way based on project alignment.
2. Perform utility easement research/coordination and identify all utilities that have prior rights.
3. Prepare all right-of-way related documents.
4. Provide title reports and/or litigation guarantees for each of the take parcels.
5. Provide full-service appraisal services in conformance with the Uniform Standards of Professional Appraisal Practice (USPAP) and the Code of Professional Ethics of the Appraisal Institute and appraiser support during the acquisition process.
6. Provide comprehensive settlement negotiations and escrow services including preparation of all related documents until required deeds are recorded.

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7. Coordinate eminent domain actions if required. If eminent domain should occur, the City and Consultant will negotiate the scope of services and fees.

The Consultant shall be responsible to ensure that all necessary right-of-way services are provided for the complete design of the project to meet all applicable State, and local requirements. The acquisition process shall be conducted in accordance with Caltrans procedures, California Civil Code, and the California Relocation Assistance law adopted by resolution of the City Council of the City of Moreno Valley on August 19, 1986, including any changes to state law since the adoption.

The following is a list of services that may be needed over the course of the contract. This list is not intended to be all-inclusive, as other services may be required:

- a. Coordinate the preparation of site surveys relating to real properties that are required for public purposes.
- b. Identify the needs for new rights-of-way, permanent easements, temporary construction easements, and rights-of-entry. Conduct alternative analysis if necessary.
- c. Analyze title reports/cases, contracts, judgments, court records, and other documents to evaluate the legal status and effect upon title of various liens, restrictions, and encumbrances; perform research for all outstanding offers of dedication.
- d. Prepare a separate right-of-way plan showing existing right-of-way, areas requiring acquisition, assessor's parcel numbers, zoning, owner's name, and addresses, type of business, property lines, footprints of buildings, and setback distances from right-of-way to buildings, vegetation, existing and proposed improvements in the taking areas, existing driveways, and easements across the property.
- e. Prepare offers, summary statements, contracts, agreements, leases, correspondence, deeds, re-conveyances, legal descriptions, plats, certificates of acceptance, and other instruments for each parcel acceptable to the City (and applicable utility companies) for conveyance of marketable title interests and for accurate representation of right-of-way necessary for construction of the project.
- f. Prepare all documents required for temporary construction easements and rights-of-entry.
- g. Prepare preliminary estimate of the market value of real property and prepare written reports.

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- h. Consult with the necessary City departments regarding real property matters.
- i. Negotiate for purchase, lease, voluntary dedication or donation of real property.
- j. Provide staking as needed during the appraisal process and/or negotiation process to establish take area boundaries.
- k. Provide project improvements alternate analysis during right-of-way negotiations phase as necessary.
- l. Conduct regular status/coordination meetings during the right-of-way phase.
- m. Record documentation at the County Recorder's Office.
- n. Provide independent review of property surveys, plats, and legal descriptions.
- o. Review draft appraisal reports for completeness and accuracy.
- p. Maintain records, databases, maps, deeds, and other documents.
- q. Provide relocation assistance to occupants of real property acquired for projects.
- r. Conduct research at the County Assessor's Office.

Appraisal (if needed):

The Consultant shall perform all appraisals in accordance with the USPAP, the Code of Professional Ethics of the Appraisal Institute, and all federal and state laws and requirements in accordance with Chapter 7 of the Caltrans Right-of-Way Manual for "Appraisals" for those projects that are state/federally funded.

Each appraisal shall be performed in a format, assuming a potential action in eminent domain (condemnation), including, but not limited to, such considerations as highest and best use as if vacant, damages to the remainder, etc.

The Consultant shall submit three (3) bound copies of the Appraisal Report in accordance with the Caltrans Right-of-Way Manual. One data book may be compiled for multiple parcels, but each parcel appraisal must have sufficient content to be stand-alone.

All three (3) approaches to value - the Cost Approach, Income Approach and Sales Comparison (Market) Approach, as outlined in Section 7.05 of the Caltrans Right-of-Way Manual, shall be considered and all approaches that apply to the subjects

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shall be employed with the most applicable being weighted appropriately.

The appraiser shall conduct all necessary research to determine owner of record, land use, zoning, encumbrances, highest and best use, and any factors that will affect value.

The appraiser shall bring forth any major issues identified on the project and discuss. If the project is federally funded, the Consultant shall have the appraisal reviewed by an independent appraiser. All appraisals shall be prepared by a certified appraiser.

I. FORMAT FOR PLANS AND SPECIFICATIONS

1. Any PS&E must conform to the City of Moreno Valley's standards and format. The Consultant shall provide clear, concise, and complete plans and profiles, which shall include, where applicable, the title sheet, street improvement, storm drain, traffic signal, striping and signing, traffic control, and detail and cross section plans. The scales for the plans are 1" = 20' for traffic signal and 1" = 20' or 1" = 40' for all other plan sheets. The City of Moreno Valley's standard title block shall be used for all sheets.

The Consultant shall indicate on the plans the stationing of all intersections, beginning and end of curves, and breaks in alignment. Survey monuments and monument wells shall be noted on the plans for preservation. Missing monuments shall be installed per City Standards. Monuments are to be placed in all street intersections, public and private. The setting or marking of the actual monuments shall be done under the direction of a licensed land surveyor at the end of construction, and a Record of Survey shall be filed with the County and copy shall be submitted to the City. These items must be quantified and shown in the PS&E. The Consultant shall note that the Contractor shall be responsible for replacing disturbed monuments or ties after construction is completed.

2. The Title Sheet shall include, but not be limited to: Project title, vicinity (location) map, title block, north arrow, scales, general notes, telephone numbers of utilities and other affected agencies and businesses, sheet index, and other required notes and information.
3. Street and Trail Improvement Plans shall include, but not be limited to: All existing surface improvements, driveways and entrances, edge of pavement, curbs, gutters, cross gutters, sidewalks, access ramps, mailboxes, landscaping, walls and fences, water valves and meters, fire hydrants, gas valves, sewer manholes, storm drain manholes, telephone manholes, electrical manholes, electrical cabinets, power poles, street lights, traffic loops, signs, catch basins and other storm drain facilities, utility lines (both underground and overhead), right-of-way and lot lines, and all other surface features that could be affected by the new construction within the project limits. Existing improvements shall be shown in a half-tone or dashed background format to distinguish them from the new improvements. Potential future improvements, such as amenities, will be

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shown with appropriate notation, where those future improvements require infrastructure support that crosses the proposed improvements.

New improvements shall include, but not be limited to: Construction notes and legends, curbs, gutters, sidewalks, street drainage facilities, street lighting (where required), all facility or structure adjustments to be performed by the Contractor (including water valves and meters, gas valves, sewer manholes, storm drain manholes, telephone manholes, electrical manholes, etc.), street centerline and top of curb profiles, all relocations, all reconstructions or modifications, and all other proposed improvements shall be shown in full tone or highlighted with appropriate construction notes, detail references or standard plan references identified. All access ramps shall be upgraded to comply with the latest ADA standards. Construction notes shall be arranged such that the first notes are “protect in place” followed with “removal” notes and end with the actual work. Notes of like work shall be grouped together.

4. Traffic Signal Plans, including Modifications, shall include, but not be limited to: Eight (8) phase controllers with bicycle logic, emergency vehicle pre-emption, telephone connection, traffic signal interconnect, battery back-up, ultimate sizing of traffic signal poles and arms, pedestrian and bicycle push buttons, poles and pole footings designed to a wind velocity of 100 MPH or greater, adequate storage for turn lanes, and any other improvements, including right-of-way in order to signalize the intersection. 1" = 20' Scale drawing of the intersection shall show background topography either dashed or at half tone line quality, dimensions, signal pole and push button pole placements, controller and power meter cabinet placements, conduit runs and hand holes or junction box placements, lane channelization and dimensions, detection loop placement, circuitry and conductor schedules, signal pole and mast arm schedules, phase schedules, schedules for signal heads, schedules for loop detectors, signal pole location details, emergency vehicle pre-emption details, and all other notes, schedules, details and/or drawing components required for a complete traffic signal construction plan. The traffic signal meter addresses shall be shown on the Traffic Signal Plans.

The Consultant shall accurately determine the height of the existing overhead utility lines and pole for traffic signal, safety lighting, and street light clearance of utilities. The plans shall clearly show the horizontal location and elevations of overhead and underground utilities that are in the immediate vicinity of proposed improvements. Elevations shall be at the low-point, and indicate the horizontal location of said low-point. Clearances to the proposed improvements shall also be shown. The Consultant shall research and establish necessary clearances for construction and operation, which are typically different. Material changes required during construction as a result of incorrect measurements by the Consultant shall be back-charged to the Consultant based on the material value of loss to the City, as determined by the City. The Consultant shall agree to pay said charges, or have appropriate monies withheld. The

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Consultant shall create a Utility Profile, showing existing utilities with proposed improvements and the clearances between the two, on one or more "Utility Profile" sheets. Utility Profile sheets shall be stamped and signed by the appropriate professional, and submitted to the City of Moreno Valley on 11"x17" sheets.

5. Striping and Signing Plans shall include but not be limited to: Existing and proposed access ramp locations and types, curbs, driveways, existing and proposed street and trail striping, street and sign legends, crosswalks, dimensions for lane widths, traffic signal loops, and all other ancillary street and trail markings and signing that may exist, or may be required to be placed or removed to complete the new traffic signal and associated street improvements. The signing notes, painted striping notes and thermoplastic marking notes are to be grouped together.

6. Landscaping, irrigation, planting, and architectural detail plans shall include but not be limited to: 1" = 20' scaled drawings; turf and plant varieties must be drought resistant and be approved for 'Sunset' Zone 18; irrigation shall be designed by a Certified Irrigation Designer with current registration from the Irrigation Association (or provide sufficient education or certifications to be considered equal to), adhere to the City Standard Plans for park projects, and the Department's Park Specifications; planting plans shall adhere to the City Standard Plans for park projects and the Department's Park Specifications; architectural details shall be referenced by number on the plans to a corresponding number in the bid documents. All landscaping and irrigation plans shall be designed in a program compatible with AutoCAD Land Development software to a size of 24" by 36" and shall be reviewed and approved by Parks and Community Services. Final plans will require a wet signed Mylar with numbered hanging file tabs on each sheet shall be signed by a registered State of California Landscape Architect, a CD or DVD of the approved plans in Tiff, PDF, DWF, and the original design software formats. It shall be understood that the City will be the owner of the plans and will adhere to any copyright laws.

7. Detail Plans shall be provided where standard plans are not available or where specific dimensioning cannot be readily shown on the improvement plans or provided by description in the project specifications or as needed to insure project constructability.

8. All drawings shall be prepared with AutoCAD Land Development software or design software that is compatible with the Land Development software approved by the City. The design shall be plotted using permanent drafting ink on Mylar, and drafted on twenty-four inch by thirty-six inch (24" x 36"). The Consultant is required to put hanging file tabs on all Mylar sheets. The final Plans shall be signed by a Civil Engineer registered in the state of California. No "stick-ons" will be allowed.

The originals and the electronic data of these drawings are to be considered to be the property of the City at all times, and shall be submitted

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to the City, along with a CD-RW disk in AutoCAD Land Development format, upon completion or as otherwise directed by the City. The electronic data shall also include all survey data and point information.

9. Specifications - The City will provide the Consultant with its boilerplate Specifications and General Technical Provisions in the current version of Microsoft Word® for Windows format. The Consultant shall be responsible for compiling the project Specifications, signed by a Civil Engineer registered in the State of California, which is complete and ready for bidding purposes. The latest edition of the Greenbook (Standard Specifications for Public Works Construction and subsequent amendments) shall be used on the project, except for traffic signals, striping, and traffic signs. The technical portion of the Caltrans Standard Specifications shall be used for the traffic signals, striping, and traffic signs.

J. GENERAL DESIGN SUBMISSION REQUIREMENTS DEFINED

The City has established criteria/requirements for submittals at progressive levels for project reviews and payment purposes. A description of "General Design Submission Requirements" is attached as Exhibit A.

K. SUBMITTALS TO (CITY, AGENCIES, UTILITIES, ETC.)

1. The Consultant shall submit four (4) sets of bond copies of the design drawings with each submittal for checking to the City, along with the previous redlined check prints and electronic file on CD. The design drawings shall be as complete, accurate, and error-free as possible before plan checking is considered, in order to reduce the number of plan checks required and related costs therefore to the City and Consultant. Incomplete submittals may be rejected.

The Consultant shall submit four (4) sets of any reports, such as geotechnical and/or quantity calculations with each submittal for checking to the City, along with the previously checked reports.

2. The Consultant shall, at no cost to the City, correct errors, omissions, and unworkable and/or improper design/drafting on the original drawings, which are discovered subsequent to the completion of the plan checking process.
3. The Consultant shall submit four (4) sets of bond copies of cross sections along with each submittal of the design drawings for plan checking. One (1) reproducible and three (3) sets bond copies of cross sections shall be submitted along with the final submittal of the design drawing.
4. The City shall receive a copy of all transmittals, submittals, and letters sent to utilities and agencies regarding the project.

L. ESTIMATE OF QUANTITIES AND COST

The estimated quantities shall itemize all new, remodeled, reconstructed,

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relocated improvements, but not be limited to: Itemizing all removals, relocations, water pollution control, storm drain, mailboxes, earthwork, sub-grade preparation, cold milling, aggregate base, asphalt concrete (AC) paving, Portland Cement Concrete (PCC) sidewalk, PCC trail, AC trail, PCC curb and gutter, driveway approaches, survey monument wells, raising manholes, water valve lids, traffic signals, traffic loops, painting of pavement legends and striping, signs, traffic control, raised pavement markers, project signs and trail amenities. The estimated quantities shall be arranged in chronological order of construction and shall contain all the information necessary to prepare the Engineer's Estimate in the format specified by the City or associated agencies. The Engineer's Estimate and bid schedule shall be broken out by funding source or as otherwise directed by the City Program Manager.

There shall be a separate detailed traffic signal estimate in addition to the overall project estimate. The detailed traffic signal estimate shall include, but not limited to, foundations, conduits, conductors, poles, arms, pedestrian and bicycle push buttons, pedestrian heads, 3 section vehicle heads, emergency vehicle pre-emption devices and cables, 250W luminaires, illuminated signs, controller and Type P cabinets, Type III service, and other appurtenances.

Computations showing estimated quantities, costs, and sum totals shall be submitted to the City for review. Submission of computations does not relieve the Consultant's responsibility of submitting an accurate estimate of quantities. The Consultant shall, at the 100% and final Plan stages, submit estimated quantities calculated and listed by plan sheet, for review by the City. The Consultant's final construction cost estimate shall be based upon, and in agreement with, the final estimate of quantities.

Consultant shall prepare a separate estimate of maintenance and operations costs, covering a minimum of twenty years of maintenance.

M. STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

The Consultant shall determine if a SWPPP or Water Pollution Control Plan (WPCP) is appropriate in accordance with either the San Jacinto Construction Activity Permit or the General Construction Activity Permit depending on the permit area of coverage. The Consultant shall include the appropriate specification as well as the provision that the contractor shall prepare the SWPPP or WPCP as part of the construction submittals.

N. COPIES OF CONTRACT DOCUMENT PACKAGE

The City will have copies of the Contract Document Package reproduced for distribution during bidding.

O. OWNER OF ORIGINAL DRAWINGS, DOCUMENTS, AND OTHER INFORMATION

The City will be the owner of all original drawings, documents, and digital information. All digital and or computer generated drawings shall be the property

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of the City and a copy shall be submitted to the City on a CD-RW disk.

P. PROJECT SCHEDULE

The Consultant shall prepare a project schedule and provide hard copies for reports and staff usage. The project schedule shall be updated regularly and handed out during the PDT meetings.

The project schedule shall be divided into tasks and subtasks in full detail showing their critical path for expeditious project completion. The schedule shall include, but is not limited to, planning, right-of-way acquisition, environmental clearance, permitting, design, advertising, construction, and any other applicable tasks. All the required time for project reviews and processing and associated agency and utility contacts and coordination shall be shown. Critical task items such as permit applications, environmental, City Council meetings, appraisals, negotiations, utility noticing, notices to proceed, notice of completion, as-built plan preparation, and GASB 34 documentation shall also be shown.

Q. PROJECT MEETINGS

The Consultant shall be responsible to schedule all necessary project meetings, prepare the meeting agenda, send invitation letters to required attendees, attend and chair the meetings. At the conclusion of each meeting the Consultant shall prepare and distribute meeting minutes, within three (3) working days, to the satisfaction of the City Program Manager. The project meetings shall include, but not be limited to:

1. Kick-off meeting to including all sub-consultants, City Departments, affected outside agencies, school districts, utilities, funding staff and other interested parties to the work.
2. Set and facilitate Project Development Team (PDT) meetings on a monthly (or higher frequency if necessary) basis. At a minimum, stakeholders including DWR representatives and the Safe Routes to School Coordinator will be invited.
3. Conduct status and coordination meetings.
4. Conduct one community workshop and schedule City staff participation as needed.
5. Conduct meetings with affected stakeholders, utility companies, and other agencies as needed.
6. Conduct field meetings with City staff, residents, utility representatives, and federal and state representatives as required over the course of design.
7. The Consultant assist City in the bidding process and assure that all State and local contracting laws have been met.

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V. CONSULTANT'S PROPOSAL AND COMPENSATION

The Consultant's Proposal shall be no more than 20 pages excluding a cover letter of up to two pages, resumes up to two pages per person, dividers, certificates, and appendices. Resumes, billing rates, project schedule, resource matrix, certificates, and other required forms shall be attached in the appendices. Proposals failing to provide sufficient information and assurances of performance to accurately assess each category of the required services and failing to comply with requirements and conditions of the Request for Proposal will not be given further consideration.

The Proposal shall include the following sections:

- A. **Project Understanding:** This section should clearly convey clear understanding of the nature of the work, identification of major project issues, and proposed solutions thereof, from both the Consultant and the sub-consultants (consultant team).
- B. **Approach and Management Plan:** This section provides the consultant team's proposed approach and management plan for providing services. Include an organization chart showing proposed relationship among consultant team/staff as well as any other parties that may have significant role in the delivery of this project.
- C. **Qualifications and Experience:** Provide qualifications and experience of the team for this project. Emphasize the specific qualifications and experience from projects similar to this project for the key team members including references. Identify and provide in-depth information for the proposed project manager's qualifications, track record and relevant experience.
- D. **Staffing Plan:** Discuss staffing plan, the workload, both current and anticipated, for all key team members, and their capacity to perform the requested services according to the proposed schedule. Discuss the firm/team's approach for completing the services required for this project within budget and schedule.
- E. **Work Plan and Schedule:** Include a description of how each task of the project will be conducted, identification of deliverables for each task and implementation schedule. The work plan should include sufficient detail to demonstrate a clear understanding of the project. Discuss the consultant team's approach for completing the project.
- F. **Quality Control and Assurance:** Discuss QA/QC proposed for each phase/deliverable for this project, including various independent plan check reviews and 95% plan biddability/constructability/claims avoidance reviews.
- G. **Additional Relevant Information:** Provide additional relevant information that may be helpful in the selection process (not to exceed two pages).

The Consultant's Proposal shall include the following statements:

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1. A statement that this Request for Proposal shall be incorporated in its entirety as a part of the Consultant's Proposal.
2. A statement that this Request for Proposal and the Consultant's Proposal will jointly become part of the Agreement for Professional Consultant Services for this project when said Agreement is fully executed by the Consultant and the Mayor or City Manager of Moreno Valley.
3. A statement that the Consultant's Services to be provided, and fees therefore, will be in accordance with the City's Request for Proposal except as otherwise specified in the Consultant's Proposal under the heading "ADDITIONS OR EXCEPTIONS TO THE CITY'S REQUEST FOR PROPOSAL."
4. A single and separate section with the heading "ADDITIONS OR EXCEPTIONS TO THE CITY'S REQUEST FOR PROPOSAL" containing a complete and detailed description of all of the exceptions to the provisions and conditions of this Request for Proposal upon which the Consultant's Proposal is contingent and which shall take precedent over this Request for Proposal for Professional Consultant Services.
5. A statement of qualifications applicable to this project including the names, qualifications and proposed duties of the Consultant's Staff to be assigned to this project; a listing of recent similar projects completed including the names, titles, addresses, telephone numbers and email addresses of the appropriate persons whom the City could contact. If one or more of the Consultant's staff should become unavailable, the Consultant may substitute other staff of at least equal competence only after prior written approval by the City.
6. A resource allocation matrix *must* be submitted with the Proposal. The resource allocation matrix must list detailed tasks in rows and the appropriate individual (Job Title Only) as well as the number of hours that these individuals will be working on each task listed, will be included in adjacent columns. The resource allocation matrix and the project design schedule are required of both the primary consultant, as well as any sub-consultant. Failure to do so will result in the Consultant's Proposal being deemed incomplete and it will not receive further consideration. The Title Reports shall be a separate line item under the right-of-way task.

The resource allocation matrix, in addition to any tasks the Consultant chooses to list, shall include but not be limited to meetings, progressive plan submittals, Summary Memo, utility relocation engineering right-of-way investigations, right-of-way acquisition, As-Built Drawings, and GASB 34 documentation.
7. A rate schedule *must* be submitted with the Proposal. The rate schedule must list titles, names, roles, and hourly billing rates in rows. A statement that said hourly rate schedule is part of the Consultant's Proposal for use in invoicing for progress payments and for extra work incurred shall also be

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included. All extra work will require prior approval from the City.

8. A statement of sub-consultant's (include relief personnel) qualifications applicable to this project including the names, qualifications and proposed duties of the sub-consultant's staff to be assigned to this project; a listing of recent similar projects completed including the names, titles, addresses, and telephone numbers of the appropriate persons whom the City could contact.

A statement that the Consultant acknowledges and understands that the Consultant will not be allowed to change the sub-consultant without written permission from the City.

9. A statement that all charges for Consultant services is a "Not-to-Exceed Fee" which must include conservatively estimated reimbursable expenses, as submitted with and made a part of said Consultant's Proposal.
10. A statement that the Consultant will document and provide the results of the work to the satisfaction of the City. This may include preparation of field and final reports, or similar evidence of attainment of the Agreement objectives.
11. A statement that the Consultant will immediately document and notify the City of any defects or hazardous conditions observed in the vicinity of the project site prior, during, or after the construction work.
12. A copy of the Consultant's hourly rate schedule and a statement that said hourly rate schedule is part of the Consultant's Proposal for use in invoicing for progress payments and for extra work incurred that is not part of this Request for Proposal. **An itemized cost breakdown for the work described herein must be submitted in a separate sealed envelope as part of the Proposal submittal.** All extra work will require prior approval from the City.
13. A statement that the Consultant will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.
14. A statement that all federal laws and regulations shall be adhered to notwithstanding any state or local laws and regulations. In a case of conflict between federal, state or local laws or regulations the strictest shall be adhered to.
15. A statement that the Consultant shall allow all authorized federal, state, county, and City officials access to place of work, books, documents, papers, fiscal, payroll, materials, and other relevant contract records pertinent to this special project. All relevant records shall be retained for at least three years.
16. A statement that the Consultant shall comply with the Davis-Bacon Fair

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Labor Standards Act (40 USC 276-a through a-7), and the implementation regulations issued pursuant thereto (29 CFR Section 1, 5), any amendments thereof and the California Labor Code. Pursuant to the said regulations, entitled “Federal Labor Standards Provisions,” Federal Prevailing Wage Decision” and State of California prevailing wage rates, respectively.

17. A statement that the Consultant shall comply with the Copeland Anti-Kickback Act (18 USC 874) and the Implementation Regulation (29 CFR 3) issued pursuant thereto, and any amendments thereof.
18. A statement that the Consultant offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 USC Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works or the subcontract. This assignment shall be made and become effective at the time the City tenders final payment to the Consultant, without further acknowledgment by the parties.
19. A statement that this Agreement is subject to 49 CFR, Part 26 entitled “Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.”

Review/Complete all attached forms included as an appendix to the proposal and do not count against the page limit.

VI. DISADVANTAGED BUSINESS ENTERPRISES (DBE)

The Consultant must ensure that DBEs and other small businesses have the opportunity to participate in the performance of the work that is the subject of this solicitation and should take all necessary and reasonable steps for this assurance.

The DBE goal for this Agreement is 10 %.

Terms as Used in This Section

- The term “Disadvantaged Business Enterprise” or “DBE” means a for-profit small business concern owned and controlled by a socially and economically disadvantaged person(s) as defined in Title 49, Code of Federal Regulations (CFR), Part 26.5.
- The term “Agreement” also means “Contract.”
- The term “Small Business” or “SB” is as defined in 49 CFR 26.65.

Authority and Responsibility

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- A. DBEs and other small businesses are strongly encouraged to participate in the performance of Contracts financed in whole or in part with federal funds (See 49 CFR 26, "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs"). The Proposer must ensure that DBEs and other small businesses have the opportunity to participate in the performance of the work that is the subject of this solicitation and should take all necessary and reasonable steps for this assurance. The Proposer must not discriminate on the basis of race, color, national origin, or sex in the award and performance of subcontracts.
- B. Proposers are encouraged to use services offered by financial institutions owned and controlled by DBEs.

Submission of DBE Information

If there is a DBE goal on the contract, Exhibit 10-O1 *Consultant Proposal DBE Commitment* must be included in the Request for Proposal. In order for a proposer to be considered responsible and responsive, the proposer must make good faith efforts to meet the goal established for the contract. If the goal is not met, the proposer must document adequate good faith efforts and submit Exhibit 15-H *DBE Information – Good Faith Efforts*. All DBE participation will be counted towards the contract goal; therefore, all DBE participation shall be collected and reported.

Exhibit 10-O2 *Consultant Contract DBE Information* must be included with the Request for Proposal. Even if no DBE participation will be reported, the successful proposer must execute and return the form.

Submit written confirmation from each DBE stating that it is participating in the contract including the proposed scope of work and dollar amount. Include confirmation with the DBE Commitment form. A letter from the DBE on its letterhead will serve as written confirmation that the DBE is participating in the contract.

A DBE may be terminated only with written approval by the City of Moreno Valley and only for the reasons specified in 49 CFR 26.53 (f). Prior to requesting the City of Moreno Valley's consent for the proposed termination, the prime consultant must meet the procedural requirements specified in 49 CFR 26.53(f).

DBE Participation General Information

It is the Proposer's responsibility to be fully informed regarding the requirements of 49 CFR, Part 26, and the Department's DBE program developed pursuant to the regulations. Proposals not meeting these requirements will be deemed non-responsive. Particular attention is directed to the following:

- A. A DBE must be a small business firm defined pursuant to 13 CFR 121 and be certified through the California Unified Certification Program (CUCP).
- B. A certified DBE may participate as a prime consultant, subconsultant, joint venture partner, as a vendor of material or supplies, or as a trucking company.

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- C. A DBE Proposer not proposing as a joint venture with a non-DBE, will be required to document one or a combination of the following:
1. The Proposer is a DBE and will meet the goal by performing work with its own forces.
 2. The Proposer will meet the goal through work performed by DBE subconsultants, suppliers or trucking companies.
 3. The Proposer, prior to proposing, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work or clearly defined portions thereof. Responsibility means actually performing, managing, and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture commensurate with its ownership interest.
- E. A DBE must perform a commercially useful function pursuant to 49 CFR 26.55, that is, a DBE firm must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work.
- F. The Proposer shall list only one subconsultant for each portion of work as defined in their proposal and all DBE subconsultants should be listed in the bid/cost proposal list of subconsultants.
- G. A prime consultant who is a certified DBE is eligible to claim all of the work in the Contract toward the DBE participation except that portion of the work to be performed by non-DBE subconsultants.

Resources

It is the Proposer's responsibility to verify that the DBE firm is certified as DBE at the proposal due date. The California Unified Certification Program (CUCP) database includes the certified DBEs from all certifying agencies participating in the CUCP. If you believe a firm is certified that cannot be located on the database, please contact the Caltrans Office of Certification at the toll free number 1-866-810-6346 for assistance. Access the CUCP database from the Department of Transportation, Office of Business and Economic Opportunity Web site at: <http://www.dot.ca.gov/hq/bep/>.

1. Click on the link in the left menu titled *Disadvantaged Business Enterprise*;
2. Click on Search for a DBE Firm link;
3. Click on *Access to the DBE Query Form* located on the first line in the center of the page.

Searches can be performed by one or more criteria. Follow instructions on the screen.

Materials or Supplies Purchased from DBEs Count Towards the DBE Goal Under

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the Following Conditions:

- A. If the materials or supplies are obtained from a DBE manufacturer, count 100 percent of the cost of the materials or supplies. A DBE manufacturer is a firm that operates or maintains a factory, or establishment that produces on the premises the materials, supplies, articles, or equipment required under the Contract and of the general character described by the specifications.
- B. If the materials or supplies purchased from a DBE regular dealer, count 60 percent of the cost of the materials or supplies. A DBE regular dealer is a firm that owns, operates or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone or asphalt without owning, operating or maintaining a place of business provided in this section.
- C. If the person both owns and operates distribution equipment for the products, any supplementing of regular dealers' own distribution equipment shall be, by a long-term lease agreement and not an ad hoc or Agreement-by-Agreement basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this section.
- D. Materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on the job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

The Proposer must:

- Take necessary and reasonable steps to ensure that DBEs have an opportunity to participate in the contract (49 CFR 26).
- Make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers. Proposers are encouraged to use services offered by financial institutions owned and controlled by DBEs.
- If a DBE subconsultant is unable to perform, Proposer must make a good faith effort to replace him/her with another DBE subconsultant if the goal is not otherwise met.

Good Faith Efforts Submittal

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If you have not met the DBE goal, complete and submit the DBE Information - Good Faith Efforts, Exhibit 15-H form with the proposal showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed towards obtaining participation by DBEs will be considered.

If your DBE Commitment form shows that you have met the DBE goal or if you are required to submit the DBE Commitment form, you should also submit good faith efforts documentation to protect your eligibility for award of the contract in the event the City of Moreno Valley finds that the DBE goal has not been met (i.e. a listed DBE IS NOT certified).

Good faith efforts documentation must include the following information and supporting documents, as necessary:

1. Items of work you have made available to DBE firms. Identify those items of work you might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is your responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
2. Names of certified DBEs and dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. You are reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.
3. Name of selected firm and its status as a DBE for each item of work made available. Include name, address, and telephone number of each DBE that provided a quote and their price quote. If the firm selected for the item is not a DBE, provide the reasons for the selection.
4. Name and date of each publication in which you requested DBE participation for the project. Attach copies of the published advertisements.
5. Names of agencies and dates on which they were contacted to provide assistance in contacting, recruiting, and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
6. List of efforts made to provide interested DBEs with adequate information about the plans, specifications, and requirements of the contract to assist them in responding to a solicitation. If you have provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.
7. List of efforts made to assist interested DBEs in obtaining bonding, lines of credit,

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insurance, necessary equipment, supplies, and materials, excluding supplies and equipment that the DBE subcontractor purchases or leases from the prime contractor or its affiliate. If such assistance is provided by you, identify the name of the DBE assisted, nature of the assistance offered, and date assistance was provided. Provide copies of supporting documents, as appropriate.

8. Any additional data to support demonstration of good faith efforts.

VII. GENERAL COMPLIANCE WITH LAWS AND WAGE RATES

The Consultant shall be required to comply with all state, and local laws and ordinances applicable to the work. This includes compliance with prevailing wage rates and their payment in accordance with California Labor Code, Section 1775.

The Consultant is required to submit certified payrolls weekly. This applies to all applicable field personnel working on the project. In accordance with Section 1771.5 (b) (5) of the California Labor Code, the City will withhold payments when the payroll records are delinquent or inadequate.

VIII. PAYMENT TO CONSULTANT

- A. This work is to be performed for a “Not-to-Exceed Fee.”
- B. The Consultant shall provide a “Payment Schedule” indicating the fee for individual tasks with a “Not-to-Exceed Fee” which shall be the sum of all tasks by part, phase, and milestone.
- C. Tasks shall include, but not be limited to, all Professional Consultant Services necessary to complete the work covered by this Proposal.
- D. The City will pay the Consultant for work completed based on milestones completed and accepted by the City. These Milestones are:
1. Alignment plan is approved by City departments and DWR.
 2. Completion of Phase 1
 3. 50% plans are complete
 4. 95% PS&E is complete
 5. Right of way is acquired.
 6. Permits are applied and obtained.
 7. 100% PS&E is complete.
 8. Any other logical task on a major task successfully completed and accepted basis, but not more frequently than monthly.

The City shall make sole and final determination if a milestone as described above is complete and acceptable for payment.

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- E. Milestone invoices, not more frequently than monthly, will specifically identify job title, person-hours, and costs incurred by each task.
- F. Sub-categorization of tasks is permitted to better define the task for payment.
- G. Reimbursement costs such as mileage, printing, telephone, photographs, postage and delivery, are to be included in the "Not-to-Exceed Fee."
- H. All tasks including labor and reimbursable costs such as printing, postage, and delivery shall have supporting documentation presented at the time payment is requested.
- I. The City will pay the Consultant for all acceptable services rendered in accordance with the "Agreement for Professional Consultant Services."
- J. When the Consultant is performing, or is requested to perform, work beyond the scope of service in the "Agreement for Professional Consultant Services," an "Amendment to the Agreement" will be executed between the City and Consultant.
- K. The Consultant shall receive no compensation for any re-work necessary as result of the Consultant's errors or oversight.

IX. INSURANCE

- A. The Consultant shall provide Errors and Omissions Professional Insurance. Such coverage limits shall not be less than \$1,000,000 per claim and aggregate.
- B. The Consultant shall have Public Liability and Property Damage Insurance in the amounts as follows:

<u>GENERAL LIABILITY</u>		
Bodily Injury	\$1,000,000	per occurrence
Property Damage	\$ 500,000	per occurrence

A combined single limit policy with aggregate limits in the amount of \$2,000,000 will be considered equivalent to the above minimum limits.

- C. The Consultant shall have Public Liability and Property Damage Insurance coverage for owned and non-owned automotive equipment in the amount of not less than \$1,000,000.
- D. The Consultant shall have Workers' Compensation Insurance in the amounts as will fully comply with the laws of the State of California.
- E. A Certificate of Insurance or an appropriate binder shall bear an endorsement containing the following provisions:

"Solely as respect to services done by or on behalf of the named insured for the City of Moreno Valley, it is agreed that the City of

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Moreno Valley, the Moreno Valley Housing Authority, and the Moreno Valley Community Services District, its officers, employees and agents are included as additional insured under this general liability policy and the coverage(s) provided shall be primary insurance and not contributing with any other insurance available to the City of Moreno Valley, the Moreno Valley Housing Authority, and the Moreno Valley Community Services District, its officers and employees and agents, under any third party liability policy."

- F. Insurance companies providing insurance hereunder shall be rated (A minus: VII - Admitted) or better in Best's Insurance Rating Guide and shall be legally licensed and qualified to conduct insurance business in the State of California.
- G. The terms of the insurance policy or policies issued to provide the above insurance coverage shall not be amended to reduce the above required insurance limits and coverage's nor shall such policies be canceled by the carrier without thirty (30) days prior written notice by certified or registered mail of amendment or cancellation to the Agency, except that cancellation for non-payment of premium shall require ten (10) days prior written notice by certified or registered mail. In the event the said insurance is canceled, the Consultant shall, prior to the cancellation date, submit to the City Clerk new evidence of insurance in the amount established.
- H. It is the consultant's responsibility to ensure that all subconsultants comply with the following: Each subconsultant that encroaches within the City's right-of-way **and** affects (i.e., damages or impacts) City infrastructure must comply with the liability insurance requirements of the City's Capital Projects Division. Examples of such subconsultant work include soil sample borings, utility potholing, etc.

The "Application for Encroachment Permit" form (four pages), including "Application for Encroachment Permit Liability Insurance Requirements," is available in the Capital Projects Division and must be completed and submitted in full to the City. It is the Consultant's responsibility to ensure that all subconsultants submit the appropriate encroachment permit and insurance documentation at the same time that the Consultant's insurance documentation is submitted.

X. INDEMNIFICATION

- A. To the maximum extent allowable by law, the Consultant, when functioning in the capacity of a design professional, agrees to indemnify, defend, and save the City, the Moreno Valley Housing Authority, and the Moreno Valley Community Services District (CSD), their officers, agents and employees harmless from any and all liability, claims, demands, damages, or injuries to any person, including injury to the Consultant's employees and all claims that arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of the Consultant, its officers, agents or employees, or its subconsultant(s) or any person acting for the Consultant or under its control or direction; provided, however, that this indemnification and hold harmless shall not include claims arising from the negligence or willful misconduct of the City, MVHA, and CSD, their officers, agents

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or employees.

- B. The consultant, when not functioning in the capacity of a design professional, agrees to indemnify, defend, and save the City, the Moreno Valley Housing Authority, and the Moreno Valley Community Services District (CSD), their officers, agents and employees harmless from any and all liability, claims, demands, damages, or injuries to any person, including injury to the Consultant's employees and all claims which arise from or are connected with the negligent performance of or failure to perform the work or other obligations of the Consultant under this Agreement, or are caused or claim to be caused by the negligent acts of the Consultant, its officers, agents or employees, or its subconsultant(s) or any person acting for the Consultant or under its control or direction; provided, however, that this indemnification and hold harmless shall not include claims arising from the sole negligence or willful misconduct of the City, MVHA, and CSD, their officers, agents or employees.
- C. The City agrees to indemnify, defend and save the Consultant and their officers, agents and employees harmless from any and all liability, claims, damages or injuries to any person, including injury to the City's, MVHA's and CSD's employees and all claims which arise from or are connected with the negligent performance or failure to perform the services or other obligations of the City under this Agreement, or are caused or claim to be caused by the negligent acts of the City, MVHA and CSD, their officers, agents or employees, or its subcontractor(s) or any person acting for the City or under its control or direction; provided, however, that this indemnification and hold harmless shall not include any claims arising from the negligence or willful misconduct of the Consultant, its officers, agents or employees.

XI. TERMINATION FOR CONVENIENCE OF THE CITY

The City reserves the right to terminate the "Agreement for Professional Consultant Services" for the "convenience of the City" at any time by giving ten (10) days written notice to the Consultant of such termination and specifying the effective date thereof. All finished or unfinished drawings, maps, documents, field notes and other materials produced and procured by the Consultant under the said aforementioned Agreement is, at the option of the City, City property and shall be delivered to the City by the Consultant within ten (10) working days from the date of such termination. The City will reimburse the Consultant for all acceptable work performed as set forth in the executed Agreement.

XII. INDEPENDENT CONTRACTOR

The Consultant's relationship to the City in the performance of the Consultant's services for this project is that of an independent Contractor. The personnel performing the said Services shall at all times be under the Consultant's exclusive direction and control and shall be employees of the Consultant and not employees of the City. The Consultant shall pay all wages, salaries and other amounts due his employees in connection with the performance of said work shall be responsible for all employee reports and obligations, including but not necessarily restricted to, social security, income tax withholding, unemployment compensation, and Workers' Compensation.

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XIII. CONTRACT

The Contract includes the Agreement for Professional Consultant Services, City's Request for Proposal, Consultant's Proposal, and Exhibits.

The Political Reform Act and the City's Conflict of Interest Code require that consultants be considered as potential filers of Statements of Economic Interest. Consultants, as defined by Section 18701, may be required to file an Economic Interest Statement (Form 700) within 30 days of signing a Consultant Agreement with the City, on an annual basis thereafter if the contract is still in place, and within 30 days of completion of the contract.

XIV. GENERAL CONDITIONS

- A. Pre-contractual expenses are defined as expenses incurred by the Consultant in: (1) preparing the Proposal; (2) submitting the Proposal to the City; (3) presentation during selection interview; (4) negotiating with the City any matter related to this Proposal; (5) any other expenses incurred by the Consultant prior to an executed Agreement.

The City shall not, in any event, be liable for any pre-contractual expenses incurred by the Consultant.

- B. The City reserves the right to withdraw this RFP at any time without prior notice. Further, the City makes no representations that any Agreement will be awarded to any Consultant responding to this RFP. The City expressly reserves the right to postpone reviewing the Proposal for its own convenience and to reject any and all Proposals responding to this RFP without indicating any reasons for such rejection(s).
- C. The City reserves the right to reject any or all Proposals submitted. Any Contract awarded for these Consultant engagements will be made to the Consultant who, in the opinion of the City, is best qualified.

XV. SELECTION CRITERIA

The Consultant may be invited to a selection interview. The Proposals will be rated/ranked according to the following criteria:

1. The Firm's General Experience and Qualification Information (20 points) – Information about the company (and all sub-Consultants) including: professional licenses held; ability to furnish required insurance and meet stipulations of the City's "boiler plate" agreement; details about comparable projects completed by the firm, as well as local experience; and its ability to provide the required services.
2. Experience of Key Personnel (40 points) – Information and background on key personnel (and all sub-consultants). Qualifications, abilities, familiarity with state and federal procedures. Local experience on comparable projects and length of service with the firm and reference information preferably with municipal agencies;
3. Project Approach/Understanding (40 points) – Understanding of project,

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discussion of major issues identified on the project and how the Consultant team plans to address them; the management approach and organization necessary to complete the specific project; and outline quality control measures to ensure delivery of a quality product on time, within budget that provides a cost efficient, timely and predictable execution of the project construction.

Attachments:

Attachment 1	CEQA Clearance - Filed NOE
Attachment 2	JB De Anza Trail Preliminary Alignment
Attachment 3	JB De Anza Trail Project Plan
Attachment 4	JB De Anza Trail ROW
Attachment 5	Location Map
Attachment 6	City Standard Agreement for Professional Consultant Services (no changes to this agreement will be allowed)
Attachment 7	MV Aqueduct Trail Full Report
Attachment 8	Exhibit 10-O1 – Consultant Proposal DBE Commitment
Attachment 9	Exhibit 10-O2 – Consultant Contract DBE Information
Attachment 10	Exhibit 15H – DBE Information – Good Faith Efforts

EXHIBIT "B"



PROPOSAL FOR
JUAN BAUTISTA DE ANZA MULTI-USE TRAIL
FROM MORENO VALLEY MALL
EUCALYPTUS AVENUE TO IRIS AVENUE
PROJECT NUMBER 801 0086

CITY OF MORENO VALLEY

MAY 28, 2020



Attachment: Agreement (4051) : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA



STATEMENT OF QUALIFICATIONS

KOA FIRM PROFILE

Founded in 1987, KOA is a leading provider in civil engineering, traffic engineering, transportation planning, and construction management services for public agencies and private sector clients. We offer our clients technical knowledge, innovative solutions and responsive services. The hallmark of our success is our dedication to every project and our desire to leave a legacy of extraordinary contributions to our communities. Our staff includes certified transportation planners, registered civil and traffic engineers, project/construction managers, and construction inspectors. With six offices located in Southern California, KOA has provided engineering services for some of the largest public works and transportation planning projects throughout California.

OUR COMMITMENT AND DEDICATION

KOA is committed to providing our engineering design services for timely and economical project completion. We dedicate the necessary resources to complete each assignment on-time and within budget. Be assured that our key personnel will be assigned to the project for its duration and will not be removed or replaced by us without concurrence from the City. We maintain close attention to our clients by tracking our contract budgets and schedules on a weekly basis. We also maintain a 6-month look-ahead by project and personnel in order to proactively identify resource needs and availability.

ENGINEERING DESIGN SERVICES

KOA has provided engineering design services for many types of public works projects for over 30 years. Our professional staff has experience in heavy civil projects, highways, roadways, trails, transportation projects, designing new and rehabilitation building projects, municipal water systems, sewers, utilities, electrical construction, bridges, and rail. KOA's engineering staff have decades of experience on Caltrans, municipal, utility and private construction projects.

KOA has helped design and plan hundreds of miles of ADA compliant trails, pedestrian facilities, safe routes to schools, and streets and bikeways locally in southern California. The impetus for many of these projects is to improve public health and to increase safety and accessibility. Design experience, familiarity, and contact with stakeholders have been key aspects to nearly all of these projects.

The KOA team is qualified, fully prepared, and eager to provide the City of Moreno Valley with the required services to complete the Juan Bautista De Anza Multi-Use Trail project. Ms. Ming Guan, who recently completed similar ATP trail improvement projects, will serve as the Project Manager for the project. In addition, Ms. Kelley Kelley, Overland, Pacific & Cutler (**OPC**); Mr. Alfredo Aguirre, **ECORP Consulting**; Mr. Lino Cheang, **Earth Mechanics, Inc.**; and Mr. Saul Melgarejo, **Calvada Surveying** have been included on the KOA team to provide right of way, environmental, geotechnical, and surveying services, respectively. Our proposed team has successfully collaborated on numerous engineering design projects together.

TYPES OF SERVICES

Civil Engineering
Traffic Engineering
Transportation Planning
Active Transportation
Highway & Transportation Design
Program Management
Construction Management

YEAR FOUNDED

1987

FORM OF THE ORGANIZATION

S Corporation

LOCATION OF OFFICES

Monterey Park
Orange
Ontario
San Diego
La Quinta
Culver City

PROJECT OFFICE LOCATION

3190 Shelby Street, Bldg, C
Ontario, CA 91764
(909) 890-9693

MAIN CONTACT

Ming Guan, PE, TE
Vice President
(909) 890-9693
mguan@koacorp.com



SUB-CONSULTANTS STATEMENT OF QUALIFICATIONS

OVERLAND, PACIFIC & CUTLER (OPC)

Established in 1980, Overland, Pacific & Cutler (OPC) provides professional services for clients with projects involving right of way program management, land and right of way acquisition, feasibility analysis, real estate appraisal, appraisal review, relocation planning and implementation, property management, and utility coordination. OPC was created to perform these services for transportation, redevelopment, public works, housing, community development, school districts, energy, and utilities. Local, regional, state, and federal agencies call upon OPC to provide on-call and project based real estate services for their most challenging assignments.



LOCATION OF PROJECT OFFICE

2280 Market Street, Suite 200
Riverside, CA 92501
(951) 683-3901
Ms. Kelley Kelley, Project Manager
kKelley@opcservices.com

NUMBER OF EMPLOYEES

120

YEAR FOUNDED

1980

EST % OF TOTAL SCOPE OF WORK

47.27%

ECORP CONSULTING, INC.

ECORP Consulting, Inc. (ECORP) is a California "S" Corporation that specializes in assisting government agencies and private clients with a wide range of environmental services including technical expertise in land use planning; biological, cultural, and water resources; and regulatory compliance with California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), Clean Water Act, federal and state Endangered Species Acts, National Historic Preservation Act (NHPA), and other laws and regulations. ECORP has well-established working relationships with the resources agencies, including the U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), and the U.S. Fish and Wildlife Service (USFWS). ECORP brings an experienced team of more than 100 CEQA and NEPA specialists, environmental permitting specialists, environmental analysts, terrestrial and aquatic biologists, wetland specialists, archaeologists/cultural resource specialists, paleontology specialists, air quality/noise analysis specialists, geographic information systems (GIS) specialists, and unmanned aerial systems (UAS) specialists. ECORP is a financially sound firm with five offices (Redlands, Santa Ana, San Diego, Rocklin, and Chico) serving clients throughout California. ECORP is registered with the Department of Industrial Relations (#1000012875).



FORM OF THE ORGANIZATION

S Corporation

LOCATION OF PROJECT OFFICE

215 North 5th Street
Redlands, CA 92374
Alfredo Aguirre, AICP
Senior Environmental Planner
(909) 307-0046
aaguirre@ecorpconsulting.com

NUMBER OF EMPLOYEES

118

YEAR FOUNDED

1987

EST % OF TOTAL SCOPE OF WORK

0.72%



CALVADA SURVEYING, INC. (DBE)

Calvada Surveying, Inc. is a Disabled Veteran and Minority Disadvantaged-Owned land surveying business established in 1989. They provide professional land surveying services for various industries, including the Real Estate, Telecommunications, Construction, and Environmental industries. They pride themselves not only as pioneers of advanced land surveying technology, but also as a family-oriented company with an immensely dedicated and experienced staff on which Calvada Surveying was built. These individuals include professional land surveyors, qualified field and office personnel, in-house support staff, mapping technicians, and project managers all of which maintain strict professionalism and expertise. Their Corona Headquarters currently employ 25 professionals, including 5 Professional Licensed Land Surveyors and 6 fully equipped 2 man-crews.

CAL VADA SURVEYING, INC.

FORM OF THE ORGANIZATION
S Corporation

LOCATION OF PROJECT OFFICE
411 Jenks Circle, Suite 205
Corona, CA 92880
Saul Melgarejo Jr., Project Manager
(951) 280-9746
smelgarejo@calvada.com

NUMBER OF EMPLOYEES
25

YEAR FOUNDED
1989

EST % OF TOTAL SCOPE OF WORK
13.61%

EARTH MECHANICS, INC. (EMI) (DBE)

Founded as a California Corporation in 1989, Earth Mechanics, Inc. (EMI) is a geotechnical and earthquake engineering consulting firm specializing in major geotechnical site investigations and testing, seismic hazard and earthquake retrofit evaluations, and foundation design for projects related to transportation infrastructure including roadways, bridges, freeways, and tunnels. With a staff of 33, EMI has offices located throughout California. The headquarters is in Fountain Valley, California in Orange County. Other offices are located in San Marcos, Hayward, San Pedro, and San Bernardino. EMI has provided geotechnical services including field exploration and soil laboratory testing, seismic evaluation, foundation design, report preparation, and construction support for several bridge projects in San Bernardino County such as the Orange Street over Plunge Creek Overflow in Highland, the La Cadena Bridge over Santa Ana River in Colton, and the Miles Avenue Bridge over Whitewater River in Indio. EMI has completed over 30 projects which were federally funded and followed Caltrans Local Assistance policies for the Highway Bridge Rehabilitation Program (HBP).



Earth Mechanics, Inc. Geotechnical and Earthquake Engineering

FORM OF THE ORGANIZATION
Corporation

LOCATION OF PROJECT OFFICE
234 East Drake Drive
San Bernardino, CA 92408
Alahesh Thurairajah, Project Engineer
(909) 890-1551
A.Thurairajah@earthmech.com

NUMBER OF EMPLOYEES
33

YEAR FOUNDED
1989

EST % OF TOTAL SCOPE OF WORK
3.50%



A. PROJECT UNDERSTANDING

The City of Moreno Valley is seeking a professional services engineering consultant firm to provide engineering design services to develop construction Plans, Specifications, and Estimate (PS&E) for the Juan Bautista De Anza Trail from Moreno Valley Mall-Eucalyptus Avenue to Iris Avenue. The proposed construction consists of approximately four miles of an off-street multi-use trail for bicyclists and pedestrians including a Class I Bike path and ADA compliant pedestrian path, street crossings, sidewalk improvements, and connections to existing trails.

The project includes 11 segments as shown on figure to the right.

The proposed Juan Bautista De Anza Trail Project in the city of Moreno Valley will upgrade and complete the entire trail system across the city serving as a non-motorized corridor. The multi-purpose alignment will meet ADA compliancy; provide high visibility crosswalks; and crossing signals for pedestrians/bicyclists. KOA will prepare the PS&E for the Juan Bautista De Anza Trail from Moreno Valley Mall – Eucalyptus Avenue to Iris Avenue. Design will be based on the Project Alignment plan that has already been developed by the City, and the environmental approval.

In 2014, the entire length of the trail corridor received Congestion Mitigation and Air Quality Improvement (CMAQ) program funding through the Riverside County Transportation

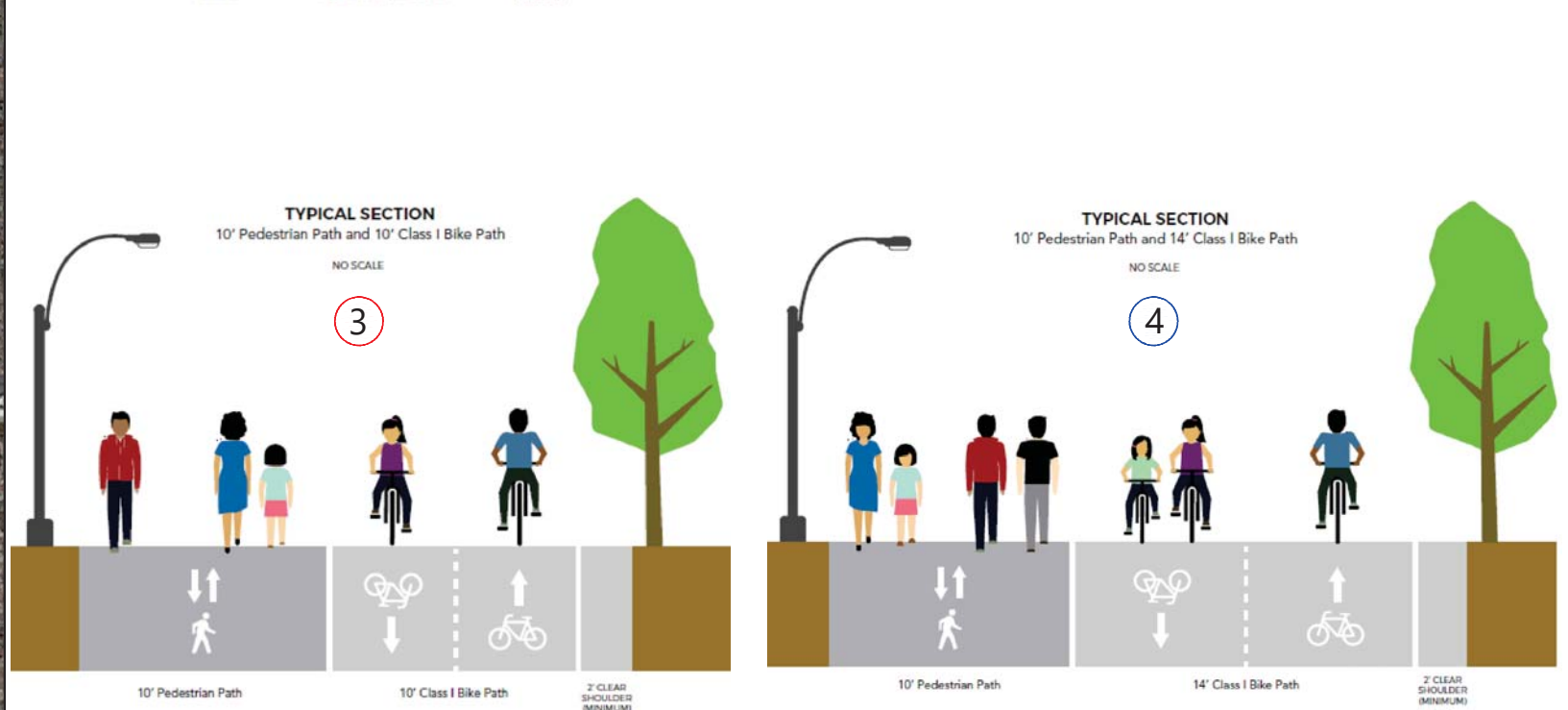
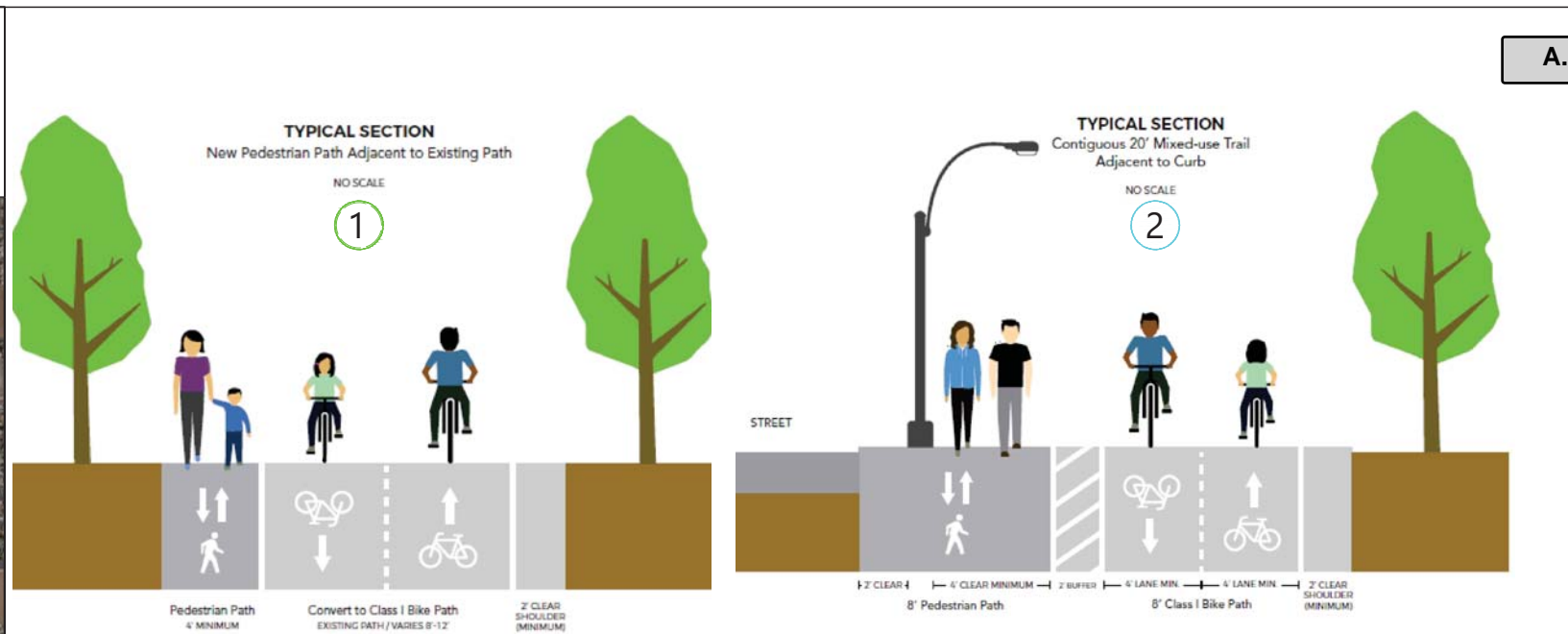
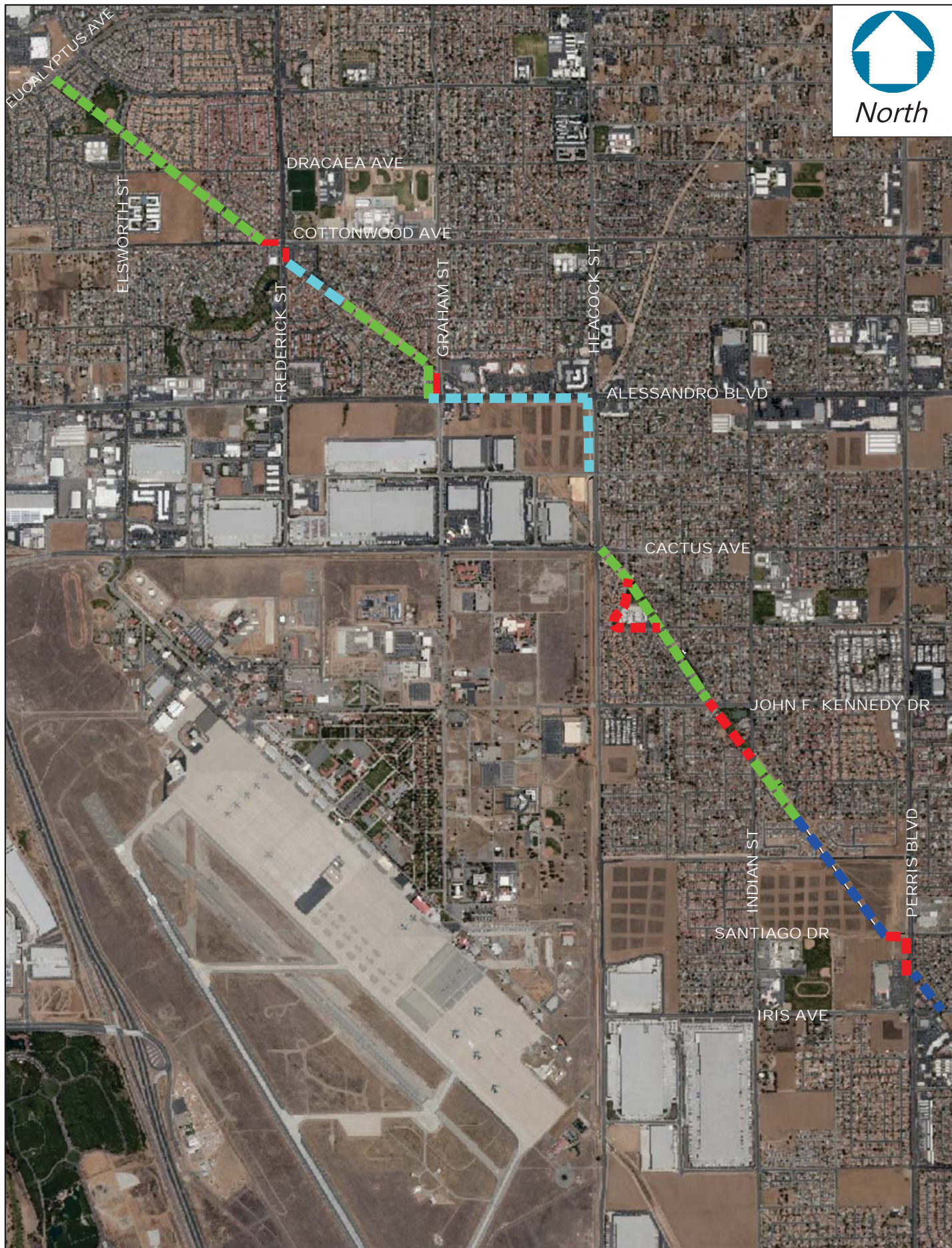
Commission (RCTC) for the Project Approval and Environmental Document (PA&ED) phase. The preliminary design and environmental document were approved by Caltrans in November 2018. The environmental document was a Categorical Exemption and a Categorical Exclusion (CE/CE) in compliance with CEQA and NEPA. The Juan Bautista De Anza Multi-Use Trail alignment is mainly along the existing California Department of Water Resources' (DWR) aqueduct pipeline.

The four-mile multi-use trail project is funded by the State Active Transportation Program – Cycle 4 administered by the California Department of Transportation (Caltrans) District 8 Local Assistance Program. Caltrans' Division of Local Assistance will serve as the administering agency for the approval and dispersal of funds.

The City will retain the services of a professional engineering firm to develop the construction Plans, Specifications, and Estimate (PS&E). In addition to the technical engineering work, the KOA team will provide for overall project management; prepare engineering design and support services including geotechnical investigations, surveying, and Right of Way services; assist the City in obtaining the Caltrans encroachment permit and Authorization to Proceed with construction (E-76 documents) from Caltrans; provide engineering consultation services during the construction bidding phase; comply with all federal and state grant funding program requirements; and maintain accounting on all invoices as required for the grant funding programs.



- 11 EUCALYPTUS AVENUE TO DRACAEA AVENUE
- 9 DRACAEA AVENUE TO COTTONWOOD AVENUE
- 8 COTTONWOOD AVENUE TO BAY AVENUE
- 10 BAY AVENUE TO GRAHAM STREET
- 7 ALESSANDRO/GRAHAM TO HEACOCK/BRODIAEA
- 12 HEACOCK ST/CACTUS DR TO JOHN F KENNEDY DRIVE
- 13 JOHN F KENNEDY DRIVE TO FAY AVENUE
- 5 FAY AVENUE TO TO SOUTH SIDE OF PARCEL APN 485121011
- 6 SANTIAGO DRIVE (WALMART) TO TO NORTH SIDE OF PARCEL APN 485220040
- 3 SANTIAGO DRIVE TO SANTIAGO DRIVE
- 4 IRIS AVENUE TO SANTIAGO DRIVE (WALMART)



LEGEND

①	PROP. PED. PATH	
②	COMBINED 20' TRAIL	
③	COMBINE TRAIL USE (VAR. WIDTH)	
④	14' BIKE TRAIL	



KEY ISSUES

In order to develop a sound project approach, it is important to understand the project objective and correctly identify project challenges that will be encountered during project development. The extensive knowledge gained from the PA/ED and PS&E phase of the Juan Bautista De Anza Trail project enable the KOA team to have an in-depth understanding of the residents' need for active transportation improvement projects, and identify potential project risks, as well as provide more cost-effective service. All key members of the KOA project team have visited the project site, and studied and researched the project area. Project key elements that will influence the design decisions related to project developments are discussed below.

LANDSCAPING/WAYFINDING

ATP funding typically does not allow for landscaping costs in the federal-aid portion of the funding. We expect that any landscaping will be minimal, and will include restoration of any impacts to existing landscaping and irrigation along the trail. We anticipate that wayfinding will mimic any design being developed on the ATP 3 project.

RIGHT OF WAY

We anticipate that right of way/easements will need to be considered for approximately 42 parcels in order to complete the Juan Bautista De Anza Multi-Use Trail project. Due to unity of use, common ownership and contiguity of some of the 42 parcels, we have determined a total of 37 legal larger parcels need partial acquisitions for easements.

If it is determined that the value of the take will not exceed \$10,000 and the take would be minor and uncomplicated, a Waiver Valuation or Minimum Value Estimate (MVE) may suffice in lieu of a full right of way appraisal report, which can significantly reduce the project cost and schedule.



Existing undeveloped trail looking SE from the intersection of Alessandro Blvd. and Graham St.

IMPACTS TO EXISTING FACILITIES AND UTILITIES

KOA will coordinate with utility agencies to identify existing utility locations and finalize trail design to minimize impacts to existing facilities.



Existing manhole between Alessandro Blvd and Brodiaea Ave, north of Rebecca St.











Existing drainage structure between Bay Avenue and Caspian Way to be protected in place.

Attachment: Agreement (4051) : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

INTERSECTIONS/STREET CROSSINGS

There are multiple street crossings along the trail. Correctly identifying traffic control and crossing treatments is essential for the projects. Below are a few crossing concepts along the trail.

Location	Existing Condition	With Proposed Treatment
Pan Am Blvd. south of Aqueduct Wy.	<p>Mid-block Crossing</p> 	<p>Curb ramp on west side of Pan Am Blvd., speed table</p> 
Indian St. at Vandenberg Dr.	<p>Non-signalized Intersection</p> 	<p>Median refuge, high-visibility crosswalk, construct curb ramps on Indian St.</p> 
Filaree Ave. east of Indian St.	<p>Mid-block Crossing</p> 	<p>Speed table</p> 
Elsworth St. at Westlake Dr.	<p>Non-signalized Intersection</p> 	<p>High-visibility crosswalk on east leg</p> 

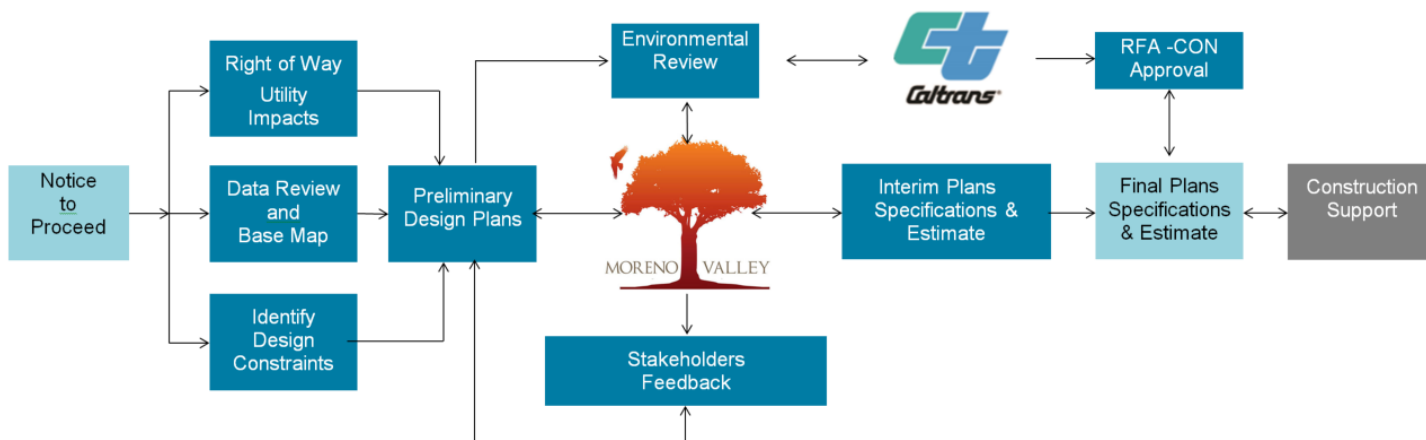
Attachment: Agreement (4051) : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

B. APPROACH AND MANAGEMENT PLAN

PROJECT APPROACH

The KOA team has the resources and extensive experience in completing similar roadway improvement projects. We are familiar with the required standards, procedures, and regulations. We have recently completed or are developing similar projects in Moreno Valley, Colton, Beaumont, Highland, and Redlands.

At project commencement, KOA will meet with the City to discuss the project goals and scope of work in depth. We will establish an agreed-upon schedule and budget, and review the program with the City. The schedule and project cost will be monitored throughout project development, and regular updates provided to the City through reporting and/or at our regular project meetings. We will have detailed cost reports available each month at the reconciliation of our accounting system. It is anticipated that there will be one Project Development Team (PDT) meeting per month during the duration of this contract. The KOA team has developed a project flow chart that demonstrates our thorough understanding of the anticipated and required efforts from inception to completion of the project.



Our approach to this project will develop an organized, strategic plan that identifies and takes into account the specific project goals and objectives, with time and budget constraints in mind. The project is to be completed in four general phases, the first being Concept Approval and Environmental Clearance. The second phase will include completing the Plans, Specifications and Estimate (PS&E). The third phase will consist of right of way engineering and construction bid support, followed by support during the actual construction phase.

The scope of services delivery is based on an integrated work plan involving technical disciplines assigned to key elements of the scope of work. The overall methodology will be structured to provide for full continuity across project deliverables to avoid conflict between various project objectives. This will ensure that best design solutions are integrated with smooth construction activity and seamless project delivery. We are committed to providing innovative and constructible solutions, and exceeding the City's expectations for the deliverables mentioned in the RFP.

An initial task critical to ensuring a smooth start to the project is to collect and review all existing relevant data available to the project. Project site constraints and background data will be validated. A brief summary of the scope delivery methodology for various phases is as follows:

The first effort on this project will include development of the base map which will outline existing right-of-way limits. This effort includes review of as built plans and design plans for improvements within the project limits. The base mapping effort will include aerial mapping for which we will establish horizontal and vertical controls so that composite base maps can be prepared that show centerline and right of way limits on the aerial. The base mapping will document the side slopes and edge conditions where the proposed trail will be constructed and or modified. Collecting above and below ground utility information is highly critical for all urban locations, and we will coordinate this effort with all local utility companies including, but not limited to, water, sewer, natural gas, electrical, cable TV, and telephone, etc. We will also obtain information related to meter boxes, survey monuments, power poles, manholes, trees, and valve covers, etc.

On this particular project, one important aspect is to ensure that the proposed trail meets current ADA standards and provides needed ADA improvements. Another important aspect is to coordinate with Moreno Valley staff to identify potential right of way impacts, and obtain pre-design consensus from impacted parcels for proposed trail improvements.

KOA has an FAA waiver to conduct aerial drone photographic surveys. We will collect aerial imagery for documentation of the project area, and for presentation and public outreach purposes.

Upon approval of the 60% Preliminary Plan, we will continue on to develop the detailed PS&E construction bid documents. The PS&E will be developed in phases and reviewed with the City at the initial geometric layout, 90%, and 100% stages, and leading up to the final submittal. Internal project meetings will be conducted weekly to ensure that the project is on schedule. KOA will complete the final plans, specifications and estimate for the City and provide support during construction phase.

PROJECT MANAGEMENT

Our organizational approach will be based upon our knowledge of the City’s objective, project requirements, and our subsequent translation of those into a project plan. It will provide structure for directing, controlling, and reporting project activities. KOA’s management plan for the engineering services will provide a mechanism to ensure high-quality end products, in a timely and cost effective manner. The management plan elements include technical, schedule and cost control, progress reporting, coordination, and organization. Internal cost control procedures include budget control, which is facilitated by computerized management information reports that provide tabulations of actual cost and manpower expenditures incurred against those budgeted. The project manager will be responsible for exercising cost control, manpower scheduling, resource allocation, and estimates of cost-to-complete performed on a period-by-period basis.

A key aspect of a successful project is the ability of the consultant team’s project manager and the City project manager to work together both closely and effectively. To facilitate this, KOA’s project manager will be responsive to questions and issues that may arise; be responsible for ensuring that the budget and schedule are maintained; and provide support and advice to the City’s project manager, as needed. She will provide a single point of contact for questions and concerns and will ensure consultant team members are meeting standards for quality of work. Effective project management will include scheduled progress meetings and status updates via phone and e-mail as information becomes available. Status reports will accompany invoices, and summaries of meeting minutes will be provided to the City within one business day. KOA’s PM will maintain a reasonable workload so that she can be responsive and available to the City while maintaining flexibility to deal with changes and adjustments to the project schedule.

Our approach to providing the City with the necessary high quality level of service involves the following key elements:

A STRONG AND FAST START

Prior to receiving the Notice to Proceed (NTP), KOA will study the project locations to understand the challenges and issues, project schedule, and the budget.

SKILLFUL COORDINATION OF THE PROJECT

KOA understands that prioritizing coordination with the project’s stakeholders is key to the project’s success. The Project Manager, Ming Guan, will use the kickoff meeting with the City to share information about the design; to identify potential issues early on; and to gain consensus with the City staff as early as possible.

CONTINUING SUPPORT AND PROJECT COMMITMENT

As she has demonstrated on past projects, Ms. Guan is committed to this project from start to finish. She will provide overall project management, strategic coordination, and continuous supervision throughout the project duration.

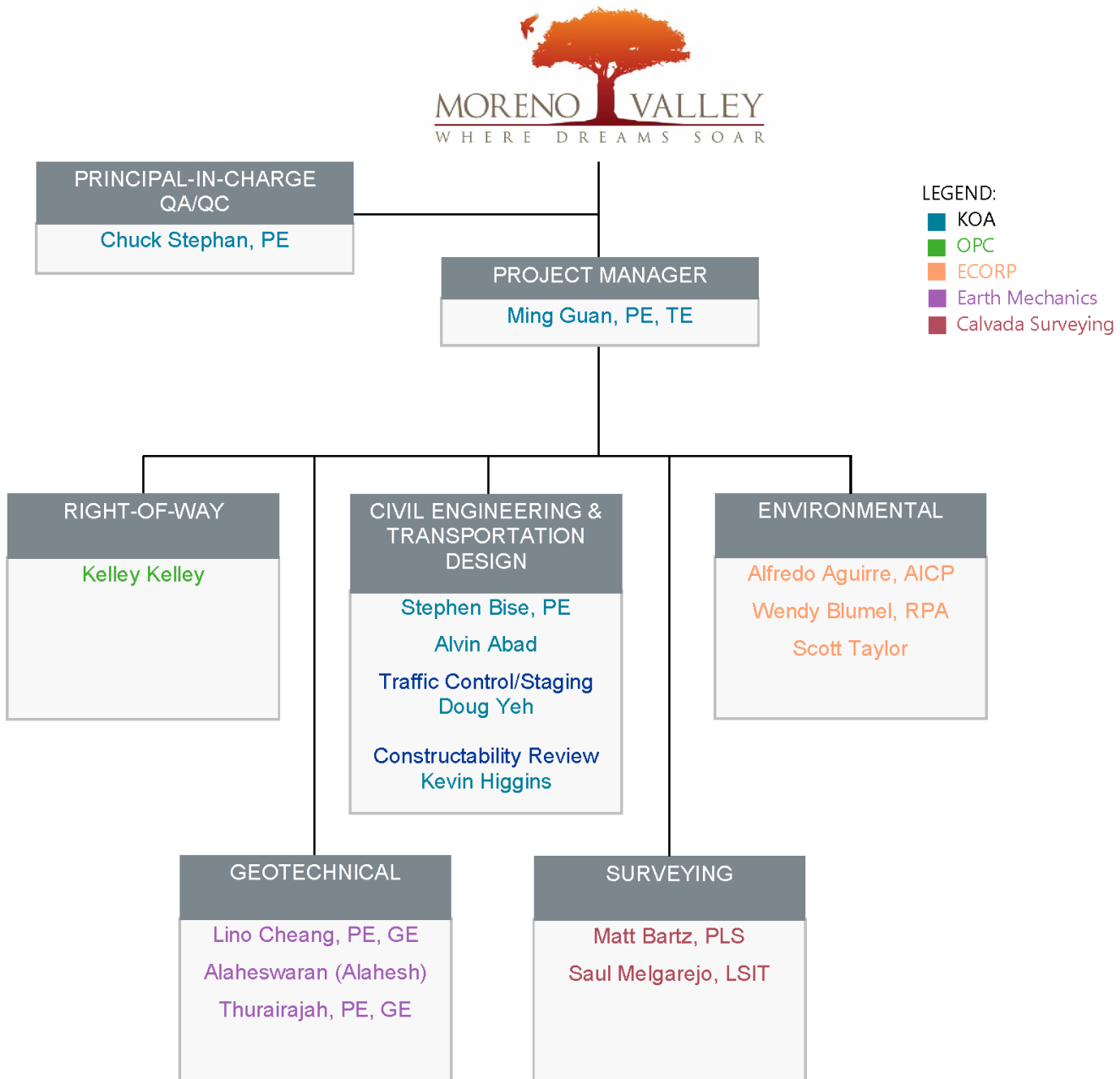
MAXIMIZING TEAM STRENGTH

In addition to those listed in the Organization Chart, KOA’s resource-pooling approach will take advantage of additional support from staff in the other KOA offices. Some of the potential tasks to be addressed include community toolboxes, preparation of display graphics and videos, and other traffic engineering issues.

GUARANTEED RESPONSIVENESS

Above all, KOA will be responsive to the needs of the City. Having worked with the City on previous design projects, KOA truly understands that the key step towards project success is to be responsive. All individuals listed on the organization chart are highly reliable and proficient within the KOA team. The KOA Project Manager and Principal-in-Charge will make all reasonable efforts and take the appropriate measures, within our means, to ensure that sufficient staffing resources are available to handle any of the City's requests. KOA will communicate on a regular basis with the City regarding project matters, and will notify the City of any anticipated difficulties, issues, or concerns so that there are no surprises to the City. As needed, we will meet with City staff at key milestones to discuss project status and deliverables, and to resolve any project issues.

ORGANIZATION CHART



Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

C. QUALIFICATIONS AND EXPERIENCE

KOA SIMILAR PROJECT EXPERIENCE

AQUEDUCT MULTI-USE TRAIL SYSTEM: JUAN BAUTISTA DE ANZA TRAIL; TRAIL PLAN; ATP GRANT FUNDING

MORENO VALLEY, CA

The 9.5-mile-long Juan Bautista de Anza Pedestrian and Bicycle Path transects Moreno Valley from the northwest to the southeast corners of the city, providing a safe and viable commuter and recreation trail for the entire city. The trail connects schools and parks, dining, shopping, entertainment, office, commercial, and residential areas along the route, leading to the Lake Perris State Recreation Area and the City of Perris regional trail system to the south, and major shopping centers to the north. The project will provide an off-street Class I bike path, walking, and jogging facility for most of the length, on-street connections at two schools, and improved crossing at local and arterial streets. KOA is preparing the major planning and engineering basis of design, and environmental document for the project. During document development, KOA assisted the City in applying for, and winning, two Active Transportation Program (ATP) grants for significant portions of the project, which will connect several schools and parks along the corridor.

REFERENCE: City of Moreno Valley, Margery Lazarus, PE, Senior Engineer, 14177 Frederick Street, Moreno Valley, CA 92552, (951) 413-3133, margryl@moval.org.



RECHE VISTA CANYON REALIGNMENT

MORENO VALLEY, CA

The City of Moreno Valley expressed the desire to realign Reche Vista Drive from the intersection of Perris Boulevard/Heacock Street to 200 feet north of the city limits of Moreno Valley. For this federally-funded project, the City selected KOA to complete the NEPA/CEQA documentation; right of way appraisal and acquisition along with study of alignments; and preparation of PS&E. The stretch of Reche Vista Drive to be realigned was included in the Federal Route System and the Comprehensive Transportation Plan (CTP) network; Reche Vista Drive is classified by the City's General Plan as an arterial highway. The Project is included in the CETAP as an alternative route in the San Bernardino County – Moreno Valley Corridor. RCTC has included the project in their RTIP/TIP. **REFERENCE:** City of Moreno Valley, Quang Nguyen, Senior Engineer/Project Manager, 14177 Frederick Street, Moreno Valley, CA 92552, (951) 413-3159, quangn@moval.org.

The Project is included in the CETAP as an alternative route in the San Bernardino County – Moreno Valley Corridor. RCTC has included the project in their RTIP/TIP. **REFERENCE:** City of Moreno Valley, Quang Nguyen, Senior Engineer/Project Manager, 14177 Frederick Street, Moreno Valley, CA 92552, (951) 413-3159, quangn@moval.org.



GRAND AVENUE BIKE IMPROVEMENTS & MULTI-PURPOSE TRAIL IMPROVEMENTS PROJECTS

WILDOMAR, CA

KOA is leading a team to improve bicycle facilities for the City of Wildomar along a five-mile span of Grand Avenue and Clinton Keith Road. Street widening and trail improvements include the incorporation of Class 1, Class II, and Class III facilities for bicyclists and other non-motorized forms of transportation. The work, which consists of three separate projects with different funding sources, is being completed concurrently as a single unit. Financing is being provided by local sources and state and federal grants. The team's services include traffic engineering, utility research, surveying, hydrology, geotechnical engineering, and right-of-way analysis. KOA is providing conceptual plans and alignments, bicycle safety and awareness education, traffic calming design, street crossing designs for bicycle and



JUAN BAUTISTA DE ANZA MULTI-USE TRAIL FROM MORENO VALLEY MALL – EUCALYPTUS AVE TO IRIS AVE CITY OF MORENO VALLEY

pedestrian uses, and designs for incorporating ADA access. KOA is involved in public meetings to obtain the community's input and to educate locals about safe bicycling practices. **REFERENCE:** City of Wildomar, Dan York Assistant City Manager, 23873 Clinton Keith Rd., Suite 201, Wildomar, CA 92595, (951) 677-7751, x216, dyork@cityofwildomar.org.

HIGHLAND-REDLANDS CONNECTOR PROJECT, ATP CYCLE 1, FEDERAL PROJECT NO. ATPL-5449

HIGHLAND/REDLANDS, CA

The proposed project would construct a non-motorized transportation project along 4.7 contiguous miles of streets and easements in the cities of Highland and Redlands. The project would construct bicycle and pedestrian improvements including pavement widening, curb and gutter, curb ramps, median curbs, sidewalks, pavement widening, pavement rehabilitation, slurry seal, pavement markings and striping, Class I and II bikeway/pedestrian paths, **bicycle/pedestrian bridge**, bike racks, bollards, bike signals, in-roadway bicycle detection, pedestrian heads, sharrows, enhanced crosswalks, warning beacons, roadway and bikeway signage, lighting, and speed feedback signs. KOA team is responsible for Conceptual Development, Environmental Clearance, Right of Way engineering, and Final PS&E. KOA team conducted workshop and public outreach in June 2017. The conceptual design has been completed for the project.



REFERENCE: Dennis Barton, Project Manager, City of Highland, 27215 Base Line, Highland, CA 92346, (909) 864-8732, dbarton@cityofhighland.org.

OPC SIMILAR PROJECT EXPERIENCE SR-60 AT NASON STREET INTERCHANGE PROJECT

MORENO VALLEY, CA

Overland, Pacific & Cutler has provided right of way services for several projects for the City of Moreno Valley. The *SR-60 @ Nason Street Interchange Project* reconstructed and realigned Nason Street On-Off ramps to State Route 60 in the city of Moreno Valley. The project required the acquisition of temporary and permanent right of way from 8 commercial land parcels. Each parcel involved intense and complex negotiations that included high profile businesses such as Kohl's and Marie Callender's; *Ironwood Improvement Project – Perris to Nason*, this road widening of Ironwood between Perris and Nason involved 76 partial acquisitions; *Ironwood Avenue – Heacock to Perris* - This street widening project of Ironwood Avenue between Heacock and Perris involved 30 full and part take acquisitions and 4 residential relocations; *Alessandro Boulevard Widening*, OPC provided right of way acquisition and relocation services for the widening of Alessandro between I-315 and Frederick. The project consisted of 23 property acquisitions and 6 business relocations. OPC also was responsible for the relocation plan preparation; *SR-60/Moreno Beach Interchange Project*, OPC provided acquisition services for 32 parcels. The project included the construction eastbound on/off ramps, westbound on/off ramps, and road improvements on Moreno Beach Drive that replaced the existing 2-lane bridge with a 6-lane bridge crossing State Route 60. In addition, the project included construction of approximately 1,800 feet of storm drain improvements along Ironwood Avenue near Moreno Beach Drive. The project alleviated congestion, enhanced freeway access, and replaced the existing bridge over SR60. **REFERENCE:** City of Moreno Valley, Josh Frohman, PE, Associate Engineer, Public Works, 14177 Frederick St., Moreno Valley, CA 92553, (951) 413-3251, joshf@moval.org.

ECORP SIMILAR PROJECT EXPERIENCE BIKE AND MULTI-PURPOSE TRAIL IMPROVEMENTS PROJECT

WILDOMAR, CA

ECORP, as a subcontractor to KOA, prepared a Caltrans PES and Joint Categorical Exclusion/ Categorical Exemption (CE/CE) for Phases 1 and 2 of the proposed project. The purpose of the proposed project was to install Class II and Class III bike lanes to promote non-motorized transportation for the City of Wildomar. Proposed improvements would include the widening of existing pavements, re-striping, and other safety improvements along the roadway segments. The project would not require any additional right-of-way. A CE was also prepared for the Multi-Purpose Trail proposed along a

portion of Grand Avenue. Additional cultural resources documentation (APE, ASR, HPSR, Native America Consultation) was also prepared at the request of Caltrans. The studies and design are complete, and the bike lanes were constructed in 2018. **REFERENCE:** City of Wildomar, Kev Tcharkhoutian, Project Manager, 23873 Clinton Keith Road, Suite 201, Wildomar, CA 92595; (951) 677-7751; ktcharkhoutian@interwestgrp.com.

CALVADA SIMILAR PROJECT EXPERIENCE

CITY CREEK/ALABAMA STREET BIKEWAY PS&E

CITY OF HIGHLAND, CA (2018)

The City Creek/Alabama Street Bikeways (Project), a non-motorized transportation project along 3 contiguous miles of streets and easements in the City of Highland, will construct bicycle and pedestrian improvements including pavement widening, curb ramps, sidewalks, pavement markings and striping, Class I and II bikeway/pedestrian paths, bicycle/pedestrian bridge, bike racks, bollards, bike signals, in-roadway bicycle detection, pedestrian heads, enhanced crosswalks, roadway and bikeway signage and lighting. Calvada Surveying Inc. was contracted to perform aerial and terrestrial land surveying services within the project limits. The survey will be used as the base map for the final PS&E for all street, bikeway and pedestrian improvement plans and profiles including removals, utility relocations and adjustments, pavement widening, curb and gutter, curb ramps, median curbs, sidewalks, pavement widening, pavement rehabilitation, slurry seal, pavement markings and striping, Class I and II Bicycle/Pedestrian paths, bike racks, bollards, bike signals, in-roadway bicycle detection, pedestrian heads, enhanced crosswalks, warning beacons, roadway and bikeway signage, lighting, and traffic control.

REFERENCE: KOA, Ming Guan, Vice President, 3190 C Shelby Street, Ontario, CA 91764, (909) 890-9693, mguan@koacorp.com.

EARTH MECHANICS SIMILAR PROJECT EXPERIENCE

ROCK SPRINGS ROAD BRIDGE OVER THE MOJAVE RIVER

HESPERIA, SAN BERNARDINO COUNTY, CA

The project involved widening the existing Rock Springs Road from two to four lanes from Glendale Avenue to Deep Creek Road. As part of the widening, the existing low-water crossing will be replaced with 938 feet long seven-span bridge. The bridge will be supported on driven HP piles at the abutments (14x89) and 8-foot CIDH piles at the piers. In addition to the bridge structure, the proposed improvements also include a new Caltrans Standard Plan retaining wall, new cut slopes and fill slopes, and new pavement structural sections. EMI was responsible for planning and performing the geotechnical investigation for the bridge and associated roadway improvements, geotechnical analysis for the bridge and retaining wall foundations and preparation of a bridge foundation report and a materials report for submittal to the County of San Bernardino.

REFERENCE: County of San Bernardino, Sri Srirajan, PE, GE, Engineering Manager, 825 East Third Street, San Bernardino, CA 92415, (909) 387-8166, ssrirajan@dpw.sbcounty.gov.

D. STAFFING PLAN

Our organizational approach will be based upon our knowledge of the City's objective, project requirements, and our subsequent translation of those into a project plan. It will provide structure for directing, controlling, and reporting project activities. KOA's management plan for the engineering services will provide a mechanism to ensure high-quality end products, in a timely and cost effective manner. The management plan elements include technical, schedule and cost control, progress reporting, coordination, and organization. Internal cost control procedures include budget control, which is facilitated by computerized management information reports that provide tabulations of actual cost and manpower expenditures incurred against those budgeted. The project manager will be responsible for exercising cost control, manpower scheduling, resource allocation, and estimates of cost-to-complete, performed on a period-by-period basis. KOA has assembled a very qualified team that has worked on similar Federally-Funded Safe Route to School projects. Our proposed project manager, Ms. Ming Guan, PE, TE, will lead the project team, and will be responsible for the day-to-day work and contact with the City for this project. Ms. Guan is authorized to negotiate the contract on behalf of the firm. She can be reached in our Ontario office at (909) 890-9693 or by e-mail at mguan@koacorp.com. She will be supported by a team of

JUAN BAUTISTA DE ANZA MULTI-USE TRAIL FROM MORENO VALLEY MALL – EUCALYPTUS AVE TO IRIS AVE
CITY OF MORENO VALLEY

qualified KOA staff and sub-consultants. None of the project team members will be removed and/or replaced without the prior written consent of the City of Moreno Valley project manager.

STAFF TO BE ASSIGNED

A minimum of **15** KOA and sub-consultant personnel (key and support staff) will be assigned to this project. Supplemental support staff will be assigned as needed, according to skills and availability. Our pool of staffing resources encompasses all six KOA offices, which are all located in the Southern California region.

PROJECT TEAM

The personnel shown in the following organization chart will be the staff members principally responsible for working with the City. It includes the name, discipline, project title/role, and responsibility for each proposed KOA staff members and Sub Consultants. All proposed staffs are available and committed to provide engineering services to the City. Their respective resumes, which include workload availability, are provided later in the Appendix.

E. WORK PLAN AND SCHEDULE

WORK PLAN

PROJECT MANAGEMENT

TASK 1.0 - PROJECT MANAGEMENT AND ADMINISTRATION

Under the project management task, KOA will be responsible for maintaining contact with the City's Project Manager to keep him/her informed of the developments on the project. KOA will develop a list of contact information. KOA will coordinate with each agency including DWR and determine permits or project specifications that are required. KOA will serve as the main coordinator and liaison between the City and agencies. It is anticipated that monthly PDT meetings will be held until the final completion of the project. The following specific subtasks will be performed:

- 1) *Management of project team including sub-consultants*
- 2) *Attend Project Start-up Meeting, Development and Agreement on Design Standards*
- 3) *Conduct PDT Meetings including Preparing Agenda and Meeting Minutes*
- 4) *Submittal of Monthly Progress Reports and Invoices including Updating Schedules*
- 5) *Quality Control of Submittals*

Deliverables:

- Meeting agendas, attendance rosters, and minutes /Detailed project schedule/ Monthly project reports

PA&ED COMPLETION

TASK 1.1 - REVIEW AND EVALUATE CONCEPTUAL DESIGN AND PRELIMINARY PROJECT REPORT

The KOA team will meet with the City to establish the design parameters for this project. KOA will also meet with the City and identify all applicable agencies with authority over any particular aspects of the project. KOA will review existing design plans, project reports, and other available project documents; and evaluate and refine conceptual design. ECORP will be available to consult with the design team to avoid environmental impacts, and to advise the City in regards to the Environmental document. Specific subtasks include:

- 1) *Review PA/ED Documents*
- 2) *Evaluate and Refine Conceptual Design*
- 3) *Communications with Stakeholders*

Deliverables:

- Refined Conceptual Design, Change of Funding Scope Memorandum, if needed

TASK 1.2 - UTILITY RESEARCH AND COORDINATION

KOA will provide preliminary notification/request letter and relocation/removal notices to all utility companies that have facilities within the limits of the project. The City shall provide KOA with the required format for the utility notice in Microsoft Word format. Specific subtasks include:

- 1) *Contact and Obtain Utility Information*

- 2) *Prepare notices and follow up requests with plans to utility companies*

Deliverables:

- Utility Log, Spreadsheet log of notices sent to utility companies and responses received

TASK 1.3 - IDENTIFY RIGHT OF WAY IMPACT

The proposed multi-use trail will require easements or right of way along most of the Trail. It is important that exact property lines on the parcel are indicated on the base map. Once the design footprint has been finalized, KOA will identify the needs for new rights-of-way, permanent easements, temporary construction easements, and rights-of-entry. The KOA team will prepare right-of-way maps showing existing rights-of-way and easements; areas requiring acquisition; assessor’s parcel number; zoning; owner’s name, addresses, and type of business; street centerlines; property lines; building footprints; setback distances from right-of-way to building; existing and proposed improvements within the affected areas, including potential easements required for maintenance access; utilities; and construction work area, as necessary.

KOA will assist the City in obtaining the necessary easements and right of way for the project. Specific subtasks include:

- 1) *Identify Right of Way Impact*
- 2) *Prepare Right of Way Impact Map*
- 3) *Prepare legal descriptions*

Deliverables:

- *Right of Way Impact Map, Legal Descriptions*

TASK 1.4 - ENVIRONMENTAL REVIEW

ECORP will confirm that the environmental clearance prepared by others is consistent with the proposed design and in compliance with CEQA and NEPA. ECORP will also confirm the requirements for the various permits necessary for the project including the 401 (RWQCB), 404 (USACE), 1602 (CDFW), and encroachment permits from DWR. We will review the project for consistency with the Western Riverside County Regional Conservation Authority (RCA) Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and determine the applicability of biological survey requirements per the MSHCP.

Deliverables:

- *Confirm environmental compliance and permit requirements*

TASK 1.5 - PRELIMINARY DESIGN PLANS (50% PLANS)

Preliminary design plans will focus on issues that require general agreement before proceeding with detailed design work. These will be resolved during the preliminary phase of the project. KOA will review and refine the conceptual plan and preliminary alignment plan for the proposed improvements; and identify associated impacts and costs. The preliminary design plan will include existing right-of-way, curbs, striping and marking, and As-Built data. Subtasks for this task will include:

- 1) *Prepare Preliminary Design Plan (50%)*
- 2) *Prepare Preliminary Cost Estimates*

Deliverables:

- Four (4) full-size copies of plan submittals at 50% / Cost Estimates at 30%

FINAL PLANS, SPECIFICATIONS & ESTIMATES

TASK 2.1 - DATA REVIEW, FIELD SURVEYING AND BASE MAPPING

Under this main task, the following subtasks will be performed. The KOA team will photograph the entire project area for our use during design, review, and as a pre-construction record. We can utilize our aerial camera (“drone”) to obtain aerial imagery where beneficial.

The KOA team will obtain the available “As-Built” files. We will review the available data, proposed work, and develop a specific list of additional field data required for the project. The as-built information will also be field verified, as necessary, and the plans will be updated accordingly. Utility maps will be obtained from the utility agencies. Above ground and overhead utility information will be field verified. Specific subtasks include:

- 1) *Obtain and Review Existing Record Drawings and Utility Maps*
- 2) *Field Survey Topographic Features*
- 3) *Field Review Verification*
- 4) *Preparation of Base Map*

Deliverables:

- Report of potential conflicts/ Electronic copy of all field surveys in AutoCAD, latest format

TASK 2.2 - UTILITY COORDINATION AND POTHOLING

KOA will send second notices to inform the utility company of their need to relocate their facilities prior to construction, or to adjust their facilities to grade after completion of the pavement construction. If requested by the City, potholing services will be performed under a supplement agreement. Specific subtasks include:

- 1) *Utility Coordination*
- 2) *Prepare notices and follow up requests with plans to utility companies*
- 3) *Pothole utilities (optional)*

Deliverables:

- Utility log / Pothole Report (extra)

TASK 2.3 - GEOTECHNICAL INVESTIGATION

A geotechnical investigation will be performed to sample existing soils, and provide data and engineering for the Trail design. The geotechnical engineer will provide recommendations for pavement sections sufficient for the Trail structure and support of anticipated maintenance vehicle loadings. Additional data will be provided to support the Contractor in development of the bridge abutment design. In addition, an infiltration study will be performed of existing on site soils to determine permeability rates. The project will be designed to infiltrate stormwater and avoid runoff from the project site. Specific subtasks will include:

- 1) *Perform field investigation and sampling of on-site soils*
- 2) *Perform laboratory testing and analysis and infiltration study*
- 3) *Finalize Trail pavement section*
- 4) *Provide soil data for abutment design*

TASK 2.4 - PREPARE INTERIM AND FINAL PLANS, SPECIFICATIONS AND ESTIMATE

KOA will prepare and assemble a set of drawings for this project in a bid package format for City review, in accordance with the City of Moreno Valley standards. These plans will be prepared in 90%, 100% and Final Stages. The plans will be assembled after individual tasks are completed as defined in the tasks above. Other plans include, Vicinity Map, Roadway Sections showing pavement thickness, etc. Plans include:

- Trail improvement plans
- Traffic signal design plans
- Intersection crossing plans
- Signing, striping and markings

All approved plans will be provided to the City on compact disk in AutoCAD, as well as on "D" size Mylar. Specifications documents, including technical specifications, will be provided on digital medium disks in Microsoft Word format. The Engineers Estimate will be provided in Excel format. Specific subtasks include:

- 1) *Specifications and Special Provisions and Engineers Estimate*
- 2) *2nd Review 90% Submittal*
- 3) *Final 100% Review and Submittal*

Deliverables:

- Four (4) full-size copies of plan submittals at 90%, and 100% completion milestones
- Cost estimates at 90%, and 100% completion milestones
- Project specifications at 90% and 100% completion milestones
- One full-size signed Mylar of approved 100% plan set
- One CD containing final signed plans (PDF and Autocad format), specifications, and estimate

TASK 2.5 - STAKEHOLDER OUTREACH & PERMIT ASSISTANCE

KOA will work extensively with the City of Moreno Valley and all stakeholders to effectively communicate complex issues to all impacted parties, enabling them to actively participate in policy, planning, and design processes, in order for them to make informed decisions. KOA will coordinate with all stakeholders during the PA/ED and PS&E phases and assist the City with any permits that may be required. Specific subtasks include:

- 1) *Outreach and Coordination with Stakeholders; Permit Assistance*

RIGHT OF WAY ENGINEERING

TASK 3.0 - RIGHT OF WAY SERVICES

City of Moreno Valley may need to acquire easements of approximately 42 parcels in order to complete the Juan Bautista De Anza Multi-Use Trail Project. Due to unity of use, common ownership and contiguity of some of the 42 parcels, we have determined a total of 37 legal larger parcels need partial acquisitions for easements. OPC will assume that no rights are to be acquired on parcels owned by the City of Moreno Valley.

TASK 3.1 - RIGHT OF WAY PROJECT MANAGEMENT (OPC)

Project management and planning begins prior to the appraisal and acquisition activities. As the point of contact for all activities described in this proposal, OPC's Project Manager will Track and manage all budgetary-related aspects of the project associated with OPC's Scope of Work. Assist with the development of administrative policies, procedures, and forms necessary to carry out the initial program. Manage ongoing general consultation and project coordination with the Client, City, other project team members and subconsultants, including one (1) project team meeting. Preparation and presentation of a monthly status report/tracking reports based on the agreed- upon guidelines on information to be provided. Confer with client verbally on general status, issues, and progress. Coordinate with federal and state oversight agencies, as applicable. Oversee subcontracting for, and managing of, any necessary disciplines needed for the project.

TASK 3.2 - TITLE INVESTIGATION SERVICES (COMMONWEALTH TITLE)

Upon Notice to proceed, OPC will order and review applicable title work through (Commonwealth Title or client's choice) to make sure there are not any encumbrances that cannot be removed administratively by the title company. Any parcels with items that cannot be removed by the title company may have to be prioritized for condemnation to receive clear title.

TASK 3.3 - APPRAISAL WAIVER VALUATION / MINIMUM VALUE ESTIMATE (MVE) IN LIEU OF APPRAISAL:

If it is determined that the value of the take will not exceed \$10,000 and the take would be minor and uncomplicated, a Waiver Valuation or Minimum Value Estimate (MVE) may suffice in lieu of a full right of way appraisal report. A Waiver Valuation would be completed in-house by OPC. It should be noted though, that a waiver valuation would not be enough to condemn, if condemnation becomes necessary, in which case, a full appraisal report and appraisal review would need to be initiated.

1. OPC will mail a notification letter and acquisition policies brochure to the property owner requesting permission to conduct an on-site inspection of the property, advising them of their right to accompany the Valuation Analyst at the time of the inspection, and requesting information
2. Valuation Analyst will review title information pertaining to respective ownership and will review drawings and other pertinent information relative to the parcel.
3. Valuation Analyst will inspect the property personally with the owner (if possible) and document the inspection with photographs for use in the report.
4. Valuation Analyst will perform market research to support the selected appraisal methodologies.
5. Prepare waiver valuation report.
6. Provide QA/QC of final work product, submit to client and other Project Team members and respond to inquiries.

TASK 3.3A - APPRAISAL SERVICES (SANTOLUCITO DORE GROUP, INC) (OPTIONAL)

Appraisal work will be performed by Santolucito Dore Group, Inc. (SD Group) under the requirements of the Uniform Standards of Professional Appraisal Practice (USPAP) and the Code of Ethics of the Appraisal Institute.

In appraising property for acquisition, it is necessary to contact subject property owners and invite them to accompany appraisers on the property inspection. This is facilitated using a Notice of Intent/Decision to Appraise

(NDA) letter, sent certified mail with return receipt requested.

TASK 3.4 - PROPERTY ACQUISITIONS/NEGOTIATIONS (OPC)

OPC will perform all acquisition work in a manner that adheres to all professional standards, ethics and all applicable laws and regulations, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and Title 25, California Code of Regulations, as amended. We have an exceptional working knowledge of Title 49 Code of Federal Regulations (CFR) Part 24, State of California eminent domain law, and Caltrans Right of Way Manual Acquisition guidelines.

PRE-ACQUISITIONS. During the early phase of the project, OPC will perform pre-acquisition activities consisting of a comprehensive review of the title reports and underlying record documents, legal descriptions, right of way maps and other information relevant to the project. OPC’s Project Manager will coordinate with the appraisers on title issues, property inspection, and clarification of engineering design elements. This initial stage will also include preparation of written offers of just compensation, deeds, and right of way agreements in accordance with applicable requirements, to submit to the City for approval.

NEGOTIATIONS. Following the City’s approval of just compensation, OPC will present the City’s written purchase offer to the owner and/or owner’s representative. Negotiations will involve an interactive, face-to-face discussion with the property owner *while maintaining proper social distancing*; explanation of the project and its impacts to the property; explanation of the appraisal process and how the value was concluded by the appraiser; and answer any questions or concerns the owner may have.

Based upon OPCs decades of experience, they have found that the most important aspect of acquiring private property under the threat of eminent domain is to establish and maintain a good, respectful and trusting relationship with the property owner. OPC’s goal is always to achieve a “win – win” result for all right of way activities.

OPCs agents will negotiate in good faith, with an open mind for creative solutions that would be mutually beneficial to all parties involved. In the event a counter proposal is made, OPC will evaluate its merits and make recommendations if an administrative adjustment or settlement is warranted, based on the facts. OPC consults with the real estate appraiser to provide supplemental research and analysis of property owner presented reports or theories. Supplemental negotiations may also include addressing any objection or question concerning the project the owner has by conferring with the City’s Project Manager. Once an agreement is reached, OPC will submit the appropriate executed documents to the City for approval, including letters of recommendation with supporting documentation if an administrative settlement is being recommended.

TASK 3.5 - ESCROW COORDINATION (OPC)

OPCs in-house escrow coordinators will assist the escrow/title company to:

1. Open escrow and coordinate execution of closing instructions providing for title insurance coverage at the settlement amount.
2. Provide escrow officer with fully executed acquisition contract and notarized deed(s).
3. Work in conjunction with escrow officer to facilitate the clearance of title matters as set forth in the settlement memorandum and escrow instructions.
4. Assist escrow to secure full or partial reconveyance and/or subordination instruments from lien holders of record, if needed.
5. Review settlement statement for accuracy.
6. Coordinate deposit of acquisition price and estimated closing costs with escrow.
7. After the closing, review the title insurance policy for accuracy, if ordered.
8. Prepare and mail a letter to County Assessor requesting cancellation of taxes, if appropriate.

IF SETTLEMENT BY EMINENT DOMAIN: OPC will assist eminent domain counsel with the following:

1. Prepare a letter for the client signature, to City council requesting proceeding to condemnation.
2. Provide eminent domain counsel with available right of way maps and legal descriptions, preliminary title reports and title review documents, and information on how to contact each owner or interest holder.

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

3. Provide eminent domain counsel with a duplicate copy of the parcel file, together with a copy of the appraisal, offer to purchase, correspondence, acquisition contract, and deed as presented.
4. Convert preliminary title reports to litigation guarantees for eminent domain counsels' use. Title company fees (based on the value of the interest required) are additional.

TASK 3.6 - RIGHT OF WAY CERTIFICATION SERVICES (OPC)

Following settlement, OPC will support the City to:

1. Attend certification planning meeting with client's Right of Way Local Assistance Coordinator and project team.
2. Ensure that all interests necessary for the project have been secured.
3. Prepare certification forms, in coordination with the engineer and client, to include the compilation of all necessary back-up documents required including deed, final order of condemnation, access easements, cooperative agreements, permits, right of entries, etc.
4. Submit all necessary certification documentation to the Client.

Deliverables:

- Monthly status reports and schedule updates
- Preliminary Title Reports
- Minimum Value Estimate /Appraisal Reports
- Written offers of just compensations including draft deeds and right of way agreements; executed deeds and right of way agreements and administrative settlement, if applicable; closed files.
- Final Closed Escrow Documents, Recorded Deed, and Policy of Title Insurance.
- Right of Way Certifications.

BIDDING AND CONSTRUCTION SUPPORT

TASK 4.0 - ENGINEERING SUPPORT DURING BIDDING, AWARD & CONSTRUCTION PHASE

KOA will assist the City in advertising for bids, and providing plans and specifications. Tasks may include answering questions from prospective bidders, providing responses to requests for information (RFI's), preparing addenda to the PS&E during the advertisement period, and providing consultation and interpretation of construction documents. KOA will attend the project pre-construction meeting. During construction, we will be available to answer requests for information, requests for clarification, and address interpretation needing comment. We will issue clarifications or addenda if necessary. We will be available to review and comment on project submittals. KOA will work closely with the City's appointed construction inspector. Subtasks will be as follows:

- 1) *Bidding Services*
- 2) *Preconstruction meeting*
- 3) *Review Inquiries, submittals and change orders during construction*
- 4) *Prepare As Built Drawings*

Deliverables:

- RFI Responses /As Built Drawing

PROJECT SCHEDULE

A preliminary Project Schedule is included in the Appendix per RFP requirements. The schedule is very conservative and includes all of the necessary tasks to complete the project. While this schedule reflects our ideas regarding the most efficient and expeditious manner for taking on this project, we are open to suggestions from the City's staff and will modify our schedule accordingly.

F. QUALITY CONTROL AND ASSURANCE

KOA is well known for producing high quality work products. We have numerous repeat public clients in the county of San Bernardino and elsewhere who appreciate the quality of work and services that we provide. KOA has established a thorough in-house quality control manual. All work prepared by KOA will go through a QA/QC process based on a checklist procedure. Two individuals are usually involved in the QA/QC process. The primary objective of KOA's quality control program is to ensure that every aspect of the work is constructed in accordance with the contract documents and approved submittals; is in compliance with the applicable code and to industry standards; and is performed consistent with the owner's expectation.

The City of Moreno Valley is our very valuable client and we will exercise our utmost care, as always, to ensure that the City receives the best professional services from us. Quality Control applies to the full spectrum of project activity from preparing proposals all the way to project close-out. It is inherent in the way we plan, do, check, and act to produce the work we perform for our clients, both internal and external.

A QA/QC program is essential in providing sound environmental and engineering documents that can quickly be approved by the appropriate agencies with minimal comments and re-work. Prior to all submittals, each report is reviewed by a technical leader in the pertinent discipline for internal procedures followed, document revisions, check print stamps, and completed checklists, until the reviewer is satisfied with the submittal. When an inter-discipline review is required, it is performed in the same manner as the discipline reviews. All QA/QC documentation will be filed in the project files for easy retrieval for internal audits, and is readily available should the City require proof of review.

Chuck Stephan will be the Quality Control Officer for this project. He is well suited for the role as he is an experienced hands-on engineer and project manager who routinely reviews and guides the work of KOA design teams.

Understanding the expectations of the client and stakeholder agencies in advance ensures that the submittals will meet those expectations. This, in turn, builds trust and helps expedite the review and approval process. When submitted to City for review, the Project QA/QC Plan will be reviewed and assessed to ensure that these topic areas are covered and adequately addressed by the plan.

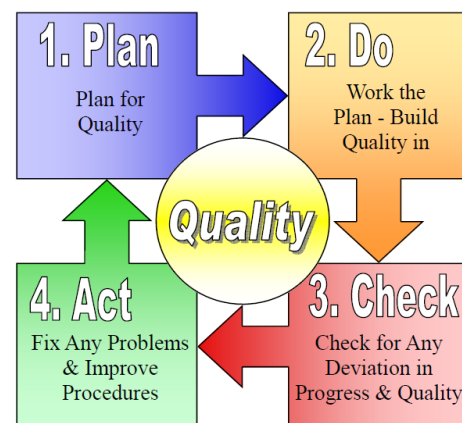
KOA is committed to generating quality work products and strive for producing error-free plans. Our Quality Assurance/Quality Control (QA/QC) process involves having plans go through a minimum of two stages of internal review, before allowing plans to be submitted to an agency for plan review and approval. The first stage of internal review involves a peer review by an experienced design engineer. The second stage of internal review involves another round of reviews by one or more senior-level registered engineers. Each reviewer confirms that plans reflect the appropriate improvement scope and conform to the approving agency's design standards and plan format. The reviewers also verify that all plan check comments have been properly addressed on any plan revisions we prepare. All of our planning and study efforts also go through the same rigorous review process. This approach ensures a high level of quality in our engineering plans. We believe our team has established a strong reputation with many agencies for producing high quality work products.

G. ADDITIONAL RELEVANT INFORMATION

N/A

H. ADDITIONS OR EXCEPTIONS TO THE CITY'S REQUEST FOR PROPOSAL

KOA takes has no additions and takes no exceptions to the City's provisions and conditions of the RFP.



Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA



Resource Allocation
 Professional Consultant Services for Juan Bautista De Anza Multi-Use Trail from Moreno Valley Mall to Iris Ave.
 Project No. 801 0086
 City of Moreno Valley

TASKS	QA/QC Engineer	Project Manager	Project Engineer	Associate Engineer	Admin. Assist.	Right-of-Way OPC	Environmental ECorp	Survey Calvada	Environmental ECORP	Geotech EMI
Project Management										
Task 1.0 - Project Management and Administration										
1) Management of project team including sub-consultant		40	40							
2) Develop and agree on design standards		4	4					2		
3) Conduct PDT Meetings including Preparing Agenda and Meeting Minutes	2	24	20		8			8		
4) Submit Monthly Progress Reports and Invoices including Updating Schedules		12			12					
5) Quality Control of Submittals	24									
Subtotal	26	80	64	0	20	0	0	10	0	0
PA&ED Completion										
Task 1.1 - Review and Evaluate Conceptual Design and Preliminary Project R										
1) Review PA/ED Documents		4	4							
2) Evaluate and Refine Conceptual Design		2	8	16						
3) Communications with Stakeholders		4	4							
Subtotal	0	10	16	16	0	0	0	0	0	0
Task 1.2 - Utility Research and Coordination										
1) Contact and obtain utility information		2	4	12	4					
2) Prepare notices and follow up requests with plans to utility companies		2	4	12	4					
Subtotal	0	4	8	24	8	0	0	0	0	0
Task 1.3 - Identify Right of Way Impact										
1) Identify Right of Way Impact		2	4	4						
2) Prepare Right of Way Impact Map		1	8	16						
3) Prepare legal descriptions		2	4	16				21		
Subtotal	0	3	12	20	0	0	0	21	0	0
Task 1.4 - Environmental Review										
1) Environmental Review		4	8						24	
Subtotal	0	4	8	0	0	0	0	0	24	0
Task 1.5 - Preliminary Design Plans (50% Submittal)										
1) Prepare Preliminary Design Plan (50%)	2	8	60	120						
2) Prepare Preliminary Cost Estimates		2	8	12						
Subtotal	2	10	68	132	0	0	0	0	0	0
Final Plans, Specifications, & Estimates										
Task 2.1 - Data Review, Field Surveying and Base Mapping										
1) Obtain and Review Existing Record Drawings and Utility Maps		2	2						40	
2) Field Survey Topographic Features		2							120	
3) Field Review Verification		1	4	8					7	
4) Preparation of Base Map		2	4	8					104	
Subtotal	0	7	10	16	0	0	0	0	271	0
Task 2.2 - Utility Coordination and Potholing										
1) Utility Coordination		4	12	20	4					
2) Prepare notices and follow up requests with plans to utility companies		4	12	20	4					
3) Pothole utilities (optional)		2	4	8						
Subtotal	0	8	24	40	8	0	0	0	0	0
Task 2.3 - Geotechnical Evaluation Studies										
1) Perform field investigation and sampling of on-site soils		2	2							4
2) Perform laboratory testing and analysis and infiltration study		2								32
3) Finalize Trail pavement section		2								24
4) Provide soil data for abutment design		2	4							40
Subtotal	0	8	6	0	0	0	0	0	0	100
Task 2.4 - Prepare Interim and Final Plans, Specifications and Estimate										
1) Specifications and Special Provisions and Engineers Estimate	1	2	12	40	16					
2) 2nd Review 90% Submittal	4	20	80	160						
3) Final 100% Review and Submittal	2	12	40	80						
Subtotal	7	34	132	280	16	0	0	0	0	0
Task 2.5 - Stakeholder Outreach & Permit Assistance										
1) Outreach and Coordination with Stakeholders; Permit Assistance	2	20	20	20						
Subtotal	2	20	20	20	0	0	0	0	0	0
Right of Way Engineering										
Task 3.1 - Right of Way Project Management (OPC)										
1) Right of Way Project Management (OPC)						95				
Subtotal	0	0	0	0	0	95	0	0	0	0
Task 3.2 - Title Investigation Services (Commonwealth Title)										
1) Title Investigation Services (Commonwealth Title)		2				84				
Subtotal	0	2	0	0	0	84	0	0	0	0
Task 3.3 - Appraisal Waiver Valuation / Minimum Value Estimate (MVE) In Lieu of Appraisal:										
1) Appraisal Waiver Valuation / Minimum Value Estimate (MVE) In Lieu of Appraisal:		4	4			126				
Subtotal	0	4	4	0	0	126	0	0	0	0
Task 3.3a - Appraisal Services (Santolucito Dore Group, Inc) (OPTIONAL)										
1) Appraisal Services (Santolucito Dore Group, Inc) (OPTIONAL)										
Subtotal	0	0	0	0	0	0	0	0	0	0
Task 3.4 - Property Acquisitions/Negotiations (OPC)										
1) Property Acquisitions/Negotiations (OPC)		4	4			504				
Subtotal	0	4	4	0	0	504	0	0	0	0
Task 3.5 - Escrow Coordination (OPC)										
1) Escrow Coordination (OPC)		4	4			110				
Subtotal	0	4	4	0	0	110	0	0	0	0
Task 3.6 - Right of Way Certification Services (OPC)										
1) Right of Way Certification Services (OPC)						10				
Subtotal	0	0	0	0	0	10	0	0	0	0
Bidding and Construction Support										
1) Bidding Services		2	2							
2) Preconstruction meeting		2	2							
3) Review Inquiries, submittals and change orders during construction	8	8	8							
4) Prepare As Built Drawings		2	8	20						
Subtotal	8	14	20	20	0	0	0	0	0	0
TOTAL HOURS	45	216	400	568	52	929	0	31	295	100

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CALVADA COMMITMENT LETTER

CALVADA

SURVEYING INC

May 28, 2020

Ming Guan, PE
 VP | Managing Director
 KOA (Ontario)
 3190 C Shelby Street
 Ontario, CA 91764
 mguan@koacorp.com

Subject: Letter of Commitment to the KOA Team for
 Juan Bautista de Anza Multi-Use Trail
 From Moreno Valley Mall Area to Lake Perris State Recreation Area

Calvada Surveying, Inc. commits to joining the KOA team on this project.

Calvada Surveying, Inc. is available and committed for the duration of the contract.

Calvada Surveying, Inc. provides Professional Land Surveying Services.

Calvada Surveying, Inc. is a certified MBE/SBE/DVBE firm and has attached current certifications to this letter.

The amount of this contract between KOA and Calvada is \$65,705.00 as stated in proposal P20-1274-R1

Sincerely,



Armando DuPont, President
 Calvada Surveying, Inc.

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

EARTH MECHANICS, INC. (EMI) COMMITMENT LETTER



Earth Mechanics, Inc.

Geotechnical & Earthquake Engineering

May 28, 2020

Ming Guan, PE
 VP | Managing Director
 KOA
 3190 C Shelby Street
 Ontario, CA 91764

Subject: Letter of Commitment for Professional Consultant Services
 for Juan Bautista De Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue
 (PROJECT NUMBER: 801 0086)

Dear Ms. Guan,

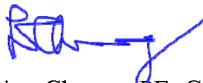
Earth Mechanics, Inc. (EMI) is pleased to join KOA for Professional Consultant Services for Juan Bautista De Anza Multi-Use Trail from Moreno Valley Mall to Iris Avenue (Project Number: 801 0086). EMI will provide the KOA team needed resources to support the full delivery of this project if awarded.

A certified DBE firm, EMI will provide geotechnical and earthquake engineering services. EMI has provided geotechnical services including field exploration and soil laboratory testing, seismic evaluation, foundation design, report preparation, and construction support for several active transportation projects including the Salt Creek Trail Phase 2 in Riverside County, the Bayshore Bikeway and the El Portal Pedestrian/Bicycle Underpass in San Diego County, as well as the Kelvin Pedestrian Bridge, the Venta Spur Bicycle/Pedestrian Trail, the Santa Ana River Trail Project and the I-5/Jeffrey Road Bicycle and Pedestrian Bridge in Orange County.

EMI is fully committed to assist KOA in meeting the needs and exceeding the expectations of the agency lead. We appreciate your interest in EMI and look forward to working with the KOA team and the agency lead for this contract.

If you have any questions please do not hesitate to contact me at 714-751-3826 or e-mail at l.cheang@earthmech.com

Sincerely,
 Earth Mechanics, Inc.



Lino Cheang, PE, GE
 Principal

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

CITY-REQUIRED STATEMENTS

- 1) This RFP will be incorporated in its entirety as a part of KOA's Proposal.
- 2) This RFP and KOA's Proposal will jointly become part of the Agreement for Professional Consultant Services when said Agreement is fully executed by KOA and the Mayor or City Manager of Moreno Valley.
- 3) KOA's services to be provided, and fees therefore, will be in accordance with the City's RFP except as otherwise specified in our Proposal under the heading "ADDITIONS OR EXCEPTIONS TO THE CITY'S REQUEST FOR PROPOSAL."
- 4) KOA's hourly rate schedule is part of KOA's Proposal for use in invoicing for progress payments and for extra work incurred that is not part of the RFP. All extra work will require prior approval from the City.
- 5) All charges for KOA services are a "Not-to-Exceed Fee" which include conservatively estimated reimbursable expenses, as submitted with and made a part of KOA's Proposal.
- 6) KOA acknowledges and understands that it will not be allowed to change the sub-consultant without written permission from the City.
- 7) KOA will document and provide the results of the work to the satisfaction of the City. This may include preparation of field and final reports, or similar evidence of attainment of the Agreement objectives.
- 8) KOA will immediately document and notify the City of any defects or hazardous conditions observed in the vicinity of the project site prior to, during, or after the construction work.
- 9) KOA will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.
- 10) All federal laws and regulations will be adhered to notwithstanding any state or local laws and regulations. In a case of conflict between federal, state, or local laws or regulations the strictest will be adhered to.
- 11) KOA will allow all authorized federal, state, county, and City officials access to place of work, books, documents, papers, fiscal, payroll, materials, and other relevant contract records pertinent to this special project. All relevant records will be retained for at least three years.
- 12) KOA will comply with the Davis-Bacon Fair Labor Standards Act (40 USC 276-a through a-7), and the implementation regulations issued pursuant thereto (29 CFR Section 1, 5), any amendments thereof and the California Labor Code. Pursuant to the said regulations, entitled "Federal Labor Standards Provisions", "Federal Prevailing Wage Decision" and State of California prevailing wage rates, respectively.
- 13) KOA will comply with the Copeland Anti-Kickback Act (18 USC 874) and the Implementation Regulation (29 CFR 3) issued pursuant thereto, and any amendments thereof.
- 14) KOA offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 USC Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works or the subcontract. This assignment will be made and become effective at the time the City tenders final payment to KOA, without further acknowledgment by the parties.
- 15) This Agreement is subject to 49 CFR, Part 26 entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs."

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

EXHIBIT C**CITY - SERVICES TO BE PROVIDED
TO CONSULTANT**

1. Furnish the Consultant all in-house data which is pertinent to services to be performed by the Consultant and which is within the custody or control of the City, including, but not limited to, copies of record and off-record maps and other record and off-record property data, right-of-way maps and other right-of-way data, pending or proposed subject property land division and development application data, all newly developed and pertinent design and project specification data, and such other pertinent data which may become available to the City.
2. Provide timely review, processing, and reasonably expeditious approval of all submittals by the Consultant.
3. Provide timely City staff liaison with the Consultant when requested and when reasonably needed.

EXHIBIT D

TERMS OF PAYMENT

1. The Consultant's compensation shall not exceed \$482,824.00.
2. The Consultant will obtain, and keep current during the term of this Agreement, the required City of Moreno Valley business license. Proof of a current City of Moreno Valley business license will be required prior to any payments by the City. Any invoice not paid because the proof of a current City of Moreno Valley business license has not been provided will not incur any fees, late charges, or other penalties. Complete instructions for obtaining a City of Moreno Valley business license are located at: <http://www.moval.org/dobiz/biz-license.shtml>
3. The Consultant will electronically submit an invoice to the City once a month for progress payments along with documentation evidencing services completed to date. The progress payment is based on actual time and materials expended in furnishing authorized professional services during the preceding calendar month. At no time will the City pay for more services than have been satisfactorily completed and the City Engineer's determination of the amount due for any progress payment shall be final. The consultant will submit all original invoices to Capital Projects Division staff at Techinfo-capproj@moval.org or calls directed to (951) 413-3130.
4. The Consultant agrees that City payments will be received via Automated Clearing House (ACH) Direct Deposit and that the required ACH Authorization form will be completed prior to any payments by the City. Any invoice not paid

because the completed ACH Authorization Form has not been provided will not incur any fees, late charges, or other penalties. The ACH Authorization Form is located at: <http://www.moval.org/cityhall/forms.shtml#bf>

5. The minimum information required on all invoices is:
 - A. Vendor Name, Mailing Address, and Phone Number
 - B. Invoice Date
 - C. Vendor Invoice Number
 - D. City-provided Reference Number (e.g. Project, Activity)
 - E. Detailed work hours by class title (e.g. Manager, Technician, or Specialist), services performed and rates, explicit portion of a contract amount, or detailed billing information that is sufficient to justify the invoice amount; single, lump amounts without detail are not acceptable.
6. The City shall pay the Consultant for all invoiced, authorized professional services within forty-five (45) days of receipt of the invoice for same.

PROPOSAL FEE

Professional Consultant Services for Juan Bautista De Anza Multi-Use Trail from Moreno Valley Mall to Iris Ave.

Project No. 801 0086

City of Moreno Valley



TASKS	QA/QC Engineer \$225	Project Manager \$193	Project Engineer \$139	Associate Engineer \$94	Admin. Assist. \$100	Right-of-Way OPC	Survey Calvada	Environmental ECORP	Geotech EMI	TOTAL COST
Project Management										
Task 1.0 - Project Management and Administration										
1) Management of project team including sub-consultant		40	40							\$13,299
2) Develop and agree on design standards		4	4				\$600			\$1,930
3) Conduct PDT Meetings including Preparing Agenda and Meeting Minutes	2	24	20		8		\$1,200			\$9,876
4) Submit Monthly Progress Reports and Invoices including Updating Schedules		12			12					\$3,524
5) Quality Control of Submittals	24									\$5,400
Subtotal	26	80	64		20	\$0	\$1,800	\$0	\$0	\$34,029
PA&ED Completion										
Task 1.1 - Review and Evaluate Conceptual Design and Preliminary Project Report										
1) Review PA&ED Documents		4	4							\$1,330
2) Evaluate and Refine Conceptual Design		2	8	16						\$3,001
3) Communications with Stakeholders		4	4							\$1,330
Subtotal		10	16	16		\$0	\$0	\$0	\$0	\$5,661
Task 1.2 - Utility Research and Coordination										
1) Contact and obtain utility information		2	4	12	4					\$2,470
2) Prepare notices and follow up requests with plans to utility companies		2	4	12	4					\$2,470
Subtotal		4	8	24	8	\$0	\$0	\$0	\$0	\$4,941
Task 1.3 - Identify Right of Way Impact										
1) Identify Right of Way Impact		2	4	4						\$1,319
2) Prepare Right of Way Impact Map		1	8	16						\$2,808
3) Prepare legal descriptions (\$550 each optional)		2	4	16			\$23,100			\$25,544
Subtotal		3	12	20		\$0	\$23,100	\$0	\$0	\$4,126
Task 1.4 - Environmental Review										
1) Environmental Review		4	8					\$3,500		\$5,387
Subtotal		4	8			\$0	\$0	\$3,500	\$0	\$5,387
Task 1.5 - Preliminary Design Plans (50% Submittal)										
1) Prepare Preliminary Design Plan (50%)	2	8	60	120						\$21,603
2) Prepare Preliminary Cost Estimates		2	8	12						\$2,626
Subtotal	2	10	68	132		\$0	\$0	\$0	\$0	\$24,229
Final Plans, Specifications, & Estimates										
Task 2.1 - Data Review, Field Surveying and Base Mapping										
1) Obtain and Review Existing Record Drawings and Utility Maps		2	2				\$6,000			\$6,665
2) Field Survey Topographic Features		2					\$43,200			\$43,586
3) Field Review Verification		1	4	8			\$1,785			\$3,285
4) Preparation of Base Map		2	4	8			\$12,920			\$14,614
Subtotal		7	10	16			\$63,905			\$68,150
Task 2.2 - Utility Coordination and Potholing										
1) Utility Coordination		4	12	20	4					\$4,721
2) Prepare notices and follow up requests with plans to utility companies		4	12	20	4					\$4,721
3) Pothole utilities (up to 20 holes)		2	4	8			\$20,375			\$22,069
Subtotal		8	24	40	8	\$20,375	\$0	\$0	\$0	\$9,442
Task 2.3 - Geotechnical Evaluation Studies										
1) Perform field investigation and sampling of on-site soils		2	2						\$2,500	\$3,165
2) Perform laboratory testing and analysis and infiltration study		2							\$3,818	\$4,205
3) Finalize Trail pavement section		2							\$4,440	\$4,826
4) Provide soil data for abutment design		2	4						\$3,536	\$4,479
Subtotal		8	6			\$0	\$0	\$0	\$14,294	\$16,675
Task 2.4 - Prepare Interim and Final Plans, Specifications and Estimate										
1) Specifications and Special Provisions and Engineers Estimate	1	2	12	40	16					\$7,640
2) 2nd Review 90% Submittal	4	20	80	160						\$30,908
3) Final 100% Review and Submittal	2	12	40	80						\$15,840
Subtotal	7	34	132	280	16				\$0	\$54,388
Task 2.5 - Stakeholder Outreach & Permit Assistance										
1) Outreach and Coordination with Stakeholders; Permit Assistance	2	20	20	20						\$8,975
Subtotal	2	20	20	20		\$0	\$0	\$0	\$0	\$8,975
Right of Way Engineering										
Task 3.1 - Right of Way Project Management (OPC)										
1) Right of Way Project Management (OPC)							\$22,000			\$22,000
Subtotal							\$22,000	\$0	\$0	\$22,000
Task 3.2 - Title Investigation Services (Commonwealth Title)										
1) Title Investigation Services (Commonwealth Title)		2					\$29,600			\$29,986
Subtotal		2					\$29,600	\$0	\$0	\$29,986
Task 3.3 - Appraisal Waiver Valuation / Minimum Value Estimate (MVE) In Lieu										
1) Appraisal Waiver Valuation / Minimum Value Estimate (MVE) In Lieu of Appraisal:		4	4				\$44,400			\$45,730
Subtotal		4	4				\$44,400	\$0	\$0	\$45,730
Task 3.3a - Appraisal Services (Santolucito Dore Group, Inc) (OPTIONAL)										
1) Appraisal Services (Santolucito Dore Group, Inc) (OPTIONAL)							\$122,800			\$122,800
Subtotal							\$122,800	\$0	\$0	\$122,800
Task 3.4 - Property Acquisitions/Negotiations (OPC)										
1) Property Acquisitions/Negotiations (OPC)		4	4				\$111,000			\$112,330
Subtotal		4	4				\$111,000	\$0	\$0	\$112,330
Task 3.5 - Escrow Coordination (OPC)										
1) Escrow Coordination (OPC)		4	4				\$19,400			\$20,730
Subtotal		4	4				\$19,400	\$0	\$0	\$20,730
Task 3.6 - Right of Way Certification Services (OPC)										
1) Right of Way Certification Services (OPC)							\$1,850			\$1,850
Subtotal							\$1,850	\$0	\$0	\$1,850
Bidding and Construction Support										
1) Bidding Services		2	2							\$665
2) Preconstruction meeting		2	2							\$665
3) Review Inquiries, submittals and change orders during construction	8	8	8							\$4,460
4) Prepare As Built Drawings		2	8	20						\$3,376
Subtotal	8	14	20	20						\$9,166
ODC										\$2,624
TOTAL HOURS	45	216	400	568	52					
TOTAL COST	\$10,125	\$41,728	\$55,716	\$53,252	\$5,223	\$228,250	\$65,705	\$3,500	\$16,918	\$482,824

Attachment: Agreement (4051 : AUTHORIZATION TO AWARD A PROFESSIONAL CONSULTANT SERVICES AGREEMENT TO KOA

BILLING RATES

KOA Corporation 2020 Hourly Billing Rates	
Professional Services	2020 Rates
President/CEO	\$ 330.75
Principal II	\$ 278.25
Principal I	\$ 236.25
Senior Engineer II	\$ 225.75
Senior Engineer I	\$ 189.00
Senior Associate Engineer II	\$ 147.00
Senior Associate Engineer I	\$ 131.25
Associate Engineer II	\$ 120.75
Associate Engineer I	\$ 105.00
Senior Designer II	\$ 136.50
Senior Designer I	\$ 120.75
Associate Designer II	\$ 105.00
Associate Designer I	\$ 78.75
Senior Planner II	\$ 225.75
Senior Planner I	\$ 189.00
Senior Associate Planner II	\$ 147.00
Senior Associate Planner I	\$ 131.25
Associate Planner II	\$ 120.75
Associate Planner I	\$ 105.00
Administrative Assistant II	\$ 89.25
Intern	\$ 57.75

General Provisions:

- Project reimbursable expenses are billed at cost.
- Project expenses include: Non-commuter automobile mileage (\$0.58 per mile) or current IRS rate, postage and special courier expenses, travel expenses, reproduction, subcontractor services and other direct project expenses as requested by the client.
- Telephone, equipment, and fax are included in the above hourly costs.
- Direct expenses including blacklining, commercial CAD plotting, sub-consultant expense, issuance of specially endorsed insurance certificate, and direct costs are billed at cost plus 5% unless stated otherwise in the proposal.
- Annual adjustments in these billing rates of approximately 5% will occur on January 1 of each calendar year.

KOA’s hourly rate schedule is part of KOA’s Proposal for use in invoicing for progress payments and for extra work incurred that is not part of the RFP. All extra work will require prior approval from the City.

EXHIBIT E**INSURANCE REQUIREMENTS****Minimum Scope of Insurance**

Coverage shall be at least as broad as:

1. The most current version of Insurance Services Office (ISO) Commercial General Liability Coverage Form CG 00 01, which shall include insurance for “bodily injury,” “property damage” and “personal and advertising injury” with coverage for premises and operations, products and completed operations, and contractual liability.
2. The most current version of Insurance Service Office (ISO) Business Auto Coverage Form CA 00 01, which shall include coverage for all owned, hired, and non-owned automobiles or other licensed vehicles (Code 1- Any Auto).
3. Workers’ Compensation insurance as required by the California Labor Code and Employer’s Liability Insurance.
4. Professional Liability (Errors and Omissions) insurance appropriate to Consultant’s profession.

Minimum Limits of Insurance

Consultant shall maintain limits of liability of not less than:

1. General Liability:
 - \$1,000,000 per occurrence for bodily injury and property damage
 - \$1,000,000 per occurrence for personal and advertising injury
 - \$2,000,000 aggregate for products and completed operations
 - \$2,000,000 general aggregate
2. Automobile Liability:
 - \$1,000,000 per accident for bodily injury and property damage
3. Employer’s Liability:
 - \$1,000,000 each accident for bodily injury
 - \$1,000,000 disease each employee
 - \$1,000,000 disease policy limit

4. Professional Liability (Errors and Omissions):

\$1,000,000 per claim/occurrence
\$2,000,000 policy aggregate

Umbrella or Excess Insurance

In the event Consultant purchases an Umbrella or Excess insurance policy(ies) to meet the "Minimum Limits of Insurance," this insurance policy(ies) shall "follow form" and afford no less coverage than the primary insurance policy(ies).

Deductibles and Self-Insured Retentions

Consultant shall be responsible for payment of any deductibles contained in any insurance policy(ies) required hereunder and Consultant shall also be responsible for payment of any self-insured retentions. Any deductibles or self-insured retentions must be declared to, and approved by, the City Manager or his/her designee. At the option of the City Manager or his/her designee, either (i) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects City, CSD, Housing Authority and each of their officers, officials, employees, agents and volunteers; or (ii) Consultant shall provide a financial guarantee, satisfactory to the City Manager or his/her designee, guaranteeing payment of losses and related investigations, claim administration and defense expenses. At no time shall City be responsible for the payment of any deductibles or self-insured retentions.

Other Insurance Provisions

The General Liability and Automobile Liability insurance policies are to contain, or be endorsed to contain, the following provisions:

1. City, CSD, Housing Authority and each of their officers, officials, employees, agents and volunteers are to be covered as additional insureds.
2. The coverage shall contain no special limitations on the scope of protection afforded to City, CSD, Housing Authority and each of their officers, officials, employees, agents and volunteers.
3. Consultant's insurance coverage shall be primary and no contribution shall be required of City.

The Workers' Compensation insurance policy is to contain, or be endorsed to contain, the following provision: Consultant and its insurer shall waive any right of subrogation against City, CSD, Housing Authority and each of their officers, officials, employees, agents and volunteers.

If the Professional Liability (Errors and Omissions) insurance policy is written on a claims-made form:

1. The retroactive date must be shown, and must be before the effective date of the Agreement or the commencement of work by Consultant.
2. Insurance must be maintained and evidence of insurance must be provided for at least 3 years after any expiration or termination of the Agreement or, in the alternative, the policy shall be endorsed to provide not less than a 3-year discovery period.
3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the effective date of the Agreement or the commencement of work by Consultant, Consultant must purchase extended reporting coverage for a minimum of 3 years following the expiration or termination of the Agreement.
4. A copy of the claims reporting requirements must be submitted to City for review.
5. These requirements shall survive expiration or termination of the Agreement.

All policies of insurance required hereunder shall be endorsed to provide that the coverage shall not be cancelled, non-renewed, reduced in coverage or in limits except after 30 calendar day written notice by certified mail, return receipt requested, has been given to City. Upon issuance by the insurer, broker, or agent of a notice of cancellation, non-renewal, or reduction in coverage or in limits, Consultant shall furnish City with a new certificate and applicable endorsements for such policy(ies). In the event any policy is due to expire during the work to be performed for City, Consultant shall provide a new certificate, and applicable endorsements, evidencing renewal of such policy not less than 15 calendar days prior to the expiration date of the expiring policy.

Acceptability of Insurers

All policies of insurance required hereunder shall be placed with an insurance company(ies) admitted by the California Insurance Commissioner to do business in the State of California and rated not less than "A-VII" in Best's Insurance Rating Guide; or authorized by the City Manager or his/her designee.

Verification of Coverage

Consultant shall furnish City with all certificate(s) and **applicable endorsements** effecting coverage required hereunder. All certificates and **applicable endorsements** are to be received and approved by the City Manager or his/her designee prior to City's execution of the Agreement and before work commences.



Report to City Council

TO: Mayor and City Council

FROM: Marshall Eyerman, Assistant City Manager
Mike Lee, Interim City Manager

AGENDA DATE: June 16, 2020

TITLE: CONSIDERATION OF A RESOLUTION CREATING THE MORENO VALLEY CITIZENS PUBLIC SAFETY COMMITTEE

RECOMMENDED ACTION

Recommendation:

1. Approve Resolution No. 2020-_____, a Resolution of the City Council of the City of Moreno Valley, California, establishing the Moreno Valley Citizens Public Safety Committee
2. Ratify Mayor's appointment of Mayor Pro Tem Victoria Baca to serve as the Ad Hoc Committee Chairperson and Council Member Dr. Carla Thornton to serve as the Vice Chairperson. These positions shall be tasked with working with community stakeholders to guide the development of the Moreno Valley Citizens Public Safety Committee.
3. Direct the City Clerk to seek applications for the review and potential appointment by the Mayor to the Committee.

SUMMARY

Due to the ongoing and recent events surrounding violence throughout the Country, at the June 2, 2020 City Council meeting, the City Council provided direction to review the potential establishment of the City's first Moreno Valley Citizens Public Safety Committee in order to identify and address community concerns and to make meaningful changes to the delivery of public safety services through well-planned and synergistic strategies.

The Ad Hoc Committee shall be established to engage community stakeholders, identify community concerns, identify quality of life concerns, gather information on police services and practices, and develop potential positions of advocacy for the City Council.

The Committee would provide proposed solutions to best solve issues and address them before they become real problems. These efforts will ultimately strive to not only meet the goals of the City Council, but also address the concerns of the citizens and assure their voices are heard.

DISCUSSION

Moreno Valley has contracted with the Riverside County Sheriff's Department for law enforcement services since incorporation. The Sheriff's Department continues to provide high quality public safety services to the community of Moreno Valley. Over the years, the Department has remained receptive to receiving feedback from the contracting cities and has continued to adopt and amend operational policies as necessary to best serve the citizen's needs.

The Committee shall consist of eleven (11) Mayor-appointed voting members. The 11 members shall be composed of two (2) Council Members acting as the Chair and Vice-Chair; five (5) public members each of whom shall have the ability to evaluate the specific task and objectives of the Committee; two (2) non-profit members (e.g. Clergy) from churches located within Moreno Valley; and two (2) representatives from businesses located in Moreno Valley. Additionally, the Committee shall include three (3) nonvoting members to include members of the City Manager's Department; Police Department; and the Fire Department.

The Resolution recommends the creation of the Moreno Valley Citizens Public Safety Committee and lists the consolidated duties of this committee. Along with the assistance of Committee members and community stakeholders, the Committee shall be focused on identifying and developing positions of advocacy and awareness to make meaningful changes to the delivery of public safety services through well-planned and synergistic strategies.

The Committee shall have the general power and duty to act in an advisory capacity to the City Council with which shall include the following tasks:

- Make recommendation to the City Council in regard to public safety
- Solicit input and feedback on public safety events and outreach efforts
- Develop new programs to enhance the transparency and outreach
- Identify existing community concerns related to the delivery of police services and quality of life concerns

ALTERNATIVES

1. Approve proposed Resolution establishing an Ad Hoc Committee regarding the development of the Moreno Valley Citizens Public Safety Committee and appoint two members of the City Council and seek community stakeholders to guide the development of the Moreno Valley Citizens Public Safety Committee for Moreno Valley residents. *Staff recommends this alternative.*
2. Do not approve proposed Resolution establishing the Moreno Valley Citizens Public Safety Committee and do not appoint two members of the City Council and do not seek community stakeholders to guide the development of the Moreno Valley Citizens Public Safety Committee for Moreno Valley residents. *Staff does not recommend this alternative.*
3. Provide alternate direction to staff.

FISCAL IMPACT

A newly-constituted Moreno Valley Citizens Public Safety Committee would focus on improving police services which may reduce future liability and future contract rates.

NOTIFICATION

Posting of the agenda.

PREPARATION OF STAFF REPORT

Prepared By:
Marshall Eyerman
Assistant City Manager

Department Head Approval:
Mike Lee
Interim City Manager

CITY COUNCIL GOALS

Advocacy. Develop cooperative intergovernmental relationships and be a forceful advocate of City policies, objectives, and goals to appropriate external governments, agencies and corporations.

Public Safety. Provide a safe and secure environment for people and property in the community, control the number and severity of fire and hazardous material incidents, and provide protection for citizens who live, work and visit the City of Moreno Valley.

Positive Environment. Create a positive environment for the development of Moreno Valley's future.

Community Image, Neighborhood Pride and Cleanliness. Promote a sense of community pride and foster an excellent image about our City by developing and executing programs which will result in quality development, enhanced neighborhood preservation efforts, including home rehabilitation and neighborhood restoration.

CITY COUNCIL STRATEGIC PRIORITIES

- 1. Economic Development
- 2. Public Safety
- 3. Library
- 4. Infrastructure
- 5. Beautification, Community Engagement, and Quality of Life
- 6. Youth Programs

ATTACHMENTS

- 1. Committee Formation Resolution

APPROVALS

Budget Officer Approval	<u>✓ Approved</u>	6/08/20 5:14 PM
City Attorney Approval	<u>✓ Approved</u>	6/11/20 6:29 PM
City Manager Approval	<u>✓ Approved</u>	6/11/20 6:32 PM

RESOLUTION NO. 2020-___

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, ESTABLISHING THE MORENO VALLEY CITIZENS PUBLIC SAFETY COMMITTEE OF THE CITY COUNCIL

WHEREAS, on June 2, 2020 the City Council provided direction to review the establishment of Moreno Valley Citizens Public Safety Committee; and

WHEREAS, the City Council and the community have expressed concerns on the delivery of public safety services within the County and the City; and

WHEREAS, in order to fully identify and address concerns to make meaningful changes to the delivery of public safety services, well-planned and synergistic strategies must be established; and

WHEREAS, the City Council of the City of Moreno Valley will work with community stakeholders to guide the development of those strategies.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE THAT THE MORENO VALLEY CITIZENS PUBLIC SAFETY COMMITTEE IS ESTABLISHED WITH THE FOLLOWING SCOPE AND CHARACTERISTICS:

Section 1. Specific Tasks and Objectives

Specific tasks and objectives of the Ad Hoc Committee shall include, and be limited to, the following:

1. The Committee shall have the general power and duty to act in an advisory capacity to the City Council pertaining to the following tasks;
2. Solicit select community stakeholder participation;
3. Solicit resident input;
4. Identify existing community concerns related to the delivery of police services;
5. Identify existing quality of life concerns as a result of police services;
6. Solicit information on current or proposed police services and policies;
7. Assist in the planning for the public safety events and outreach, including the public safety expo and the Coffee with a Cop events;
8. Provide periodic progress reports to the City Council; and

1
Resolution No. 2020-___
Date Adopted: June 16, 2020

9. With the goal of identifying positions of advocacy to present to the City Council, as appropriate.

Section 2. Term

The Ad Hoc Committee shall exist until June 30, 2021, unless such term is extended by resolution of the City Council.

Section 3. Committee Type and Composition:

1. The Committee shall be a temporary Ad Hoc Committee.
2. The Committee shall consist of eleven (11) City Council-appointed voting members serving without compensation, and appointed in the manner and for the terms prescribed
3. The members of the Committee, including the chairperson and vice-chairperson shall be appointed by the Mayor with the approval of the City Council
4. The 11 voting members shall be composed of two (2) Council Members acting as the Chair and Vice-Chair; five (5) public members each of whom shall have the ability to evaluate the specific task and objectives of the Committee; two (2) non-profit members (e.g. Clergy) from churches located within Moreno Valley; and two (2) representatives from businesses located in Moreno Valley.
5. Three (3) nonvoting members of the Committee shall attend meetings as necessary and shall include members of the City Manager's Department; Police Department; and the Fire Department.

Section 4. Support to the Committee:

Staff support shall be initially provided to the Committee by the City Manager's Department staff with the provision that other department staff may be utilized for expertise as needed.

Section 5. Meetings:

The Committee shall hold, one regular meeting per month as needed and

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designate the times, dates and places therefor. If there is a lack of substantive agenda items for a regular meeting, and if there is no pending request from the City Council, such meeting may be cancelled by the chairperson or by a majority of the Committee. Meetings shall not be subject to the Ralph M. Brown Act.

Six or more voting members of the Committee shall constitute a quorum for the conduct of business, and a majority of such quorum shall be necessary to approve or deny an issue.

APPROVED AND ADOPTED this 16TH day of June, 2020.

Mayor of the City of Moreno Valley

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

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Attachment: Committee Formation Resolution [Revision 7] (4068 : CONSIDERATION OF A RESOLUTION CREATING THE MORENO VALLEY

RESOLUTION JURAT

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) ss.
CITY OF MORENO VALLEY)

I, Pat Jacquez-Nares, City Clerk of the City of Moreno Valley, California, do hereby certify that Resolution No. 2020-_____ was duly and regularly adopted by the City Council of the City of Moreno Valley at a regular meeting thereof held on the 16th day of June, 2020 by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

(Council Members, Mayor Pro Tem and Mayor)

CITY CLERK

(SEAL)

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Date Adopted: June 16, 2020